

## An Evaluation of the Effectiveness of Infant and Child Survival Interventions in Yendi District

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### Abstract

**Introduction:** Child survival continues to improve worldwide. The total number of deaths of children under five years old fell from 12.4 million in 1990 to 8.1 million in 2009. The mortality rate in children under five years old has fallen correspondingly from 89 per 1000 live births in 1990 to 60 per 1000 live births in 2009, representing a reduction of about one third. At the same time, the average annual rate of decline has accelerated over the period 2000–2009 compared with the 1990s. The level of mortality, however, remained alarmingly high in certain regions of the world.

**Method:** The study was a community-based cross sectional study. The study employed multi-stage random cluster sampling procedure to select households and villages in Yendi district. Both quantitative and qualitative methods were used to collect data from the study target population which included the caregivers, the community based agent and community health officers.

**Results:** Majority of the respondents practice exclusive breastfeeding up to six months of child's age while others practice up to four months. A good percentage (48%) of the caregivers introduced complementary food at six months and beyond and fed their children more than five times in a day as indicated in the figure below. This showed good feeding practice by caregivers. Greater percentage (68.5%) of children are immunized through the outreach services and 31.5 were immunized through the static clinic sessions.

**Conclusion:** The finding concluded that there was general improvement in the infant and child health interventions. These findings predict that improvement in outreach and community level service is potential for improving child survival. There is also low uptake of vitamin A supplementation and de-wormers. A significant number (30.3%) of new born missed OPV at birth. As the ages of the children increased coverage of antigens decreased. This finding is worrisome and needs attention by health providers.

### Introduction

There has been significant decrease in the likelihood of dying during the first year of life. Although about 30 to 40 percent of infants born died before they could celebrate their first birthdays, occasionally hitting extremely high peaks when epidemics, famines, and war created mortality crisis for the general population (Meckel, 2000). Today, in even the most underdeveloped and high-mortality regions of the world, barely a tenth do die. The most developed and wealthiest regions less than one percent of infants fail to survive their first year (UNICEF, 2008). The vast majority of this sharp reduction in infant mortality took place in the twentieth century (Meckel, 2000).

Child survival continues to improve worldwide. Several researches (WHO, 2011; WHO, 2009; UNICEF 2009; and United Nations 2009) have indicated that the total number of deaths of children under five years old fell from 12.4 million in 1990 to 8.1 million in 2009. The mortality rate in children under five years old has fallen correspondingly from 89 per 1000 live births in 1990 to 60 per 1000 live births in 2009, representing a reduction of about one third. At the same time, the average annual rate of decline has accelerated over the period 2000–2009 compared with the 1990s (WHO, 2011). The level of mortality, however, remained alarmingly high in certain regions of the world. In 2009, the levels of mortality in children under five

years old in the WHO African Region (127 per 1000 live births) and in low-income countries (117 per 1000 live births) were still higher than the 1990 global level of 89 per 1000 live births. It was also reported that little or no progress has been made in 68 countdown priority countries, which are responsible for 97% of maternal and child deaths worldwide (UNICEF, 2008).

Much more needs to be done to achieve the target of a two-thirds reduction in the 1990 mortality levels even after the 2015 deadline of the MDGs. In particular, efforts to reduce neonatal mortality rates (deaths during the first 28 days of life) need to be increased as the rates of decline are slower than those observed among older children. In 2009, 40% of all deaths among children under five years old occurred in the neonatal period (WHO, 2011).

A more recent systematic review of child mortality worldwide and the updated MDG Countdown Report of 2010 have also indicated an accelerated decline of 30% since 2000 (Bhutta, et al. 2010; Rajaratnam et al. 2010).

Child survival varies among world regions, and these differences are large and increasing. The main concern countries are concentrated in sub-Saharan Africa, where the absolute number of under-five deaths increased from 4.2 to 4.6 million during the 2000 to 2008 period, primarily due to the persistently high fertility levels as well as the continuing high rates of mortality (United Nations, 2009). In 1990, there were 180 deaths per 1000 live births in sub-Saharan Africa and only 9 per 1000 in industrialized countries, a 20-fold difference (Black, et al. 2003; UNICEF, 2001). In 2000, this gap had increased to 29-fold with mortality rates of 175 and 6 per 1000 children in sub-Saharan Africa and industrialized countries, respectively (UNICEF, 2001). About 41% of child deaths occur in sub-Saharan Africa and another 34% in south Asia (UNICEF, 2001).

In Ghana, the MDG four target of a two-thirds reduction in under-five mortality is 40 deaths per 1,000 live births relative to the figure in 1990 which was 120 per 1,000 live births (WHO, 2009 and UNICEF, 2009). However, by 2007 the figure had only declined to 115 per 1,000 live births (UNICEF, 2009). The MDG Countdown Report in 2008 rated Ghana as a “No Progress” country and warned that the country had to reduce its under-five mortality rate by 12% annually on average between 2007 and 2015 in order to reach the MDG four target (UNICEF, 2008). Although Ghana has not achieved the MDG four at the end of September 2015, it further declined to 60 deaths per 1000 live births which is close to the two-third reduction of 40 deaths per 1000 live births target.

Two recent surveys the Maternal Health Survey (MHS) 2007 and the Demographic and Health Survey (DHS) 2008 have both suggested a high rate of decline since 2003 (26% and 28%, respectively). The 2008 GDHS reported an appreciable decline in under-five mortality rate to 80 per 1,000 live births, representing the above 28% decline. The regions with significant reduction in under-five mortality rate between 1998 and 2008, are Upper East Region (reduction of up to 77.6 per 1000 live births), Western, Brong Ahafo and Volta Regions (up to 52.7 per 1000 live births reduction), while those that recorded the least improvement over the same period, are Ashanti (increased by 1.8 per 1000 live births), Eastern, Greater Accra and Upper West (reduced by up to 13.3 per 1000 live births only). So far Upper East, Western, Brong Ahafo and Volta Regions are on track to achieving the MDG on under-five mortality, while the rest including Northern Region where Yendi the study area, is part are off-track in spite of the numerous child health interventions.

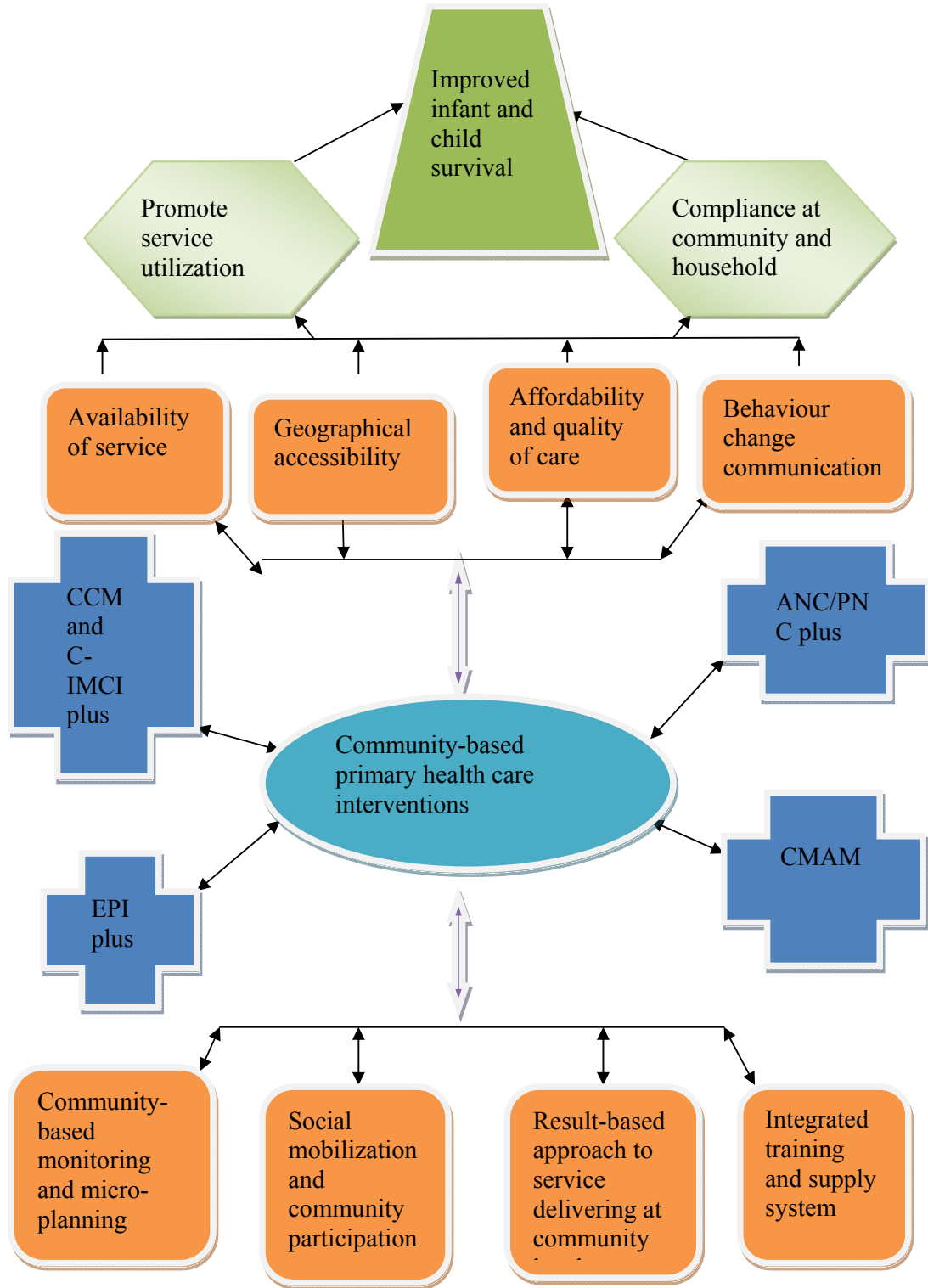
In 1993, children in the Northern Region faced the greatest risk of dying before their first birth day (i.e. 114 deaths per 1,000 live births), followed by Upper East and Upper West Regions (105 and 85 deaths per 1,000 live births respectively). Between 1993 and 1998, Infant Mortality Rate (IMR) declined from 114 deaths per 1,000 live births to 70 deaths per 1,000 live births in the Northern Region (GDHS, 1998, 2008).

