SOCIO-ECONOMIC AND GEOGRAPHICAL DIFFERENCES IN UTILIZATION OF ROUTINE IMMUNISATION SERVICES AMONG MOTHERS WITH CHIDREN AGED 0-2 YEARS IN ENUGU EAST LOCAL GOVERNMENT AREA

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TITLE PAGE

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M.Sc. DISSERTATION
IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTERS OF SCIENCE DEGREE IN COMMUNITY HEALTH NURSING

DEPARTMENT OF NURSING SCIENCES,
FACULTY HEALTH SCIENCE AND TECHNOLOGY
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CERTIFICATION

I, Akakwa Njideka Peace, Registration Number: PG/MS.c/09/54181certify that the original work is mine except as specified in acknowledgement and reference and that neither the dissertation nor the original work contained therein has been submitted to this University or any other institution in Nigeria for the award of degree.

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APPROVAL

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DEDICATION

This work is dedicated to God Almighty, for His mercies that endureth forever.

ACKNOWLEDGEMENT

My gratitude goes to God Almighty, who made it possible for me to complete this course.

My profound gratitude goes to my invaluable supervisor, Dr (Mrs) Okoronkwo I.L. for her patience, outstanding support, understanding and encouragement while supervising this work.

I also wish to express my gratitude to all the lecturers in the Department for their advice and support in the successful completion of my programme.

I am also indebted to my husband, Mr P.C. Akakwa for his love and support. May God bless him always.

I am also grateful to all my friends, who in one way or the other made my stay in school easy and memorable, May God continue to bless and guide them in all they do.

To my typist, the non academic staff of the Department who contributed in one way or the other, may God continue to bless you all.

Finally, to all who sustained me with prayers throughout my study period, May the Lord reward you all.

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ABSTRACT

This study was carried out to assess the socio-economic and geographical differences in utilization of routine immunization in Enugu East L.G.A. of Enugu State. The objectives of the study were to determine the utilization of routine immunization service among children 0-2 years in different geographical locations, compare utilization of routine immunization services among different socio-economic classes and identify factors that affect utilization of routine immunization. A cross-sectional descriptive survey design was used for the study. A simple random sampling technique was used to select 2 communities (1 rural, 1 urban) from the L.G.A. for the study and snow-ball non-probability sampling technique was used to select the participant for the study who met the inclusion criteria. A sample size of 384 was determined using Godden formula for infinite population. A validated researcher developed questionnaire was used to collect data. Descriptive and inferential statistics were used to analyze data. Chi-Square was used to test the hypothesis. Findings revealed that the location of respondents did not affect utilization of immunization. It was also discovered that utilization increased with increase in socio-economic status, the higher the socio economic status, the higher the utilization. It was also discovered that there are factors that affect utilization of routine immunization which include time schedule, availability of vaccines, erroneous beliefs about immunization, attitude of some health workers. Based on these findings it was concluded that health workers should intensity effort to see that children receive the needed immunization as at when due. It is recommended that mothers should be encouraged to immunize their children to avoid the risk of future occurrence of these preventable diseases.

CHAPTER ONE

INTRODUCTION

Background to the Study

Immunization is one of the most successful and cost effective public health interventions. In 2010, global efforts to immunize children with vaccines against life-threatening diseases set a record high, reaching 109 million children and averting more than two million deaths along with countless episodes of illness and disability annually (UNICEF, 2012). However, despite significant gains in recent years, millions of children are not immunized, exposing them to disabilities or premature death. Active immunization of infants and children against vaccine preventable diseases has therefore been regarded as an effective means of disease prevention and health maintenance.

According to Singh and Yadav (2011), around the world, thirteen million people die from infectious diseases every year and over half of these people are children under the age of five. Most of these deaths could be prevented with routine immunization, an essential and basic strategy on which all Expanded Programme on Immunization (EPI) - targeted disease

Elimination programmes are built. Immunization programme against several communicable diseases of children have been implemented in many countries of the world (NPI, 2009). In the industrialized countries these programmes have produced very good results in the past twenty years.

It is significant to note that diphtheria, poliomyelitis, measles, pertursis, tetanus, tuberculosis, hepatitis B, yellow fever and cerebrospinal meningitis which constitute the "Vaccine preventable diseases" are amongst the many causes of high infant mortality rate (Ogunmekan, 2010). Obionu (2007) opined that they are indicators of the socio-economic

and health status of a country and are responsible for the heavy toll of infant deaths in most of the developing countries of the world.

The desire to provide immunization against the above vaccine preventable diseases led to the launching of Expanded Programme on Immunization (EPI) in Nigeria in 1978 and the implementation process in 1979 (Federal Ministry of Health FMOH, 2004; National Programme on Immunization NPI, 2001; & Sofoluwe, 2006). EPI was formally launched in 1979 as a follow-up of the smallpox eradication programmes. According to FMOH (2004) the first five years of implementation in Nigeria resulted in low coverage hence the programme was revised and relaunched in 1984.

Between 1984 and 1990 the Universal Childhood Immunization (U.C.I) target of 80% coverage was achieved in Nigeria and the incidence of target diseases particularly measles became insignificant. The success is attributable to the support the programme received from all levels of government in Nigeria, the partnership with foreign Non-Governmental Organizations (NGOs), social mobilization and the motivated health work force.

Immunization coverage like most other Primary Health Care (PHC) programmes suffered a sharp decline to an all time low level of less than 30% for all the antigens (Akesode, 2012). The consequence of this trend led to the renaming of the Expanded Programme on Immunization (EPI) as National Programme on Immunization (NPI) in 1996 to reflect Nigeria ownership and commitment to the Programme. The NPI was created through decree N0.12 of August 1997 with the mandate of rebuilding immunization programme in Nigeria. It aims at providing immunization services to all children under the age of five against the childhood killer diseases. The NPI in its effort has continued to implement sustainable strategies and interventions in collaboration with the states, local government areas and international agencies for example World Health Organization (WHO), United

Nations Children's Fund (UNICEF) among others with the vision of making immunization a community owned, community driven and community operated service.

Although worldwide immunization campaigns have gone a long way in helping to save the lives of millions of children and women of child bearing age, one would therefore expect that more effort should be put in place to persuade families to bring their children to be immunized at the right time and complete the full course of immunization services. UNICEF noted that the health of children should occupy a prime place in the health strategy of a nation.

Accessibility to utilization of services is an essential precondition to obtaining health care because some access barriers like distance of health facility, money and time can result in adverse health outcomes. Little wonder, why "accessibility" is the first objective of sub national management of immunization services during Health System Reform, where they emphasized that health system as a whole needs to provide adequate access to utilization of immunization services including physical, financial, cultural and social (WHO, 2013).

Low economic and educational status could also contribute to the lack of utilization of immunization Programme. According to Partnership for Transforming Health Systems (PATHS, 2010) several socio demographic factors such as age, educational level and occupation can affect uptake of immunization services by the people. Those who have been through formal education system and with higher socio-economic status could have greater awareness of immunization activities and benefits. Occupation and socio-economic status could also be some other important predictors of use of immunization services because these increase a person's exposure to information and consequently a higher knowledge of vaccine preventable diseases and routine immunization. Level of education of mothers could also have significant relationship with their knowledge of

routine immunization because mothers with a higher education are likely to have better knowledge of vaccine preventable diseases and routine immunization (PATH, 2010).

When planning for immunization Programme, there is a tendency to neglect rural communities which are usually under served. These rural communities need effective expanded programme on immunization irrespective of the ages, level of education and occupation of the mothers.

If this is done, one would be in a better position to understand the variables associated with the socio-economic and geographical differences in utilization to routine immunization. It is against this background that this study has been designed to determine the socio-economic and geographical differences in utilization to routine immunization services in Enugu East L.G.A of Enugu State.

Statement of the Problem

Vaccine preventable diseases impose serious challenges on the health, social and economic development of any family where they exist. Information about these diseases and how to prevent them have in most cases been emphasized in the news media by the government and non-governmental organizations. Going by the government and NGO's campaign about these diseases mothers are supposed to have adequate information about routine immunization. In most cases this ideal situation does not exist leading to the death of most of these children.

An evaluation report by Enugu East Local Government Area (NPI Unit) on 2006 national Immunization day showed that there were forty new cases of measles attack, twenty new cases of whooping cough and ten new cases of tuberculosis among children in the area. The reported coverage of the basic NPI vaccines particularly DPTs and OPV3 in Enugu East L.G.A. in 2008 were 45% and 53% respectively. This may account for sporadic

epidemic of vaccine preventable disease like poliomyelitis and measles in the area. Furthermore, it has also been observed by the researcher that immunization coverage is not uniform throughout the LGA, with difficult to reach rural areas presenting significantly lower coverage and thus contributing to the circulation of polio virus and measles. Socio-economic status and geographical issues may be the most common reason for partial immunization. Consideration of socio-economic and geographical differences in utilization to routine immunization is very important in the development and implementation of appropriate solutions. Therefore, this study is aimed at determining the socio-economic and geographical differences in utilization of routine immunization services in Enugu East L.G.A, Enugu State.

Purpose of the Study

The purpose of this study is to investigate the socio-economic and geographical differences in utilization of routine immunization services in Enugu East L.G.A. of Enugu State.

Objectives

The specific objectives of the study were to:

1) Determine geographical differences in utilization of routine immunization services among mothers with children aged 0 – 2 years in urban and rural communities of Enugu East L.G.A.
2) Compare differences in utilization of routine immunization services among mothers with children 0 – 2 years among different socio-economic classes in Enugu East L.G.A.
3) Identify factors that affect utilization of routine immunization services among mothers in Enugu east L.G.A.

Research questions

1) What are the differences in utilization of routine immunization services among mothers with children aged 0 – 2 years in rural and urban communities in Enugu East L.G.A of Enugu State.
2) What are the differences in the utilization of routine immunization services among mothers with children aged 0 – 2 years in different socio-economic classes in Enugu East L.G.A of Enugu state?
3) What factors affect utilization of routine immunization services among mothers with children aged 0-2 years in Enugu East L.G.A?

Hypothesis

1. There is no significant difference in utilization of routine immunization services among the respondents based on their geographical location.
2. There is no significant difference in utilization of routine immunization services among the respondents based on different socio-economic classes Enugu East L.G.A.

Significance of the Study

The findings from this study will help the health workers to identify areas of gap in the immunization coverage and assess the extent of use of the available/provided immunization services in the area. This will be useful in planning for future epidemiological surveillance and control strategies.

Also the findings from the study will help the health educators in planning health education programme aimed at giving health messages on vaccine preventable diseases and routine immunization. Findings from the study will identify which geographical group (urban or rural children) utilize immunization services more. This will enable health workers to devise strategies in ensuring that children are fully immunized.

The study will also reveal factors responsible for the differences in utilization of routine immunization by mothers. The study would serve as a base for further research on the vaccine preventable diseases, and help researchers who may want to carry out similar study in a different area. Finally, the study will add to the existing literature on vaccine preventable diseases.

Scope of the Study

The study was delimited to mothers with children under 2 years living in the selected rural and urban communities in Enugu East L.G.A. in Enugu State. The study covered socio-economic and geographical differences in utilization of routine immunization services by mothers and factors affecting utilization of routine immunization among mothers.

Operational Definition of Terms

Utilization of routine immunization: refers to ability of every child to get all the required immunization as scheduled.

Utilization of immunization services: refer to extent of use of available immunization vaccines by mothers with children 0-2 years.

Socio-Economic differences: social and economic standing/level of families – upper, middle and lower, based on their education, income earning and asset ownership.

Geographical differences: differences in living areas of families based on location – urban or rural.

Factors affecting utilization: attributes of mothers/caregivers such as beliefs, misconceptions, practice, etc that can hinder the use of immunization services.

CHAPTER TWO

LITERATURE REVIEW

This chapter presents related materials reviewed from books and journals such as published and unpublished articles from university libraries and internet materials. This presentation will be done under the following headings, conceptual review, theories underlying the study, empirical studies, including summary of literature review.

Conceptual Review

Concept of Immunization

Immunization has been defined as the purposeful introduction into the body of small doses of germs that are either killed or extremely weakened by some chemical processes (Sofoluwe, 2006). When the germ is introduced into the body, the body recognizes the protein makeup of the germ and slowly builds up an army of antibodies to fight the specific disease. This process is called active immunity because the body played an active part in producing the desired antibody. In order to be effective all active immunity should be given long before the anticipated illness. This is to give the body adequate time to form antibodies. In certain cases where a quick protection of the body against invading organism is required, passive immunization is employed. This is the extraction of animal or human serum, which contains the antibodies against specific disease being prevented. The serum is injected into the individual to produce passive immunity. In this regard the body plays no part in the production of antibodies. Passive immunity lasts for only a short period often not more than six weeks.

Immunization is a form of preventive medicine aimed at protecting individuals and communities from infectious diseases (Lucas & Gilles 2008). It operates like an early warning system that prepares the body to fight against infection. It operates on the premise that once a disease is contacted, one is unlikely to contact it again. The body has a natural

defense system against diseases and is referred to as the 'immune system'. It produces substances called antibodies that fight against diseases. This defense system sometimes needs help to combat diseases, immunization provides this help.

Era of Vaccine Invention

The close of the 19th century and the beginning of the 20th Century were marked by the achievements of great vaccine scientists such as Pasteur. The introduction of vaccines by Jenner two hundred years ago (WHO, 2000), was followed by the use of vaccines to control some diseases of man namely:-1798-Smallpox, 1885-Rabies, 1897-Plague, 1923-Diphtheria, 1926-Pertussis, 1927-Tetanus, 1935-Yellow fever. They were followed after the World War II and the explosion of technology by: 1955-Injectable Polio Vaccine (IPV), 1962-Oral polio Vaccine (OPV), 1964-Measles, 1967 -Mumps, 1970-Rubella, 1981-Hepatitis B.

