KNOWLEDGE AND PRACTICE OF CAREGIVERS AND IMMUNIZATION SERVICE PROVIDERS ON ROUTINE IMMUNIZATION IN GWAGWALADA LOCAL GOVERNMENT AREA, FCT-ABUJA, NIGERIA

BY

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DEDICATION

To my God, the Greatest Physician and Healer;

To the best parents in the whole universe, the late Dr. Gabriel Oyedele Ogunwale (father) and Dr. Mrs. Grace Mopelola Ogunwale (mother);

To all healthcare service providers in Nigeria

ABSTRACT

Millions of children are at risk of vaccine preventable diseases (VPDs) in Nigeria. Yet, the factors which influence the provision and acceptance of immunization services have not been fully explored.

This cross-sectional study was conducted at select health facilities in Gwagwalada Local Government Area, Abuja, Nigeria to assess the knowledge and practice of caregivers and Immunization Service Providers (ISPs) on routine immunization (RI). Random sampling technique was used in selecting 70 ISPs and 436 consenting caregivers (parents) who used the health facilities between October 2006 and March 2007. A validated semi-structured questionnaire containing a 4-point knowledge scale and best practices on childhood immunizationwas used to collect data from the caregivers while data collection from ISPs was done with another validated semi-structured questionnaire with a 14-point knowledge scale. Analysis of the data was done using descriptive, t-test and ANOVA statistics with 0.05 set as level of significance.

The caregivers' mean age was 27.3 ± 4.3 years, their children's mean age was 5.6±4.4 months, while the mean age of the ISPs was 31.5±8.3 years. Most (97.5%) caregivers were females and 61.0% had at least primary education. Only 17.2% of the caregivers knew that a child should receive four doses of oral polio vaccine OPV. A few (25.5%) of them correctly mentioned that a child should receive three doses of diphtheria-pertussis-tetanus (DPT) vaccines. Only three (0.7%) correctly mentioned that a child should receive one dose of Measles vaccine (MV) at 9 months of age. Majority (63.5%) of them affirmed that they were aware of the specific immunization side effects on their children but a few (34.4%) also registered their ignorance. No

significant difference existed in caregivers' mean knowledge scores by age ($p>0.05$). The mean knowledge score of caregivers who were Christians (2.2±1.3) was significantly higher than the Muslims (1.7±1.5), ($p<0.05$). There was a statistically significant difference between education and mean knowledge score of the caregivers. Caregiver's reasons for heath facility visits on the days they were interviewed included: child's immunization only (56.2%), child's illness only (28.0%), and 15.8% for both child's illness and immunization. Vaccines already given to the children included*BCG* (63.5%), *OPV1* (78.6%), *HBV1* (78.8%) and *DPT1* (79.4%).*DPT3* (12.5%), *OPV3* (11.3%), *HBV3* (5.8%), and *MV* (1.2%). Majority (93%) of mothers had ever received tetanus toxoid (TT). Only 5% of the caregivers mentioned they would not visit the same facility for next immunization appointment and their reasons included change of residence (23.9%), too long waiting time (26.8%) and repeated vaccines stock-out (9.8%). Most ISPs correctly identified Poliomyelitis (94.3%), Measles (85.7%), Diphtheria (84.3%) among others vaccines preventable diseases (VPDs) but a few ISPs did not know that Tuberculosis (24.3%), Tetanus (20.0%) and Pertussis (17.1%) were preventable by vaccination. Correctly identified VPDs presenting with fever by the ISPs included Measles (80%), Poliomyelitis (60%) and Pertussis (55.7%); 54% of ISPs stated correctly that a sick child should be brought for immunization. Majority 88.6% knew that a parent of the immunized child should be informed of what side effects may occur. The overall mean knowledge score of the ISPs was 10.1±2.0. The ISPs' mean knowledge scores by training, rank, or years of working experience were not significantly different ($P>0.05$). Indicators on selected best practices among ISPs showed that: 92.2% stored vaccines in cold boxes and maintained the cold chain; 78.4% filled out the stock sheet according cold chain maintenance whenever vaccines are moved; 77% estimated the target population for RI; 98% properly disposed of used safety boxes and other wastes shortly after

immunization sessions; 94% informed the caregivers about VPDs and the importance of the RI scheme.

Overall, knowledge about RI is low among both the caregivers and ISPs in this study. Limiting factors relating to health system may hinder continued provision and acceptance of immunization service delivery in the study area. Suitable and sustainable health care resources and interventions to strengthen the health system, increase the RI demand from the recipient community and effective delivery of RI services at both the public and private primary health care centres are strongly recommended.

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CERTIFICATION

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TABLE OF CONTENTS PAGE

Title Page.....i

Dedication.....ii

Abstract.....iii

Acknowledgements.....vi

Certification.....vii

Table of Contents.....viii

List of Tables.....xi

List of Figures.....xii

CHAPTER ONE: INTRODUCTION

1.1. Background Information.....1

1.2. The Rationale for Study.....9

1.3. Purpose of Study.....9

1.4. General Objective.....10

1.5. Specific Objectives.....10

CHAPTER TWO: LITERATURE REVIEW

2.1. Immunization, Immunity and Vaccines.....11

2.2. Immunization Programme in Nigeria- An Overview.....15

2.2.1. Routine Immunization.....17

2.2.2. Supplemental immunization.....18

2.2.3 Strategies for routine immunization service delivery.....18

2.3. Communication activities for routine immunization program.....19

2.4. Communication channels and content for immunization.....20

2.5. Best practices for immunization service delivery.....21

2.6. Why people do not utilize routine immunization services?.....22

2.7 Strategies for increasing immunization coverages.....24

2.8. Reaching Every Ward (REW).....31

2.8.1 Fundamental principles for strengthening immunization.....32
2.8.2. Ownership and participation.....32
2.8.3. Planning and management of resources.....32
2.8.4. Supportive supervision.....33
2.8.5. Monitoring for action.....33
2.8.6. Building capacity.....33
2.8.7. Increasing access to immunization services.....34
2.8.8. Linking services with communities.....34
2.9. Knowledge of health workers on immunization.....34
2.10. Knowledge of caregivers on immunization.....36
2.11. Practices of immunization by health workers.....38
2.12. Practices of immunization by caregivers.....39

CHAPTER THREE: METHODOLOGY

3.1. The Setting and Study Population.....41
3.2. Study Design.....44
3.3. Inclusion and Exclusion Criteria.....46
3.4. Data Collection Instrument.....46
3.5. Reliability and Validity.....49
3.6. Collection of Data.....49
3.7. Data and Statistical Analysis.....50
3.8. Ethical Approval.....50
3.9. Limitations.....50

CHAPTER FOUR: RESULTS

4.1. Results of responses from the caregivers.....51
4.2. Results of responses from Immunization Service Providers.....62

CHAPTER FIVE: DISCUSSION.....72

5.1. General Information.....72
5.2. Socio-Demographic Characteristics.....72

5.3. Knowledge and Practice of caregivers and Immunization Service Providers.....74
5.4. Knowledge and Practice of ISPs on Routine Immunization 79
5.5 Conclusion.....84
5.6 Recommendations.....85
REFERENCES.....90
Appendix 1: Plates.....100
Appendix 2: Immunization coverage (2006-2007) in Gwagwalada LGA.....104
Appendix 3: List of recognized Health Facilities in Gwagwalada LGA.....105
Appendix 4: Questionnaires.....109

LIST OF TABLES

List of Tables **Page**

Table 1: Age group distribution of the children.....52

Table 2: Distribution of the caregivers by selected demographics.....54

Table 3: Information about clients' visit to the health facilities.....55

Table 4: Distribution of caregivers' responses to four knowledge items on RI.....56

Table 5: Association between caregivers' mean knowledge scores and age group.....57

Table 6: Age distribution of immunization service providers.....62

Table 7: Distribution of ISPs by professional group and facility type.....64

Table 8: Distribution of ISPs' responses to knowledge items on routine immunization....66

Table 9: Relationship between ISPs' knowledge and training, rank.....68

Table 10: Distribution of ISPs' roles by selected best practices.....70

LIST OF FIGURES

List of Figures **Page**

Figure 1: Age group distribution of the caregivers.....51

Figure 2: Proportion of children by antigens and supplement received before.....58

Figure3: Percentage distribution of caregivers (mothers) by tetanus toxoid.....59

Figure 4: Proportion of caregivers willing to bring their children for the next Immunization at the same health facility.....60

Figure 5: Percentage distribution of responses to why caregivers may not present their children for next immunization at the same health facility 61

Figure 6: Percentage distribution of the ISPs by sex.....63

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND INFORMATION

Nigeria is a Federation made up a Federal Capital Territory, Abuja, and 36 States, which are divided into 774 Local Government Areas. The states are grouped into six geo-political zones; namely the North Central, North East, North West, South East, South-South and South West. The political history of Nigeria dates back to 1914 following the amalgamation of the Northern and Southern protectorates with the colony of Lagos under the British Colonial administration; and its Subsequent independence in 1960 (FMOH, 2004a).

Administratively, the political structure of Government has three tiers, namely Federal Government, State Government and Local Government Authorities. In the same vein, the public health services are also organized along the same tiers of Government as follows: Primary care, which is largely the responsibility of local government area councils, with the support of the State Ministry of Health and the Federal Government; Secondary care, which provides specialized services to patients referred from the primary health care level and is the responsibility of the State government; and Tertiary care, which provides highly specialized services referred from the primary and secondary levels of care and is the responsibility of the Federal and State Governments (FMOH, 2004a).

In addition to the public health sector, Nigeria has a viable private health sector that provides various health services ranging from primary care to tertiary care services. These include private not for profit sector notably Non Governmental Organizations (including religious organizations), individuals, and the for-profit sector, which is dominated by private hospitals,

clinics and registered drug shops. There is substantial community contribution to health care in the country especially at primary care level (FMOH, 2004a).

Nigeria operates the immunization schedule of the Expanded Programme on Immunization which prescribes five visits to receive one dose of Bacille Calmette Guerin (BCG), four doses of oral polio vaccine, three doses of diphtheria, pertussis and tetanus vaccine, and one dose of measles vaccine (FMOH, 1995). In 2004, the country included hepatitis B and yellow fever vaccines in its schedule, recommending the receipt of three doses of hepatitis B at birth, at six weeks of age, and at 14 weeks of age while yellow fever should be given at nine months of age, along with measles vaccine (WHO, 2005).

Routine immunization (RI) is provided largely through the public health establishments, with significant variations between the 36 States and Federal Capital Territory (FCT); private or NGO providers are the source of up to one-third of RI in some States in the south (NICS, 2003). Public sector provision is by health staff based at facilities run by Local Government Areas (LGAs) who have a Director of Primary Health Care (DPHC), an NPI Officer and a Cold Chain Officer. These health personnel are under the control of the elected LGA Chairman and are employees of the State Government (Ministry of Local Government or Local Government Service Commission). The elected Governor controls the State's budget. In the State Ministry of Health (SMOH) the Director of PHC, State Epidemiologist, NPI Manager and Cold Chain Officer – all civil servants – are working alongside a Vaccine Security and Logistics Officer and a Social Mobilisation Officer working for UNICEF but contracted through Deloitte Touche, a State Coordinator and a Surveillance Officer contracted by WHO (sometimes from other countries), and a Zonal State NPI Officer and a Zonal NPI Officer employed by NPI and based at one of NPI's six zonal offices. Some States and LGAs have additional coordination with other donors

supporting aspects of RI and PHC. Each State has its own vaccine store. In addition there are six zonal stores which are not shared with the States where they are located. The national store moved from Lagos to Abuja in 2002.

Zonal Map of Nigeria

(Source: NPHCDA HQ, Abuja, 2007)

Another parastatal, the National Primary Health Care Development Agency (NPHCDA), has responsibilities pertaining to immunization. Both parastatal are under the control of the Permanent Secretary in the FMOH and hence of the Minister of Health. There are 774 LGAs and within these there are 5,450 Districts; within the Districts are 9,555 wards and numerous villages. For the purposes of WHO and UNICEF's Joint Reporting Form, the LGAs are the "districts" for which completeness of reporting is analysed (NICS, 2003).

In 1986, Nigeria initiated the implementation of the World Bank/IMF structural adjustment programme aimed at stimulating economic growth through privatization of public utilities and

introduction of policies aimed at improving welfare of the population. However, the broad objectives of this programme were not realized and instead, led to a decline in living standards and health service delivery (NPHCDA, 2001). Nigeria still ranks among the 20 poorest nations of the world, with a high level of poverty and unemployment, mortality and morbidity rates among children and women, poor basic social services and HIV/AIDS prevalence, particularly among children, young people and women (HDR, 2004; FMoH, 2004b). These emerging trends not only reduce the chance of child survival and optimal development but impose formidable challenges in the realization of the protection and participatory rights of children and women (FMOH, 2004b).

In 2006, the national population census results confirmed Nigeria as one of the largest and most populous countries in Africa, with approximately 140 million inhabitants (NPC, 2006). The population is predominantly young; approximately 45% are under 15 years of age, 20% are under five years of age, and women of child bearing age (15-49 years) account for 22% of the total population. Nigeria's population growth has slowed somewhat in recent years (2% per year); yet the World Bank estimates that more than 3.4 million additional inhabitants were added in 2006 alone. This rapid increase in population makes it difficult for the Nigerian government's development efforts, including its health sector development efforts, to keep pace. Coverage of key Maternal and Child interventions is still low with focus on single disease entities as opposed to the delivery of a comprehensive package of evidence based core interventions.

According to NDHS 2003, out of Nigeria's population of 31 million women of childbearing age, the country loses 145 women everyday to death. Annually, an estimated 52,900 maternal deaths occur in Nigeria, and a woman's chance of dying from pregnancy and childbirth in Nigeria is 1

in 13 (NDHS. 2003). The major causes of maternal death include haemorrhage (23%), infections (17%), toxaemia/eclampsia (11%), obstructed labour (11%), unsafe abortion (11%), malaria (11%) and anaemia (11%).

The neonatal mortality rate (deaths of infants within the first 28days of life) is 48 per 1000 live births (NDHS, 2003). There is also a wide regional variation in the distribution of neonatal mortality. The highest neonatal rates were observed in the NE and NW regions of the country. The lowest rates were seen in the SE region. 10% of children were born with low birth weight, a condition that plays an important role in new born mortality. Most new born deaths in Nigeria occur within the first week of life, reflecting the intimate link of new born survival to the quality of maternal care (NDHS 2003). Of the neonatal deaths that occurred in 2003, 37% were due to infection, while preterm birth and asphyxia accounted for 49%.

Common childhood diseases like Malaria, Acute Respiratory Infections (particularly pneumonia), Diarrhoea, Malnutrition and Vaccine Preventable Diseases (VPDs) especially measles are the leading causes of mortality and morbidity in Nigeria (FMOH, 2006). These diseases are estimated to contribute to over 70% of deaths in children less than five years of age. They are also the reasons for three out of four visits to health facilities by sick children. In November 2004, Nigeria has reported 518 cases of paralytic polio, being about 80% of the global case load and representing a four-fold increase compared to the same period the previous year (WHO, 2004). The annual incidence of acute diarrhoea is between 4.3 and 4.9 episodes per child. In addition, the NDHS 2003 reports that an estimated fifty-three percent (53%) of preschool children in Nigeria are malnourished. Although Immunization against childhood killer diseases (measles, neonatal tetanus, tuberculosis, whooping cough, poliomyelitis and diphtheria) is

considered critical to survival of the child, national coverage in the target population fell dismally from 80% in 1991 to 17% in 1999 and 13% as reported by the NDHS 2003. The summation of the problems highlighted above, is that one out of every five children born alive will not live to celebrate the fifth birthday given the under five mortality rate of 201 per 1000. Similarly, the Infant mortality rate is as high as 100 per 1000 live births (NDHS, 2003).

Based on the magnitude of these problems, several child survival programmes on control of diarrhoea diseases and acute respiratory infections, growth monitoring, breast feeding, immunizations among others have been instituted and are currently being implemented in the country (NHPCDA, 2001; Ogundahunsi G.A., 2003). In 1997, the National Council on Health ratified the implementation of Integrated Management of Childhood Illness (IMCI) strategy as a main thrust of these efforts. A 2001 report by the Federal Ministry of Health on the implementation of integrated management of childhood illness (IMCI) revealed that only 22% of health facilities visited during IMCI follow up visits provided routine immunization services, while in 2006 over 30 states of the federation are implementing IMCI (FMOH, 2006). Despite all these, our health indicators for children less than five years of age have not been impressive.

The most recent NDHS (2008) provided data on a number of key maternal and child health indicators. The exclusive breast feeding (EBF) rate is 13 percent, and there are widespread sub optimal complementary feeding practices. Stunting, wasting and underweight rates are 41%, 14% and 23% respectively, showing high rates of under-nutrition. The infant mortality rate is 75 deaths per 1,000 live, child mortality (age 12 months to 4 years) is 88 deaths per 1,000 live births, while the overall under-five mortality rate is 157 deaths per 1,000 live births. Although there has been a decline in the under five mortality rate from 201 in the 2003 NDHS to 157

deaths per 1,000 live births in the 2008 NDHS, this 20% decline indicates that the annual rate of progress made to date is insufficient to realize the health related MDGs. Easily preventable and/or treatable infectious diseases account for most of these being attributable to malaria (24%), pneumonia (20%), diarrhoea (16%) and measles (6%). It is evident that if the lives of children are to be saved in the country, there will be a need to scale up a core package of proven evidence based interventions (NDHS, 2008).

The immunization indicators do not tell a better story. Overall, 23 percent of children ages 12-23 months are fully vaccinated. Although overall, the vaccination coverage figure (23 percent) has nearly doubled from the estimate in the 2003 NDHS (13 percent), the picture is still that of low coverage. Nationally, only about one-quarter of children had a health card. At least half of Nigerian children received vaccinations for BCG (50 percent), DPT 1 (52 percent), polio 1 (68 percent), and polio 2 (57 percent). However, the percentage of children who go on to receive DPT 3 and polio 3 is lower, 35 and 39 percent, respectively. Overall, 29 percent of children in Nigeria have not received any vaccinations. There are considerable regional disparities as well as among states in vaccination coverage; the children with full vaccination coverage range from a high of 43 percent for South West and South East to a low of 6 percent for North West. For states, percentage of children that are fully vaccinated ranges from less than 1 percent in Katsina and Jigawa to 58 percent in Ondo and 59 percent in Osun. In summary, northern Nigeria has one of the lowest rates of immunization coverage in the world. Coverage rates for the vaccine against tetanus among women are equally low.

A number of reasons have been advanced for the low immunization coverage in Nigeria notably:

(a) frequency of NIDs campaigns have resulted in public expectations that all forms of

immunization would be brought to their homes; (b) poor infrastructure for the distribution, storage and maintenance of the vaccines, that is, cold chain at grass root level; (c) higher motivation (in terms of social benefits) for health workers to carry out national immunization days (NIDS) compared to routine immunization; (e) absence of organized supervision, monitoring and evaluation of the routine immunization activities especially at health facility level (FBA Health Systems Analysts, 2005). Prioritization of programs such as Polio Eradication, malaria control and measles elimination are mostly based on donor preferences and are being scaled up in campaign modes that are often more expensive vertical approaches.

A formerly strong primary health care system in the northern states of Nigeria has weakened over many years. Polio outbreaks, rumors on the safety of the polio vaccine, and subsequent campaigns disrupted routine immunization services. Routine immunization services are either no longer available or irregular; limited resources for health services and gaps in vaccine storage and distribution add to the challenge of increasing immunization coverage (NPHCDA, 2007). Health sector reform initiatives from 2004 – 2007 were designed to address the weak health system and thereby meet the MDGs. Despite increases in government funding and support from development partners, funding gaps remain. Lack of funding for day-to-day operation of the public health system, shortages and mal-distribution of human resources, decaying health infrastructure, lack of a harmonized and efficient logistics system, and a weak national health management information system are all major challenges. These deficiencies are further exacerbated by inadequate health program management capacity. As a result, the routine health system remains weak (FBA Health Systems Analysts, 2005; NPHCDA, 2007).

1.2 THE RATIONALE FOR STUDY

Children, as one of the most vulnerable populations, face unusually high risks as they grow. With still-developing immune systems, they are completely reliant on others for their survival. Successful societies safeguard their future by continually striving to improve the well being of their children. They understand that healthy, well-developed, educated and respected progeny ensure that past achievements serve as the foundation for continuing progress (Aminu and Agle, 2003).

Achievement of immunization goals is affected by the actions of many groups, including politicians/policy markers, community leaders, health care providers, managers and supervisors, women of reproductive age, parents, children, and their families (USAID, 2003). Indications that routine immunization recipients (clients/parents) and providers (healthcare workers) are not carrying out the desired behaviours can be found in: (a) low immunization coverage data (b) high drop-out rates, and (c) increased disease incidence (USAID, 2003).

1.3 PURPOSE OF STUDY

To date, millions of Nigerian children are at risk of vaccine preventable diseases. Yet, the factors which influence the provision and acceptance of health facility-based routine immunization services have not been fully explored. Health facility-based routine immunization services are less likely to be used by people who are: uninformed, dissatisfied, too busy, poor and powerless, misinformed, or distant (USAID, 2003). In several countries, studies have shown that most people will use immunization services as long as they know when and where to bring their children and those services are available, accessible, reliable, and friendly (USAID, 2003). Improved knowledge and practices caregiver and immunization service providers on routine

immunization service delivery for child survival at the LGA, health facility and community levels are inevitable to achieve childhood immunization goal. Undoubtedly, across various communities there are both common and varied issues which when identified and reported would help to set strategic direction and develop appropriate actions for strengthening routine immunization and achieving immunization goal and objectives in Nigeria.

1.4 GENERAL OBJECTIVE

The study aims to assess the knowledge and practice of caregivers and immunization service providers on health facility-based routine immunization service delivery in Gwagwalada Area Council, FCT, Nigeria.

1.5 SPECIFIC OBJECTIVES

1. To determine the caregivers' knowledge of routine immunization services at the health facilities under Gwagwalada Area Council;
2. To determine the immunization service providers' knowledge of routine immunization services at the health facilities under Gwagwalada Area Council;
3. To determine the caregivers' practices on routine immunization service delivery at the health facilities under Gwagwalada Area Council;
4. To determine the immunization service providers' practices on routine immunization service delivery at the health facilities under Gwagwalada Area Council;
5. To determine the proportions of caregivers and immunization service providers performing selected best practices for routine immunization service delivery at the health facilities under Gwagwalada Area Council.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 VACCINES, IMMUNITY AND IMMUNIZATION

A vaccine is a suspension that contains a part of a pathogen that induces the immune system to produce antibodies that combat the antigen (National Institutes of Health, 1998; Tom Besty and Jim Keogh, 2005). It as substance which contains antigens to a disease or a weak form of a disease, used to protect people against it ((Heather Bateman, Ruth Hillmore, Daisy Jackson, Sarah Lusznat, Katy McAdam, and Charlotte Regan, (Editors), 2005). The concept of a vaccine stems from the variolation process (requires that a needle tip of smallpox be placed in the vein of a patient) that was used in eighteenth-century England to protect people from smallpox. Nearly all the patients contracted a mild case of smallpox, which left them with antibodies that protected them from contracting the disease. Half (50%) of the patients who contracted smallpox died. By contrast, only one percent (1%) who received the variolation process died. Edward Jenner noticed that dairymaids who contracted cowpox, which is related chemically to smallpox, were immune to smallpox. Jenner discovered that injecting cowpox into the skin of a healthy person prevented them from developing smallpox. Jenner's discovery enabled Louis Pasteur to develop the technique of creating vaccines. The injection of an antigen induces the primary immune and secondary immune responses in the patient. The primary immune response produces antibodies and the secondary immune response produces memory cells that attack a future invasion of the antigen (National Institutes of Health, 1998; Centers for Disease Control and Prevention, 2002; Tom Besty and Jim Keogh, 2005).

CHAPTER TWO

2.0 LITERATURE REVIEW

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Live attenuated vaccines are derived from disease-causing viruses or bacteria that have been weakened under laboratory conditions. They will grow in a vaccinated individual, but because they are weak, they will cause either no disease or only a mild form. Usually, only one dose of this type of vaccine provides life-long immunity, with the exception of oral polio vaccine, which requires multiple doses (National Institutes of Health, 1998).

Types of Vaccines					
	Live attenuated	Inactivated			
		Whole	Fractional		Recombinant
			Protein-based	Polysaccharide-based	
Virus	Oral Polio vaccine (OPV), Measles, Yellow Fever	Inactivated Polio vaccine (IPV)			Hepatitis B
Bacteria	BCG	Whole-cell Pertussis			
Subunit			Acellular Pertussis		
Toxoid			Diphtheria and Tetanus		
Pure				Meningococcal	
Conjugate				Haemophilus influenzae type b (Hib)	

Inactivated vaccines are produced by growing viruses or bacteria and then inactivating them with heat or chemicals. Because they are not alive, they cannot grow in a vaccinated individual and therefore cannot cause the disease. They are not as effective as live vaccines, and multiple doses are required for full protection. Booster doses are needed to maintain immunity because protection by these vaccines diminishes over time. Inactivated vaccines may be whole-cell or fractional. Whole-cell vaccines are made of an entire bacterial or viral cell. Fractional vaccines, composed of only part of a cell, are either protein-or polysaccharide-based. Polysaccharide-based

vaccines are composed of long chains of sugar molecules taken from the surface capsule of the bacteria. Unless coupled with a protein, by a process termed "conjugation", pure polysaccharide vaccines are generally not effective in children under the age of two years (National Institutes of Health, 1998; Centers for Disease Control and Prevention, 2002; Tom Besty and Jim Keogh, 2005).

