

**FACTORS INFLUENCING UPTAKE OF EXPANDED PROGRAMME ON
IMMUNIZATION SERVICES IN RARIEDA DIVISION, SIAYA COUNTY,
KENYA**

BY

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ABSTRACT

The Expanded Programme on Immunization (EPI) was established in 1974 to ensure that all children in all countries benefited from a universal access to life-saving vaccines. The diseases targeted by the EPI are diphtheria, whooping cough, tetanus, measles, poliomyelitis, tuberculosis, hepatitis B, Haemophilus influenza type b and pneumonia. These diseases are among the leading causes of high childhood morbidity and mortality in Kenya and they remain a major public health problem due to low vaccination uptake in some regions. In Kenya the immunization coverage is estimated at 78% and infant mortality rate is 52 per 1000 live births. In Siaya County the immunization coverage is at 65%. The infant mortality rate in Rarieda Division is 120 per 1000 live births. The low immunization coverage and high infant mortality rate can be attributed to lack of awareness, attitude of mothers and socio-economic and cultural factors. Therefore the overall objective of this study was to examine factors that influence uptake of EPI services in Rarieda Division, Siaya County. Specific objectives were: 1.establish awareness levels of mothers on vaccines and vaccinations of children 2.identify the socio-economic and cultural factors that influence the uptake of EPI services and 3.determine the perception/attitude of mothers on vaccination of children against the immunizable diseases as per EPI schedule. The study design was cross-sectional and utilized both quantitative and qualitative methods of data collection. Systematic random sampling procedure was used to select and interview 346 mothers from a target population of 3,518 mothers with children aged between 0-24 months at the household level in Rarieda Division. The tools for collecting quantitative data were household questionnaires and key informants interviews were used to collect qualitative data where the nurses in charge of the health facilities in Rarieda Division were purposively sampled to be interviewed. Quantitative data was analyzed using descriptive statistics and qualitative data was analyzed through manual content analysis by categorizing relevant responses to answer research questions and analyzed data was presented in the form of frequency distribution tables, pie charts and graphs. The findings indicated that 96% of respondents were aware of polio vaccine, 77% measles, 55% BCG, 21% pentavalent, 17% PCV 10 and 2% yellow fever. 89% of mothers were aware that children should be given the first vaccine at birth and 83% of the mothers were aware that children should receive their last vaccine at nine months.19% of mothers gave birth at home, mothers made most decisions on vaccination of children and Muslims did not support vaccination.97% showed positive attitude towards vaccination. In conclusion awareness level of mothers on vaccines and vaccinations was low; the attitude of mothers towards vaccinations was also seen to be positive. It also emerged that religion, level of education, agricultural activities and cultural factors influence the uptake of immunization services. Recommendations are health education for mothers, sensitization of religious leaders and employment of community health workers. The study sought to assist researchers, planners and policy makers to build a case for more focused planning on how to improve the uptake of vaccinations in our community and reduce the child mortality and morbidity rates.

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CHAPTER ONE

INTRODUCTION

1.1 Background Information

The Expanded Programme on Immunization (EPI) was established in 1974 through a World Health Assembly resolution to build on the success of the global smallpox eradication programme, and to ensure that all children in all countries benefited from life-saving vaccines (Holtz, 2002). Since the launch of EPI in 1974, millions of deaths have been prevented every year by delivery of infant immunization through national immunization programmes. The first diseases targeted by the EPI were diphtheria, whooping cough, tetanus, measles, poliomyelitis and tuberculosis (WHO 2011). Global policies for immunization and establishment of the goal of providing universal immunization for all children by 1990 were established in 1977, this goal was considered an essential element of the WHO strategy to achieve health for all by 2000 (WHO 2011). In 2010, an estimated 85% of children less than one year of age globally had received at least three doses of DTP vaccine (DTP3). Additional vaccines have now been added to the original six recommended in 1974. Most countries, including the majority of low-income countries have added hepatitis B and Haemophilus influenzae type b (Hib) to their routine infant immunization schedules and an increasing number are in the process of adding pneumococcal conjugate vaccine and rotavirus vaccines to their schedules (WHO 2011).

The Expanded Programme on Immunization remains committed to its goal of universal access to all relevant vaccines for all at risk. The programme aims to expand the targeted groups to include older children, adolescents and adults and work in synergy with other public health programmes in order to control disease and achieve better health for all populations, particularly the underserved populations (WHO 2011). Immunization is a proven tool for controlling and even eradicating infectious diseases. An immunization campaign carried out by the World Health Organization (WHO) from 1967 to 1977 resulted in the eradication of smallpox. When the programme began, the disease still threatened 60% of the world's population and killed every fourth victim. Eradication of poliomyelitis is now within reach. Since the launch by WHO and its partners of the Global Polio Eradication Initiative in 1988, infections have fallen by 99%, and some five million people have escaped paralysis. Between 2000 and 2008, measles deaths dropped worldwide by over 78%, and some regions have set a target of eliminating the disease.

Maternal and neonatal tetanus has been eliminated in 20 of the 58 high-risk countries (WHO 2011).

Despite these advances, however, diseases that are preventable through immunization still remain a major public health problem in many developing countries. In 1995, a single disease among them, measles, claimed the lives of an estimated 1.2 million children and infected more than 45 million people (WHO, 1995). And by the end of the twentieth century, researchers discovered that, in the developing world, more than 3 million children still die annually from measles, neonatal tetanus, and pertussis, while more than a quarter of a million children are crippled by poliomyelitis (Matsuda 2002). The knowledge and information regarding importance of vaccines plays an important role for the decision to vaccinate family members. The primary care professionals involved in vaccination process have a pivotal role in educating parents on the safety and effectiveness of the vaccine, therefore health professionals need to have besides the knowledge about diseases and the vaccines, the ability to build awareness in a trustful relationship to the patients (Lorenz & Khalid 2012).

The effectiveness of immunization programs in resource-poor settings can be influenced by factors such as the coverage of the health network, the existence and quality of outreach services, the quality of the cold chain, the liaison of communities with health services, the existence of population movements, and several other factors that are related to the vaccines in use, to health services or to communities. The relative effect of each one of the above factors may significantly vary according to geographical areas. In this context, the understanding of local hurdles for effective immunization programs is crucial to develop and implement appropriate solutions (Jani et al 2008). Parents' perception that the risk associated with vaccination could be increased when a child has a minor illness may delay vaccination. 'Overloading the child's immune system is a common parental fear; many are concerned about the number and mix of vaccines, especially for vulnerable (for example, asthmatic) children. The perception that vaccines are dangerous, parents belief that they can control a disease should it develop, doubts about vaccine effectiveness, and belief that doctors overstate the dangers of disease may all prevent or delay vaccination, as may decisions made under conditions of uncertainty (if you are unsure of the outcome, you are less likely to make a decision) (Forrest et al 2000).

In 1981, the Kenya government, with assistance from the Danish International Development Agency (DANIDA), began to implement an EPI in Kenya (Mbai 1992). EPI is a part of the Primary Health Care (PHC) strategy which was adopted by the World Health Organization at its conference in 1978. At the time of EPI's introduction, only 43 percent of children in Kenya received immunization against various infectious diseases. Furthermore, immunization figures across the country were not evenly distributed. In some parts of the country, more children received immunization than in other areas. By 1987, the national immunization coverage had increased to 51 percent, but regional disparities in coverage had not been eliminated. Today, Kenya's national immunization coverage is estimated at 78 percent. This figure is slightly above the target of 75 percent which had been set by the Ministry of Health and DANIDA for 1990. As a result of this achievement, EPI has generally been regarded as a success. But despite this vaunted success, the national average in immunization has masked serious disparities among different regions of the country. (Mbai 1992)

Although 77 percent of children are fully immunized at any time, only 65 percent are fully immunized by their first birthday. The substantial increases in childhood immunization coverage levels at the national level and in all eight provinces most probably contributed to the overall drop in childhood mortality in Kenya. Infant mortality has dropped by 32 percent from 77 deaths per 1,000 in the 2003 KDHS to 52 deaths per 1,000 in the 2008-09 KDHS. There's Provincial variation in vaccination coverage in Kenya. The highest proportion of children fully vaccinated is in Central province 86 percent, followed by Rift Valley province with 85 percent. North Eastern and Nyanza provinces have the lowest proportion of children fully vaccinated, 48 percent and 65 percent, respectively (KNBS 2010).

In Siaya County the vaccination coverage is quite low compared to other regions in the country, it stands at 65 percent (CRA 2011) equal to the vaccination coverage of Nyanza. In Rarieda Division (Asembo) in Siaya county, infectious diseases are also common. Consequently, the area has high mortality figures that reflect this burden of infectious diseases. It has an infant mortality rate of 120 per 1,000 live births (Adazu 2005) which is quite high compared to the national average infant mortality rate of 52 per 1,000 live births (KNBS 2010). It is known that

universal immunization of children against vaccine-preventable diseases is crucial to reducing infant and child mortality in our communities. Therefore the study intends to establish the effects of awareness of mothers, socio-economic and cultural factors and attitude of mothers on vaccination uptake in Rarieda Division.

1.2 Problem Statement

Expanded Programme on immunization has a goal to provide universal access to vaccines for all infants in the world who are at risk of infectious diseases. Since the launch of EPI in 1974, millions of infants' deaths have been prevented every year by delivery of infant immunization through national immunization programmes. The EPI target diseases in Kenya include pneumonia, diphtheria, whooping cough, tetanus, measles, poliomyelitis and tuberculosis. These diseases are among the leading causes of high childhood morbidity and mortality in Kenya and they remain a major public health problem. Vaccinating a child significantly reduces costs of treating diseases, thus providing a healthy childhood and reducing poverty and suffering. Despite the high IMR in the developing countries, and the benefits of vaccinating an infant, vaccination coverage is still low in some parts of Kenya. In Siaya County the vaccination coverage is at 65 percent (KNBS 2010). In Rarieda Division within Siaya County the IMR is 120 per 1,000 live births (Adazu 2005) which is quite high. Therefore the study intends to establish the role of awareness of mothers, socio-economic and cultural factors and attitude of mothers play on vaccination uptake in Rarieda Division.

1.3 Objectives

1.3.1 Main Objective

To examine factors that influence uptake of EPI services in Rarieda division, Siaya County

1.3.2 Specific Objectives

- a) To establish awareness level of mothers on vaccines and vaccinations of children.
- b) To identify the socio-economic and cultural factors that influences the uptake of EPI services

c) To determine the perception/attitude of mothers on vaccination of children against the immunizable diseases as per EPI schedule.

1.4 Research Questions

- a) Are mothers aware of vaccines and vaccinations of children?
- b) What are the socio-economic and cultural factors that influence the uptake of EPI services?
- c) What is the perception/attitude of mothers on vaccination of children against the immunizable diseases as per EPI schedule?