Improvement on the crude form of these vaccines have proven to be robust and efficient and continue to be the workhorses of global immunization programmes which resulted in the dramatic reduction in disease burden and death, thus giving credence to the entire preventive health movement.

Early National Immunization Programmes

This era was characterized by low immunization coverage and outbreak of preventable disease because the use of vaccines was confined to industrial countries. Smallpox vaccine although administered to all ages was limited to those at risk-health workers and travelers. This informed the need for massive vaccination and isolation or quarantine of infected or suspected cases.

Other vaccines such as BCG were gradually introduced but only rich families could afford them, the poor benefited least. Low coverage continued leading to devastation of

communities with occasional outbreaks of these vaccine preventable diseases throughout the 1930s and in the 1940s (Akesode, 2002).

According to, WHO (2012), in 1955 Injectable Polio Vaccine (IPV) became available for widespread administration in schools and clinic in the industrialized countries. However, in 1962 Oral Polio Vaccine (OPV) replaced the injectable form and continued to show potential dramatic reduction in the incidence of polio cases when administered to a wide age range over a short interval of time. Vaccines used during this era up to 1974 for National Immunization programmes include: smallpox vaccine, BCG, Diphtheria toxoid, tetanus toxoid, pertussis, IPV later OPV and measles vaccines.

The early programme gave the opportunity of the utilization of maternal and child Health Services (MCH) to deliver routine immunization as a strategy. Such efforts were mainly directed at acceptance and not at achieving total coverage.

The scientific community had employed disease eradication strategy to tackle bovine contagious pleuro-pneumonia (a highly fatal disease of cattle), hookworm, yellow fever, malaria and yaws. This strategy was further strengthened by the notable attempt at large scale control undertaken by Foege and his team in Gambia in 1967 – 1970 through the administration of measles vaccine in a mass country wide campaign which ensured the entire elimination of indigenous measles in Gambia in 1972.

The Expanded Programme on Immunization (EPI)

The impressive success recorded by the smallpox eradication programme emboldened the World Health Organization (WHO) to look at other activities which could be built on the achievement. This led to the conception and birth of the Expanded Programme on Immunization (EPI) which was created in 1974 (Sofoluwe, 2006; Obionu, 2001 & WHO, 2000.)

The programme was aimed at bringing six childhood disease preventing vaccines to all the world children (WHO, 2012). The choice of the six killer diseases was informed by the disease burden and availability of well tried vaccines at an affordable price. The period 1974 to 1980 witnessed the commitment to the success of EPI through the development of training materials and hundreds of courses, training of personnel and the adoption of EPI by many countries as the principle of their National Immunization Programmes.

EPI got off to a slow start largely because of resource constraint and no doubt recorded limited success in coverage until 1984 when it became reversed. However, the introduction of the concept of Universal Childhood Immunization with resultant injection of US 100million dollars per year by UNICEF for EPI, ensured accelerated increase in immunization coverage from five percent of birth cohort to eighty percent in 1990 (Gold, 2000 & WHO, 2002).

Further impressed by this success, the World Health Assembly embarked on global program of polio eradication, neonatal tetanus elimination and measles control. Goals and objectives were set up with challenges of achieving the latest two desires by 1995 and the former by 2000. Although varied degrees of success have been attained the goals set for these diseases are yet to be met (Sofoluwe, 2006 & Egwu, 2000). At this point, it is interesting to note that routine immunization programme has been expanded further to include yellow fever, hepatitis B and cerebrospinal meningitis vaccines (FMOH, 2004). It has been observed that no real further progress has been made since 1990. Evidence shows that globally, at least two million vaccine preventable deaths still occur every year in children under five years (Nossal, 2002).The expanded programme on immunization was introduced in Nigeria in 1978 and was re-launched as National Programme on Immunization (NPI) in 1996.

Routine Immunizable Diseases (NPI Target Diseases)

The current routinely immunizable disease in Nigeria's immunization programme include: tuberculosis, diphtheria, tetanus (maternal and neonatal), whooping cough, poliomyelitis, measles, yellow fever, hepatitis B and cerebrospinal meningitis (FMOH, 2000; FMOH, 2004).

Tuberculosis is caused by a germ called mycobacterium tuberculosis. The public health burden of this disease has been profoundly worsened by the pandemic of HIV infection and by an increase in multi-drug resistant tuberculosis bacteria. The disease usually attacks the lungs, bones, joints and brain. The risk of developing tuberculosis is highest in children under three years and in the very old although anyone may be affected. It is spread through the air and in some areas it is possible to become infected by consuming un-pasteurized milk (Bovine TB). The signs and symptoms include weakness, weight loss, fever, persistent cough, coughing up blood, failure to thrive in children, joint pains etc (Watson & Royle, 2007).

Treatment involves a course of therapy using a combination of two or more anti-tuberculosis drugs for at least six months. Prevention is through routine immunization with BCG vaccine given immediately at birth.

Diphtheria is a bacterial infection caused by corynebacterium diphtheria transmitted from person to person through close physical and respiratory contact in overcrowded and poor socio-economic conditions (Watson & Royle, 2007). The germ produces toxin that can destroy the human body and organs. It attacks the pharynx and the throat and affects all ages but mostly non-immunized under fifteen years of age. The incubation period is two to four days. It is spread through droplets and secretions from nose, throat and eye and also through contact with skin ulcers.

The signs and symptoms of the disease include sore throat, swelling of neck, skin lesion which may be painful, reddened and swollen. It can be treated by the administration of appropriate antibiotics and isolation of the infected person. It can be prevented by maintaining a high level of immunization in the community. Diphtheria toxoid vaccine is given together with pertussis and tetanus vaccine as DPT or triple vaccine (Watson & Royle, 2007).

Tetanus or lock jaw is caused by the germ clostridium tetani found in the soil (Lucas & Gilles, 2008). It is particularly common and serious in newborn babies when it is called neonatal tetanus. People of all ages can contract tetanus. It is not transmitted from person to person but a person may become infected if soil or animal dung enters a wound. It can also occur from the use of dirty instruments for circumcision, scarification or in the treatment of the umbilical cord of the newborn. It manifests in muscular stiffness of the jaw, stiffness of the neck, difficulty in swallowing etc. Its complication could be fractures of the spine, abnormal heart beat, coma and death. Neonatal tetanus is an important cause of infant mortality in developing countries. Wounds should be thoroughly cleaned, tetanus immune globulin (ATS) should be administered to persons not fully protected. All women of child bearing age should receive correct doses of tetanus toxoid. All children under one year should be immunized with DPT vaccine, and there should be observation of clean practices during delivery and wound care (Lucas & Gilles, 2008).

Pertussis (Whooping Cough) is a disease of the respiratory tract caused by a germ called bordetella pertussis (Lucas $ Gilles, 2008). The germ lives in the mouth, nose and throat. It is common in non immunized children but most dangerous in children aged less than one year. It is also common in people living in crowded conditions and where nutrition is poor. It spreads very easily from person to person through droplets produced by coughing or sneezing. Watson (2007) stated that the disease is characterized by common cold,

coughing bouts of several weeks duration with a high pitched whoop, vomiting etc. Complications of the disease are bacterial pnenmonia, convulsion, seizures, dehydration etc. It can treated by the use of antibiotics such as erythromycin, and by increasing fluid intake. Prevention is by immunization with diphtheria, pertussis and tetanus (DPT) vaccine. A person infected with pertussis usually acquires lifelong immunity. Newborn infants are not protected against pertussis by maternal antibodies.

Poliomyelitis is an acute viral infection caused by poliomyelitis virus. The disease is spread through the faeco-oral route and transmission is higher in areas of poor sanitation. It occurs in adults but is more common in children. The incubation period is 3-35 days. It is spread by eating food or drinking water contaminated by feaces, by airborne droplets through coughing and sneezing. It enters the blood stream and invades certain nerve cells thereby damaging or destroying it. Nearly all children living in households where someone is infected become infected (UNICEF, 2010).

It is important to note that in Nigeria the period of transmission has been characterized by the two seasons – one with low transmission (March to May) mainly in the Southern Zones and the other with highest transmission predominantly in the northern zones (between July and November) (WHO 2010).

Measles is a highly infectious acute viral infection caused by the measles virus. The incubation period ranges from seven to eighteen days. It is usually severe in children not receiving vitamin A and living in a crowded condition. It is spread by contact with throat and nose secretions of infected people and through airborne droplets released when an infected person coughs or sneezes (Obionu, 2007).

According to Watson and Royle (2007), the infection is characterized by high prodromal fever, conjunctivitis, coryza, cough, and presence of koplick spots with appearance on the 3rd to the 7th day of red rash on the face, becoming generalized and lasting four to seven

days. The infection can lead to lifelong disabilities, including pneumonia, blindness, brain damage and deafness. Treatment is mainly symptomatic and supportive with antipyretic fluids, calamine lotion, vitamin A administration, nutritional support, antibiotics for secondary infection and encouraging oral rehydration solution. Prevention is by immunization with measles vaccine.

Yellow fever is an acute viral hemorrhagic fever caused by the yellow fever virus. It is an acute disease of high mortality and is transmitted between humans (urban type) by infected mosquito, Aedesaegyptic that breed in small stagnant water collections facilitated by poor environmental conditions. However, in the forest pattern of yellow fever, the most common in Americans, the main host is the monkey and man is an accidental host (WHO, 2010). The initial symptoms include high fever general muscle pain, backache, shivers, headache, loss of appetite, nausea and vomiting. However, progression of the disease may lead to convulsion, shock, bleeding from mouth, nose, eyes, stomach and kidney. It may also lead to liver failure, coma and death. In fact about half of the patients in this toxic phase die within ten to fourteen days (Watson & Royle, 2007).

An estimated two hundred thousand yellow fever cases with thirty thousand deaths occur each year, almost all in Sub-Saharan Africa. At least thirty three countries in Africa are considered at risk of yellow fever. Yellow fever vaccine was introduced into Nigeria's expanded programme on Immunization in 1993 as part of another long term strategy for the control and eradication of the disease (WHO, 2003). Prevention is by immunization and the elimination of stagnant water where the mosquito breeds. Persons recovering from yellow fever have lifelong immunity.

Acute Hepatitis B is caused by the hepatitis B virus (HBV). It affects all ages but infants and young children are most at risk of the infection. The main route of transmission in developing countries is the prenatal "vertical" transmission from a carrier to her baby and

"horizontal" transmission between young children during social contact through cuts, scrapes and scratches. In the industrial countries, the main routes of transmission are sexual intercourse (which also plays a role in central and East Africa and much of Asia), blood to blood contact e.g. transfusion, needle sharing among intravenous drug users, use of unsterilized needles etc, and by contact with infectious body fluids. Although the mode of infection is similar to the AIDS causing virus-HIV, hepatitis B is 40 to 100 times more infectious than HIV (Lucas & Gilles, 2008).

Watson and Royle (2007), stated that persons at increased risk of infection because of their life style, occupation or other factors include parenteral drug abusers, individuals who change sexual partners frequently, health care workers who are at the risk of injury from blood stained sharp instruments and haemophiliacs. Also at risk are babies born to mothers who are hepatitis B virus surface antigen positive and individuals who might acquire the infection as the result of medical or dental procedures in countries of high prevalence.

Symptoms of the disease include general weakness and fatigue, loss of appetite, jaundice, dark urine, pale stool etc. The main public health consequences are chronic liver disease and liver cancer. Routine immunization is recommended and has been implemented in some countries.

Cerebrospinal Meningitis (CSM), is a contagious meningococcal disease caused by gram negative bacteria called Neisseria meningitides with several sero group of meningococci namely: A,B,C,X,Y,Z. In Africa epidemics of meningitis are caused by sero group A and C (Lucas & Gilles, 2008). The disease although worldwide in occurrence is particularly a severe problem in the countries of "meningitis belt", in Sub-Saharan Africa. Children and the young are the age groups most affected by the epidemic.

In Nigeria, epidemic occurs during the dry season (January to March) but elsewhere it begins in the dry season and ends when the rainy season begins. The risk factors for the disease are associated with over-crowding, low socio-economic status, malaria, nutritional status and previous upper respiratory infections (WHO, 2005). The incubation period is 2 – 10 days and it is spread by droplets infection. Signs and symptoms of the disease include fever, headache, Nausea, and vomiting, neck stiffness, petechial rash, loss of consciousness etc. Complications that may arise include deafness, arthritis, encephalitis and death. The most effective treatment is the use of a single long acting chloramphenicol. Prevention is by immunization with CSM vaccine (WHO, 2011).