Northern Regional Health Directorate in their 2010 performance review reported 106 deaths of children zero to one month in 2008, 207 deaths in 2009 and 277 deaths in 2010 indicating increasing trends. Children of age one to eleven months also showed worrying trends, two recorded deaths in 2008, 66 deaths in 2009 and 63 deaths in 2010.

In Yendi municipality, the trend is not different from what was observed in other part of Ghana and around the globe. This study attempted looking at what interventions that was available to address infant and child survival in the Yendi Municipality.

### **Conceptual Model**

The conceptual framework describes the linkage of some infant and child survival interventions, namely: community case management and integrated management of childhood illness; expanded program on immunization; antenatal and postnatal; and community management of acute malnutrition to improved infant and child survival. The availability of service, geographical accessibility, affordability and quality of service delivery, as well as promoting service utilization and compliance at community and household levels will translate the community-based primary health care interventions to the needed outcome of improved infant and child survival. Four service delivery strategies are used to support the main community-based primary health care interventions for greater coverage. These include community-based monitoring and micro-planning, social mobilization and community participation, a results-based approach to service delivery at community level, and integrated training and improved supply systems.



Source: Sukerazu, 2015  
**Figure 1.** Conceptual Model

## **Method**

### **Background to the study area (municipal profile)**

Yendi Municipality ranks sixth (6<sup>th</sup>) in the Region in terms of surface area with a landmass of 5350sqkm. The Municipality is located in the eastern corridor of the Northern Region of the Republic of Ghana between Latitude 9° – 35° North and 0° – 30° West and 0° – 15° East. The Greenwich Meridian passes through a number of settlements within Yendi Municipality. The centrality of the Municipality within the Eastern Corridor puts it in a better position to serve the remaining districts. However, the advantages inherent in the centrality and the large catchments area of the municipality also put undue pressure on the health facilities of the municipality. The population of the Municipality is 199,592 (GSS, 2010).

The economy of the district is predominantly subsistence with agriculture being their main occupation.

The health service in the municipality can be categorized into curative and preventive services. The Municipality has nine functional CHPS zones and six health centers which are fully operational. It has only one hospital which serves as a referral hospital for not only the Yendi Municipality but also the entire districts in the eastern corridor. The Municipality has only one private clinic operated by church of Christ mission. These facilities are distributed around the Municipality, but many communities still travel long distances to seek health care.

The Municipality operates the three-tier system for the delivery of primary health care which the nation adopted in 1980. Under this system, the villages and community represent the first level, the sub-districts the second level and the District Hospital and the District Health Management Team the third level. The hospital manages the curative diseases and the Municipal Health Directorate deals with preventive medical cases.

### **Study design**

A research design is an organized collection of procedures used by researchers to collect data. It is used to structure the research and show how the major parts of the research project, samples, measures and methods work together to address the research question. Research design focuses upon turning a research question and objectives into a research project (Saunders et al, 2007). Hakim (2000) compares a researcher designing a research project with an architect designing a building. Like architecture, the research design needs to fulfill a particular purpose within a particular constraint of time and money.

It emphasizes the need to have a good research design in order to avoid what Robson (2002) describes as ‘the research equivalent of the many awful houses put up by speculative builders without the benefit of architectural experience’. This is essential because good research, like good building, is attributed to its architect. Hence, for any research study, the choice of an appropriate design is important to arrive at findings and conclusions.

In the consideration of the population at hand, a community-based cross sectional study was believed to be the most appropriate design for this study. According to Varkevisser et al, (2003) cross-sectional survey is aimed at quantifying the distribution of certain variables in a study population at one point in time that may cover physical characteristics, socioeconomic characteristics, behavior, knowledge, attitudes, beliefs, and opinions of the people. Qualitative and quantitative information regarding child health activities in the communities was collected among caregivers.

### **Study population**

A population is the total collection of elements about which we wish to make some inferences (Cooper and Schindler, 2001). Anaman (2003) describe population in the context of research as elements, objects or events of a group that conform to specific criteria that the researcher intends to investigate to make generalizations. Kumeckpor (2002) defines population in the context of research as the total number of all units/elements of the phenomenon to be investigated that exists in the area of investigation. In this study, the researcher's target population included the caregivers at the household level as well as reviewing community based surveillance registers and child health record booklets.

### **Sampling Method**

Sampling refers to the process of selecting a portion of the population to represent the entire population or the process of selecting a number of study units from a defined study population (Varkevisser, et al, 2003). Sampling is used because of limited time and resources available. The main purpose of sampling is to get a representation of the population to draw conclusions which are valid for the whole study population. The sampling technique that was used in order to get the accessible population and households was a community-based multi-stage, random cluster sampling procedure of households and villages in the Yendi district. Multi-stage sampling is a technique whereby the elements are successively selected randomly from natural occurring groups or areas and then selecting individual elements from the chosen groups and areas.

The district is composed of six (6) sub-districts and each sub-district has several villages.

The following four-stage sampling procedure was adopted:

- I. Four (4) Sub-districts was selected out of the six (6) sub-districts by simple random sampling.
- II. For each Sub-district four (4) communities were selected by simple random sampling ( $4 \times 4=16$  communities in total).
- III. For each community selected 25 households were identified ( $25 \times 16=400$  household in total). Since simply choosing households in the centre of the village would produce a biased sample, the following sampling procedure was carried out:
- IV. The selection of households for interview was done by going to the centre of the village. A direction was randomly chosen. A bottle was spun on the ground and the direction of the bottleneck indicated the direction along which the houses were numbered.

The first house was selected randomly. Subsequent houses were selected by walking in the chosen direction and selecting every second house until the 25<sup>th</sup> house was gotten. If the boundary of the community was reached and the interviewer still does not have 25 households, the interviewer returns to the centre of the community, walked in the opposite direction and continue to select the sample in the same way until the 25 households was obtained. In each house, women who had children less than five years were identified and only one was selected randomly for interview. If a house did not have an eligible respondent, the interviewer moved to the next house until the required number of respondents was obtained. In each community 25 respondents were interviewed. This was therefore produced a total of 400 respondents. However, there was a number of missing observations in some of the questionnaire items. Therefore only valid observations were used in the calculations and analysis.

In selecting individual survey subjects, the research assistants explained the nature of the study to an adult in each selected household, and inquired if there was/were one

or more children aged five years or less who presently lived in the house. If there was, and a person who provided household health management to the child was available, that person was invited to participate in answering the questionnaire. If primary caretaker was not immediately available or no one at home, the house would be visited another time to conduct the interview. And if primary caregiver had more than one child aged less than five years, only one of them was randomly selected for the study.

### Sample size

In research determining the appropriate sample size is very critical. The sample frame for this study considered the 8,336 households registered in the district (2010 population projection). The Sample size calculation was based on the assumption that approximately 50% of households have benefited from a community based primary health intervention. Calculations were made to allow a precision of 5%, with an alpha type one error of 5%; which resulted in minimum sample size households of 400 surveyed

Sample size calculation of households

$$n = \frac{N}{1 + N(e)^2}$$

Where,  $n$  = sample size

$N$  = total household population

$e$  = level of precision

$$n = \frac{8336}{1 + 8336(.05)^2}$$

$$n \approx 400$$

### Data collection and study instruments

Both quantitative and qualitative methods were employed in measuring the variables of the study. A questionnaire for caregivers of children under five years of age was designed. The questions used a combination of multiple-choice and open-ended response formats. The open-ended questions provided an opportunity for respondents to elaborate and provide further details while the multiple-choice questions gave respondents time to provide appropriate answers to the questions by choosing from possible options made available. The multiple-choice questions were meant to minimize the rate of some respondents' failure to provide answers to questions due to time constraint. The tool was pre-tested.

### Analysis and presentation of results

The end result of the data collection is the accumulation of raw data, in a quantitative form; such data are then summarized and subjected to statistical analysis. Standard scoring procedure was adopted and data was coded and analyzed statistically by using the SPSS (Statistical Package for Social Sciences) software. For the quantitative data the researcher categorized and analyzed it manually, and then used Percentages and frequencies to transform raw data collected from the field into more meaningful information which can easily understood by readers.

### Quality control

In order to obtain information on the acceptability and quality of the intervention, caregivers of children under five years of age were interviewed in their households so

that they can feel comfortable to provide accurate and complete answers to maintain quality of the study.

The survey team was made up of interviewers who were health staff from the district. They all have experience in field surveys and speak the various dialects present in the district. Data was therefore collected from the respondents in their native language. Therefore, questions were asked to the best of their understanding and no ambiguities, so quality was not compromised. In addition, the supervisor who coordinated the data collection was also a health staff and was available to make sure that omissions and mistakes were rectified. Before and during data processing, the information was checked for completeness and internal consistency.

### **Ethical consideration**

Written ethical clearance and authorization were sought from the Regional Director of Health Services (RDHS) for Northern Region through the District Director of Health Services (DDHS) for Yendi and was given. For interviewees, verbal consent was sought from each individual before the interviews conducted. Confidentiality was assured and ensured.

### **Study limitations**

The study had limitation as with most studies. The first limitation was the sample size as a result of the time constrain for such extensive study. The target population of the study was all the primary caregivers of children less than five years. However, complete coverage of those populations was not possible considering the time, the nature of the study and size of the municipality. This in fact limited the generalization of the result. Secondly, self reporting may be subjected to reporting errors and biases, and could not be easily addressed. Finally the scope of the study was limited to only community level interventions which agreeably cannot by themselves alone increase child survival without facility level interventions.

### **Analysis of Result**

#### **Household characteristics of respondent**

The general characteristics of the 400 household are presented in Table 1.0. The profile of the households was typical of a rural, northern Ghana population. The minimum number of household was one and the maximum of six households given the mean household of 1.94. The minimum number of one and maximum number of seven women with children less than five years lived in a household and the minimum and maximum numbers of children living in a house hold was also one and seven respectively. The overall average number of women with children less than five years in a household was 2.67 and that of children was 4.37.