1.5 Justification of the Study

Vaccination is important in improving child health in our communities. It helps prevent infant mortality and morbidity from vaccine preventable diseases. There have been reported cases in various parts of Kenya of outbreaks of vaccine preventable diseases which have led to disability and death in some instances. Some children either do not complete their vaccinations schedule or do not get vaccinated at all in spite of the benefits of vaccination. This could be as a result of mothers' lack of awareness or knowledge, attitude or some socio-economic and cultural factors. In Rarieda Division, infant morbidity and mortality rates are high; this may be as result of low vaccination coverage in the area. Therefore the concern of this study was to examine factors that influence uptake of EPI services (vaccinations) in Rarieda Division, Siaya County. There are eight Millennium Development Goals (MDGs) in which one of them, which is the fourth MDG is to reduce by two-thirds the under five mortality rates. Therefore the study findings and recommendations could go along way into helping the Government realize this goal. The study results and recommendations will also help the health policy makers and Ministry of Health (which has a policy to provide quality immunization services for the protection of all children under 5 years of age and all women of child bearing age from vaccine preventable diseases) to put in place policies that would help improve the vaccination uptake in Rarieda division and other regions in the country with similar conditions as the study area.

1.6 Scope and Limitation

The study was limited to only examine the factors that influence uptake of EPI services in Rarieda Division. From a target population of 3518 mothers with children aged 0-24 months, only 346 mothers were interviewed. Time and financial constraints did not allow all mothers with children aged 0-24 months to be interviewed in the division and also it did not allow for the study to be done in all households with children aged 0-24 months in the division, but the selected sample size for those mothers whose households were selected for interviews was adequate to give conclusive results.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Vaccination has been regarded as the most cost-effective intervention for child health promotion by the World Health Organization. Vaccinating a child significantly reduces costs of treating diseases, thus providing a healthy childhood and reducing poverty and suffering. In the past years, vaccination coverage rates have improved sufficiently in the developed countries, thereby conferring herd immunity, whereas most of the developing countries are still struggling with faltering rates. EPI target diseases are one of the leading causes of high childhood morbidity and mortality, as evidenced by high Infant Mortality Rates (IMR) in developing countries. (Siddiqi et al 2010). Epidemiological investigations of recent outbreaks of vaccine preventable diseases indicated that incomplete immunization was the major reason for the outbreaks. Moreover, a low immunization rate was the major reasons for many of the outbreaks of infectious diseases in the past two decades (Tadesse et al. 2008).

Many deaths in early childhood are preventable if children are immunized against preventable diseases and receive prompt and appropriate treatment when they become ill. Universal immunization of children against the seven vaccine-preventable diseases namely, tuberculosis, diphtheria, whooping cough (pertussis), tetanus, polio, pneumonia and measles are crucial to reducing infant and child mortality. Other childhood vaccines given in Kenya protect against hepatitis B and haemophilus influenzae type b (Hib). The proportion of children fully immunized in Kenya has increased from 57 percent in 2003 to 77 percent in 2008-09 (KNBS 2010).

Reasons underlying poor coverage has been studied by researchers worldwide and besides other factors, parental knowledge and beliefs have been documented to influence vaccination uptake. The challenge for immunization service providers, therefore, is to offer parents balanced and comprehensive information about the risks as well as the benefits of immunization during counseling sessions. Another emerging issue that threatens vaccination coverage, especially in developed countries is 'Concerns about vaccine safety'. Owing to disease eradication, the memory of immunizable diseases is fading; therefore, parents feel more threatened by the side

effects of vaccines, which are being observed and reported more frequently than the actual disease itself. (Siddiqi 2010). Therefore, the literature to be reviewed will look into some factors that influence uptake of EPI services.

2.2 Awareness of mothers on vaccines and vaccinations of children

The knowledge and information regarding importance of vaccines plays an important role for the decision to vaccinate family members. The primary care professionals involved in vaccination process have a pivotal role in educating parents on the safety and effectiveness of the vaccine, therefore health professionals need to have besides the knowledge about diseases and the vaccines, the ability to build awareness in a trustful relationship to the patients (Lorenz & Khalid 2012).

In Bangladesh, it was discovered that the knowledge, attitude and practice of parents of children under five years in respect of expanded programmes on Immunization target diseases, showed that attitude towards immunization was good and improved with further education. They observed that increase in knowledge with regards to increase in Immunization centers and days on which services are available were significant. There is improvement in knowledge and attitude ranging from 30 to almost 100%, but improvement in acceptance of vaccine was only within 6 to 10%. In Singapore, awareness and acceptance of hepatitis B vaccination showed that 46.5% were aware of the long time consequences of the infection. However uptake had increased to 48.3%. More than 2/3rd increase in uptake rate can be attributed to a reduction in the cost of Hepatitis B vaccination and vigorous nationwide education programmes (Adeyinka et al 2009).

In A study done in Delhi, it was found that the proportion of respondents who were aware about various aspects of Routine Immunization (RI) was quite low; mothers had fair knowledge regarding the need for immunization but had poor knowledge regarding the diseases that it prevents. A declining trend in awareness about diseases covered under RI was observed, especially the age at which the vaccine is administered. The only exception was tuberculosis; the awareness about it was lower probably because questions were asked about 'tuberculosis', not BCG. However, this in itself may be a significant finding that many people do not associate BCG with the disease it is actually meant for. Previous studies have shown a declining trend in

coverage, with vaccines given at higher ages having progressively lower coverage percentage. The findings about a declining trend of awareness levels about vaccines with the age for vaccination can be a direct contributory factor for the 'drop-out' in the coverage of vaccines. Knowledge about RI increases with the education level of the respondents correlates well. A study in Bangladesh found lack of knowledge in mothers on vaccine preventable diseases to be strongly associated with no or delayed immunization. A UNICEF report had identified 'caregivers not knowing the value of vaccines and time and place of administration' as the top challenge to immunization programmes worldwide. A study in Rajasthan had found that specific information about vaccine preventable diseases other than polio was very limited in mothers (Sharma & Bhasin 2008).

In a study done in India in Pilani town, majority of the mothers were able to mention at least one benefit of immunization as preventing illness, paralysis, or death. Polio prevention was the most often mentioned benefit. Mothers of fully and partially immunized children mentioned more than one benefit in general. Average number of correctly identified diseases for which EPI vaccines are given was only 2.01 among the mothers of fully immunized children. Though majority expressed favorable attitudes and is satisfied with the program, mothers' inability to name or identify diseases other than poliomyelitis indicates that health education should be emphasized to enhance mother's knowledge about the complete program. Main reasons for non-immunization such as obstacles, misconceptions/beliefs and lack of information among mothers clearly indicate that they do not fully understand the importance of immunizing their children. Examining mothers' responses closely indicated that some expressed that they did not take the child for immunization because of gender; girl child was neglected at least in five instances in the study (Manjunath & Pareek 2003).

It appears that there is no association between parents' knowledge and vaccination coverage rates, and the public accept vaccination despite limited knowledge about it. Also, when parents resist vaccination, it is because they want to protect their children from harm. In 2003, political and religious leaders in three Nigerian states boycotted a WHO polio vaccination campaign, claiming that the vaccine caused sterility and AIDS. Similarly, certain Hindu and Muslim groups in India have long held the belief that vaccination is a covert method of family planning, primarily targeting Muslims. The greater acceptance of vaccination found among Javanese

transmigrants as opposed to Acehnese villagers in the same area has been attributed to the former's more positive cultural attitudes towards health. Both groups were found to have an equally poor understanding of vaccination and health in general (Jheeta & Newell 2008).

In a study done in south coast and Busia regions of Kenya by Ojaka in 2011, it was noted that in general, parents were aware of local immunization programs and could name different diseases for which children are vaccinated. Pharmacists were more knowledgeable than parents about these programs. Participants in both research settings generally reacted positively to the idea of having children vaccinated. For example, one of the chiefs interviewed explained that nothing he knew about vaccines would deter him from accessing the services, and a women's leader said she knew it was her responsibility to take her child to be vaccinated. Similar views were shared in FGDs with older women and younger parents, who explained that they had not experienced major problems in accessing vaccination services. The majority of participants held the view that the main benefit of immunization was avoidance of disease-related child death and disability and reduction in the severity of disease. Some participants said they understood that vaccines worked for a limited time, while others said that vaccines ensured that children did not get infections too frequently. Some misconceptions included statements that vaccines can cure diseases.

2.3 Socio-economic and cultural factors influencing uptake of EPI services

The effectiveness of immunization programs in resource-poor settings can be influenced by factors such as the coverage of the health network, the existence and quality of outreach services, the quality of the cold chain, the liaison of communities with health services, the existence of population movements, and several other factors that are related to the vaccines in use, to health services or to communities. The relative effect of each one of the above factors may significantly vary according to geographical areas. In this context, the understanding of local hurdles for effective immunization programs is crucial to develop and implement appropriate solutions (Jani et al 2008).

Vaccine controversies do have an impact on vaccination rates. The vaccine controversies may have roots in religious and cultural factors such as the polio vaccine controversy in Nigeria in

2003 and in India in 2006. A solution in similar situations might be the engagement of local religious leaders to clarify the concerns as well as having a well planned dissemination strategy of the scientific evidence of safety of the vaccine. Health education as a tool to disseminate the information should be used, keeping in view the cultural context and the local communities. For example, in 2007 some of the conservative religious clerics claimed that the polio vaccine is an "Infidel Vaccine" and the main purpose is to sterilize Muslims and blamed it to be a Western plot against Muslims. Some of the religious clerics even claimed that it is un-Islamic to vaccinate their children and those who die of Polio are martyrs. Unfortunately, due to lack of information and awareness of the local people, 24,000 children were deprived of polio vaccination just because of this controversy and became difficult to run polio awareness campaign. The awareness campaign was halted after health professionals were targeted during polio awareness campaign (Lorenz & Khalid 2012).

A multiregional study from Bangladesh, Ethiopia, India, Malawi and the Philippines concluded there was a "very sizeable social demand" for better quality of vaccination services and that serious damage was being done to the Expanded Programme on Immunization (EPI) by poor interaction between staff and clients. Other studies suggest that vaccination demand and acceptance depend on factors that are far more numerous and complex. Supply related factors are clearly important, particularly the relationship between health-care workers and mothers (including attitudes of vaccinators towards mothers, as well as their perceived motives and technical competence). The opportunity costs (such as lost earnings or time) incurred by parents may also have an important impact on uptake. Suppliers may not be fully aware of these costs or may fail to address them through convenient locations and timing of services (Jheeta & Newell 2008). Similarly, followers of the Aga Khan in Pakistan were found to be receptive to biomedical or western medicine and reasoning despite the fact that as a group they were largely illiterate and understood little about vaccination. Cultural receptivity to perceived modernity and education, as well as trust in health workers, was considered to be the most important factors influencing attitudes. In short, knowing little about vaccination does not necessarily translate into negative attitudes towards it; factors such as trust (e.g. in health-care providers or western medicine) and culture may be more influential (Jheeta & Newell 2008).

In Mozambique, migrants were found to be less well vaccinated compared to long term residents in the area. In Cameroon, children of mothers with a history of migration were seen to be less vaccinated. Migration might also be associated with low vaccine uptake due to the weak social integration of migrating populations. Nevertheless, factors such as the vaccination coverage in the settlement area and the mother's awareness of the importance of immunization may also play an important role (Jani et al 2008).