Table 1 Routine Immunization schedule

AGE	ANTIGEN	DESCRIPTION OF THE INFECTIOUS DISEASE
At BIRTH	BCG	• BCG is the tuberculosis vaccine. Tuberculosis causes pulmonary infection, but can spread to many other organs, causing serious illness, death and disability.
	OPV1	• OPV1 is also called oral polio vaccine. Polio mainly affects children under five years of age. One in 200 infections leads to irreversible paralysis. Among those paralyzed, 5% to 10% die when their breathing muscles become immobilized.
	HBV	• HBV is the Hepatitis B vaccine. Hepatitis B can cause chronic liver disease and put people at high risk of death from cirrhosis of the liver and liver cancer.
6 weeks	OPV1,/Pentavalent 1,	• Pentavalent vaccine is a combination of five vaccines-in-one that prevents diphtheria, tetanus, whooping cough, hepatitis B and haemophilus influenza type B, all through a single dose. • Diphtheria is a fatal disease. It is a bacterium that causes a severe throat and upper lung infection. • Tetanus is also a fatal disease. It is a bacteria causes weakness and paralysis when allowed to fester in a deep, dirty wound. • Whooping cough (also known as pertussis) is a bacteria that causes severe coughing fits. It can lead to fatalities do occur especially in young infants. • Hepatitis B is a virus that causes severe liver damage. It can be fatal. • Haemophilus Influenza type B is a bacteria that causes meningitis and bloodstream infections. Most cases are in infants or the elderly. It can be fatal.
	PCV (optional),	• PCV is also called pneumococcal conjugate vaccine. Pneumococcal disease, an infection caused by the bacteria Streptococcus pneumoniae or pneumococcus can lead to bacterial meningitis, pneumonia and bacteremia.
	Rotavirus 1(optional)	• Rotavirus vaccine is an oral vaccine against rotavirus infection, a common cause of diarrhoea and sickness. Rotavirus typically strikes babies and young children, causing an unpleasant bout of diarrhoea, sometimes with vomiting, tummy ache and fever.

10 weeks	OPV2, Pentavalent 2, PCV (optional)	• See above
14 weeks	OPV3, Pentavalent 3, PCV, Rotavirus 2 (optional)	• See above
9 months	Measles	• Measles vaccine is a highly effective vaccine used against measles.
12 months	Yellow fever	• Yellow fever is a potentially fatal viral infection, transmitted by mosquitoes in tropical regions. There is no specific treatment for yellow fever.
15-18 months	MMR, OPV, chicken pox (optional)	• MMR is the measles, mumps and rubella vaccine. Measles, mumps and rubella are very common, highly infectious, conditions that can have serious, potentially fatal, complications, including meningitis, swelling of the brain (encephalitis) and deafness. • The chickenpox (varicella) vaccine provides protection against the varicella zoster virus that causes chickenpox.
24 months	Meningitis, Typhoid fever (optional)	• Meningococcal vaccine is a vaccine used against Neisseria meningitis, a bacterium that causes meningitis, meningococcemia, septicemia, and rarely carditis. • Typhoid vaccine helps prevent typhoid fever. Typhoid is a serious disease caused by bacteria called Salmonella Typhi. Typhoid causes a high fever, weakness, stomach pains, headache, loss of appetite, and sometimes a rash.

Contraindications to Immunization

A contraindication to vaccination is a rare condition in a recipient that increases the risk for a serious adverse reaction (WHO, 2010). Ignoring contraindications can lead to avoidable vaccine reactions. Most contraindications are temporary and the vaccination can be administered later.

The only contraindication applicable to all vaccines is a history of severe allergic reaction (anaphylaxis, collapse, or shock, encephalopathy, non-febrile convulsion) after a previous dose of a vaccine. In such a case subsequent dose of the same vaccine should not be given. Also, history of allergic reactions (generalized urticaria, difficulty in breathing, swelling of mouth and throat, hypotension, shock) following egg ingestion has been noted as a contraindication to immunization. Further, Obioha (2010) stated that pregnancy is a contradiction to the use of live virus because of the theoretical possibility of harm to the fetus. Children with neurological disorders such as uncontrolled epilepsy, infantile spasms, progressive encephalopthy, should not be given vaccine containing pertussis antigen. Precautions are not contraindications, but are events or conditions to be considered in determining if the benefits of the vaccine outweigh the risks (WHO, 2010).

Reactions following Immunization

Modern vaccines are extremely safe although some may lead to reactions, occurrence of which may not prove the vaccine as a cause of the symptoms. However, an association between an adverse event and specific vaccine is suggested: If there is an unusual occurrence of a condition in people who received a vaccine within a short interval after immunization; If people who receive vaccines experience the event at a rate significantly higher than that in groups of similar age or background who have not recently received a vaccine.

According to Mehta (2008), adverse reaction may be caused by reactions to the immunizing antigen itself or to other components of the vaccines, such as antibiotics (Kanamycin or Neomycin in measles vaccine; streptomycin or neomycin in OPV), a preservative (Merthiolate, a mercury – containing compound present in DPT, DT and TT) or Aluminum adjuvant present in absorbed vaccines. Mild adverse events occurring as

transient fever or local irritations following DPT vaccine are quite frequent in twenty percent to fifty percent of vaccines.

Adverse reaction may be caused by faults of administration (programmatic errors) or be associated with the properties of vaccine (WHO, 2009).The most common errors are abscesses resulting from inadvertent inoculation into superficial layer of skin or poorly mixed or absorbed vaccines (Sterile abscess) and abscesses caused by the use of improperly sterilized syringes and needles. Serious adverse reactions can occur if vaccines are given to persons for whom they are truly contraindicated for example BCG and measles vaccines given to immunosuppressive individuals can cause disseminated disease. WHO, (2009) stated that serious reactions such as vaccine related paralysis have followed OPV immunization. Abscesses rarely have occurred with vaccines containing aluminum adjuvants. Fever and rashes after measles vaccine are other examples of mild adverse reactions following immunization.

Localized and regional adenitis and prolonged ulcerations have complicated BCG infection which may occur in immuno-suppressed individuals should be treated with anti TB drugs. Some persons especially the aged may develop hyper immune reactions to diphtheria toxoid or more rarely Tetanus toxoid after receipt of the booster doses as a result of reaction with the high titres of the respective antitoxins.

Egg sensitive individuals may react to live virus vaccines, for example, yellow fever or influenza vaccines prepared with hen's egg tissues (WHO, 2010). Severe reactions are rare but the major ones include encephalitis, after mumps and measles vaccines, encephalopathy after pertussis vaccines and paralysis after Oral polio vaccine among vaccines. It should be noted that the rates of occurrence of severe reactions are far less than complications caused by the disease themselves, hence the detection of serious adverse events following immunization is important for the success of immunization,

since such events can influence community acceptance of immunization. In developing countries most of the identified complications following immunization appear to be programme related thus emphasizing the need to identify and correct them.

Utilization of Routine Immunization

This refers to ability of every child to get properly vaccinated by their first birthday. All children (African and others) have a right to utilization of vaccines (Steinglassa, 2013). Life, survival, maximum development, and utilization of health services are not just basic needs of children and adolescents, but fundamental human rights embodied in the UN Convention on the Rights of the Child (CRC). In addition, there are compelling moral arguments for the routine immunization of children, especially those in developing countries. However, with only 71% coverage in 2011, the African Region trails the South East Asian Region (75%), the Eastern Mediterranean Region (85%), and the Western Pacific Region (96%). If immunization coverage is an index of how a child's right to basic health is respected, then the CRC is currently failing children in African countries. A child born in a typical low-income country in Africa is 17 times more likely to die before reaching the age of five compared to a child in a high-income country

Factors Affecting Utilization of Routine Immunization in Nigeria

There are several factors affecting proper utilization of routine immunization in Nigeria. According to Steinglass (2012) primary health care services are highly ineffective and have deteriorated due to the lack of investment in personnel, facilities and drugs, as well as poor management of existing resources. There is also a lack of confidence and trust by the public in the health services resulting from the poor state of facilities and low standards of delivery. These problems have been exacerbated by “vertical” interventions undertaken by outside agencies which undermined the capacity of the local service

providers to implement sustainable programmes. At the family/community level there is a low demand for immunization due to a lack of understanding of its value (Feilden, 2012). Some of these problems are briefly discussed below:

Misperceptions of routine immunization

Incorrect knowledge as to the preventive role of routine immunization is widespread in Nigeria. Quantitative research conducted in six states in 2004 reveals that in rural Enugu, diarrhoea, fever, convulsion, vomiting and malaria are believed to be vaccine-preventable diseases (VPDs), while in rural and urban Kano, malaria, teething problems, vomiting, convulsion and pneumonia are listed. During pilot community research in March 2005, a number of immunization decision-makers and caregivers in Katsina state stated that only polio immunization is required that once a child has received its polio 'drops', it is immunised against all childhood illnesses, including those for which there is no vaccine available, e.g. acute respiratory infection (Feilden, 2012). Those least likely to demonstrate high levels of correct knowledge include people who do not use public facilities for the treatment of common illnesses, those who lack easy utilization of public health facilities, and illiterates (Oluwadere, 2009).

Influence of religion

In Nigeria, the greatest challenge to the acceptance of immunization is a religious one especially among the northern Nigerian Muslims. Generally, the Muslim north has a low immunization coverage, the least being 6% (northwest) and the highest being 44.6% (southeast). In Ekiti state (southwest), for example, the northeast and west of Ekiti, with a stronger Islamic influence, has low immunization coverage and also poor educational attainment. Christians have 24.2% immunization coverage as compared to only 8.8% for Muslims (Ankrah, 2014).

Inadequate cold chain equipment

Over the years Nigeria has received huge quantities of cold chain equipment. Despite this support, much of the cold chain appears to be beyond repair. This is partly due to the focus on polio eradication, which uses freezers. In one zonal store, only one of the three cold rooms was working, with only a single compressor operational. Substantial numbers of solar refrigerators have been bought in the last few years; although, a useful addition these are expensive ($5,000 each) and prone to breakdowns. At the state level, the cold stores are poorly equipped and badly managed. More than half of the refrigeration equipment is either broken or worn out. In the eight states visited, 47% of the installed solar fridges were broken and $205,000 worth of solar equipment remained uninstalled (Yahya, 2005).

Political problems

The downward trend in the coverage of all the antigens appears to be associated with political problems. In Nigeria, the boycott of polio vaccinations in the three northern states in 2003 created a global health crisis that was political in origin (Kaufman et al, 2009). These political problems included low government commitment to ensure the fulfillment of EPI policy as well as over-centralization in the administration of EPI at the federal level of governance in Nigeria. The poor coverage of measles between 1998 and 2005 was blamed on vaccine shortages and administrative problems, as was the case in 1996, 1999 and 2000 when polio coverage was only 26%, 19% and 26% respectively (Obioha, 2010). Some positions offer potential for patronage due to the large payments for NID activities. This has led to political appointments and frequent changes in personnel as some LGA chairmen wish to bestow or repay political favours. Even at the state government level, increased political interference has been reported to be in the appointment of civil servants, also resulting in frequent changes of staff and the appointment of inappropriately qualified staff (Babalola, 2005).

Rejection of routine immunization

Another problem and challenges facing utilization of immunization services in Nigeria is the rejection of selected vaccines/vaccination by parents or religious bodies more especially in the northern part of this country. The reasons for such rejection are outlined below;

Fear and confusion

Many decision-makers and caregivers reject routine immunization due to rumour, incorrect information, and fear. Attempts to increase coverage must include awareness of people's attitudes and the influence of these on behaviour. Fears regarding routine immunization are expressed in many parts of Nigeria. Fathers of partially immunised children in Muslim rural communities in Lagos State see hidden motives linked with attempts by non-governmental organisations (NGOs) sponsored by unknown enemies in developed countries to reduce the local population and increase mortality rates among Nigerians. Belief in a secret immunization agenda is prevalent in Jigawa, Kano and Yobe States, where many believe activities are fuelled by Western countries determined to impose population control on local Muslim communities (Feilden, 2005).

Low confidence and lack of trust

Lack of confidence and trust in routine immunization as effective health interventions appears to be relatively common in many parts of Nigeria (Babalola, 2005). A 2003 study in Kano State found that 9.2% of respondents (mothers aged 15–49) evinced 'no faith in immunization', while 6.7% expressed 'fear of side effects'. For many, immunization is seen to provide at best only partial immunity, e.g. in Kano and Enugu (Feilden, 2005). The widespread misconception that immunization can prevent all childhood illnesses reduces

trust because when, as it must, immunization fails to give such protection, faith is lost in immunization as an intervention, for any and all diseases.

Shortage of vaccines and immunization supplies

Under the NPI's the first mandate is to "support the states and local governments in their immunization programmes by supplying vaccines, needles and syringes, cold chain equipment and other things and logistics as may be required for those programmes". However, the supply of vaccines has always been problematic for Nigeria, primarily because funds were not sufficient and were not released on time. For example in 2001 the whole amount was approved but only 61% was released, the late release of funds (April 2001) meant that vaccine had to be bought on the spot market at inflated prices. In 2002 no funds were released and by March 2003 the funding cycle had only reached the stage of getting the budget approved. NPI did not supply any syringes for Rubella infection in 2005, and the only safety boxes that have been supplied are the limited quantities given by donors for SIAs. Following an assessment in 2003, it was decided that UNICEF would supply vaccines in future. In the last quarter of 2003, UNICEF began supplying vaccines through a procurement services agreement, and this arrangement continues to date. However, it has not solved the problem of vaccine shortages. For example, cerebrospinal meningitis (CSM) vaccine was not supplied in time to allow CSM immunization to take place before the cerebrospinal meningitis season, and some states had to buy their own stocks of CSM using state funds. Measles vaccine also arrived too late to limit the effects of a measles outbreak in the north, and an insufficient quantity of measles vaccine was supplied to Abia.

Problems with Utilization

Utilization of vaccines in many parts of Africa is not equitable, with large disparities between socio-economic and rural-urban segments of the population. There are numerous rural areas where a child is not able to get properly vaccinated even when the parents are interested. Remote places exist with no functional primary health centre nor cold chain infrastructure to allow for routine immunization.

Problems with Information

Many parents are not fully aware of the benefits of vaccination and as a result do not immunize their children against the vaccine preventable diseases. They are unaware of the numerous benefits their children would derive from a very simple, routine process.