Table 1.0 also includes the researcher's observations on household facilities. Of the 400 households surveyed most of the households (91.5%) had no latrine and the most common used source of water for the households was borehole (47.8%) and Surface water (river and dam) 45%. Only 7.2% used piped water. Majority of the household (62.5%) do not do anything to the water to make it safer to drink. Only 30.8% do something to make the water safer to drink. Of those who do something to make the water safer to drink, 30.5% of them let the water stand to settle, 4.5% boiled the water, 15% used water filter, and 2.5% add bleach/alloy and 8.5% strain the water through a piece of cloth. The normal sources of water for most of the households (57.8%) do not vary seasonally.

**Table 1.0.** Household Characteristics of Respondent

<b>Variable</b>	<b>percentage</b>
<b>Is there a latrine in the house</b>	8.5



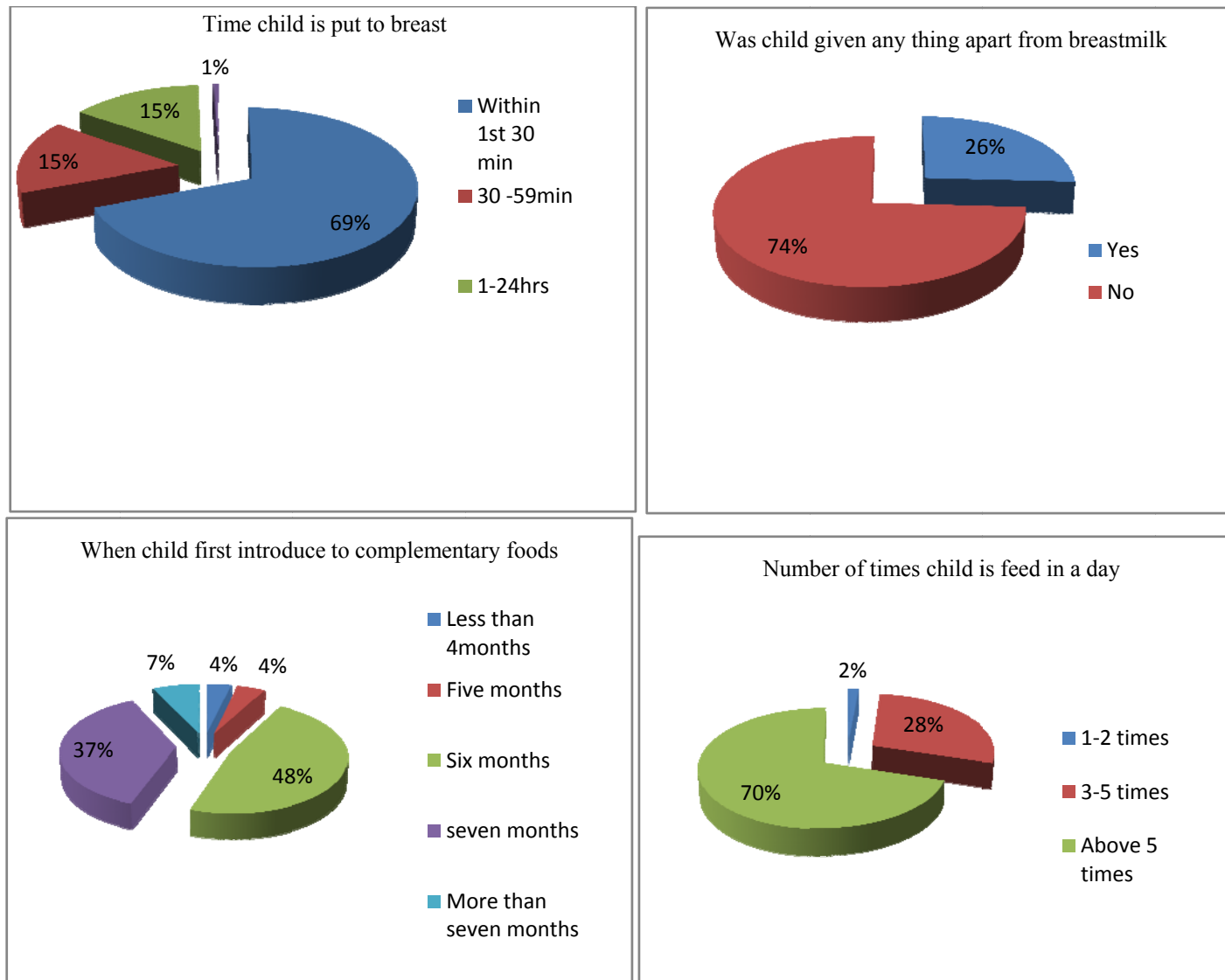
<b>Yes</b>	91.5						
<b>No</b>							
<b>The most common used source of water for the household</b>							
<b>Piped water</b>	7.2						
<b>Borehole</b>	47.8						
<b>Surface water (river, dam, lake)</b>	45.0						
<b>Does the household do anything to the water to make it safer to drink</b>	30.8						
<b>Yes</b>	62.5						
<b>No</b>	6.7						
<b>Don't know</b>							
<b>What does the household usually do to make the water safer to drink</b>	4.5						
<b>Boiling</b>	15.0						
<b>Use water filter</b>	2.5						
<b>Add bleach/chlorine/alloy</b>	30.5						
<b>Let stand and settle</b>	8.5						
<b>Strain through a cloth</b>	0.0						
<b>Solar disinfection</b>	0.2						
<b>Other,</b>	4.5						
<b>Don't know</b>	34.2						
<b>No response</b>							
<b>Does the normal source of water vary seasonally</b>	36.5						
<b>Yes</b>	57.8						
<b>No</b>	5.8						
<b>Don't know</b>							
<b>Variable</b>	<b>Min</b>	<b>Max</b>	<b>mean</b>	<b>S.E mean</b>	<b>SD</b>	<b>Varia nce</b>	<b>Median</b>
<b>Number of households</b>	<b>1</b>	<b>6</b>	<b>1.94</b>	<b>0.054</b>	<b>1.064</b>	<b>1.133</b>	<b>2.0</b>
<b>Number of women with under fives living in the household</b>	<b>1</b>	<b>7</b>	<b>2.67</b>	<b>0.084</b>	<b>1.665</b>	<b>2.772</b>	<b>2.0</b>
<b>Number of children living in household</b>	<b>1</b>	<b>7</b>	<b>4.37</b>	<b>0.1</b>	<b>1.995</b>	<b>3.98</b>	<b>4.0</b>

### **Factors affecting child survival**

The study considered some factors contributing to child survival. This was to ascertain the level of health risk of the primary caregivers and their children. The factors affecting infant and child health include; Breastfeeding practices, Vaccination coverage, nutritional status, receipt of vitamin A supplementation, prevalence and treatment of common childhood illnesses such as acute respiratory infections (ARI), fever and diarrhea. Ante natal and post natal care also promote positive infant and child survival. The findings are represented in the figures under.

Children nutrition is vital for child's survival, therefore the study sought to find out caregivers knowledge and practice in relation to child nutrition. The finding was illustrated in Figure 2. Of those caregivers studied 69% of mothers first put their children to breast within the first 30 minutes after delivery.

Majority of the respondents practice exclusive breastfeeding up to six months of child's age while others practice up to four months. A good percentage (48%) of the caregivers introduced complementary food at six months and beyond and fed their children more than five times in a day as indicated in the figure below. This showed good feeding practice by caregivers.



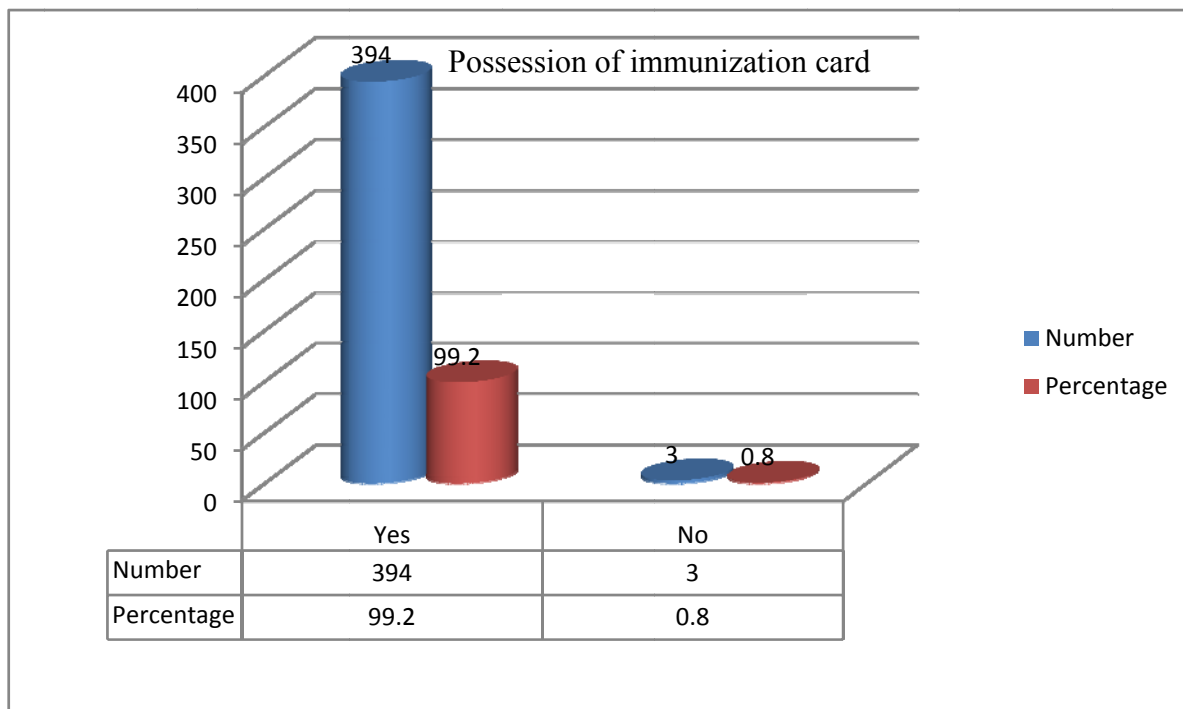
Source: field survey

**Figure 2.** Child Nutrition

**Preventive health service and child health care service utilization**

The questionnaire was intended to ascertain the number of children less than five years who were at risk or prevented from preventable childhood diseases. The researcher was of interested in child health care service utilization. The following figures and tables are the summary of the findings.