In a study done in south coast and Busia regions of Kenya results indicated that decision-making related to child vaccination varies. In the Coast region, parents said the decision usually fell to the father or to another adult male household member. In Busia, parents generally agreed that mothers were the ones who usually decided whether or not to vaccinate a child because when they go to clinic, they are taught about various types of vaccinations and their sequencing, including dates. Some study participants had more nuanced answers on the question of who might decide whether or not to have a child vaccinated. They noted that in some instances, the family as a whole, including the extended family, may be involved in such a decision. In many situations, who makes the decision may depend on who is the main income earner, how busy the mother is at home, and who can provide transportation for the mother and child. Some participants noted that the family may also be influenced by a broader network of people that includes neighbours, community leaders, and health workers (Ojaka 2011).

Certain traditional cultural practices may inhibit timely immunization, especially with regard to vaccines given soon after birth. In the Busia region, study participants reported that mothers who deliver at home are required to keep the baby indoors for three to four days after birth (three days for a girl, four days for a boy). In addition, some mothers do not like their children to be weighed naked during a check-up or to have them share the weighing basket with others. Study participants noted that some religious denominations also forbid childhood immunization (Ojaka 2011). In some societies with cultural discrimination against female children; boys have a greater chance to be vaccinated. In other settings, both younger and older, age of mothers has been reported to be associated with incomplete vaccination (Jani et al 2008).

2.4 Attitude/perception of mothers on vaccination of children

Parents' perception that the risk associated with vaccination could be increased when a child has a minor illness may delay vaccination. 'Overloading the child's immune system is a common parental fear; many are concerned about the number and mix of vaccines, especially for vulnerable (for example, asthmatic) children. The perception that vaccines are dangerous, parents belief that they can control a disease should it develop, doubts about vaccine effectiveness, and belief that doctors overstate the dangers of disease may all prevent or delay vaccination, as may decisions made under conditions of uncertainty (if you are unsure of the outcome, you are less likely to make a decision) (Forrest et al 2000).

The attitude of the parents can strongly influence vaccination rate. This parental attitude is not only influenced by the perceptions of infectivity and severity of the disease, but also by the parental perception of vaccine safety and its effectiveness. The parental perception of severity of the disease is also influenced by the prevalence of the disease itself. If the prevalence of a particular vaccine preventable disease is low, the fear of the disease and its severity is also low as the disease is not physically seen in the communities. In the UK, pertussis was perceived to be associated with whooping cough and MMR vaccine with autism that affected the perception of the parents about the safety of vaccine which had a serious negative impact on the vaccine rate. Therefore it is important that parents are informed about safety and effectiveness of vaccines, about the severity of the disease and the risks involved in case their child is not vaccinated (Lorenz & Khalid 2012).

Demand-related factors, such as parents' knowledge about vaccination and immunization and their attitudes towards them, are also likely to influence uptake. What remains unclear, however, is whether people's attitudes are more strongly influenced by the perceived benefits of vaccination or by the perceived risks of not being vaccinated. According to one school of thought, the demand for vaccination is triggered by a general perception that vaccines are good for infants and/or a strong feeling of vulnerability to serious illness. A contrasting viewpoint is that the greatest determinant of vaccination uptake is the perceived quality of vaccination services. The situation is likely to differ depending on the context (Jheeta & Newell 2008).

In Italy, vaccination of children is regulated by a dual system that is a certain number of compulsory immunizations, and a number of other facultative vaccinations. This has resulted in a different coverage against infections under the two regimens. In order to verify the attitude of mothers towards vaccination, a questionnaire-based study was proposed to women taking their children to vaccination services for mandatory immunization. The preliminary results on 300 questionnaires show a generally favorable attitude towards vaccines of 80% of mothers. Only 7% of them would not immunize at all their children if vaccinations were not mandatory (Bonanni & Bergamini 2001).

Nigeria like many countries in Africa is making efforts to strengthen its health system especially the routine immunization so as to reduce the burden from vaccine preventable diseases. This is against the backdrop of poor routine immunization coverage of 13%. In Northern Nigeria, on the perception, beliefs and practices towards measles and measles vaccination showed 1 of 500 mothers interviewed believed that measles is prevented by immunization, 16% believed that it is contagious, 26% believed that it is caused by evil spirit, witchcraft and heat, 25% has never heard of measles immunization, 27% said that they did not believe immunization was effective and 4% were not allowed to go for immunization by their husbands (Adeyinka et al 2009).

Parents' beliefs influence their acceptance of vaccination and the perception of risk is subjective. Many non-vaccinating parents believe the risk of disease is low and the risk of vaccine side effects is high, and/or vaccination is ineffective. The Melbourne based study, conducted in 1995 with 45 mothers, showed that 'complete immunizers' were fearful of the outcomes of unfamiliar diseases, and 'incomplete immunizers' considered vaccines less effective. Specifically, many 'non-immunizers' were fearful of unknown/long-term side effects of vaccines, mistrusted the motives of health providers, and believed vaccination was a social experiment. They felt diet and building up general immunity were viable and safe alternatives (Forrest et al 2000).

2.5 Theoretical Framework

The study will adopt a theoretical framework based on health belief model. The health belief model (HBM) was one of the first, and remains one of the best known social cognition models.

The Health Belief Model (HBM) is a psychological model that attempts to explain and predict health behaviors. This is done by focusing on the attitudes and beliefs of individuals. The HBM was first developed in the 1950s by social psychologists Hochbaum, Rosenstock and Kegels working in the U.S. Public Health Services. The model was to study and promote the uptake of health services. It was developed in response to the failure of a free tuberculosis (TB) health screening program. The model was furthered by Becker and colleagues in the 1970s and 1980s. Subsequent amendments to the model were made as late as 1988, to accommodate evolving evidence generated within the health community about the role that knowledge and perceptions play in personal responsibility (Glanz et al, 1997). Originally, the model was designed to predict behavioural response to the treatment received by acutely or chronically ill patients, but in more recent years the model has been used to predict more general health behaviors. The HBM suggests that your belief in a personal threat together with your belief in the effectiveness of the proposed behaviour will predict the likelihood of that behaviour.

The HBM is based on the understanding that a person will take a health-related action (take a child for vaccination) if that person: feels that a negative health condition(immunizable diseases)can be avoided, has a positive expectation that by taking a recommended action, he/she will avoid a negative health condition (vaccination will be effective at reducing child morbidity and mortality)and believes that he/she can successfully take a recommended health action(i.e. take a child for vaccination with confidence) (Glanz et al, 2002).

The HBM was spelled out in terms of four constructs representing the perceived threat and net benefits: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. These concepts were proposed as accounting for people's "readiness to act." An added concept, cues to action, would activate that readiness and stimulate overt behavior. A recent addition to the HBM is the concept of self-efficacy, or one's confidence in the ability to successfully perform an action. This concept was added by Rosenstock and others in 1988 to help the HBM better fit the challenges of changing habitual unhealthy behaviors, such as being sedentary, smoking, or overeating (Glanz et al, 2002).

The Health Belief Model has been applied to a broad range of health behaviors and subject populations. Three broad areas can be identified (Conner & Norman, 1996): 1) Preventive health

CHAPTER THREE METHODOLOGY

3.1 Study Design

The main objective of the study was to examine factors that influence uptake of EPI services in Rarieda Division, Siaya County. The study therefore employed a cross sectional descriptive survey design. The design is where a researcher employs a single point of data collection for each participant or system being studied. It is useful for examining phenomena expected to remain static through the period of interest. The design was preferred because it involves only one contact with the study population, therefore it was comparatively cheap to undertake and easy to analyze. It was also useful in obtaining an overall picture as it stands at the time of study.

3.2 Study Area

This study was conducted in Rarieda Division in Siaya County, located on the shores of Lake Victoria in Nyanza Province, western Kenya. Rarieda Division is situated at $-0.220S-0.230N$ latitude, $34.530W-34.280E$ longitude. Rainfall is seasonal with the heaviest 'long' rains usually occurring from March through May and 'short' rains falling between October and December. Average temperature ranges between $17^{\circ}C$ and $35^{\circ}C$ at a mean altitude of approximately 1070 meters above sea level (Odhiambo, 2012). The division covers an area of 179.5 km^2 with a widely dispersed ethnically homogeneous population of 31,289 males and 34,669 females with 15,350 households (KNBS, 2010). Approximately 96% of the population belongs to the Luo ethnic group. The majority are subsistence farmers and fishermen. Infant and under-five mortality are considerably higher in this region than in other parts of Kenya (176/1000 and 275/1000) (McElroy et al, 2001), though the infant mortality has reduced to 120/1000 (Adazu 2005) but still remains high. Rarieda Division is divided into 4 locations (West Asembo, Central Asembo, East Asembo and South Asembo), 10 sub-locations and 75 villages. The division has a total of 9 health facilities that offer vaccination services. Most of these facilities do not offer vaccination services on daily basis but have specific days in a week for immunization.

3.3 Study Population

It consisted of the total number of mothers with children aged between 0-24 months from which the sample size was drawn. In Rarieda division, number of mothers with children who fell in that age category was 3518 in total, hence those mothers were considered for sampling. The populations for each sub-location was as follows; Omia diere 265, omia malo 468, omia mwalo 263, memba 450, south ramba 202, north ramba 495, mahaya 228, siger 586, akom 195, nyagoko 366.

3.4 Sample Size

The sample size was calculated by the use of Cochran's formula. For populations that are large, Cochran (1963:75) developed the following formula to yield a representative sample for proportions.

Formula:

$$n_0 = \frac{Z^2 pq}{e^2}$$

Description:

n_0 = desired sample size (if the target population is more than 10,000)

Z = standard normal deviate at the required confidence level, usually 1.96.

This corresponds to 95% confidence interval

p = the estimated proportion of an attribute that is present in the population

q = 1-p (level of statistical significance).

e = the desired level of precision (standard value of 0.05).

This formula is normally used when the target population is more than 10,000. In this case the target population is less than 10,000. If the population is small then the sample size can be reduced slightly. This is because a given sample size provides proportionately more information

for a small population than for a large population. The sample size (n) can be adjusted using the following formula.

Formula:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Description:

n = the desired sample size when the population is less than 10,000

n_0 = the desired sample size when the population is more than 10,000

N = the population size

In this study $p=0.5$ and $q=0.5$. At 0.05% confidence limit level=1.96

Hence:

$$n_0 = \frac{1.96 \times 1.96 \times 0.5 \times 0.5}{0.05 \times 0.05} = 384.16$$

Therefore:

$$n = \frac{384}{1 + \frac{(384-1)}{3518}} = 346.26$$

So the total sample size used was 346.

The total sample size was divided between the sub-locations according to the ratio of the number of mothers of children aged 0-24 months in each sub-location by stratified sampling method.