Problems with Misinformation

In Northern Nigeria particularly, the problems being encountered by immunization services programme are largely due to misinformation. The polio vaccine for example faces some resistance from certain parts of the country because it is believed to cause a reduction in fertility later in life. This misinformation is usually borne out of ignorance

Problems with Financing

Most developing countries have difficulties affording vaccines. International initiatives such as the Global Alliance for Vaccines and Immunization (GAVI) have the much needed funding that have helped increase immunization coverage and the number of vaccines provided. Vaccines are much less profitable than medicines, and thus pharmaceutical firms are understandably reluctant to make the huge investments necessary to develop vaccines against infectious diseases, realizing that the largest pool of potential customers are governments that likely will not afford to pay enough for these products to ensure a profit.

Problems of Supply and Demand

In many developing countries places, supply is not enough to meet existing demand. As a result of the problems in financing vaccines that have already been highlighted, when new vaccines have been developed, limited quantities are usually manufactured, thus increasing the cost per dose.

Problems with Logistics

Nigeria is synonymous with epileptic power supply. As a result of this, generators are a necessity. Even when generators are available, there is often no money to fuel them to maintain the cold chain. Solar fridges and freezers lay fallow due to lack of maintenance.

Determinants of Utilization of Routine Immunization

Determinants of childhood vaccination uptake still remain complex, and are dependent on various socioeconomic, demographic factors and also supply and demand factors (D'Onofrio & Manfredi, 2010). Supply-related factors are important however, the adequate supply of vaccines does not necessarily translate into children being vaccinated. Several studies suggest that factors associated with vaccination demand/uptake and acceptance are even more complex (Jheeta & Newell, 2008) emphasizing the need to eliminate the unnecessary inequities associated with norms and structural factors that may hinder increased vaccination uptake. Maternal characteristics, sex of child and birth order of the child, place of delivery and antenatal care (ANC) follow up, wealth index, knowledge about vaccination and place of residence could influence immunization coverage among children (New & Senior, 2010).

Characteristics of the Mother

Characteristics of the Mothers are the most known determinant factors of child immunization. A study done at southern district of Nigeria revealed that mothers with

lowest education and unemployed women were less likely to complete a child immunization. Education empowers a woman to utilization of relevant health services, interact effectively and assimilate information relating to prenatal care, childhood immunizations and nutritional needs (Becker et al., 2007).

Caldwell (2010) mentioned that maternal education is a significant determinant of child health and no other factor has such impact. Breiman et al., (2009), observed maternal education as the strongest independent factor for protection against childhood mortality. In the study conducted in Ghana by Daniel Buor, (2009) there was an obvious significance in children's vaccination pattern with mother's education level. Jamil et al., (2011) found that mothers who completed at least primary level of education were 1.7 times more likely to have their children fully immunized compared to those who had no education.

It was also indicated that children whose mothers were aged less than 30 years were 2.26 times more likely to be fully immunized (Odusanya et al., 2008). Socio-economic status (particularly education and wealth status) of individuals strongly controls the behaviour of individuals and thereby controls health-seeking behaviour and ultimately child survival (Becker et al., 2007). In addition, higher socio-economic status is associated with better health (Lynch et al., 2006) and this is the same as the study conducted by Antai (2009). In 2008 NDHS, the data revealed that about 53 % of children in the wealthiest households and 5 % in the poorest household were immunized. Some studies have shown that socio-economic status of the family is an important factor that can influence vaccination compliance with higher socio-economic status being associated with higher uptake of vaccination (Topuzoglu et al., 2005; Cui & Gofin, 2007). In Bangladesh, children of relatively better-off households had an 80% higher chance of being fully immunized compared to the economically disadvantaged group (Jamil et al., 2011). This may be due to the fact that children who are from poor homes find it difficult to be reached by the

health services and parents may encounter barriers to reach health facility compared to those of better socio-economic status. Other studies have found no difference in vaccination rates with respect to socio-economic status (Castro-Leal, 2008; Pande, 2011).

Rural–urban inequities in immunization coverage are certainly linked to supply-related factors, e.g. accessibility to vaccination facilities, provision of childhood immunization services, and demand-related factors, such as the knowledge and attitude of mothers (Antai, 2011). About 38% of children in urban areas reported to be more than twice as likely as rural children (16%) to be fully vaccinated (NPC, 2008).

The population of Nigeria is largely rural, and the geographical distance of most rural areas tends to influence the availability and effectiveness of immunization campaigns across the country (Antai, 2011). From the NDHS, there have been urban-rural differentials in immunization uptake in Nigeria. Fewer children in rural areas are vaccinated compared to those in urban areas. The major reason for this could be as a result of limited number of facilities in rural areas. In 2008 NDHS, 38% of children in urban received full immunization compared to their counterparts in the rural areas with 16.2%. From the study conducted in Malawi by Munthali (2007), the percentage of children who were fully vaccinated in urban areas was higher than in rural areas. This is most likely related to the problems of accessing health facilities in rural areas compared to urban areas in Malawi.

Study by Hassan (2009) also found that children living in urban Bangladesh are more likely to complete the immunization schedule than the children living in rural areas. The urban rural inequality in terms of immunization coverage of children is clear, as they are respectively 66 percent and 54 percent for urban and rural in Bangladesh (Mushtaque, et al., 2008).

Also, in studies conducted in Nigeria and Niger, there were urban-rural differences in vaccination coverage. In Niger, 1 in 10 rural children have received all the eight immunizations compared to half of urban children. While the overall vaccination coverage levels in rural areas are less than half of those children in urban areas who had received BCG and measles. In addition, because of higher dropout rates from the health system in rural areas in Niger, coverage levels for the third dose of DPT and polio are less than one-quarter of the rates seen in urban areas (Gage et al., 2013). In Nigeria, rural urban differences in vaccination coverage, though marked, are not as large as those seen in Niger. In the case of BCG and measles vaccines, rural coverage levels are about two-thirds of the levels in urban areas (Reichler et al., 2011). In Eastern Turkey, measles vaccination was found to be higher in urban regions than suburban and rural regions (Altainkaynak et al., 2012). In a similar study conducted in China by Xie and Dow (2010), as it is with other literatures, household wealth, mother's education and urban city are positively associated with immunization use while the opportunity costs are the barriers to immunization use However, child's gender is not a significant determinant in the joint cross-sectional model, nor did the results reveal any differential effect of gender between urban and rural areas.

Utilization of Health Facilities

Utilization of health services like antenatal care and place of delivery in health care facility are other factors that are associated with the immunization status of children. Studies indicate that mothers who attend ANC and give birth at health facility are more likely to fully vaccinate their children as antenatal clinic is a means for women to be aware of immunization programme (Mutua et al., 2011; Takum et al., 2011). In a study conducted in Nigeria by Adedayo et al., (2009), most of the mothers interviewed (65.7%) got their awareness of immunization at the antenatal clinics.

It is also similar to the study done in Columbia on the uptake, behavioural and attitudinal determination of immunization of hepatitis B among infants which showed that immunization was significantly associated with suggestion from health care practitioners (Big bam et al., 2006).

A study done in Niger Delta area of Nigeria revealed that there was an association between the place of delivery and immunization status of a child (Oyo-Ita et al, 2012). A child born in a health unit was significantly more likely to have been vaccinated with BCG which is given immediately after birth, and to be up to date with their vaccination compared to a child delivered at home (Odiit & Amuge, 2013).

Characteristics of the Child

Sex of the child can also predict the immunization status of the child in societies where gender inequality is prevalent. For instance in Bangladesh, females are 0.84 times less likely to be fully vaccinated than male children (WHO, 2009). But in a study done in Nigeria in 2009, there was no significant relationship between sex and full immunization status (Antai, 2011). In 2006, the Ethiopian Expanded Programme Immunization survey also showed that no statistically significant difference between girls and boys with regard to their immunization status (Kidane et al., 2008). In the studies conducted in North India and Nepal, male children were twice as likely to have received immunization as female (Ahluwalia, et al., 2012). Jamil et al., (2011), in spite of almost universal access to immunization services, sex discrimination against female children exists in seeking full immunization coverage in rural areas of Bangladesh. Female children were 30 percent less likely found no significant association between immunization coverage and child's sex (Mahboob, et al., 2012).

Birth order could have a close relationship with vaccination coverage. According to NDHS 2008, vaccination coverage decreases as birth order increases, 27% of first-born

children have been fully immunized, compared with 14% of birth order six and above. In Nigeria, another reason by caretakers/parents for their children not to be fully vaccinated could be because of distance to the health. Distance to the health post which is an alternative measure of accessibility has been found to affect immunization coverage in 2006 in Kenya (Ndiritu et al., 2006). Close proximity to the clinic was associated with an increased likelihood of vaccination, with immunization coverage declining with increasing distance from vaccination clinics in Egypt (Reichler et al., 2011) and in Pakistan (Reichler et al., 2011). A possible explanation for this could be that visibility of a clinic may attract a parent's attention and/or act as a reminder to the parent of the immunization status of the child.

Geographical Differences in Utilization of Routine Immunization

The term urban and rural is a subjective concept. The two cannot be viewed as two opposing entities. However, with the increased degree or urban influence on rural communities, the differences are no longer as distinct as they were some decades (Stanhope & Lancaster, 2012). In general, rural is defined in terms of the geographic location and population density or it may be described in terms of the distance from (e.g. 20 miles) or the time (9 30 minute) needed to commute to an urban centre. Other definitions equate rural with farm residency and urban with nonfarm residency. Some consider "rural" to be a state of mind for the more affluent, rural my bring to mind a recreational retirement, or resort community located in the mountains or take country where one can relax and participate in outdoor activities such as skidding fishing, hunting etc. For the less affluent, the term can impose grim scenes, for example, some may think of an impoverished and undeveloped settlement or it may bring to mind images of a migrant labor camp with several families living in a one room with no utilization to safe drinking water or adequate sanitation (Stanhope et al, 2012).

Just as each city has its unique features it is also difficult to describe a "typical rural community because of the wide population and geographic diversity. Although, each community is unique, the experience of living in a rural area has several common characteristics. Concomitantly, barriers to health care may be associated with these characteristics, and include whether health services and professional are available, accessible and or acceptable to rural consumers.

Availability implies the existence of health services as well as the necessary personal to provide essential services like this immunization. Sparseness of population limits the number and array of health care services in a given rural geographic region unlike the urban counterparts. Therefore, the cost of providing special and essential service to people is often prohibitive, particularly in areas where health care providers are scarce.

Accessibility implies that a person has the logistic and ability to access and purchase needed services. Affordability is associated with availability and accessibility of care and infers that services re of reasonable cost that a family can successfully be able to reach for them.

Acceptability of care means that a particular service is appropriate and offered in a manner that is congruent with the values of a target population. (Stanhope, 2012).

The above mentioned basic principles can be in immunization uptake by both the client's cultural preference and the urban orientation of health care service providers.

Providers' attitude, insight and knowledge about rural populations are also important. A demeaning attitude, lack of accurate information and knowledge about rural population, or insensitivity about the rural lifestyle on the part of health care providers perpetuate difficulties and mistrust in relating with the people, thereby resulting in rural clients perceiving health care providers as "outsiders to our communities" (Patgsm 2008). The aforementioned therefore influence the uptake of immunization in rural geographic areas

than in urban areas. Also, the lack of electricity in most rural setting affect the maintenance of cold chain storage system of vaccines for immunization, as well as lack of access road network.

Socio – Economic Differences in Utilization of Routine Immunization

Socio-economic status is an important predictor of use of immunization services (PATHS, 2010). **Socioeconomic status** (**SES**) is an economic and sociological combined total measure of a person's work experience and of an individual's or family's economic and social position in relation to others, based on income, education, and occupation. When analysing a family's SES, the household income, earners' education, and occupation are examined, as well as combined income, versus with an individual, when their own attributes are assessed (National Centre for Educational Statistics, 2008).

Socioeconomic status is typically broken into three categories (high SES, middle SES, and low SES) to describe the three areas a family or an individual may fall into. When placing a family or individual into one of these categories, any or all of the three variables (income, education, and occupation) can be assessed.

People who have been through formal education system and with higher socio-economic status had greater awareness of immunization activities and benefits. Limited media exposure and access to public health facilities among lower income residents were also observed as hindrances to immunization uptake and knowledge about vaccine preventable diseases. It was observed that people who were exposed to child health information through media had improved immunization practices (PATHS, 2010). Childhood immunization is an important component of health care of young children.

A study in Katanga Valley in Kampala established that the mother’s highest level of education attained was a significant factor which influenced immunization coverage in the area (kasule & Kampikaho, 2011). Also a study done in Ijebuode, a rural local government

area in Ogun State of Nigeria in 1990 confirmed the influence of low educational status of mothers on immunization. Knowledge of immunization was established to be a significant factor influencing immunization coverage (Kasule & Kampikaho, 2013). Lack of understanding by mothers of both concept and the practice of immunization was also a contributing factor as to why children were not fully immunized (Yakubu, 2009). Awareness was very important in immunization.

Theoretical Review

The Health Belief Model

The theoretical review of this study is the Health Belief Model.

The Health Belief Model (HBM) is a psychological model that attempts to explain and predict health behaviours. This is done by focusing on the attitudes and beliefs of individuals. The HBM was first developed in the 1950s by Rosenstock working in the U.S. Public Health Service. The model was developed in response to the failure of a free tuberculosis (TB) health screening program. Since then, the HBM has been adapted to explore a variety of long and short term health behaviours.

The model was furthered by Becker and colleagues in the 1970s and 1980s. Subsequent amendments to the model were made in 1988 to accommodate evolving evidence generated within the health community about the role that knowledge and perceptions play in personal responsibility (Glanz, Lewis & Rimer, 2002). The HBM has also been applied to problems concerning immunization and people's different responses to public health measures and their uses of health services (Rosenstock, 2004).

