FACTORS AFFECTING IMMUNIZATION COVERAGE FOR CHILDREN UNDER FIVE YEARS IN RWANYAMAHEMBE SUB-COUNTY, MBARARA DISTRICT- UGANDA

BY

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Declaration

l Omia Santos, declare that the information contained in this research report is my own work and it has never been submitted for any award to Kabale University or any other institution of higher learning.

Signed ~ **Date signed 09/02/2022**

OMIA SANTOS

(Student)

Approval

This research report titled, **"Factors affecting Expanded Program on Immunization (EPI) service coverage in Rwanyamahembe sub-county",** prepared and submitted by Omia Santos in partial fulfillment of the requirement for the award of bachelors of environmental health Science was conducted under my supervision.

Signed ~ **……..** **Date** 17/02/2022

MR. BYAMUKAMA TOPHER

(Research supervisor)

Dedication

I dedicate this research report to my beloved parents and wife for their devoted and tireless support ever since the beginning of my academic journey. God bless them abundantly.

Acknowledgement

I would like to thank in a special way the almighty God for his love, mercy and sustenance that he accorded to me and my family and for the countless blessing he granted us. Sincere thanks to my supervisor for the time and fatherly guidance which has enabled me produce this work successfully. I would like to express my appreciation to my colleagues with whom l discussed. Thanks also go to my sisters, brothers, and other relatives for their moral support and advice towards my Education. Finally, thanks go to my fellow students and friends for their courage and academic support during my course struggle.

List of Abbreviations

AD	Auto-disable
ANC	Antenatal Care
BCG	Bacillus Calmette-Guerin
DPT	Diphtheria-Pertussis-Tetanus Expanded
EPI GA	Program on Immunization
VI	Global Alliance for Vaccines and Immunization Global
GVAP	Vaccine Action Plan
HBVI	Hepatitis B Vaccine
MHCP	Minimum Health Care Package
OPV0	Oral Polio Vaccine
PCV	Pneumococcal Conjugate Vaccine
PHC	Primary Health Care
SIAs	Supplemental Immunization Activities
SSA	Sub-Saharan Africa
TDHS	Tanzania Demographic Health Survey
UNEPI	Uganda National Expanded Programme on Immunization Vaccine
VPDs	Preventable Diseases
WHO	World Health Organization

Definition of terms

Immunity: Protection from an infectious disease. If you are immune to a disease, you can be exposed to it without becoming infected.

Vaccine: a product that stimulates a person's immune system to produce immunity to a specific disease, protecting the person from that disease. Vaccines are usually administered through needle injections, but can also be administered by mouth or sprayed into the nose.

Vaccination: the act of introducing a vaccine into the body to produce immunity to a specific disease. It is a simple, safe, and effective way of protecting people against harmful diseases, before they come into contact with them. It uses your body's natural defenses to build resistance to specific infections and makes your immune system stronger.

Immunization; a process by which a person becomes protected against a disease through vaccination. This term is often used interchangeably with vaccination or inoculation.

A vaccine-preventable disease (VPDs); is an infectious disease for which an effective preventive vaccine exists. If a person acquires a vaccine-preventable disease and dies from it, the death is considered a vaccine-preventable death.

An expanded program on immunization (EPI) is one of the world health organization programs, which has a goal to make vaccines available to all the children through-out the world. EPI has been delivered the immunization services to the targeted children of below one-year-old and pregnant women.

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Abstract

The **study** was focusing on the factors affecting immunization coverage for children under five years taking Rwanyamahembe sub-county, Mbarara district as a case study. The specific objectives were to; determine the level of expanded program on immunization (EPI) service **coverage,** identify socio-demographic and institutional factors affecting with EPI service coverage. The study adopted cross- sectional study design employing a quantitative approach for **data** collection. Information was gathered from 120 respondents using questionnaire and interview guide. Data was analyzed using SPSS version 18 to generate both descriptive and regression statistics. The study found out the level of expanded program on immunization (EPI) **service** coverage to be relatively low as evidenced by few respondents who had children that are **fully** vaccinated as compared to majority who did not complete vaccination. The study also identified socio-demographic factors affecting EPl service coverage in the area such as lack of information about immunization, age of the mother/guardian. level of education. negative experiences with immunisation, possession of vaccination cards, sex of the child and accessibility of vaccination sites. The study further identified inadequate funding of the program, perceived shortage of staff, cost of vaccination and vaccination cards, inadequate supply of vaccine stock, inadequate vaccination sites and corruption and embezzlement of funds as the main institutional factors affecting with EPI service coverage. As a result of the significant results, the study concludes that EPI service coverage in Rwanyamahembe sub-county is low due to different socio-demographic and institutional factors. It therefore recommends the provision of vaccine related targeted health education to mothers at home and during ANC visits is an effective strategy to improve immunization completion rates in low literacy and income settings. Supervision of immunization activities by the district EPI focal person. This is key in identifying gaps during static and outreach programs. Emphasis on vaccinators arriving on time and all services given to mothers without a cost.

Chapter One: Introduction

1.0 Introduction

This chapter consisted of the background, statement of the problem, objectives, research questions, scope and the significance of the study

1.1 Background of the study

WHO. (2010) defines immunization as, "the process whereby, a person is made immune or **resistant** to an infectious disease typically by the administration of a vaccine." Vaccines stimulate **the body's** own immune system to protect the person against subsequent infection or disease.

Immunization is a protective measure against infectious diseases Taiwo et al., (2017). Childhood immunization remains one of the highest impact public health interventions, reducing infectious diseases-related morbidly and mortality of children at a low cost (Abebe et al., 2018). It is a core **child** survival strategy and is demonstrated to avert more than l ·2 million child deaths each year (**ljarotimi** et al., 2018). While global progress has been made to ensure provision of childhood vaccinations, difficulties still exist especially on how to reach the disadvantaged childhood populations in remote communities, especially within sub-Saharan Africa Chiabi et al., (2017).For example the global Vaccine Action Plan (GVAP) had an immunization coverage target of at least 90% in every nation and 80% of DPT3 coverage in every district by 2019 (Bangura et al., 2020); however, it was only achieved by 56 of the 194 WHO member states (Kagone et al., 2017). Drivers of immunization inequities in vaccine coverage across populations range from socio-economic, cultural, political and institutional factors (Adedire et al., 2016).

In Uganda, the Expanded Program on Immunization (EPI) program emphasizing six vaccines has been given on a routine and outreach basis since the 1990s(Chiabi et al., 2017). Uganda follows the WHO immunization schedules and provides the following vaccines based on the specified schedules: one dose of Bacillus Calmette-Guerin (BCG) and initial dose of oral polio vaccine *(OPVO)* given at birth; three doses of each Pentavalent (DPT-HepB-Hib),OPV, and Pneumococcal Conjugate Vaccine (PCV) given at 6th, I *0th,* and 14th weeks; two doses of Rotavirus vaccine given at 6th and I 0th weeks; and lastly measles vaccine at 9th month (ljarotimi et al., 2018).

Expanding immunization service is among one of the Ugandan child survival strategies targeted to protect nearly 3-million annual births against VPDs (Bangura et al., 2020) but a significant **portion** of children has not been immunized. As a result deaths in the first few years of life in Uganda are somewhat among the highest in the world and many of these were believed to be attributed to VPDs (Babirye et al., 2011).

Though, full immunization coverage has been raised from 34% in 2011 to 54% in 2016 UDHS report (Bangura et al., 2020); this achievement remains far below the goal set in the 4th Health Sector Development Plan and the MOH target plan to achieve 90% coverage nationally and 80% in every district for all vaccines by 2023(Abebe et al., 2018).Studies have also reported maternal education, access to health services, socioeconomic status, antenatal care (ANC) visits as some **of** the predictors of poor immunization coverage (Bangura et al., 2020). However, the relationship of these factors in predicting immunization coverage has not always been consistent across study areas.

In Mbarara district, coverage for DPT3 among children aged 12-23 months is administratively estimated at 72% for DPT3 and measles at 76%. These are all below the district and the national targets of 85% for DPT3 and 90% for measles and may partly explain the frequent outbreaks of vaccine preventable diseases (Lakew et al., 2015). In a routine immunization coverage for July to December 2019, the district was reported to have good access to immunization services yet poor utilization was registered. The dropout rate from when a child receives DPT-1 up to DPT-3 was 14% while the dropout rate from when a child receives DPT-I up to measles was 20%. Studies done in other parts of Uganda have found different factors to be associated with low EPI coverage. No study has been done in Rwanyamahembe sub-county on this phenomena hence triggering the need to study EPI coverage in Rwanyamahembe with associated factors. The results of the study may add to existing knowledge of the problem, and guide policymakers to improve immunization programs in the study area.

1.2 Statement of the problem.

Immunization is considered as one of the most successful and cost-effective public health sustainable interventions for human beings against diseases that affect our health (Ministry of Health, 2017). Routine immunization plays an important key role to significantly reduce child mortality, resulting from vaccine preventable diseases. To curb down childhood mortality due to

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PDs. every child in Uganda must receive one dose of Bacillus Calmette Guerin (BCG), Oral • ·accine (OPV0) and Hepatitis B Vaccine (HBV I) at birth, Penta 1 & OPV 1 at 6 weeks of *nee* **Penta?** & OPV2 at IO weeks of age, Penta3 and OPV3 at I4 weeks of age and measles and fever at 9 months of age. Despite the benefit of childhood immunization uptake, routine vaccination coverage for all recommended EPI vaccines has remainedlow in Uganda (at 55%). e situation is even worse in some remote parts of the country like Rwanyamahembesubcounty, where coverage is much lower at 38%. This coverage is below the target endorsed by **IO** in the 2014 Global Vaccine Action Plan, which aimed to ensure delivery of universal ess to immunization with associated targets reaching 90% national vaccination coverage and ,_ -~ 80% vaccination coverage in every district (Ministry of Health Uganda, 2015). Different **cultural,** institutional and socio-demographic factors including maternal age, maternal educational status, ethnicity etchave been linked to low EPI coverage is some areas. No study on ·he similar subject matter has been done to explain the situation in Rwanyamahembe sub-county. **Toe** study identified the factors responsible for low expanded program on immunization (EPI) **service** coverage in Rwanyamahembe sub-county.