3.5 Sampling Procedure

The study applied both probability and non probability sampling methods. Rarieda division was purposely sampled. All the four locations (West Asembo, Central Asembo, East Asembo and South Asembo) in Rarieda Division were sampled. In the four locations, proportionate stratified sampling was used to allocate the sampled population to the sub-locations. Each sub-location was allocated a fraction of the sample size based on its population. In each sub-location once the number of women to be interviewed had been established, systematic random sampling procedure was used to purposely interview only mothers with children aged between 0-24 months at the household level in the division. After randomly identifying the first mother to be interviewed, then progressively in the list every tenth mother was interviewed until the target number was achieved. The table below shows how the sample size was distributed to the sub-locations.

Table 1; Estimated sample size per sub-location.

| SUB-LOCATION | ESTIMATED POPULATION OF MOTHERS WITH CHILDREN AGED 0-24 MONTHS | SAMPLE SIZE PER SUB-LOCATION |
|--------------|--|------------------------------|
| OMIA DIERE | 265 | $265/3518 \times 346 = 26$ |
| OMIA MALO | 468 | $468/3518 \times 346 = 46$ |
| OMIA MWALO | 263 | $263/3518 \times 346 = 26$ |
| MEMBA | 450 | $450/3518 \times 346 = 44$ |
| SOUTH RAMBA | 202 | $202/3518 \times 346 = 20$ |

| | | |
|--------------|-------------|----------------------------|
| NORTH RAMBA | 495 | $495/3518 \times 346 = 49$ |
| MAHAYA | 228 | $228/3518 \times 346 = 22$ |
| SIGER | 586 | $586/3518 \times 346 = 58$ |
| AKOM | 195 | $195/3518 \times 346 = 19$ |
| NYAGOKO | 366 | $366/3518 \times 346 = 36$ |
| TOTAL | 3518 | 346 |

Source: KEMRI/CDC-HDSS 2012 unpublished data

3.6 Data Collection

3.6.1 Primary Data

For primary data collection, both quantitative ways of administering household questionnaires and qualitative method of key informant interviews were utilized in this study.

3.6.1.1 Household Questionnaire

From a target population of 3518 mothers with children aged between 0-24 months, a sample of 346 mothers were selected; this sampled population was proportionately stratified among all the 10 sub-locations in Rarieda Division. Systematic random sampling procedure was used to choose the respondents and household questionnaires were administered to those mothers to collect quantitative data.

3.6.1.2 Key Informant Interview

For qualitative data collection, key informants were selected from all the 9 health facilities offering immunization services in Rarieda Division. Interview guides was used to obtain

information on vaccination practices at the health facilities, outreach programmes and training of health workers. The informants were the nurses in charge of the health facilities.

3.6.2 Secondary Data

Secondary data was collected through a review of available literature from the journals, books, newspapers and internet sources.

3.7 Data Analysis and Presentation

Once primary data had been collected from the field, questionnaires and interview guides were checked to ensure that all questions were properly answered and errors corrected. Primary data were entered into a computer using codes developed under different variables to allow for the use of Statistical Package for Social Sciences. Quantitative data was processed with the use of statistics associated with cross tabulations; Chi-square and coefficient correlations. These statistical tools were used to measure the degree, strength and direction of association as well as relationship. To facilitate data interpretation and ease of understanding the results of the study, data was presented in form of frequency distribution tables, pie charts and graphs. Qualitative data analysis was done manually through content analysis by categorizing relevant responses to answer research questions and presented alongside quantitative data.

3.8 Ethical Consideration

Before going to the field to collect data, the researcher first sought permission from the relevant authorities. Permission to conduct this study was obtained from Maseno University School of Graduate Studies (SGS), District Medical Officer of Health (DMOH) in Rarieda District, District Public Health Nurse (DPHN) Rarieda, Government Administration Officers and a written consent from mothers through their signature or fingerprint (for those who were unable to read and write) after the aim of the study was explained. All the information obtained from the mothers was kept confidential and were only used for the purpose of this research only. Consenting mothers were free to withdraw from the study at any point without any penalties.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter deals with the analysis of research questions based on responses from the questionnaires administered to 346 mothers with children aged between 0-24 months and key informant interviews administered to 9 nurses in charge of the health facilities which offer vaccination services in Rarieda Division, Siaya County. Based on the responses from the questionnaires and interview guides, the following information was gathered, analyzed and interpreted.

4.2 Demographic characteristics of the respondents

The study set to interview only mothers with children aged 0-24 months at household level. A total of 346 mothers were sampled to participate in this study. It was necessary to understand the marital status of this sampled population so as to understand the social aspects of their lives. From the findings the highest percentage of this sampled population are married 69%, followed by single mothers at 22%, divorced mothers were 5% and the lowest percentage were widowed mothers at 4%. (Table 2).

Table 2: Frequencies on the marital status of the respondents

| Marital Status | Age Categories | | | | | Total(N%) |
|----------------|----------------|---------|---------|---------|------|-----------|
| | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 + | |
| Single | 42 | 24 | 10 | 0 | 0 | 76 (22) |
| Married | 21 | 81 | 60 | 24 | 51 | 237 (69) |
| Divorced | 0 | 0 | 3 | 6 | 9 | 18 (5) |
| Widowed | 0 | 3 | 3 | 6 | 3 | 15 (4) |
| Total | | | | | | 346(100) |

Source: Field data

For the study to achieve its set objectives as outlined it was necessary to know the religious affiliation of the mothers. Religion in most cases is seen to influence individual decision making and this would apply to decision making regarding vaccination of children. From a total of 346 mothers with children aged 0-24 months who were sampled for the study 29% belonged to various religious affiliations, 25% were catholics, 22% were Anglican, 13% were Nomiya Luo

church members, 8% were Seventh Day Adventists(SDA),3% are legio Maria, and the lowest percentage were Muslims at 1%.(Table 3)

Table 3: Frequencies on the religious affiliations of the respondents

| Religious affiliation | Age category | | | | | Total (N%) |
|-----------------------|--------------|---------|---------|---------|------|------------|
| | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 + | |
| Catholic | 21 | 27 | 25 | 3 | 12 | 88 (25) |
| Anglican | 15 | 24 | 15 | 6 | 15 | 75 (22) |
| Muslim | 0 | 0 | 0 | 0 | 3 | 3 (1) |
| Legio maria | 0 | 6 | 0 | 3 | 0 | 9 (3) |
| Nomiya luo church | 6 | 12 | 12 | 6 | 9 | 45 (13) |
| SDA | 3 | 3 | 6 | 6 | 9 | 27 (8) |
| Other religion | 18 | 36 | 18 | 12 | 15 | 99 (29) |
| Total | | | | | | 346 (100) |

Source: Field data

Education level of any individual influences the social interaction of an individual and the behaviour of individuals too. Education level may be seen to influence the level of awareness on vaccination; education level can also influence the attitude of mothers towards vaccination. Therefore the study sought to understand the education level of the participants so as to be able to compare with other variables in the study. From the findings out of 346 mothers who were interviewed the majority (62%) had achieved primary education as their highest level of education, 29% had attained secondary education, 8% had attained post secondary education and 1% had not gone to school at all.(Table 4).

Table 4: Frequencies on the education level of the respondents

| Education | Age category | | | | | Total (N %) |
|----------------|--------------|---------|---------|---------|------|-------------|
| | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 + | |
| Primary | 54 | 57 | 40 | 21 | 42 | 214 (62) |
| Secondary | 9 | 45 | 27 | 9 | 9 | 99 (29) |
| Post secondary | 0 | 6 | 9 | 6 | 9 | 30 (8) |
| None | 0 | 0 | 0 | 0 | 3 | 3 (1) |
| Total | | | | | | 346(100) |

Source: Field data

Income of an individual determines the ability of an individual to afford the basic necessities of life. With some sought of income an individual is able to tackle some of the economic challenges that they are faced with. Financially empowered mothers are able to make certain key decisions without difficulty. Therefore the study sought to understand the source of income of the respondents so as to understand if that may have an impact on decisions to vaccinate children. From the findings out of 346 mothers interviewed most of them were housewives, and they consisted 32% of the total number interviewed,19% of the mothers were self employed, 14% percent had other sources of income or were unemployed, 11% were farmers, 10% were salaried workers, 9% were casual workers and 4% were still students(table 5)

Table 5: Frequencies on the source of income of the respondents

| Source of income | Age category | | | | | Total (N%) |
|------------------|--------------|---------|---------|---------|------|------------|
| | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 + | |
| Farmer | 0 | 9 | 9 | 6 | 15 | 39 (11) |
| Salaried worker | 3 | 0 | 12 | 6 | 15 | 36 (10) |
| Self employment | 6 | 12 | 18 | 12 | 18 | 66 (19) |
| Student | 12 | 0 | 3 | 0 | 0 | 15 (4) |
| Casual worker | 9 | 6 | 3 | 3 | 9 | 30 (9) |
| Housewife | 9 | 57 | 30 | 9 | 6 | 111 (32) |
| Other sources | 30 | 12 | 6 | 0 | 0 | 49 (14) |
| Total | | | | | | 346(100) |

Source: Field data

4.3 Awareness levels of mothers on vaccines and vaccination of children

The study set to determine the awareness level of mothers on vaccines being administered to children in the routine immunization schedule. It was revealed that respondents are aware of some of the vaccines being administered in the routine immunization schedule. The findings indicated that out 346 mothers interviewed, 96% were aware of polio vaccine,77% were aware of measles ,55% were aware of BCG,21% were aware of pentavalent,17% were of PCV 10 and 2% were aware of yellow fever(Table 6).

Table 6: Awareness level of mothers on various vaccines

| Vaccines administered | Awareness level |
|------------------------------|------------------------|
| BCG | 55% |
| Polio | 96% |
| Pentavalent | 21% |
| PCV 10 | 17% |
| Yellow fever | 2% |
| Measles | 77% |

Source: Field data

The level of awareness on the vaccines is important in determining whether a mother will take their child for vaccination or not. When a mother is not aware of a particular vaccine then they may not see the need or benefits of taking their children for vaccines. According to Lorenz and Khalid (2012) the knowledge and information regarding importance of vaccines plays an important role for the decision to vaccinate family members. The primary care professionals involved in vaccination process have a pivotal role in educating parents on the safety and effectiveness of the vaccine, therefore health professionals need to have besides the knowledge about diseases and the vaccines, the ability to build awareness in a trustful relationship to the patients.

During analysis a comparison between religious affiliation of mothers and their awareness about vaccines being administered to children in the routine immunization schedule was done. The highest percentage of the respondents mentioned that they know about polio and measles vaccines. On polio vaccine the lowest response rate was at 92% who were Anglicans, on measles the lowest response rate was at 65% who were from other religious affiliations. Awareness about BCG vaccine was average. On the response rate the lowest response was at 39% for BCG vaccine. Awareness on pentavalent, PCV10 and yellow fever vaccines was poor. Among the Legio Maria none of them was aware of the three vaccines. Awareness on the yellow fever vaccine was the poorest, because only 7% of the respondents were aware of it and again they all belonged to the catholic faith only (Table 7).