The HBM relates largely to the cognitive factors predisposing a person to a health behaviour. It is based on the understanding that a person will take a health related action (routine immunization) if that person: Feels that a negative health condition (vaccine preventable diseases) can be avoided; Has a positive expectation that by taking a

recommended action, he or she will avoid a negative health condition (i.e, practicing routine immunization will be effective at preventing childhood killer diseases); Believes that he or she can successfully take a recommended health action (i.e. he or she can use immunization services comfortably and with confidence).

The HBM was spelled out in terms of four constructs of the core beliefs of individuals based on their perceptions:

- Perceived susceptibility (one's opinion or assessment of chances of getting a condition). Perceived severity (one's opinion or assessment of how serious a condition and its consequences are).
- Perceived barriers (an individual's assessment of the influences that facilitate or discourage adoption of the promoted behavior or advised action).
- Perceived benefits (an individual's assessment of the positive consequence of adopting the behaviour).

Constructs of mediating factors were later added to connect the various types of perceptions with the predicted health behaviour.

Self – efficacy (an individual's self-assessment of ability to successfully adopt the desired behaviour i.e. confidence in one's ability to take action).

Cues to action (external influences promoting the desired behaviour, may include information provided or sought, reminders by powerful others, persuasive communications and personal experiences).

Perceived threat (whether the danger imposed by not undertaking a certain health action recommended is great). Health motivation (whether an individual is driven to stick to a given health goal). Demographic variables (such as age, gender, ethnicity, occupation, educational level).Socio-psychological variables (such as socioeconomic status, personality, coping strategies).

The prediction of the model is the likelihood of the individual concerned to undertake recommended health action such as preventive and curative health actions.

Application of Health Belief Model (HBM) to the Study

Perceived Susceptibility: When parents have the opinion or perceive the possibility of their children getting infected or attacked by the preventable diseases, it will motivate them to seek immunization services.

Perceived Severity: If parents understand or realize the dangers or extent of damage associated with getting any of the dreaded preventable diseases, it will equally motivate them to get their children immunized against all odds.

Perceived Barriers: Parents will access the factors that hinders access to this routine immunization like availability, affordability, accessible roads, proximity etc. and device a means to overcome them.

Perceived Benefits: When parents weigh the gains of getting their children immunized, realize the importance of diseases free life, not having to go often to the hospital because of illness and good performance of their children in schools and other social activities, all these motivate utilization of routine immunization services against all odds.

Self Efficacy: Parents develop confidence in themselves and encourage themselves with the fact that they can do it after weighing it.

Perceived Threat: When parents consider the dangers of not immunizing their children, having sickly children and the money involved in always going to the hospital for treatment, as a result of not doing what they should have done, it propels them into positive action.

The prediction of the health belief model is the likelihood of parents to undertake recommended health action such as getting their children fully immunized.

Review of Empirical Studies

Niederhauser (2006) conducted a study to explore the issue of childhood immunization uptake. In this qualitative descriptive design, twenty eight mothers from two first Nation communities in North-Western Ontario, Canada were interviewed about the perception of childhood immunization and vaccine preventable diseases. Data analysis revealed the following reasons: fear of the disease, the efficacy of immunizations, immunization experience, the consequences of immunization, negative interaction with health professionals. Participants were motivated to seek immunization for their children by a fear of vaccine preventable diseases. A small proportion of mothers however question the effectiveness of vaccines in preventing diseases. He reported that the immunization statistics report showed that the children of native India have lower vaccination coverage than children in the general Canadian population.

Singh and Yadav (2008) carried out a study to ascertain the knowledge, attitude, perceptions and expectations of mothers about routine immunization. A cross-sectional research method was used with a total of 166 mothers. They used a pre-tested interview schedule/questionnaire on Knowledge, Attitude, Perceptions and Expectations. After the study they reported that lack of information in addition to mothers' illiteracy and inaccessibility to immunization centers have contributed to low levels of immunization in Rajasthan India. They also showed that understanding about immunization helps planners to develop health education programmes.

PATHS (2010) conducted a research in six states of Nigeria namely Borno, Enugu, Jigawa, Lagos, and Yobe. Cross sectional descriptive survey design was employed in the study. Simple random sampling was used to draw a sample of 7,065 men and women from the 4,760 households in the six states for the study. Chi-square was used to analyze the study. Their findings showed that uptake was very low in the study states and rates

increased with socio economic status and formal education but there was considerable variation among the states for example Northern States had a lower immunization rates than Southern States. This showed that southern state accepts and utilizes routine immunization more.

Ambe (2007) carried out a study in order to elucidate the contributing factors from the attitudes, beliefs, and practice of mothers towards measles and its vaccination. In this cross sectional survey, 500 mothers in Konduga local government area in Northern Nigeria participated. His findings reported that 1% of the five hundred mothers interviewed believed that measles is prevented by immunization, 16% said it is contagious, 26% said it is caused by evil spirit and 25% had never heard of measles immunization, 25% did not believe immunization was effective and 4% were not allowed to go for immunization by their husbands. Of those mothers whose children had developed measles, only 31% had been treated in formal health facilities. His findings indicated an unfavourable attitude and practice by mothers in relation to measles and measles vaccination.

Sharma and Bhasin (2006) carried out a study in East Delhi, India to find out the possible hindrances that hamper progress to the coverage of routine immunization among caretakers of children attending polio immunization. It was a community – based cross-sectional study. The respondents were people who took children under five years to a polio immunization booth in the national capital territory of Delhi. They used a semi-open-ended questionnaire to ask and record the responses of the interviewees to various questions asked to test their knowledge about routine immunization. Their sample consisted of 682 people. The findings of the study were that nearly two thirds (67%) of the respondents belonged to the age group of 21 – 40 years. Less than half of the respondent (49%) knew that routine immunization is done for children up to the age of five years. The

respondents were asked to mention the diseases for which vaccines are administered under the programme. Majority (61%) of the respondents knew about measles followed by tuberculosis (52%). Only 123 (18%) respondents correctly mentioned the age for measles vaccination as nine months. Educational level of the respondents was found to have an association with the knowledge about routine immunization. Illiterate respondents were least likely to be sentient about routine immunization while higher proportions of the respondents who had attained graduation or higher education knew significantly about routine immunization. They concluded by highlighting the necessity of planned information, Education and Communication (IEC) activities as a felt need of the caretakers.

Angelillo et al, (2009) evaluated the knowledge, attitudes and behaviour of mothers regarding immunization of 841 infants who attended public Kindergarten in Cassino and Crotone, Italy using cross sectional design method. Mothers who brought their children to fourteen public Kindergartens in Crotone and to ten public Kindergartens in Cassino Italy from January to June 1997 were surveyed using interview schedule/questionnaire. The results of their study showed that 53% of mothers knew about all mandatory vaccinations for infants and this knowledge was significantly greater among those with a higher rather than lower educational level and among those mothers who were older at the time of the child's birth. Only half of the respondents could identify all the mandatory vaccines for infants and worse still only 20% knew that pertussis, measles, mumps, and rubella were diseases that are vaccine – preventable in children. The study also found that although vaccination coverage for infants in Italy has recently improved, overall they remain below the goals set by WHO for the year 2000.

Antai (2009) assessed inequitable childhood immunization uptake in Nigeria. In this study, multi variable regression analysis was used on a nationally representative sample of

women aged 15-49 years. From 2003 Nigeria Demographic and Health Survey, multi level regression analysis was performed with children (level 1, rested within mothers, (level 2), who were in turn nested within the communities. (Level 3) the data was analyzed using strata 10 software and package. Result showed that the pattern of full immunization clusters within the families and communities and socio-economic characteristics are important in explaining the differentials in full immunization among children in the study. At the individual level, ethnicity, mother's occupation and mother's household wealth were characteristics of the mothers associated with full immunization of the children. At the community level, the proportion of mothers that has hospital delivery was a determinant of full immunization status.

Abdulraheem, Onajole, Yimoh and Oladipo (2010) carried out a study in Nigeria to find out the reasons for incomplete vaccination and factors for missed opportunities for immunization in children less than one year of age. This cross sectional study was used with 685 respondents from 85 villages in Awe L.G.A., Nasarawa State. The completeness and correctness of vaccination schedules were checked using standardized questionnaires. The results of their study showed that about two third (62.8%) of the children were not immunized by one year of age, 33.4% had expressed a missed opportunity for immunization and 36.4% were partially and incorrectly immunized. Parents objection, disagreement or concern about immunization safety (38.8%) long distance walking (17.5%) and long waiting time at the health facility (15.2%) are the most common areas for partial immunized.

Singh (2013) carried out a study in India to find out the trends in child immunization across geographical regions with focus on urban-rural and gender differentials. Data from three rounds of National Family Health Survey (NFHS) was conducted and analyzed. Bivariate analyses, urban-rural and gender inequality ratios and the multivariate pooled

logistic regression model were applied to examine the trends and patterns of inequalities over time. The result showed that there was considerable variation in child immunization coverage across six geographical regions in India. Despite a decline in urban-rural and gender differences over time, children residing in rural areas and girls remained disadvantaged. Moreover, Northeast, west and south regions, which had the lowest gender inequalities in 1992 observed an increase in gender difference overtime.

Eboreime, Abimbola and Bozzani (2015) carried out a study in Northern Nigeria to elucidate access to routine immunization comparative analysis of supply-side disparities between Northern and southern Nigeria. A cross sectional study was used to compare equity in access in two northern and two southern Nigeria states. Four states were identified using purposive selection based on relative immunization coverage and socio-cultural characteristics. The results showed no significant association between geographical location and expenses of vaccine stock-out. Further, there has evidence of significant association between residing in Northern versus southern Nigeria and accessing routine immunization services within a 5km radius. People residing in Northern Nigeria were 1:13 times more likely to live within 5km of routine immunization service delivery points than those residing in Southern Nigeria.

Summary of Literature Review

Literature reviewed described the various concepts understudy which include concept of immunization, routine immunization, immunization vaccines, routine immunization schedule, utilization of routine immunization and factors affecting utilization of routine immunization. Health belief model was adopted as a framework of the study.

Empirical review on socio-economic and geographical differences in utilization of routine immunization services was carried out. A number of studies had been carried out internationally and nationally but none had been carried out in Enugu East Local

Government Area. In the studies reviewed, a number of factors were found to affect the utilization of routine immunization, this ranged from lack of information about the immunization programme, attitude of mothers towards immunization vaccine, non-availability of vaccine, misconception about immunization to prolonged waiting time.

None of the studies reviewed were on socio-economic and geographical differences on the utilization of routine immunization. The only difference observed in the studies was in the time frame of the routine immunization.

It is therefore important to investigate the socio-economic and geographical differences in utilization of routine immunization services in our own area.

CHAPTER THREE

RESEARCH METHODS

This chapter presented a description of the research design, area of study, population of the study, sample and sampling procedure, instrument for data collection, validity of instrument, reliability of instrument, ethical consideration procedure for data collection and method of data analysis.

Research Design

A cross-sectional descriptive survey research was used. According to Basavanikappa (2010), this design collects data about various variables from the sample at one point of time in order to uncover relationship existing among those variables. This design was successfully used by researchers for similar studies (Walsh, 2010 and Senbanjo et. al., 2009). It is therefore, considered appropriate for this study.

Area of Study

The study was carried in two communities in Enugu East L.G.A of Enugu State, 1 urban Abakpa and 1 rural – Ugwogo community. Abakpa is located at the Eastern part of Enugu behind the major eastern Orthopaedic hospital and towards Onitsha express road. Ugwogo is bounded on the east by Mbu, Isi-uzo L.G.A; on the west byUkehe, Igbo-Etiti L.G.A; on the south by Ogbeke, Enugu East L.G.A and on the north by Opi, Nsukka L.G.A all in Enugu State. There are 74 health facilities in Enugu East, 20 public and 54 private health facilities. Out of the 20 public health facilities, 1 is tertiary health facility – Orthopaedic hospital, 3 were secondary health facilities namely, Iji-Nike Cottage Hospital, Ugwogo Nike Cottage Hospital and Akpuoga Cottage Hospital. The rest were primary health facilities. 2 were health post namely: Akpogazi and Ugwuomu and remaining 14 were primary health care centres. They include: Abakpa Health Centre, Ako-Nike, Alulu,

Akpuoga, Amuokpo-uno, Neke Obodoukwu, Neke-uno, Ogbeke , Obodo Nike, Ugbo-owa, Umuchi-oha, Onuluoha, Nchata-Ncha and Ugwogo.

Population of the study

The total population of Enugu East L.G.A is 277,119 (Nigeria 2006 Population Census, 2007). However, the target population which comprised mothers with children aged 0-2 years used for the study was unknown in the study area.

Sample

A sample size of 384 was statistically determined using Godden formular for infinite (unknown) population (Godden, 2004).

$$SS = \frac{Z^2 \times P (1 - P)}{M^2}$$

Where:

SS = Sample size for infinite population (more than 50,000).

Z = Z value (e.g. 1.96 for 95% confidence interval).

P = Population proportion (expressed as decimal) (assumed to be 0.5 (50%) since this would provide the maximum sample size).

M = Margin of Error at 5% (0.05)

Inclusion Criteria

i) Child`s mother or caregiver.

ii) Resident in the selected community.

iii) Mothers or caregivers who have a child below 2 years of age in the family at the time of the study.

iv) willingness to participate

Sampling Procedure

Simple random sampling technique was used to select 2 communities for the study, 1 urban and 1 rural communities. The use of non-probability sampling - exponential non-discriminative snowball sampling (also known as chain referral) technique was used to locate mothers with children aged 0-2 years in the communities who meet the inclusion criteria. Snowball sampling is a non-probability sampling technique that is used by researchers to identify potential subjects in studies where subjects are hard to locate. This method was ideal for this study as the mothers do not have a particular place where they meet; and each mother referred to two other mothers, thereby ensuring a wider distribution of mothers and children that was covered. Following this method 30% of the questionnaire was allotted to the rural part, and 70% of the questionnaire allotted to the urban. This is based on the fact that most people are moving from the rural area of the community to urban area thereby resulting to a higher population in the urban area.