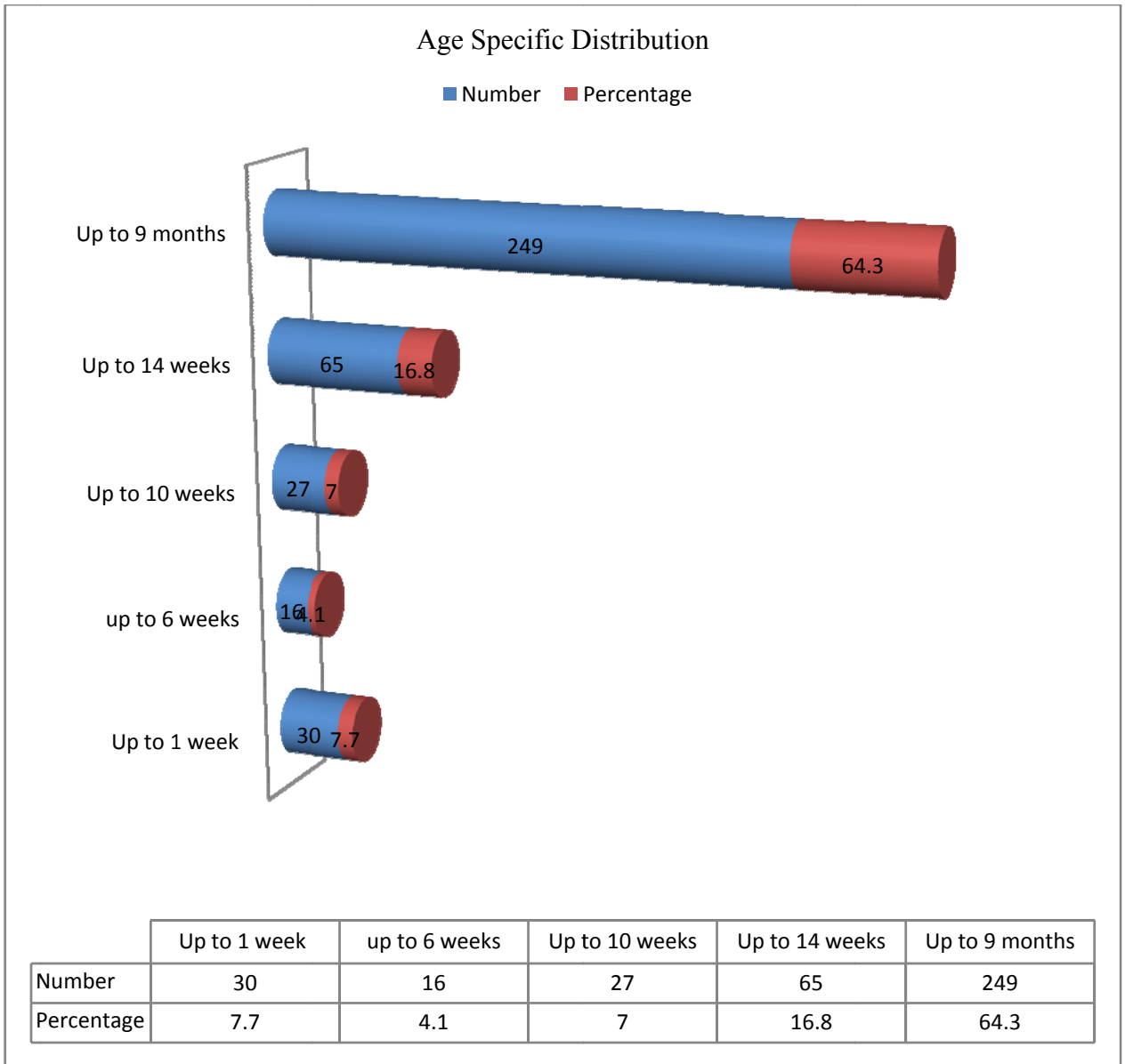
Children whose mothers responded to the questionnaire 99.2% were reported to have immunization card or child health record booklet and have come in contact with vaccinator at least once. Those reported to have no child health record booklet were 0.8%, and information on vaccination status was collected from the mother’s verbal reports.



*Source: Field survey. Totals may not sum up to f=400 due to missing observations*

**Figure 3.** Possession of immunization card

Figure 4 showed the number vaccinated within specific age distribution for vaccination schedule. The indicated that majority of the respondents who have their children aged up to 9 months were 64.3% and respondents with children up to 6 weeks were the minority in terms of number (4.1%). The number of mothers with children up to 10 weeks was also 7% and up to 14 weeks were 16.8%.



Source: Field survey. Totals may not sum up to  $f=400$  due to missing observations

**Figure 4.** Age Specific Distribution

From table 2.0, revealed over 90% coverage of BCG, PENTA1, OPV2, over 80% for PENTA2, PENTA3, and OPV2 and about 60% Measles and yellow fever. A significant number (30.3%) of new born missed OPV at birth. As the ages of the children increased coverage of antigens decreased.

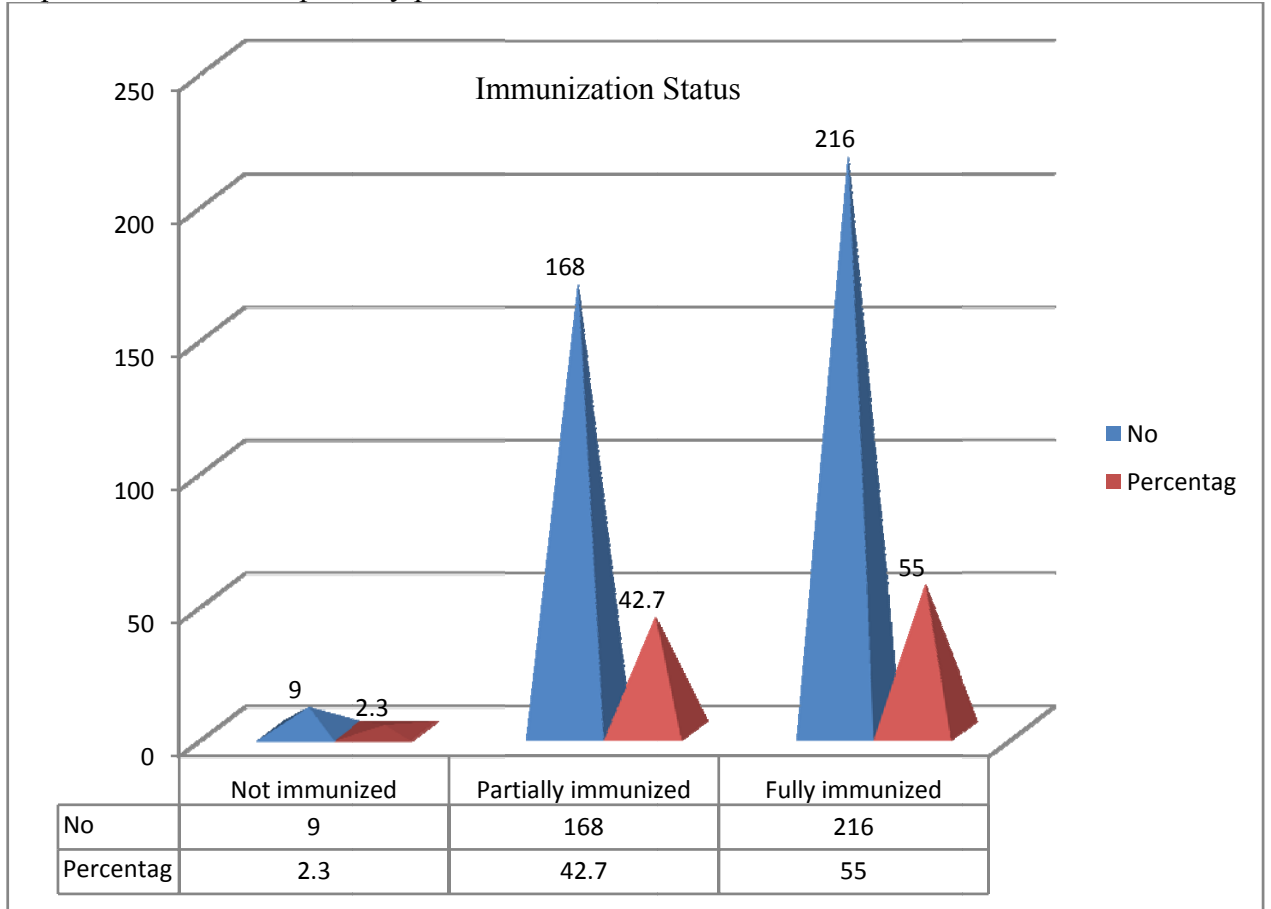
**Table 2.0.** Total vaccinated with specific antigen

Age	Vaccine	Vaccinated		Not Vaccinated	
		No	%	No	%
1 week	BCG	392	98.7	5	1.3
6 weeks	PENTA1	361	91.2	35	8.8
10 weeks	PENTA2	349	88.4	46	11.6
14 weeks	PENTA3	320	81.2	74	18.8
1 week	OPV (birth)	279	69.7	121	30.3*
6 weeks	OPV1	359	90.9	36	9.1

10 weeks	OPV2	346	87.6	49	12.4
14 weeks	OPV3	315	79.7	80	20.3
9 months	Measles	235	60.3	155	39.7
9 months	Yellow fever	234	60.0	156	40.0

Source: Field survey. Totals may not sum up to  $f=400$  due to missing observations