Table 7: Comparisons between religious affiliation of the mothers and the general knowledge on vaccines

| Religious affiliation | BCG | Polio | Pentavalent | PCV 10 | Yellow fever | Measles |
|-----------------------|------|-------|-------------|--------|--------------|---------|
| Catholic | 62% | 100% | 17% | 14% | 7% | 86% |
| Anglican | 67% | 92% | 29% | 21% | 0 | 79% |
| Muslim | 100% | 100% | 100% | 0 | 0 | 100% |
| Legio maria | 50% | 100% | 0 | 0 | 0 | 100% |
| Nomiya luo church | 40% | 93% | 7% | 13% | 0 | 80% |
| SDA | 78% | 100% | 44% | 44% | 0 | 78% |
| Other | 39% | 97% | 16% | 13% | 0 | 65% |

Source: Field data

Religion is seen to play a role in awareness about vaccines because they can influence an individual's decision to vaccinate their children. According to Jheeta and Newell (2008), in 2003, political and Muslim leaders in three Nigerian states boycotted a WHO polio vaccination campaign, claiming that the vaccine caused sterility and AIDS. Similarly, certain Hindu and Muslim groups in India have long held the belief that vaccination is a covert method of family planning, primarily targeting Muslims

A comparison between education level of the mothers and the general knowledge on the vaccines being administered in the routine immunization schedule was done during analysis. The results indicated that the level of education played a big role on the awareness of mothers on the vaccines. Mothers who had post secondary education were more aware of the vaccines compared to those mothers who had primary education, secondary education or no education at all. The results showed that mothers who had no education at all only knew about measles vaccine. In the study results most parents were mostly aware of polio and measles vaccines and poorest awareness was observed on yellow fever vaccine (Table 8).

Table 8: Comparisons between education level of the mothers and the general knowledge on vaccines

| Education level | Vaccines administered | | | | | |
|-----------------|-----------------------|-------|-------------|--------|--------------|---------|
| | BCG | Polio | Pentavalent | PCV 10 | Yellow fever | Measles |
| Primary | 46% | 96% | 12% | 10% | 0 | 69% |
| Secondary | 64% | 100% | 27% | 24% | 6% | 88% |
| Post secondary | 90% | 100% | 60% | 40% | 0 | 100% |
| None | 0 | 0 | 0 | 0 | 0 | 100% |

Source: Field data

The findings indicate that the higher the level of education the higher the level of awareness on the vaccines and the higher the chances that children will receive the vaccines. This poses a big challenge to the service providers. From the findings in the study majority of the mothers interviewed had primary education as their highest level of education and the findings also indicated that apart from those who have not gone to school at all, this group have the lowest level of awareness. According to Sharma and Bhasin (2008) a declining trend of awareness levels about vaccines with the age for vaccination can be a direct contributory factor for the 'drop-out' in the coverage of vaccines. Knowledge about Routine Immunization increases with the increased level of education of the respondents. A study in Bangladesh found lack of knowledge in mothers on vaccine preventable diseases to be strongly associated with no or delayed immunization. A UNICEF report had identified 'caregivers not knowing the value of vaccines and time and place of administration' as the top challenge to immunization programmes worldwide.

During analysis a comparison between age of the mothers and the general knowledge on the vaccines being administered in the routine immunization schedule was done. The findings showed that there was low awareness level in the lower age bracket of 15-19 years and high awareness level in the 30-34 years age category. Awareness on polio and measles vaccine was also seen to be high in this case (Table 9).

Table 9: Comparisons between age of the mothers and the general knowledge of the vaccines

| Age category | Vaccines administered | | | | | |
|--------------|-----------------------|-------|-------------|--------|--------------|---------|
| | BCG | Polio | Pentavalent | PCV 10 | Yellow fever | Measles |
| 15-19 | 45% | 95% | 5% | 5% | 0 | 50% |
| 20-24 | 53% | 100% | 15% | 24% | 3% | 82% |
| 25-29 | 56% | 96% | 24% | 8% | 4% | 92% |
| 30-34 | 81% | 100% | 36% | 27% | 0 | 64% |
| 35+ | 52% | 90% | 33% | 24% | 0 | 86% |

Source: Field data

The low awareness level in the lower age bracket of 15-19 years can be attributed to various factors. The education level of this group is still low due to their age. Some of them might have dropped out of school due to pregnancies and therefore did not get higher education. The study findings actually indicated low awareness level among those who are least educated. The age bracket of 30-34 years has a high awareness because most of them may be having post secondary education. A study done by Jani et al (2008) indicated that in some societies with cultural discrimination against female children; boys have a greater chance to be vaccinated. In other settings, both younger and older, age of mothers has been reported to be associated with incomplete vaccination

The findings indicated that awareness on vaccine preventable diseases in Rarieda Division is very low. Polio is the highly known disease by the respondents. At least 81% was the lowest response rate in all the age categories. Most respondents also knew about measles with the lowest response rate being 38%. Awareness about vaccine related diseases was averagely highest among the respondents who were over 35 years of age. Awareness on the diseases to be vaccinated against was poorest in the lower age bracket of 15-19 years. No respondent was aware of the haemophilus influenza type b disease. The findings also showed that certain participants did not know any of the vaccine preventable diseases. The highest number of participants who did not know at all any of the vaccine preventable diseases was in the lower age bracket of 15-19 years and the response rate was 10% (Table 10).

Table 10: Comparisons between age of the mothers and the general knowledge on the vaccine related diseases.

| Diseases vaccinated against | Age category | | | | |
|-----------------------------|--------------|---------|---------|---------|------|
| | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 34 | 35 + |
| Tuberculosis | 1% | 5% | 4% | 16% | 28% |
| Whooping cough | 0 | 3% | 8% | 8% | 14% |
| Diphtheria | 0 | 3% | 4% | 0 | 10% |
| Measles | 38% | 75% | 88% | 75% | 86% |
| Polio | 81% | 89% | 88% | 92% | 86% |
| Pneumonia | 14% | 22% | 16% | 17% | 24% |
| Tetanus | 5% | 8% | 8% | 0 | 29% |
| Hepatitis b | 0 | 0 | 0 | 0 | 5% |
| Haemophilus influenza b | 0 | 0 | 0 | 0 | 0 |
| Don't know | 10% | 8% | 0 | 8% | 0 |

Source: Field data

Many respondents in most instances were aware that they should be taking their children for vaccination; they even believed it was their responsibility. The sad part is the little knowledge they had was that vaccines were important and prevented child illness but had no idea which diseases their children were being protected against. Sharma and Bhasin (2008) indicated that in a study done in Delhi, it was found that the proportion of respondents who were aware about various aspects of Routine Immunization (RI) was quite low; mothers had fair knowledge regarding the need for immunization but had poor knowledge regarding the diseases that are being prevented by the vaccines. This is a worrying trend and health education should be emphasized. This finding also concur with what Manjunath and Pareek (2003) also found out that in a study done in India in Pilani Town, majority of the mothers were only able to mention one benefit of immunization as preventing illness, paralysis, or death. Polio prevention was the most often mentioned benefit. Mothers of fully and partially immunized children mentioned more than one benefit in general. Average number of correctly identified diseases for which EPI vaccines were given was only 2% among the mothers of fully immunized children. Though majority expressed favorable attitudes and is satisfied with the program, mothers' inability to name or identify diseases other than poliomyelitis indicates that health education should be emphasized to enhance mother's knowledge about the complete program rather than stressing on polio. In a study done in South Coast and Busia regions of Kenya by Ojaka (2011), it was noted

that in general, parents were aware of local immunization programs and could name different diseases for which children are vaccinated.

The findings showed that 89% of the respondents are aware that the first vaccine should be administered to the child at birth, 10% stated that the first vaccine is administered at 1 month and 1% do not know when the first vaccine should be administered (Figure 1).

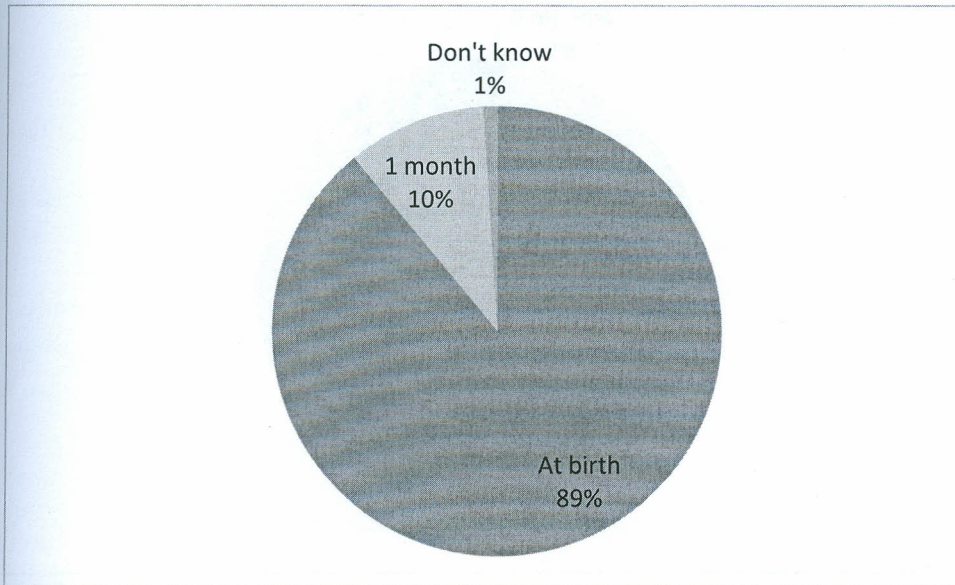


Figure 1: Age first vaccine administered to children

Source: Field data

The findings showed that at least 89% of the respondents would have their children begin their immunization schedule on time and 11% would either delay or have their children miss out on the first vaccines all together. This puts the children who have not received these first vaccines at risk, for instance a child may miss to have BCG on time and this puts the child to risk of tuberculosis. According to Sharma and Bhasin (2008) in a study done in Delhi, a declining trend in awareness about diseases covered under RI was observed, especially the age at which the vaccine is administered. The only exception was tuberculosis; the awareness about it was lower probably because questions were asked about 'tuberculosis', not BCG. However, this in itself may be a significant finding that many people do not associate BCG with the disease it is actually meant for.

The findings showed that 83% of the respondents were aware that the last vaccine should be administered to the child at 9 months, 11% knew that the last vaccine should be administered at 1 year and 4% did not know when the last vaccine should be administered to the child and 2% know that the last vaccine should be administered at 6 months (Figure 2).