Recombinant vaccines are produced by inserting genetic material from a disease-causing organism into a harmless cell, which replicates the proteins of the disease-causing organism. The proteins are then purified and used as vaccine (National Institutes of Health, 1998; Centers for Disease Control and Prevention, 2002).

Immunization is a process the process of making a person immune to an infection, either by injecting an antiserum, passive immunization or by inoculation (Heather Bateman, Ruth Hillmore, Daisy Jackson, Sarah Lusznat, Katy McAdam, and Charlotte Regan, (Editors), 2005). Vaccines play an important role in controlling the spread of viruses. A virus cannot be treated with antibiotics. However, you can minimize catching the flu by getting a flu shot, which is a vaccine against a particular strain of flu virus. Vaccines also prevent bacterial infections such as typhoid, but are not as effective on bacteria as they are on viruses. However, bacteria infections are treatable with antibiotics, which is a common method of combating bacterial diseases.

Vaccines are used to provide herd immunity to a population. A basic concept of public health is that every individual who is protected from a disease as a result of an immunization is one less individual capable of transmitting the disease to others. Individuals who have been immunized serve as a protective barrier for other individuals who have not been immunized, provided that the number immunized has reached a certain level. Reaching and maintaining that level, which

varies by communicable disease, provides "herd immunity" to unimmunized individuals (National Institutes of Health. 1998; Centers for Disease Control and Prevention. 2002; WHO. 2003; Tom Besty and Jim Keogh, 2005;). Herd immunity requires that most—not all—of the population be immunized in order to prevent an epidemic of a disease. An outbreak of a disease would be isolated to a small percentage of the population and therefore have a minimum effect (Centers for Disease Control and Prevention, 2002; Tom Besty and Jim Keogh, 2005). Immunization is the most cost effective public health intervention. It is a sure means of protecting the children from killer diseases such as tuberculosis, poliomyelitis, measles, yellow fever, hepatitis, and tetanus in women (WHO, 2003).

Immunity is the ability to resist attacks of a disease because antibodies are produced (Heather Bateman, Ruth Hillmore, Daisy Jackson, Sarah Lusznat, Katy McAdam, and Charlotte Regan, (Editors), 2005). The immune system is comprised of organs and specialized cells that protect the body by identifying harmful substances, known as antigens, and by destroying them by using antibodies and other specialized substances and cells (Centers for Disease Control and Prevention, 2002; Tom Besty and Jim Keogh, 2005). There are two basic ways to acquire this protection – active immunity and passive immunity. Active immunity is provided by a person's own immune system. This type of immunity can come from exposure to a disease or from vaccination. Active immunity usually lasts for many years and often is permanent. Live microorganisms or antigens bring about the most effective immune responses, but an antigen does not need to be alive for the body to respond. Passive immunity results when antibodies are transferred from one person or animal to another. The most common form of passive immunity occurs when a fetus receives antibodies from his or her mother across the placenta during pregnancy. Other sources of passive immunity include blood and blood products, immune or

hyper-immune globulin, and animal anti-toxins. Passive immunity disappears over time, usually within weeks or months. (Centers for Disease Control and Prevention, 2002; Tom Besty and Jim Keogh, 2005).

2.2 IMMUNIZATION PROGRAMME IN NIGERIA - AN OVERVIEW.

The Federal Government of Nigeria (FGN) through the Federal Ministry of Health (FMoH) initiated the Expanded Programme on Immunization (EPI) in 1979 (National Immunization Policy, 2003). Nigeria is a signatory to the declaration on the survival, protection and development of children, which was articulated at the 49th World Health Assembly in 1988. This was further reinforced by the World summit for children held in New York in 1990. This declaration established challenges for global immunization.

The national health policy document, revised in 1996, indicates that local governments are expected to be the main implementers of primary health care policies and programs, with the federal government responsible for formulating overall policy and for monitoring and evaluation, and state governments for providing logistical support to the LGAs such as personnel training, financial assistance, planning and operations (FMOH 1996). However, the current Constitution (1999) of Nigeria is unclear with regards to the autonomy of Local Governments in providing basic services, such as primary health for which they have been given responsibility through segmental directives. This contributes to the inefficiency of the local government functionaries to deliver quality primary health care services.

However, in view of the critical need to enhance the effectiveness of immunization, which was fast declining, and to meet the global challenges of immunization, the EPI was restructured in

1997. It was renamed National Programme on Immunization (NPI) and established as a parastatal of the FMoH by decree 12 of 1997 (National Immunization Policy, 2003). NPI was mandated to give strategic support to the States and LGAs to ensure the provision of quality routine immunization service delivery and improve coverage of all antigens. NPI reviewed its National Immunization Policy of 1995 in May 2003 which in context was expected to have a boosting effect on EPI in the provision of an effective, and sustainable immunization service which is community driven, operated and owned (National Immunization Policy, 2003). However in 2003, UNICEF took over the job of international procurement because of chronic shortage of vaccines in Nigeria, largely due to late or non-release of funds.

National Review Meeting of June 1998 and 2001 brought the number of components of Ward Minimum Health Care Package WMHCP from thirteen to four and five respectively. The WMHCP describes a priority set of health interventions which should be provided in PHC centres on daily basis at all times and at little or no cost to clients, through government financial mechanism. The NPHCDA in collaboration with WHO convened a meeting in 2005 to update the WMHCP, added the sixth component and adopted instruments for its (WMHCP) costing. The six components of WMHCP are: (a) Child Survival (IMCI & Routine Immunization); (b) Safe motherhood (ANC, Delivery, Postnatal Care, FP); (c) Control of Communicable diseases of public health importance (Malaria, TB, HIV/AIDS); (d) Health Information, Education and Communication; (e) Nutrition; and (f) Control of Non Communicable diseases(NPHCDA, 2007).

Prior its transition to NPHCDA fully in 2006, NPI has received a lot of international support from partners in the Inter-Agencies Coordinating Committee (ICC) in its effort to provide effective implementation of the immunization strategy. These partners include WHO for

surveillance and technical issues: UNICEF for procurement and supplies of antigens. US Agency for International Development (USAID) for social mobilization, finance, and training; and Rotary International for advocacy and social mobilization at the grassroots level. Other partners, such as European Union (EU), UK Department for International Development (DFID), Japanese International Cooperation Agency (JICA), Canadian International Development Agency (CIDA), have provided support to the Polio Eradication Initiative (PEI) as well as strengthening routine immunization. Locally, Nigerian Red Cross collaborates with the national efforts when necessary (Abebe, 2006).

2.2.1 ROUTINE IMMUNIZATION

This is given during regular visits to health facilities. The target groups eligible for immunization as enlisted in the National Immunization Policy (NIP) include:

1. Children 0 – 11 months for routine immunization.
2. Children 0 – 59 months for Polio Eradication Initiative.
3. Women of Childbearing age.
4. At-risk populations such as health workers, populations in meningitic belt, etc
5. International travelers (NIP, 2003).

These eligible populations adhere to the following routine immunization schedules.

i. Infants (Under 1 year) : at birth a baby receives Bacillus Calmette-Guerin (BCG), Oral polio vaccine (OPV 0) and Hepatitis B vaccine (HBV 1); six weeks later, it receives OPV 1, Diphtheria, pertussis and tetanus (DPT 1), and HBV 2; four weeks later (i.e. at 10 weeks old) it receives OPV 2 and DPT 2, four weeks later (i.e. at 14 weeks old) it receives OPV 3, DPT 3 and HBV 3, and finally at nine months old the baby receives Measles (MV) and Yellow fever (YF) vaccines with Vitamin A supplement. For an infant with symptomatic HIV infection BGC and YF vaccines are exempted. In Nigeria a 'Fully Immunized Child' is one who is 11 months or

younger and who is receiving the last of all routine vaccines at the time of visit. The routine vaccines for this purpose include BCG; OPV 1, 2 & 3; DPT 1, 2, & 3 and measles vaccines (NIP, 2003).

ii. Women of child bearing age (16 to 49 years): tetanus toxoid first dose (TT 1) is administered at first contact with women of childbearing age, or as early as possible in pregnancy. The second dose (TT 2) is given least 4 weeks after TT 1. The woman receives TT 3 at least 6 months after TT 2, and TT 4 at least 1 year after TT 3 or during subsequent pregnancy. TT 5 is given at least 1 year after TT 4 or during subsequent pregnancy, and this provides protection for all the childbearing years (NIP, 2003).

2.2.2 SUPPLEMENTAL IMMUNIZATION

This is given on an *ad hoc* basis to supplement routine immunization through:

National Immunization Days (N.I.Ds) – are special days dedicated for a synchronized mass immunization campaigns throughout the country. It is targeted against specific disease(s) marked for eradication such as poliomyelitis;

Sub National Immunization Days (S.N.I.Ds) – have the same objectives as NIDs, but it is limited to regions within the geographical boundary of the country; and

Mop-Ups – are carried out when the infection is restricted to focal areas and is surveillance driven (National Immunization Policy, 2003).

2.2.3 STRATEGIES FOR ROUTINE IMMUNIZATION SERVICE DELIVERY

Three different strategies adopted in Nigeria are:

Fixed facility strategy - this refers to regular delivery of vaccinations in a designated health facility on specified days of the week and hours of the day;

Outreach strategy - implies the delivery of services to people who cannot get to the health facility or who do so only with difficulty. Trips to outreach sites are usually completed within a day and are made by health facility staff on foot or using motor-cycle, bicycles, or pack animals; and

Mobile strategy - is the delivery of services by health workers to people in remote areas. Mobile teams may spend several days traveling to reach the people (National Immunization Policy, 2003).

2.3 COMMUNICATION ACTIVITIES FOR IMMUNIZATION PROGRAM

Communication activities for immunization program include the following:-

i. Behaviour change (or program) communication: encourages actions among target populations that directly support more effective immunization coverage and disease control, for example, providing information, motivation, and job aids so that health workers will treat parents with respect, give information clearly, and encourage parents to bring children for vaccinations as soon as they are due;

ii. Social mobilization: aims at gaining and maintaining the involvement of a broad range of group and sectors; for example, by holding a service of meetings with representatives of private companies, other government agencies, and Nongovernmental organizations (NGOs) to discuss how they can support Routine Immunization;

iii. Advocacy: focuses on gaining and maintaining the support of political leaders, opinion leaders, and other decision-makers; for example, by making presentations and producing an information packet that describes the burden of specific disease (polio, measles, etc) and how this audience can support efforts to reduce it (UNICEF/ WHO, 2000).

These communication techniques can also be used to mobilize the community to build support for routine immunization as it has been frequently used for campaigns (GAVI, 2000).

2.4 COMMUNICATION CHANNELS AND CONTENT FOR IMMUNIZATION

Immunization programs use numerous channels to reach the recipient community, caregivers and other target audiences, from radio and television, to folk media to community events, to counseling at health facilities. The choice of communication channels may only be appropriate based on good recommendation, obtained from evaluations and/or formative research, on how to reach the audience (USAID, 2003).

Generally, parents perceived health workers as a credible source of information about health (USAID, 2003). Growth promotion and Integrated Management of Childhood Illness (IMCI) sessions provide excellent opportunities for health workers to assess a child's immunization status and then to give needed vaccinations or advise caregivers (parents) how to get the vaccinations as soon as possible. The best channels for reaching rural people are health workers, local leaders (of village and district) and groups, and in some cases, radio. It is generally not very effective to use print material for low-literacy population, or mass media for those with little access to television and other mass media (USAID, 2003).

Discussion between health workers (and health educators) and small groups of parents can be held as part of immunization sessions and on other occasions in and outside of a health facility to: address people's doubts about immunizations; identify and fill information gaps and correct misinformation; respond to questions and reinforce positive attitudes and behaviours. One-on-one counseling is the best way to give parents information on when and where to bring their children for the next vaccination (USAID, 2003).

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However, simply giving people information is not enough: the message must be understood and remembered. In a study conducted in the Northwest Frontier Province, Pakistan, health workers were observed telling 85% of the mothers when to bring their children for the next vaccination. Exit interviews held later the same morning with these mothers indicated that only 8% remembered when they were supposed to return (PRICOR, 1990). The content of the communication is as important as the channel. There is ample evidence that shows that because most parents already know that immunizations prevent some dangerous diseases, they do not need further convincing nor hear clinical details. The most essential information they need is when and where they should bring their child for his or her next immunization, what common side effects they might expect, and what they should do if these do occur. In addition, if any rumours or common misconceptions regarding immunization are detected, they should be corrected (USAID, 2003).

2.5 BEST PRACTICES FOR IMMUNIZATION SERVICE DELIVERY

WHO/UNICEF/USAID in 2002 jointly recommended the following as desired practices for various groups that affect the immunization services.

Mothers (Primary caregivers):	Bring children to immunization service delivery points at the ages recommended in the national schedule; Bring each child's health or vaccination card at each health visit; Treat side effects as recommended; Seek tetanus toxoid immunizations for yourself (this is applicable to mothers and other women of child bearing age); For campaigns, bring children of the recommended ages to immunization sites on the day(s) recommended. For a house-to-house strategy of National Immunization Days, keep those children around the home and have them immunized when the vaccination team arrives.
Fathers:	Bring children to immunization service delivery points yourself, or encourage their mothers to do so; Provide mothers with money for transport or other expenses

	related to immunizing children;
Health Workers:	Perform immunization tasks correctly, including those that ensure safe injections; Give mothers and other caretakers essential information; Schedule and organize services to make them convenient for parents; Praise families whose children are fully immunized by one year of age;
Political and Public Health Leaders:	Allocate sufficient financial and human resources for immunization services; Remind families when children need to receive the next dose(s) of vaccine; Encourage families to complete each child's basic immunizations in his or her first year of life; Inform families about outreach services, supplemental immunization activities and new vaccines and improvements in the immunization programme; Assist health facility staff in planning and monitoring services; Provide logistical support, e.g. by transporting vaccines, supplies and staff.

(Source: WHO, UNICEF and USAID, 2002)

2.6 WHY PEOPLE UNDER-UTILIZE ROUTINE IMMUNIZATION SERVICES?

Problems of child immunization were partly caused by the government who had no coherent comprehensive national policy on the control of many communicable diseases that still account for a high death toll among infants in Nigeria, poorly structured immunization activities, poorly managed (vaccine stock out, overcrowding and long waiting period) and poorly sited immunization centres far from the reach of target population; while ignorance and lack of education among the recipient community, were potential barriers to child immunization, as many parents simply believed that immunization is for curing disease and not for prevention and so an apparently healthy child need not to be exposed to what can cause fever and convulsions, others forgot the date of next appointment (Adekunle, 1978; USAID, 2003; Basics II, 2003; Niang, A. W., Van Roekel, K., & Diallo, M. A.,2004; NPI, 2005).

The following factors have also been documented to be responsible for under-utilization of immunization services:

i. Lack of information: this is the primary obstacle to achieving full immunization of children and women who have good access to services. Many families lack accurate information about immunization services. Others have both poor knowledge about the advantages of vaccination and low awareness of services (USAID, 2003; BasicsII, 2003; NPI, 2005).

ii. Poor services: some people receive one or more immunizations, but are unwilling to return for the rest because they are dissatisfied with the services they have received for such reasons as: (i) long waits (ii) rudeness or insensitivity on the part of health worker (iii) poor vaccination techniques that can cause abscesses or other discomfort and concerns related to reactions to injections and adverse events following immunization (iv) unauthorized fees charged by health care providers (v) unscheduled facility closure (vi) shortages of personnel, vaccines, drugs or other supplies (USAID, 2003; NPI, 2005).

iii. Time constraints: most parents or care givers spend most of their time on the farm and other businesses, leaving almost no time for child's health and well-being (USAID, 2003; Basics II, 2003; NPI, 2005).

iv. Social, cultural, or political barriers: rejection of vaccinations by household, community or political leaders which may be partly caused by lack of involvement of local leaders (Adekunle, 1978; USAID, 2003; Basics II, 2003; NPI, 2005).

v. Misinformation: false beliefs or malicious rumours also keep people from using services and use of traditional practitioners who either discourage immunization or cause doubt related to immunization (USAID, 2003; Basics II, 2003; Niang, A. W., Van Roekel, K., & Diallo, M. A.,2004; NPI, 2005).

vi. Distance: some people, nomads and seasonal migrants, and do not simply live within reach of health services (USAID, 2003; Aissatou Wade et. al., 2004; NPI, 2005).

vii. Poverty: lack of money to attend health centres providing immunization services (Niang, A. W., Van Roekel, K., & Diallo, M. A.,2004; BasicsII, 2003).

viii. Others: lack of outreach services; insufficient community mobilizers and mobilizers not always well-received by parents (Niang, A. W., Van Roekel, K., & Diallo, M. A.,2004; BasicsII, 2003).

2.7 STRATEGIES FOR INCREASING ROUTINE IMMUNIZATION COVERAGES

Nigeria has taken impressive steps to improve vaccine access in recent years. In 2005, five major activities were implemented in Nigeria by NPHCDA (then NPI) to strengthen and sustain routine immunization performance. These activities were: (i) Re-establishment of outreach services: regular outreach for communities with poor access; (ii) Supportive supervision: onsite training by supervisors; (iii) Community links with service delivery: regular meetings between community and health staff; (iv) Monitoring and use of data for action: chart doses, map population in each health facility; and (v) Planning and management of resources: better management of human and financial resources (NPI Nigeria Vol.1 No.1, 2005).

Although these concerted efforts by the government and its partners has resulted in somewhat improved immunization coverage rates in the last few years, Nigeria still falls short of its national coverage targets and of global benchmarks for immunization. Over the 2000 to 2010 decade, DTP3 coverage increased from 29% to 69% (NICS, 2010; WHO/ UNICEF, 2011). These improvements, though significant, remain below national targets and international benchmarks. In other words, of the 6 million Nigerian children born every year, more than 1

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million fail to get fully vaccinated by their first birthday (WHO/ UNICEF, 2011). Moreover, national coverage averages masks the marked heterogeneity in coverage across the geopolitical zones and states. Even in the generally improved coverage data reflected in the 2010 NICS, zonal DPT3 coverage rates ranged from 16 percent in Taraba to 98 percent in Enugu states (NICS, 2010). These disparities in vaccine coverage reflect inequities in vaccine service delivery performance, and unless addressed, will continue to exacerbate health inequities in Nigeria. Poor performance of the routine immunization system in delivering routine vaccines has served as a barrier for the successful introduction of newer vaccines including those against *Haemophilus Influenzae type b*, pneumococal and rotavirus infections.

Polio is still a problem for Nigeria. After nearly finishing the job of elimination in 2010, the country slipped, and since then the virus has made an unnerving comeback. International condemnation of Nigeria over the polio crisis put the government on notice. Everyone wants to know how to crack the polio nut in Nigeria, and raising routine immunization rates is part of the answer. And in 2012, Nigeria began a three-year rollout of the pentavalent vaccine.

Reports from other developing countries in Africa showed efforts being made to increase routine immunization coverage. For example, during the past decade, immunization coverage in Uganda has been as low as 30% in some districts. Poor social mobilization and insufficient community participation are two of the reasons identified as major contributing factors for poor coverage (The Republic of Uganda Ministry of Health/ UNEPI, 2003a). A Knowledge, Attitude and Practice survey in 1998 found that health workers were deficient in their understanding of immunization and that community participation in immunization services was low, despite the willingness of communities to fully support programs. The existing top-down approach of the

health system and lack of capacity of building interpersonal skills for health workers were found to be critical inhibitors to a successful immunization program (Basics II, 2003)

To address these challenges, the UNEPI (Uganda National Expanded Program on Immunization) Policy and Revitalization Plan of the National Health Policy and Health Sector Strategic Plan calls for community involvement in health and linkages between health workers and the community (The Republic of Uganda Ministry of Health, 2003; The Republic of Uganda Ministry of Health/ UNEPI, 2003b). This approach is aligned with the Reaching Every District (RED) strategy that was developed and supported by the GAVI partners, including UNICEF and WHO. The RED strategy identifies the need for "links between community and service- regular meetings between community and health staff" and states that "immunization services need to integrate better into community and health managers" (GAVI, 2005). The Uganda Ministry of Health support of immunization as a national health priority is now being facilitated by the Community Problem Solving and Strategy Development (CPSSD) approach. The aim is to help health workers find ways to work effectively with their communities so that in partnership, full immunization coverage can be attained (The Republic of Uganda Ministry of Health/ UNEPI, 2003a).

In Guinea, strategies such as Performance Improvement (PI) approach and the Client-Oriented Provider-Efficient services (COPE) method were applied to improving the performance of vaccinators in routine expanded programme on immunization. PI is a process that consists of achieving desired institutional and individual results, with a view to providing sustainable, high-quality health care services. For many years, organizations thought training was the best way to improve performance. But despite all the training provided, it became apparent that service

providers do not always use their newly acquired skills. Thus, training alone is not sufficient to ensure performance: other interventions need to be considered, taking into account factors that have a direct impact on performance. These performance factors are: (a) expectations regarding work, (b) work tools and environment. (c) motivation, (d) organizational support. and (e) knowledge and skills required to accomplish the tasks (Niang Aissatou Wade et. al., 2004).

In several developed nations, legislation plays a vital role in increasing access to immunization services. In Canada for example, all children are required by law to be immunized against six designated disease: diphtheria, tetanus. polio. measles. mumps and rubella (German measles). Pertussis. Haemophilus influenza B (HIB) and Hepatitis B vaccines are also strongly recommended Parents receive a yellow immunization card from the doctor at the time of baby's first vaccination, file it carefully and bring it to subsequent doctor appointments for updating. This information is required when a child is enrolled in daycare and school (Walkinshaw E., 2011; Mah CL, Guttmann A, McGeer A, Krahn M, Deber RB, 2010). The Health Unit maintains immunization records for all school-aged children to age eighteen years. The Health Unit sends consent forms through the schools to parents whose children arc due for immunization and requests missing immunization information. These consent forms arc returned to the school as soon as possible, so records can be kept up to date Unless a child is formally exempted from immunization on the basis of medical reasons, conscience or religious beliefs, children are required by the Immunization of School Pupils Act. 1982, to be immunized accordingly. Parents who fail to provide the required information or to have their children immunized are liable to a fine of up to $1,000 and the child may be suspended from school (Walkinshaw E., 2011; Mah CL, Guttmann A, McGeer A, Krahn M, Deber RB, 2010).

In the United States, immunization is the leading preventive health service for children. It was estimated that for every dollar spent on immunization of preschool children with diphtheria-tetanus-pertussis (DTP) vaccine, $27 is saved in health care and other costs (Hatziandreu EJ, Palmer CS, Brown RE, Halpern, MT, 1994.). The national goal for the year 2000 was to achieve and sustain coverage of at least 90% of 2-year-old children with all recommended immunizations to reduce the cases of most vaccine-preventable diseases to zero (National Center for Health Statistics, 2001). The development and widespread use of vaccines, combined with increased funding and enhancement of infrastructure, have been instrumental in reducing the incidence of many infectious diseases, particularly childhood diseases. Approximately 80 percent of childhood vaccine doses are recommended for administration before the second birthday; and vaccination coverage among children in the United States is at record high levels (Centers for Disease Control and Prevention, 1994).

Protecting children against vaccine-preventable diseases has become a national priority. Vaccination levels among children are the highest ever recorded in the United States. The proportion of children 19–35 months fully vaccinated against *Haemophilus* influenza type b (Hib) increased to 94 percent in 1999 from 2 percent in 1991 when the recommendations were published; the proportion of children vaccinated against polio increased 76 percent between 1991 (53 percent) and 1999 (90 percent). The proportion of children who have received a series of vaccinations measured by having four doses of diphtheria-tetanus-pertussis vaccine, three doses of polio vaccine, and one dose of measles-containing vaccine (MCV) increased from 55 percent in 1992 to 80 percent in 1999 (National Center for Health Statistics, 2001).

The incidence of almost all vaccine-preventable diseases in children continued to be low during 1999. There were no cases of diphtheria or polio due to wild virus, fewer than 6 cases of tetanus among persons 25 years of age and under, and only 6 cases of reported congenital rubella syndrome. The number of rubella cases in 1999 (267) dropped 76 percent from the number of cases reported in 1990 (1,125). An interruption of indigenous measles transmission likely occurred in the fall of 1993, although importation of the virus resulted in moderate measles outbreaks in 1994 primarily among groups that refused vaccination. The number of measles cases decreased 99.6 percent from 1990 (26,527) to 1999 (100). However, pertussis incidence, which had declined by 15 percent in 1994 from the 20-year high reported in 1993, increased to an even higher level in 1996, with 7,796 cases, and remained high in 1999 (7,298). The incidence rate of hepatitis B (HBV) has continued to decline since the start of the decade, and in 1999 was far below the baseline rate reported in 1987 and far below the target rate set for the year 2000. Although cases of HBV infection in children have become rare, as a result of high levels of hepatitis B vaccine coverage in younger age groups, a substantial number (estimated 180,000) of adults continue to be infected with HBV because of low levels of vaccine coverage in older age groups. The incidence of tuberculosis declined after 1992 to 6.4 cases per 100,000 persons in 1999, well below the 1988 baseline of 9.1. Also by 1999, the percent of multi-drug resistant tuberculosis cases was reduced to 1.1 percent from a 1992 high of almost 3 percent (National Center for Health Statistics, 2001).