Instrument for Data Collection

Data collection was done by the use of questionnaire developed by the researcher. The instrument was designed from literature, taking into consideration the objectives of the study and research questions. The instrument comprised two (2) sections, Section A covered demographic information of the mothers and children with 7 questions; Section B was on utilization of routine immunization in different geographical locations with 14 questions. Section C was on utilization of routine immunization among different socioeconomic group. The SES was derived using upper, middle and lower classes based on husband's education, occupation and income. Section D was on factors that affect access to routine immunization with 13 questions. This was structured in a modified likert scale format of Strongly Agree (SA), Agree (A), Strongly Disagree (SD) and Disagree (D).

Validity of the Instrument

The face and content validity was determined by the project supervisor and two experts, one in Measurement and Evaluation and the other in Community Health Nursing from Department of Nursing Sciences, University of Nigeria Enugu Campus. Their observations and comments were used to effect corrections before the instrument was administered to the respondents.

Reliability of the Instrument

A pilot test was done by administering 30 copies of the questionnaire to 30 respondents from Enugu South L.G.A. with similar characteristics like the study area using split half method. Responses obtained were subjected to statistical test using Cronbach Alpha to test the internal consistency of the instrument. A reliability co-efficient of 0.8 was obtained indicating that the instrument was reliable. (Appendix II).

Ethical Consideration

Approval was obtained from the Research Ethical Committee of the University of Nigeria Teaching Hospital, Ituku-Ozalla after submitting the research proposal and the introductory letter from the Department. All participants were fully informed of the proposed objectives of the study. Informed consent was obtained from the mothers/caregivers who were willing to participate in the study. Respondents were given the option to withdraw from the study at any time they felt like.

Procedure for Data Collection

With the ethical approval and introductory letter from the Department of Nursing Sciences, University of Nigeria, administrative permit was obtained from Enugu East L.G.A, which was presented to the traditional rulers/elders council, oral permission was given which enabled the researcher to administer the questionnaire. Five research

assistants were instructed and guided on the purpose of the study and how to collect data from the respondents. Both the researcher and the assistants administered the 384 copies of the questionnaire to the respondents in their various homes and retrieval was done as soon as each participant completes the questionnaire. Data collection process lasted for four (4) weeks.

Method of Data Analysis

Descriptive statistics which include frequency count, percentages, mean and standard deviation were used for general description of study participants' profile and to answer the research questions. The socio-economic status (SES) was analyzed using upper, middle and lower classes based on the husband's education, occupation and income.

A modified 4 point likert type scale was used for responses to section D (factors that affect access to utilization of routine immunization services) and was scored 4 and 3 for strongly agree and agree, respectively, strongly disagree and disagree were scored 2 and 1 respectively.

Criterion mean of 2.5 which is the average of the likert scale =

$$\left(\frac{4 + 3 + 2 + 1}{4} = \frac{10}{4} = 2.5 \right)$$ was gotten

Chi -Square was used to determine variables significantly associated with utilization of routine immunization at 0.05 level of significance. All data analyses were performed with the aid of Statistical Package for Social Sciences (SPSS version 17.0).

CHAPTER FOUR

PRESENTATION OF RESULTS

In this chapter, the results of data analysis were presented according to the research questions and the hypotheses set for the study. Out of 384 copies of questionnaires administered to the respondents, 12 copies were wrongly filled, leaving out 372 copies, giving a return rate of 91.88%. These 372 copies were subjected to data analysis and results presented here are based on this number. The results were presented in tables.

Table 2: Demographic characteristics of mothers/caregivers

n = 372

	quency	Percent
Age group		
< =25	44	11.8
26 – 30	87	23.4
31 – 35	86	23.1
36 – 40	91	24.5
41 – 45	24	6.5
>45	40	10.8
Mean Age: 34.5, (SD) + 7.52		
Occupation		
Civil/public servant	251	67.5
Self employed	35	9.4
Trader	45	12.1
Not employed	41	11.0
Level of education		
No formal education	12	3.2
Primary education'	4	1.1
Secondary education	91	24.5
Tertiary education	265	71.2
Marital status		
Single	18	4.8
Married	340	91.4
Divorced	4	1.1
Widowed	4	1.1
Co-habiting	6	1.6
Religion		
Catholic	193	51.9
Anglican	86	23.1
Pentecostal	87	23.4
Muslim	6	1.6
How many children do you have?		
1 – 4	332	89.2
>4	40	10.8

Table 2 above presents the frequency distribution of the demographic characteristics of the study participants. Of the 384 participants, none was below 20 years. The majority were

between 36 -40 year (24.5%) followed by 23.4% and 23.1% which were between 26 - 30 years and 31-35 years respectively; very few were above 40 years.

The occupation of the respondents on the same table shows that majority 67.5% were civil /public servants, followed by 12.1% who were traders, 11..0% not employed and the least 9.4% were self employed.

The table also showed that the majority of respondents 71.2% had up to tertiary education, 24.5% secondary school certificate holders, while 3.2% and 1.1% had no formal education and primary education respectively. The respondents were mostly Christians while few, 1.6% were Muslims. They were predominantly married 340, (91.4%), 18 (4.8%) single, 6 (1.6%) co-habiting while the rest 4 (1.1%) were either divorced or widowed.

Majority of the respondents 352(89.2%) had 1 - 4 children, while 40(10.8%) had more than 4 children.

Research question 1: What are the differences in utilization of routine immunization services among children 0-2 years in Enugu East L.G.A

Table 3: Differences in utilization of routine Immunization Services among children 0-2 years in rural and urban communities in Enugu East L.G.A.

Questions	Rural n=103	Urban n = 269	Total n = 372	X^2	P - Value
Did you give your child immunization at birth?					
Yes	101 (98.1)	261 (97.02)	362 (97.3%)	5.916	0.116
No	2 (1.9%)	8 (3.65%)	10 (2.7%)		
Did you give pentavalent to your child?					
Yes	98 (95.1%)	232 (86.2%)	330 (88.7%)	6.110	0.256
No	5 (4.9%)	37 (13.8%)	42 (11.3%)		
Did you complete it?					
Yes	83 (90.6%)	231 (85.9%)	314 (84.4%)	1.645	0.649
No	20 (19.4%)	38 (14.1%)	58 (15.6%)	1.462	1.111
Did your child receive measles vaccine at nine months?					
Yes	98 (95.1%)	246 (91.4%)	344 (92.5%)	2.751	0.712
No	5 (4.9%)	23 (8.6%)	28 (7.5%)		
What other vaccine did your child receive?					
Hepatitis B	100 (97.1%)	245 (9.1%)		2.844	0.416
Yellow fever vaccine	98 (95.5%	238 (88.5%)	345(92.7%)	1.462	1.111
Vitamin A	96 (93.2%)	262 (97.4%)	358(96.2%)	2.001	0.431
Meningitis	101 (98.1%)	261 (97.02%)	362(97.3%)	3.425	0.321
OPV	102 (99.02)	264 (98.1%)	366 (98.4%)	2.101	0.141
DPT	101 (98.1%)	261 (97.02%)	362(97.3%)	3.406	0.112
Rotavirus	88(85.41%)	240 (89.02%)	328 (88.2%)	6.111	0.332
Tetanus toxoid	100 (97.1%)	245 (91.1%)	345 (92.7%)	2.111	0.131
PCV	88 (85.4%)	240 (89.2%)	328 (88.2%)	5.013	0.441
Chicken pox	86 (83.5%)	238 (88.5%)	324 (87.1%)	3.444	0.761

Table 3 above shows that 362 (97.3%) of the respondents gave their children BCG immunization at birth while 10 (2.7%) did not immunize. 330 (88%) had pentavalent

vaccine while 42 (11.3%) did not receive the vaccine, 314 (84.4%) completed the 3 doses of pentavalent vaccine while 58 (15.6%) defaulted and did not complete the immunization.

Majority of the respondents 344 (92.5%) immunized their children up to the measles vaccine and was able to complete the routine immunization schedule while 28 (7.5%) did not.

Research question 2: What is the difference in SES on utilization of routine immunization?

Table 4: Distribution of Respondents based on SES

	Frequency	Percent
What is your husband's educational level?		
Primary	20	5.4
Secondary	107	28.8
Tertiary	245	65.9
What is your husband's occupation?		
Civil servant	177	47.6
Business man	140	37.6
Trader	36	9.7
Farmer	13	3.5
No employment	6	1.5
Is the place where you live?		
Owned by you	97	26.1
Rented	25	71.2
Company	10	2.7
What is your family income per month?		
18,000 – 25,000	50	13.4
30-50,000	61	16.4
55-100,000	103	27.7
150-200,000	72	19.4
250-300,000	38	10.2
Above 300,000	48	12.9

The result in table 4 above showed that majority 245 (65.9%) of the respondent's husband attained tertiary education, while 107 (28.8%) attained secondary education. Also, majority 177 (47.6%) were civil servants and 140 (37.6%) were businessmen. Regarding house ownership, majority 255 (68.5%) live in rented houses, while 97 (26.1%) live in

their own houses. Also, the income per month of majority was between ₦55,000-₦100,0000. This was closely followed by those who earn between ₦150,000-₦200,000 72 (19.4%).

Table 5: Utilization of Routine Immunization Services based on SES

	Lower n=27	**Middle n=291**	**Upper n=54**	**X^2**	**P-value**
Immunization at Birth					
Yes	27(100%)	281(96.6%)	54(100%)	2.860	0.239
No	0(0%)	10(3.4%)	0(0%)		
Pentavalent	27(100%)	261(89.7%)	42(77.8%)	10.159	0.001
Yes	0(0%)	30(10.3%)	12(22.2%)		
No					
Completed	19(70.4%)	249(85.6%)	46(85.2%)	4.365	0.113
Yes	8(29.6%)	42(14.4%)	8(14.8%)		
No					
Measles	23(85.2%)	269(92.4%)	52(96.3%)	3.195	0.202
Yes	4(14.8%)	22(7.6%)	2(3.7%)		
No					
Other Vaccines Received					
Hepatitis B	24(88.9%)	280(96.2%)	5092.6%)	1.282	0.613
Yellow Fever	25(92.6%)	281(96.6%)	52(96.3%)	6.270	0.114
Vitamin A	27(100%)	281(96.6%)	54(100%)	3.101	0.516
Meningitis	27(100%)	285(97.9%)	54(100%)	2.711	0.621
OPV	27(100%)	281(96.6%)	54(100%)	5.211	0.140
DPT	23(85.2%)	254(87.3%)	51(94.4%)	4.001	0.627
Rotavirus	24(88.9%)	269(92.4%)	52(96.3%)	4.021	0.764
T. Toxoid	22(81.5%)	254(87.3%)	52(96.3%)	3.269	0.118
PCV	25(92.6%)	255(87.6%)	50(92.6%)	1.284	0.615
Chicken Pox	22(81.5%)	252(86.6%)	50(92.5%)	2.328	0.614

The above table showed that the majority 291(78.2%) of the respondents belonged to the middle class category, 54 (14.5%) belonged the upper class category while 27 (7.3%) belonged to lower class group.

The findings indicated that the utilization of immunization among the various subgroups showed no significant difference since the various Chi-Square statistics (X^2) and P-Value were greater than 0.05 for all the items tested with the exception of the utilization of Pentavelent vaccine which was significant (P = 0.001).

Research question 3: What factors affect Utilisation of Routine Immunization in Enugu East L.G.A.?

Table 6: Factors that Affect Utilization to Routine Immunization in Enugu East LGA

	Strongly agree n (%)	Agree n (%)	Disagree n (%)	Strongly disagree n (%)	Mean ± SD
Primary health care services are highly ineffective	44 (11.8)	68 (18.3)	132 (35.5)	128 (34.4)	2.92 ± 0.99
Lack of understanding of the value of routine immunization	107 (28.8)	159 (42.7)	66 (17.7)	40 (10.8)	2.92 ± 0.94
Incorrect knowledge as to the preventive role of routine immunization	87 (23.4)	161 (43.3)	70 (18.8)	54 (14.5)	2.76 ± 0.97
My religion forbids the use of immunization services	22 (5.9)	24 (6.5)	166 (44.6)	160 (43.0)	1.75 ± 0.82
Non-availability of vaccines on some occasion.	98 (26.3)	160 (43.0)	68 (18.3)	46 (12.4)	2.83 ± 0.96
Fear that vaccines are used by the developed world to reduce local population	31 (8.3)	60 (16.1)	167 (44.9)	114 (30.6)	2.02 ± 0.89
Fear of side effects of the vaccines on children	35 (9.4)	95 (25.5)	162 (43.5)	80 (21.5)	2.23 ± 0.89
Lack of functional P.H.C offering immunization services.	77 (20.7)	132 (35.5)	109 (29.3)	54 (14.5)	2.62 ± 0.97
Belief that vaccines cause reduction in fertility late in life	35 (9.4)	52 (14.0)	151 (40.6)	134 (36.0)	1.97 ± 0.94
The health care is far from my house	30 (8.1)	87 (23.4)	149 (40.1)	106 (28.5)	2.11 ± 0.91
Non availability of nurses/health personal to give the vaccines	56 (15.1)	77 (20.7)	149 (40.1)	90 (24.2)	2.27 ± 0.99
Lack of finance	46 (12.4)	73 (19.6)	138 (37.1)	115 (30.9)	2.13 ± 0.99
Grand mean = 2.85, (SD) ± 0.93					

Result in table 6 showed that factors which affect utilization of routine immunization by women with children 6 – 2 years in Enugu East Local Government Area include ineffectiveness of the PHC with a mean value of 2.92(0.99), lack of knowledge as to the preventive role of routine immunization with a mean of 2.76 (0.9), non-availability of vaccines with a mean value of 2.83 (0.96) and lack of functional PHC that offer immunization services in the area with a mean of 2.62(0.97). The respondents however disagreed with the assertions that religion forbids the use of immunization services 1.75 (0.82), and the belief that vaccines cause reduction in fertility 1.97(0.94) etc.