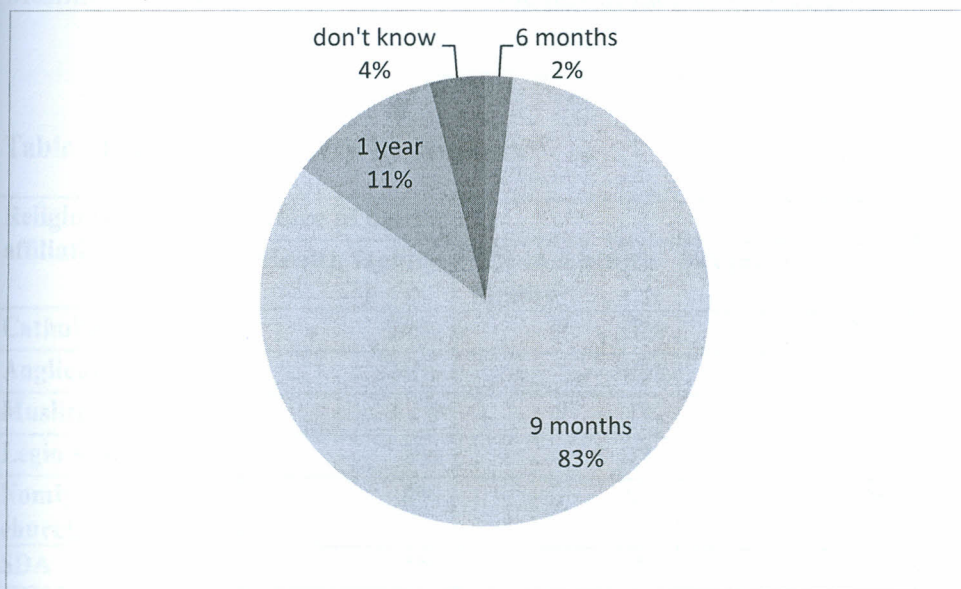


Figure 2: Age last vaccine administered to children

Source: Field data

From the findings respondents who knew that children should receive the last vaccine at 9 months and 1 year respectively stand a chance that their children will receive all the vaccines. Respondents who knew that children should receive the last vaccine at 6 months, are the likely vaccination defaulters because their children will not receive measles vaccines unless outreach or follow ups are done. Respondents who do not know when the last vaccine should be administered; again these are the likely defaulters in the community as well. According to Sharma and Bhasin (2008), previous studies had shown a declining trend in coverage, with vaccines given at higher ages having progressively lower coverage percentage. The findings about a declining trend of awareness levels about vaccines with the age for vaccination can be a direct contributory factor for the 'drop-out' in the coverage of vaccines.

4.4 Socio-economic and cultural factors that influences the uptake of EPI services

The findings indicated that 81% of the mothers reported to have delivered their youngest child in a health facility and 19% reported to have delivered their youngest child outside a health facility. Generally at least 1% of the mothers from all the religions delivered at home. None of the Muslims reported to have delivered in the health facility (Table 11).

Table 11: Place of delivery by mothers

| Religious affiliation | Place of delivery | | Total |
|-----------------------|-------------------|--------------------------|-------------|
| | Health facility | Not in a health facility | |
| Catholic | 20% | 5% | 25% |
| Anglican | 20% | 2% | 22% |
| Muslim | 0 | 1% | 1% |
| Legio maria | 2% | 1% | 3% |
| Nomiya luo church | 8% | 5% | 13% |
| SDA | 7% | 1% | 8% |
| Other | 24% | 4% | 28% |
| Total | 81% | 19% | 100% |

Source: Field data

Place where a mother delivers a baby may be dependent on so many factors and are not necessarily influenced by religion. The respondents who gave birth to their youngest child in a health facility stood a higher chance that their infants would receive their first vaccines on schedule compared to those who were born at home. Cultural practices that babies should be kept indoors for some days after birth may also work against those babies who were born at home, because some babies may be kept for too long in the house to an extent that they may miss their vaccination and therefore be at risk of vaccine preventable diseases. According to Ojaka (2011) he indicated that certain traditional cultural practices may inhibit timely immunization, especially with regard to vaccines given soon after birth. In the Busia region, study participants reported that mothers who deliver at home are required to keep the baby indoors for three to four days after birth (three days for a girl, four days for a boy). In addition, some mothers do not like their children to be weighed naked during a check-up or to have them share the weighing basket with

others. This would therefore make some mothers to avoid taking their children for vaccination in order to avoid the discomfort

From the findings certain mothers reported that their children had not received any vaccination at the time of the interview. 97 % of the children whose mothers were interviewed had received at least a vaccine at the time of the visit and 3% had not received any vaccine at the time the interview was carried out. All children whose mothers were Muslims had not received any vaccine at the time of the interview. 50% of children whose mothers were in the Legio Maria had received at least a vaccine (Table 12).

Table 12: Comparison of vaccination uptake and religious affiliation.

| Religious affiliation | Child received any vaccine | | |
|-----------------------|----------------------------|--------------|-----------------|
| | Yes (n%) | No(n%) | Total |
| Catholic | 88 (25) | 0 | 88 (25) |
| Anglican | 75 (22) | 0 | 75 (22) |
| Muslim | 0 | 3 (1) | 3 (1) |
| Legio maria | 6 (2) | 3 (1) | 9 (3) |
| Nomiya luo church | 45 (13) | 0 | 45 (13) |
| SDA | 27 (8) | 0 | 27 (8) |
| Other | 96 (28) | 3 (1) | 99 (29) |
| Total (N%) | 334 (97) | 12(3) | 346(100) |

Source: Field data

The findings indicated that certain religions do not support vaccination at all. For instance in this case all the children with Muslim mothers had not received any vaccine at all. Two thirds of the children whose mothers were Legio Maria faith had received vaccination. Most of the religions supported vaccination and actually had their children vaccinated. Religion therefore affects the decision of the mothers to take their children for vaccination. Certain religions believe that vaccines are not safe for their children. According to Lorenz and Khalid (2012) Vaccine controversies do have an impact on vaccination rates. The vaccine controversies may have roots in religious and cultural factors such as the polio vaccine controversy in Nigeria in 2003 and in India in 2006. A solution in similar situations might be the engagement of local religious leaders to clarify the concerns as well as having a well planned dissemination strategy of the scientific evidence of safety of the vaccine. Health education as a tool to disseminate the information

should be used, keeping in view the cultural context and the local communities. For example, in 2007 some of the conservative religious clerics claimed that the polio vaccine is an "Infidel Vaccine" and the main purpose is to sterilize Muslims and blamed it to be a Western plot against Muslims. Some of the religious clerics even claimed that it is un-Islamic to vaccinate their children and those who die of Polio are martyrs. Unfortunately, due to lack of information and awareness of the local people, 24,000 children were deprived of polio vaccination just because of this controversy and became difficult to run polio awareness campaign. The awareness campaign was halted after health professionals were targeted during polio awareness campaign

During analysis a comparison was made on who makes the decisions about child vaccination and its effects on child vaccination. The findings indicate that irrespective of who makes the decision 97% percent of the children had received at least a vaccine at the time of the visit and 3% had not. All the 3% percent who had not received vaccination were in the situation where the mother was responsible of making decision about child vaccination. The findings also show that in most cases the mother is the one who makes decision about child vaccination. In this study 88% of the decisions were made by the mother, 7% of the decisions were made by the husband and 5% of the decisions on child vaccination were made by other individuals which included other relatives of the mother (Table 13).

Table 13: Effects of decision makers on vaccination uptake

| Decision maker | Child received any vaccine | | |
|-------------------|----------------------------|----------|-------------|
| | Yes (n %) | No (n %) | Total (N %) |
| Mother | 292 (85) | 12(3) | 304 (88) |
| Husband | 24 (7) | 0 | 24 (7) |
| Other | 18 (5) | 0 | 18 (5) |
| Total (N%) | 334(97) | 12(3) | 346(100) |

Source: Field data

The findings also show that decision maker on child vaccination in the household also played a role on child vaccination because in instances where husband or other individuals were making decisions, all the children had at least received a vaccine at the time of the interview. 3% of the children who had not received vaccination were in a situation where the mother herself was the decision maker on the child vaccination in the household. The study also indicated that decision making on children vaccination also varies. Normally whoever has the financial power in the

household normally makes the decisions. According to Ojaka (2011) in a study done in south coast and Busia regions of Kenya results indicated that decision-making related to child vaccination varies. In the Coast region, the decision usually fell to the father or to another adult male household member. In Busia, parents generally agreed that mothers were the ones who usually decided whether or not to vaccinate a child because when they go to clinic, they are taught about various types of vaccinations and their sequencing, including dates. Some study participants had more nuanced answers on the question of who might decide whether or not to have a child vaccinated. They noted that in some instances, the family as a whole, including the extended family, may be involved in such a decision. In many situations, who makes the decision may depend on who is the main income earner, how busy the mother is at home, and who can provide transportation for the mother and child. Some participants noted that the family may also be influenced by a broader network of people that includes neighbours, community leaders, and health workers (Ojaka 2011).

During analysis a comparison was made between the respondents' source of income and its effects on vaccination uptake. The findings indicated that irrespective of the source of income 96% of the respondents reported that their children had received at least a vaccine at the time of the interview, 4% reported that their children had not received any vaccination. The findings also indicated that the highest percentage of those whose children had not received any vaccine at the time of the visit were farmers at 2%. Those who were self employed and housewives also reported that their children had not been vaccinated at 1% (Table 14).

Table 14: Comparison of vaccination uptake and source of income.

| Source of income | Child received any vaccine | | |
|------------------|----------------------------|-----------|-------------|
| | Yes (n%) | No(n%) | Total |
| Farmer | 9% | 2% | 11% |
| Salaried worker | 10% | 0 | 10% |
| Self employment | 18% | 1% | 19% |
| Student | 4% | 0 | 4% |
| Casual worker | 9% | 0 | 9% |
| Housewife | 31% | 1% | 32% |
| Other sources | 14% | 0 | 14% |
| Total | 96% | 4% | 100% |

Source: Field data

With the current high poverty levels in the country, individuals may choose to concentrate on their economic activities rather than take their children for vaccination. From the key informants interview it was indicated that during farming seasons most mothers tend to go to the farm at the expense of taking their children for vaccination. The findings also indicated that most children who had not received any vaccine were from parents who were farmers.

A comparison was done between health seeking behavior and religion. The findings indicated that 98% of the respondents do seek medical attention at the hospital when their children fall ill, 2% of the respondents do not seek medical attention at the hospital when their children fall ill instead they resort to prayers. The findings also indicated that all the Muslims who were interviewed did not seek medical attention at the hospital when their children fell ill but prayed for their children to get well. None of the respondents reported to visit traditional diviners or herbalists when their children fell ill (Table 15).

Table 15: Health seeking behaviour by religion

| Religious affiliation | Seeking medical attention | | | |
|-----------------------|---------------------------|-----------|----------------------|------------|
| | Hospital | Prayers | Traditional diviners | Herbalists |
| Catholic | 25% | 0 | 0 | 0 |
| Anglican | 22% | 0 | 0 | 0 |
| Muslim | 0 | 1% | 0 | 0 |
| Legio maria | 2% | 1% | 0 | 0 |
| Nomiya luo church | 13% | 0 | 0 | 0 |
| SDA | 8% | 0 | 0 | 0 |
| Other | 28% | 0 | 0 | 0 |
| Total | 98% | 2% | 0 | 0 |

Source: Field data

From the findings it's evident that for those who do not visit a hospital when their children are unwell, then the chances are also high that they will not take their children for vaccination because of their attitude. This will affect the vaccination uptake and will put those children at risk of vaccine preventable diseases. Some of these parents held a belief that modern medicine was not good for their children. According to Jheeta and Newell (2008) they indicated that parents' knowledge about vaccinations was poor, and the knowledge they had was often wrong. It appeared that there was no association between parents' knowledge and vaccination coverage

rates, and the public accepted vaccination despite limited knowledge about it. However, when parents resisted vaccination, it was because they wanted to protect their children from harm.