In Virginia, USA, a retrospective analysis of 1992 school entry data found that the statewide immunization rate among 2-year-old children was 58%, with children residing in low-income urban areas having a significantly lower immunization rate (Williams IT, Milton JD, Farrell JB, Graham NMH, 1995). In the following year 1993, the Centers for Disease Control and

Prevention (CDC) initiated Women. Infants and Children (WIC) program - a community-based intervention project in Norfolk and Newport News, two medium-sized, demographically similar port cities in southeastern Virginia (Ardythe L. Morrow, Jorge Rosenthal, Hassan D. Lakkis, Jeanne C. Bowers, Frances D. Butterfoss, R. Clinton Crews and Barry Sirotkin, 1998)

Ahead of the WIC program, a survey of preschool children residing in randomly selected households was undertaken to establish baseline immunization rates in these cities and to assess the household and health service factors associated with low immunization coverage. This was the first representative, population-based study that examines immunization rates of children in relation to the characteristics of public, private, and military health care systems (Ardythe L. Morrow, et. al. 1998) Overall, one third of parents perceived barriers to pediatric immunization services, and parent-reported problems accessing services had a dose–response association with under-immunization. The most commonly reported problems were long waiting times and difficulty obtaining appointments, but the pattern and magnitude of problems reported differed among public, private, and military services. Despite free immunizations, parents most often reported problems accessing public and military providers. Thus, parents did not necessarily consider cost-free and geographically available pediatric services to be barrier-free.

Consequently, enrollment in Women, Infants and Children (WIC) program was associated with significantly increased immunization rates, although this study was conducted before linkage of the WIC program with immunization services. This finding suggests the importance of WIC as a point of access to the health care system for vulnerable families. In this population, significant variation in immunization rates was found among health care providers and insurers that was not readily explained by measured population characteristics or parent-reported access barriers,

possibly attributable, in part, to differences in provider practices. Population-level measurement of immunization rates and parent perception of services is critical for improving access to, and quality of, immunization services (Ardythe L. Morrow, et. al. 1998).

2.8 REACHING EVERY WARD (R.E.W)

In 2002, the World Health Organization (W.H.O) and partners designed the Reaching Every District (R.E.D) approach in response to the decline or stagnation in routine immunization coverage across the Africa region. This innovative method is designed to increase and sustain high levels of routine immunization (RI), *particularly* in the Africa region (W.H.O, 2008). In 2004, W.H.O's Africa regional office and its partners developed and disseminated a RED guide, encouraging countries to adapt it to their context. This guide was updated and revised in 2008, and includes a monitoring tool. WHO's Africa regional office led the revision process, with *UNICEF* and *USAID's IMMUNIZATIONbasics* project partnering in the effort (IMMUNIZATIONbasics, 2009; W.H.O, 2008).

In December 2004 Nigeria adapted the Reaching Every District approach to its own country context as the "Reaching Every Ward" approach (REW) since the ward represents the lowest administrative level in the country. Nigeria defined its REW approach as *"a strategy aimed at the provision of regular, effective, quality and sustainable routine immunization activities in every ward, so as to improve immunization coverage"* (NPI, 2007). Nigeria used WHO's 2004 Africa region RED guide to develop its REW guide.

In 2006, Nigeria disseminated nationwide its REW guidelines and tools. The National Primary Health Care Development Agency (NPHCDA) and partners provided cascade training in all

states and Local Government Areas (LGA) starting in 2007. However, a nationwide assessment of REW in 2008 revealed that less than half of the 774 LGAs and health facilities were implementing REW strategy.

2.8.1 FUNDAMENTAL PRINCIPLES FOR STRENGTHENING IMMUNIZATION USING THE CONCEPT OF R.E.W.

Strengthening a health care system involves an ongoing effort, with strong partner collaboration and continuous capacity building. The process requires years of concentrated efforts and maintaining a functional system lasts forever. All levels of the health care system- health facility, ward, LGA, state, district, and national-must understand and apply the concepts of REW. In addition to building capacity, continuous advocacy is required to guarantee that the system is adequately funded at all levels. A firm foundation with the capacity for supportive supervision must be in place first even before health workers are trained.

2.8.2 OWNERSHIP AND PARTICIPATION

Participatory planning and tools development promotes ownership and commitment. LGA and health facility staff can assist in collecting baseline information or health staff can set their own standards by which to be supervised.

2.8.3 PLANNING AND MANAGEMENT OF RESOURCES

It is imperative to entrench a planning culture. One way to accomplish this involves using a recognition approach. There are other motivators besides money—recognition among peers can be used as motivation and encouragement for others to adopt good management practices. Local

management teams also must realize that they play a critical role in both the political and the technical aspects of health care, and that their actions (or inactions) affect other levels as well.

2.8.4 SUPPORTIVE SUPERVISION

Supportive supervision and training go hand-in-hand, providing the much needed reinforcement training through continuous on-thejob coaching and mentoring. Routine use of an analytical supervision check list with quantifiable scores documents the visit, measures performance, and creates accountability.

2.8.5 MONITORING FOR ACTION

Health workers need and want training on how to analyze and use their own data; not just on filling in forms and reporting. Simple, hand-drawn charts and graphs can be used; a computer is not necessary. When immunization service providers understand the value of their own data, data quality improves.

2.8.6 BUILDING CAPACITY

Long-term structures must be put into place for training future staff or for refresher trainings. A government-driven structure for capacity building and for maintaining standards is essential for sustaining any health service. Participatory and practical training should be built into a long term structure for continuous capacity building.

2.8.7 INCREASING ACCESS TO IMMUNIZATION SERVICES

All fixed service points (primarily health facilities) must be fully functional and friendly, with enough trained health workers with good interpersonal communication skills and a clean working environment, before outreach. The health facility catchment area must be clearly defined. This allows for easier implementation and more accurate monitoring, and also for better linkage with the community.

2.8.8 LINKING SERVICES WITH COMMUNITIES

Community members and health facility staff must interact regularly for guaranteeing joint commitment toward more effective and more efficient health services. By implementing these lessons learned from the Nigeria RED experience, partners and governments can help improve the quality of other primary health care services systematically and sustainably. (NPI, 2007; Immunization Basics 2007; W.H.O, 2008)

2.9 KNOWLEDGE OF CAREGIVERS ON IMMUNIZATION

Utilization of immunization service is dependent not only on factors on its supply side such as, density of health workers, accessibility to vaccination clinics, availability of safe needles and syringes to mention but few, but on other factors on its demand side including knowledge and practice of the caregivers (Odusanya O.O., Alufohai E.F., Meurice F.P., Ahonkhai V.I., 2008; Etokidem A.J., Wondifon, 2013; Nadia Abd El-Hamed Montasser, Randah Mohamad Helal, Noha Eladawi, Eman Mostafa, Fatma Abd El Rahman, Maged Saad and Soha Hamza, 2014).

Lack of knowledge about the importance of vaccines has been identified as a main barrier to immunization. De Courval F. P, De Serres G, Duval B, 2003 declared that concerns about vaccines, even without scientific support, have the potential to erode the public's confidence and

support for the immunization programme. Provision of information about a disease and the effectiveness of the vaccine have also been shown to increase uptake, so receiving vaccine-information materials during pregnancy or at a well-child visit before the vaccination visit is very essential (De Courval F. P, De Serres G, Duval B, 2003).

WHO/UNICEF/USAID jointly recommended the following six key messages on routine immunization the ISP must clearly communicate to the caregivers in order to ensure that their children are fully immunized. Each caregiver should know or understand:

- Number of visits your child (the client) still needs in order to be fully immunized or protected;
- What side effects may occur and how to treat them;
- Date of next immunization;
- Place and time of next immunization;
- To bring the child for immunization even if he or she is sick;
- To take good care of the immunization card and bring it every time you bring your child to the health facility (WHO/UNICEF/USAID, 2002).

Parental knowledge of vaccination and the diseases that vaccines protect against is an important determinant in the decision to vaccinate their child (Bond L, Nolan T, Pattison P, Carlin J., 1998; 12; Meszaros J.R., Asch D.A., Baron J., Hershey J.C., Kunreuther H., Schwartz-Buzaglo J., 1996). Caregivers who regularly immunized their children had better knowledge than caregivers who delayed child immunization. Delayed vaccination has been attributed mainly to deficient information about the importance of vaccination at time or the timing of vaccination (Nadia Abd El-Hamed Montasser, Randah Mohamad Helal, et.al., 2014). Caregivers' knowledge about the

disease and the vaccine is a predictor of higher vaccination compliance (Joseph N., Subba S., Nelliyanil M., Kotian S., Haridath A., Attavar S. et al. 2011). Other causes of delayed vaccination have also been reported. These include. insufficient vaccines in the health centres (De Serres G, Duval B. Boulianne N. 2002). or anxiety about vaccines safety as some mothers refused to complete child vaccination due to high anxiety levels about vaccine side effect (Ozkaya E, Eker HH. Aycan N, Samanci N. 2010; De Serres G. Duval B. Boulianne N. 2002). some parents believed that their children might have serious side effects when vaccinated (Freed GL. Clark SJ, Butchart AT, Singer DC. Davis MM, 2010).

Similarly, caregivers' satisfaction about perceived knowledge related to vaccines from physician and nurse showed that those who regularly immunized their children reported significant higher satisfaction compared to those who delayed the vaccination regarding vaccine safety. fever development, number of visits or vaccine schedule, and additional vaccines (Nadia Abd El-Hamed Montasser, Randah Mohamad Helal. Noha Eladawi. Eman Mostafa. Fatma Abd El Rahman, Maged Saad and Soha Hamza. 2014).

2.10 PRACTICE OF CAREGIVERS ON IMMUNIZATION

Some of the recommended best practices of caregivers on immunization include the following. Caregivers should bring children to immunization service delivery points at the ages recommended in the national schedule; bring each child's health or vaccination card at each health visit; treat side effects as recommended; seek tetanus toxoid immunizations for yourself (applicable to mothers and other women of child bearing age); bring children of the recommended ages to immunization sites on the day(s) recommended for Campaigns; and keep

those children around the home and have them immunized when the vaccination team arrives for a house-to-house strategy of National Immunization Days (WHO/UNICEF/USAID.2002).

However, one of the documented poor practices of caregivers on immunization across the globe is delayed vaccination of their children. From a study carried out on 1000 caregivers attending immunization setting in 5 urban and rural health facilities in Mansoura district, Egypt, no one refused to immunize their children but the frequency of delayed vaccination was 10% only in which more half of them mentioned that the delay was for DPT (60%). This delayed vaccination was mainly due to insufficient information about the importance of vaccination (56%), child illness (52.5%), negative knowledge about the vaccines (32%) while about one quarter due to vaccine deficiency in the health offices (Nadia Abd El-Hamed Montasser, Randah Mohamad Helal, Noha Eladawi, Eman Mostafa, Fatma Abd El Rahman, Maged Saad and Soha Hamza, 2014).

Other reasons for low uptake of vaccines already reported were that mother did not have someone to assist with taking child for vaccination (no time or resources), father did not approve of immunization linked to low uptake of BCG vaccine, misconceptions regarding vaccinations, child was ill and not vaccinated, and reported illness following previous vaccination or fear of adverse events (Odusanya O.O., Alufohai E.F., Meurice F.P., and Ahonkhai V.I., 2008; Ozkaya E., Eker H.H., Aycan N., and Samanci N., 2010).

Omotara BA, Okujagu TF, Etatuvie SO, Beida O, Gbodossou E. 2012 used Focus Group Discussions (FGDs) methodology to collect information from the various stakeholders (recipient community) in 18 selected Local Government Areas of Borno State, Nigeria, representing both

rural and urban areas. All stakeholders were aware of immunization and its benefits as well as the routes and schedule of administration and allow their children to receive it. They all attested to the reduction in the incidence and prevalence of childhood disease in their communities, but different groups have different traditional alternatives to immunization. Lack of adequate information about logistics and time of immunization programme. inadequate involvement of traditional and religious leaders and poor attitude of health workers were reasons for not fully involved in immunizations in some communities. Mothers looked forward to incentives for bringing their children for immunization in terms of soap. free drugs and complimentary health care services while others demanded for better care by health workers during immunization. improved sanitation. renovation of health care facilities and provision for more. while traditional. community and opinion leaders should be actively involved in immunization campaign (Omotara BA, Okujagu TF, Etatuvie SO, Beida O, and Gbodossou E., 2012).

2.11 KNOWLEDGE OF HEALTH WORKERS ON IMMUNIZATION

Health workers are grass root agencies in immunization for rural as well as urban population. General practitioners and nurses were found the most important and the most reliable source regarding vaccination knowledge (Rogalska J. Augustynowicz E. Gzyl A. Stefanoff P. 2010).

Similarly, to assess the knowledge, attitude and practice regarding immunization, Bairwa Amrit, Meena K.C., and Gupta P.P., (1995) interviewed 306 health workers (260 female and 146 male) of Nagaur district in Rajasthan. Knowing that inadequate management of cold chain, incorrect administration and dose may reduce the potency of vaccines and lead to adverse effects, information was sought in the questionnaire about the place of storage of vaccines, method of storing vaccine in the refrigerator, method of carrying vaccines in the field, days of using the

same vaccine bulk. what is done with the frozen diphtheria. pertussis, tetanus (DPT) and oral polio vaccine, dose of vaccine, route of administration, and age of vaccination. They found that knowledge of health workers increased with higher basic qualification and recommended the possibility of raising the minimum eligible qualification for health workers training. Proper intermittent reorientation training and periodic reassessment for all health workers is necessary for successful immunization programme (Bairwa Amrit, Meena K.C., Gupta P.P., 1995).

2.12 PRACTICE OF HEALTH WORKERS/ ISPs ON IMMUNIZATION

The roles of ISPs in conducting routine immunization service delivery sessions include vaccination, recording, health talk and supervision including vaccine management, however, multi-tasking and roles shifting are inevitable (FMoH, 1995; NPI Nigeria, 2005a; WHO, 2004). In addition, ISPs should be able to perform immunization tasks correctly, including those that ensure safe injections; give caregivers, essentially mothers, and other stakeholders in the community essential information; schedule and organize services to make them convenient for caregivers; and praise families of caregivers whose children are fully immunized by one year of age (WHO, 2004).

Some rules and best practices for good vaccine management in the immunization setting of the health facility include the following. (1.) Vaccine stocking: - Maximum of 1 ½ month supply of each vaccine; Regular monthly cycle of vaccine deliveries; Inventory and vaccine usage records kept. (2.) Vaccine stock rotation: - Different expiry dates: expiring first, use first; Same expiry date: "First in, First out" principle; Write date of delivery on vaccine boxes. (3.) Location of vaccine in the refrigerator: - No vaccine in door; Measles, OPV, BCG in the upper main compartment of a refrigerator (+2 to +8°C, are not damaged by freezing); DPT, TT, BCG, in

refrigerator at +2 to +8°C. Never freeze. (4.) Keeping the refrigerator cold: - Thermometer read and recorded twice daily; Adjust thermostat dial very carefully; Unused space full of sealed undrinkable water bottles: Ice-packs in freezer; No food or drink; Avoid unnecessary door openings: cold air falls out. (5.) Looking after your refrigerator: - Make one person responsible: Defrost when frost exceeds 0.5 cm thickness. (6.) Organizing the vaccination session: - Put day's estimated vaccine requirements in vaccine carrier; Foam pad lid on top of ice pack in the vaccine carrier; Protect from light; Use foam pad to hold opened vaccines while vaccinated. (7.) After the vaccination session: - Reconstituted BCG and measles destroyed at day's end; Label remaining vials for first use next day. (8.) Protect DPT, TT and DT from freezing: - Let icepacks sit 20 minutes at room temperature before loading these toxoids into cold boxes or vaccine carriers (condition the ice packs). (9.) Packing cold boxes: - Use icepacks, not blocks of ice which can soak labels off; Fill one third volume with icepacks; Line bottom, top, and sides with icepacks. (10.) Prepare for cold chain failures: - Identify emergency energy source; Know where to find key at all times (FMoH, 1995; NPI Nigeria, 2005a; WHO, 2004).

CHAPTER THREE

3.0 METHODOLOGY

3.1. The Setting and Study Population

Nigeria is located on the west coast of Africa at the Gulf of Guinea. Clockwise, its borders are the Gulf of Guinea to the south, Benin to the west, Niger to the north, Chad to the northeast and Cameroon to the east. The Niger and the Benue are two large rivers that flow from the west and east of Nigeria respectively, unite to form the Niger River which flows south to the Gulf of Guinea. The area of Nigeria is 923,768 sq km. Nigeria is divided into 36 States and one territory called the Federal Capital Territory. There are 744 Local Government Areas (LGAs) in the entire federation (Nigeria Federal Ministry of Health/ John Snow Incorporated. 2004).

The Setting for the study was Gwagwalada Local Government Area of the Federal Capital Territory (FCT) Abuja, Nigeria. At the centre of the ceramic picturesque of FCT map, lays the Gwagwalada Local Government Area (Gwagwalada Area Council). Kwali stretches from its southern border, Abaji on the west over shooting into its north, Bwari, Abuja Municipal and Kuje Area council took turns in the border relays on its eastern ventricle.

It was created on the 15th October 1984. Its official population figure of 157, 770 people (National Bureau of Statistics, 2006) has since become obsolete. The population of its residents has grown astronomically and can be estimated at 500,000 people due to the final relocation of the federal government from Lagos to Abuja in 1991 which brought about a massive influx of people into the LGA. This comprises the original settlers, namely: Gwari, Koro, Bassa, Gede and the Hausa Fulani as well as the immigrant population of other Nigerians and expatriates. Conceived in the Abuja master plan as its industrial zone, Gwagwalada stands out as the second most cosmopolitan city of the FCT after the capital city.

Gwagwalada falls within the Nok culture area. Before the creation of the FCT, Gwagwalada and its environs were under the Kwali District of the former Abuja emirate now Suleja emirate. Its strategic location on the Suleja-Lokoja highway and burgeoning commerce gave it a head over a constellation of other Area Councils. The "Aguma" is the traditional ruler in Gwagwalada area. He is the chief of Zuba, the northern gateway of FCT.

Gwagwalada has rich cultural and historical heritages. It is a ready resource for archeolgists and sociologists. Some of these traditional heritages have been carried over till date. They include blacksmithing, pottery, grazing, calabash designing and weaving. It also has a rich anthology of dances, music and folklore. Hausa is the dominant language of communication. Farming is the main stay of the local population.

Gwagwalada Area Council is administered by an Executive Chairman elected through popular vote in public elections. The council is composed of 10 elected councilors representing 10 wards of the area council, namely: Zuba, Ibwa, Dobi, Kutunku, Tunga Maje, Gwako, Paiko-kore, Ikwa, Gwagwalada city central and Gwagwalada quarters. The administrative structure comprises 6 departments namely: personnel management, education, health, agric, works and housing, and finance departments.

There are twenty one (21) publicly owned and seventeen (17) privately owned health facilities in Gwagwalada LGA. The study population consisted of the immunization service providers (various cadres of of healthcare workers providing routine immunization services) at the health facilities,both public and private) and the immunization caregivers (parents or guardians of

children aged 0-24months who were eligible for routine immunization) that utilized the immunization services during the study period in Gwagwalada LGA.

Available information of Immunization coverage from August 2006 to January 2007 in Gwagwalada LGA sourced from the Monitoring and Evaluation Unit, Department of PHC. Gwagwada Area Council is summarized as follow. The annual and monthly target population for routine immunization were 6388 and 532 respectively. Distribution of vaccines is based on their availability and target population of each of the health facility providing immunization services while the vaccines stock balance is taken every time vaccines are supplied to these facilities, and the stock balance is sent to NPI Unit Public Health Division FCT, Abuja.

S/No.	Month	COVERAGE						
		BCG	DPT	OPV	HBV	MEASLES	YF	TT
1	Aug.	441	1755	1866	1429	770	677	875
2	Sept.	0	1266	685	1322	150	9	960
3	Oct.	671	1103	1175	1235	357	348	734
4	Nov.	936	4032	46998*	1154	6976	434	1752
5	Dec.	164	825	1408	814	369	352	476
6	Jan.	229	2065	61184*	5855	112	187	1242

* NIDs and IPDs coverage added which include the under-five children.

3.2. The Study Design

A cross-sectional study was carried out on caregivers and Immunization Service Providers (ISPs) attending immunization setting at the public and private health facilities within Gwagwalada Local Government Area, FCT-Abuja. The first stage of sampling required the construction of the primary sample frame which comprised 6 LGAs in FCT: *Abaji, Abuja Municipal, Bwari, Gwagwalada, Kuje, Kwali.* We used ballot with replacement to select one of the six LGAs. Outcome was 1 of the 6 LGAs: **Gwagwalada LGA.**

Stage 2: There were 21 publicly owned and 17 privately owned health facilities in Gwagwalada LGA (Please refer to the Annex). All 21 (100%) public health facilities and 7 of 17 (41%) private health facilities have recognized immunization setting and were providing routine immunization services. These 21 public and 7 private health facilities constituted the final sampling units.

Stage 3: A cross section of all consenting health personnel designated as Immunization Service Providers (ISPs) and all consenting Caregivers (mothers/ guardians) who visited the selected health facilities and received immunization for their children aged under 24 months from October 2006 to March 2007 were deemed eligible for inclusion as the respondents (study population).

Sample Size Determination:

Using the formula $n = z^2pq/d^2$,

where

n is the minimum sample size

z is the area under normal curve corresponding to 95% confidence interval (CI)

p is the prevalence (proportion of children aged 12-23 months who were vaccinated with DPT3 in Nigeria in 2005; W.H.O reported 38% DPT3 Coverage of children ages 12-23 months was achieved in Nigeria in 2005 (W.H.O, 2005b)).

q is (1-p)

d is the precision error of 5% or 0.05

therefore,

$$n = 1.96^2 * 0.38 * 0.62 / 0.05^2$$

$$= 0.90508096 / 0.05^2$$

$$= 362 \text{ (representing the minimum sample size of the Caregivers.)}$$

3.4. The Inclusion and Exclusion Criteria:

Immunization providers (healthcare workers) from all the 21 public healthcare facilities and 7 out of 17 private healthcare establishments providing routine unmunization services; and consenting caregivers (parents/ guardians) who used these health facilities between October 2006 and March 2007 are the respondents (study population). Healthcare workers and their caregivers/clients from the remaining 10 private health establishments without routine immunization service delivery were excluded.

3.5. Data Collection Instruments

A validated semi-structured questionnaire with an in-built 4-point knowledge scale was used to collect data from the caregivers while data collection from immunization providers (IPs) was done with another validated semi-structured questionnaire with a 13-point knowledge scale. (Appendix 4).

Three knowledge items each on OPV (How many drops of OPV did your child take at a time? How many times will your child take the OPV doses? When is your child due for the next immunization?); DPT (On which part of your child's body was DPT injection dose given? How many times will your child take DPT doses? When is your child due for the next immunization?) and Measles vaccinations (On which part of your child's body was measles injection dose given? How many dose of measles vaccine will your child take? When is your child due for next immunization?) were aggregated to compute the knowledge score. A fourth knowledge item, (Are you aware of any common body reaction to (side effect of) the immunization your child

received, and what you should do if it occurs?) on awareness of any common body reaction to vaccination was added, thereby making up a total knowledge score of 4 points.

A 14 point knowledge score was aggregated from these items on RI: Please identify all the target diseases that you know children are protected against by immunization: tuberculosis, poliomyelitis, whooping cough, tetanus, diphtheria, measles) 6 points: Should a sick child be brought for immunization? Yes- 1 point; What illnesses that may cause fever are preventable by immunization (tuberculosis, poliomyelitis, whooping cough, tetanus, diphtheria, measles)? 5 points; Do you know the six key messages for every parent/ guardian to ensure full immunization of a child? Yes- 1 point; Should a parent of the immunized child be informed of what side effects may occur? Yes- 1 point. The total score was computed and disaggregated over category of health worker, years of experience and previous training on immunization.

Both validated questionnaires with open and closed ended questions were developed after consultation with immunization experts, biostatisticians, researchers who are either currently working or had worked on immunizations, from field and technical experience acquired during my internship at NPI headquarters as well as from review of relevant literatures. Both questionnaires were thus designed to obtain information on the following variables.

1. **Socio-Demographic Characteristics:** Data on Gender, Age, Educational Status, Marital Status, Type of Marriage, and Employment Status were collected.

2. **Knowledge and Practices on Routine Immunization Service Delivery:** these criteria were assessed to uncover if caregivers bring children to immunization service delivery points at the

ages recommended in the national schedule, bring each child's health or vaccination card at each health visit, identify and treat side effects as recommended by healthcare provider. has ever received tetanus toxoid immunizations (applicable to only mothers/ women of child bearing age), bring children of the recommended ages to immunization sites on the day(s) recommended; and if Immunization Service Providers (ISPs) have basic knowledge of routine immunization know and give the caregivers the key messages, schedule and organize immunization services to make them convenient for parents and children are fully immunized by one year of age. and perform immunization tasks correctly including those that ensure safe injections. using the response rates of vaccinators among the ISPs as performance indicators of the best practices.

3. Immunization Related Risk Behaviour: This was sought to identify forms of immunization risk behaviour and factors responsible that could be targeted by appropriate immunization intervention and strategy.

4. Strengths Weaknesses Opportunities and Threats (SWOT) of Routine Immunization Service Delivery: Observation were made and respondents were asked questions to uncover the SWOT of routine immunization service delivery.

Information on vaccination status of the children was collected from vaccination records (child health cards or improvised exercise books) shown to the interviewers and from caregivers' verbal reports. If the cards were available, the interviewers checked on the questionnaire the antigen(s) the child had received before and on the day their caregivers were interviewed. If the caregiver was not able to provide a vaccination card, she was asked to recall whether the child

had received BCG, polio, DPT (including number of doses for each), yellow fever and measles vaccinations.

3.6. Reliability and Validity:

Following the pre-testing of the questionnaires, some questions were amended before the data collection for the study commenced. The content of these questionnaires was verified from related literature. The questionnaires were pre-tested on 15 Caregivers and 10 ISPs. A reliability value 0.78 was estimated using Cronbach alpha.