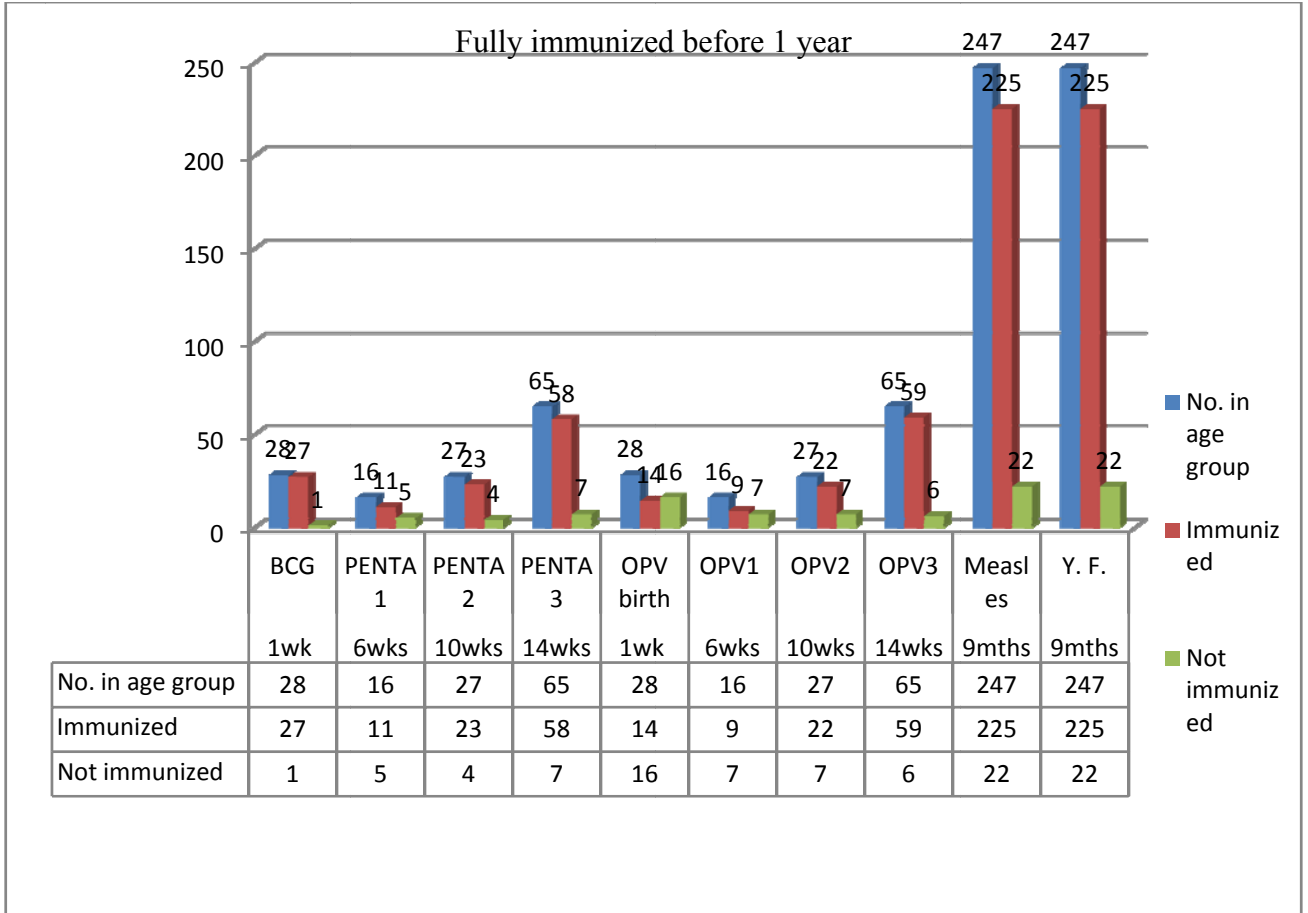
The figure 5 presents the immunization status of all the children surveyed and found 55% to have been taken all the vaccinations, 42.7% did not take all the vaccination as required and therefore partially protected and 2.3% not immunized at all.



Source: Field survey. Totals may not sum up to  $f=400$  due to missing observations

**Figure 5.** Immunization Status

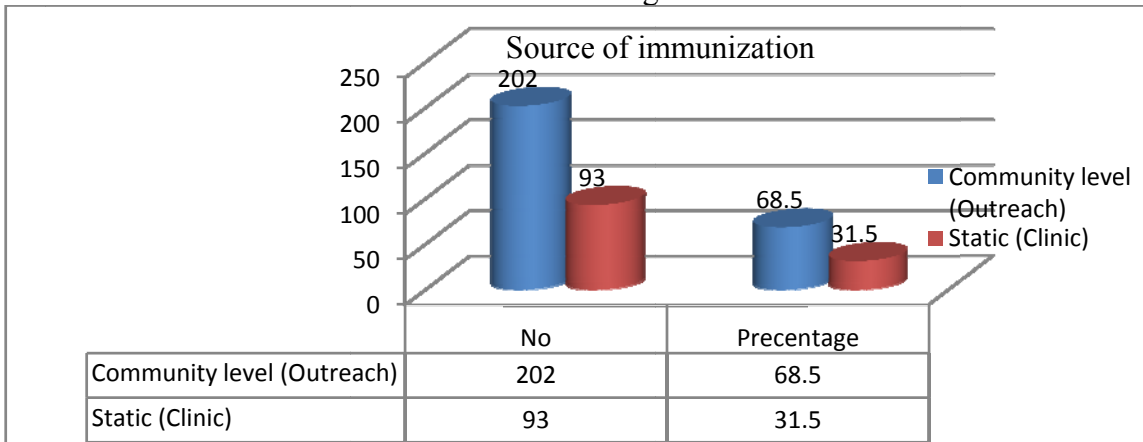
Figure 6 showed the number of children who were due for specific vaccination schedule and the number who have taken the vaccination. For BCG children aged one week and over represent 27 children out of 28 were immunized, 11 out of 16 children aged six weeks and over had received PENTA1, PENTA2 23 out of 27 of children aged ten weeks received the vaccine, and 58 out of 65 children aged 14 weeks had received PENTA3. Likewise OPV (birth) 14 of the children aged one week and over were immunized and 16 not immunized, OPV1 9 out of 16 children aged six weeks and over were immunized, OPV2 22 out of 27, and OPV3 59 out of 65 children aged 14 weeks and above were immunized. Measles 225 out of 247 and yellow fever the same 225 out of 247 children aged nine months and above were also vaccinated.



Source: Field survey. Totals may not sum up to f=400 due to missing observations

**Figure 6.** Fully Immunized Children (depending on child age to vaccine specific)

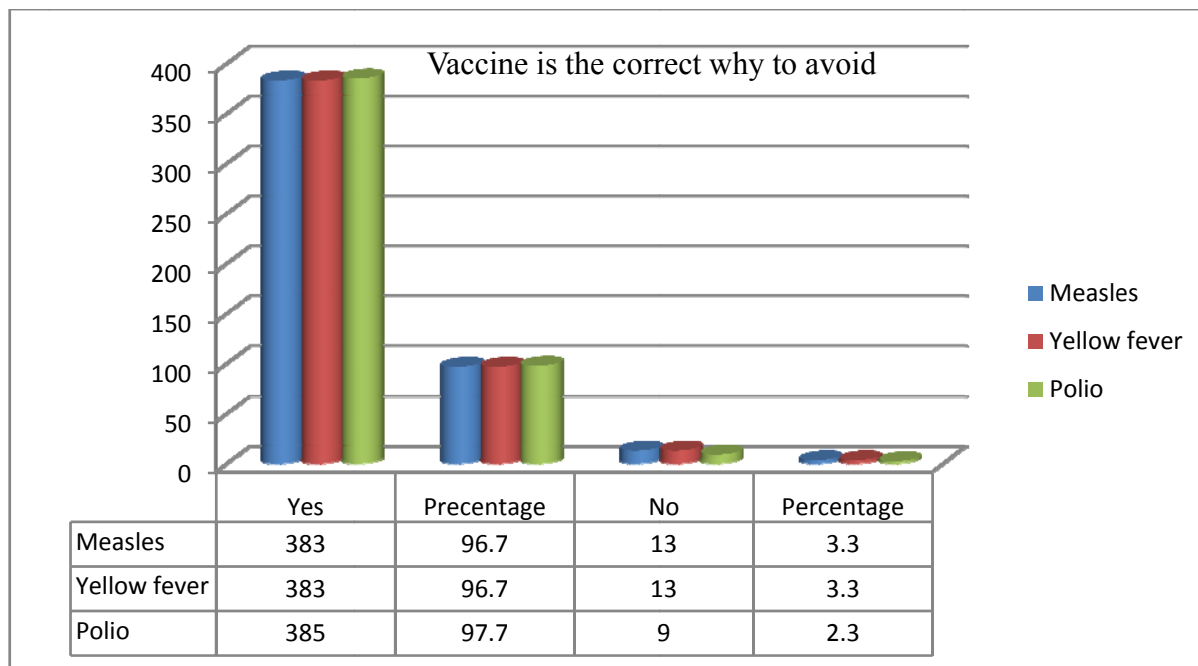
Figure 7 showed that greater percentage (68.5%) of children are immunized through the outreach services and 31.5 were immunized through the static clinic sessions.



Source: Field survey. Totals may not sum up to f=400 due to missing observations

**Figure 7.** Source of Immunization

Over 96% of the caregivers are of the view that vaccination against measles, yellow fever and polio were the correct why to avoid measles yellow fever and polio.



Source: Field survey. Totals may not sum up to  $f=400$  due to missing observations

**Figure 8.** Knowledge on Reason for Vaccination (measles, Yellow fever and Polio)

The researcher found out whether improvement in outreach, community based, and household services predict improvement in child survival. Linear regression test was applied between source of immunization and fully immunized children, and source of immunization and immunization status to test for these relationships. The following tables show the findings.

Table 3.0 showed a correlation coefficient ( $r$ ) of 0.105 and  $p$  – value of 0.038. The linear regression analysis showed weak positive correlation between source of immunization and fully immunized children. The  $p$ -value shows statistically significant relationship between where the child is taken to for immunization and being fully immunized.