The findings indicated that 94% of the respondents, their religion supported vaccinations, 3% of the religions had no position on vaccination, 2% did not support vaccination and 1% did not know if their religion had a position on vaccination. Only Legio Maria and Muslims both at 1% did not support vaccination, all the remaining religions supported vaccination of children (Table 16).

Table 16: Comparisons between religions and positions on vaccination of children.

| Religious affiliation | Religion on vaccination | | | |
|-----------------------|-------------------------|----------------------------|------------------|------------|
| | Supports vaccination | Do not support vaccination | Have no position | Don't know |
| Catholic | 25% | 0 | 0 | 0 |
| Anglican | 22% | 0 | 0 | 0 |
| Muslim | 0 | 1% | 0 | 0 |
| Legio maria | 1% | 1% | 1% | 0 |
| Nomiya luo church | 13% | 0 | 0 | 0 |
| SDA | 8% | 0 | 0 | 0 |
| Other | 25% | 0 | 2% | 1% |
| Total | 94% | 2% | 3% | 1% |

Source: Field data.

The findings indicate that certain religions did not support vaccination while others did. This may be as a result of lack of knowledge of the benefits of vaccinations or it may be due to certain cultural practices. Muslims basically do not support vaccination of children as the study revealed that all the Muslim respondents who were interviewed none of them supported vaccination. Similarly, certain Hindu and Muslim groups in India have long held the belief that vaccination is a covert method of family planning, primarily targeting Muslims. Lorenz and Khalid (2012) also indicated that in 2007 some of the conservative religious clerics claimed that the polio vaccine is an "Infidel Vaccine" and the main purpose is to sterilize Muslims and blamed it to be a Western plot against Muslims. Some of the religious clerics even claimed that it is un-Islamic to vaccinate their children and those who die of Polio are martyrs.

4.5 Perception/attitude of mothers on vaccination of children

From the analysis done on how respondents felt about child vaccination, the findings indicated that 97% of the respondents approved vaccination of children, 2% disapproved child vaccination and 1% held no opinion about child vaccination (Figure 3).

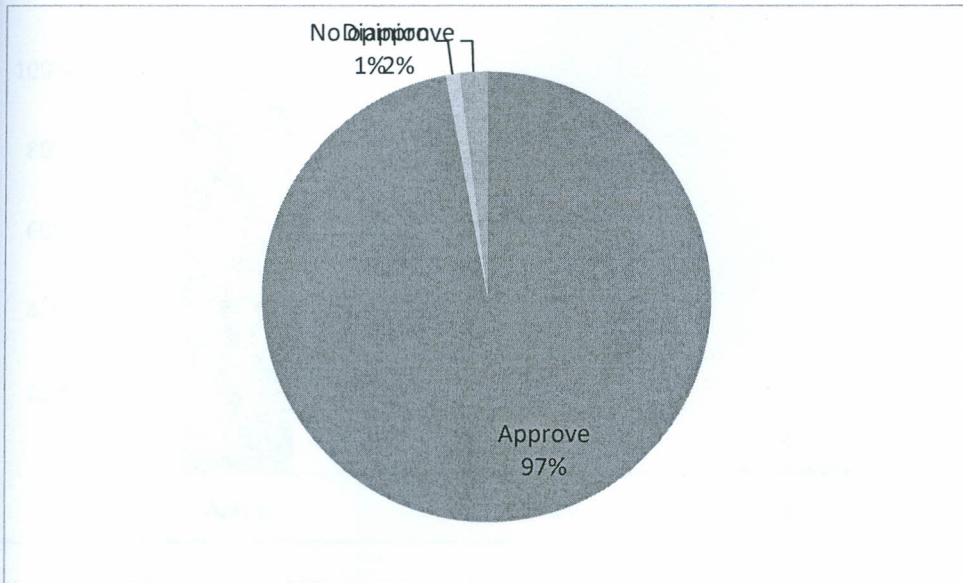


Figure 3: Mothers feeling about child vaccination

Source: Field data

From the findings most parents approved vaccinations of children. The 2% who did not approve vaccination of children could have been as a result of fear of the side effects of the vaccines that are sometimes reported. Some parents also think that the risk of vaccine related diseases are low and therefore do not see the need to vaccinate a child. Some of these respondents may also not just have faith in the modern medicine. According to Forrest et al (2000) parents' beliefs influence their acceptance of vaccination and the perception of risk is subjective. Many non-vaccinating parents believed the risk of disease was low and the risk of vaccine side effects was high, and/or vaccination was ineffective. In a study conducted in 1995 in Melbourne with 45 mothers, results showed that 'complete immunizers' were fearful of the outcomes of unfamiliar diseases, and 'incomplete immunizers' considered vaccines less effective. Specifically, many 'non-immunizers' were fearful of unknown/long-term side effects of vaccines, mistrusted the motives of health providers, and believed vaccination was a social experiment. They felt diet and building up general immunity were viable and safe alternative.

Findings indicated that most mothers agree that vaccines are safe for their children. Results show that 97% of mothers agree that vaccines are safe for their children, 2% disagree and 1% have no opinion on whether vaccines are safe or not for their children (Figure 4).

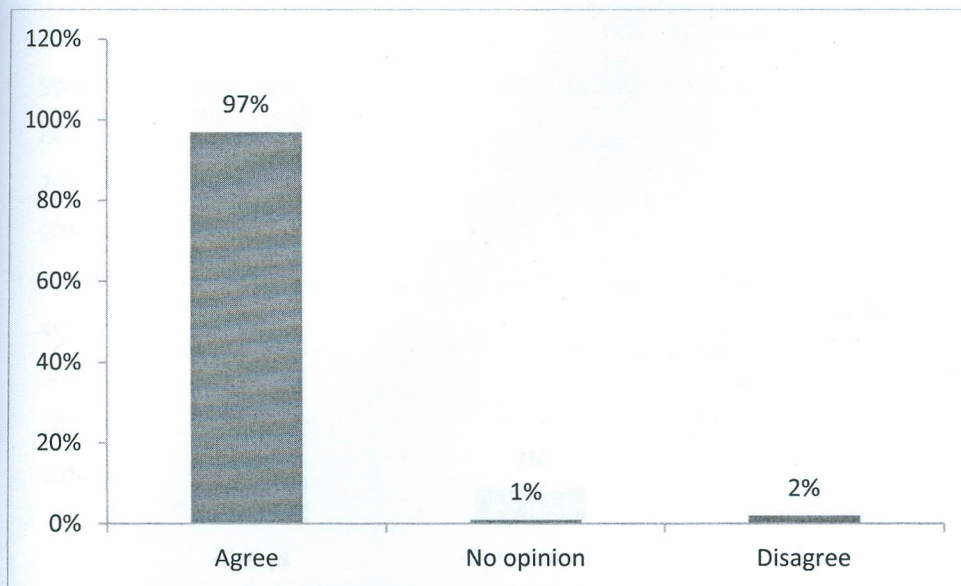


Figure 4: Mothers opinion on vaccine safety

Source: Field data

The attitude of mothers towards vaccinations may determine whether the mothers deem vaccines to be safe or not. Some parents fear that their children immune system will be overloaded when they are given various vaccines; some parents just do not trust the mix of the vaccines. The side effects reported after vaccination may also make some mothers to believe that vaccines are not safe. According to Lorenz and Khalid (2012) parental attitude is not only influenced by the perceptions of infectivity and severity of the disease, but also by the parental perception of vaccine safety and its effectiveness. The parental perception of severity of the disease is also influenced by the prevalence of the disease itself. If the prevalence of a particular vaccine preventable disease is low, the fear of the disease and its severity is also low as the disease is not physically seen in the communities. In the UK, pertussis disease was perceived to be associated with whooping cough and MMR vaccine with autism that affected the perception of the parents about the safety of vaccine which had a serious negative impact on the vaccination rate. Therefore it is important that parents are informed about safety and effectiveness of vaccines, about the severity of the disease and the risks involved in case their child is not vaccinated

From the analysis done, findings indicated that 91% of the respondents believed that vaccines prevent illness always, 7% believed that vaccines prevents illness sometimes and 2% believe that vaccines never prevent any illness (Figure 5).

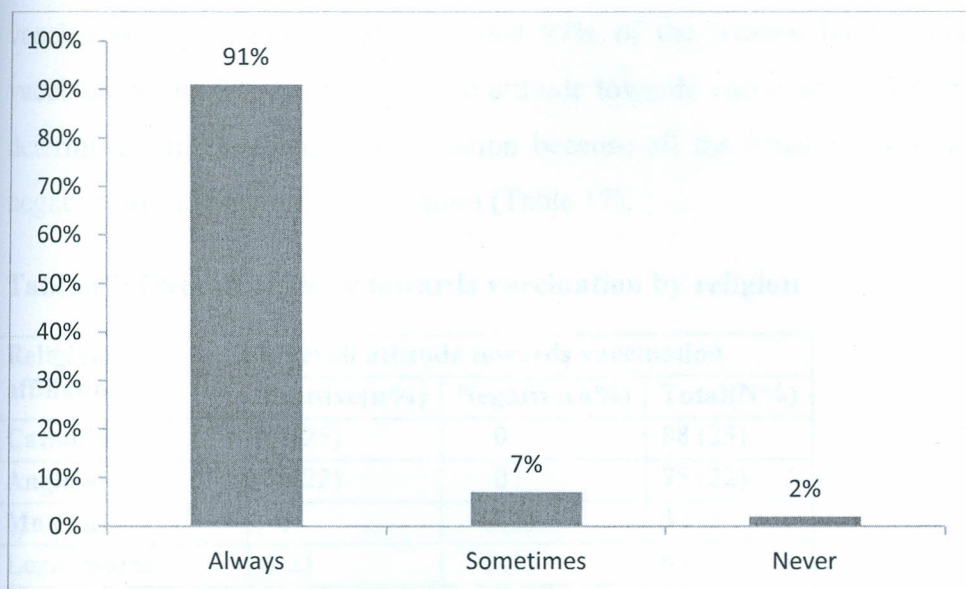


Figure 5: Belief that vaccines prevent illness

Source: Field data

The level of awareness of mothers will determine whether they believe that vaccines prevent illness. When a mother was aware of the vaccine preventable diseases and also when a mother was aware of the vaccines that are available in the immunization schedule then the chances were high that this mother believed that vaccines prevented illness. On the other hand a mother may not be aware of the vaccine preventable diseases but still have faith that vaccines prevent illness. People may hold different opinions about vaccinations depending on their past experiences too. According to Adeyinka et al (2009) indicated that in Nigeria like many African countries was making efforts to strengthen its health system especially the routine immunization so as to reduce the burden from vaccine preventable diseases. This is against the backdrop of poor routine immunization coverage of 13%. In Northern Nigeria, beliefs and practices towards measles and measles vaccination showed 1 of 500 mothers interviewed believed that measles is prevented by immunization, 16% believed that it is contagious, 26% believed that it is caused by evil spirit, witchcraft and heat, 25% has never heard of measles immunization, 27% said that they did not

believe immunization was effective and 4% were not allowed to go for immunization by their husbands.