3.7. Collection of Data

Before administration of the validated questionnaire, the purpose of the study was explained to the respondent and he/she was encouraged to respond truthfully. To ensure confidentiality, respondents were not asked to mention their names and interviewed by dialogue only (no third party was allowed to participate). Questionnaires were administered by six trained interviewers: 3 health workers with public health training and experience in immunization activities at the community level and 3 health workers with experience in training and monitoring immunization activities in the LGA. The interview lasted 25-30 minutes. Contact opportunities for interviews of respondents (immunization providers and recipients) were:

- Scheduled dates of routine immunization at the various health facilities.
- Scheduled of appointments at health facilities.

At the Gwagwalada Area Council Secretariat during formal training workshops for immunization providers (such facilitated by NPI/Partners on Immunization Plus Days (IPDs) and NIDS, and by National Agency for Foods Drugs Administration and Control (NAFDAC) on Micronutrients and Vitamin A).

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3.8. Data and Statistical Analysis:

Questionnaires data were cleaned coded and entered into computer and analyzed using SPSS version 10.0 software package. The analysis of the generated data was done using descriptives, t-test and ANOVA statistics with 0.05 set as level of significance. Information from open ended questions was analyzed manually and described by SWOT.

3.9. Ethical Approval:

Ethical clearance for this study was obtained from National Programme on Immunization Headquarters Abuja, now National Primary Health Care Development Agency after which the proposal was reviewed. Informed verbal consent was needed by the caregivers and ISPs before the questionnaires could be administered.

3.10. Limitations:

The study was constrained partly by some failed schedules of immunization sessions at the service delivery points; prolong waiting time during routine immunization sessions; hard to reach communities, health facilities/ immunization service delivery points. Weather conditions, such as heavy rainfall and harmattan, coupled with poorly sheltered structures also made exit interviews shortly after immunization sessions at the service delivery points very unpleasant.

CHAPTER FOUR

4.0 RESULTS

4.1 RESULTS OF RESPONSES FROM THE CAREGIVER (PARENTS):

Demographic characteristics of the caregivers and their children

Figure 1 represents the age distribution of the caregivers interviewed during routine immunization sessions at the selected health facilities within Gwagwalada LGA. The caregivers' mean age was 27.0 ± 4.3 years. Modal age group of the caregivers was 25-29 years.

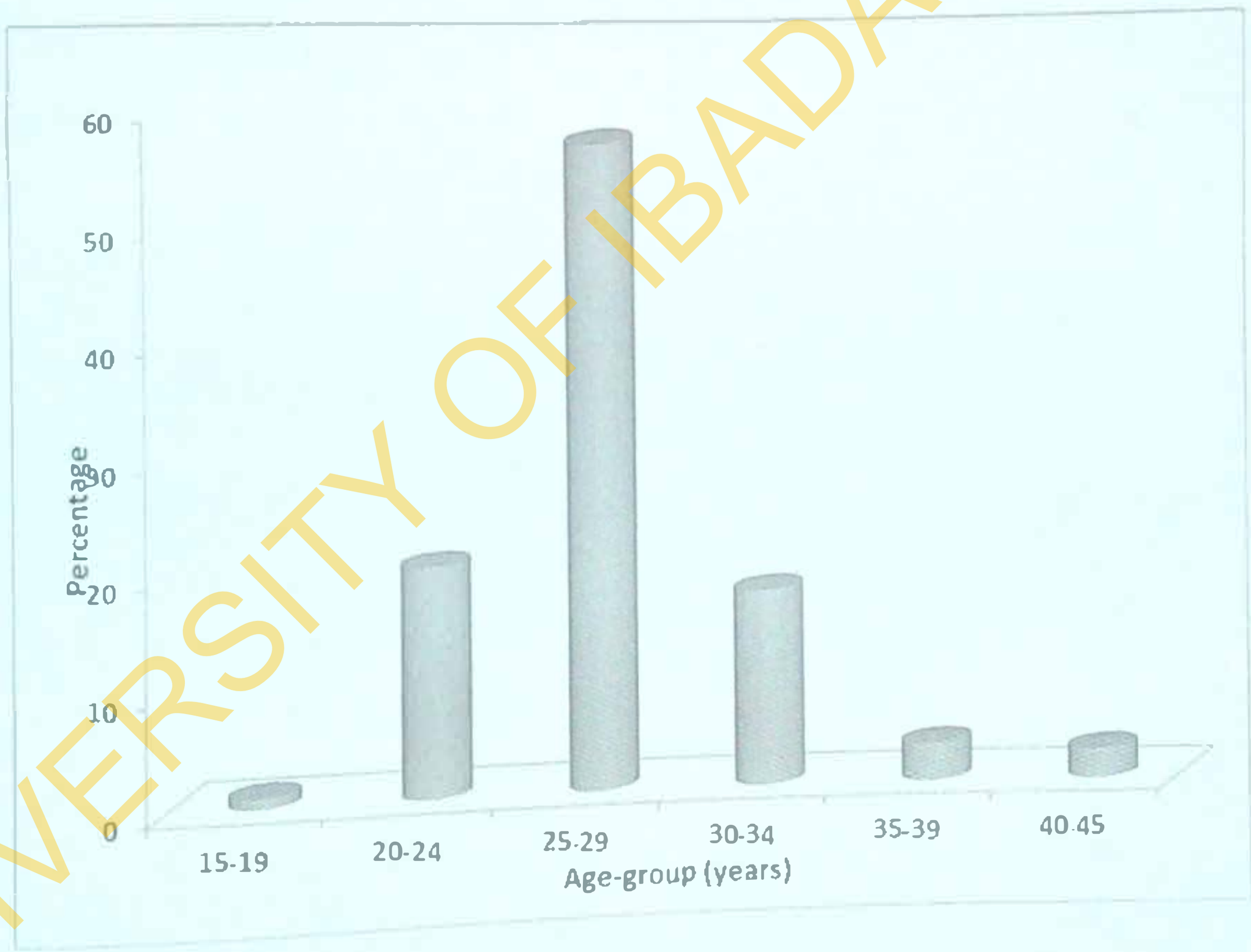

Figure 1: Age group distribution of the caregivers

Tables 1 shows age distribution of the children immunized as stated by their caregivers. The mean age of the children was 5.6±4.4 months. The modal age group of 1-6months old comprised about 75% of the children receiving immunizations. Most (91%) of the children whose Caregivers were interviewed were under 12 months of age (infants).

Table 1: Age Group Distribution of the Children

Age group (months)	Frequency	Percentage
1-6	326	74.8
7-11	71	16.3
12-23	31	7.1
24	8	1.8
Total	436	100.0

The distribution of caregivers by selected demographics is shown in table 2. Of the 436 caregivers, 52.1% were Christians and 47.9% were Muslims. Most (97.5%) caregivers were females and 61.0% of them had at least primary education.

By occupation, many (23.7%) of the caregivers were housewives, followed by farmers (21.3%), petty traders (20.4%), civil servants (16.7%) and artisans (16.7%); few (1.4%) were unemployed but none of them were students nor wholesale-traders.

Two ethnic groups, Hausa (29%) and Gwari (23.7%) together accounted for 63.7% of the caregivers. These are among the original settlers, which also included the Gede (7.6%). Koro (6.9%), Bassa (5.7%), and Fulani (4.6%). The remaining ethnic groups (23.6%) included Yoruba (6.2%) and Igbo (4.1%).

Table 2: Distribution of the Caregivers by Selected Demographics.

Characteristics of Caregivers by Social Group (N= 436)	N	%
Sex		
Male	11	2.5
Female	425	97.5
Total	436	100
Religion		
Christianity	227	52.1
Islamic	209	47.9
Traditional	0	0
Total	436	100
Occupation		
Civil servant	73	16.7
Wholesale- trading	0	0
Petty trading	89	20.4
Farming	93	21.3
Artisan	73	16.7
Housewife	102	23.4
Student	0	0
Unemployed	6	1.4
Total	436	100
Education		
Tertiary	70	16.1
Secondary	71	16.3
Primary	125	28.7
Arabic	15	3.4
None	155	35.6
Total	436	100
Ethnicity		
Hausa	126	28.9
Gwari	103	23.6
Koro	30	6.9
Basa	25	5.7
Gede	33	7.6
Fulani	20	4.6
Yoruba	27	6.2
Igbo	18	4.1
Other	54	12.4
Total	436	100

Information about clients' visit

As shown in table 3, the following reasons were stated by the 436 consenting caregivers for visiting the heath facilities: immunization only (56.2%), child's illness only (28%) and 15.8% for both child's immunization and illness treatment.

Table 3: Information about Clients' Visit to Health Facilities

Reason for visit	N	%
Immunization only	245	56.2
Seek treatment for child's illness only	122	28.0
Both immunization and treatment of child's illness	69	15.8
Total	436	100

Table 4 describes the knowledge items and distribution of caregivers' responses to the options of each of the knowledge items. Forty nine (17.2%) of the caregivers knew that a child takes four doses of oral polio vaccine OPV while majority (70.8%) of them did not know. Also, majority (66.3%) of them did not know the number of doses of diphtheria-pertussis-tetanus (DPT) vaccines a child with exception of a few (25.5%) of them who correctly mentioned three doses. Only three (0.7%) knew and mentioned correctly that a child receives one dose of Measles vaccine. Majority (63.5%) of them affirmed that they were aware of and knew what to do about the specific immunization side effects on their children but a few (34.4%) also registered their ignorance (table 4).

Table 4: Distribution of Caregivers' Responses to Four Knowledge Items on Routine Immunization

Items		Frequency	Percentage
How many times will your child take the OPV DOSES?	**Four**	**49**	**17.2**
	Other but four	78	27.4
	Don't know	309	70.8
How many times will your child take DPT doses?	**Three**	**111**	**25.5**
	Other but three	36	8.3
	Don't know	289	66.3
How many DOSE of MEASLES vaccine will your child take?	**One**	**3**	**0.7**
	Other but one	8	1.8
	Don't know	425	97.5
Are you aware of any common body reaction to (side effect of) the immunization your child received, and what you should do if it occurs?	**Yes**	**277**	**63.5**
	No	9	2.1
	Don't know	150	34.4

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	Yes	**277**	**63.5**
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	Don't know	150	34.4

Association between Caregivers' Knowledge and Selected Socio-demographic Characteristics

The mean knowledge score of caregivers below 25years (21. ±1.4) was higher than those 25years above (1.9±1.3). No significant difference existed in caregivers' mean knowledge scores by age ($p>0.05$). Table 5 also shows the relationship between caregivers' mean knowledge scores and religion. The mean knowledge score of caregivers who were Christian at 2.19±1.4 was significantly higher than their Islamic counterparts, ($p<0.05$). There was a statistically significant difference between education and mean knowledge score of the caregivers. Caregivers with tertiary education had the highest mean knowledge score (2.5±1.2) and lowest among caregivers with no formal education (1.7±1.5).

Table 5: Association between Caregivers' Mean Knowledge Scores and Age Group, Religious Group and Educational level

Variables	Mean ± SD	t-value	P-value
Age group			
≤24 years	2.1±1.4	0.460	0.647
≥25 years	1.9±1.3		
Religious group			
Christianity	2.2±1.3	19851.50	0.003
Islamic	1.7±1.5		
Educational level			
Tertiary	2.5 ± 1.2		
Secondary	1.9 ± 1.1		
Primary	2.1 ± 1.3	5.405	0.000
Arabic	2.0 ± 1.4		
None	1.7 ± 1.5		
Total	**2.0 ± 1.4**		

Figure 2 illustrated the proportion of the caregivers' children ages 0-23 months who received vaccinations before (at any time before) the survey. More children had received OPV1 (78.8%), DPT1 (79.4%), HBV1 (78.6%) than BCG (63.5%) and OPV0 (42.33%).

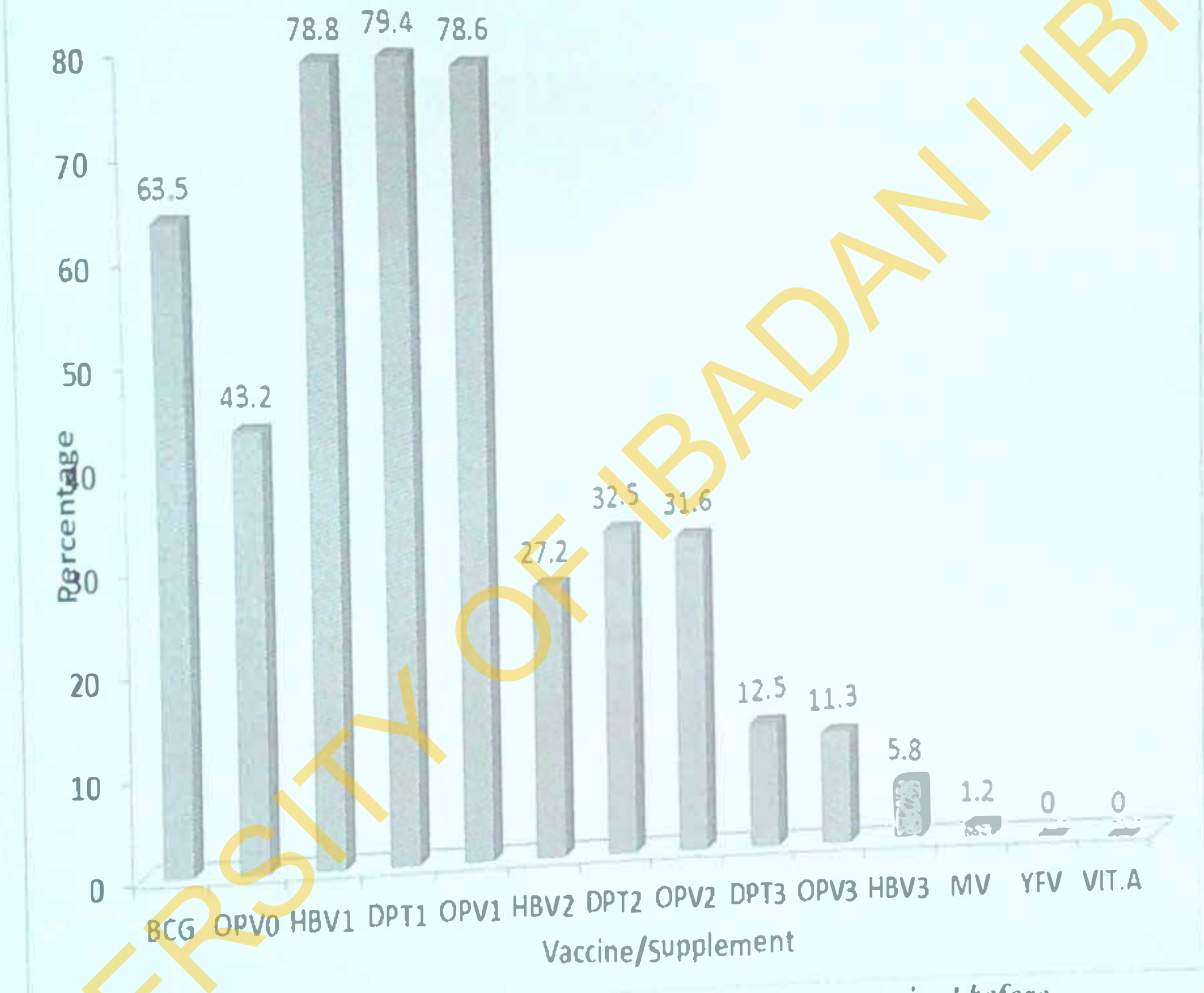

Figure 2: Proportion of children by antigens and supplement received before

Figure 3 below shows the percentage distribution of responses among caregivers (only mothers) who ever received tetanus toxoid immunization (TT1-TT5). Most (93%) of women of reproductive age interviewed had ever received tetanus toxoid immunization.

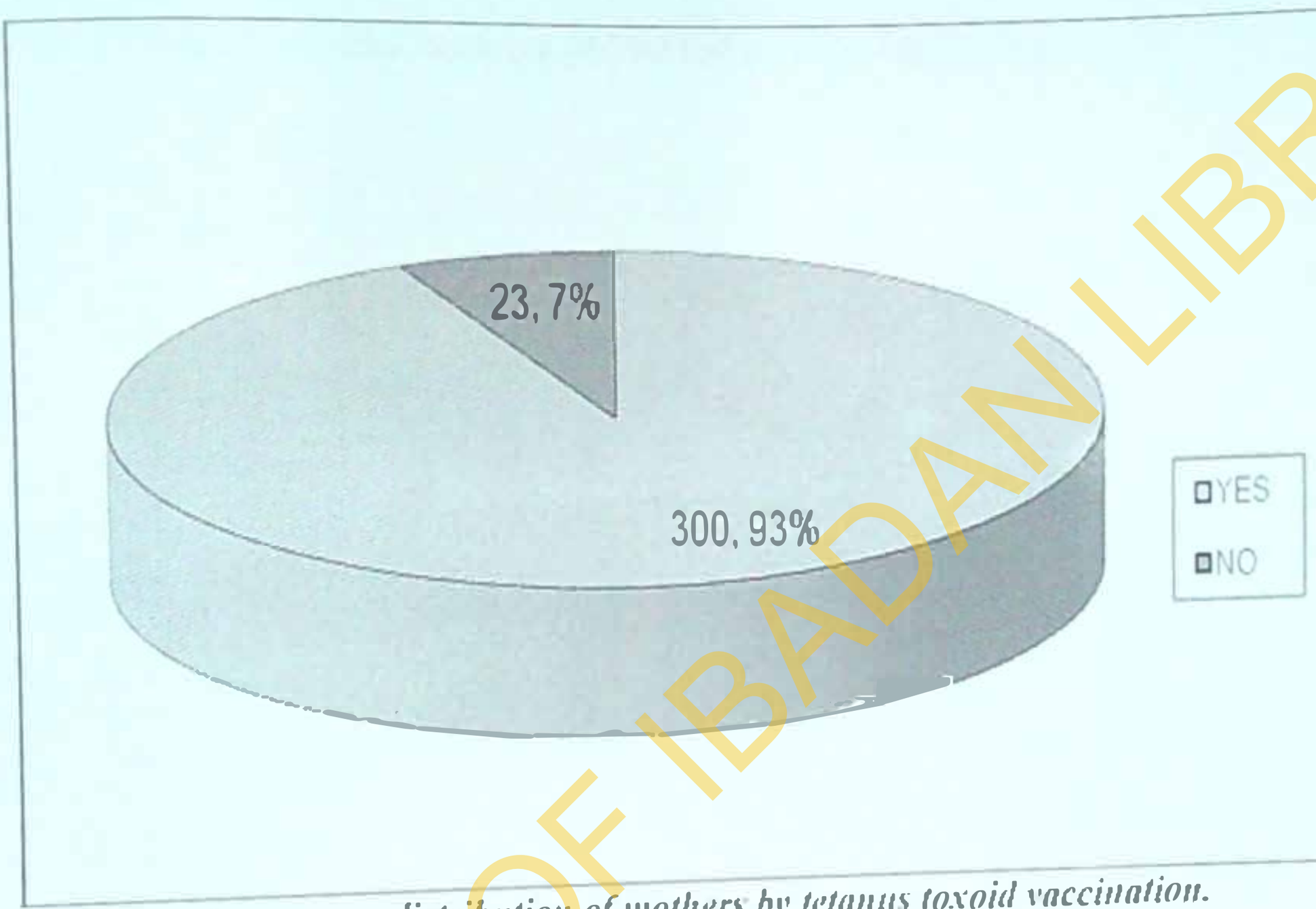

Figure 3: Percentage distribution of mothers by tetanus toxoid vaccination.

Figure 4 shows that only 5% of the caregivers mentioned that they will not present their children on the next immunization appointment dates at the same health facilities where they were interviewed; and showing their reasons in figure 5, they were change of residence (23.9%). too long waiting time (26.8%). long distance to health facilities (26.8%), repeated vaccines stock-out (9.8%) and poor facility (7.3%).

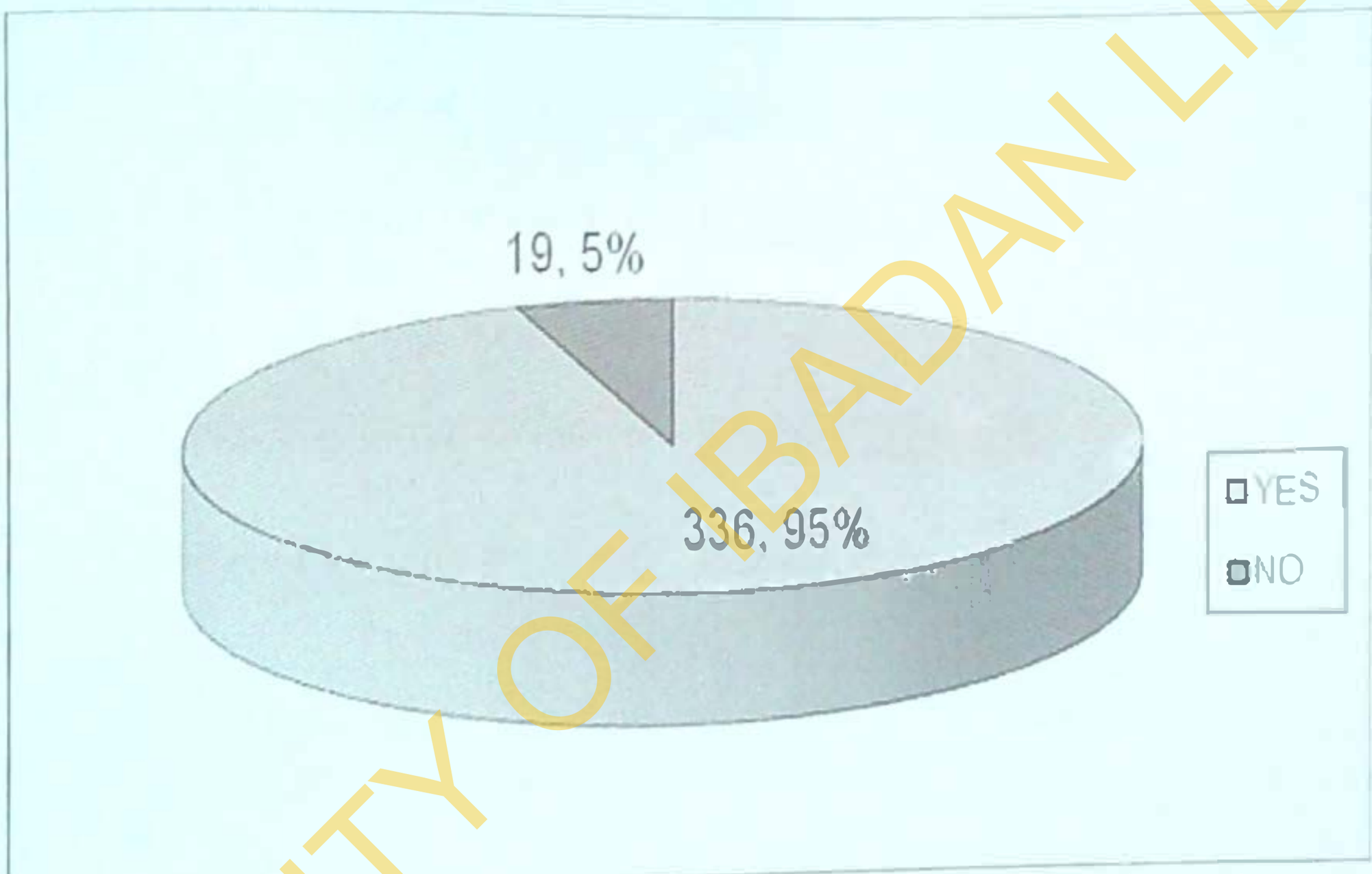

Figure 4: Proportion of caregivers willing to bring their children for the next immunization at the same health fixed post.

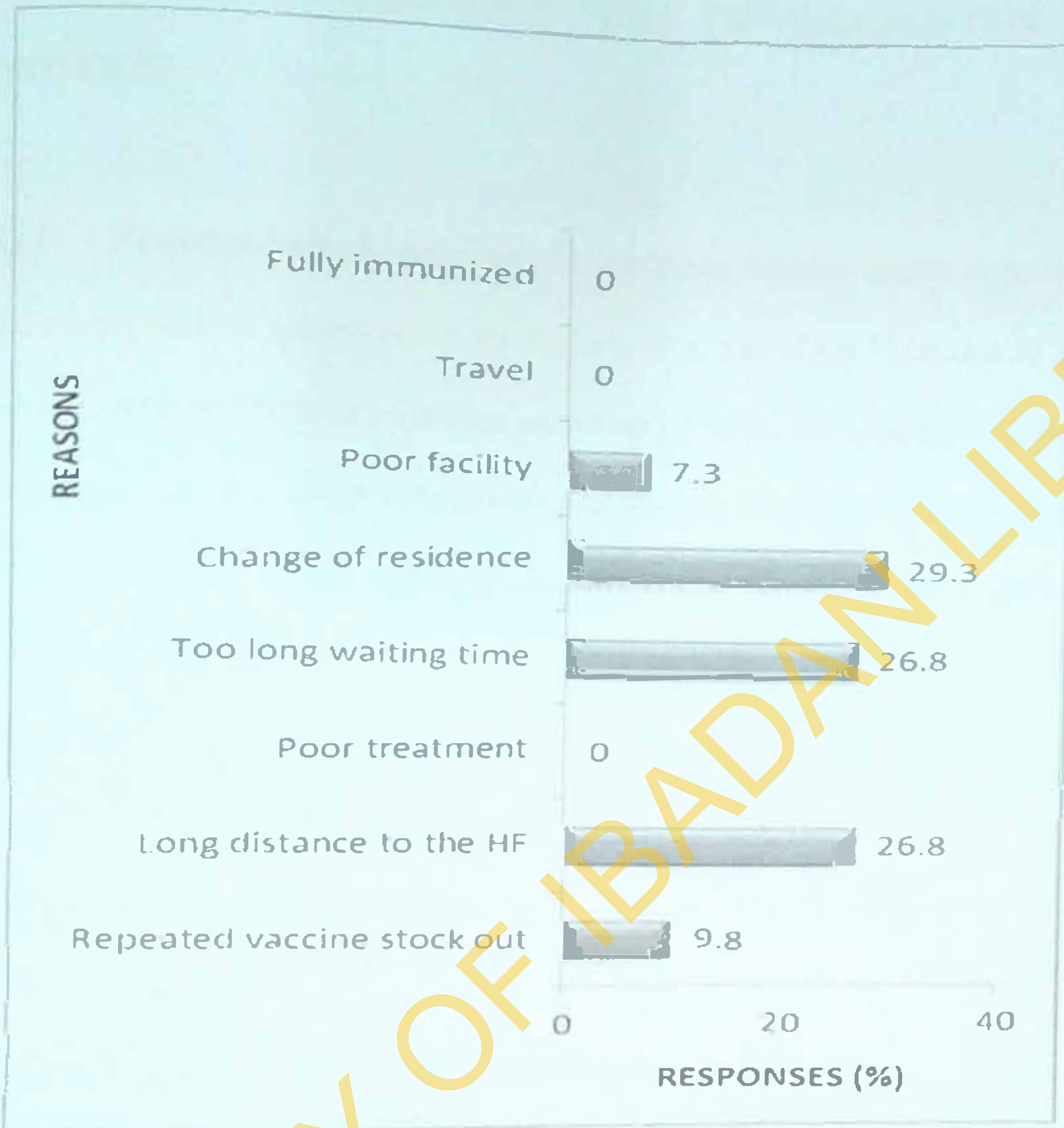

Figure 5: Percentage distribution of responses to why some caregivers may not present their children for the next immunization appointment at the same fixed post.