Test of Hypotheses

Hypothesis 1: There is no Significant Difference in Utilisation of Routine Immunization among the Different Geographical Area in Enugu East.

Table 7: Result of Pearson Chi-Square (X^2) on Utilization of Routine Immunization among the Different Geographical location – urban and rural.

Utilization of routine immunization services	Geographical location		χ^2	P value
	Urban n (%)	Rural n (%)		
Yes	253 (94.1)	91 (88.3)	3.480	0.0694
No	16 (5.9)	12 (11.7)		
Total	269 (100.0)	103 (100.0)		

Since the significant value of the Chi Square statistic (P = 0.694)is greater than 0.05 level of significance, the null hypothesis is hereby accepted. Therefore, there is no significant difference in utilization of routine immunization among the different study group based on geographical area in Enugu East. This implies that geographical location has no effect on the utilization of routine immunization by women with children 0-2 years in Enugu East LGA. Similarly this implies that SES of mothers do not affect the utilization of routine immunization in Enugu East L.G.A.

Hypothesis 2: **There is no Significant Difference in Utilization of Routine Immunization among the Different Socio-Economic Classes in Enugu East.**

Table 8: Result of Pearson Chi-Square (X^2) on Utilization of Routine to Routine Immunization among the Different Socio-Economic Classes in Enugu East.

n = 372

Utilization of routine immunization	Socio-economic class			χ^2	P value
	Lower n (%)	Middle n (%)	Upper		
Yes	23 (85.2)	243 (83.5)	42 (77.8)	1.166	0.558
No	4 (14.8)	48 (16.5)	12 (22.2)		

Since the significant value of the chi square statistic (P = 0.558) is greater than 0.05 level of significance, the null hypothesis is hereby accepted. Therefore, there is no significant difference in utilization of routine immunization among the different socio-economic class in Enugu East.

Summary of Findings

- The majority 269(72.5) of the respondents resides in the urban area.
- The findings revealed that the majority 362(97.3%) of the respondents gave their children immunization at birth.
- There was no difference in the utilization of routine immunization among the different geographical location except in timing schedule for the immunization.
- The finding also showed that majority 330(88.7%) gave their children pantavelant vaccine.
- The majority 314(84.4%) of the respondents completed the various needed immunizations for their children.

- Based on the socio-economic status, the majority 291(78.2%) of the respondents fall under the middle class category.

- There were no significant difference in the utilization of routine immunization among different SES.

- The finding indicated that 42(11.3%) of the respondents did not complete the various immunization for their children. Major factors that affected utilization of routine immunization include ineffectiveness of PHC, lack of knowledge of the preventive role of routine immunization, non-availability of vaccines and lack of functional PHC offering immunization services.

- Findings revealed that there was no difference in the utilization of routine immunization among the different SES with the exception of pantevalent immunization with P = 0.001.

CHAPTER FIVE

DISCUSSION

This chapter presented the discussion of major findings, implications of the findings, limitations of the study, suggestions for further studies, summary of the study, conclusion and recommendations.

Discussion of Major Findings

Utilization of routine immunization services among children 0-2 years in different geographical location – urban and rural, in Enugu East L.G.A.

The study revealed that majority of the respondents from both urban and rural areas utilized routine immunization. There was no significance difference in utilization with X^2 = 3.480, P = 0.062. This finding is in consonance with that of Stanhope et al (2012) who found out that the difference are no longer as distinct as they were some decades ago, due to the increased degree of urban influence on rural communities. The result however, did not agree with the study done by Singh (2013) which stated that despite a decline in urban-rural and gender differences overtime, children residing in some rural areas and girls remained disadvantaged.

Utilization of routine immunization among children 0-2 years in different socio-economic classes in Enugu East L.G.A.

The findings showed that there is no significant difference in the utilization of routine immunization among children 0-2 years in the different SES. However indicators showed that utilization of routine immunization increased with higher socio economic class. Since majority of the respondents fall under the middle class category and lived in urban area of the community, their chances of receiving information on immunization and access to health facility are more than the other groups. This finding is in consonance with that of Topuzoglu et al (2010) who find out that higher socio economic status is associated with

higher uptake of vaccination. This may be due to the fact that children who are from poor homes find it difficult to be reached by health service providers and parents may encounter barrier to reach health facility, compared to those of better socio-economic status. However, the test of hypotheses showed no significance in utilization among the SES groups. This finding is in agreements with the findings of Castro-Leal (2011) who found no difference in vaccination rates with respect to socio-economic status.

Factors that affect utilisation to Routine Immunization in Enugu East

The findings showed that a number of factors affect utilization of routine immunization services which include ineffectiveness of the PHC, lack of knowledge as to the preventive role of routine immunization, non-availability of vaccines and lack of functional PHC that offer immunization services. Other identified factors such as waiting time, long distance etc are all in consonance with the finding of that of Abdulmeheem, Anajole, Jimoh and Oladipo (2010) which identified long distant walking, long waiting time at the health facility as some of the factors that affect utilization of routine immunization.

However, it did not agree with the finding of Akesodes, (2012) which stated that the availability of vaccines and non-payment for immunization services in Nigeria do not necessarily encourage the community to use the available health services.

Conclusion

Based on the findings of the study, the following conclusions were made.

Geographical location of individuals has no influence on utilization of routine immunization rather the difference exists only in the timing of service provision.

Socioeconomic status of families has some influence on utilization as the study showed that utilization is more with higher socioeconomic status.

Lack of understanding of immunization value, poor state of facilities, non availability of vaccines in some occasions, lack of functional health centers offering immunization services are some of the identified factors that influence utilization of routine immunization.

Implication of the Findings

Communicable diseases are significant cause of morbidity and it is generally accepted that immunization against them represent a significant breakthrough in their control and eventual eradication. Therefore, all the factors affecting utilization of routine immunization which have been discussed should be addressed to avoid future reoccurrence.

Health care providers should devise strategies to reach the unreached and those in the remote areas to bridge the gap in timing of service provisions among the populace.

Limitations of the Study

The researcher encountered certain difficulties in the course of this research and they include:

- Lack of access roads limited the number of communities used for this study.
- The challenging terrain to access the communities examined.
- Some of the responses given by the respondents may have been estimated or even exaggerations. This has also been reported in similar studies.

Suggestions for further studies

There is need to further investigation if similar situations exist in other local government areas in the state and other state in south east, Nigeria.

Impact assessment on the effectiveness of routine immunization is necessary for future epidemiological studies.

Summary

This study assessed the socio-economic and geographical differences in utilisation of routine immunization service in Enugu East L.G.A., Enugu State. The study was designed to:

- Determine differences in utilization of routine immunization services among children 0-2 years in Enugu East.
- Compare differences in utilization of routine immunization services among children 0-2 years among different socio-economic class in Enugu East.
- Identify factors that affect utilization of routine immunization in Enugu East.

Literature was reviewed under conceptual review and empirical studies, which were based on the objectives and hypothesis raised. Descriptive survey research design was employed at a sampling of 384 was drawn from the study population. Validated questionnaire were administered to the respondents and their responses were analyzed with the aid of statistical package for social sciences (SPSS) software version 20, using descriptive (frequency, percentage, means and standard deviation and inferential (chi-square) was used to determine variables significantly associated with utilization of routine immunization at 0.05 level of significance.

The study revealed that location does not really affect utilization of immunization although a difference occurs in time of service provision . It was also discovered that utilisation increases with increase in socio-economic status, the higher the socio economic status, the higher the utilisation. It was also discovered that there are factors that affect utilization of routine immunization.

Recommendations

- Nigeria Government should continue to improve on supplemental immunization activities such as National Immunization Day (NIDS) and catch-up campaigns that are already in place.
- Nigeria health department should conduct immunization campaigns frequently, such a campaign should be specific communication focused on all the required vaccines.
- In addition, government should work with religious bodies especially in the northern parts of the country so as to improve the uptake of immunisation
- Nigeria ministry of health should make an effort to sensitize parents about the importance of completing the immunization schedule especially the muslin parents.
- Education programme that can target poor and uneducated people should be put in place so that they are able to make informed decision regarding immunization of their children.

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APPENDIX 1

Department of Nursing Sciences
Faculty of Health Science and Technology
University of Nigeria
Enugu Campus

Dear Respondent,

I am a Master of Science student of the above institution conducting a research on "*Socio-Economic and Geographical Differences in Utilization of Routine Immunization Services in Enugu East, L.G.A., of Enugu State"*. Your participation is strictly voluntary.

Kindly give honest and frank answer to each question. I assure you that all information given will be treated confidentially and used for the purpose of this study. Do not write your name on this questionnaire.

Yours Sincerely,

Akakwa Njideka

QUESTIONNAIRE

SECTION A

PERSONAL DATA

Demographic Characteristics

1. What is your age as at last birthday? _____
2. What is your occupation?
   a) Civil/public servant [ ]
   b) Self employed [ ]
   c) Trader [ ]
   d) Not employed [ ]
3. What is your highest educational level?

   a) No formal education [ ] (b) Primary education [ ]

   b) Secondary education [ ] (d) tertiary education [ ]

4. What is your marital status?

   a) Single [ ] (b) married [ ] (c) divorced [ ]

   d) Widowed [ ] (e) co-habiting [ ]

5. What is your religion?
   a) Catholic [ ] (b) Anglican [ ] (c) Pentecostal [ ]

   d) Muslim [ ] (e) traditional religion [ ]

6. How many children do you have? _____

SECTION B:

Utilization of Routine Immunization Services in different Geographical Locations

7. What type of health facility do you attend?

   a) private [ ] (b) public [ ]

8. What is the location of the health facility?

   a) urban [ ] (b) rural [ ]

9. Where is the distance from your house to the health facility?

   a) less than 5km [ ] (b) 5-10km (c) 10-15km (d) above 15km

10. Did you give your child BCG immunization at birth?

    a) Yes [ ] (b) No [ ]

11. Did you give pentavalent to your child? _____

a) Yes [ ] (b) No [ ]

12. Did you complete it? a) Yes [ ] (b) No [ ]

13 Did your child receive measles vaccine at nine months?

a) Yes [ ] (b) No [ ]

14 What other vaccine did your child receive? …….

15 Is the health facility accessible to you?

a) Yes [ ] (b) No [ ]

16 Are the vaccines always available? a) Yes [ ] (b) No [ ]

17 Were you asked to pay money before vaccination? a) Yes [ ] (b) No [ ]

Sometimes [ ]

18 Have you ever been refused immunization?

a) Yes [ ] (b) No [ ]

19 If yes, what was the reason?

a) could not pay [ ]

b) came late [ ]

c) quarreled with health workers [ ]

d) others specify: _____

20 What is your usual means of transport to the health facility?

a) I walked [ ] (b) took a bus [ ] (c) took a taxi [ ]

d) private car [ ]

SECTION C:

Socio-Economic Status of Respondents

Please, answer O = No, 1 = yea, 2 = don't know unless otherwise stated.

21. What is your husband's educational level?

a) Primary [ ] (b) secondary [ ] (c) tertiary [ ]

(d) no formal education [ ]

22. What is your husband's occupation?

a) civil servant [ ] (b) business man [ ] c) trader [ ] (d) farmer [ ]

(e) no employment [ ]

23. Is the place where you live (a) owned by you [ ] (b) rented [ ]

c) company [ ]

24 What is your family income per month?

a) N18,000-25,000 [ ] (b) N30,000 – 500,000 [ ]

c) N55,000-100,000 [ ] (d) N150,000-200,000

e) (250,000-300,000 [ ] (f) above N300,000 [ ]

SECTION D:

Factors that affect Access to Routine Immunization in Enugu

SA = Strongly agree

A = Agree

D = Disagree

SD = Strongly disagree

		SA	**A**	**D**	**SD**
25.	Primary health care services are highly ineffective				
26	Poor state of facilities and low standard of delivery affect utilization of immunization services				
27	Lack of understanding of the value of routine immunization				
28	Incorrect knowledge as to the preventive role of routine immunization				
29	My religion forbids the use of immunization services				
30	Non-availability of vaccines on some occasions affect the attitude of mothers towards the use of immunization services				
31	Fear that vaccines are used by the developed world to reduce local population				
32	Fear of side effects of the vaccines on children				
33	Lack of functional primary health centre offering immunization services				
34	Belief that vaccines cause reduction in fertility late in life				
35	The health care is far from my house				
36	Non availability of nurses/health personal to give the vaccines				
37	Lack of finance				

APPENDIX II

INFORMED CONSENT FORM

Introduction: My name is **Akakwa Njideka P**. J.P. a post graduate student of the Department of Nursing Sciences, Faculty of Health Sciences and Technology, University of Nigeria, Enugu Campus.

Study Procedure: I am carrying out a study on Socio-Economic and Demographic Differences in utilization of routine Immunisation services in Enugu East L.G.A.
In this study, you will be required to fill the questionnaire. Please, feel free to ask for clarification on any question you do not understand.

Risk: The process of filling the questionnaire will not cause you any harm or injury.

Voluntary nature of participation: Subjects participation in this study is entirely voluntary. You have the right to withdraw consent and discontinue participation in the study of any given time.

Confidentiality: Please, note that information you give will be kept confidential and your name will never be used in connection with any information you give.

Feedback: In case of any clarification you can contact me 08037746060.

Response: The study has been explained to me and I finally understand the consent of the study process. I will be willing to participate in the study described above.

……	**…….**	**……**
Signature of Participant	**Signature of Witness**	**Signature of Researcher**
……	**…….**	**……**
Date	**Date**	**Date**

APPENDIX III

SAMPLE SIZE CALCULATION

A sample size of 384 was statistically determined using Godden formular for infinite (unknown) population (Godden, 2004).

$$SS = \frac{Z^2 \times P (1 - P)}{M^2}$$

Where:

SS = Sample size for infinite population (more than 50,000).

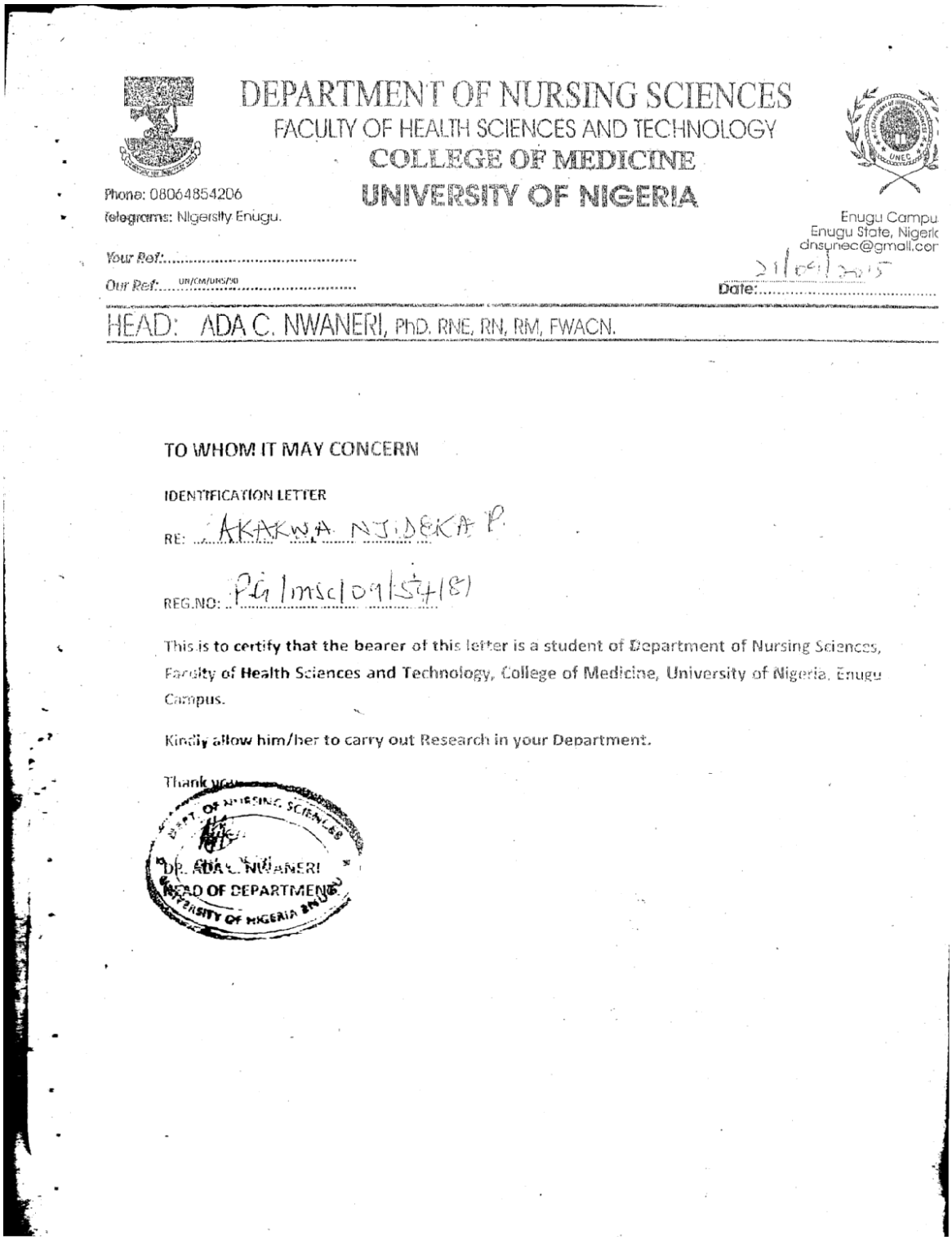
Z = Z value (e.g. 1.96 for 95% confidence interval).

P = Population proportion (expressed as decimal) (assumed to be 0.5 (50%) since this would provide the maximum sample size).

M = Margin of Error at 5% (0.05)

APPENDIX IV

LETTER OF INTRODUCTION



DEPARTMENT OF NURSING SCIENCES
FACULTY OF HEALTH SCIENCES AND TECHNOLOGY
COLLEGE OF MEDICINE
UNIVERSITY OF NIGERIA

Phone: 08064854206
Telegrams: Nigersity Enugu.

Enugu Campu
Enugu State, Nigeri
dnsunec@gmail.cor

Your Ref:.....
Our Ref: UN/CM/DNS/90

Date: 21/04/2015

HEAD: ADA C. NWANERI, PhD. RNE, RN, RM, FWACN.

TO WHOM IT MAY CONCERN

IDENTIFICATION LETTER

RE: AKAKWA NJIDEKA P.

REG.NO: PG/MSC/09/54181

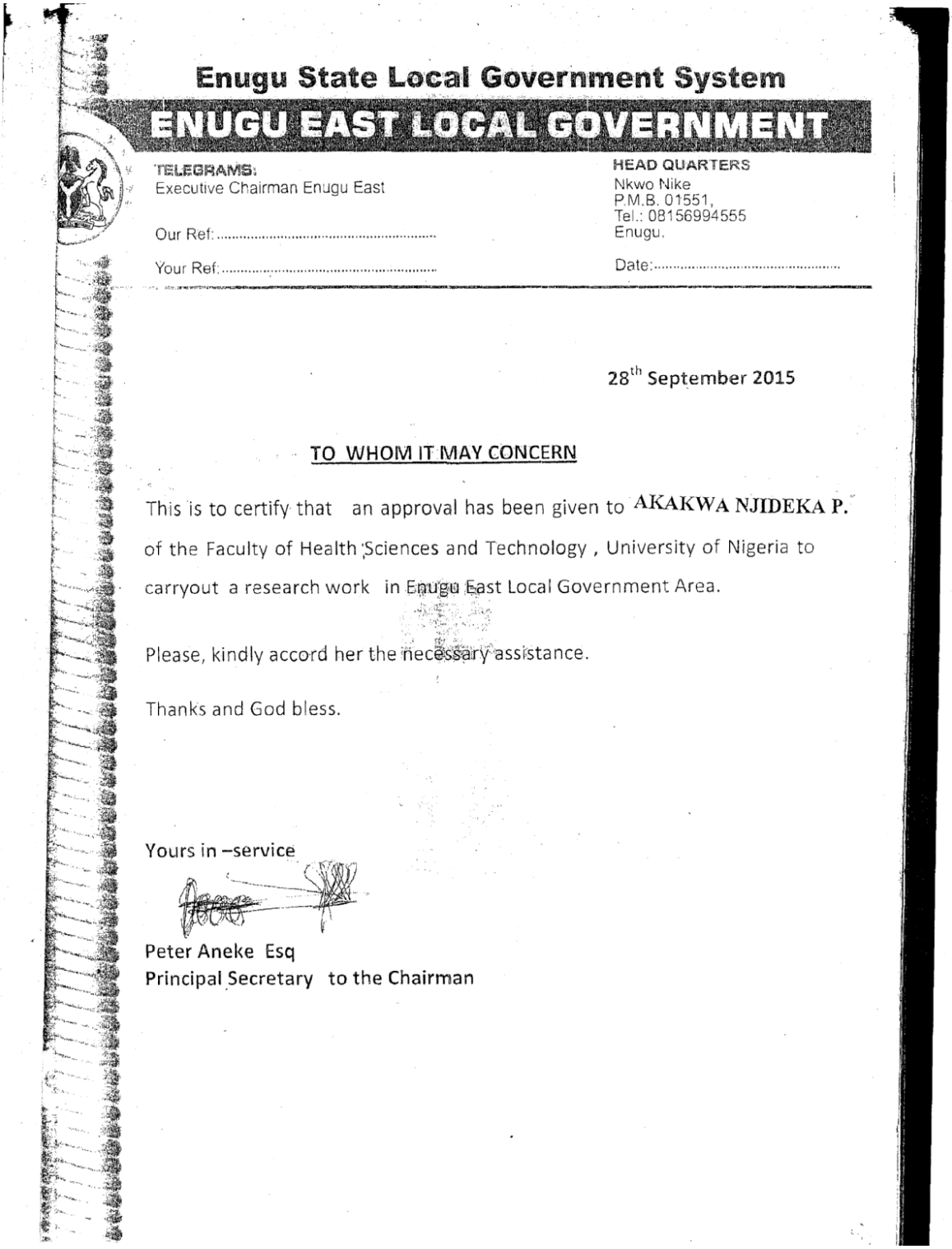
This is to certify that the bearer of this letter is a student of Department of Nursing Sciences, Faculty of Health Sciences and Technology, College of Medicine, University of Nigeria, Enugu Campus.

Kindly allow him/her to carry out Research in your Department.

Thank you

DEPT. OF NURSING SCIENCES
DR. ADA C. NWANERI
HEAD OF DEPARTMENT
UNIVERSITY OF NIGERIA ENUGU

APPENDIX V
ADMINISTRATIVE PERMIT



Enugu State Local Government System

ENUGU EAST LOCAL GOVERNMENT

TELEGRAMS:
Executive Chairman Enugu East

HEAD QUARTERS
Nkwo Nike
P.M.B. 01551,
Tel.: 08156994555
Enugu.

Our Ref:.....

Your Ref:.....

Date:.....

28th September 2015

TO WHOM IT MAY CONCERN

This is to certify that an approval has been given to AKAKWA NJIDEKA P. of the Faculty of Health Sciences and Technology , University of Nigeria to carryout a research work in Enugu East Local Government Area.

Please, kindly accord her the necessary assistance.

Thanks and God bless.

Yours in –service

Peter Aneke Esq
Principal Secretary to the Chairman

APPENDIX VI

ETHICAL APPROVAL

UNIVERSITY OF NIGERIA TEACHING HOSPITAL
ITUKU - OZALLA, P. M. B. 01129, ENUGU
TEL: 024 - 252022, 252573, 252172, 2552134, FAX: 042 - 252665
E-mail: cdunth@infoweb.abs.net
cmdunth2011@yahoo.com

Chief Sir Dr. C. J. UDEOGU, FICS
Specialist Surgeon, Endoscopist
Chairman UNTH Management Board

Barr. S. IKE NKUME;
LL.B(Hons); BL; MPA; B.Ed(Pol.Sc.);AHAN
Ag. Director of Administration/Secretary
UNTH Management Board

Dr. C. C. AMAH, MBBS, FWACS, FICS, FIAM, FNIM, FCE
Chief Medical Director

Dr. (MRS) ANNE C. NDU, MBBS, FWACP, MPH
Chairman Medical Advisory Committee

Our Ref: UNTH/CSA/329/Vol.5

Date: 15th Sept, 2015.

NHREC/05/01/2008B - FWA00002458 – IRB00002323

ETHICAL CLEARANCE CERTIFICATE

TOPIC: SOCIAL-ECONOMIC AND GEOGRAPHICAL DIFFERENCES IN UTILIZATION OF ROUTINE IMMUNISATION SERVICES IN ENUGU EAST L.G.A.

BY: AKAKWA NJIDEKA P.

FOR: A DISSERTATION FOR A MASTERS DEGREE IN NURSING SCIENCE OF THE DEPARTMENT OF NURSING SCIENCES, FACULTY OF HEALTH SCIENCES AND TECHNOLOGY, UNIVERSITY OF NIGERIA.

This research project on the above topic was reviewed and approved by the University of Nigeria Health Research Ethics Committee. This certificate is valid for one year from date of issue.

Prof. R.E Umeh **Date:** 18/09/15
Chairman Health Research Ethics Committee

APPENDIX VII

Kuppuswamy's Socio-Economic Status Scale

Table 1: Education

Sr. No.	Education of the Head	Score
1	Profession or Honours	7
2	Graduate or post graduate	6
3	Intermediate or post high school dip	5
4	High school certificate	4
5	Middle school certificate	3
6	Primary school certificate	2
7	Illiterate	1

Table 2: Occupation

Sr. No.	Occupation of the Head	Score
1	Profession	10
2	Semi-Profession	6
3	Clerical, Shop-owner	5
4	Skilled worker	4
5	Semi-skilled worker	3
6	Unskilled worker	2
7	Unemployed	1

Table 3: Income

Sr. No.	Family Income Per Months in Rs (2001)	Family Income Per Months in Rs (2014)	Family Income Per Months Score
1	≥15197	≥36017	12
2	7595–15196	18000–36016	1
3	5694–7594	13495–17999	6
4	3793–5693	8989–13494	4
5	2273–3792	5387–8988	3
6	761–2272	1803–5386	2
7	≤760	≤1802	1

Table 4: Total Score

Sr. No.	Score	Socioeconomic Class
1	26–29	Upper (I)
2	16–25	Upper Middle (II)
3	11–15	Lower Middle (III)
4	5–10	Upper Lower (IV)
5	< 5	Lower (V)