1.3 Main objective

The main objective of the study was to assess factors responsible for low expanded program on immunization (EPI) service coverage in Rwanyamahembe sub-county

1.3.1 Specific objectives

1. To determine the level of expanded program on immunization (EPI) service coverage in Rwanyamahembe sub-county.
2. To identify the socio-demographic factors affecting EPI service coverage in Rwanyamahembe sub-county.
3. To identify the institutional factors affecting with EPI service coverage 111 R wan yam ahem be sub-county.

1.4 Research questions

1. What is the level of expanded program on immunization (EPI) service coverage in Rwanyamahembe sub-county?

What are the socio-demographic factors affecting EPI service coverage 111 **Rwanyamahembe** sub-county"?

3. **What** are the institutional affecting EPI service coverage in Rwanyamahembe sub **county?**

1.5 Scope of the study

e scope of the study was categorized into geographical, content, and time as discussed below;

15.1Geographical scope

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1.5.2 Content scope

The study was limited to factors for low expanded program on immunization (EPI) service coverage as the independent variables and expanded program on immunization (EPI) service coverage as the dependent variable. It specifically; determined the level of expanded program on immunization (EPI) service coverage in Rwanyamahembe sub-county; identified the sociodemographic, and institutional factors affecting EPI service coverage in the study area.

1.5.3 Time scope

his study was conducted for a period of 10 months; May 2021 to March 2022. This was long enough for the research to collect data, analyze it and present the report before the university deadline.

1.6 Significance of the Study

The study may provide information to policy makers and technocrats on the factors responsible r low expanded program on immunization (EPI) service coverage in Rwanyamahembe subcounty Mbarara district. This information may be helpful in policy formulation and modification.

The findings of this study may be a source of information to non- Governmental Organizations, government and private enterprises who are involved in the promoting immunization services. The study may be useful to the policy makers, the ministry of health specifically in the department of disease control. The information obtained may provide useful guide for formulating appropriate policies and programs for the promotion of EPI services.

To health care system of Rwanyamahembe Sub County, the study outcomes on the factors responsible for low expanded program on immunization (EPI) service coverage may help in ensuring that government puts in place the measures and strategies to overcome these obstacles.

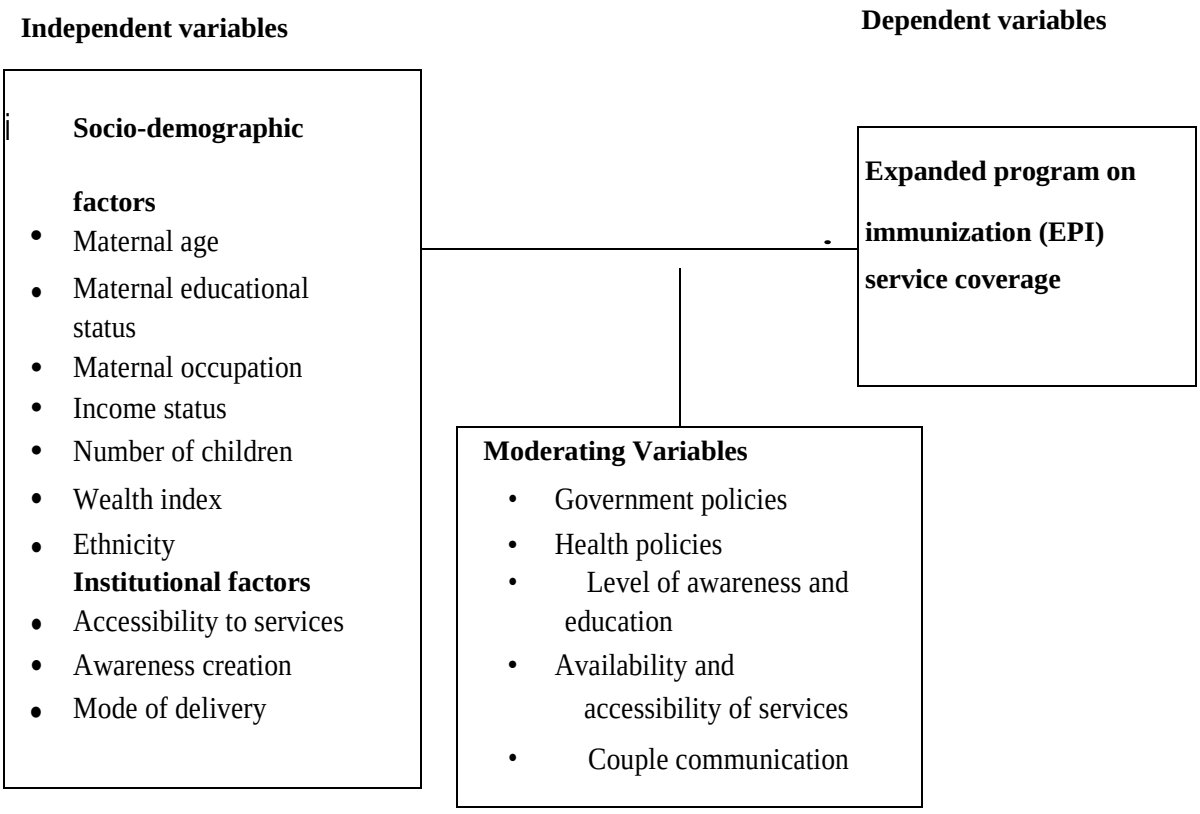
The findings may provide up to date literature for academicians since the findings may be used as a basis for further research on expanded program on immunization (EPI) service coverage. The gaps identified may be explored for further research especially in regard to coverage.

The study may help the researcher to fulfill the requirements for the award of a Degree of environmental health science of Kabale University.

Conceptual frame work

The study looked at expanded program on immunization (EPI) service coverage use as the dependent variable and associated factors as the independent variables. A conceptual model **developed** below was intended to facilitate the understanding of how factors affect EPI service, coverage at sub-county level.

Figure l: A conceptual framework describing immunization service coverage and its associated factors



Source: Malande et al., (2019) modified by the researcher

Chapter Two: Literature Review

2.0 **Introduction**

This chapter reviewed literature related to expanded program on immunization (EPI) service coverage It analyzed relevant literature about EPI service coverage and associated sociodemographic, cultural and institutional factors. Literature was generated from text books, journals, periodicals and official reports, with the intention of identifying gaps.

2.l Expanded program on immunization (EPI) service coverage

overall immunization coverage is the proportion of newborns that an immunization system brings in for the first immunization schedule to the proportion of those children who eventually complete all immunizations recommended by WHO (WHO, 2016). According to WHO, completion of three doses of any vaccine is the measure of immunization coverage levels while dropout rate of an immunization system is measured by dropout rates (WHO, 2016).

Immunization coverage is a key indicator of access to and utilization of immunization services. In spite of continuous efforts to raise immunization coverage, since 1990 global figures for EPI vaccines have leveled off at around 80% for infants, and considerable disparity remains both between and within countries. Average coverage of DTP-3 in the African region has not yet reached 60%. To improve coverage in the lowest income countries, long-term, coordinated and reliable investment by national governments and donors is required (Obasoha et al., 2018).

According to UNICEF (2014), 22.6 million children under **I** year of age did not receive DPT3 vaccine worldwide in 2015 compared to 22.3 million in 2012 and more than 70% live in ten countries including Uganda and an estimated 86% of the unvaccinated children live in countries eligible for funding from GA VI alliance and 75% live in just 10 countries in Africa and Asia. These countries include India with close to 10 million unimmunized children, Nigeria, China, Indonesia as well as Bangladesh, DRC, Ethiopia, Niger, Pakistan and Uganda. This is due to the large number of children born in these countries or low vaccine coverage (WHO, 20 I 6).

Vaccination preventable diseases still account for about a quarter of 8million deaths occurring annually among children under five year of age especially in low income countries (Malande et al., 2019). Therefore, vaccination to children could prevent more than 2 million child deaths each year thus increasing child survival (WHO, 2016).

Timely immunization is importance for reducing disease risk. Delayed infant vaccination or incomplete enlarges the gap between loss of protection from maternal antibodies and full protection from vaccine induced immunity, negatively affects herd immunity and postpones full protection in infant and children. As a consequence, infants are longer vulnerable to vaccine preventable diseases, such as Bordetella, pertussis and measles contributing to outbreaks of the aster in countries (Adedokun et al., 2017).