**Table 3.0.** Correlation between Sources of immunization and fully immunized

		Fully immunization before one (1) year of age	Source of immunization
Pearson Correlation	Fully immunization before one (1) year of age	1.000	.105
	Source of immunization	.105	1.000
Sig. (1-tailed)	Fully immunization before one (1) year of age	.	.038
	Source of immunization	.038	.
N	Fully immunization before one (1) year	283	283



of age  
Source of immunization 283 283

*Source: Field survey. Totals may not sum up to f =400 due to missing observations*

It is noted from table 4.0 that correlation coefficient (r) = - 0.083 and p-value of 0.077. This is an indication of very weak negative association between source of immunization and immunization status. The p value also shows statistically insignificant relationship and the r being negative implied that as the immunization source is closer the immunization status likely to increased.

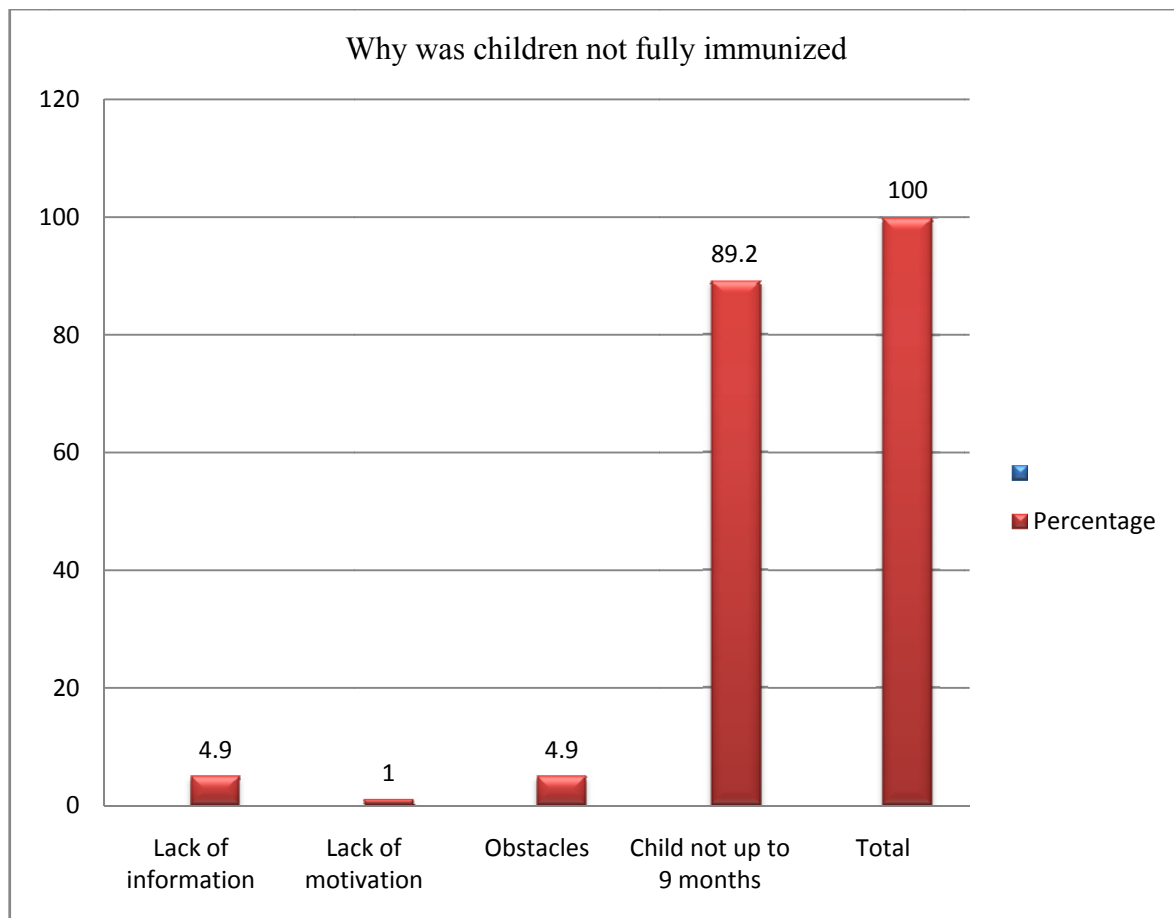
**Table 4.0.** Association between source of immunization and immunization status

<b>Correlations</b>			
		Immunization Status	Source of immunization
Pearson Correlation	Immunization Status	1.000	-.083
	Source of immunization	-.083	1.000
Sig. (1-tailed)	Immunization Status	.	.077
	Source of immunization	.077	.
N	Immunization Status	294	294
	Source of immunization	294	294

*Source: Field survey. Totals may not sum up to f =400 due to missing observations*

The questionnaire intended to find out the reasons for immunization failure. Figure 9 is the summary of the information obtained

Most of the respondents blame the immunization failure to the fact that their children were not up to nine months. The respondents were also of the view that lack of information such as; unaware of the need for immunization, unaware of need to return for 2<sup>nd</sup> and 3<sup>rd</sup> dose, place and/or time of immunization unknown, fear of side effects and wrong ideas about contraindication represent 4.9%. The respondents who agreed to obstacles such as; time of immunization inconvenient, vaccinator absent, vaccine not available, mother too busy, family problem, including illness of mother, long waiting time were also 4.9%, and 1% believed lack of motivation such as; postponement until another time, no faith in immunization, and rumors were some of the reasons for immunization failure.



Source: Field survey. Totals may not sum up to  $f=400$  due to missing observations

**Figure 9.** Reasons for immunization failure

The table 5.0 infers that majority of the household (54.8%) have insecticide treated net (ITN). And 69.7% of children sleep under ITN. It also reveals that 70% do not re-treat the nets for use, and therefore lose it potency of protecting children from mosquito bites. The table also showed low uptake of vitamin A supplementation and de-wormers by children from six months to five years in the study area.

**Table 5.0.** Utilization of Preventive Health Measures of caregivers

Variables	No	%
Number of household with ITN		
Yes	217	54.8
No	179	45.2
Number of children sleeping under ITN		
Yes	278	69.7
No	121	30.3
When was the last time bed net treated		
Within 1yr	27	17.8
Within 2yrs	17	11.2
Not treated	108	70.0
Vitamin A supplementation in the past 6 months		
Yes	129	34.7
No	243	65.3

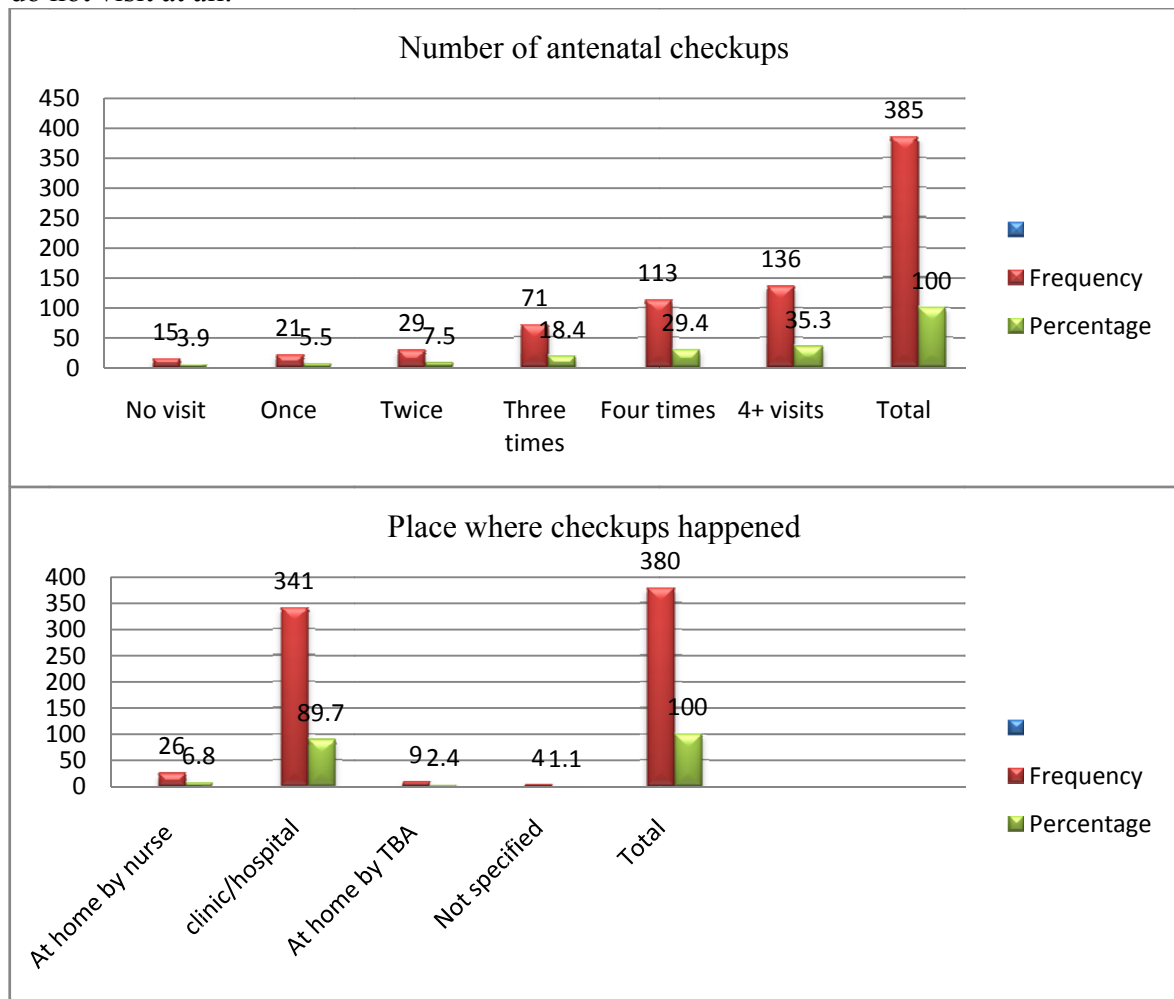
Dewormers in the past 6 months		
Yes	111	29.7
No	263	70.3

Source: Field survey. Totals may not sum up to  $n=400$  due to missing observations

**Antenatal care, delivery practices and postnatal care**

The researcher was interested in the number of antenatal checkups by the respondents for their last pregnancies. Antenatal care has the potential to promote positive infant and child survival. Figure 10 is the summary of the information obtained

Figure 10, represents the data on the number of antenatal visit by the respondents. 136 respondents representing 35.3% had visited antenatal for more than four times, 113 (29.4%) of the respondents visited four times before delivery, 71 (18.4%) of the women visited 3 times, 29 respondents representing 7.5% visited twice and 21 (5.5%) only once. 3.9% never visited at all for the last pregnancy. The study also looked at where pregnant mothers seek antenatal service and the information obtained reveals 89.7% had their ANC at the clinic/hospital. 6.8% at home by nurse and 1.1% do not specify the place for their ANC or do not visit at all.