4.2. RESULTS OF RESPONSES FROM THE IMMUNIZATION SERVICE PROVIDERS.

4.2.1. Response Rate: Seventy-two (72) healthcare workers agreed to be interviewed and completed their questionnaires out of ninety (90). Out of the 72 consenting health care workers, seventy (70) were immunization service providers (ISPs) performing the role of a vaccinator, recorder, health educator or supervisor at the health facilities. The rate of refusal was twenty percent (20%), principally due to tight work schedule, work overload, or lack of interest in the study.

4.2.2. Demographic Characteristics (N=70)

Table 6 shows demographic characteristic (age) of the ISPs. The mean age of the ISPs was 31.5 ± 8.3 years.

Table 6: Age Distribution of Immunization Service Providers

Age group (years)	Frequency	Percentage
<25	19	27.1
25-29	14	20.0
30-34	10	14.3
35-39	15	21.4
40+	12	17.1
Total	70	100.0
Mean SD	31.5 years 8.3	

Figure 6 shows the distribution according to sex of the ISPs. Fifty two (74%) of the ISPs were females and eighteen (26%) were males.

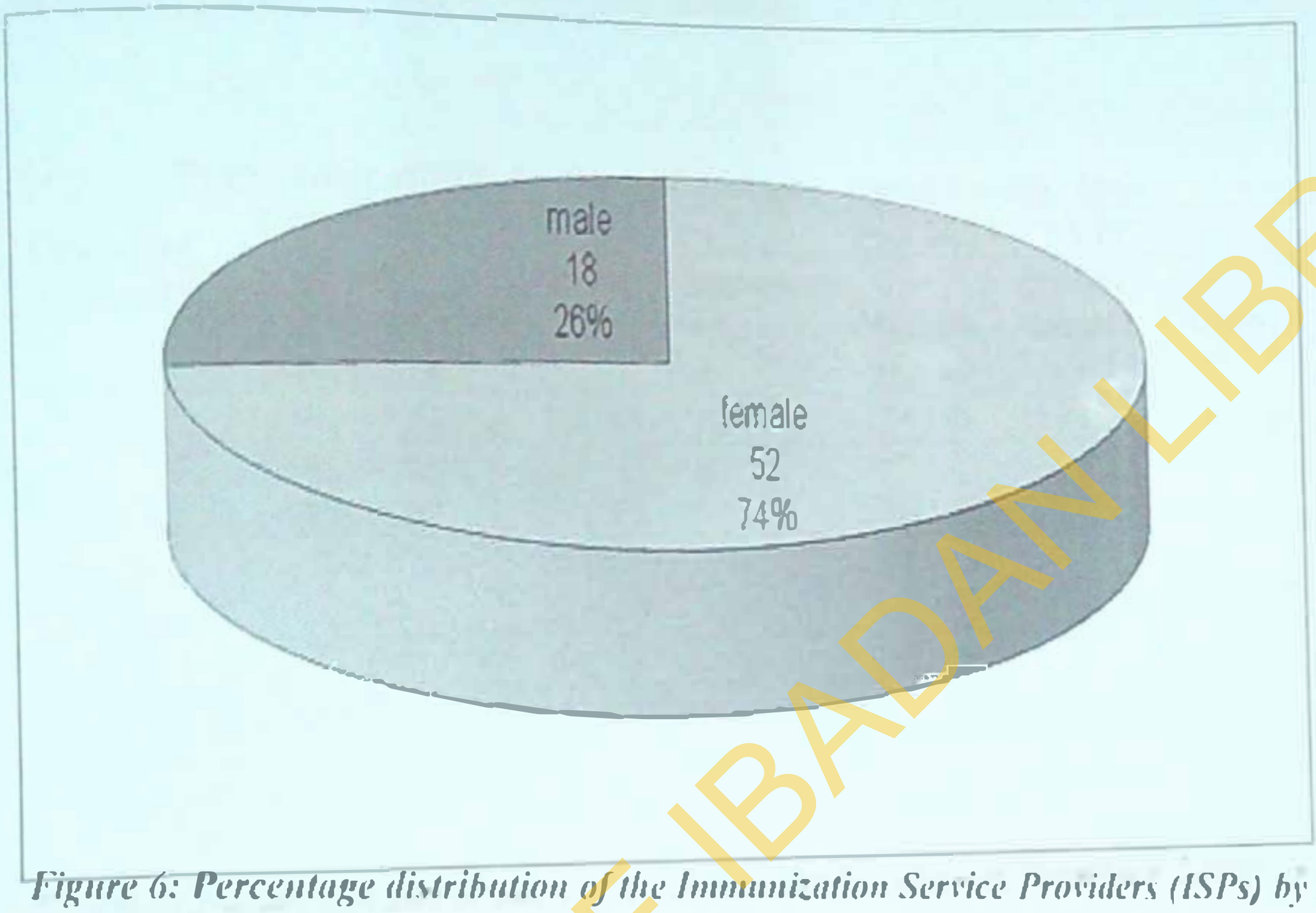

Figure 6: Percentage distribution of the Immunization Service Providers (ISPs) by sex

Table 7 represents the distribution of the ISPs by professional group and types of health facilities. Sixty seven (95.7%) of them worked at the public health facilities while only three (4.3%) worked mainly in the private hospital.

Table 7: Distribution of ISPs by Professional Group and Facility Type

Operating Authority	Category of Health Worker Interviewed	Count/ Percent	FACILITY TYPE				
			Secondary	Primary Health Center	Primary Health Post	Clinic	Total
Public	Registered Nurse	N (%)	--	2(3.0)	1 (1.5)	1(1.5)	4(6.0)
	Registered Midwife	N (%)	--	8(11.9)	1(1.5)	2(3.0)	11(16.4)
	Enrolled Nurse*	N (%)	1(1.5)	10(14.9)	--	5(7.5)	16(23.9)
	CHO	N (%)	1(1.5)	1(1.5)	1(1.5)	1(1.5)	4(6.0)
	CHEW	N (%)	4(6.0)	7(10.4)	14(20.9)	7(10.4)	32(47.8)
	Total	**N (%)**	**6(9.0)**	**28(41.8)**	**17(25.4)**	**16(23.9)**	**67(100)**
Private	Registered Nurse	N (%)	1(33.3)	--	--	--	1(33.3)
	Registered Midwife	N (%)	2(66.7)	--	--	--	2(66.7)
	Total	**N (%)**	**3(100)**	--	--	--	3(100)

(Enrolled Nurse is a certified nursing officer yet to be registered with the Nursing and Midwivery Council (NMC), thus has no practicing license issued to them by NMC).*

4.2.3. Knowledge and Practices of Immunization Service Providers (ISPs).

Tables 8 presents the ISPs' responses to knowledge item of a maximum of fourteen point scale. Most ISPs correctly identified Poliomyelitis (94.3%), Measles (85.7%), Diphtheria (84.3%) among others vaccines preventable diseases but a few ISPs did not know that Tuberculosis (24.3%), Tetanus (20.0%) and Pertussis (17.1%) were preventable by vaccination.

Among the vaccine preventable diseases presenting fever correctly identified by the ISPs were Measles (80%), Poliomyelitis (60%), Pertussis (55.7%), Diphtheria (44.3), Tetanus (38.6%), and Tuberculosis (40%). Fifty four percent of them correctly stated that a sick child should be brought for immunization (Table 8).

Majority (70%) of them identified that they knew the six (6) key messages for every parent/ guardian to ensure full immunization of a child and 88.6% correctly stated that a parent of the immunized child should be informed of what side effects may occur (Table 8).

Table 8: **Distribution of ISPs' Responses to Knowledge Items on Routine Immunization**

Variable		Responses N = 70	
		Yes (%)	**No (%)**
Please identify all the target diseases that you know children are protected against by immunization.			
	TUBERCULOSIS	75.7	24.3
	POLIOMYELITIS	94.3	5.7
	PERTUSSIS (WHOOPING COUGH)	82.9	17.1
	DIPHTHERIA	84.3	15.7
	TETANUS	80.0	20.0
	MEASLES	85.7	14.3
Should a sick child be brought for immunization?		54.3	45.7
What illnesses that may cause fever are preventable by immunization?			
	TUBERCULOSIS	40.0	60.0
	POLIOMYELITIS	60.0	40.0
	PERTUSSIS (WHOOPING COUGH)	55.7	44.3
	DIPHTHERIA	44.3	55.7
	TETANUS	38.6	61.4
	MEASLES	80.0	20.0
Do you know the six (6) key messages for every parent/ guardian to ensure full immunization of a child?		70.0	30.0
Should a parent of the immunized child be informed of what side effects may occur?		88.6	11.4

The overall mean knowledge score of the ISPs was 10.1±2.0. About one-third (37.1 %) of the ISPs scored below the mean knowledge score. The maximum and minimum scores were 13 and 5 respectively. The relationship between the ISPs' knowledge and training on routine immunization is described in Table 9. The mean knowledge scores of the trained ISPs and those who were not trained were 10.1±2.1 and 9.8±1.8 respectively. The ISPs' mean knowledge scores by training were not significantly different (P>0.05).

The relationship between the ISPs and rank (qualification) was also described in Table 9. The mean knowledge scores of CHO, Nurse and CHEW were 10.5±1.9, 10.2±2.1 and 9.9±2.0 respectively. The ISPs' mean knowledge scores by rank were not significantly different (P>0.05).

Table 9 also describes the relationship between the ISPs and years of experience. The mean knowledge scores of those with <1 year, 1-4 years, 5-9 years and ≥10 years of working experience were 9.70±2.3, 10.2±1.8, 10.4±1.1, and 11.0±1.5 respectively. The ISPs' mean knowledge scores by rank were not significantly different (P>0.05).

Table 9: Relationship between ISPs' Knowledge and ~~Training~~, Rank (Qualification) and Years of Experience

Variable	Mean ± SD	t-value	P-value
Training on Routine Immunization			
Trained	10.1±2.1		
Not Trained	9.8±1.8	0.448	0.656
Rank of IPs			
CHO	10.5±1.9		
Nurse	10.2±2.1	0.235	0.791
CHEW	9.9±2.0		
Years of Experience			
<1	9.70±2.3		
1-4	10.2±1.8	0.964	0.415
5-9	10.4±1.1		
≥10	11.0±1.5		
Total	10.1±2.0		

Distribution of the ISPs' responses according to their roles (vaccination, recording, health education, supervision) and indicators of select best practices for routine immunization service delivery is presented in Table 10.

Fifty one (72.9%) of 70 ISPs in this study indicated vaccination as the role they perform during RI sessions. Indicators on select best practices in vaccine handling showed that most (92.2%) ISPs (vaccinators) confirmed that they stored vaccines in cold boxes to maintain the cold chain; while majority (82.2%) of them arranged vaccines in refrigerator (usually at the LGA cold store) based on their sensitivity to heat and freezing (Table 10).

Indicators on best practices in monitoring and evaluation showed that a large proportion (77%) of ISPs (vaccinators) stated that they estimated the target population for routine immunization; and 78.4% of them mentioned that they filled out the stock sheet properly whenever vaccines are moved (Table 10).

Indicators on best practices in injection safety/ management of waste sharps revealed that all (100%) ISPs (vaccinators) disposed used needles and syringes without recapping into safety boxes; 98% of them properly disposed of used safety boxes and other wastes shortly after immunization sessions; and 96.1% of them used single-dose needles and syringes to administer some vaccines. Similarly, indicator on best practices in communication to caregivers revealed that most (94.1%) ISPs (vaccinators) informed the caregivers about immunization preventable diseases (IPDs) and the importance of the routine immunization scheme (Table 10).

Indicators on best practices in community mobilization for vaccination showed that 80.4% of ISPs (vaccinators) performed IEC (information/education/counselling) on immunization during their outreach activities; and 70.6% conducted active case searches or community visits for children who have missed their immunization appointments (Table 10).

Table 10: Distribution of ISPs' roles by selected best practices

Best practices in (Indicators)	Response: ISPs' roles during routine immunization sessions			
	Vaccination* N=51	Recording N=25	Health education N=32	Supervision N=10
vaccine handling				
Percent of ISPs/vaccinators storing vaccines in cold boxes according to cold chain standard	**47(92.2)**	23(92)	--	10(100)
Percent of ISPs/vaccinators storing arranging vaccines in refrigerator based on their sensitivity to heat and freezing	**42(82.4)**	--	--	9(90)
monitoring and evaluation				
Percent of ISPs/vaccinators estimating target population	**39(76.5)**	19(76)	--	10(100)
Percent of ISPs/vaccinators filling out the stock sheet according to standard whenever vaccines are moved	**40(78.4)**	20(80)	--	9(90)
Percent of ISPs/vaccinators recording target and antigen data on a sheet or in a notebook/register	--	22(88)	--	10(100)
injection safety/ management of waste sharps				
Percent of ISPs/vaccinators using a single dose syringe and needle for each injection	**49(96.1)**	--	--	9(90)
Percent of ISPs/vaccinators using safety boxes to contain used needle and syringe without recapping	**51(100)**	--	--	10(100)

Percent of ISPs/vaccinators doing proper disposal of used safety boxes/ wastes	50(98)	25(100)	–	10(100)
communication to caregivers				
Percent of ISPs/vaccinators infoming parents about immunization preventable diseases (IPDs) and the importance of the immunization scheme	48(94.1)	24(96)	32(100)	10(100)
community mobilization for vaccination				
Percent of ISPs/vaccinators doing IEC on immunization during outreach activities	41(80.4)	18(72)	25(78.1)	9(90)
Percent of ISPs/vaccinators conducting active case searches or community visit to find children who have missed their immunization appointment	36(70.6)	17(68)	21(65.6)	8(80)

--: where best practice is not applicable to role performed during immunization sessions.
Vaccination*: Fifty one (72.9%) of the ISPs in this study functioned as vaccinators during RI and their response rates were used in this study as indicators of the select best practices of the ISPs on RI.

CHAPTER FIVE

5.0 DISCUSSION

5.1 General Information: Both the caretakers and ISPs constitute key groups of stakeholders, one on demand side and the other on the supply side, who are very critical to the overall results, outcomes and even impact of routine immunization service delivery. The findings from this study describe the knowledge and practice of caregivers and immunization service providers on routine immunization services from several communities within Gwagwalada LGA, FCT, Nigeria. Overall, knowledge of the caregivers and ISPs on RI is low which informed their practices regarding immunization.

5.2 Socio-Demographic Characteristics of Respondents: On the demand side of the immunization service delivery, this study shows that most (97.5%) of the caretakers were women of reproductive ages 15 - 45 years (table 2, Figure 1). This age group has been reported for most caretakers Male respondents only account for less than 3 percent (table 2). This could be attributed to traditional views and social roles of women in respect of care for the children in most Nigerian communities (Adekunle, 1978; Aminu and Agle, 2003) or less emphasis on fathers' roles in immunization.

Two ethnic groups, Hausa (29%) and Gwari (23.7%) together accounted for 63.7% of the caregivers. These are among the original settlers, which also include Gede, Koro, Bassa and Fulani (Table 2). Other ethnic groups including Yoruba and Igbo accounted for 23.6% of the caretakers interviewed. The final relocation of government from Lagos to Abuja in 1991 brought about a massive influx of people- immigrant population of other Nigerians and expatriates- into Gwagwalada Area Council (LGA) which stands out as the second most

cosmopolitan city of the FCT after the capital city (Nigeria National Population Commission. Census, 2006).

Level of education and occupation are basic indicators of socio-economic status of a population (Parks, 2005). In this study, two-thirds (61.1%) of the caregivers mostly (97.5%) females had at least primary education while 34.4% of them were non literate. By occupation, many (23.4%) were housewives, followed by farmers (21.3%), petty traders (20.4%), civil servants (16.7%) and artisans (16.7%), few (1.4%) were unemployed but none of them were students or wholesale-traders (table 2). Apparently, these proportions of educational level and occupations of the caregivers in this study indicate their poor socio-economic status.

The other groups of respondents were the ISPs, who are simply designated health care workers handling immunization services, as a vaccinator, recorder or supervisor. In this study, 70 consenting ISP's from the immunization setting completed the self administered questionnaire. The ISPs, aged 20 to 56 years (mean age 31.5 years; standard deviation 8.3 years) were predominantly (74%) females (table 6). Most (95.7%) ISPs worked mainly at the public health facilities and only 3 (4.3%) of them were from the few private health establishment (table 7). We also observed that most of the private health providers did not provide immunization services while few (2) who agreed initially to be interviewed later disclosed they were neither ISPs nor permitted to grant the interview by their management. From the public health facilities, a large proportion (47.8%) of the immunization providers were Community Health Extension Workers (CHEWs); the nursing staff (registered nurse, registered midwife and enrolled nurse) accounted for 46.3% of the ISPs at the public health facilities and 100% from the private immunization setting. Shortage of trained nursing staff providing immunization services especially at the Primary Health Care Centres (PHCs) both public and private, is not consistent with the Ward

Minimum Health Care Package and this may be attributed to the action or inaction of the policy decision makers and local government authorities. The operationality of the package requires that government defines minimum health manpower requirement, equipment, drugs, infrastructure and services for the primary health centre (NPHCDA, 2007). This plan of action acknowledges that many local government authorities and communities may possess enough resources to provide services based on all the components of PHC (NPHCDA, 2007). The adequacy and distribution and of human resources for primary healthcare services especially immunization service delivery is however not within the scope or objectives of this study, but an emerging health system factor for further study.

5.3 Knowledge and Practice of Caregivers on Routine Immunization

Findings from this study show that of the 436 consenting caregivers, majority (56.2%) brought their children for immunization only, 28% for child's illness only and 15.8% for both child's immunization and treatment of illness. This implies that they were informed of or probably assumed these primary health care services including routine immunization are provided at these health facilities, and demonstrated a positive mobilization response on the demand side of service delivery. It has been documented that parental knowledge of vaccination and the diseases that vaccines protect against is an important determinant in the decision to vaccinate their child (Bond L, Nolan T, Pattison P, Carlin J., 1998; 12; Meszaros J.R., Asch D.A., Baron J., Hershey J.C., Kunreuther H., Schwartz-Buzaglo J., 1996). Though the channel of their information is not an objective of this study but was explored and found to be mostly (84.7%) health workers. Specifically, this study revealed that the caregivers brought their children aged 1 to 24 months for routine immunizations at the health facilities (table 1), and were mostly (91.1%) infants (less than one year old), and the mean age was 5.6±4.4 months. Their ages are found consistent with

the eligible age group for childhood routine immunization scheduled by the WHO and FMoH/ NPHCDA (National Immunization Policy, 2003).

Caregivers' knowledge about the disease and the vaccine is a predictor of higher vaccination compliance (Joseph N., Subba S., Nelliyanil M., Kotian S., Haridath A., Attavar S. et al. 2011). Findings on knowledge of the caregivers on RI showed that only 17.2% of the caregivers knew that a child should receive four doses of oral polio vaccine OPV from birth to first birthday; a few (25.5%) of them correctly mentioned that a child should receive three doses of diphtheria-pertussis-tetanus (DPT) vaccines; and only 3 (0.7%) correctly mentioned that a child should receive one dose of Measles vaccine (MV) at 9 months of age. These proportions showed critical knowledge gaps on schedule of child's immunization among the caregivers. It has been reported that caregivers who regularly immunized their children had better knowledge than caregivers who delayed child immunization. Delayed vaccination has been attributed mainly to deficient information about the importance of vaccination at time or the timing of vaccination (Nadia Abd El-Hamed Montasser, Randah Mohamad Helal, et al., 2014).

Furthermore, majority (63.5%) of the caregivers interviewed in this study mentioned that they were aware of the side effects of the specific immunization administered to their children and more than one-third (34.4%) also registered their ignorance. This is another knowledge gap which may lead to delayed vaccination. It has been reported some mothers refused to complete child vaccination due to high anxiety levels about vaccine side effect (Ozkaya E, Eker HH, Aycan N, Samanci N, 2010; De Serres G, Duval B, Boulianne N. 2002), and some parents believed that their children might have serious side effects when vaccinated (Freed GL, Clark SJ, Butchart AT, Singer DC, Davis MM, 2010).

A further analysis of this result showed that no significant difference existed in the caregivers' mean knowledge scores by age ($p>0.05$), but the mean knowledge score of the caregivers who were Christians (2.2±1.3) was significantly higher than Muslims (1.7±1.5). ($p<0.05$). Similarly, there was a statistically significant difference between education and mean knowledge score of the caregivers. Caregivers with tertiary education had the highest mean knowledge score (2.5±1.2) and lowest among caregivers with no formal education (1.7±1.5). Level of mother's education and religion has been linked to knowledge and practice of caregivers on immunization (CDC, 2009) and consistent with the findings in this study.

Regarding caregivers' practice on immunization, findings in this study revealed that vaccinations already received by the children of the caregivers at the time of interview included *BCG* (63.5%), *OPV1* (78.6%), *HBV1* (78.8%) and *DPT1* (79.4%), *DPT3* (12.5%), *OPV3* (11.3%), *HBV3* (5.8%), and *MV* (1.2%), while majority (93%) of the caregivers (mothers) themselves had ever received tetanus toxoid (TT) vaccinations. Given the mean age of the children as 5.6±4.4 months in this study, a best practice should be that 90 to 100% of the children had received BCG, OPV1&2, HBV1&2 and DPT1&2 vaccinations at 10 weeks (about 3moths) of age. Similarly, 18% of these children, who were aged 9 months and above, were expected to have received measles vaccination, but only 1.2% did. The gaps here suggested a practice of delayed vaccinations and others studies have identified that adherence to vaccine schedules tend to be highest at birth for hospital deliveries, but subsequently fall due to various factors, including low levels of knowledge of vaccine specific schedules and gaps between awareness and adherence to vaccine schedules.

It was observed during the study that there was stock out of BGC and Yellow Fever vaccines in most health facilities in the LGA during the period of this study. The gaps between the expected uptake and the actual uptake of vaccinations of the eligible children are indications of action and inactions within the immunization service delivery system whether the demand side or the supply side and need to be addressed to ensure fully immunized children by 12 months of age. In Nigeria, a child is considered to be fully immunized at the completion of a dose of BCG vaccine against tuberculosis at birth or soon after; three doses of DPT for the prevention of diphtheria, pertussis (whooping cough), and tetanus; at least 3 doses of polio vaccine; and a vaccination against measles. The DPT and polio vaccination should be given at approximately 4, 8, and 12 weeks of age; there is also a dose of polio vaccine that should be given at birth. Measles should be given at or soon after the child reaches nine months. W.H.O further recommends that children receive the complete schedule of vaccinations before 12 months of age and that each vaccination is recorded on a health card given to the parent or caregiver (WHO, 2004). In this study, we observed that many of the caregivers were given exercise books where the vaccinations given to the children were recorded.

Caregivers' satisfaction about perceived knowledge related to vaccines showed that those who practice regular vaccination of their children reported significant higher satisfaction compared to those who delayed the vaccination regarding vaccine safety, fever development, number of visits or vaccine schedule, and additional vaccines. The frequency of delayed vaccination in their study was 10% only in which more half of them mentioned that the delay was for DPT (60%). This delayed vaccination was mainly due to insufficient information about the importance of vaccination (56%), child illness (52.5%), negative knowledge about the vaccines (32%) while about one quarter due to vaccine deficiency in the health offices (Nadia Abd El-Hamed

Montasser, Randah Mohamad Helal, Noha Eladawi, Eman Mostafa, Fatma Abd El Rahman, Maged Saad and Soha Hamza, 2014). Similarly, it was found in this study that 5% of the caregivers mentioned they would not visit the same facility for next immunization appointment and their reasons included too long waiting time (26.8%), change of residence (23.9%) and repeated vaccines stock-out (9.8%).