Vaccine preventable diseases are a challenge in most developing countries, especially in sub-Saharan Africa, where it accounts for 25% of the infant deaths. Recently Tanzania demographic health survey (TDHS) for 2018 showed that proportion of fully immunized is 75% and this is an increase compared to 61% in 2012 as cited by Kagone et al., (2018). The Zambia demographic and health survey shows that 68% of children aged 12-13 months in Zambia were fully immunized in 2016. ln Ethiopia demographic and health survey show 24.3%. The prevalence of fully immunized children was 24.3 %. Specific vaccination coverage for three doses of DPT, three doses of polio, measles and BCG were 36.5 %, 44.3 %, 55.7 % and 66.3 %, respectively. Kenya has the lowest immunization coverage in East Africa. With 86 per cent national immunization coverage, Kenya has the lowest number of fully immunized children in East Africa compared to Tanzania which has 92 per cent (Legesse and Dechasa, 2015) against the 90 per cent target of the global immunization vision and strategy.

In Uganda, immunization is a countrywide programme covering all districts of Uganda. The Ministry of Health/ Uganda National Expanded Programme on Immunization (UNEPI) is responsible for policy, standards and priority setting, capacity building, coordinating with other stakeholders and partners, resource mobilization, procurement of inputs such as vaccines and injection safety materials, monitoring and technical support supervision to the districts (Braka et al., 2012).

The districts and health sub-districts are responsible for planning; management and delivery of EPI (Expanded Programme on Immunization) services through the implementation of the overall district health plan (Fadnes et al., 2011). The community is involved in mobilization of parents to take their children for immunization. Immunization is part of the Primary Health Care (PHC) and is integrated into the child survival activities at the district and health facility levels. Heamophilus Influenza and Hepatitis B were introduced to the former mandatory vaccines

(BCG, Polio, DPT, and Measles) in 2002, as part of child survival strategy (Ministry of Health, 2017).

As part of the minimum health care package (MHCP), Uganda's Expanded Program on Immunization in 2000 revitalized the role to boost immunization coverage following the previous declining trends. Issues among others included; poor access, low community involvement, poor cold chain maintenance and lack of logistics among others (Nankabirwa et al., 2010).

Information from the Demographic and Health Survey indicates that only 4 in 10 children are fully vaccinated by 12 months in Uganda. This survey further revealed that children in the rural areas had a lower likelihood of being vaccinated compared to their counterparts in the urban areas, for both single and combined vaccinations. The 54% coverage is way below the current global coverage of 84%for Polio, Diphtheria-Pertussis-Tetanus (DPT) and Measles. Vaccination coverage increases as the education attainment of a child's mother also increases and also if the mother comes from a richer household (Fadnes et al., 2011).

2.2 Socio-demographic factors associated EPI service coverage

According to Cooper et al., (2018) disparities in immunization coverage are compounded by social economic determinants. The dynamics of childhood vaccination uptake in developing countries are unclear. Numerous studies document the relationship between immunization coverage and socio-demographic factors. Socio-economic inequities within a community influence health output. The key socio-demographic factors affecting immunization coverage are discussed below;

Lack of information about immunization is a factor affecting the immunisation coverage. Mothers and caretakers may be unaware of the need for follow up visits and also unaware of the need for their children to be vaccinated. A study conducted in the Opuwo Health District identified the lack of information as one of the factors associated with child vaccination (Landoh et al., 2016)) while a study conducted in the difficult to reach areas of the metropolis of Lagos revealed that a lack of information about the details of vaccination programmes contributed to approximately 41 % of the failures either to receive or complete the required vaccinations (Ekouevi et al., 2018).

Negative experiences as regards immunization is another factor associated with low immunization coverage. Chidiebere et al. (2014) identified fear of side effects as an important or **for** under immunization when they conducted a study in an affluent community in the United States of America. In other countries such as Malawi, Ethiopia, Bangladesh, the Philippines, India and the Democratic Republic of Congo it emerged that mothers understood the effects of immunization with some mothers viewing them as a normal occurrence, some expecting them to disappear anyway and others seeing in them a sign that the vaccine was king (Negussie et al., 2016). Sato, (2019) found that another contributing factor to low immunization coverage was the possible reaction of children to vaccinations, including fever, pain on the injection site and irritability.

Several researchers have found that education plays a vital role in the decision to access health services as well as the decision to immunize children with low levels of education being associated with lower immunization coverage. This was also the finding in a study which was conducted in the Democratic Republic of Congo. The study indicated that the educational level *of* the father and the mother's knowledge of the Expanded Programme of Immunisation (EPI) ere significant factors as regards the immunisation of their children (Akwataghibe et al., 2019). **The** educational status of the parents was found to be the most significant factor as regards the immunisation status of children in rural Nigeria (Ntenda, 2019) while a study conducted in the Opuwo district in Namibia found that low educational levels of the parents were associated with **low** vaccination coverage of children (Okenwa et al., 2019).

A study conducted in the Opuwo Health District found that the age of mothers, guardians or caretakers did not significantly influence the vaccination status of the children as there was no apparent difference between those children who were fully vaccinated and those who were either partially vaccinated or not vaccinated (Tadesse et al., 2017). In Japan it was found that the main characteristics of mothers of unvaccinated children included the mothers being aged younger than 30 years, working and concerned about the adverse events of the vaccine (Ibraheem, Abdulkadir, Akintola, and Adeboye, 2019). Yismaw et al., (2019) found that in Nairobi, Kenya, maternal age was a strong predictor of the vaccination status of children with older mothers being more likely to have children who were vaccinated as compared to mothers who were aged less than 20 years and whose children were not vaccinated.

A study by Sullivan, Esmaili and Cunningham, (2017) found a positive influence of income and vaccination coverage. Family income/wealth index influences the likelihood of children receiving vaccination. Availability of money for transport for mothers to take their children to the vaccination centers is an enabling factor. The evidence in this respect indicates a link **between** income and completion of measles vaccination (Taiwo et al., 2017). This is also supported by another study in china where completeness of vaccination was associated with the come of the mothers.

Another child factor that determines completion of vaccination is possession of vaccination cards. The children born from a health facility setting and with vaccination cards are more likely :o be vaccinated than those born at home and without the cards (Kagone et al., 2017)

Family support is another determining factor especially on decision making concerning vaccination and treatment. In Uganda, men are heads of households and key decision makers therefore have influence on health matters in a home. Due to inferiority complex of women they are unlikely to take their children for vaccination if men objected. In order for mothers to take their children for vaccination a close relative has to take over the husbands duties by providing transport. Husbands do not always participate in this process making it difficult for mothers to get the lifesaving vaccine for their children (Lakew et al., 2015).

Various studies have shown that the sex of the child found to foretell the immunization status of the child in the families in which gender inequality is prevalent. A review done in India from 1996- 2006 showed that girls were found to have significantly lower immunization coverage than boys for BCG, DPT, and measles (Chiabi et al., 2017). In Bangladesh females are 0.84 times less likely to be fully vaccinated than male children (WHO, 2010). In Nigeria in 2003 showed no any significant sex difference. In 2006 Ethiopian EPI survey also showed that no statistically significant difference between girls and boys with regard to their immunization status.

Birth order has a close relationship with immunization coverage. According to Kagone et al., (2018) vaccination coverage generally decreases as birth order increases, 27% of first-born children have been fully immunized, compared with 18% of children of birth order six and above.

Among other factors associated with immunization dropout is the place of residence in those children from urban areas showed significant role in completion of the immunization. Those from rural areas have a higher immunization dropout as compared to their counterparts living in urban areas (Sato, 2019). However, another study reported that place of residence and mother's socio demographic variables were not influencing immunization dropout among children
egussie et al., 2016).

Mother's education level has significant role in immunization coverage, improvement in female education status would lead to a reduction in immunization dropout rate, mother's with a higher level of education status are more likely to complete the immunization schedule as compared to their ones of low or no formal education (Sullivan et al., 2017)). In a study a study that sought to assess immunization in urbanized villages of Delhi, Okenwa et al., (2019) noted that literate mothers were 1.4 times more likely to take their children up to full immunization as compare to illiterate mothers however education status of the father was not significantly associated with immunization completion (Akwataghibe et al., 2019).

According to Negussie et al., (2016) most illiterate mothers as well as their husbands have negative attitudes towards vaccination and believe that vaccines have got side effects on the health of their children. Negative perceptions about vaccination and anti-vaccine rumors in some communities affect the level of immunization coverage, miss-information about the side effects of vaccine during illness and false contraindications also affect the level of immunization coverage.

Children living in a household that had a monthly household income of more than fifty US dollars were more likely to complete immunization regarding findings of a cross section study that sought to assess determinants of third dose DPT completion among children F from EPl centers in Pakistan (Sato, 2019).

A cohort study that sought to establish determinants of third dose DPT completion among children who received DPT! at rural EPI centers in Pakistan revealed that participants who stay nearer to the EPI centers are more likely to complete immunization as compare to those who reside more a IO minutes away distance from the EPI centre (Ekouevi et al., 2018). The researcher concluded that interventions targeting childhood immunization dropouts aiming at

bringing more children to EPI Centers should deal with relocation centers at appropriate locations by decreasing travel time hence less dropouts. Maternal perception regarding importance of vaccines was significantly associated with higher immunization rates in studies conduction on factors associated with immunization completion in Ethiopia, India and Kenya (Legesse and Dechasa, 2015).

Accessibility of vaccination sites was found to be a predictor for childhood immunisation uptake in Southern Ethiopia (Legesse and Dechasa, 2015). Mothers who considered immunisation sites to be accessible were 5 times more likely to have their children fully immunized compared to mothers who did not consider it accessible.

Satisfaction with vaccine services was also found to influence childhood immunisation uptake in Tanzania among 380 mothers of children aged 12-23 months. Mothers who are satisfied with vaccine services were about three times more likely to have their children vaccinated compared with mothers who were unsatisfied with vaccine services (Landoh et al., 2016). The way vaccine providers behave could either enhance or discourage mothers from taking their children for vaccinations.

Several studies reported that parents of non-vaccinated children felt that it was against their religious beliefs to get their children immunized (Obasoha et al., 2018). Some parents felt that it is God's job to prevent illness and parents' job to seek treatment (Braka et al., 2012). In both Africa and Asia, some parents believe that vaccination is a way to sterilize children so they will not be able to produce children in future (Malande et al., 2019). A study in Uganda reported that fears and rumors about vaccination (e.g. children were being injected with HIV/AIDS) has reduced the acceptability level of the immunization services by the community, although these seemed to affect only a minority of people might cause infertility, paralysis, abscesses, and infections such as HIV I A IDS that they were being used as scapegoats to test treatments for celiain illness (Malande et al., 2019).

In Somalia, most Somalis rely on traditional healers. Practitioners perform operations such as bloodletting, scarification, cauterization and teeth-pulling. Cauterization is a common therapy for treating diseases such as hepatitis and parasites (Obasoha et al., 2018). The practice is based on the belief that disease and fire cannot coexist some cultures even have a form of traditional vaccination. For instance, in Somalia Sar-Sar is a traditional vaccination performed around baby's

naval. A razor blade is used to make shallow cuts into which are rubbed ashes of herbal medicines burned over hot coals.

Religious conflict is the major factor of immunization failure program and in the tribal areas is one of the biggest hindrances to polio vaccination like Nigeria, Pakistan and Afghanistan 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 (Obasoha et al., 2018), Some of the religious clerics even claimed that it is un-Islamic to vaccinate their children and thosewho 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 in this area.

Religion and cultural beliefs affect vaccination coverage one of such a belief is among a certain community in Mbale. The religious leaders of this cult do not allow the flock to vaccinate or treat their children when sick claiming their gods will heal them. They also believe vaccines are made from wild animals which will instead make their children sick (Braka et al., 2012). In Jewish ultra-orthodox communities in Jerusalem the Rabbis or religious leaders enjoy extreme respect and almost blind their followers who refer to them for guidance and advice on matters not necessarily related to religion. The public health workers in Jerusalem faced hardships of having children vaccinated against measles during an outbreak in those communities (Legesse and Dechasa, 2015).

Religious beliefs have been associated with people denying to get vaccinated. Chidiebereet al., (2014) states that religious opposition by Muslim fundamentalists is regarded as a major contributing factor in the failure of immunization programs against polio in Nigeria, Pakistan and Afghanistan. Religious conflicts in the tribal areas of Pakistan pose as one of the biggest hindrances to effective polio vaccination Ekouevi et al., (2018). Over the past years, several kidnappings and beatings of vaccinators have been reported. Vaccination campaigns in Nigeria and Afghanistan have also been hampered by Islamic extremists, especially in the Nigerian province of Kano in 2003.

Religion affiliation has been revealed by studies to be a factor influencing childhood immunisation uptake. From a cross-sectional study conducted in Uganda using Uganda Demographic Health Survey data, child immunization uptake was affected by religion status.

Children from Muslim families had a lesser chance of been fully vaccinated compared with children from Catholic families. Likewise, in Mozambique parents with no religious affiliation were found to be twice as likely not to complete their childhood immunisation uptake. This could be due to the circulation of false information obtained via religious networks. This false information may be linked to negative beliefs of vaccines, for example, the belief that vaccines **are** composed of anti-fertility drugs (UDHS, 2016).

Ethnicity was found to be a factor affecting childhood immunisation uptake in Nigeria in which children belonging to the lgbo ethnic group were about three times more likely to be fully vaccinated compared to children belonging to an ethnic group such as Hausa, Yoruba and others (Cooper et al., 2018). These disparities could be attributed to the factors prevalent at community level, for example, in the Hausa community there is low level of education, high poverty, poor utilization of antenatal care and home delivery and all these factors are associated with poor immunisation uptake. It could also be due to a misconception regarding the safety of vaccines and fear of vaccine side effects.

The study conducted by Legesse and Dechasa (2015) indicated that the tribe of parents was significantly associated with the immunisation status of children in the Opuwo Health District as the children from the Himba tribe were found to be either partially vaccinated or not vaccinated at all as compared to the children from the other tribes in the district. This study intends to establish whether this finding is still valid in view of the many interventions involving health education, outreach services and improved service delivery since 2002. These developments may imply that, since the study was carried out in 2002, there is a possibility that the effect of ethnicity on the immunisation status of children may have changed.

Gender of the child and immunization. Research conducted in Chandigarh in India indicated that measles coverage is lower in female children than in male children - 56% versus 63.5%. The study indicated that, as a result of cultural beliefs that males are more important than females; female children were not taken care of in the way that male children were (Chidiebere et al., 2014). However, a study conducted in Malawi revealed that there was no difference between the vaccination coverage of male children and the vaccination coverage of female children (Cooper et al., 2018)

2.3 Institutional associated with EPI service coverage

The major challenge to immunization campaign program sterns on lack of adequate financial support for sustenance and EPI programs in low income countries. In 2000 reuse of disposable syringes caused 22 million infections. The measles supplemental immunization activities (SAs) and the Global Alliance for Vaccines and Immunization (GA VI) by provided to improve the situation by replacing the disposable and sterilizable syringes with auto-disable (AD) syringes to improve injection safety in low income countries Obasoha et al., (2018). Although immunization is regarded as one of the "best buys" **in** global health, there prevails a notion of inequities in specific countries financing of vaccines.

Availability of service; in a study on health infrastructure and immunization coverage of children aged 2-35 months residing in rural India, it was found that the availability of health infrastructure significantly improved immunization coverage for non-Polio vaccines (Kagone et al., 2018). The study further revealed that larger and better equipped facilities such as hospitals and health centers had bigger effects on immunization coverage.

Availability of vaccines; in another cross sectional study done in Sudan showed that vaccines availability at the nearest place of vaccination strongly influenced the correct vaccination status of the child. Children of mothers who have better access to available vaccine were 3.4 times more likely to have had the correct vaccinations than were children of mothers who don't (Chidiebere et al., 2014). Unavailability of vaccines is one of the most common barriers to immunization adherence and coverage. This not only hinder mothers to comply with the present vaccination schedule but this may prevent mothers from coming back in the future as mothers may presume to be in the same predicament on the next appointment. In the Dominican Republic, 90% of mothers reported that the staff treated them right due to lack of vaccine and vaccinator (Ekouevi et al., 2018).

Health education; providing vaccine related targeted health education to mothers at home and during ANC visits is an effective strategy to improve immunization completion rates in low literacy and income settings (Negussie et al., 2016). Sato, (2019) reported that there was a 31 %

increase in DPT3 immunization completion among infants of mothers who received primary healthcare center-based education on their first immunization visit. In a randomized controlled trial that aimed at assessing the impact of a low literacy immunization promotion education

.:uervention for mothers in low income setting of Karachi on immunization completion, findings mer a Poisson regression model to estimate the effect of health education showed that improvement in educational interventions aimed at immunization completion improves routine immunization completion (Sullivan et al., 2017).ln a study that measured the hepatitis B vaccination uptake in 249 London babies born in 2004 to Hepatitis B positive mothers, findings showed that complete immunization is associated with sector of delivery, having booked for ANC visits and provision of written information on Hepatitis disease and immunization.

Mobilization of the community by political, religious leaders, traditional leaders, youth groups, women groups and the general public helped to spread immunization messages hence gaining support and good for improving measles vaccination coverage (Ekouevi et al., 2018). These findings concur with a study carried out by Zaffran and Michael, which revealed that including the general public in your outreaches and static programs for vaccination helped to establish broad support. This in the long run creates public ownership of the activity and hence changes of attitude towards vaccination.

Inadequate logistics and nonfunctional equipment is another factor under vaccination program which affects coverage of measles vaccination. Proper cooling and storage of vaccines is key to maintaining quality and potency of vaccines. Findings in a study carried out in Kenya revealed that only 40% of available equipment for keeping vaccines were in good condition and about 60% needed repair (Ekouevi et al., 2018). Vaccine supply and logistics systems in almost all developing countries will require significant investments of time and resources and this is critical if we are to reach more people with vaccines (Negussie et al., 2016). Therefore, a significant improvement in logistics translates clearly into improved vaccine coverage.

Cost of vaccination services and vaccination cards is another vaccine program related barrier to children accessing the vaccination service. When health workers sell vaccination cards and ask for money to administer the vaccine and yet these cards and services are supposed to be offered at no cost this definitely affects completion of immunization (Okenwa et al., 2019).

Chapter Three: Research methodology

3.0 Introduction

This chapter presents the methods that were followed to manage the study. It discussed different aspects such as research design, study area, study population, sample size and determination, sampling techniques and procedure, data collection methods, data quality control, data analysis and research procedure.

3.1 Research design

According to Denvir and Millett (2003), research design provides the glue that holds the research project together. It is a scheme, an outline or plan that is used to generate answers to a research problem or phenomena. A cross- sectional study design was utilized. The design applied both qualitative and quantitative approaches to data collection. A cross sectional design is a kind of design that involves measuring different variables in the population of interest at a single point in time. The design is suitable for the study because it helped in determining the relationship between and among variables. It is also economical in terms of time and financial resources. The qualitative method was used to capture respondent's views, feelings, knowledge and opinions on the subject matter using interviews while quantitative methods involved the use of questionnaire to capture quantifiable responses.

3.2 Study area

The study was carried out in Rwanyamahembe Sub County in Mbarara District in south western Uganda. Rwanyamahembe Sub County is located at about 16km north of Mbarara town along the Mbarara-1 banda highway. It is bordered by Rubaya Sub County in the East, by Mbarara municipality in the south, by Kashare Sub County in the west and by Rubindi Sub County in the north. Like other remote sub counties across Uganda, immunization coverage Rwanyamahembe sub-county had remained lower at 38%.

3.3 Study population

Kombo and Tromp (2011) defines a population as a group of individuals, objects or items from which samples are taken for measurement. The study population comprised of parents/care takers and other key informants like local leaders, VHTs and EPI program implementers. These provided the necessary information required for the study.

3.4 Sample determination

The sample size was determined by Kish (1965). According to the formula, the sample size was determined with some degree of precision of the general population used. In this case the sample was determined as follows;

$$n = pxqx(Z.) \text{ or } \&/2$$

$$= Z^2 \frac{(D)(1-p)}{e^2}$$

Where:

n = desired sample size (if the target population is greater than 10,000) p = Target population= 8.7% = 0.087

q = Non-target population= 91.3% = 0.913

e = the level of statistical significance set= 5% = 0.05

, = the standard normal deviation at the required confidence level (in this case 1.96) Substituting the values into the formula: n = 0.087 x 0.913 x (L96) = **120 respondents**

0.0025

3.5 Sample procedure

Musoke et al., (2014) defines sampling as the plan on how units or elements within a population will be picked as to form part of the study. The researcher used simple random sampling (where the researcher uses non-probability methods) in the selection of respondents. This was achieved by getting a list of parents/care takers with the help of village leaders on the day of data collection. Each parents name was assigned a random number and it was from the random numbers that the researcher selected the required number of respondents. Simple random sampling method was used because it was the best in dealing with large number of respondents as it saves time and costs. Purposive sampling method (where the researcher chooses respondents basing on the characteristics) was used for key informants because it is a method that helps in

gathering data from respondents with more knowledge about a specific phenomenon. Key informants in this case provided supplementary information that would not be provided by other respondent categories.

3.6 Source of data

Data was gathered from both primary and secondary sources. Primary data was collected from **the** respondents using questionnaire and interviews. Secondary information on the other hand was collected from sources like; child health registers/HMIS, text books, internet, newspaper, magazines, and journals. This information was reviewed by visiting places like libraries and internet cafes and was used to supplement the collected data from different categories of the respondents.

3.7 Data collect methods

This study used questionnaires and interviews for data collection. **3.7.1**

Questionnaire

The study utilized a semi-structured questionnaire to gather data from patients. The questionnaire had both open and closed ended questions which were filled by respondents by writing down their responses. The questions in this tool were originally designed in English and later translated into local languages to make the questions more simple, clear and understandable to the respondents. The questionnaire was given to the respondents and hence gathered more reliable data as the respondents were allowed to answer in their own language and time without being frightened by the researcher's presence. Secondly, it was used because of being cheap as well as collects responses with minimum errors and high level of confidentiality. The instrument was divided into sections that included background information of the respondents, level of expanded program on immunization (EPI) service coverage as well as the socio-demographic, cultural institutional affecting with EPI service coverage.

3.7.2 Interview Guide

An interview guide was drafted with questions that the researcher asked during interview sessions with key respondents. The researcher administered interviews to the key informants with a help of an interview guide reflecting the study objectives. With this instrument, the researcher engaged key respondents in oral questions. The interviews were used widely to

supplement and extend the researchers' knowledge about individual (s) thoughts, feelings and behaviors. While interviewing, probing was applied in cases where respondents did not give inadequate answers. This method was used to gather data from key informants.

3.8 Data quality control

3.8.1 Validity of Instruments

According to Latunji and Akinyemi, (2018) validity is a demonstration that a particular instrument measures what it intends to measure. In quantitative data, validity may be improved through, appropriate instrumentation. Validity of the questionnaire was ensured through contact and guidance from the supervisor, and adjustments were incorporated where necessary. The questionnaire was also pre-tested on ten respondents outside the target sample to harmonize validity.

3.8.2 Reliability of instruments

Reliability is the tendency to obtain the same results if the measure was to be repeated by using the same subjects under the same conditions (Hjelmand A twine, 2011). A number of measures were taken during field work, sub-sequent analysis and conclusion process in order to ensure the quality of the instrument. Before actual collection of data, instruments were pre-tested on respondents across in the area to determine reliability; these were not part of the respondents. Cronback's Alpha Coefficient was used to measure the reliability of the instrument in relation to consistency.

3.9.2 Data analysis

Data was analyzed under two major principles that is quantitative and qualitative analysis **3.9.2.1**

Quantitative data analysis

The data collected was cleaned, coded and entered into SPSS version 18. Using SPSS version 18, descriptive statistics was used to determine indices.Data was analyzed at the Univariate and bivariate levels. At the Univariate level demographic characteristics of the respondents was described using largely descriptive statistics such as frequencies and percentages. Bivariate analysis was used to identify the significant factors affecting EPI coverage. The outcome of the analysis was presented in statistical tables, graphs and pie-charts.

3.9.2.2 Qualitative data analysis

Qualitative data was analyzed by developing themes (headings) or sub themes, which were derived from the study objectives. The recorded information was transcribed verbatim and translated from local languages into English. Observational field notes were incorporated into the data for analysis. The transcripts were read repeatedly and words with similar meanings grouped into categories. Similar categories were grouped into themes and subthemes which were presented as results.

3.10 Anticipated limitations of the study

The researcher was challenged with getting adequate information to cover all the objectives since during data collection; respondents were busy with other socio-economic activities. The researcher however solved this problem by making prior communication and commitment with respondents before actual data collection.

The researcher did not get adequate resources in time for example money for transport, printing work and for buying materials to use. Early preparations by the researcher however helped him to get the required resources in time.

The weather in the area was hot and this affected the movement of the researcher as the whole process was very tiresome. However this was solved by the researcher buying an umbrella that helped him continue with research process.

3.11 Ethical considerations

The study was approved by the Faculty of Medicine, Kabale University. Further approval was obtained from authorities of R wanyamahembe sub-county and finally informed consent from the participants themselves. Participants were guaranteed confidentiality of the information collected. This was preceded by thorough explanation of the aim and objective of the study. Participation was based on informed and voluntary consent. Respondents for the study were informed of their right to withdraw from the study at any time they deem necessary. They were fully assured of their confidentiality and anonymity. Confidentiality of data was maintained by

use of identification numbers rather than names and limiting access to the data. Throughout the field work, ethical consideration was emphasized. The questionnaire that was administered to the

in-patients were prefaced with a consent form requesting consent of the respondents before participation in the study.

Chapter four

Analysis, Presentation and Interpretation of Results

4.0 Introduction

This chapter presents the study findings that were in line with the objectives. Quantitative methods of analysis were used to generate descriptive and inferential statistics that aided in the interpretation of the study findings. The findings are presented inform of socio-demographic characteristics, level of expanded program on immunization (EPI) service coverage, sociodemographic and institutional factors affecting with EPI service coverage in Rwanyamahembe sub-county.All the 120 respondents targeted for the study were accessed and questionnaires recovered giving a response rate 100%.

4.1 Respondents characteristics

The most important demographic characteristics for the study included; gender, age bracket, educational level, occupation, household size and source of income. Findings ondemographic characteristics are presented as below;

Table 1: Socio-economic characteristics of the respondents

Socio-demographic characteristics	Total (n=120)
Gender of respondents ***(Freq/"?)***	
Male	38 (31.7%)
Female	82 (68.3%)
Respondents age bracket ***(Freq/%)***	
15-25	6 (5%)
26- 35	35 (29.2%)
36-45	53 (44.2%)
46-55	17(14.2%)
56 and above	9 (7.5%)
Marital status of the respondents ***(Freq/%)***	
Single	23(19.2%)
Married	85 (70.8%)
Separated	9 (7.5%)
Widowed	3 (2.5%)
Level of education (Freq/%)	
None	IO (8.3%)
Primary	25 (20.8%)
Secondary	51 (42.5%)
Others	34 (28.3%)
Household size(Freq/"%)	
2-5	48 (40%)
6-9	66 (55%)
l0 and above	6 (5%)
Sources of income ***(Freq!%)***	
Farming	73 (60.8%)
Salary	19 (15.8%)
Business	20 (16.7%)
Casual work	8 (6.7%)

Results in table l indicates that majority 68.3%of the study respondents were female whereas 31.7% were male. The dominance of females in the study originates from the fact that immunisation programs attract more female than male. Most (44.2%) of the respondents were aged 36- 45 years, 29.2% were aged 26- 35. 7.5% 56 and above and 5% 15-25 years. 70.8% were married, 19.2% single while 7.5% and 2.5% were separated and widowed respectively.

Results about education level indicate that 42.5% of the respondents had secondary education, 28.3% other levels of education like university and tertiary, 20.8% had primary education whereas 8.3% had never attended school. Most (55%) of respondents were from households

made up of 6- 9 members, 40% 2 -5 members and only 5% came from households with 10 members and above.60.8% relied on farming as the main source of income, 16.7% small-scale petty businesses, 15.8% salary earned both formal and none formal employment while 6.7% depended on casual work.