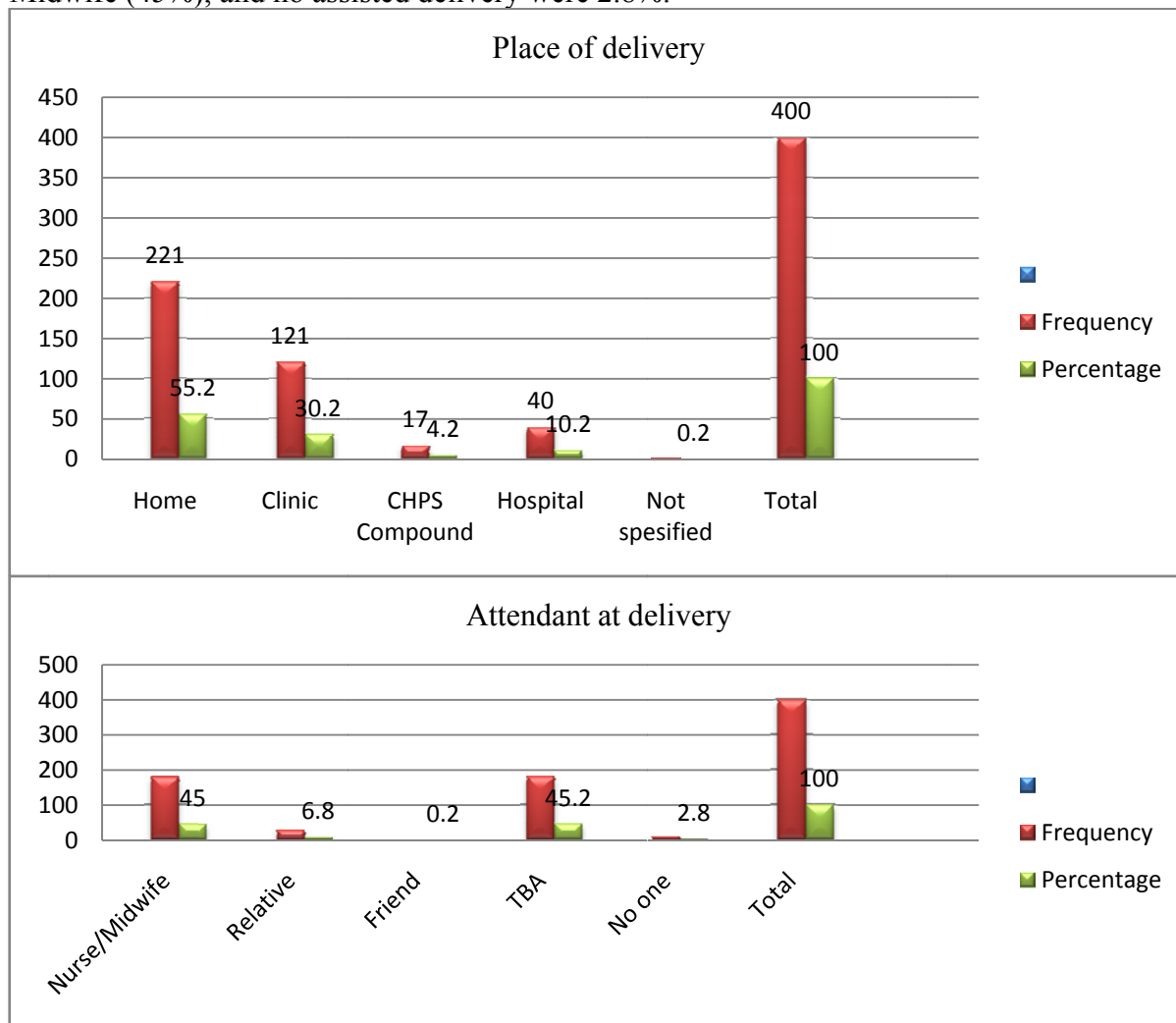


Source: field survey 2012

**Figure 10.** Number and place of antenatal visits of mothers

For the sake of skilled delivery the questionnaire sought to find out the place and attendant at the delivery of the last child. The finding is summed up in figure 11.

Majority of the delivery took place at home (55.2%), 30.2% at clinic, and 4.2% at CHPS compound. Only 10.2% of the deliveries took place at the hospital which is the only Emergency Obstetric Care (EmOC) facility in the district. Only 0.2% did not specify the place of delivery. Majority of the deliveries were attended by TBA (45.2%) and Nurse or Midwife (45%), and no assisted delivery were 2.8%.

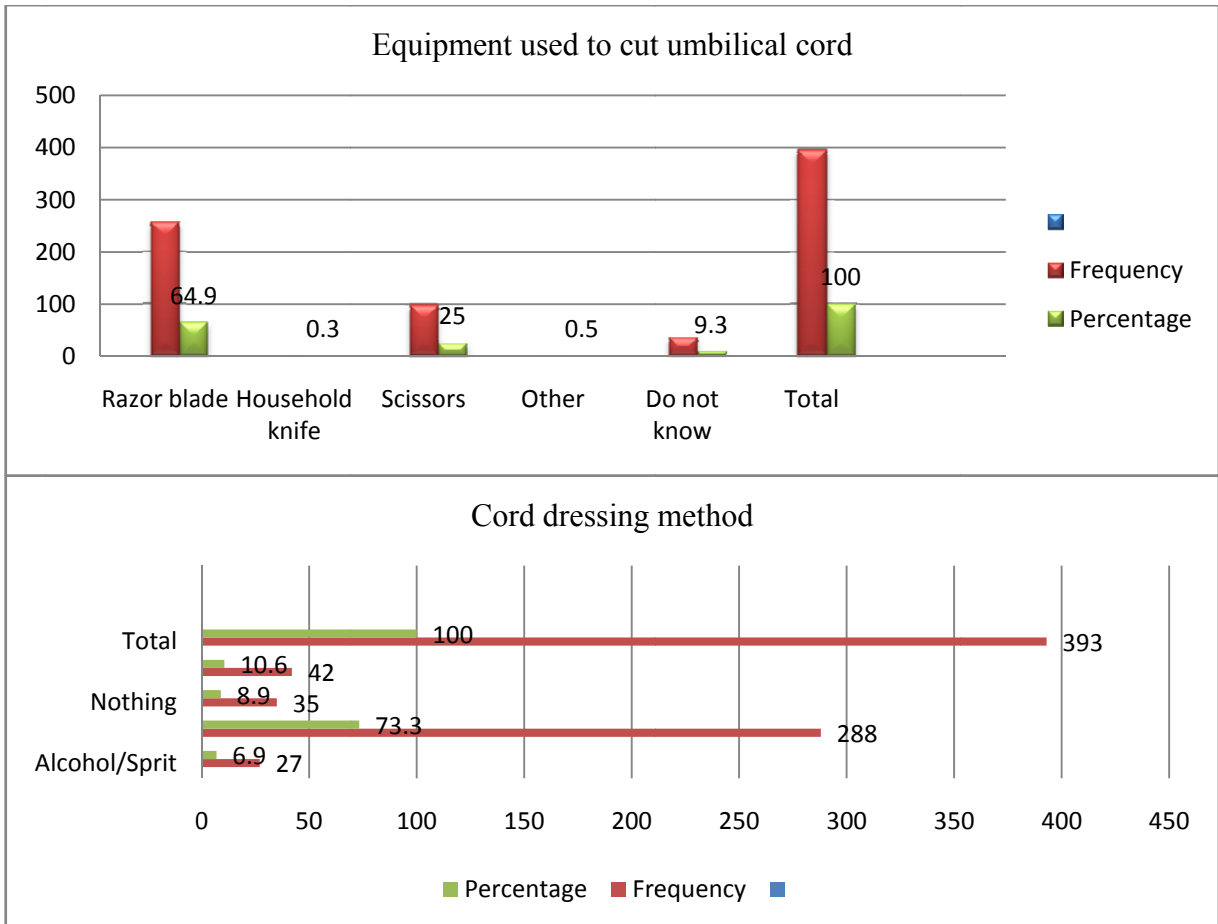


Source: Field survey. Totals may not sum up to  $f=400$  due to missing observations

**Figure 11.** Place of delivery and attendant at delivery of mothers

For the sake of better infection control during labor the questionnaire sought to find out the equipment used to cut umbilical cord during labor. The finding is summed up in figure 12.

The figure 12 below reveals razor blade to be the equipment mostly used to cut baby umbilical cord during labor and the least is household knife representing 0.3%. It was reported that 25% of umbilical cord were cut by using scissors and about 9.3% were unaware of the equipment used to cut the baby umbilical cord during labor in their last delivery. The illustration below also revealed that Palm oil or Shea butter was found to be the most used method of cord dressing and alcohol or sprit was the least cord dressing method.

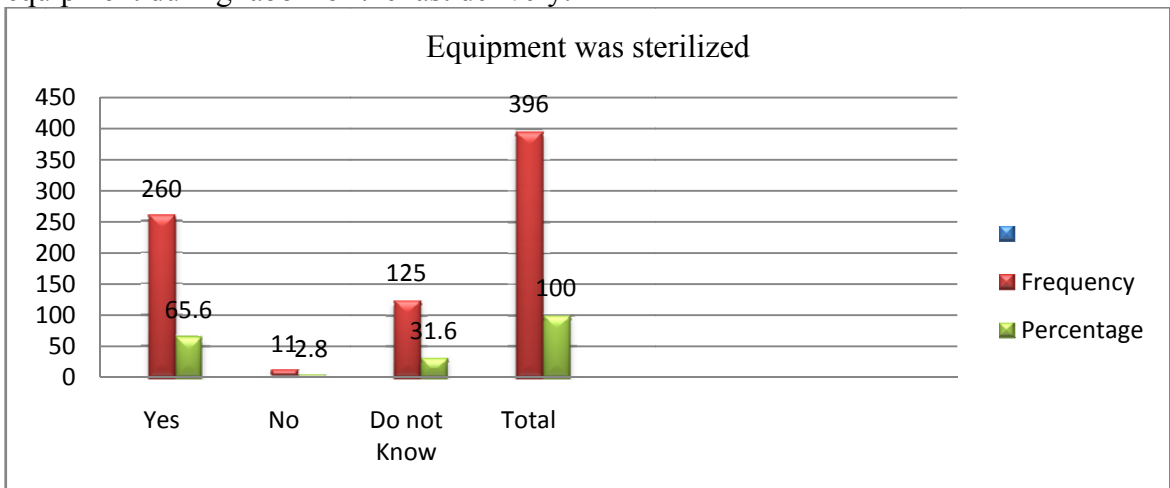


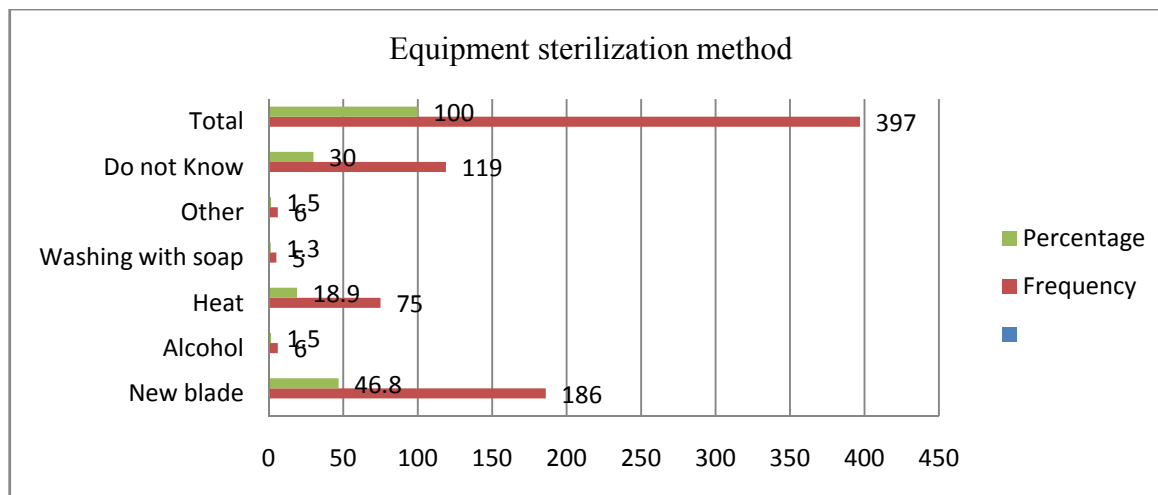
Source: Field survey. Totals may not sum up to  $f=400$  due to missing observations

**Figure 12.** Equipment used to cut umbilical cord and cord dressing method

The questionnaire further sought to find out whether the equipment was sterilized and found out the following results in figure 13.

According to figure 13, 65.6% attested to the fact that the equipment was sterilized, 2.8% said equipment was not sterilized whereas 31.6% do not know whether it was sterilized or not. The figure also indicated new razor blade as the most used method of sterilization, hand washing the least and 30% do not know what sterilization method used for the equipment during labor for the last delivery.





Source: Field survey. Totals may not sum up to  $f=400$  due to missing observation

Figure 13. Equipment Sterilization method

## Discussions

### Effects of community based interventions on child survival

Factors that affect child survival were used as proxy indicator for the effects of community-based primary health intervention. Presence of health facility was also used as an indicator for community based intervention.

The practice of infant and child feeding was good. Most mothers put their children to breast within the first 30 minutes and continue to practice exclusive breastfeeding for at least four months. A very high percentage (85%) of the caregivers introduced complementary food at six months and beyond.

Almost all children less than five years have child health record booklets (99.2%). This showed that almost all children born in the district have come in contact with a health worker. Again the possession of child health record is an indication that can be useful in child birth registration and birth certification.

In Ghana, childhood vaccination remains an important strategy for infant and child survival from common vaccine-preventable diseases such as Tuberculosis, Diphtheria, Pertussis, Tetanus, Hepatitis B, and Haemophilus Influenza type B infections, measles, Poliomyelitis and Yellow fever. According to the immunization schedule, children ought to be fully immunized before their first birthday. This is usually not the case due to missed opportunities (GHS, 2007). The expanded Program on immunization (EPI) of the (WHO) and United Nations Children's Fund guidelines recommend that all children receive one dose each of Bacillus Calmette-Guérin (BCG), yellow fever and measles vaccine, and three doses of (Diphtheria, Pertussis, Tetanus, Hepatitis B, and Haemophilus Influenza type B infections) PENTA vaccines.

High vaccination coverage is a crucial goal of all child survival programs in Ghana. The results from the study showed 98.7% coverage for BCG, 88.4% for PENTA-2, and 89% for PENTA3. This finding is consistent with the RCH (2007) annual report. Using PENTA-3 as proxy, the national immunization coverage was 88.1%. But the results fell below the coverage recorded by the Northern Region (119%). The study also found the coverage for OPV as follows; OPV (at birth) 69.7%, OPV1 90.1%, and OPV3 90.7%. This revealed that a significant number (30.3%) of new born missed OPV at birth. Measles and yellow fever recorded about 60% coverage each. Most of the coverage in this study does not meet the national targets of 90% coverage (GHS, 2007). The coverage that fell below the target set

by GHS present a challenge to the District Health Management Team. It is clear from the finding that as the ages of the children increased coverage of antigens decreased. The reason for this drop up phenomenon was not considered by this research. Therefore further research needs to be carried out to ascertain the reasons.

Considering all the age groups and not taking in to consideration age to vaccine specific, 55% were fully immunized 42.7% partially because they were below nine months and 2.3% not immunized. This implies that over 90% of children aged nine months to five years were fully immunized. Again the study found out that majority of the vaccination took place at outreach service. Over 96% of the caregivers were knowledgeable about and could explain the importance of immunization. The caretakers indicated that vaccination is the correct way to avoid measles yellow fever and polio. Although caregivers surveyed understood the importance of immunization, very few of them still do not send their children for vaccination.

Linear regression analysis showed weak positive correlation between source of immunization and fully immunized children ( $r = 0.105$  and  $p$  – value is 0.038). The  $p$  value shows statistically significant relationship between the two variables. The correlation coefficient ( $r$ ) is near 0. The finding also showed very weak negative association between source of immunization and immunization status ( $r = - 0.083$  and  $p$  value is 0.077). The negative  $r$  value implies increased immunization status when there is difference in source of immunization. The  $p$  value also shows statistically insignificant relationship.

The study infers that majority of the household (54.8%) have ITN and 69.7% of children sleep under ITN. It also reveals that 70% do not re-treat the nets for use. This means that nets may lose the effectiveness to kill the mosquitoes. There is also low uptake of vitamin A supplementation and de-wormers. This finding is worrisome and needs attention by health providers.

#### **Antenatal care, delivery practices and postnatal care**

The minimum number of visits required to ensure the delivery of essential service package has not yet been achieved (GHS, 2007). In this study the number of more than four antenatal visits represents 35.3% and four visits were 18.4% making a total of 53.3%. This is an improvement over the 2007 figure found in northern region and below the target set by GHS. The target set for at least four visits is 70%. The finding reveals that 3.9% do not visit at all despite the benefits and the awareness created. To address this challenge, improved information, Education, Communication and appropriate documentation in all health facilities is expected to contribute in achieving the minimum four visit requirement.

Majority of these antenatal checkups were conducted in clinic/hospital (89.7%), similar to finding in Guinea Bissau (King et al, 2010). Most deliveries occurred at home, 44.8% at health facilities with only 0.2% in hospital, the only EmOC facility in the district. This is not a good sign as facility deliveries are encouraged. Almost the same number of the deliveries was attended by TBA (45.2%) and Nurse/Midwife (45%). In 64.9% of the deliveries razor blade was the equipment used to cut baby umbilical cord during labor, 65.6% attested to the fact that the equipment was sterilized. This is a positive sign of infection prevention during labor. However, palm oil/Shea butter was found to be the most used method of cord dressing.

#### **Summary, recommendation and conclusion**

Factors that affect child survival were used as proxy indicator for the effects of community-based primary health intervention. Presence of health facility was also used as an indicator for community based intervention.

The results from the study showed very appreciable level of immunization coverage. BCG coverage was 98.7%, PENTA3 was 89% and OPV-379.7%. The study also revealed that a significant number (30.3%) of new born missed OPV at birth. Measles and yellow fever recorded 60% coverage. It is clear from the finding that as the ages of the children increased coverage of antigens decreased. Over 90% of children aged nine months to five years were fully immunized. Again the study found out that majority of the vaccination took place at outreach service. Over 96% of the caregivers were knowledgeable about and could explain the importance of immunization.

Linear regression analysis showed weak positive correlation between source of immunization and fully immunized children, and p-value shows statistically significant relationship between the two variables. The finding also showed very weak negative association between source of immunization and immunization status. These findings predict that improvement in outreach and community level service is potential for improving child survival. The study infers that majority of the household have ITN and about half of the children sleep under ITN. There is also low uptake of vitamin A supplementation and de-wormers. This finding is worrisome and needs attention by health providers.

In this study the number of four (4) and four plus (4+) visits to antenatal clinic were over 64.7%. Most deliveries occurred at home and attended by TBA.

They should improve on the existing campaign to create the awareness of caregivers on the importance of OPV at birth, and vitamin A supplementation of children above six months. This can be achieved through the collaboration of CBAs with the full participation of the communities. So that the many babies through home deliveries can be captured for OPV at birth, which coverage was found to be very worrisome.

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