A comparison between religious affiliations of the mothers and overall attitude towards vaccinations was done. It showed that 97% of the women have a positive attitude towards vaccination and 3% have a negative attitude towards vaccination. But religion was observed to determine attitude towards vaccination because all the Muslims who were interviewed had a negative attitude towards vaccination (Table 17).

Table 17: Overall attitude towards vaccination by religion

| Religious affiliation | Overall attitude towards vaccination | | |
|-----------------------|--------------------------------------|--------------|-----------------|
| | Positive(n%) | Negative(n%) | Total(N%) |
| Catholic | 88(25) | 0 | 88 (25) |
| Anglican | 75(22) | 0 | 75 (22) |
| Muslim | 0 | 3(1) | 3 (1) |
| Legio maria | 6(2) | 3(1) | 9 (3) |
| Nomiya luo church | 45(13) | 0 | 45 (13) |
| SDA | 27(8) | 0 | 27 (8) |
| Other | 96(28) | 3(1) | 99 (29) |
| Total(N%) | 337(97) | 9(3) | 346(100) |

Source: Field data

From the findings some religions are generally against child vaccinations. They have held beliefs that are based on lack of awareness. Some of the religions believe that vaccination are a form of family planning, others believe that vaccines make children weak. Some religions like Muslims also believe that vaccines make their children sterile. All these may be attributed to lack of awareness among these people on the benefits of vaccinations and therefore contributes to their negative attitude towards vaccination. The negative attitude also affects the vaccination uptake in the society.

A comparison between education level of the mothers and overall attitude towards vaccinations was also done. It showed that amongst those who had their highest level of education being primary school 96% of them had a positive attitude towards vaccination and 4% had a negative attitude. Those respondents who had their highest level of education being secondary school,

post secondary school and those who had not gone to school at all had a positive attitude towards vaccination at 100% (Table 18).

Table 18: Overall attitude towards vaccination by education level

| Education level | Overall attitude towards vaccination | | |
|-----------------|--------------------------------------|--------------|-----------|
| | Positive(n%) | Negative(n%) | Total(N%) |
| Primary | 205(96) | 9(4) | 214(100) |
| Secondary | 99(100) | 0 | 99(100) |
| Post secondary | 30(100) | 0 | 30(100) |
| None | 3(100) | 0 | 3(100) |

Source: Field data

Education level and awareness about vaccines are related. The lower the level of education the higher the chances that the level of awareness on vaccines and vaccinations is low. This in turn could translate into the attitude of the mothers too. Generally the attitudes of mothers are positive towards vaccination. According to Bonanni and Bergamini (2001) they indicated that In Italy, vaccination of children is regulated by a dual system that is a certain number of compulsory immunizations, and a number of other facultative vaccinations. This has resulted in a different coverage against infections under the two regimens. In order to verify the attitude of mothers towards vaccination, a questionnaire-based study was proposed to women taking their children to vaccination services for mandatory immunization. The preliminary results on 300 questionnaires showed a generally favorable attitude towards vaccines of 80% of mothers. Only 7% of them would not immunize at all their children if vaccinations were not mandatory (Bonanni & Bergamini 2001).

4.6 Other findings

From the interview guides administered to the key informants, the findings were that 2 health facilities offer vaccination once a week, 1 health facility offers vaccinations more than once a week but not daily, the remaining 6 health facilities offer vaccination services daily. The informants indicated that certain children who are born underweight or with complications are normally not given BCG vaccine even when they are born at home or at the health facility. When asked about some of the reasons why some children are not vaccinated in the community the informants mentioned distance to the health facility for some mothers, they talked of ignorance about benefits of vaccinations on the part of the mothers, they mentioned that some religions do

not believe in vaccination of children or taking children to hospital when ill and that some religions (roho and Nomiya Luo church) believe that a child should be kept in the house without being seen for between 1-2 months after birth depending on the sex of the child. Informants also indicated farming seasons to affect vaccination as most mothers claim that they are too busy and do not have time to take children for vaccination, they also talked about lack of proper follow-ups for those defaulter cases in the community.

The informants also indicated that the mid wives have a big role to play in the community regarding vaccination since most of the time they encourage those mothers who give birth at home to take their children for vaccinations when they make their visits. They also offer health education to the mothers at home.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a brief summary of the findings, recommendations arising from these findings and suggestions for further research.

5.2 Summary of findings

The above findings show a number of factors that influence uptake of vaccination services. By comparing the religious affiliation to awareness about vaccines, it was revealed that respondents are aware of some of the vaccines being administered in the routine immunization schedule. The highest percentage of the respondents mentioned that they know about polio and measles vaccines because at least 50% and above mentioned the two vaccines. Awareness about BCG was equally good but not as much as polio and measles. Awareness on pentavalent, PCV10 and yellow fever vaccines were poor, especially awareness on the yellow fever was extremely poor because only 7% of the respondents were aware of it and again they all belonged to the catholic faith only. Generally religion did not have a big effect on awareness of vaccination. The results indicate that the level of education played a big role on the awareness of mothers on the vaccines. Mothers who had post secondary education were more aware of the vaccines compared to those mothers who had primary education, secondary education or no education at all. The results showed that mothers who had no education at all only knew about measles vaccine.

The findings also indicate that age of the mothers also played a role on the awareness of mothers on vaccines. Mothers in the lower bracket of 15-19 had the lowest awareness level compared to other age categories. The findings also revealed that 89% of mothers were aware that children should be given the first vaccine at birth. This is a high level of awareness but the 10% who know that children should be given the first vaccine at 1 month risk delaying children in receiving their first vaccines on time. 1% of the respondents do not know when the child should be given the first vaccine this group equally risks delaying children in receiving their vaccines. On the other hand 83% of the respondents are aware that children should receive their last vaccine at nine months which is also high level of awareness. 2% of the respondents know that children should receive the last vaccine at 6 months, this group are the likely defaulters because their children will not receive measles vaccines unless outreach or follow ups are done. 4% do

not know when the last vaccine should be administered; again these are the likely defaulters in the community as well.

The results also reveal that 81% of the respondents gave birth to their youngest child in a health facility and therefore those infants stood a higher chance of receiving their first vaccines on schedule compared to those who were born at home. The results show that 19% of the respondents gave birth to their youngest child not in a health facility; these children have a lower chance of receiving their first vaccines on time. The findings also show that decision maker on child vaccination in the household also played a role on child vaccination because in instances where husband or other individuals were making decisions, all the children had at least received a vaccine at the time of the interview. 3% of the children who had not received vaccination were in a situation where the mother herself was the decision maker on the child vaccination in the household.

The findings also indicate that the health of the baby may determine whether or not the child will receive vaccines on time or not. The informants indicated that if a child was underweight or had health complications then no vaccine was administered to that child even if the mother brought the child for vaccination. Religion was seen to play a big role when it comes to child vaccinations. Certain religions do not believe in child vaccinations as they believe vaccines are not good for children. Religious beliefs that a child should be kept in the house without being seen for between 1-2 months after birth depending on the sex of the child also affects the child's vaccination. When a child is restricted in the house for two months then this child is likely to miss quite a number of vaccines or will receive them later than they should be given.

The findings also show that economic activities like farming also affect vaccinations. Key informants indicated that during farming seasons mothers concentrate too much on farming and do not create time to take their children for vaccination as they see that to be a waste of time. Distance to the health facility was seen to a challenge to some mothers in terms of bringing their children for vaccination. Some parents defaulted to bring their children for vaccination and when asked they pointed to the distance to the health facility and lack of transport to be the cause. Mid wives have been part of African culture and so the findings indicated that they played an important role in the community because they are instrumental in advising parents to take their children for vaccination and even referring them to the nearest health facilities.

The findings indicated that 97% of the respondents approved vaccination, 2% disapproved and 1% had no opinion on child vaccination. When asked about the safety of the vaccines 97% agree that vaccines are safe, 2% disagree and 1% have no opinion whether vaccines are safe or not. 91% of the respondents believe that vaccines prevent illness always, 7% believe that vaccines prevent illness sometimes and 2% believe that vaccines never prevent any illness. Overall 97% showed positive attitude towards vaccination 3% showed negative attitude. From the findings religion and education level played a big role in the negative attitude towards vaccination. For instance all the Muslims who were interviewed all had a negative attitude towards vaccination. Also all the 3% of the individuals who had negative attitude towards vaccination have attained primary education as their highest level of education.

5.3 Conclusion

The aim of this study was to examine factors that influence uptake of EPI services in Rarieda Division, Siaya County. The study intended to establish awareness level of mothers on vaccines and vaccinations of children. The study aimed at identifying the socio-economic and cultural factors that influence the uptake of EPI services. The study also intended to determine the perception/attitude of mothers on vaccination of children against the immunizable diseases as per EPI schedule. A summary of the findings of this research study are as explained below.

Awareness level of mothers on the vaccines being administered in the routine immunization is average because most parents only know about polio and measles vaccines, a few also know about BCG, but most do not know about pentavalent vaccines, PCV 10 vaccine and yellow fever vaccine. On that account the parents should be sensitized on all the vaccines available on the Expanded Programme on Immunization schedule so that they can know the importance of vaccination. Most parents are also aware when the children should receive their first and last vaccine, though others are still not aware so more effort should be put in place to improve the awareness. Religion, education level, economic activities and distance were also seen to affect the uptake of vaccination services. Certain religious practices were harmful to child vaccination; low education level also affected the knowledge on vaccination and attitude towards vaccination. The attitude of most mothers was seen to be positive towards vaccination except in a few instances in the study findings. Religion was also seen to affect the attitude of some mothers towards vaccination. In general the awareness of mothers on vaccines is still low in Rarieda

Division, the attitude towards vaccination is positive and socio-economic and cultural factors are also seen to affect negatively the uptake of vaccines and vaccination services.

5.4 Recommendations

From the research findings it was noted that the awareness level on vaccines and vaccinations was still low among most mothers, the attitude of most mothers was also seen to be positive in most cases, though religion also played a role in determining the attitude of some mothers, socio-economic and cultural factors were also seen to negatively affect the uptake of vaccination services. Due to this and other findings the researcher recommends the following measures to be put in place to improve the uptake of EPI services.

During clinic visits, the nurses administering the vaccines should first educate the mothers on the vaccines and the importance of vaccination so that the mothers are made aware of what is happening.

Religious leaders should be sensitized on the importance of vaccination of children so that they may spread the message to their members.

Government should employ more Community Health Workers (CHW) . The CHWs are crucial in educating the community about health matters and could help develop positive attitude towards vaccination in the community.

5.5 Suggestions for further study

Due to inadequate time and funds, the researcher only covered Rarieda Division in the study of factors that influence the uptake of EPI services. The study also concentrated on specific households of mothers with children aged between 0-24 months only. This left grounds for further study in the related areas. Consequently the researcher suggests the following areas for further study.

To study the factors that influence uptake of Expanded Programme on Immunization services in Kenya.

To study the impact of religion on vaccination uptake in Kenya

To study vaccine related mortality and morbidity cases in Kenya

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