4.2 Immunization accessibility and EPI service coverage

This segment of the study addresses research objective one which sought to determine the level of expanded program on immunization (EPI) service coverage in Rwanyamahembe sub-county. The gathered responses were analyzed using a quantitative descriptive approach to generate frequency counts and percentages as in 2 below;

Table 2: Immunization accessibility and EPI service coverage

	Total (n=l20)
Number of the children under 5 ***(Freq/%)***	
2 -3	32 (26.7%)
4 and above	79 (65.8%)
Age of the child ***(Freq%)***	9 (7.5%)
Less than a year	32 (26.7%)
between 2-3 years	67 (55.8%)
between 4-5 years	21 (17.5%)
Has your child/children been fully immunized ***(Freq/%)***	
Yes	45 (37.5%)
No	75 (62.5%)
Type of vaccine received(Freq"%)	
Measles	40 (33.3%)
Polio	33 (27.5%)
Hepatitis	28 (23.3%)
DPT	19 (15.8%)
Number of times the vaccine the child has received the vaccine ***(Freq%)***	
Once	55 (45.8%)
Twice	40 (33.3%)
Thrice	16 (13.3%)
More than four times	8 (6.7%)
Access site for immunization services(Freq")	
Government hospital	63 (52.5%)
Private clinic	35 (29.2%)
Outreach teams	22 (18.3%)

Study results in table 2 above indicate that two thirds (65.8%) of the respondents were from households with 2-3 children under the age of five, 26.7% had on 1 under five child whereas 7.5% had more than 4 under five children. 55.8% of the respondents had children who were aged between 2-3 years, 26.7% less than a year and 17.5% between 4-5 years. Only 37.5% revealed that their children were fully vaccinated compared to majority (62.5%) who said no. 33.3% of the respondents reported that their children received measles vaccine, 27.5% polio vaccine while 23.3% and 15.8% received hepatitis and DPT vaccines respectively. Most (45.8%) of the children received the vaccine once, 33.3% twice, 13.3% thrice and 6.7% more than 4 times. 52.5% accessed the vaccine from public/government hospital, 29.2% private clinic and 18.3% community outreaches.

4.3 Socio-demographic factors affecting EPI service coverage in Rwanyamahembe subcounty

This section of the study addresses research objective two which sought to identify the sociodemographic factors affecting EPI service coverage in Rwanyamahembe sub-county.The association between the two sets of variables (independent and dependent) was analyzed using logistic regression as presented in tables 3 below.

Table 3: Parameter estimates for the socio-demographic factors a socio-demographic factors affecting EPI service coverage

Variable	Value	AOR (95% CI)	p-value
Lack of information about immunization	Yes No	0.898 (.806- 1.00 I)	0.042
Age of the mother/guardian	15 -25	0.683 (0.330- 1.415)	0.306
	26-35	0.572 (0.275 -1.188)	0.134
	36-45	1.441 (.656- 3.164)	0.003
	46 and above		
Education level	None	0.856 (0.312-2.351)	0.763
	Primary	0.882 (422 -1.845)	0.738
	Secondary	1.569 (1.239-2.327)	0.001
	Others		
Negative experiences with immunisation	Yes No	0.984(0.169-1.871)	0.002
Possession of vaccination cards	Yes	2.685 (1.507 - 4.782)	0.000
	No		
Place of residence	Urban	0.956 (0.568 - 1.608)	0.864
	Village		
Employment status	Un-employed	0.588 (0.367 -0.940)	0.327
	Employed		
Sex of the child	Boy	1.760 (0.219-2.154)	0.002
	Girl		
Income status	Low	1.419 (0.462 -2.362)	0.201
	High		
Family support	Yes	0. 7 I 7 (0 .44 7-1. I 5 I)	0.168
	No		
Accessibility of vaccination sites	Have access	0.884 (0.455 -1.322)	0.031
	Don't have access		
Religious and cultural beliefs	Yes	2.009 (0.932 -4.021)	0.136
	No		
Maternal perception regarding importance of vaccines	Yes No	1.419 (0.462 -2.362)	0.541

a. Dependent variable: EPl service coverage

b. The reference category is: last.

c. This parameter is set to zero because it is redundant.

- OR» Odds Ratio
- CI» Confidence Interval

The regression results of socio-demographic factors affecting EPI service coverage in Rwanyamahembe sub-county were presented in table 3 above. The results were achieved using a logistic regression model. The coefficients explain the changes in the probabilities of the outcome as a result of a unit change in the explanatory variables. EPI service coverage was used as the outcome category in the equation. Thirteen variables were set as predictors and only seven (7) variables remained statistically significant at multivariate level of analysis including lack of information about immunization, age of the mother/guardian, level of education, negative experiences with immunisation, possession of vaccination cards, sex of the child and accessibility of vaccination sites.

Lack of information about immunization decreased the log of the probability of utilizing immunization services among children under 5 years by 0 .898. Parents/caretakers who lacked information on immunization were 0.898 times less likely to seek for immunisation services and otherwise [AOR = 0.898; (95% CI: 0.806 - 1.001); p = 0.042). In this case the earlier stated null hypothesis that there was no association between information access and EPI service coverage was rejected.

Age of the mother/guardian increased the log of the probability of utilizing immunization services among children under 5 years by 1.441 and was significant. Mother/guardians aged 3645 years were 1.441 times more likely to seek for immunisation services compared to those aged 46 and above. However there was no difference in immunisation service uptake between mothers/guardians aged 15 - 25, 26- 35 as well as those of 46 and above.

Education level increased the log of the probability of immunization service utilization among children under 5 years by 1.569. Parents/guardians with secondary education were 1.5 times more likely to take their children for immunisation services compared to those with university education [AOR = 1.569; (95% CI: 1.239 -2.327) p = 0.001]. There was however no observed

difference in immunisation service seeking for those with none formal education, primary and other levels of education. ln this case the earlier stated null hypothesis that there was no association between education level and immunisation service utilization was rejected.

Negative experiences with immunisation increased the log of immunization service utilization among children under 5 years by 0.984. Parents/guardians who had negative experiences with immunisation were 0.984 times more likely to utilize immunisation services and otherwise [AOR = 0.984; (95% CI: 0.169 - 1.871); p = 0.002]. The earlier stated null hypothesis was therefore rejected.

Possession of vaccination cards increased the log of probability of utilizing immunisation services by 2.685. Parents who possessed vaccination cards were 2.6 times more likely to access immunisation services compared to those who never had cards [AOR = 2.685; (95% Cl: 1.507 4.782); p = .000]. Therefore, the earlier stated null hypothesis for this very factor was also

rejected.

Sex of the child increased the log of the probability of utilizing immunisation services among under five children by 1. 760 and was significant at 5%. Parents/guardians with a child of male gender were 1.760 times more likely to go for immunisation services compared to those with a girl [AOR = 0.760; (95% CI: 0.219-2.154); p = 0.002]. Therefore the earlier stated null hypothesis for no association between child's sex and immunisation service use was rejected.

Lastly, accessibility of vaccination sites decreased the log of the probability of utilizing immunisation services among under five children by 0.884 and was significant at p = 0.031. Parents who lacked access to vaccination sites were 0.884 times less likely to seek for immunization services compared to otherwise [AOR= 0.884; (95% CI: 0.455 - 1.322): p = 0.031]. The earlier stated null hypothesis was therefore rejected.

4.4 Institutional factors affecting with EPI service coverage

This section of the study addresses research objective four which sought to institutional factors affecting with EPI service coverage in Rwanyamahembe sub-county. The association between the two variables (independent and dependent) was analyzed using logistic regression as presented in tables 4 below.

Table 4: Parameter estimates for the institutional factors affecting with EPI service coverage

Variable	Value	AOR (95% CI)	p-value
Inadequate funding of the program	Yes	0.743 (0.121 -3.518)	0.037
	No		
Covid restrictions	Yes	0.531 (0.296 - 1.231)	0.157
	No		
Perceived shortage of staff	Yes	0.962 (1.169- 1.294)	0.011
	No		
Perceived quality of care	Yes	0.782 (0.368 -1.249)	0.531
	No		
Cost of vaccination and vaccination cards	Yes	0.741 (0.392 -1.401)	0.037
	No		
Inadequate supply of vaccine stock	Yes	0.723 (0.390 -2.933)	0.023
	No		
Politicization of immunization services	Yes	1.323 (.829 -2.109)	0.240
	No		
Inadequate vaccination sites	Yes	0.893 (0.375-1.887)	0.002
	No		
Lack of advocacy on immunization programme	Yes	1.213 (0.704- 2.092)	0.486
	No		
Poor supervision and monitoring of the programmes	Yes	1.455 (0.837-2.126)	0.371
	No		
Corruption and embezzlement of funds	Yes	0.366 (0.205 -0.653)	0.001
	No		
Security concerns	Yes	0. 71 7 (0 .44 7-1.151)	0.168
	No		

a. Dependent variable: EPI service coverage

b. The reference category is: last.

c. This parameter is set to zero because it is redundant.

- OR Odds Ratio
- CI» Confidence Interval

At multivariate analysis, the results were achieved using a logistic regression model. The coefficients explain the changes in the probabilities of the outcome as a result of a unit change in the explanatory variables. Twelve variables were hypothesized and only five (6) variable emerged significant including inadequate funding of the program, perceived shortage of staff, cost of vaccination and vaccination cards, inadequate supply of vaccine stock, inadequate vaccination sites and corruption and embezzlement of funds.

Inadequate funding of the program decreased the log of the probability of EPT service coverage among under five children by 0.743. A unit reduction in the funds allocated for EPI program was 0.743 times likely to affect service coverage [OR= 0.743; 95% CI: 0.121-3.518; p = 0.037]. In this case the earlier stated null hypothesis that there was no association between funding of the program and EPI service coverage was rejected.

Perceived shortage of staff presented as a significant factor affecting EPI service coverage among under five children. Parents/guardians who perceived the vaccination sites or facilities to have few staff were 0.962 times likely not to show for child vaccination and otherwise [AOR = 0.962; (95% CI: 0.169 - 1.294); p = 0.01 l]. The earlier stated null hypothesis between the two variables was rejected.

Cost of vaccination and. vaccination cards decreased the log of the probability of EPI service coverage among under five children by 0.741 and was significant at 5%. A unit increase in the cost of vaccination and vaccination cards was 0.741 times likely to reduces of parents/guardians turning up for vaccination [AOR = 0.741; (95% CI: 0.392-I .40 I); p = 0.037). The earlier stated null hypothesis that there was no relationship between cost of vaccination and EPI service coverage among under five children was rejected.

Like, cost of vaccination and vaccination cards, vaccine stock outs decreased the log of the probability of EPI service coverage among under five children by 0.723 and was significant at 5%. A unit reduction in vaccines was 0.723 times likely to affect vaccination coverage [AOR = 0.723; (95% Cl: 0.390 - 3.933): p = 0.023]. The earlier stated null hypothesis that there was no relationship between vaccine stocks and EPI service coverage among under five children was rejected.

Inadequate vaccination sites decreased the log of the probability of EPI service coverage among children under-five by 0.893 and was significant at 5%. A unit reduction in vaccination

sites/facilities was 0.893 times likely to reduce EPI service coverage [AOR = 0.893; (95% CI: 0.375 - 1.887); p = 0.002]. The earlier stated null hypothesis that there was no relationship between vaccination sites and EPI service coverage among under five children was rejected.

Lastly, corruption and embezzlement of funds decreased the log of the probability of EPI service coverage among children under-five by 0.366 and was significant at 5%. Corruption and embezzlement of funds by officials was 0.366 times likely to affect EPI service coverage [AOR = 0.366; (95% CI: 0.205 - 0.653); p = 0.001]. The earlier stated null hypothesis that there was no relationship between corruption and embezzlement of funds and EPI service coverage among under five children was rejected.

Chapter Five

Discussion, Conclusion and Recommendations

5.1 Introduction

The study was assessing the factors affecting immunization coverage for children under five years in Rwanyamahembe sub-county, Mbarara district- Uganda. This chapter discusses the major findings, conclusions and recommendations in relation to the objectives of the study. This chapter further suggests the areas for further research.

5.2 Discussion of results

5.2.1 Level of expanded program on immunization (EPI) service coverage

The study discovered the level of expanded program on immunization (EPl) service coverage to be relatively low. This was evidenced by 37.5% revealed that their children were fully vaccinated as compared to majority (62.5%) who said no. Among those vaccinated, 33.3% of the respondents reported that their children received measles vaccine, 27.5% polio vaccine while 23.3% and 15.8% received hepatitis and DPT vaccines respectively. Immunization compliance rates remains significantly low in the area with most respondents who reported their children receiving the vaccine once. The low immunization coverage in the study area is attributed to limited vaccinations sites which are not easily accessible and are under facilitated to provide immunization services on weekly basis. This is further exuberated by lack of community outreach immunization services provided in each of the parishes which would otherwise encourage mothers to take their children for immunization services brought nearer. These study findings are comparable with findings byObasoha et al., (2018) who reported that average coverage of DTP-3 in the African region has not yet reached 60%. To improve coverage in the lowest income countries, long-term, coordinated and reliable investment by national governments and donors is required

5.2.2Socio-demographic factors affecting EPI service coverage

The study identified different socio-demographic factors affecting EPI service coverage in Rwanyamahembe sub-county. For example, lack of information about immunization decreased the log of the probability of utilizing immunization services among children under 5 years by 0

.898. Parents/caretakers who lacked information on immunization were 0.898 times less likely to seek for immunisation services and otherwise. It was reported that most mothers and caretakers are always unaware of the need for follow up visits and also unaware of the need for their children to be vaccinated. This study finding is in agreement with findings by a study conducted in the Opuwo Health District identified the lack of information as one of the factors associated with child vaccination (Landoh et al., 2016) while a study conducted in the difficult to reach areas of the metropolis of Lagos revealed that a lack of information about the details of vaccination programmes contributed to approximately 41 % of the failures either to receive or complete the required vaccinations (Ekouevi et al., 2018).

Education level was found to significantly affect utilization of immunization services among children under 5 years. Parents/guardians with secondary education were 1.5 times more likely to take their children for immunisation services compared to those with university education. There was however no observed difference in immunisation service seeking for those with none formal education, primary and other levels of education. Education level is one of the major boosters of knowledge and capacity to make informed decisions regarding health. Bettereducated patients are more willing to engage in innovative behavior than the less educated. Therefore there was doubt that those partially education would welcome and participate in diabetic medical care related services. The relationship between education level and attention to treatment was positive showing educated people to be more concerned about their health probably because of better knowledge of the consequences of not receiving the appropriate treatment. This study finding coincides with findings by a study which was conducted in the Democratic Republic of Congo by (Akwataghibe et al., 2019). The study indicated that the educational level of the father and the mother's knowledge of the Expanded Programme of Immunisation (EPI) were significant factors as regards the immunisation of their children.

Negative experiences with immunisation increased the log of immunization service utilization among children under 5 years by 0.984. Parents/guardians who had negative experiences with immunisation were 0.984 times less likely to utilize immunisation services compared to otherwise. In some instances children developed severe reactions to the vaccines, including fever, pain on the injection site and irritability. This finding is in line with findings from other studies done in Malawi, Ethiopia, Bangladesh, the Philippines, India and the Democratic Republic of Congo ((Negussie et al., 2016) which identified fear of side effects as an important

factor for under immunization. In these studies mothers understood the side effects of immunisation with some mothers viewing them as a normal occurrence, some expecting them to disappear anyway and others seeing in them a sign that the vaccine was working.

Possession of vaccination cards increased the log of probability of utilizing immunisation services by 2.685. Parents who possessed vaccination cards were 2.6 times more likely to access immunisation services compared to those who never had cards. This finding is agreement with findings by Kagone et al., 2017) who in their study found out that possession of vaccination cardsdetermines completion of vaccination. The children born from a health facility setting and with vaccination cards are more likely to be vaccinated than those born at home and without the cards.

Sex of the child increased the log of the probability of utilizing immunisation services among under five children by 1.760 and was significant at 5%. Parents/guardians with a male child were 1.760 times more likely to go for immunisation services compared to those with a girl. This study finding is in agreement with findings by WHO, (2010) which reported that in Bangladesh females are 0.84 times less likely to be fully vaccinated than male children.

Accessibility of vaccination sites decreased the log of the probability of utilizing immunisation services among under five children by 0.884 and was significant at $p = 0.031$. Parents who lacked access to vaccination sites were 0.884 times less likely to seek for immunization services compared to otherwise. This finding is in agreement with findings of a study by Legesse and Dechasa, (2015) in in Southern Ethiopia where they reported accessibility of vaccination sites to be a predictor for childhood immunisation uptake.). Mothers who considered immunisation sites to be accessible were 5 times more likely to have their children fully immunized compared to mothers who did not consider it accessible.

5.2.31nstitutional factors affecting with EPI service coverage

The study came out with different institutional factors affecting with EPI service coverage in Rwanyamahembe sub-county. For example, inadequate funding of the program decreased the log of the probability of EPl service coverage among under five children by 0.743. A unit reduction in the funds allocated for EPI program was 0.743 times likely to affect service coverage. This study finding is comparable to findings by Obasoha et al., (2018) who also reported lack of

adequate financial support for sustenance and EPI programs in low income countries as a major challenge to immunization campaign program.

Perceived shortage of staff presented as a significant factor affecting EPI service coverage among under five children. Parents/guardians who perceived the vaccination sites or facilities to have few staff were 0.962 times likely not to show for child vaccination and otherwise. This finding is in agreement with Okenwa et al., (2019) who also reported shortage and underpayment of staff as one of the major challenges affecting coverage of government health related programs.

Cost of vaccination and vaccination cards decreased the log of the probability of EPl service coverage among under five children by 0.741 and was significant at 5%. A unit increase in the cost of vaccination and vaccination cards was 0.741 times likely to reduces of parents/guardians turning up for vaccination. There were reported cases of health workers selling vaccination cards as well as asking for money to administer the vaccine and yet these cards and services are supposed to be offered at no cost. This study finding is in line with Okenwa et al., (2019) who also reported Cost of vaccination services and vaccination cards is another vaccine program related barrier to children accessing the vaccination service.

Perceived vaccine stock outs decreased the log of the probabi I ity of EPI service coverage among under five children by 0.723 and was significant at 5%. A unit reduction in vaccines was 0.723 times likely to affect vaccination coverage. Unavailability of vaccines was reported as one of the most common barriers to immunization adherence and coverage in the area. This not only hindered mothers to comply with the present vaccination schedule but also prevented them from coming back in the next time as they presumed to be in the same predicament on the next appointment. This study finding is in line with Chidiebere et al., (2014) who in their study also reported availability of vaccines at the nearest place of vaccination as strong influencer of correct vaccination status of the child.

Inadequate vaccination sites decreased the log of the probability of EPl service coverage among children under-five by 0.893 and was significant at 5%. A unit reduction in vaccination sites/facilities was 0.893 times likely to reduce EPI service coverage. This study finding is in line with Ekouevi et al., (2018) who reported limited number of vaccination facilities as a major problem to vaccination coverage.

Corruption and embezzlement of funds decreased the log of the probability of EPI service coverage among children under-five by 0.366 and was significant at 5%. Corruption and embezzlement of funds by officials was 0.366 times likely to affect EPI service coverage. This study finding is in line with Negussie et al., (2016) who also reported corruption and funds embezzlement as key factors causing failure of many government implemented health care programs.

5.3 Conclusions

In conclusion, the results of this study confirmed that the level of expanded program on immunization (EPI) service coverage was relatively low as evidenced by few respondents who had children that are fully vaccinated as compared to majority who did not complete vaccination. The main socio-demographic factors affecting EPI service coverage included lack of information about immunization, age of the mother/guardian, level of education, negative experiences with immunisation, possession of vaccination cards, sex of the child and accessibility of vaccination sites. In addition, inadequate funding of the program, perceived shortage of staff, cost of vaccination and vaccination cards, inadequate supply of vaccine stock, inadequate vaccination sites and corruption and embezzlement of funds were the main institutional factors affecting with EPI service coverage.

5.4 Recommendations

Based the findings, the following areas of recommendations were identified;

Providing vaccine related targeted health education to mothers at home and during ANC visits is an effective strategy to improve immunization completion rates in low literacy and income settings.

Health workers should give sufficient information to mothers on the importance of childhood vaccination, return dates during vaccination sessions and attendance of antenatal care visits.

Supervision of immunization activities by the district EPI focal person. This is key in identifying gaps during static and outreach programs. Emphasis on vaccinators arriving on time and all services given to mothers without a cost.

Religious leaders, political leaders should continue with mobilization of immunization activities more so encouraging men to participate in immunization, involving their wives in decision making at household level and providing transport for them to take children for immunization.

Health education aiming at informing rather than creating fear of vaccine preventable diseases is needed as it could empower parents to make informed decisions and would increase male support for their partners/ spouses.

Health workers require additional in-service training on medical ethics to promote the culture of treating people with dignity and respect. In addition, effective communication skills should be strengthened to address the various issues which could potentially reduce immunisation coverage such as health worker's response to mother's appearance, the fear of vaccines and vaccine side effects.

Improving mother's health seeking behavior toward pregnancy follow-up and enhancing mothers' knowledge on child immunization, strengthening outreach services, community engagement, and actively working with local community-based health agents are recommended to increase number of children to be vaccinated.

There is a need for primary health service expansion and health education to "hard to reach areas" to improve immunization coverage for children aged under five.

Educational interventions aimed at immunization completion should be improved as this will improve routine immunization completion. Clear health education on the side effects that can be experienced after immunization could reduce dropout due to misconceptions about vaccine side effects.

Immunization sites should be set up in remote areas; this is intended to provide a greater opportunity for children to access immunization services by reducing the distance to these services. Bringing more children to EPI Centers should deal with relocation of centers to appropriate locations by decreasing travel time hence less dropouts.

5.5 Suggested areas for further research

The researcher recommends the following areas for further research.

It is suggested that a further be conducted on; knowledge, attitude and perception and their influence on EPI in rural settings like Rwanyamahembe.

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Appendix I: Questionnaire for Parents/Care Takers for children below 5 years

Dear Respondent

I am .....a student of Kabale University carrying out a study titled "Factors affecting Expanded Program on Immunization (EPI) service coverage in Rwanyamahembe subcounty". This study is part of the requirements for my course and is for academic purposes only. The answers that you provide will be treated with utmost confidentiality. Please co-operate by providing the required information.

Thank you

SECTION A: Demographic data

Nan1e ....

Telephone number (optional) ....

Parish .....Village ....

Position in the household ....

I. Gender: 1. Male ( ) 2. Female ( )

2. **Age bracket**

a. 15-25 ( ) b. 26- 35 ( ) c. **36-45** ( )

d. 46- 55 e.56 >

3. **Marital status**

a. Single ( ) b. Married ( ) c. Separated ( )

d. Widowed ( )

4. Formal educational level

a. none ( ) b. primary ( ) c. secondary ( )

d. tertiary ( ) e. others .....

5. Occupation

1.Civil servant ( )

2.House wife ( )

3.Teacher ( )

4.Student ( )

5.Farmer ( )

6.Petty trader ( )

7.Other ....

6. Household size

a. 2-3 ( ) d. b. 4-5 ( ) **c.6-7** ( )

7-8 ( ) e. Others specify .....

7. Sources of income

a. Farming ( ) b. Salary ( ) c. Business ( ) d. casual worker ( )

d. Others specify .....

8.If, farming

Type of crops grown

a.Maize ( )

b.Banana ( )

c.Beans ( )

d. Vegetables ( )

e.Tea ( )

f.Others ....

Animals reared

a. Cattle ( )

b. Piggery ( )

c. Poultry ( )

d. Goats ( )

e. Others .....

Section B: Immunization accessibility and EPI service coverage 9.

How old is your child?

a. Less than a year ( ) b. between 2-3 years ( ) c. between 4-5 years ( )

I0. Have you ever immunized your child?

a. Yes ( ) b. No ( )

11. Do you have the immunization card?

a. Yes ( ) b. No ( )

12. Has the child received BCG?

a. Yes ( ) b. No ( )

13. How many times has the child ever been given polio vaccine orally?

a. l ( ) b. 2 ( ) c. 3 ( ) d. 4 ( ) e. Never ( )

14. How many times has the child ever been given DPT? 45

a. I ( ) b. 2 ( ) c. 3 ( ) d. Never ( )

15. Was the child given measles vaccine?

a. Yes ( ) b. No ( )

16. Do you have health facility in your area?

a. Yes ( ) b. No ( )

17. Where do you get the immunization services?

a. Government hospital ( ) b. Private clinic ( ) c. Outreach teams ( )

18. What is the approximate distance from your home to the health facility (KM)?

a. Less than I KM ( ) b. l-5l<M ( ) c. More than 5 I<M ( )

19. How do you get there?

a. On foot ( ) b. By taxi () c.Bybus ( ) d. Others ( )

20. How much money do you spend on transport?

a. 5,000 - I 0,000 Ugshs ( )

b. 11,000-20,000 U gshs ( )

c.More than 20,000 Ugshs ( )

21. Does it take you long time to get your child vaccinated?

a. Yes ( ) b. No ( )

22. Does a short distance from your home to immunization center encourage you to take your child to receive immunization services?

a. Yes ( ) b. No ( )

23. Have you ever experienced shortage of health workers in the clinic?

a. Yes ( ) b. No ( )

24. Have you ever experienced any shortage of vaccine whenever you take your child for immunization?

a. Yes ( ) b. No ( )

25. Do mobile vaccinating teams encourage you to utilize immunization services?

a. Yes ( ) b. No ( )

26. Does migration of families affect utilization of immunization services?

a. Yes ( ) b. No ( )

27. Are health workers friendly?

a. Yes ( ) b. No ( )

28. Do you have outreach of immunization services?

a. Yes ( ) b. No ( )

Section C: Socio-demographic factors affecting EPI service coverage

29. Could there be some socio-demographic factors affecting EPI service coverage in this area?

a. Yes ( ) b. No ( )

30. If yes, choose from the factors below

a. Lack of information about immunization
b. Negative experience with immunisation
c. Age of the mother/guardian
d. Income status
e. Family support
f. Sex of the child
g. Mother's education level
h. Diseases are supernaturally caused illness and cannot be prevented
i. Belief Fate
j. Traditional healers are alternative
k. Negative perception towards immunization process
l. Causes infertility
m. Other .....

31. If no, justify your answer?

…… …… …… …… …… ……

…… …… …

……

SECTION D: Institutional factors affecting EPI service coverage in Rwanyamahembe sub-county

32. Could there be some institutional factors affecting EPI service coverage in this area?

a. Yes ( ) b. No ( )

33. If yes, choose from the factors below

a. Inadequate health facilities for immunization services
b. Inadequate supply on immunization programme
c. Lack of supervising and monitoring on Immunization programme
d. Lack of advocacy on immunization programme
e. Security concern

f.Other .

34. If no, justify your answer?

…… …… …… …… …… ……

……

…… ……

35. What can do to improve EPI service coverage in this area?

…… ..... …… …… .... … ....

…… …… ....

…… …… …… ……

36. Any last remarks?

…… … …… …… …… ……

……

……

Thank you

Appendix II: Interview for Key Informants

Dear Respondent,

I am Omia Santos, a student of Kabale University carrying out a study titled "Factors affecting Expanded Program on Immunization (EPI) service coverage in Rwanyamahembe sub-county". This study is part of the requirements for my course and is for academic purposes only. The information you give will be treated confidentially and will be anonymously used for purposes of writing the research report, and will not be used for any other purpose.

1. What is your age?
2. What is your qualification
3. What is your occupation?
4. What is the main source of income for people in this area?
5. What is the rightful age for a child to get vaccinated?
6. Do mothers of this area vaccinate their children?
7. At what age do they usually bring their children for vaccination?
8. On average, how many children get polio vaccine orally?
9. How many children get DPT?
10. How many children get measles vaccine?
11. Where do mothers access these immunization services?
12. What level of expanded program on immunization (EPI) service coverage in area?
13. What are the socio-demographic factors affecting EPI service coverage in this area?
14. What are cultural factors affecting EPI service coverage in this area?
15. What are the institutional affecting with EPI service coverage in this area?
16. What can done to overcome such factors?
17. Any last remarks?

Thank you for your time