During this study, while waiting to conduct exit interview for some caregivers, it was observed from the discussions between the ISPs and the mothers at various immunization sessions that some of the mothers did not attend antenatal care services, did not receive tetanus toxoid vaccination, were delivered of their babies at home or by traditional birth attendants, and did not want their babies to receive DPT vaccines due to their misconceptions about its possible side effects. These behaviours if not properly addressed may result into incidence of neonatal tetanus, diphtheria and whooping cough. Delayed vaccination among this study group might be pointing at educational, religious and/ or economic differences that impede effective communication between health workers and the caregivers. Effective communication begins when a health worker starts thinking about what keeps people from coming to a health facility and/ or what prevents them from keeping their next appointments (USAID, 2003). Therefore, training, reinforced by supportive supervision can increase health workers' technical and communication skills to promote behaviour change among the caregivers. Community-focused health communication activities involving the health care workers for increasing the level of awareness and knowledge regarding routine immunization and its benefits may also be effective.

For the sake of emphasis, as little as this proportion of the caregivers was, the actions of the 5% of caregivers when replicated over the entire 774 LGAs will adversely affect the overall

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For the sake of emphasis, as little as this proportion of the caregivers was, the actions of the 5% of caregivers when replicated over the entire 774 LGAs will adversely affect the overall

immunization coverage or achieving fully immunized children in Nigeria, which was earlier reported to have the world's second lowest rate of immunization coverage and the global centre of transmission of wild polio virus (WHO, 2005). The World Health Report in 2000 even ranked Nigeria as the 187th of the 191 member nations for its health systems performance.

Another observation made during the study was that that majority of the public primary health facilities selected in this study required infrastructural upgrade and health workforce to improve the effectiveness of essential health care service delivery including routine immunization (you may please refer to photo plates in the Annex). This is consistent with the report that primary healthcare services are highly ineffective and have deteriorated due to the lack of investment in personnel, facilities and drugs and because of poor management of the existing resources (PAHO, 2003). This speaks a whole lot about the fact that the health system, particularly at the primary level, is not working and is in a state of collapse. This could easily be avoided if the primary health care system goes through a reform and enhanced by political commitment essentially at the LGA level.

5.4 Knowledge and Practice of ISPs on Routine Immunization

Health workers are grass root agencies in immunization for rural as well as urban population. General practitioners and nurses were found the most important and the most reliable source regarding vaccination knowledge (Rogalska J, Augustynowicz E, Gzyl A, Stefanoff P, 2010). In order to achieve a balanced assessment, this study also assessed the knowledge of the immunization service providers regarding immunization service delivery. A 14 point knowledge score was aggregated from items of target diseases (tuberculosis, poliomyelitis, whooping cough, tetanus, measles), need to bring a sick child for immunization, fever presenting illnesses that

immunization can prevent (tuberculosis, poliomyelitis, whooping cough, tetanus, measles), and the need to inform parents about sides effects that can occur following immunization. The total score was computed and disaggregated over category of health worker, years of experience and previous training on immunization. The overall mean knowledge score of 70 consenting ISPs was 10.07±2.03. The maximum and minimum scores were 13 and 5 respectively. Few (37.1 %) ISPs scored below the mean knowledge score (table).

This study further reveled that most ISPs correctly identified Poliomyelitis (94.3%), Measles (85.7%), Diphtheria (84.3%) among others vaccines preventable diseases but a few ISPs did not know that Tuberculosis (24.3%), Tetanus (20.0%) and Pertussis (17.1%) were preventable by vaccination. Among the vaccine preventable diseases presenting fever correctly identified by the ISPs were Measles (80%), Poliomyelitis (60%), Pertussis (55.7%), Diphtheria (44.3), Tetanus (38.6%), and Tuberculosis (40%). Fifty four percent of them correctly stated that a sick child should be brought for immunization (table 8). ISPs showed knowledge gap about vaccinating these sick children; 37.1% of them actually stated that sick children need not to be brought by their caregivers for immunization. This implies that, any eligible sick child may be missed out from being vaccinated at the right age according to the national immunization scheme even after being presented at the health facilities. As already documented, like the caregivers, health workers themselves sometimes have misconceptions about immunization and therefore need technical assistance, which is best acquired in a setting similar to their work environment (USAID, 2003) and information on key immunization messages, which they can find in manuals from their country programme or from international sources (National Immunization Policy, 2003; WHO, 2004). The fact that majority (70%) of them identified that they knew the six (6) key messages for every parent/ guardian to ensure full immunization of a child and 88.6%

correctly stated that a parent of the immunized child should be informed of what side effects may occur (table 8) was pointing to that fact that the ISPs do completely know these knowledge items which is critical to ensuring fully immunized children.

The overall mean knowledge score of the ISPs was 10.1±2.0 (table 9). The mean knowledge scores of the trained ISPs and those who were not trained were 10.1±2.1 and 9.8±1.8 respectively. The ISPs' mean knowledge scores by training were not significantly different (P>0.05). By rank, the mean knowledge scores of CHO, Nurse and CHEW were 10.5±1.9, 10.2±2.1 and 9.9±2.0 respectively. The ISPs' mean knowledge scores by rank were not significantly different (P>0.05). By years of experience, the mean knowledge scores of those with <1 year, 1-4 years, 5-9 years and ≥10 years of working experience were 9.70±2.3, 10.2±1.8, 10.4±1.1, and 11.0±1.5 respectively. The ISPs' mean knowledge scores by rank were not significantly different (P>0.05). Similar to findings in this study, it has been reported that knowledge of health workers increased with higher basic qualification and recommended the possibility of raising the minimum cligible qualification for health workers training. Proper intermittent reorientation training and periodic reassessment for all health workers is necessary for successful immunization programme (Bairwa Amrit, Meena K.C., Gupta P.P., 1995).

Overall, indicators of best practices on routine immunization among the ISPs (vaccinators) in this study was good and could be attributed to the capacity building activities, mentoring and supervisory visits, material support sponsored by NPHCDA and its Partners on routine immunization and injection safety. Indicators on select best practices showed that 92.2% of them stored vaccines in cold boxes and maintained the cold chain; 78.4% filled out the stock sheet according cold chain maintenance whenever vaccines are moved; 77% estimated the target

population for routine immunization; 98% properly disposed of used safety boxes and other wastes shortly after immunization sessions; 94% informed the caregivers about immunization preventable diseases (IPDs) and the importance of the routine immunization scheme. However, periodic refresher trainings and supportive supervision for ISPs on cold chain maintenance and vaccines inventory management, estimating target population, monitoring, injection safety and health communication could help maintain the best practices (Aissatou Wade N., Karen V.R. and Mamadou A.D, 2004).

Some of the challenges or threats identified by the ISPs and caregivers in response to the open ended questions were predominantly health system challenges needed to be addressed to achieve the goal of routine immunization in the LGA/ health facility level included the following.

a. Inconsistent availability of vaccines in Gwagwalada LGA and vaccines stock out in the health facilities resulting to increasing drop-outs;

b. Poor support for outreach services especially to the hard to reach settlements;

c. Lack of dedicated vehicle for immunization service at LGA/ health facility level;

d. Poor community support/ involvement in routine immunization service delivery;

e. Mothers refusing to accept DPT antigens for their babies due to fear of side effects and misconceptions that sick children should not receive vaccinations;

f. Responsibility for tertiary, secondary and primary health is devolved across the three levels of government – federal, state and local respectively, but the capacity to handle responsibilities varies considerably, and is much lower at lower levels. Primary Health Care, and by extension, immunization services, which is the responsibility of the Local Government Areas (LGAs), bears the brunt of this capacity/responsibility gap.

g. Funding constraints identified resulted more from the failure to expend than failure to budget. There are federal and state budget line items for routine immunization, but the release of such funds is neither guaranteed nor timely. The same thing happens at the LGAs, and to an even greater extent here, provisions are made but funding disbursements are not. As such, RI programs struggle to conduct basic operational tasks needed to vaccinate children. For example, program managers and health workers complained about the lack of funds to fuel vehicles or take public transport to collect vaccines from state or LGA cold stores.

h. With the country's unreliable power supply, generators are a necessity. Where generators exist, there is often no money to fuel them to maintain the cold chain. Solar fridges and freezers lay fallow due to lack of maintenance. Partners like GAVI, WHO, UNICEF, DFID, EU and USAID have helped make strides in some areas, but problems still remain.

i. The federal government plays an important role in procuring and supplying vaccines to states and providing technical oversight, but because of the structure of Nigeria's government, the federal government does not have authority to drive change at lower levels.

Solutions must be implemented at the state and LGA level, because most barriers are occurring in these levels. In planning and communication, provision is needed to increase availability and access to routine immunization service delivery at both the all primary healthcare centres, both private and public; deal with effects of incomplete education and knowledge regarding routine immunization, and how this might lead to irrationality and paranoia in large population.

Building local capacities on communication for behaviour change in the context of improving routine immunization will increase health workers' knowledge and improve technical and

communication skills, and consequently influence desirable behaviour among their recipient community. Comprehensive information about immunization/ injection safety profiles and side-effects is needed for effective community mobilization. Parents should be infonned about possible side-effects and what to do should they occur. Independent experts with knowledge of pharmacovigilance must be on hand to quickly investigate unexpected effects.

Parents and the general public should be briefed about the purpose of immunization programmes especially in children or pregnant women. People and their culture, and problems that could emerge, need understanding. Standing emergency committee is needed to manage sudden crises and public relations, and for rapid deployment of experts on the ground or by telephone if necessary.

In addition to building capacity, continuous advocacy is required to guarantee that the system is adequately funded at all levels. A firm foundation with the capacity for supportive supervision must be in place first even before health workers are trained.

CONCLUSION: Knowledge about RI is low (but not poor) among both the caregivers and ISPs which informed their practices on immunization in this study. Also limiting factors relating to the health system may hinder continued provision and acceptance of immunization service delivery in the study area. Consequently, suitable and sustainable health care resources and interventions to strengthen the health system, increase the RI demand from the recipient community and effective delivery of RI services at both the public and private primary health care centres are strongly recommended.

RECOMMENDATIONS:

Policy review and implementation, to ensure that National Immunization Policy is well implemented, NPHCDA currently implementing NPI must review its systems of operations and ensure consistent development of the Strategic Plan like using definite logical framework and updates to capture relevant issues and gaps identified through lessons learnt and consultative meetings with all stakeholders.

The REW strategy for example, is very critical to improving and strengthening RI in Nigeria and should be fully implemented. Strengthening a health care system involves an ongoing effort. with strong partner collaboration and continuous capacity building. The process requires years of concentrated efforts and maintaining a functional system lasts forever. All levels of the health care system- health facility, ward, LGA, state, region, and national-must understand and apply the concepts of REW.

Participatory planning and tools development promotes ownership and commitment. LGA and health facility staff can assist in collecting baseline information or health staff can set their own standards by which to be supervised. It is imperative to entrench a planning culture. One way to accomplish this involves using a recognition approach. There are other motivators besides money—recognition among peers can be used as motivation and encouragement for others to adopt good management practices. Local management teams also must realize that they play a critical role in both the political and the technical aspects of health care, and that their actions (or inactions) affect other levels as well.

Supportive supervision and training go hand-in-hand, providing the much needed reinforcement training through continuous on-the-job coaching and mentoring. Routine use of an analytical supervision check list with quantifiable scores documents the visit, measures performance, and creates accountability. Health workers need and want training on how to analyze and use their own data; not just on filling in forms and reporting. Simple, hand-drawn charts and graphs can be used; a computer is not necessary. When immunization service providers understand the value of their own data, data quality improves. Long-term structures must be put into place for training future staff or for refresher trainings. A governmentdriven structure for capacity building and for maintaining standards is essential for sustaining any health service. Participatory and practical training should be built into a long term structure for continuous capacity building.

Reaching one hundred percent immunisation coverage: As a priority programme this is one of the most important public health activities that a health facility can undertake. Immunization services providers should discuss these ideas together and carry out these and other efforts to assure that every child born in the catchment area of the clinic is fully immunized before reaching his/her first birthday.

1. **Register** each pregnant woman by name in a pregnancy register (ANC) and follow up to be sure that her child comes for immunization on a regular basis, even if she delivers in a different institution. Many registers are incorrectly used, writing the name on a new line each time the mother or child comes to the clinic. A single line on the register is adequate to identify the mother and then the newborn child and follow that child, recording each immunization recorded until fully immunized with the nine months dose of yellow fever, measles and vitamin A having

completed BCG, polio, DPT, HBV series. A large box at the right-hand end of the line can indicate full immunization and the date.

2. **Wall chart** - a wall chart can be maintained listing the names of children in the month in which they will reach their first birthday. Each child, as they come to be immunized, is entered once on that chart in the month of their first birthday. When the child completes full primary immunization his name is ticked off or a star is placed next to the name. Each month, any child in that month's box who does not already have a star next to the name will be actively sought out and brought to the clinic to complete full immunization if the 'yellow card' does not indicate that it was already done elsewhere. This provides an easy to monitor tool for clinic staff to see who has been missed out and they may take early action.

3. **A cumulative coverage graph for fully immunized children** to be kept on the wall of each immunization service delivery point. The supervisor can show how to prepare and maintain this graph showing progress each month.

4. **A missed opportunity contest** can be held between nurses/ immunization providers to see who can detect children coming to clinic for other complaints who need to be immunized before they leave the clinic. Nurses are recognized for having found and immunized the most children.

Ask the village/ community elders to help celebrate a special immunization day, perhaps a particularly convenient time for mothers and children on a given afternoon or a Saturday morning when the clinic will celebrate immunization and all children will come. Drums, traditional dancing, music and a festive occasion can involve everyone in the village/ community.

5. **Mobilize the schools** to have each child go home and check their own sibling's immunization cards and bring their siblings to the clinic if immunization is missing. This is a school health and education activity, which teaches school children the importance of immunization and uses them to reach into every home, their own and neighbours. to find un-immunized children.

6. Ask the district office for transport for a **special village outreach** on an announced day to enable clinic staff to provide an immunization service in the more distant villages of your catchment area making it more convenient. Adequate advance announcement to that village through its leaders and key informants is very important. This may be done with a special visit of your clinic supervisor who can help you organize and will of course arrange for your transport.

7. Ask the village/ community elders or responsible women volunteers in the village to **collect all immunisation cards** of children under two years of age and bring those cards to the clinic. Look at each card and determine whether the child is either fully immunized, or if further doses are needed, dividing them into two piles. Return the cards to the women volunteer showing her which pile of cards belong to children who must return to the clinic as soon as possible to complete their immunisation while the other pile of cards will be returned to children who are fully immunized and are not required to come to the clinic (until later boosters are required). Cards can be collected and returned on the same day as this takes very little time to sort in the clinic. A list can be kept of the names of the cards returned that are requiring further shots. If the wall chart and register are being used, check that these names also appear there.

8. Institutionalize Quality Assurance/ Quality Improvement actions: Reproduce and widely disseminate the IEC materials on immunization to provide vaccinators with tools to be used during IEC sessions with mothers. Solve the logistical problems faced by vaccinators by providing motorcycles for immunization activities, in order to boost their motivation. Update vaccinators' tools to include all the necessary headings (population, target, date, antigen) for recording data on a tally sheet or in a notebook, and produce management tools in sufficient quantity, especially infant cards, immunization cards and books, and stock sheets, to avoid frequent stock outs at health centers. Update the list of indicators to emphasize vaccine coverage.

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ANNEX

CHILDREN UNDER 1 YEAR:

Contact	Age	Vaccine	Dosage	Route of administration/ Site
1st	At birth	BCG	0.05 ml	Intradermal/ Right Upper Arm
		OPV0	2 drops	Oral/ Mouth
		HBV1	0.5 ml	Intramuscular (IM)/ Upper arm
2nd	6 weeks	OPV1	2 drops	Oral/ Mouth
		DPT1	0.5 ml	IM/ Antero lateral thigh
		HBV2	0.5 ml	IM/ Upper arm
3rd	10 weeks	OPV2	2 drops	Oral/ Mouth
		DPT2	0.5 ml	IM/ Antero lateral thigh
4th	14 weeks	OPV3	2 drops	Oral/ Mouth
		DPT3	0.5 ml	IM/ Antero lateral thigh
		HBV3	0.5 ml	IM/ Upper arm
5th	9 months	MV	0.5 ml	Subcutaneous/ Left upper arm
		YF	0.5 ml	Subcutaneous/ Left upper arm
		Vitamin A	10,000 IU	Oral/ Mouth

TETANUS TOXOID IMMUNIZATION SCHEDULE FOR WOMEN OF CHILDBEARING AGE:

Dose	Schedule	Expected duration of protection
TT1	At first contact with women of childbearing age, or as early as possible in pregnancy	None
TT2	At least 4 weeks after TT1	1-3 years
TT3	At least 6 months after TT2	5 years
TT4	At least 1 year after TT3 or during subsequent pregnancy	10 years
TT5	At least 1 year after TT4 or during subsequent pregnancy	All the childbearing years

ANNEX

CHILDREN UNDER 1 YEAR:

Contact	Age	Vaccine	Dosage	Route of administration/ Site
1st	At birth	BCG OPV0 HBV1	0.05 ml 2 drops 0.5 ml	Intradermal/ Right Upper Arm Oral/ Mouth Intramuscular (IM)/ Upper arm
2nd	6 weeks	OPV1 DPT1 HBV2	2 drops 0.5 ml 0.5 ml	Oral/ Mouth IM/ Antero lateral thigh IM/ Upperarm
3rd	10 weeks	OPV2 DPT2	2 drops 0.5 ml	Oral/ Mouth IM/ Antero lateral thigh
4th	14 weeks	OPV3 DPT3 HBV3	2 drops 0.5 ml 0.5 ml	Oral/ Mouth IM/ Antero lateral thigh IM/ Upper arm
5th	9 months	MV YF Vitamin A	0.5 ml 0.5 ml 10,000 IU	Subcutaneous/ Left upper arm Subcutaneous/ Left upper arm Oral/ Mouth

TETANUS TOXOID IMMUNIZATION SCHEDULE FOR WOMEN OF CHILDBEARING AGE:

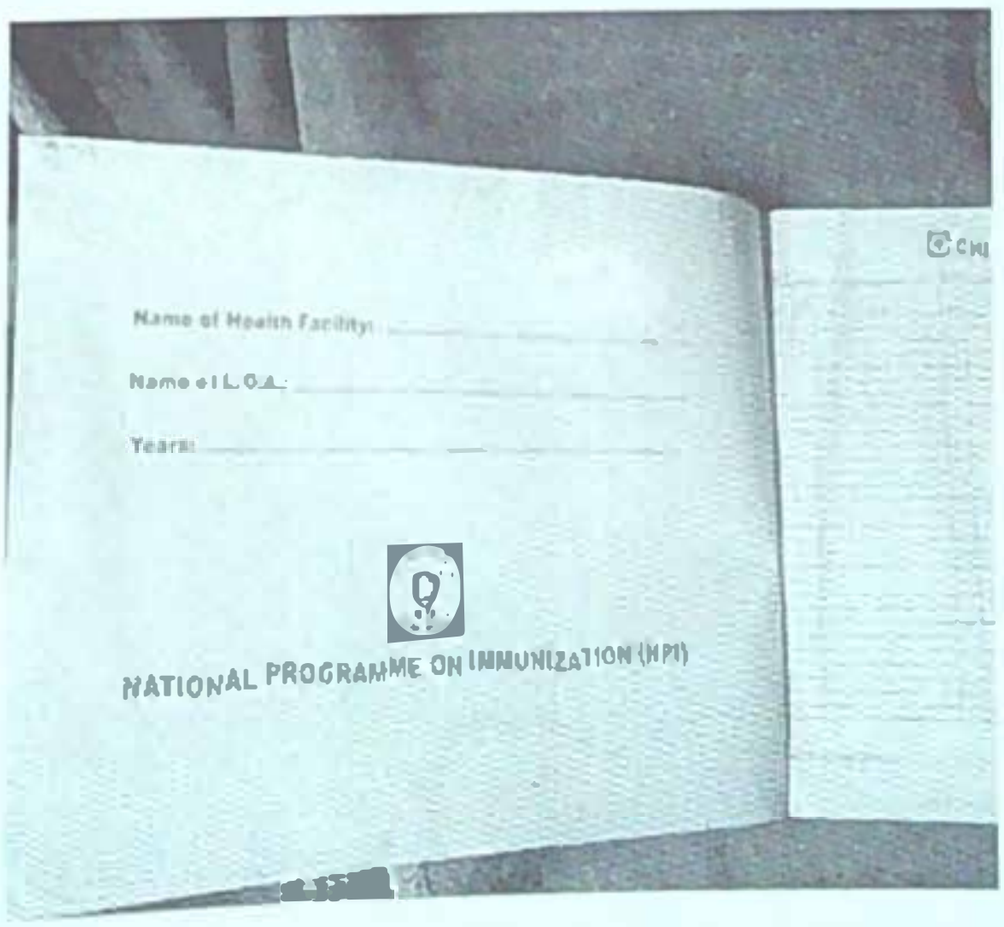
Dose	Schedule	Expected duration of protection
TT1	At first contact with women of childbearing age, or as early as possible in pregnancy	None
TT2	At least 4 weeks after TT1	1-3 years
TT3	At least 6 months after TT2	5 years
TT4	At least 1 year after TT3 or during subsequent pregnancy	10 years
TT5	At least 1 year after TT4 or during subsequent pregnancy	All the childbearing years

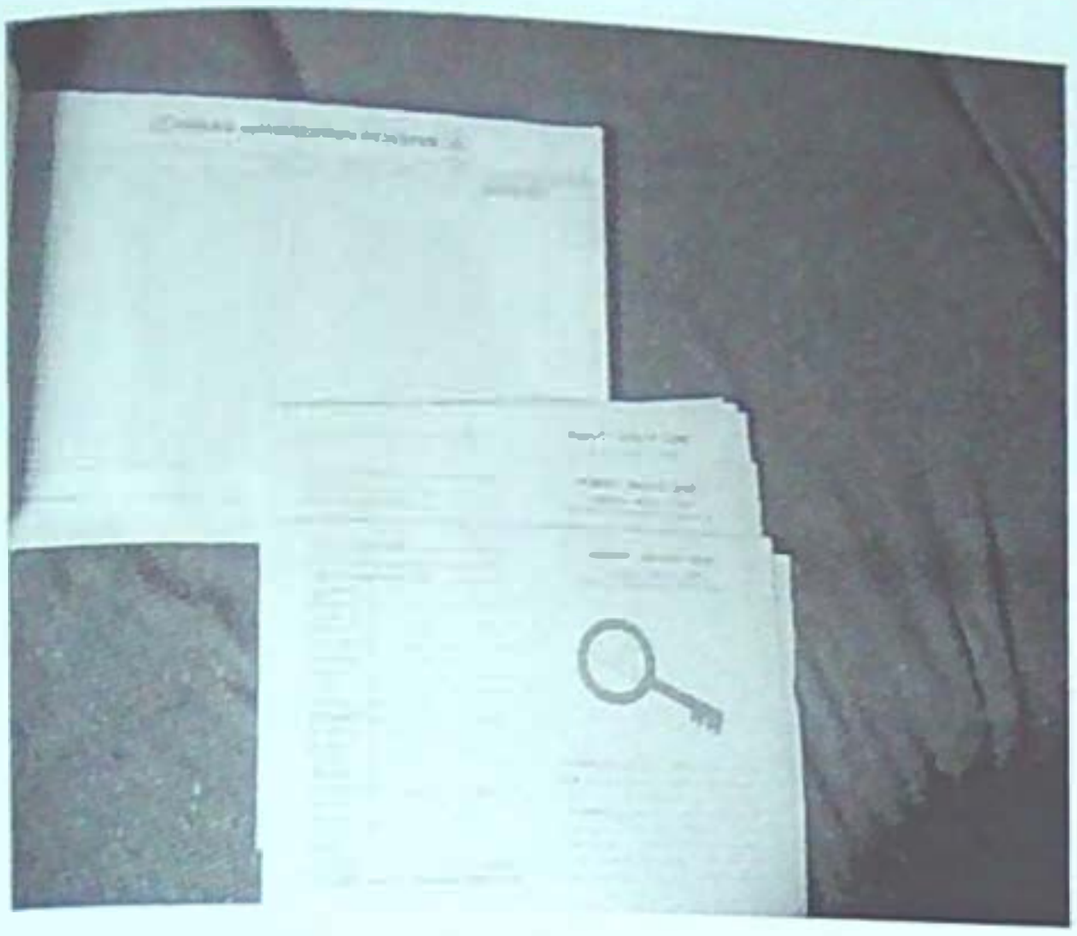
RECOMMENDED SCHEDULE FOR CHILDREN WITH HIV/AIDS INFECTION:

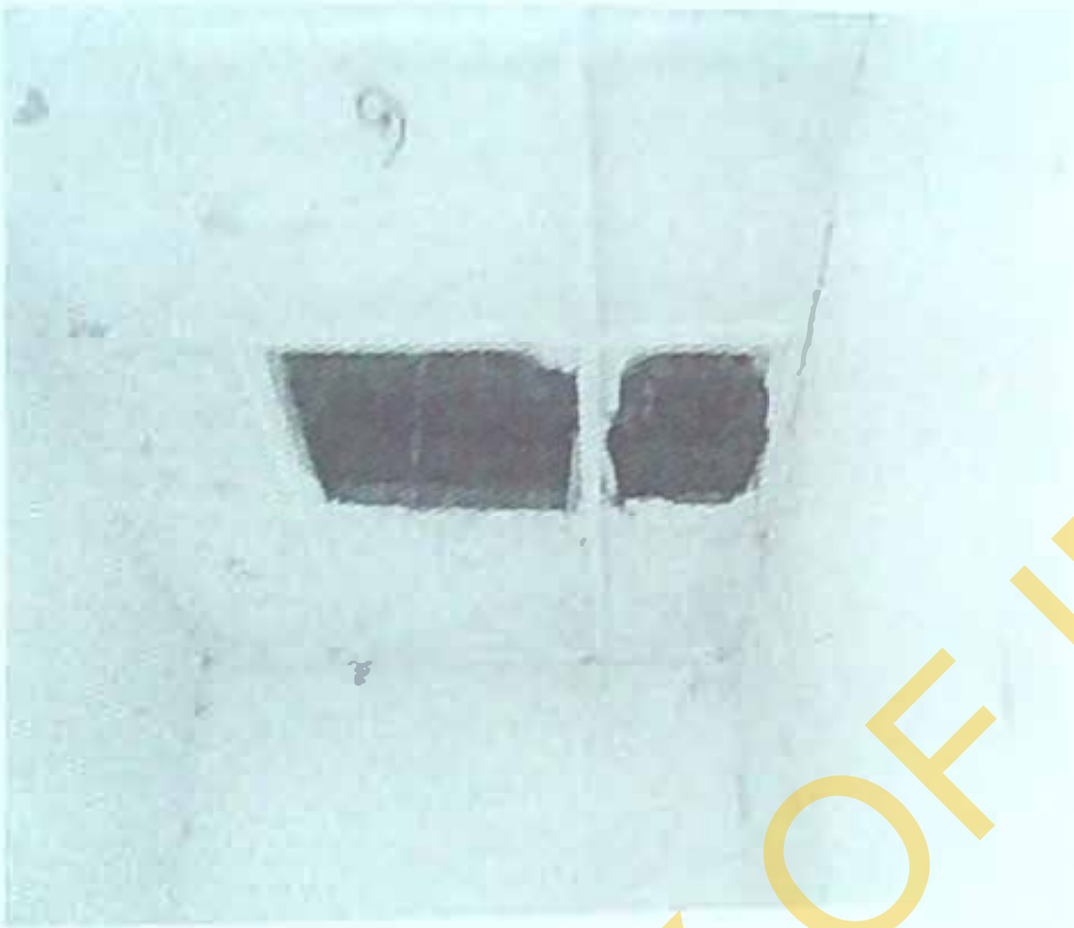
Vaccine	Asymptomatic HIV infection	Symptomatic HIV infection	Optimal timing of immunization
BCG	YES	NO	At birth
DPT	YES	YES	6,10,14 weeks
OPV	YES	YES	0,6,10,14 weeks
MV	YES	YES	9 months
HBV	YES	YES	0,6 and 14 weeks
YF	YES	NO	9 months
TT	YES	YES	5 doses as for Women of Child Bearing Age

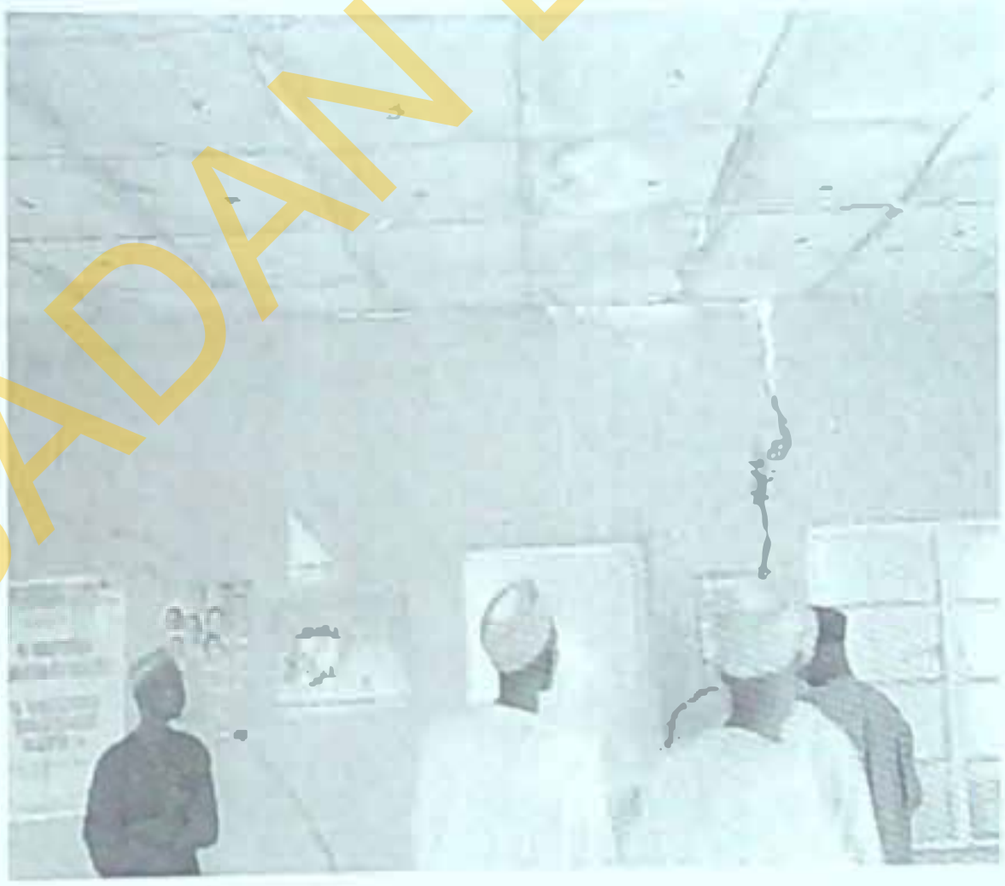
Source: National Immunization Policy, 2003.

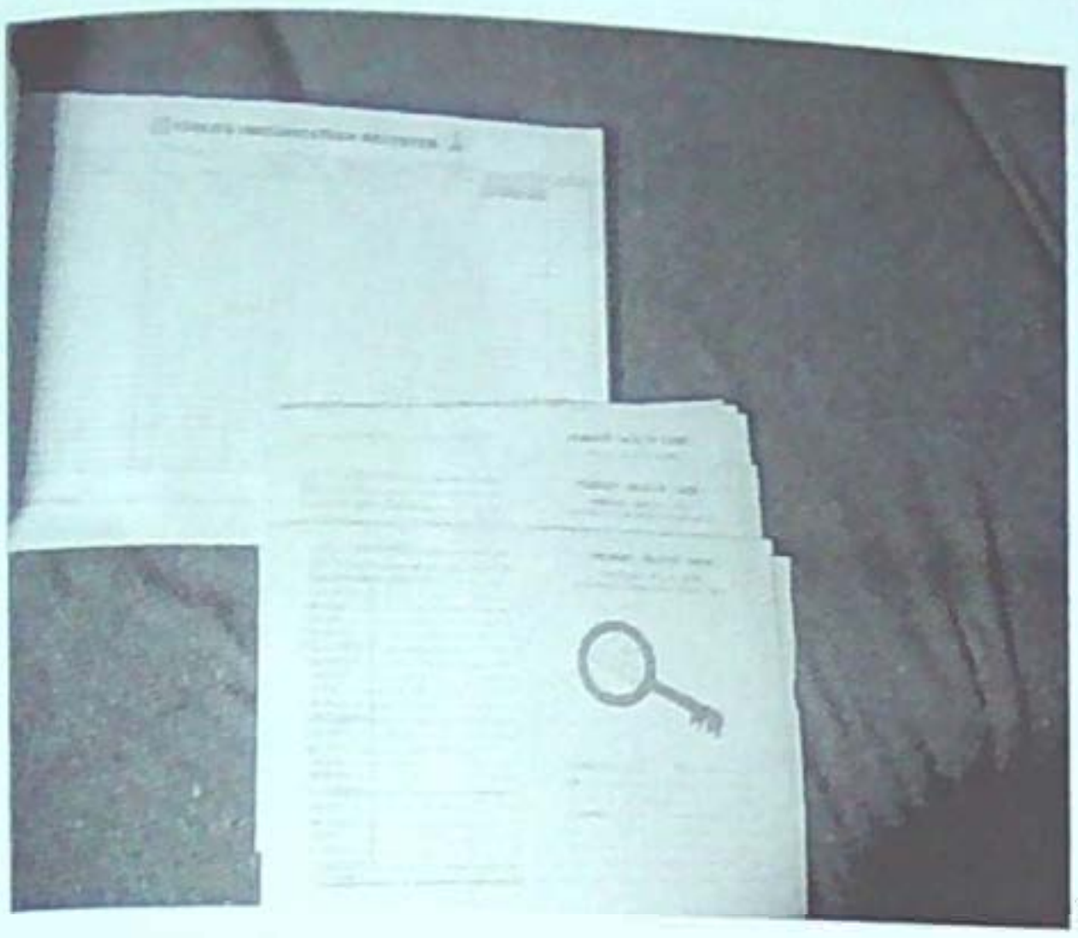
Appendix 1: Plates

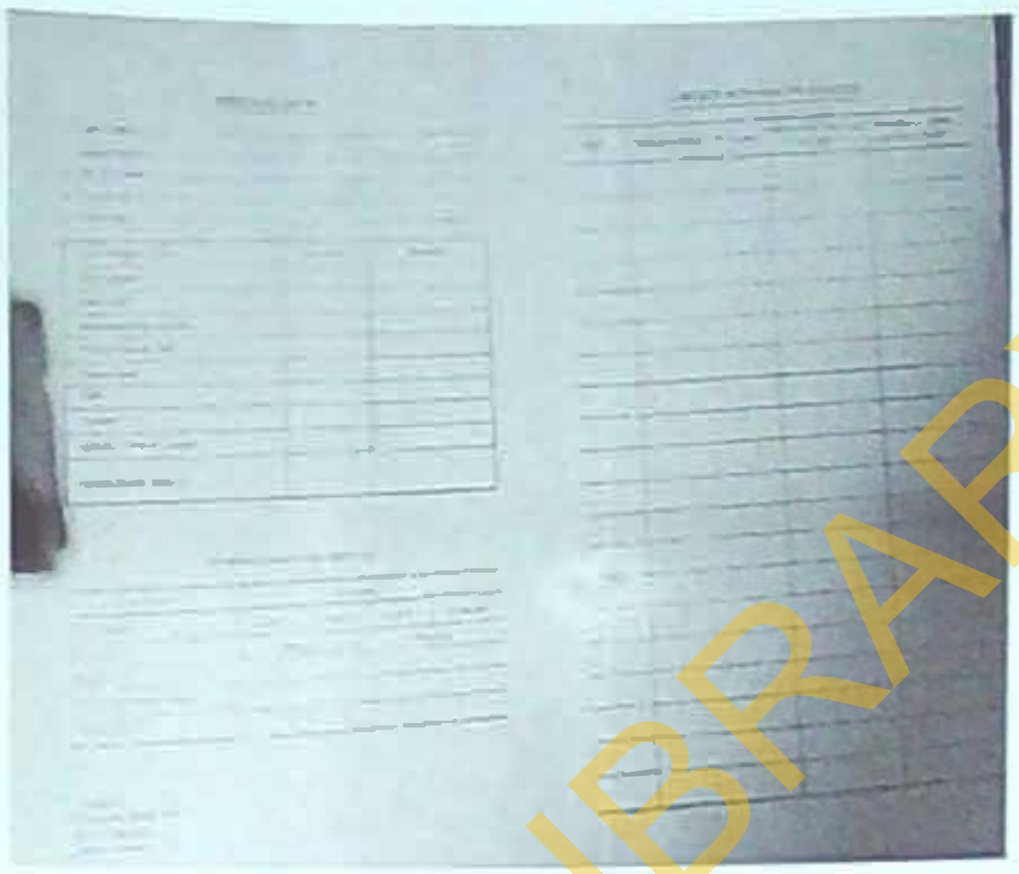


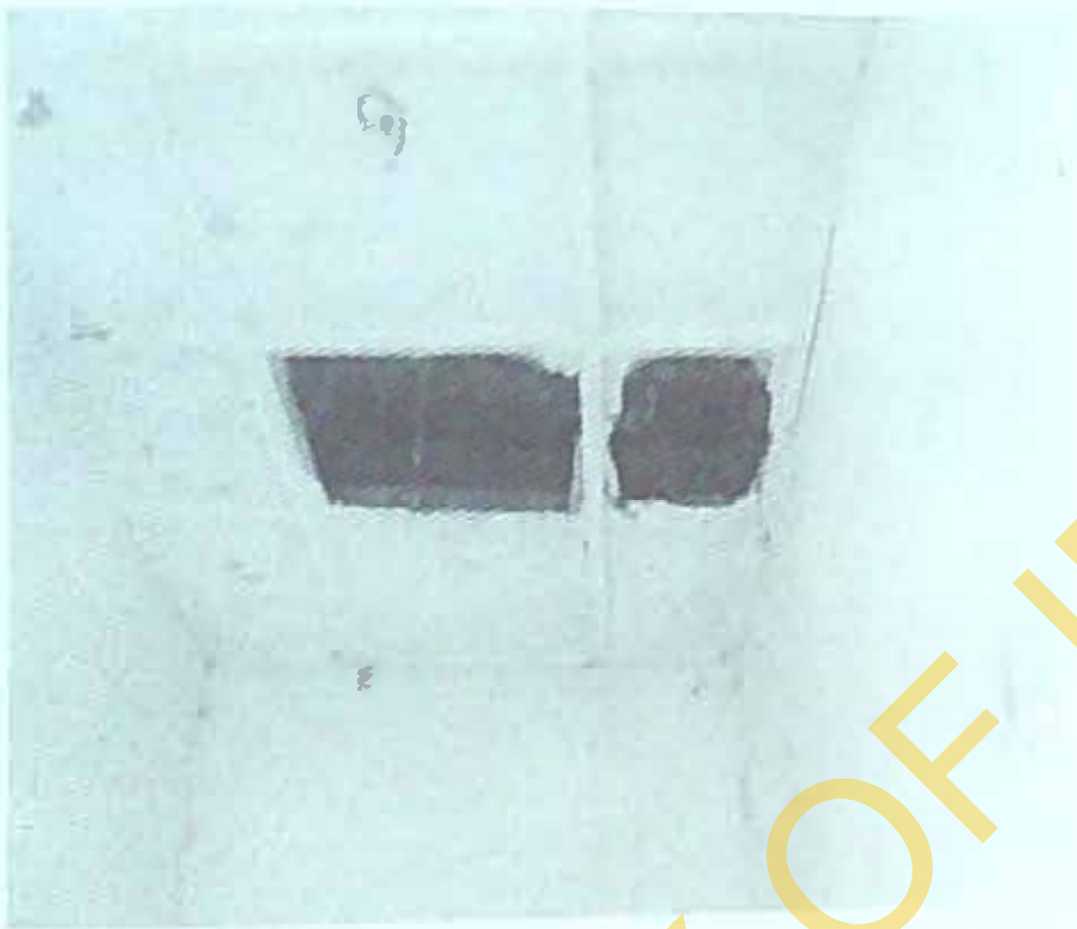


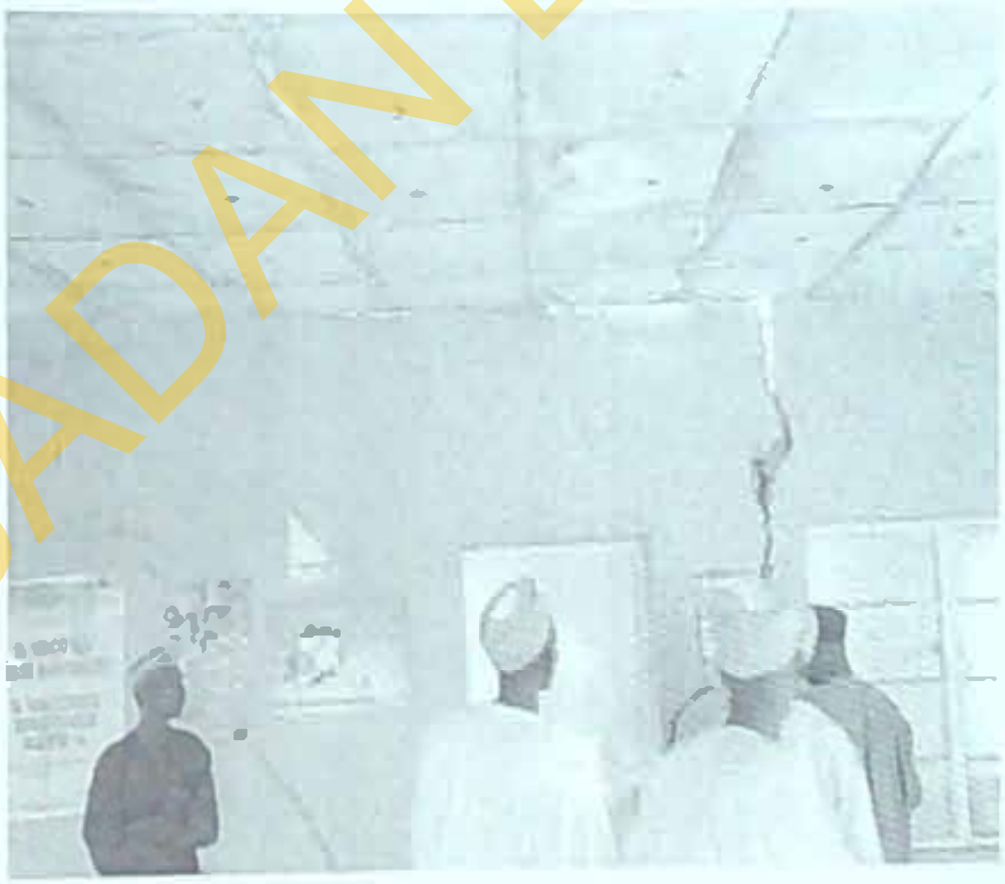


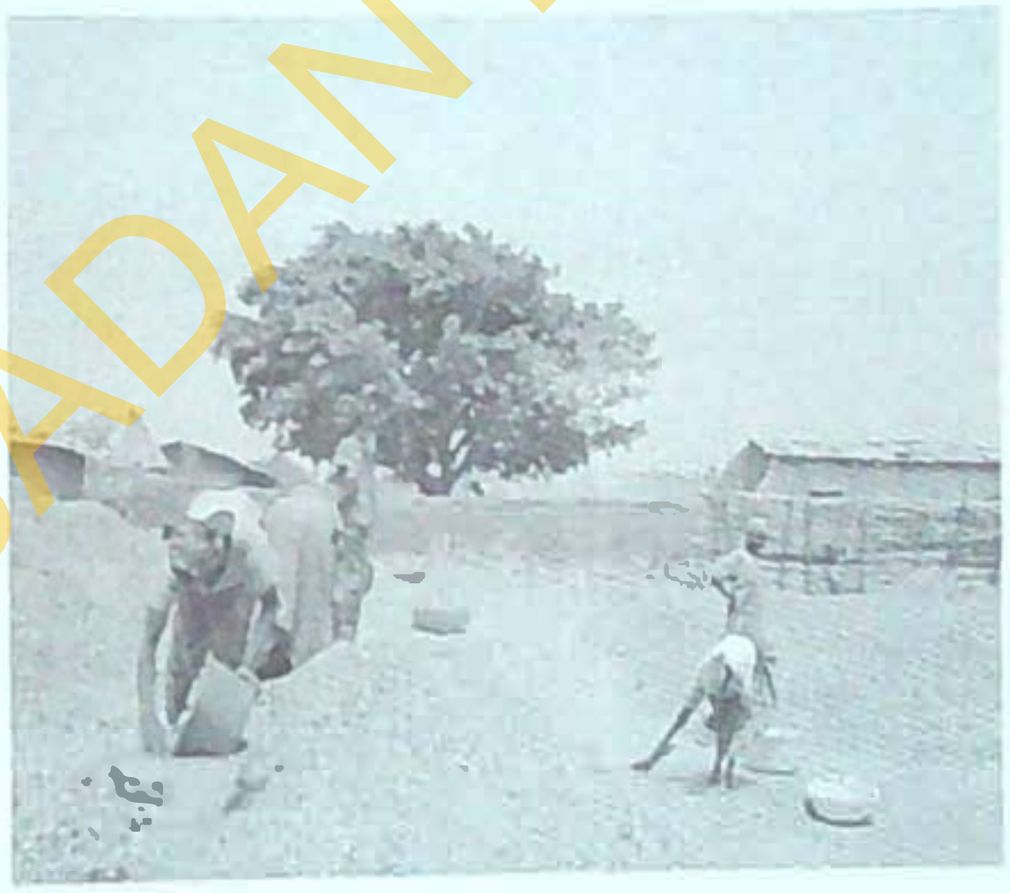












Appendix 2: Immunization coverage from August 2006 to January 2007 in Gwagwalada LGA

S/No.	Month	COVERAGE						
		BCG	DPT	OPV	HBV	MEASLES	YF	TT
1	Aug.	441	1755	1866	1429	770	677	875
2	Sept.	0	1266	685	1322	150	9	960
3	Oct.	671	1103	1175	1235	357	348	734
4	Nov.	936	4032	46998*	1154	6976	434	1752
5	Dec.	164	825	1408	814	369	352	476
6	Jan.	229	2065	61184*	5855	112	187	1242

* NIDs and IPDs coverage added which include the under-five children.

- Annual Target Population for Routine Immunization: 6388
- Monthly Target Population for Routine Immunization: 532
- Distribution of vaccines is based on their availability and target population of implementing health facilities.
- Stock balance is taken every time vaccines are supplied to these facilities, while stock balance is sent to NPI Unit Public Health Division FCT, Abuja.

Appendix 3:

LIST OF RECOGNIZED HEALTH FACILITIES IN GWAGWALADA LGA

PUBLIC HEALTH FACILITIES

CODE	NAME OF HEALTH FACILITY	LOCATION	ROUTINE IMMUNIZATION
GRI01	GWAGWALADA SPECIALIST HOSPITAL	ALONG DOBI ROAD	PRESENT
GRI02	KUTUNKU 1 HEALTH CLINIC	OLD KUTUNKU	PRESENT
GRI03	KAYIDA TSOHO HEALTH POST	KAYIDA TSOHO, GWAGWALADA	PRESENT
GRI04	GWAKO HEALTH CLINIC	ALONG GIRI-AIRPORT ROAD	PRESENT
GRI05	GIRI HEALTH CLINIC	ALONG AIRPORT ROAD	PRESENT
GRI06	ANAGADA HEALTH POST	ALONG SULEJA ROAD	PRESENT
GRI07	SHENAGU HEALTH POST	GWAGWALADA	PRESENT
GRI08	TUNGAN MAJE HEALTH CLINIC	ALONG SULEJA ROAD	PRESENT
GRI09	YIMI HEALTH POST	YIMI, GWAGWALADA	PRESENT
GRI10	WUNA HEALTH POST	IBWA, GWAGWALADA	PRESENT
GRI11	DOBI HEALTH CLINIC	DOBI, GWAGWALADA	PRESENT
GRI12	TSAUNI HEALTH POST	GWAGWALADA	PRESENT
GRI13	ZUBA HEALTH CLINIC	MINISTER'S HILL AREA	PRESENT
GRI14	RAFIN ZURFI HEALTH POST	ALONG GAC SECRETARIAT ROAD	PRESENT
GRI15	WUMI HEALTH POST	ALONG IZOM ROAD	PRESENT
GRI16	GURFATA HEALTH POST	NEAR IBWA VILLAGE	PRESENT
GRI17	PEBEYI HEALTH POST	AFTER DOBI, ALONG OLD IZOM ROAD	PRESENT
GRI18	HEATH CLINIC PAIKOKORE	PAIKOKORE, DOBI DISTRICT, GWAGWALADA	PRESENT
GRI19	DUKWA HEALTH POST	ALONG G.A.C. SECRETARIAT ROAD	PRESENT
GRI20	BASIC HEALTH CENTRE	DOBI, KAYIDA DISTRICT, GWAGWALADA	PRESENT
GRI21	GWAGWALADA TOWN CLINIC	ALONG TOWN HALL ROAD	PRESENT

PRIVATE HEALTH ESTABLISHMENTS

GRI22	GWAGWALADA CLINIC & MATERNITY	KUTUNKU	PRESENT
GRI23	JERAB HOSPITAL	FRCN ROAD KUTUNKU	PRESENT

GRI24	MARABA CLINIC & MATERNITY	OPP. COOPERATIVE BANK, GLADA	PRESENT
GRI25	ALHERI CLINIC & MATERNITY	OPP. YUSHAHAT HOTEL, KUTUNKU	PRESENT
GRI26	IBWA CLINIC	IBWA VILLLAGE	PRESENT
GRI27	UNIVERSAL NURSING & MATERNITY HOME	PAIKOKORE, ALONG DOBI ROAD	ABSENT
GRI28	JAMAD CLINIC	DAGIRI	ABSENT
GRI29	GONITA CLINIC & MATERNITY	DAGIRI	ABSENT
GRI30	ALHERI CLINIC GWAKO	GWAKO	ABSENT
GRI31	LIVINGSTREAM CLINIC	ANGLE 90 NEAR UNIABUJA	ABSENT
GRI32	OJOCHIDE CLINIC	IBWA	ABSENT
GRI33	YIMI CLINIC	YIMI	ABSENT
GRI34	NASSARA CLINIC	T/MAJE	ABSENT
GRI35	GIRI CLINIC AND MATERNITY	GIRI	ABSENT
GRI36	NAKOWA CLINIC	GWAGWALADA	ABSENT
GRI37	SALIU MEMORIAL HOSPITAL, ZUBA	MADALA JUNCTION	PRESENT
GRI38	ST. MARY HOSPITAL	FRCN ROAD KUTUNKU	PRESENT

Distribution of the Health Facilities/ Establishments by Type and Ownership

	Hospital		Health Clinic		Health Centre		Health Post		
	Providing Routine Immunization Services								
Ownership	Yes	No	Yes	No	Yes	No	Yes	No	Total
Public	1	0	8	0	1	0	11	0	21
Private	3	0	4	10	0	0	0	0	17
Total	**4**	**0**	**12**	**10**	**1**	**0**	**11**	**0**	**38**

- 21 (100%) public health facilities and 7 of 17 (29%) private health facilities were providing routine immunization services.

Appendix 4: Questionnaires

COLLEGE OF MEDICINE OF THE UNIVERSITY OF IBADAN

STRENGTHENING ROUTINE IMMUNIZATION SERVICE DELIVERY IN NIGERIA

Assessment on Routine Immunization Service Delivery

FORM 1: Self-administered Interview for the Immunization Service Provider/ Healthcare Worker

1. Facility Identification

District: _____ DISTRICT CODE.....

Town: _____ TOWN CODE .....

Name and address of the health facility: _____

_____

_____ FACILITY CODE .....

Type of health facility*: 1=Hospital
2=Health Center
3=Health Post
4=Clinic
5=Other: _____ FACILITY TYPE .....

Operating authority*: 1=Government
2=Non-Governmental Organization
3=Private for-profit
4=Other: _____ OPERATING AUTHORITY .....

2. Information about Interview

Date: _____ DAY .....
MONTH .....
YEAR .....

Name of the interviewer: _____ INTERVIEWER CODE .....

Age of health worker AGE

Sex of health worker (Enter 1=Female; 2=Male in the boxed cell) SEX

Health worker's code**: HEALTH WORKER CODE

** Health worker's code Clinician (01), Pharmacist (02) Registered Nurse (03), Registered midwife (04), Enrolled nurse (05), CHO (06), CHEW (07), others (08)

*Use local facility type names or operating authority

3. Information about Visit

INTRODUCE YOURSELF TO THE HEALTH WORKER.

Hello. I am from the College of Medicine of UI, Department of EMSEH. We are collecting some information regarding the quality of services that you render today in this facility. All the information you give me will be kept strictly confidential, and your services in this facility in the future will not be affected by your participation or nonparticipation. You may refuse to answer any of the questions, and you may stop the interview at anytime.

Do you have any questions for me now? Do you agree to participate?

NO.	QUESTIONS	CODING CLASSIFICATION	GO TO
	May I begin the interview?	HW AGREES..... 1 HW REFUSES..... 2	→STOP
1	For how long have you been working in this health facility? CIRCLE THE APPROPRIATE RESPONSE	LESS THAN 1 YEAR..... 1 1-5 YEARS ..... 2 5-10 YEARS..... 3 10 YEARS ABOVE..... 4 DON'T KNOW..... 5	
2	Does this facility render routine immunization services	YES..... 1 NO..... 2	→STOP
3	IF YES: Which activity/ activities do you handle regularly during immunization session?	SUPERVISION.....1 HEALTH TALK.....2 VACCINATION.....3 RECORDING.....4	
4	When was the last routine immunization session held in this facility?	WITHIN THE PAST 1WEEK.....1 WITHIN THE PAST 1MONTH.....2 MORE THAN 1 MONTH AGO.....3 DON'T KNOW.....4 NEVER DONE.....5	
5	How many times in a month is routine immunization session conducted in your health facility?	ONCE.....1 TWICE.....2 THRICE.....3 OTHER _____ 4 (SPECIFY)	
6	How long ago were you trained as immunization provider?	WITHIN THE PAST 1WEEK.....1 WITHIN THE PAST 1MONTH.....2 2 – 6 MONTHS AGO.....3 6 MONTHS - 1 YEAR..... 4 1-5 YEARS .....5 5-10 YEARS.....6 10 YEARS ABOVE.....7 CAN'T REMEMBER.....8	
7	Please identify all the target diseases that you know children are protected against by immunization.	TUBERCULOSIS.....1 POLIOMYELITIS.....2 WHOOPING COUGH.....3 DIPHTHERIA.....4 TETANUS.....5 MEASLES.....6	
8	Should a sick child be brought for immunization?	YES..... 1 NO..... 2 DON'T KNOW..... 3	

3. Information about Visit

INTRODUCE YOURSELF TO THE HEALTH WORKER.

Hello. I am from the College of Medicine of UI, Department of EMSEH. We are collecting some information regarding the quality of services that you render today in this facility. All the information you give me will be kept strictly confidential, and your services in this facility in the future will not be affected by your participation or nonparticipation. You may refuse to answer any of the questions, and you may stop the interview at anytime.

Do you have any questions for me now? Do you agree to participate?

NO.	QUESTIONS	CODING CLASSIFICATION	GO TO
	May I begin the interview?	HW AGREES..... 1 HW REFUSES..... 2	→STOP
1	For how long have you been working in this health facility? CIRCLE THE APPROPRIATE RESPONSE	LESS THAN 1 YEAR..... 1 1-5 YEARS ..... 2 5-10 YEARS..... 3 10 YEARS ABOVE..... 4 DON'T KNOW..... 5	
2	Does this facility render routine immunization services	YES..... 1 NO..... 2	→STOP
3	IF YES: Which activity/ activities do you handle regularly during immunization session?	SUPERVISION.....1 HEALTH TALK.....2 VACCINATION.....3 RECORDING.....4	
4	When was the last routine immunization session held in this facility?	WITHIN THE PAST 1WEEK.....1 WITHIN THE PAST 1MONTH.....2 MORE THAN 1 MONTH AGO.....3 DON'T KNOW.....4 NEVER DONE.....5	
5	How many times in a month is routine immunization session conducted in your health facility?	ONCE.....1 TWICE.....2 THRICE.....3 OTHER _____ 4 (SPECIFY)	
6	How long ago were you trained as immunization provider?	WITHIN THE PAST 1WEEK.....1 WITHIN THE PAST 1MONTH.....2 2 – 6 MONTHS AGO.....3 6 MONTHS - 1 YEAR..... 4 1-5 YEARS .....5 5-10 YEARS.....6 10 YEARS ABOVE.....7 CAN'T REMEMBER.....8	
7	Please identify all the target diseases that you know children are protected against by immunization.	TUBERCULOSIS.....1 POLIOMYELITIS.....2 WHOOPING COUGH.....3 DIPHTHERIA.....4 TETANUS.....5 MEASLES.....6	
8	Should a sick child be brought for immunization?	YES..... 1 NO..... 2 DON'T KNOW..... 3	

NO	QUESTIONS	CODING CLASSIFICATION
9	**What illnesses that may cause fever are preventable by Immunization?** **CIRCLE SPONTANEOUS ANSWERS, THEN PROBE AND TICK FOR OTHERS?**	**TUBERCULOSIS.....1** **POLIOMYELITIS.....2** **WHOOPING COUGH.....3** **DIPHTHERIA.....4** **TETANUS.....5** **MEASLES.....6**
10	**Do you know the six (6) key messages for every parent/ guardian to ensure full immunization of a child?**	**YES.....1** **NO.....2**
11	Should a parent of the immunized child be informed of what side effects may occur?	YES.....1 NO.....2
12	Which of these NPI vaccines/ supplement are usually not available for use in your health facility/ community?	BCG .....1 OPV .....2 HBV .....3 DPT .....4 MEASLES .....5 YELLOW FEVER .....6 VITAMIN A.....7 TETANUS TOXOID.....8 NONE.....9
13	Any successful attempt to procure the vaccine(s) stated not available in 12 above?	YES.....1 NO.....2
14	Which of the following is/are peculiar challenge(s) facing routine immunization in your facility/ community?	Repeated vaccines stock out.....1 Deficient cold chain system ..... 2 High drop-out rate ..... 3 Low turn-out for immunization... 4 Inadequate staffing ..... 5 Insufficient funding.....6 Poor communal support.....7
15	Which of these can cause (or had caused) low turn-out for immunization in your health facility/ community?	Repeated vaccines stock out.....1 Distance to the health facility ..... 2 Poor treatment.....3 Lack of awareness ..... 4 Inadequate staffing..... 5 Insufficient funding.....6 Poor communal support.....7 Poor interpersonal communication.....8
16	Have you been trained on routine i mmunization?	YES.....1 NO.....2
17	What are the main topics you talk about as you meet client/parents during visit or immunization session?	Child feeding.....1 Exclusive breastfeeding.....2 Vaccination.....3 Malaria.....4 Don't know.....5 OTHER_____ 6 (SPECIFY)
18	What are the main roles immunization providers perform in your health facility?	Home visits/ follow up.....1 Group education/Health talk.....2 Supervision.....3 Vaccination.....4 Recording.....5 Monitoring.....6

3. Information about Visit

19	How often do members of the community come to you for advice or treatment of health problems?	Often.....1 Sometimes.....2 Rarely.....3 Never.....4
20	Do you receive any support and/or encouragement for your routine immunization activities?	YES.....1 NO.....2
21	If 'YES', from whom do you receive support?	State.....1 LGA.....2 Community.....3 NGO/ Internat'l Organizations.....4 Private Individual.....5 OTHER_____ 6 (SPECIFY)
22	What kind of support do you receive?	Money.....1 Certificate.....2 Recognition/ Award .....3 Materials.....4 OTHER_____ 5 (SPECIFY)
23	Which of the following recording matenals do you use for routine immunization in your health facility?	Immunization card.....1 Immunization Register .....2 Tally sheet.....3 Charts.....4 Note book.....5 OTHER_____ 6 (SPECIFY)

OBSERVE OR PROBE *Immunization Activities 24 to 34*

24	Estimating the target population using demographic indicators	YES.....1 NO.....2
25	Storing vaccines in the cold box according to standards	YES.....1 NO.....2
26	Arranging vaccines in the refrigerator based on their sensitivity to heat and freezing	YES.....1 NO.....2
27	Filling out the stock sheet according to standards whenever vaccines are moved	YES.....1 NO.....2
28	Recording target and antigen data on a sheet or inn a notebook/register.	YES.....1 NO.....2
29	Doing IEC on immunization during outreach activities (IEC: Information, Education and Communication)	YES.....1 NO.....2
30	Conducting active case searches or community visits to find children and women who have missed their immunization appointments	YES.....1 NO.....2

3. Information about Visit

31	Informing parents about the NPI target diseases and the importance of following the immunization schedule?	YES.....1 NO.....2
32	Using a single-dose syringe and stenle needle for each injection	YES.....1 NO.....2
33	Placing syringes and needles in an appropnate container/ safety box after each injection without recapping them?	YES.....1 NO.....2
34	Properly disposing of waste materials causing no health risk to people.	YES.....1 NO.....2

4. Personal Satisfaction/ Relationships

35 What aspect(s) of your activities as immunization provider do you like doing most?

.....

36 What aspect(s) of your activities as immunization provider do you like doing least?

.....

37 What is the major challenge you encounter in carrying out your activities as immunization provider and how would you overcome it?

a. Major Challenge	b. Possible Solution
.....	.....

38 What changes or suggestions would you recommend that would improve the effectiveness of routine immunization in general?

.....

39 How do you think the people in your community feel about your activities as an immunization provider?

.....

This is the end of the interview. Thank you for your participation.

Interviewer's comments:

COLLEGE OF MEDICINE OF THE UNIVERSITY OF IBADAN

PUBLIC HEALTH, E.M.S.E.H., FIELD EPIDEMIOLOGY

STRENGTHENING ROUTINE IMMUNIZATION SERVICE DELIVERY IN NIGERIA

Assessing caregiver's knowledge and practices regarding routine immunization service delivery

FORM 2: Exit Interview for the Child's Parent or Caregiver

1. Facility Identification

District: _____ DISTRICT CODE .....

Community: _____ COMMUNITY CODE .....

Name and address of the health facility: _____

_____

_____ FACILITY CODE .....

Type of health facility*: 1=Hospital
2=Health Center
3=Health Post
4=Clinic
6=Other: _____ FACILITY TYPE .....

Operating authority*: 1=Government
2=Non-Governmental Organization
3=Pnvate for-profit
4=Other: _____ OPERATING AUTHORITY .....

2. Information about Interview

Date: _____ DD/MM/YY

Name of the interviewer: _____ INTERVIEWER CODE .....

Tribe of the Caretaker/ Parent interviewed
Gwari (1), Koro (2), Bassa (3), Gede (4), Hausa (5), Fulani (6), Yoruba (7), Igbo (8), Other (9) TRIBE

Occupation of Caretaker/ Parent interviewed
Civil servant (1), Whole sale trading (2), Petty trading (3), Artisan (4), Farming (5), House wife (6), Student (7), Unemployed (8) OCCUPATION

Level of education of Caretaker/ Parent interviewed
Tertiary (1), Secondary (2), Primary (3), Arabic (4), None (5) LEVEL OF EDUCATION

Marital status of Caretaker/ Parent interviewed
Married (1), Single (2), Divorced (3), Widowed (4) MARITAL STATUS

Religion of the Caretaker/ Parent interviewed
Christianity (1), Islamic (2), Traditional (3), Others (4) RELIGION

Age of the Caretaker/ Parent interviewed AGE OF CARETAKER/ PARENT INTERVIEWED

Age of Child/Client _(MONTH: 1 to 24) AGE OF CHILD/CLIENT

Sex of the Child/Client Enter (1=Female, 2=Male) SEX OF CHILD/CLIENT

Sex of the Caretaker/ Parent interviewed Enter (1=Female, 2=Male) SEX OF CARETAKER/PARENT INTERVIEWED

Client code**: _____ CLIENT CODE

Client Code (number) should be the same as the one used for Routine Immunization

•Use local facility type names or operating authority •• Client code should be the same code in Form 1 (observation of outpatient consultation)

3. Information about Visit

INTRODUCE YOURSELF TO THE RESPONDENT.

Hello I am from the College of Medicine of UI, Department of EMSEH. We are collecting some information regarding the quality of healthcare services that you have received today in this facility. All the information you give me will be kept strictly confidential, and the care that you receive at this facility in the future will not be affected by your participation or non-participation. You may refuse to answer any of the questions, and you may stop the interview at anytime.

Do you have any questions for me now? Do you agree to participate?

NO.	QUESTIONS	CODING CLASSIFICATION	GO TO
	May I begin the interview?	CLIENT AGREES ..... 1 CLIENT REFUSES 2	 →STOP
1	For what reason(s) did *you come / bring this child* to this health facility today? CIRCLE ALL ITEMS THE RESPONDENT MENTIONS.	IMMUNIZATION ONLY ..... 1 ILLNESS ..... 2 IMMUNIZATION & ILLNESS 3	→ 11 → 2 → 2
2	Did *you come / bring this child* to the health facility today because of any of the following: 01 Cough or difficult breathing 02 Diarrhoea 03 Fever/body hotness at home 04 Eye problems 05 Sore skin 06 Injury 07 Weakness of the upper or lower limbs PROBE: Anything else?	COUGH / HARD BREATHING ..... 1 DIARRHOEA ..... 2 FEVER (BODY HOTNESS) ..... 3 EYE PROBLEMS ..... 4 SORE SKIN ..... 5 INJURY ..... 6 WEAKNESS OF LIMBS ..... 7 OTHER _____ 8 (SPECIFY)	
3	Have *you come or brought this child* to this heath facility before for this same type of sickness?	YES ..... 1 NO ..... 2 DON'T KNOW 3	→5 →5
4	IF YES: How long ago ?	WITHIN THE PAST 1WEEK ..... 1 WITHIN THE PAST 1MONTH ..... 2 MORE THAN 1 MONTH AGO ..... 3 DON'T KNOW 4	
5	How many days ago did the illness for which you came/ brought this child here began?	DAYS AGO ..... ☐☐ IF LESS THAN 1 DAY, WRITE "00"	
6	Did the health worker tell you what illness it is?	YES ..... 1 NO 2	→8
7	What illness did the health worker tell you? CIRCLE ALL ITEMS THE RESPONDENT MENTIONS. IF NECESSARY, PROBE.	MALARIA ..... 1 COUGH/ HARD BREATHING ..... 2 DIARRHOEA ..... 3 HIV/AIDS ..... 4 DON'T KNOW ..... 5 OTHER _____ 6 (SPECIFY)	
8	Did the health worker tell you about any signs or symptoms you may feel/ see for which you must *immediately come back/* bring the child back?	YES ..... 1 NO ..... 2 DON'T KNOW 3	

NO.	QUESTIONS	CODING CLASSIFICATION	GO TO
9	What symptoms would make you come back/ bring the child back immediately to the health facility? CIRCLE ALL SYMPTOMS MENTIONED ELSE? PROBE BY ASKING WHAT	GETS SICKER IN 2 DAYS IF FEVER PERSISTS ..... 1 PERSISTENT VOMITING ..... 2 CONVULSION ..... 3 OTHER _____ 4 (SPECIFY) DON'T KNOW 5 6	
10	Did the health worker give or prescribe any medicines for you/ the child to take at home?	YES ..... 1 NO 2	
11	ASK TO SEE VACCINE(S) WHICH THE CHILD/ CLIENT RECEIVED LAST/ AT THE ROUTINE IMMUNIZATION SESSION TODAY CIRCLE THE RESPONSE DESCRIBING THE VACCINES YOU SEE IN THE IMMUNIZATION CARD (Yellow Card)/ ROAD TO HEALTH WITH THE RESPONDENT/ PARENT.	BCG ..... 1 OPV 0 ..... 2 HBV 1 ..... 3 DPT1 ..... 4 OPV 1 ..... 5 HBV 2 ..... 6 DPT 2 ..... 7 OPV 2 ..... 8 DPT 3 ..... 9 OPV 3 ..... 10 HBV 3 ..... 11 MEASLES ..... 12 YELLOW FEVER ..... 13 VITAMIN A ..... 14 TETANUS TOXOID ..... 15 OTHER _____ 16 (SPECIFY)	
12	Which vaccine(s) has the child / client received before?	BCG ..... 1 OPV 0 ..... 2 HBV 1 ..... 3 DPT1 ..... 4 OPV 1 ..... 5 HBV 2 ..... 6 DPT 2 ..... 7 OPV 2 ..... 8 DPT 3 ..... 9 OPV 3 ..... 10 HBV 3 ..... 11 MEASLES ..... 12 YELLOW FEVER ..... 13 VITAMIN A ..... 14 TETANUS TOXOID ..... 15 OTHER _____ 16 (SPECIFY)	
13	IS THERE ANY VACCINE THE CHILD / CLIENT CAME FOR TODAY BUT DID NOT RECEIVE DUE TO STOCK OUT IN THE HEALTH FACILITY? PROBE AND CIRCLE ALL MENTIONED.	BCG ..... 1 OPV ..... 2 HBV ..... 3 DPT ..... 4 MEASLES ..... 5 YELLOW FEVER ..... 6 VITAMIN A ..... 7 TETANUS TOXOID 8	
14	CHECK 11:	"OPV" CIRCLED ☐	"OPV" NOT CIRCLED ☐

3. Information about Visit

	ENTER "1" ↓	ENTER "2"	19
15	BY SHOWING THE VACCINE (OR ITS ILLUSTRATION), ASK THE PARENT/CARETAKER: How many DROPS of **OPV** did your child take at a time?	TWO(2) ..... 1 OTHER BUT TWO(2) ..... 2 DON'T KNOW 3	
16	How many times will your child take the OPV DOSES?	FOUR(4) ..... 1 OTHER BUT FOUR (4) ..... 2 DON'T KNOW 3	
17	When is your child due for the next immunization? COMFIRM THE DATE MENTIONED WITH THE DATE STATED ON THE YELLOW CARD/ ROAD TO HEALTH	CORRECT DATE ..... 1 WRONG DATE ..... 2 DON'T KNOW 3	
18	Will you bring your child to this health facility for the next immunization?	YES ..... 1 NO ..... 2 DON'T KNOW 3	
19	**CHECK 11**: "**DPT**" CIRCLED ENTER "1" ☐ ↓	"**DPT**" NOT CIRCLED ENTER "2" ☐ →	24
20	On which part of your child's body was **DPT** injection dose given?	OUTER PART OF THIGH ..... 1 OTHER ..... 2 DON'T KNOW 3	
21	How many times will your child take DPT doses?	THREE(3) ..... 1 OTHER BUT THREE(3) ..... 2 DON'T KNOW 3	
22	When is your child due for the next immunization? COMFIRM THE DATE MENTIONED WITH THE DATE STATED ON THE YELLOW CARD	CORRECT DATE ..... 1 WRONG DATE ..... 2 DON'T KNOW 3	
23	Will you bring your child to this health facility for the next immunization?	YES ..... 1 NO ..... 2 DON'T KNOW 3	
24	**CHECK 11**: "**MEASLES**" CIRCLED ENTER "1" ☐ ↓	"**MEASLES**" NOT CIRCLED ENTER "2" ☐ →	28
25	On which part of your child's body was **MEASLES** injection dose given?	UPPER LEFT ARM ..... 1 OTHER ..... 2 DON'T KNOW 3	
26	How many DOSE of MEASLES vaccine will your child take?	ONE(1) ..... 1 OTHER BUT ONE(1) ..... 2 DON'T KNOW 3	
27	When is your child due for next immunization? PROBE FURTHER FOR WHICH IMMUNIZATION	CORRECT DATE ..... 1 WRONG DATE ..... 2 DON'T KNOW 3	
28	**CHECK 11**: "**OTHER**" CIRCLED ENTER "1" ☐ ↓	"**OTHER**" NOT CIRCLED ENTER "2" ☐ →	30

3. Information about Visit

	ENTER "1" ↓	ENTER "2"	19
15	BY SHOWING THE VACCINE (OR ITS ILLUSTRATION), ASK THE PARENT/CARETAKER: How many DROPS of **OPV** did your child take at a time?	TWO(2) ..... 1 OTHER BUT TWO(2) ..... 2 DON'T KNOW 3	
16	How many times will your child take the **OPV** DOSES?	FOUR(4) ..... 1 OTHER BUT FOUR (4) ..... 2 DON'T KNOW 3	
17	When is your child due for the next immunization? COMFIRM THE DATE MENTIONED WITH THE DATE STATED ON THE YELLOW CARD/ ROAD TO HEALTH	CORRECT DATE ..... 1 WRONG DATE ..... 2 DON'T KNOW 3	
18	Will you bring your child to this health facility for the next immunization?	YES ..... 1 NO ..... 2 DON'T KNOW 3	
19	**CHECK 11:** "**DPT**" CIRCLED ENTER "1" ☐ ↓	"DPT" NOT CIRCLED ENTER "2" ☐ →	20
20	On which part of your child's body was **DPT** injection dose given?	OUTER PART OF THIGH ..... 1 OTHER ..... 2 DON'T KNOW 3	
21	How many times will your child take **DPT** doses?	THREE(3) ..... 1 OTHER BUT THREE(3) ..... 2 DON'T KNOW 3	
22	When is your child due for the next immunization? COMFIRM THE DATE MENTIONED WITH THE DATE STATED ON THE YELLOW CARD	CORRECT DATE ..... 1 WRONG DATE ..... 2 DONT KNOW 3	
23	Will you bring your child to this health facility for the next immunization?	YES ..... 1 NO ..... 2 DON'T KNOW 3	
24	**CHECK 11:** "**MEASLES**" CIRCLED ENTER "1" ☐ ↓	"**MEASLES**" NOT CIRCLED ENTER "2" ☐ →	28
25	On which part of your child's body was **MEASLES** injection dose given?	UPPER LEFT ARM ..... 1 OTHER ..... 2 DON'T KNOW 3	
26	How many DOSE of MEASLES vaccine will your child take?	ONE(1) ..... 1 OTHER BUT ONE(1) ..... 2 DON'T KNOW 3	
27	When is your child due for next immunization? PROBE FURTHER FOR WHICH IMMUNIZATION	CORRECT DATE ..... 1 WRONG DATE ..... 2 DON'T KNOW 3	
28	**CHECK 11:** "**OTHER**" CIRCLED ENTER "1" ☐ ↓	"**OTHER**" NOT CIRCLED ENTER "2" ☐ →	30

3. Information about Visit

29	Where did you receive the vaccine? Please PROBE and specify what "OTHER" is, as in 11 above.	Within Nigeria ..... 1 Outside Nigena 2	
30	IF THE RESPONDENT/CARETAKER IS A WOMAN OF THE REPRODUCTIVE AGE (15 TO 50), ASK IF SHE HAS BEEN VACCINATED WITH TETANUS TOXOID	YES ..... 1 NO ..... 2 DON'T KNOW 3	
31	Are you aware of any common body reaction to (side effect of) the immunization your child received, and what you should do if it occurs?	YES ..... 1 NO ..... 2 DON'T KNOW 3	
32	Will you ensure that your child (every child) receives FULL immunization no matter what it costs you to protect your child from killer diseases?	YES ..... 1 NO 2	
33	Will you come/ bring your child to this health facility for the next immunization?	YES ..... 1 NO 2	→34
34	If NO: why won't you come/ bring your child to this health facility for the next immunization? PROBE BY ASKING, "WHAT ELSE?" CIRCLE ALL ITEMS MENTIONED	Repeated vaccines stock out ..... 1 Long distance to health facility ..... 2 Poor treatment ..... 3 Too long waiting time ..... 4 Inadequate staffing ..... 5 Change of residence ..... 6 Travel ..... 7 Poor facility ..... 8 Fully immunized 9	
35	Mention ALL who have informed you about the benefits of immunization?	Husband/Wife ..... 1 Family ..... 2 Relation ..... 3 Healthcare workers ..... 4 Village/Community Head ..... 5 Town crier ..... 6 Friend ..... 7 From School ..... 8 From Church ..... 9 From Mosque ..... 10 Radio ..... 11 Television ..... 12 Posters/ Newspapers 13	

4. Information about Client's Satisfaction

Now I am going to ask you some questions about the services you received today. I would like to have your honest opinion about the things that we will talk about. This information will help us to improve the health services.

36	What do you suggest this facility should do to serve you better on immunization? ....
37	What can you do together with others to help this facility serve you better? ....

3. Information about Visit

Interviewer's comments: