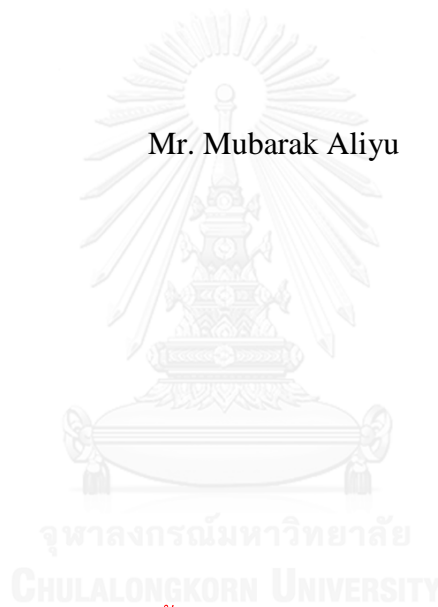


FACTORS AFFECTING HEALTH CARE UTILIZATION: EVIDENCE FROM
THE 2013 NIGERIAN DEMOGRAPHIC AND HEALTH SURVEY.

Mr. Mubarak Aliyu



บทคัดย่อและแฟ้มข้อมูลฉบับเต็มของวิทยานิพนธ์ตั้งแต่ปีการศึกษา 2554 ที่ให้บริการในคลังปัญญาจุฬาฯ (CUIR)
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ปัจจัยกำหนดการเข้ารับการรักษาพยาบาล หลักฐานจากการ
สำรวจ Demographic and Health Survey ของประเทศไนจีเรีย พ.ศ. 2556



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต

สาขาวิชาเศรษฐศาสตร์สาธารณสุขและการจัดการบริการสุขภาพ

คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

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งานวิจัยนี้มีวัตถุประสงค์เพื่อวิเคราะห์ปัจจัยกำหนดการเข้ารับการรักษาพยาบาลของประชาชน โดยศึกษาจากความแตกต่างทางเศรษฐกิจทางสังคมและลักษณะพื้นฐานส่วนบุคคล งานวิจัยนี้ศึกษา ข้อมูล ทู ดิ ย ภู มิ จ จาก ผล ส ำ ร ว จ ทาง ด ำ น ล ั ก ษ ณะ พ ื น ฐ า น แ ล ะ ส ุ ข ภ า พ (Demographic and Health Survey) ของประเทศไนจีเรีย ในช่วงเดือนกุมภาพันธ์ ถึง เดือนมิถุนายน พ.ศ. 2556 ประกอบด้วยประชาชนจำนวน 56,307 คน เป็นเพศชาย 17,359 คน และเพศหญิง 38,948 คน ในช่วงอายุ 15-49 ปี การเข้ารับการรักษาพยาบาลสามารถจำแนกตามชนิดของการให้บริการ ชนิดของความชำนาญเฉพาะด้าน และระยะของโรค งานวิจัยนี้ได้วิเคราะห์ทางเลือกต่างๆ ของการเข้ารับการรักษาพยาบาลสำหรับภาวะก่อนคลอดและหลังคลอด การวางแผนครอบครัว ภาวะไข้ อุจจาระร่วง และโรคติดต่อทางเพศสัมพันธ์ ตัวแปรตามชนิดต่างๆ ได้ถูกนำมาวิเคราะห์ด้วยวิธีการวิเคราะห์ความถดถอยโลจิสติกและการวิเคราะห์ความถดถอยโลจิสติกพหุกลุ่ม

ผลการวิจัยพบว่าการประกันสุขภาพไม่มีผลต่อการเข้ารับการรักษาพยาบาลอย่างมีนัยสำคัญทางสถิติ ดัชนีความมั่งคั่ง การศึกษา ตำแหน่งของที่อยู่อาศัย รายได้ และค่าเฉลี่ยของการเคลื่อนย้ายเป็นปัจจัยที่มีความสัมพันธ์เชิงบวกกับการเข้ารับการรักษาพยาบาลในด้านต่างๆ ทั้งชนิดของการให้บริการและชนิดของความชำนาญเฉพาะด้านอย่างมีนัยสำคัญทางสถิติ และนอกจากนี้ยังพบว่าประชาชนชอบที่จะเลือกเข้ารับการรักษาพยาบาลจากภาคเอกชนมากกว่าภาครัฐบาล

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5785628229 : MAJOR HEALTH ECONOMICS AND HEALTH CARE MANAGEMENT

KEYWORDS: HEALTH CARE / CHOICE OF FACILITY / CHOICE OF PROFESSIONAL / UTILIZATION / SOCIOECONOMIC / DEMOGRAPHIC / HEALTH INSURANCE

MUBARAK ALIYU: FACTORS AFFECTING HEALTH CARE UTILIZATION: EVIDENCE FROM THE 2013 NIGERIAN DEMOGRAPHIC AND HEALTH SURVEY.. ADVISOR: NOPPHOL WITVORAPONG, Ph.D., 89 pp.

This paper seeks to analyze the factors that determine the factors that affect the choices of the types of health care facility being utilized by individuals based by examining the differences in socio-economic and demographic characteristics of the respondent.

The study analyzed secondary data from the 2013 Demographic and Health Survey (DHS) conducted in Nigeria from February to June 2013. A total number of 56, 307 individuals were involved out of which males were 17,359 in number and females were 38,948. The ages of the respondents being analyzed in this study is between 15-49 years.

Utilization was categorized according to choice of facility, choice of professional and disease state sought for treatment. The different choices of facility for health care utilization for the conditions of antenatal/post-natal care, family planning, fever, diarrhoea and STI were examined. Logit and multinomial logit regressions were used to analyze the various categories of the dependent variables.

The result of the study showed that health insurance does not statistically affect the utilization of health care service. Wealth Index, education, location of residence, income and means of mobility were statistically significant and positively associated with the utilization of various categories of health care services, both in terms of choice of facility and choice of professional. Formal private health facilities were found to be more preferred in seeking for health care than the formal public facilities.

Field of Study: Health Economics and Student's Signature

Health Care Management Advisor's Signature

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LIST OF ABBREVIATIONS

CIDA	Canadian Agency for International Development
COPD	Chronic Obstructive Pulmonary Disease
DFID	Department for International Development
DHS	Demographic and Health Survey
EAs	Enumeration Areas
EDL	Essential Drugs List
FCT	Federal Capital Territory
FMOH	Federal Ministry of Health
FSHIP	Formal Sector Health Insurance Program
GAVI	Global Alliance for Vaccine Initiative
GDP	Gross Domestic Product
HCP	Health Care Provider
HMO	Health Maintenance Organization
NC	North-central
NE	North-East
NHIS	National Health Insurance Scheme
NPC	National Population Commission
NW	North-West
OOP	Out-of-pocket
OTC	Over-the-Counter
PHCs	Primary Health Care Centers
PSU	Primary Sampling Units
RCSHIP	Rural Community Social Health Insurance Program
SE	South-East
SMOH	State Ministry of Health
SS	South-South
STI	Sexually Transmitted Infection
SW	South-West
THE	Total Health Expenditure
UNFPA	United Nations Population Fund
UNICEF	United Nations International Children Emergency Fund
USAID	United States Agency for International Development
USSHIP	Urban Self-Employed Social Health Insurance Program
WHO	World Health Organization

Chapter 1.

INTRODUCTION

Health care utilization is a major component of equity in health care. The levels health inequity in any society can be assessed by determining the population's accessibility to health care services and health care seeking behavior among different people in different geographic locations. In most of the developing countries in the world, there is usually a wide gap in accessibility and utilization of health care services between the rich and the poor, between those living in rural versus urban areas, sometimes even with differences in gender and marital statuses of individuals, among other factors(Gerdtham, 1997).

Health care utilization trends are considered as key elements in finding out the equitable distribution of health care services. With this, the different levels and extent of inequity in the society, community or area of interest could be determined. The utilization of health care services is an important aspect of human life because it is essential in upholding and maintaining healthy status, thereby increasing quality of life and life expectancy. Additionally, it increases productivity at work which culminates in overall economic well-being(Luft, 1975).

One of the major concerns of the World Health Organization (WHO) in terms of health system performance is equity in health care utilization. With the recent signing of the National health Bill by the Federal Government of Nigeria which seeks to improve the general health indices of Nigeria, there is an emerging concern among the citizens of the right to have equal access to health care services irrespective of socio-economic status of individuals and families(NHB, 2014). The Nigeria's National health bill seeks to provide a framework for the regulation, development and management of a national health system and set standards for rendering health services in the federation. The bill is designed to have a framework that will encompass public and private providers of health services; promote a spirit of cooperation and shared responsibility among all providers of health services in the

Federation; provide for persons living in Nigeria the best possible health services within the limits of available resources; set out the rights and obligations of health care providers, health workers, health establishments and users; and to protect, promote and fulfill the rights of the people Nigeria to have access to health care services. A study regarding health care seeking behavior and utilization among different socio-economic and demographic groups can help policy makers make informed decisions that will help reduce the inequity gaps in Health care access and outcomes(FMOH, 2014; NHB, 2014). With the vast population of Nigeria, the concept of increasing access and equity in the utilization of health care services of great importance.

Nigeria is a country in Sub-Saharan Africa with a population of approximately 170 million people from different socio-economic back-grounds and health seeking behaviors. A large proportion of people live in the rural areas where accessibility to health care is difficult and a lot of people cannot afford quality paid health care services. The Federal Ministry of Health is responsible for overall planning of health while the state ministries of health assist the Federal level by making available the needs of their peculiar region and also act in execution of health activities. Nigeria's health care system is composed of several strata in which people seek health care when ill. Usually, individuals who are employed in formal sectors of the country have a mandatory health insurance to cover their medical need and thus usually seek services from established hospitals that provide services to insured patients. Large proportions of people are either employed in informal sector or unemployed, thus access to health care utilization could be challenging to this category of people.

There are many different choices of health care facilities that are available to individuals in Nigeria from which health care services are sourced. The choices of which type of health facility individuals decide to use depend on many factors which this paper seeks to analyze. Some of the factors that could influence the choice of utilization of a particular health facility include the age of an individual, educational status, health status of the patient, gender, etc. The range of facilities that provide health care services include tertiary health centers which comprises of the teaching hospitals, federal medical centers and federal neuropsychiatric centers; state level general hospitals; primary health care centers; private hospitals/clinics, privately

owned pharmacies, patent medicine shops as well as traditional medical centers. Also, there could be variations in the utilization of health care services across the different regions of the country which could be due to differences in cultural beliefs and practice.

Theoretically, health care service utilization could be seen as a result of individual's perception and attitude towards health. Attempts have been made to elucidate this as a function of the characteristic of the individual himself as well as the environment in which he/she lives and the interactions between them (Andersen & Newman, 2005).

A theoretical framework of health care utilization categorizes utilization into three main aspects namely: Characteristics/Features of health service delivery; advancements in technology in medicine and norms pertaining to treatment of illnesses; individual level determinants of health care utilization.

Analysis from the DHS survey is important as it can provide an understanding of the nature and pattern of health care utilization among different groups of individuals based on socio-economic and demographic characteristics. This information will enable the formulation and strengthening of policies that will improve health care accessibility and utilization, reduce the level of inequity in the country as well as improve the overall health situation in the country.

This paper seeks to analyze the factors which affect the choices of the type of health care facility to use by individuals based on differences of socio-economic and demographic characteristics. Health care utilization is major component of the Nigeria's Demographic and Health Surveys. The most recent DHS survey in Nigeria was conducted in 2013 and no study has been done on health care utilization using the data set.

1.1 Research Questions

1.1.1 General Question

What are the demographic and socio-economic factors that influence the choice of health care services in Nigeria based on the 2013 DHS survey?

1.1.2 Specific Questions

- What are the differences in the pattern of utilization of health care services based on health insurance coverage?
- What are the variations in the utilization of health care among the different income categories among the people of Nigeria based on the 2013 DHS Survey?
- What are the differences in the choices of health care facilities among the different income categories of the population?
- What are the socio-economic and demographic differences in the utilization of health care facilities among the population of Nigeria in the 2013 National DHS survey?

1.2 Objectives

1.2.1 General Objectives

To identify the factors that influences the choice facilities for health care utilization among different demographic and socio-economic groups in Nigeria according to the 2013 DHS.

1.2.2 Specific Objectives

- To examine the difference and level of utilization of health care services among the insured and non-insured.
- To examine the effects of socio-economic conditions on the choices of health care utilization in Nigeria in 2013.
- To determine the differences in the choices of utilization of health care services at different utility levels among various economic classes in Nigeria in 2013 survey
- To identify the difference in the use of different kinds of health services among socio-demographic groups in Nigeria.

1.3 Hypotheses

- The insurance status of individuals is expected to have a positive correlation with utilization rates of health care services. Insured individuals should have higher utilization rates in comparison to un-insured individuals.
- With respect to income, it is expected that the people with higher income utilize more health care facilities and at more equipped centers (both private and public) than people of lower income status.
- Females tend to have higher utilization rates in general and teaching hospitals than males. It is expected that males will utilize more of private care from pharmacies or private hospitals due to lower patient waiting time and ease of access.
- It is expected that married people utilize more of health care facilities than singles. Also, married couples are expected to use more of public hospitals and organized private hospitals than private facilities.
- Also, individuals with higher educational attainment are expected utilize more in terms of quality health care utilization than individuals who are less educated.
- With regards to age, the expectation is that children and elderly persons consume more of health care than the middle-aged adults.
- Furthermore, utilization rates of health care services is expected to be higher among individuals employed in either the formal or informal sector, than those not employed at all.
- The location of residence of individuals is expected to affect the utilization rates to health care services. Individuals who live in rural areas will have lower utilization rates and lower choices of facilities than individuals living in urban areas.
- As for health status, individuals with poorer health are expected to have more number of visits to health professionals, more hospitalizations and more likely to register for voluntary health insurance

1.4 Scope

The scope of the study is based on cross sectional secondary data obtained from the entire country data set for the 2013 National Demographic and Health Survey (NDHS) survey using independent and dependent variables that are relevant to this study. The unit of analysis is the individual level. The 2013 NDHS sample was collected using a stratified three-stage cluster design consisting of 904 clusters, 372 in urban areas and 532 in rural areas. There are 38,522 observations and 3,878 variables in the data set. The dependent variables used in this model are the need for care, choice of health care facility and choice of health care professional. The utilization measures used are antenatal care, post-natal care, family planning, diarrhoea and STI. The independent variables used are health insurance, age, sex, employment status, highest educational attainment, marital status, place of residence, wealth quintiles, means of mobility and region.

1.5 Possible Benefits

This study will provide an insight in to the health care seeking behavior and utilization based on the most recent survey carried out in 2013. Nigeria is at the verge of adopting the national health bill, thus this study has the potential of enabling policy makers to make informed amendments to the health care system in order to improve accessibility and equity especially for the poor, the rural population and other vulnerable groups.

Chapter 2.

BACKGROUND

2.1 General Information

Nigeria is a country in sub-Saharan Africa located on the west coast of Africa between latitudes 4°16' and 13°53' north and longitudes 2°40' and 14°41' east. Its approximate land size is 923,768 square kilometers stretching from the Gulf of Guinea on the Atlantic coast in the southern region to the fringes of the Sahara Desert in the North region. It is surrounded by Nigeria and Chad republic from the North, Cameroun from the east and Benin republic through the west. Nigeria is the most populous country in Africa with a population of 173 million people and the 14th largest in land mass(DHS, 2013).

Nigeria is basically divided into six geo-political zones namely: North-Central (NC), North-East (NE), North-West (NW), South-East (SE), South-South (SS), and South-West (SW). The regions of the northern and southern parts of Nigeria have distinctly different socio-economic, cultural and religious practices, which account for differences in health care utilization across different regions in the country.

Table 2.1. Country Health Profile

Indicator	<u>Statistics</u>	<u>Year</u>
Population	173,615	2013
Population under 15(%)	44	2013
Life Expectancy	58	2013
Population aged over 60(%)	5	2013
Median age(years)	18	2013
Population living in urban areas (%)	46	2013
Total fertility rate(per woman)	6.0	2013

Number of live births(thousands)	7173.0	2013
Number of deaths(thousands)	2071.4	2013
Birth registration coverage (%)	30	2013
Gross national income per capita(PPP int.\$)	5360	2013
Total expenditure on health per capita (Intl \$)	161	2012
Total expenditure on health as % of GDP	6.1	2012
Mortality rate, under-5 (per 1,000 live births)	117.4	2013
Mortality rate, neonatal (per 1,000 live births)	37.4	2013
Hospital beds (per 1,000 people)	0.53	2004
Community health workers (per 1,000 people)	0.137	2008
Physicians (per 1,000 people)	0.395	2010
Nurses (per 10,000 Population)	14.8	2007
Out-of-pocket health expenditure (% of total expenditure on health)	65.88	2012
Out-of-pocket health expenditure (% of private expenditure on health)	95.69	2012
Health expenditure, private (% of	4.18	2012

GDP)		
Health expenditure, public (% of total health expenditure)	31.15	2012
Health expenditure, public (% of government expenditure)	6.66	2012
Health expenditure, public (% of GDP)	1.89	2012
Health expenditure, total (% of GDP)	6.07	2012

Source (WHO, 2015; World bank, 2014)

Table 1 above describes some selected country health profile of relevance to this study. It showed that less than half of the population of Nigeria lives in urban areas (46%). The remaining 54% live in rural areas. In 2012, the total health expenditure on health per capita is 161 dollars while the total expenditure on health as a percentage of GDP is 6.1%. The OOP health expenditure as a percentage of total health expenditure is 65.88% and the percentage of private OOP expenditure is 95.68%. The private health expenditure as a percentage of GDP is 4.18%. The percentage of government health expenditure is 6.66% (WHO, 2015; World bank, 2014).

2.2 Health Care Delivery System

The Nigeria's national health system is categorized into two broad categories which are public health sector and private health facilities. The Public health facilities which constitute 80% of all hospitals are owned and managed by the three tiers of government which are the federal, state and local governments. All the three levels of government are involved in the stewardship, financing and service provision in these

hospitals under the respective jurisdictions(FMOH, 2015a). These three tiers will be discussed briefly as below:

a. The federal Level

The federal level has the Federal Ministry of Health (FMOH) headed by the minister of Health. The FMOH is responsible for overall policy formulation for the country's health sector, technical support provision as well as handling of international matters relating to health. Also, the FMOH is responsible for the provision of health services at the tertiary hospitals, teaching hospitals and national laboratories(WHO, 2014b). There are 20 accredited university teaching hospitals, 22 Federal Medical centers and 13 specialty hospitals all under the control of FMOH.

Table 2.2: List of Tertiary Teaching Hospitals

S/no	Hospital Name	Location	State
1.	University of Benin Teaching Hospital	Benin	Edo
2.	University of Calabar Teaching Hospital	Calabar	Cross-river
3.	University of Abuja Teaching Hospital	Gwagwalada	FCT
4.	University College Hospital	Ibadan	Oyo
5.	Obafemi Awolowo University Teaching Hospital	Ile-Ife	Osun
6.	University of Ilorin Teaching Hospital	Ilorin	Kwara
7.	Irrua Specialist Teaching Hospital	Irrua	Edo
8.	University of Nigeria Teaching Hospital	Ituku-Ozalla	Enugu
9.	Jos University Teaching Hospital	Jos	Plateau
10.	Aminu Kano University Teaching Hospital	Kano	Kano

11.	Lagos University Teaching Hospital	Lagos	Lagos
12.	University of Maiduguri Teaching Hospital	Maiduguri	Borno
13.	Nnamdi Azikwe Teaching Hospital	Nnewi	Anambra
14.	University of Port Harcourt Teaching Hospital	Port Harcourt	Rivers
15.	Usman Dan Fodio University Teaching Hospital	Sokoto	Sokoto
16.	University of Uyo Teaching Hospital	Uyo	Akwa Ibom
17.	Federal Teaching Hospital	Abakaliki	Ebonyi
18.	Abubakar Tafawa Balewa University Teaching Hospital	Bauchi	Bauchi
19.	National Hospital	Abuja	Abuja
20.	Ahmadu Bello University Teaching Hospital	Zaria	Kaduna

Source(FMOH, 2015b)

The 22 Federal medical centers that provide tertiary care in addition to the teaching hospitals are located in Abeokuta(Ogun); Asaba(Delta); Azare(Bauchi); Bida(Niger); Birnin Kebbi(Kebbi); Birnin Kudu(Jigawa); Ebutte-Metta(Lagos); Gombe(Gombe); Gusau(Zamfara); Ido Ekiti(Ekiti); Jalingo(Taraba); Katsina(katsina); Keffi(Nasarawa); Lokoja(Kogi); Makurdi(Benue); Nguru(Yobe); Owerri(Imo); Owo(Ondo); Umuahia(Abia); Yenegoa(Bayelsa); Yola(Adamawa); Jabi(FCT)(FMOH, 2015b)

Table 2.3: List of Federal Specialty Hospitals

S/no	Name of Hospital	Location	State
1.	Federal Neuro-Psychiatric Hospital	Maiduguri	Borno
2.	Federal Neuro-Psychiatric	calabar	Cross-river

	Hospital			
3.	Federal Hospital	Neuro-Psychiatric	Usulu, Benin	Edo
4.	Federal Hospital	Neuro-Psychiatric	Enugu	Enugu
5.	Federal Hospital	Neuro-Psychiatric	Kaduna	Kaduna
6.	Federal Hospital	Neuro-Psychiatric	Yaba	Lagos
7.	Federal Hospital	Neuro-Psychiatric	Aro, Abeokuta	Ogun
8.	Federal Hospital	Neuro-Psychiatric	Kware	Sokoto

Source:(FMOH, 2015b)

The Federal specialty hospitals are mainly concerned about neurological and psychological disorders, and the hospitals are distributed across the geo-political locations of the country.

b. The State Level

The state level is composed of the state ministries of health (SMOH). The SMOH are responsible for the provision of secondary health centers as well as the primary health care services. The secondary health centers are composed of general hospitals in each of the local government areas of the states. In total, there are 774 local government areas in Nigeria, and 774 general hospitals charged with the provision of secondary health care services across the country.

c. The Local Government Level

The local government level is responsible for health care activities at the primary health care centers that are located in the wards. Each local government is divided in to 7-15 wards. At local government level, the primary health care centers serve as the first level of contact to health care system for communities, families and individuals. PHCs serve to bring health care close to the people for ease of access and continuing health process. For the purpose of sustainability of PHCs, the Federal

Government of Nigeria established the National Primary Health Care Development Agency (NPHCDA) powered by decree 29 of 1992 charged with the responsibility of mobilizing support in all aspects of PHC programme implementation, both nationally and internationally (Alenoghena, Aigbiremolen, Abejegah, & Eboreime, 2014).

2.3 Nigeria's Health Care Financing

Financing of health care activities comes from statutory budget allocation from the federal, state and local governments. The health care sector also enjoys a lot of patronage and support from international organizations like the World Health Organization (WHO), United Nations International Children Fund (UNICEF), United States Agency for International Development (**USAID**), Canadian Agency for International Development (**CIDA**), U.K. Department for International Development (**DFID**), Global Alliance for Vaccines and Immunizations (GAVI) and friendly foreign governments. In 2014, the total budget allocation to health sector is 262 Billion Naira (1.7 Billion USD), and this represents 6% of the total budget. The National Health Insurance NHIS has 4 billion naira out of this budget, and the scheme covers only 4% of the population which are mostly employees of the Federal government and its parastatals (FMOH, 2015b).

The total health expenditure (THE) as a percentage of GDP in Nigeria was 6.07 in 2013, while it was lower in 2012 with a value of 5.72. There is a high rate of out of pocket expenditure which could give rise to catastrophic health expenditure and inequity in health care. In 2013, the percentage of OOP expenditure was as high as 65.88%.

Health expenditure, total (% of GDP)

Table 2.4. Health Expenditure, Total (% of GDP)

VALUE	YEAR
6.46	2009
6.85	2010
5.58	2011
5.72	2012

6.07	2013
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Source: (World bank, 2014)

Table 2.5. Out-of-pocket Expenditure (% of total expenditure on health

VALUE	YEAR
60.49	2009
65.84	2010
70.55	2011
63.08	2012
65.88	2013

Source: (World bank, 2014)

2.4 National Health Insurance in Nigeria

The national health Insurance scheme (NHIS) in Nigeria was established in 1999 under Act 35 of the Federal government. The aim of this establishment is to provide easy access to health care services to all Nigerians at affordable costs through various payment mechanisms. The scheme was officially commissioned in June 2005 and enrollment began in September 2005. The NHIS in Nigeria can be broadly classified into 3 different groups to target different segments of the population. These are:

- a. The Formal Sector Social Health Insurance Programme (FSSHIP);
- b. The Urban Self-Employed Social Health Insurance Programme (USSHIP);
- c. The Rural Community Social Health Insurance Programme (RCSHIP)

The Formal Sector Social Health Insurance Programme (FSSHIP) basically insures employees in the public sector as well as organized private sector employees, armed forces, police and allied services and students of tertiary institutions. The FSSHIP is financed through percentage contributions from employers and employees. A total of 15% of the basic salary of individual is contributed to the scheme. The employee pays 5% which is usually deducted directly from his/her income while the employer pays 10%. It is mandatory for all public institutions and for organized

private organizations with ten or more employees(Mohammed, Souares, Bermejo, Sauerborn, & Dong, 2014; NHIS, 2015b).

In Nigeria, It is difficult to find up-to-date specifics of schemes that are functional or a recent accurate estimate of national participation rate. It has been estimated that the overall program of NHIS covers around 5 million people nationwide which represent approximately 3% of the entire population. Only FSHIP is being rolled out by the NHIS and is yet to reach a significant level of implementation. Some pilot studies of some community social health insurance programs have been conducted in Kwara and Lagos states but enrolment rates was poor because of lack of proper awareness, poverty, lack of confidence in the scheme and often due to non-sustainability of the funding(Odeyemi & Nixon, 2013).

The FSSHIP program by default covers the employee, one spouse and four (4) biological children not above the age of 18 years. Any additional children or children above the age of 18 years are covered through additional payments made from the principal as additional contribution to the scheme. Furthermore, students who are above 18 years of age are covered under the tertiary health insurance program.(NHIS, 2015a). Once registered, the enrollees have series of benefits as outlined below:

- a. Out-patient care (including consumables)
- b. Prescribed drugs as contained in the NHIS Essential Drugs List
- c. Diagnostic tests as contained in the NHIS Diagnostic Tests List
- d. Antenatal care
- e. Maternity care for up to four (4) live births for every insured person
- f. Post natal care
- g. Routine immunization as contained in the National Programme on Immunization
- h. Family planning
- i. Consultations with a defined range of specialists e.g. physicians, surgeons, etc.
- j. Hospital care in a public or private hospital in a standard ward during a stated duration of stay, for physical or mental disorders;
- k. Eye examination and care excluding prescription glasses/spectacles and contact lenses
- l. Dental care, i.e., pain relief and treatment

m. Prostheses, i.e., Nigerian-made simple artificial limbs.

According to Act 35 of 1995 that establishes NHIS, health insurance is mandatory for all workers in the public (government) sector as well as the organized private sector with number of employees exceeding 10 persons. An employer registers him/herself and his/her workers with the scheme. Thereafter, the employee enrolls him/herself with an NHIS approved Health Maintenance Organization (HMO), who will thereafter provide the employees/contributors with a list of NHIS approved healthcare providers (public and private). The employee registers him/herself and dependents with the health care provider of his/her choice. Upon registration, a contributor/employee and his/her dependents will be issued identity cards by the NHIS with personal Identification Numbers (PIN). In the event of sickness, the contributor/employee presents his/her identity card to his/her chosen primary care provider for treatment. An enrollee reserves the right to change his/her primary healthcare provider after a minimum of 6 months, if he/she is not satisfied with the services being given. The HMO will make payment for services rendered to an enrollee to the healthcare provider. An enrollee may however be asked to make a small co-payment (where applicable) at the point of service (NHIS, 2015a, 2015b).

There are three forms in which health care providers are being paid for services rendered. These include capitation, fee-for-service per diem or case payment (NHIS, 2015a, 2015b). In capitation system, payment is made to a primary health care provider (HCP) by the HMOs on behalf of a contributor, for services rendered by the provider. This payment is made regularly in advance for services to be rendered irrespective of whether enrollees utilize the service or not. In the case of fee-for-service, the HMO makes this payment to non-capitation –receiving health care provider who provide services on referral from other approved providers. Per-diem payment is made for services and expenses per day (medical treatment, drugs, consumables, admission fees etc.) during hospitalization. Lastly, CASE PAYMENT which is made based on a single case rather on a treatment act. A provider gets paid for every medical case handled to the end (NHIS, 2015b; Odeyemi & Nixon, 2013).

The USSHIP component of NHIS is a not-profit health insurance programme. It is meant for occupation-based User Groups (UGs) with common economic or business

activities and administered by a constituted Board of Trustees. The composition of the UG must not be less than 500 members in order to ensure adequate risk pooling. Revenue for USSHIP is raised through participants monthly flat rate contribution based on desired benefit packages as desired by the subscribers. Health benefits are stipulated to be provided by NHIS accredited HCPs, just the same as the formal sector program(Odeyemi & Nixon, 2013).

The RCSHIP is also a non-profit health insurance program. This is designed for a group of households or individuals that form a community. The operation of the scheme is also by its members, using the same management structure as the USSHIP. The scheme can incorporate Non-Governmental Organizations (NGOs), Faith-Based Organizations (FBOs), Community-Based Organizations (CBOs), and Civil-Society Organizations (CSOs). Members of the specified community, based on their health needs, acquire NHIS accreditation and then choose the health care benefits with contributions being made in cash, paid as a flat monthly rate or by means of periodic installments. This contribution rate will depend on the health package chosen by members of the UG(Odeyemi & Nixon, 2013).



Chapter 3.

LITERATURE REVIEW

3.1 Health care utilization

Utilization of health care can be defined as the individual's or patient attitude or behavior in seeking health care services whether in government owned or private hospitals or other health care service centers. Health care utilization is the final product obtained from decision of what kind of health care facility or service do we seek (Shaikh & Hatcher, 2005). Health care utilization pattern in any country in the world is of paramount importance in policy making as it ensures that policy makers make informed decision on policies that will be effective in addressing health inequities as well as barrier's to health care access and utilization. In most studies of health care utilization, demographic factors, factors that affect utilization include gender, age, educational level, occupation, place of residence (urban or rural) and distance to the nearest health facility (A & Mustard, 1998).

Several literatures exist on the determinants of health care utilization. Anderson-Newman model is a famous framework of studying the behaviors that relate to health care utilization. This model assumes that an individual's utilization of health care service is a function of three important factors. The first category is the pre-disposing factors which are the socio-demographic variables. The second group consists of the Enabling factors which could include family income, social support, availability of services, access to regular source of care, etc. The third category consists of the need factors such as health status perception of individuals, severity of disease, quality of life, etc. (Andersen & Newman, 2005).

In a study on the socio economic determinants of maternal health care utilization in Turkey using the data from Turkey DHS in 1993 that was analyzed using logistic regression, the results indicated that educational attainment, parity level, health insurance coverage, ethnicity, household wealth and geographic region are

statistically significant factors that affect the use of health care services thought essential to reduce infant and child mortality rates. The results of the model were used to provide insights for both micro- and macro-level planning of maternal health service delivery(Celik & Hotchkiss, 2000).

Furthermore, a study was conducted in Zambia to determine why the sick not utilize health care. The study conducted was aimed to determine the predisposition of individuals to seek health care when sick from a health care facility, use self-medication or do nothing; as well as to examine other factors that influence health utilization other than individual's health status. The study used data collected from November to December of 1998 covering 16,710 house-holds comprising of 94,000 individuals. Multinomial logit model was used to estimate the model. It was found out that utilization of health care by individuals is influenced by Income, Insurance, type of illness, distance to health facility and owning a vehicle. The probability of using self-medication (compared to doing nothing), was found to be negatively affected by variables indicating type of disease compared to if the individual is suffering from malaria. Also, Level of income affects the use of self-medication positively implying that individual's with higher income have more propensity for self-medication as an out of pocket spending due to affordability. Household that owns motor- vehicle were shown to have a positive correlation with self-medication, compared to house-hold with none. Also, individuals living in rural areas have negative influence on using self-medication(Hjortsberg, 2003).

3.2 Demographic Factors Affecting Health Care Utilization

Demographic factors refers to Socio-economic characteristics of households or individuals, such as educational level, sex, age, level of income, marital status, occupation, religion, average family size, etc. Demographic factors are usually collected during a census or general survey programs.

In a study conducted in Nigeria on the determinants of maternal care utilization using a multilevel analysis involving sample from 17,542 aged 15-49 years, it was shown that several individual factors were significant in determining the utilization of

maternal care. The factors analyzed include age of the mothers, region of residence and educational attainment (Ononokpono & Odimegwu, 2014).

Additionally, several other studies conducted around the world used the models with variables of age, sex, gender, marital status, insurance, location of the individual (urban/rural), family size, religious beliefs and insurance coverage (Dachs et al., 2002; Manning, Newhouse, Duan, Keeler, & Leibowitz, 1987; Owoseni Joseph Sina, 2014; Shaikh & Hatcher, 2005; Shen, 2013a).

3.2.1 Gender

With regards to gender, a descriptive study was conducted in Manitoba, Canada, and the study used sex and age specific per capita use of resources in health care using data obtained over one year period(1995-1995) among 1,140,200 persons that were registered with Manitoba Health Insurance plan, it was reported that approximately 22 percent of health care expenditures for female subjects was associated with conditions specific to sex, including pregnancy and childbirth, as compared with 3 percent of expenditures for male subjects. (A & Mustard, 1998)

In another study to determine the “sex differences in general practice attendance and help seeking for minor illness” using qualitative analysis involving sets of questionnaires filled by patients aged between 20 and 45 years, it was observed that the rate of women’s health utilization was higher in almost all services than that of men. The study aimed to explore the variables that influence seeking behaviors among the genders of male and female and the result was analyzed using logistic regression. It was reported that women have more acceptability of reporting illnesses to health professionals and confidants, as compared to men. Also, women have more flexibility in their time schedule making it easier to seek health care in event of illness. Additionally, women are more familiar with surgical procedures and medical staff involved in the hospital due to attendance during pregnancy (ante-natal) and also hospital visits with children(Corney, 1990).

A study was conducted in the United States to compare health status and health seeking behavior among males and females. The data used for analysis was obtained from the survey of the National health center for Health statistics in the US in 1982. The data were mainly from interview survey (National Health Interview

Survey-NHIS) which has questions relating the incidence of acute and chronic diseases, disease prevalence, self-ratings of health, drug use and use of health services, the result showed that the incidence of acute illness was more among females than in males, and also has more outpatient utilization including medication. The difference in utilization appeared among all the ages between the gender groups, except for the early childhood stage in which it was reported that boys have worst health profile than girls and thus more frequent use of health facilities(Verbrugge, 1982).

3.2.2 Age

A study was conducted in Ontario, Canada using the Ontario Health Survey (OHS) of 1990, using data collected from 1000 individuals who are representative of the sex and age profiles in each of the 43 public health units (PHU). Service utilization was modeled as a logistic regression equation using age, sex, income and service-environment as the independent variables. It was found out that the aged individuals of 65 years and above have a higher rate of utilization of health care services compared to individuals of other age groups(Rosenberg & Hanlon, 1996). This could be associated with the increase in degeneration of all organs and health as one age.

Another study was conducted in the USA to determine the factors that influence the rate of out-patient care in general hospitals. The data consisted of result from interviews conducted in about 27,000 house-holds including approximately 90,000 persons across all age groups. It was reported that children under the age of 14 have higher rate of health care utilization compared to the people in the productive ages of 15 to 35 years(Odoroff & Abbe, 1957). This shows that children below the ages of 14 years are more vulnerable to diseases, and thus seek more health care than other age groups.

Additionally, a study was conducted in Nairobi, Kenya to evaluate the determinants of health care seeking for childhood illnesses in Nairobi slums. Their study was carried out using the data from Nairobi Urban Demographic Surveillance System) with a sample size of 15,174 households of which 3015 children in the house-holds are less than 5 years old. It was reported that young children between the

ages of 0-11 months have higher utilization rate than older children. Children in this age group of the study were more vulnerable to illness and hospitalizations in comparison to children of older age groups(Taffa & Chepngeno, 2005).

3.2.3 Geographical location (Rural/Urban)

One important aspect that determines health care utilization is accessibility. Accessibility implies process in which individuals have to undergo before gaining contact in to a health care facility in order to receive treatment or services. Accessibility usually specifies the barriers to gaining access to health care service or facility. Usually, the more the accessibility of public health facilities, the higher the utilization rate and the higher the government expenditure on health care(Newman, 2005).

A study was conducted in China on the disparities in health care utilization between urban and rural population. The data used in the study was collected by China Health and Nutrition Survey (CHNS) and it consist of a sample of 27,897 rural and 13,898 urban respondents of ages of 18 years and above. Logistic regression was used for calculating the adjusted Odd ratios (OR) and 95% CI were calculated for independent predictors of health seeking behavior. The result showed that urban residents are less likely to visit physicians than are rural residents and the trend has been on the increase since 2007. Studies have demonstrated significant health disparities between urban and rural areas. Most health care providers, such as clinics, hospitals, and specialists, are located in urban areas. As a result, rural residents frequently face difficulties in obtaining health care services due to either limited availability of health care providers or long travel distances to health care providers, compared with their urban counterparts(Hai Fang, 2009).

3.2.4 Marital status

Marital status of individuals can be categorized as either being single, married, separated, divorced or widowed. A study was conducted to determine the relationship between marital status and health care utilization while controlling the confounding factors of age and sex. Baseline data from longitudinal study on Socio-Economic Differences in the Utilization of Health Services was collected comprising of 2662

persons aged between 25 and 75 years old in the Netherlands. Multiple regression models were used making the analysis. The result showed that educational level is an important confounder of the relationship between health care utilization and marital status. In addition, differences in health status to a considerable extent explain the higher utilization of health services of widowed and divorced people, but not the lower utilization of the never married. After control for confounding factor and health status, there still were unexplained differences in health care utilization by marital status: e.g. the divorced were more frequently hospitalized than married people (I M A Joung, 1995)

3.2.5 Occupation

A study was conducted in Nigeria on socio-economics factors affecting utilization of health care services. The study is a descriptive survey and it employed both qualitative and quantitative means of data collection. Focus group discussion and the use of structured questionnaires were employed for the qualitative data collected and the sample size used in the study was 400 persons. Inferential statistical analysis was used to make interpretation of the collected data. It was shown from the results that individuals employed in the formal sector, otherwise known as government employees have higher utilization rates than those employed in informal sectors, like farmers, and those that are unemployed. It was further reported that visits to medical facilities by government employees was not associated with income loss unlike the situation for the self-employed. This explains why there is a wide margin in the utilization of health care services among people with different occupation status (Owoseni Joseph Sina, 2014).

3.2.6 Education

Several studies have indicated a positive correlation between education and health care seeking behavior. A study was conducted in Nigeria using the cross-sectional data from 2008 DHS survey and the data processed was analyzed using multilevel logistic regression. It was found out that people who have more educational attainment have more utilization of health care services than less educated or

illiterates both when in times of illness and for health check-ups(Ononokpono & Odimegwu, 2014). It was also discovered in the study that people having low education level usually seek more of traditional medicine than orthodox treatments in the hospitals. It was further reported from the same study that children born to mothers who have higher number of years in schooling have more access to health care utilization than children born to illiterate mothers.(Hong, Dibley, & Tuan, 2003; Owoseni Joseph Sina, 2014)

3.2.7 Health Status

Health is defined as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Health status is a more encompassing concept that is determined by more than the presence or absence of any disease as it takes in to cognizance life expectancy or individual's self-assessed health status. Individual health status may be measured by an observer who could be a physician through examinations on individuals overall health indices. Also, Individual health status could also be measured by asking the person to report his/her health perceptions in the areas of concern, such as physical functioning, emotional well-being, pain or discomfort, and overall opinion or perception of health(WHO, 2014a). Several studies were conducted and have shown that poor health status, whether self-rated health measured or measured by functional limitations, presence of a disease or symptoms, is highly correlated with greater costs of services, more visits to physicians, more drug use, and higher risk of hospitalization(Bosworth, Butterfield, Stechuchak, & Bastian, 2000; Garfinkel, Riley, & Iannacchione, 1987).

A study was conducted titled Socio-economic differences in the utilization of health services in a Dutch population: the contribution of health status. The data consisted of 2867 respondents from a cross-sectional survey on utilization of six different types of health services which were used for analysis. The six health services used in the study are contact with a general practitioner within the last 2 months prior to the survey, contact with specialist physician, contact with physiotherapist, hospitalization within the past one year, use of prescription drugs within the past 14 days and use of OTC within the past 14 days. Five different health status measures were used, and their impact on the size of socioeconomic differences in health care

utilization was calculated. The measures for health status were given based on disease categories and grades of severity or absence of the disease. The five health statuses that were used in assessment in this study are Asthma/COPD, heart disease, diabetes and lower back pain. Logistic regression was used in the analysis and utilization was used as the dependent variable. The result of the study revealed that the impact of a single health measure depends on the type of health service considered, but is usually 40-70% of the impact of the five measures together. Individual's Perceived General Health (PGH) had the largest influence, and the subjective health status measures PGH and Nottingham Health Profile (NHP) together had a larger impact than all 'objective' health status measures together (chronic conditions, disabilities and handicaps)(van der Meer, van den Bos, & Mackenbach, 1996).

Another study was conducted in North America on quantifying the effect of health status on health care utilization using a preference-based health measure. The main objective of the study was to ascertain the degree of the effect of health status on health care payments and number of visits to health professionals in a large sample representative of a geographically defined population in North America. Health status was measure using the Health Utilities Index (HUI). The study population used was based on respondents to the Canadian National Population Survey in 1994/1995 who were 12 years of age and above. The data was analyzed using the cox-box method. It was revealed from the study that HUI is a significant predictor of utilization of health services when considering medical services plan covered payments and visits to health professionals. The total adjusted cost ratio per 0.1 unit change in HUI was 0.89 and the total adjusted visit ratio was 0.91. Assuming this relationship is causal and other factors are held constant, a 0.1 unit improvement in health utility would, on average, result in a 10% reduction in payments and visits to health professionals. This implies that an increase in health status will lead to decrease in hospital visit and reduction in spending on health related issues(Lima & Kopec, 2005).

3.3 Health Insurance

The decision and level of use of health care service by individuals depends on the individual's insurance coverage. Health insurance is usually an endogenous variable because it is the individuals own choice to have insurance or not. This is to say that people who have higher probability of illness or at great need of health care have more tendency and incentives to purchase health insurance.

In a study conducted in Senegal to determine the behavior of individuals in health care utilization based on whether they are insured or not, and controlling for endogeneity, it was discovered that people who have insurance have higher propensity of seeking for health services in the respective registered health centers compared to individuals who are not insured and have to pay substantially in case of need for health care. It was further shown that health insurance schemes attract mostly people from lower economic class but the poorest still remain excluded(Jütting, 2004).

Another study was conducted in the USA on Health Insurance and the Demand for Medical Care using data from randomized experiment between the period of 1974 and 1977 and the results analyzed using probit as well as linear regression models. The study was composed of different groups of individuals assigned to different categories of insurance coverage and the group with no insurance were compensated with incentives that will enable them seek health care OOP. The result showed that the more the percentage of insurance coverage according to plan based on premium payment, the more the utilization of health care. On the other hand, people who have to pay higher percentage of cost out of pocket have lesser utilization rates both in terms of preventive and curative services(Manning et al., 1987).

Additionally, a study was conducted in 1996 in the US using the secondary data from the Medical Expenditure Panel Survey(MEPS) and the paper the determinants of three health care decisions namely Insurance, utilization and expenditures. The model used for the study used both parametric and semi-parametric approach to make the estimates. It was found out that having private insurance increases the likelihood of health care seeking and utilization by approximately 15% and the parametric estimation predicted a 125% increase in spending when universal coverage was given(Shen, 2013b).

3.4 Economic factors affecting Health Care Utilization

Economic factor is an important determinant of health care access and utilization in most of the developing countries of the world. It can directly affect the availability of health services to individuals. A high cost of treatment or health service above what an individual can afford or above his perception of appropriateness can imply that such treatment becomes unavailable to that individual. Usually, fee for service being charged for health care services rendered discourage people from using health care facilities(Shen, 2013a).

Financial accessibility to health, which is also the same as affordability is one of the most important determinants of health care utilization and this is directly correlated with poverty dimensions. Patients have both direct costs and indirect costs associated with seeking of treatment. These indirect costs usually discourage and deter the poor individuals from seeking health care. Some of the indirect cost that act to deter patients include time-cost opportunity, costs of transportation, food and sometimes lodging for both the patient as well as the accompanying person(Peters et al., 2008).

A study was conducted in 31 countries of the world on Economic Status, Education and Empowerment (3Es) and the implications of these 3Es on maternal health care utilization in developing countries. The data used was obtained from DHS survey carried out in the 31 countries studied. The results were analyzed by employing separate logistic regression for each of the variables and meta-analysis was used to infer and compare result from different countries. It was analyzed from the result that women in the poorest wealth quintile have 94% less in terms of ante-natal and pot-natal utilization of health services compared to the group of women in the highest wealth quintile(Ahmed, Creanga, Gillespie, & Tsui, 2010). This report indicates that the lower economic status has less tendency of seeking proper health care even in an important health condition due to very low income.

Furthermore, another study was conducted on maternal health care utilization in Ghana both before and after introduction of free maternal care policy. The study used secondary data from Ghana DHS 2008 and it consist of sample of women in the age range of 15-45 years that have had at least a live birth 5 years preceding the

survey. The study used both univariate and multivariate analysis to investigate the effect of wealth and other socio-economic variables on antenatal care use in Ghana. The model was estimated using logistic regression. It was found out that wealth has a positive and significant influence on the utilization of maternal care services both before and after the policy implementation. Individuals of the highest wealth quintile has 96.3% utilization rate in maternal care services, while the lowest quintile has 68% utilization(Arthur, 2012).

Additionally, a study was also conducted in the United States to determine the effect of growing income disparities on adults' dental care utilization using time series data (2002, 2004, 2006, 2008 and 2010 obtained from database maintained by the US center for disease control. The authors used estimated linear probability models and regressed health care utilization in the previous 12 months on the categorical variable for a year of survey and poverty status while controlling for other demographic variables. The result of the study showed that there is a significant gap in dental care utilization between poor and non-poor adults in each state of the US and the District of Columbia in 2002 and 2010. In California for example, the gap between the poor and non-poor adults in utilization of dental services in 2002 was 8.2% and was statistically significant. The study thus concluded that in the US, non-poor adults have a better utilization of Dental services than poor adults(Nasseh & Vujicic, 2014).

From the literature reviewed above, it can be seen that the utilization of health care is affected by gender, age of individuals, education, occupation, place of residence, health status, distance to health care facility, marital status, health insurance coverage as well as income level of individuals.

Chapter 4.

METHODOLOGY

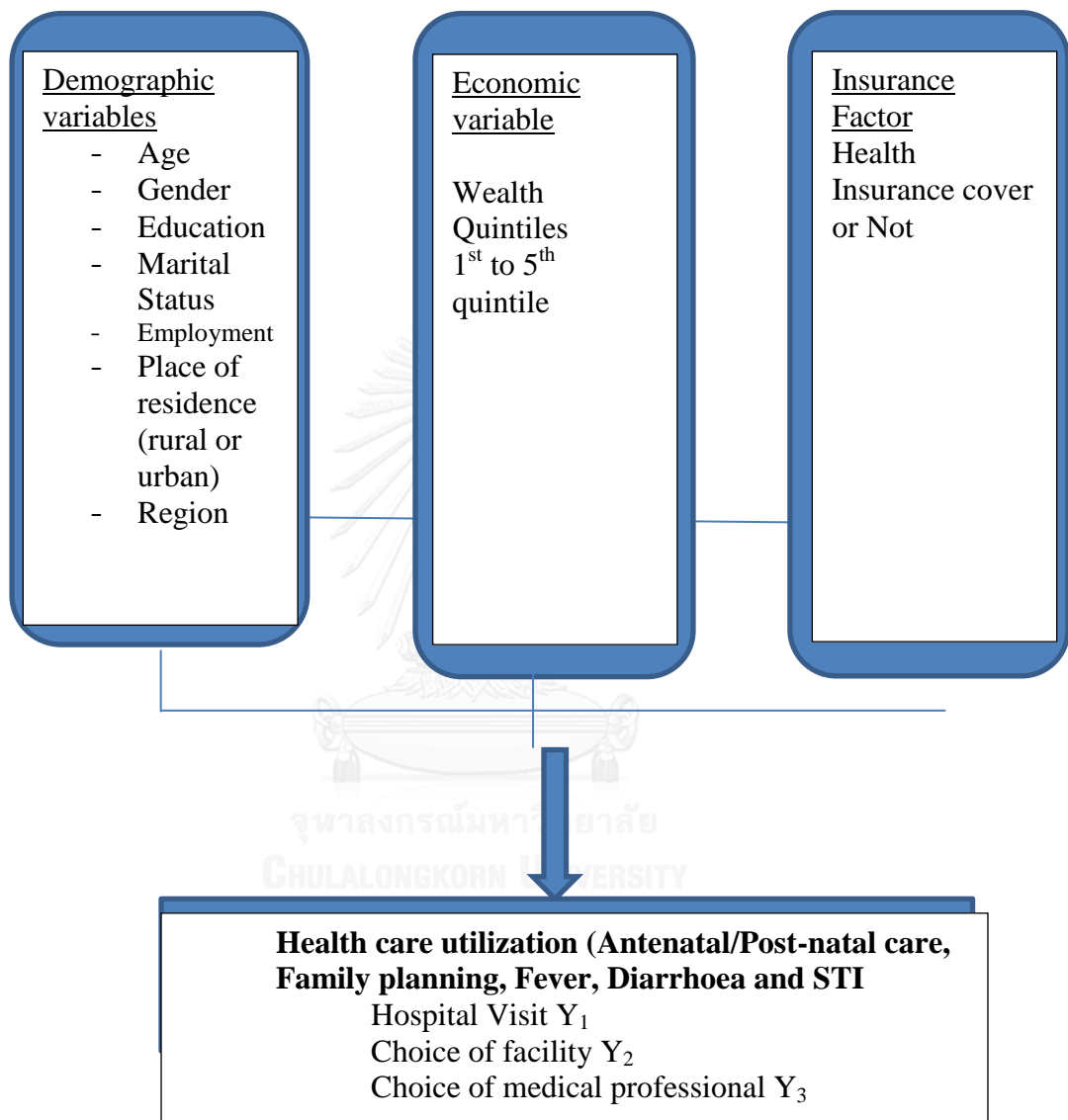
4.1 Conceptual Framework

Health care utilization is dependent on Socio-economic and demographic factors, based on the reviewed literature and pattern observed in the Nigerian health system. These factors are health insurance, age, employment, education, marital status, place of residence, wealth index, means of mobility, region. The health insurance system in Nigeria is mandatory for all civil servants and employees in the organized private sector. Once employed, contributions in to the scheme are automatically deducted for the monthly salary of the individual and the individual is then entitled to be a beneficiary of the scheme. Other individuals who are not employed in any of these sectors are automatically exempted from having the benefits that goes with the insurance package, and will therefore have to bear the cost of their health though OOP expenditure. Endogeneity is not expected in this kind of system as there is not option for opting in to the insurance presently. Other factors used in the model are age of the individual, gender, educational attainment (primary, secondary, higher), employment, place of residence (urban or rural), and region of the country. This can be represented as follows:

$U=f$ (health insurance, age, employment, education, marital status, place of residence, wealth index, means of mobility, region).

Where U = Health Care Utilization.

The diagrammatic representation of the conceptual framework is as shown below:



4.2 Survey data

Cross-sectional data from the 2013 Demographic and Health survey were obtained and permission granted for the use of such data for analysis. The 2013 Nigeria Demographic and Health Survey (NDHS) were implemented by the National Population Commission (NPC) with the support of United States Agency for

International Development (USAID), United Kingdom Department for International Development (DFID) and United Nation Population Fund (UNFPA). It is the fifth in the series of Demographic and Health Surveys conducted so far in Nigeria. The primary sampling unit (PSU), referred to as a cluster in the 2013 NDHS, was defined on the basis of Enumeration areas (EAs) from the 2006 EA census frame. The 2013 NDHS sample was selected using a stratified three-stage cluster design consisting of 904 clusters, 372 in urban areas and 532 in rural areas. A representative sample of 40,680 households was included for the survey across the 36 states and 6 geo-political zones of the country.

4.3 Variable description

This study uses health states and conditions as measures of health care utilization, and the dependent variables were derived from these categories of health conditions and a model subsequently developed which was used in analysis. The health conditions include antenatal care, post natal care, family planning, fever, diarrhoea and STI (sexually transmitted Infection).

There are three (3) categories of dependent variables. First category is Y_1 which represent the incidence of the need for care, where 1 indicates that the individual had the health condition and sought for care at least one month before the sure, and 0 indicate otherwise. The second dependent variable Y_2 represents decision to use the public or private hospital. The public hospitals include all government hospitals, health centers, mobile clinics and other public health facilities owned by the government. The Private facilities include private hospital/clinic, private owned pharmacies, private doctor and chemist.

The third dependent variable is Y_3 and it represents the type of medical professional that the individual consulted for the provision of the care. These are categorized in to utilization of health care from a medical professional, non-medical profession or not attended to.

The explanatory variables used include a dummy variable of Health Insurance cover continuous variable of Age, a dummy variable of Gender (Male and female), categorical variable of Education, categorical variable of Occupation, categorical variable of Marital Status, categorical variable of Wealth Quintiles, a categorical

variable of location, a dummy variable for means of transportation and a categorical variable of region. The summary of the variables is as shown in table 4.1 below:

Table 4.1: Variables Description

S/No.	Variable	Explanation	Predicted Sign
Dependent Variables			
1.	Y_1	1= need for care/incidence of disease; 0 = if otherwise	
2.	Y_2	0 if used formal public health facility; 1 if used formal private health facility 2 if used informal facility	
3.	Y_3	0 if attended to by a medical Professional 1 if attended to by a non-professional	
Independent/Explanatory variables			
1.	Health Insurance	1 if respondent has any form of health insurance; 0 if otherwise.	Positive/Negative
2.	Age	Continuous	Positive
3.	Gender	1 for male; 0 of otherwise	Negative/Positive
4.	Education	0 if no formal education; 1 if completed primary school only; 2 if completed secondary school only; 3 if completed higher education	Positive
5.	Employment	0 if unemployed;	Positive/Negative

		1 if employed in formal sector; 2 if employed in the informal sector.	
6.	Marital status	0 if single; 1 if married 2 if widowed 3 if separated	Positive/Negative
7.	Wealth Quintiles Quintile 1(Poorer) Quintile 2(Middle) Quintile 3(Richer) Quintile 4(Richest)	This variable was given in quintiles 1 to 5 in the dataset ranging from poorest to riches. Poorest was used as the base group 1 if respondent belongs to the 1 st quintile; 0 if otherwise. 1 if respondent belong to the 2 nd quintile; 0 if otherwise. 1 if respondent belong to the 3 rd quintile; 0 if otherwise. 1 if respondent belong to the 4 th quintile; 0 if otherwise	
8.	Means of transportation Bicycle	1 if owns a bicycle	

	Motorcycle	0 if otherwise 1 if owns motorcycle	
	Car	0 if otherwise 1 if owns a car 0 if otherwise	
9.	Location	1 if respondent reside in the urban area; 0 if otherwise	Positive
10.	Region	1=North-central(NC) 2=North-east(NE) 3=North-west(NW) 4=South-east(NE) 5=South-south(SS) 6=South-west(SW)	

4.4 Data Analysis

The Models for analysis of the data used are logistic regression and multinomial logit regression.

- I. Logistic regression model is as represented below:

$$Y_i^* = X_i\beta + \epsilon_i$$

Where $Y_i^* = 1$ if $Y_i^* \geq 0$

$Y_i = 0$ if $Y_i^* < 0$

$$P(Y_i = 1) = \frac{\text{Exp}(X_i\beta)}{1 + \text{Exp}(X_i\beta)}$$

$$P(Y_i = 0) = \frac{1}{1 + \text{Exp}(X_i\beta)}$$

The model equations for the 3 dependent variables are as represented in the following equations.

$$Y_1 = \beta_0 + \beta_1 \text{CovHI} + \beta_2 \text{Age} + \beta_3 \text{Gender} + \beta_4 \text{Employment} + \beta_5 \text{Rural} + \beta_6 \text{Urban} + \beta_7 \text{Wealth Quintile1} + \beta_8 \text{Wealth quintile2} + \beta_9 \text{Wealth quintile3} + \beta_{10} \text{Wealthquintile4} + \beta_{11} \text{Single} + \beta_{12} \text{Married} + \beta_{13} \text{Widowed} + \beta_{14} \text{Separated} + \beta_{15} \text{Bicycle} + \beta_{16}$$

Motorcycle + β_{17} Car + β_{18} North-central + β_{19} North-east + β_{20} North-west + β_{21} South-east + β_{22} South-west + β_{23} South-south + ε

Where β_0 is constant

$Y_2 = \beta_0 + \beta_1 \text{CovHI} + \beta_2 \text{Age} + \beta_3 \text{Gender} + \beta_4 \text{Employment} + \beta_5 \text{Rural} + \beta_6 \text{Urban} + \beta_7 \text{Wealth Quintile1} + \beta_8 \text{Wealth quintile2} + \beta_9 \text{Wealth quintile3} + \beta_{10} \text{Wealthquintile4} + \beta_{11} \text{Single} + \beta_{12} \text{Married} + \beta_{13} \text{Widowed} + \beta_{14} \text{Separated} + \beta_{15} \text{Bicycle} + \beta_{16} \text{Motorcycle} + \beta_{17} \text{Car} + \beta_{18} \text{North-central} + \beta_{19} \text{North-east} + \beta_{20} \text{North-west} + \beta_{21} \text{South-east} + \beta_{22} \text{South-west} + \beta_{23} \text{South-south} + \varepsilon$

Where β_0 is constant

$Y_{3=} \beta_0 + \beta_1 \text{CovHI} + \beta_2 \text{Age} + \beta_3 \text{Gender} + \beta_4 \text{Employment} + \beta_5 \text{Rural} + \beta_6 \text{Urban} + \beta_7 \text{Wealth Quintile1} + \beta_8 \text{Wealth quintile2} + \beta_9 \text{Wealth quintile3} + \beta_{10} \text{Wealthquintile4} + \beta_{11} \text{Single} + \beta_{12} \text{Married} + \beta_{13} \text{Widowed} + \beta_{14} \text{Separated} + \beta_{15} \text{Bicycle} + \beta_{16} \text{Motorcycle} + \beta_{17} \text{Car} + \beta_{18} \text{North-central} + \beta_{19} \text{North-east} + \beta_{20} \text{North-west} + \beta_{21} \text{South-east} + \beta_{22} \text{South-west} + \beta_{23} \text{South-south} + \varepsilon$

Where β_0 is constant

- II. Multinomial logit regression model was used in analyzing the choices of facility and choices of medical professional. The equation for the model is as represented below:

$$\Pr(Y_i = K - 1) = \frac{e^{\beta_{K-1} \cdot X_i}}{1 + \sum_{k=1}^{K-1} e^{\beta_k \cdot X_i}}$$

Where Y= 0 if attended a formal public health facility
 Y= 1 if attended a formal private health facility
 Y= 2 if attended an informal facility

And for medical profession

Y= 0 if attended by a medical professional
 Y= 1 if attended by a non-professional
 Y= 2 if unattended to

Marginal effect was thereafter computed using stata to obtain the effect of each of the independent variables on the respective dependent variables of need for care, choice of health care facility and lastly the choice of medical professional.

The marginal effect of an independent variable(X) measures the impact of change in an independent variable(X) on the expected change in the dependent variable(Y) in a regression model, especially when the change in the independent variable is substantially small or just marginal. The marginal effects of each independent variable X on the dependent variable Y were computed by taking the partial derivative of $E(Y | X)$ with respect to X if the independent variable is continuous and thus differentiable.



Chapter 5.

DATA

5.1 Description of Data

The data used for this study are from the most recent DHS Survey conducted in 2013. The general dataset consists of sections about marriage and sexual activity, fertility, fertility preferences, family planning, infant and child mortality, reproductive health, child health, nutrition of children and women, malaria, HIV-and-AIDS-related knowledge, attitudes and behavior, adult and maternal mortality, women empowerment and demographic and health outcomes, domestic violence, orphans and vulnerable children and lastly female genital cutting.

The data set is divided into two categories. The first category is the Individual variable dataset which consist of 100 percent female observation, and it has a total of 38,948 observations and 4,618 variables. The second category is the male variables data set and it has a total of 17,359 observations with 748 variables. This implies that the female sample is much larger than the male observation.

Each dataset was cleaned and recoded differently. After data cleaning, the female dataset was trimmed down to 51 relevant variables while the male dataset was trimmed to 34 variables and they were subsequently appended to form one data set comprising variables of both male and female. However, conditions relating to health care such as the antenatal care, post-natal care and delivery were attributed to only the female variable. Also, fever was found only in the female dataset but not available in the male dataset. Family planning, diarrhoea and STI were available in both the male and female datasets. All these conditions stated are part of the benefit package which insured individuals have access to upon registration with NHIS.

5.2. Description of Dependent variables

The dependent variables in this study uses diseases/conditions as health care utilization measures and these measures are broadly classified in to 4 namely antenatal/post-natal care, family planning, fever, diarrhoea and STI. Antenatal care, post natal care and fever were only available in the female dataset while fever, diarrhoea and STI are found in both male and female dataset. The breakdown is as shown in the table below.

Table5.1. Main Categorization of data set

S/NO	UTILIZATION MEASURE	TYPE OF VARIABLE	RELEVANT GENDER	NUMBER OF OBSERVATIONS
A.	ANTE/POST-NATAL CARE			
	Antenatal Choice of Professional	Dummy	Female	20,026
	Antenatal Choice of Facility	Dummy	Female	12,915
	Post-natal choice of professional	Dummy	Female	8,928
B.	FAMILY PLANNING			
	Family planning visit	Dummy	Female	38,784
	Facility/source of Family planning	Categorical	Male/Female	6,269
C.	FEVER			
	Occurrence of fever	Dummy	Female	18,875
	Choice of facility for the treatment of fever	Categorical	Female	2,572
D.	DIARRHOEA			
	Occurrence of Diarrhoea	Dummy	Male/Female	18,892
	Facility choice for the treatment of diarrhoea	Categorical	Male/Female	1,695
E.	STI (Sexually transmitted infection)			
	Sought for advice/treatment of STI	Dummy	Male/Female	2,887
	Facility Choice for the treatment of STI	Dummy	Male/Female	1,863

Table 5.1 above shows the different categorization of the dataset used to categorize the dependent variables. The female specific utilization measures are antenatal care,

post-natal care planning visit and fever. The utilization measure that are common to both and females in the data set are fever, diarrhoea and sexually transmitted Infection.

Utilization is measured using occurrence of the disease, choice of facility and then choice of professional.

5.3 Categorization of the Dependent variables

Categorization of the dependent variables is based on its availability in the dataset used; the Y variables are categorized in to 3 as shown in table 5.2 below. Dependent variable Y1 is defined as the need for care in which family planning, fever, diarrhoea and STI have the need for care while antenatal and post natal care don't have. This is represented as either Yes or No for the listed condition. Second dependent variable is Y2 which is defined as the choice of facility for the utilization of health care and all the variables have Y2 except post natal care. The last facility visited by the individual for utilization of health care was used to compute for the choice of facility. The third is Y3 which refers to the choice of medical professional (care-giver) and only antenatal and post natal care has this category.

Table 5.2. Summary of Dependent Variables

S/No.	Dependent Variables	Need for care(Y ₁)	Choice of Facility(Y ₂)	Choice of Professional(Y ₃)
1.	Antenatal Care	NA	Available	Available
2.	Post-natal care	NA	NA	Available
3.	Family Planning	Available	Available	NA
4.	Fever	Available	Available	NA
5.	Diarrhoea	Available	Available	NA
6.	STI	Available	Available	NA

KEY: NA = Not Available in the dataset

5.4 Descriptive statistics of Dependent Variables

The descriptive statistics of each of the dependent variables based on conditions for health care utilization is as shown in the tables below:

5.4.1 Choice of Professional Antenatal Care

Table 5.3. Choice of Professional Antenatal Care

Dependent Variable 1	Description	No. of Observations	%
0	Attended to by a non-professional/self-medication	6,687	34.39
1	Attended to by a professional	13,139	65.69
Total		20,026	100

Table 5.3 above describes the categorical variable of choice of health professionals for antenatal care. Being attended to by a professional implies the individual receives antenatal care from either a Doctor, nurse/midwife, auxiliary midwife of a community extension health worker. A large proportion of women were attended to by health professionals (65.69%) for antenatal care. On the other hand, 34.39 percent of the female sample was attended to by a non-professional; where non-professional in this category refer to attended to by traditional birth attendants, village health workers and other non-professionals that don't have medical training.

5.4.2 Choice of Facility for Antenatal Care

Table 5.4. Antenatal Choice of facility

Dependent Variable 2	Description	No. of Observations	Percentage
0	Formal-Public facility	10,059	77.89
1	Formal- Private facility	2,856	22.11
Total		12,915	100

Table 5.4 above explains the dummy variable of choice of facility for health care delivery. 77.89% of the sample population attended the formal public facilities while 22.11% attended the formal-private health facilities. Formal-public facilities include government hospital, government health center or government health post. On the other hand, formal-private facilities include antenatal services received in private hospital/clinic and other formal private-medical sectors.

5.4.3 Post-natal choice of Professional

Table 5.5. Post natal Choice of Professional

Dependent	Description	No. of	Percentage
-----------	-------------	--------	------------

Variable 3		Observations	
0	Attended to by a non-professional	1,307	14.64%
1	Attended to by a professional	7,621	85.36%
Total		8,928	100

The table 5.5 above shows the dummy variable of choice of professional for post-natal care. Majority of women in the sample population who delivered were attended to by a professional (85.36%) while those attended to by non-professional have a proportion of 14.64%. A health professional here refers to being attended to by either a doctor, nurse, midwife or community health extension worker. Non-professional category includes the traditional birth attendants and community health workers. No one reports not being attended to after delivery.

5.4.4 Family Planning

Table 5.6. Family planning visit and Source of Family planning

Dependent Variable 4	Description	No. of Observations	Percentage
	Family planning Visit		
0	No	29,909	77.12
1	Yes	8,875	22.88
	Last source of Family planning		
0	Formal-Public facility	1,236	19.72
1	Formal- Private facility	4,432	70.70
2	Informal	380	6.06
	Total	6,048	100

Table 5.6 above describes family planning variables. Dummy variable of family planning visit is designated as FP_visit which describes whether the individual has attended a family planning facility in the last 12 month preceding the date of the interview or not. The sample proportion consists of 38,784 females and only 22.88% (8,875) of these reported having attended a family planning visit. The remaining 77.12% have not attended any facility for family planning.

The second category in family planning from the table above shows the last source where family planning services were received for the current users. It includes both

for male and female gender. Out of the total of 6,269 individuals, 70.70% attended the formal private facility which include private hospitals/clinics, pharmacy, chemist/private medical store, private doctor and/or mobile clinic. 19.72% of the total attended the formal public facilities while 6.06% went to the informal sector for family planning. The informal sector include shop, church or from a relative.

5.4.5 Fever

Table 5.7. fever incidence and facility choice for treatment

Dependent Variable 6	Description	No. of Observations	Percentage
	Had fever in the last 2 weeks before survey		
0	No	16,096	85.28
1	Yes	2,779	14.72
Dependent Variable 7	Facility choices for the treatment of fever		
0	Formal Public Facility	845	32.85
1	Formal Private facility	1,518	59.02
2	Informal facility	209	8.13
		2,572	100.00

Table 5.7 above describes utilization of health care services based on incidence of fever as an illness. The number of individuals who reported having fever at least 2 weeks prior to survey was 2,779 persons. Majority of that sought for treatment from formal private facility (57.72%) while 34.53% of the fever patients went to formal public facility. Only 7.76% of the proportion sought for treatment of fever from the informal facilities.

5.4.6 Diarrhoea

Table 5.8. Diarrhoea and facility choice for treatment

Dependent Variable 8	Description	No. of Observations	Percentage
	Respondent had diarrhoea		

	2 weeks before survey		
0	No	16,533	87.51
1	Yes	2,359	12.49
Dependent Variable 9	Source for the treatment of Diarrhoea		
0	Formal Public facility	595	35.1
1	Formal Private facility	877	51.74
2	Informal facility	223	13.16
	Total	1,695	100

Table 5.8 above describes the dummy variable of individuals whom have had diarrhoea in the last 2 weeks preceding the survey and the first place sought for treatment for the ailment. The number of individuals who reported to have had diarrhoea is 2,359 (12.49%). Majority of individuals who had diarrhoea sought for treatment from the formal private facility (51.74%). However, significant number also attended the formal public facilities (35.1%). Only 13.16% reported seeking for treatment from the informal facilities.

5.4.7 STI (sexually transmitted infection)

Table 5.9. STI and choice of facility for treatment

Dependent Variable 10	Description	No. of Observations	%
	Had STI and sought for treatment		
0	No	792	27.43
1	Yes	2,095	72.57
Dependent Variable 11			
	Choice of facility for the treatment of STI		
0	Formal Public facility	734	39.40
1	Formal Private facility	1,110	60.20
	Total	1,844	100

Table 5.9 above describes the dummy variable sti which means those who reported to have sought for advice or treatment for sti or not and secondly sti_CF which implies facilities of choice where treatment of STI was sought for or obtained. The table showed that 2,095 (72.57%) individuals sought for advice / treatment for STI disease.

On the choice of facility, more people attended the formal private sector to seek treatment for STI (60.20%) while 39.40% sought for treatment from the formal public facilities.



5.5 Descriptive Statistics of Independent Variables

Table 5.10. Descriptive statistics of Independent Variables

Variables	Description	No. of Observations	%	Mean	Std. Dev.
Health Insurance	CovHI(Covered by Health Insurance(HI)) 0= No 1= Yes	54,919 1,388	97.53% 2.47%	0.247	0.155
Age(Years)	Min = 15 Max = 48	56,307	-	28.942	9.762
Sex	Males = 1 Female = 0	17,359 38,948	30.83% 69.17%	0.308	0.462
Employment status	0=unemployed 1=Employed	17,839 38,468	31.68% 68.32%	0.683	0.465
Educational attainment	0= No Education 1=Primary 2=Secondary 3=Higher	17,094 10,083 22,797 6,333	30.36% 17.91% 40.49% 11.25%	0.179 0.405 0.112	0.383 0.491 0.316
Place of Residence	0= Rural 1= Urban	33,618 22,689	59.70% 40.30%	0.403	0.490

Marital status	Single=0	20,476	36.36%	0.636	0.481
	Married=1	35,831	63.64%		
Wealth Index	Poorest=1	9,248	16.42%	0.187	0.390
	Poorer=2	10,548	18.73%		
	Middle = 3	11,539	20.49%		
	Richer=4	12,492	22.19%		
	Richest=5	12,480	22.16%		
Means of Transportation	Bicycle(Yes)	8,054	20.68%	0.207	0.405
	Motorcycle(Yes)	14,085	36.16%	0.362	0.480
)	4,150	10.66%	0.167	0.309
	Car(Yes)				
Region	1=North-Central	9,269	16.46%	3.389	1.671
	2=North-East	9,473	16.82%		
	3=North West	13,804	24.52%		
	4=South-East	6,143	10.91%		
	5=South-South	9,093	16.15%		
	6=South-West	8,525	15.14%		

Table 5.10 above describes the independent variables used in this study. It comprises different independent variables used, description of each of the variables, the number of observations, percentage distribution, mean and standard deviation corresponding to each category.

Health Insurance has a total coverage of 2.47% which represents 1,388 people out of 56,307. The remaining 97.53 % (54,919 individuals) are not covered by health insurance. Age is represented as a continuous variable with 15 years as the minimum age and 49 years as the maximum age. Total number of observations is given as 56,307 individuals. This number comprises of 69.17% (38,948) females and 30.83%

(17,359) males. Next is the dummy variable of employment status. Individuals employed in the informal sector have the highest percentage (61.35%) while the lowest is formal sector employees with 6.97%. The employed persons comprised a total of 68.32% and this is composed of individuals working in both formal as well as informal sectors, both public owned and private owned. Formal sector comprise of people that work as professional/technical/managerial position as well as clerical staff. Informal sector employees are composed of individuals whose jobs are sales, agricultural employees/self-employed, domestic and house-hold workers, skilled and unskilled manual workers and others. Educational attainment is a categorical variable ranging from uneducated, having primary school, secondary school or higher school as the highest educational attainment. The percentage of people with higher education is comparatively lower than all other educational levels. Individuals with higher education constitute 11.25% (6,333) of the sample population while individuals having only secondary school attainment have a high percentage of 40.49% (22,797). Individuals with no educational attainment have a proportion of 30.36% (17,094) and those with primary school education as the highest educational attainment are 17.91% (10,083). Place of residence is a dummy variable with 1 representing individual resides in urban area and 0 for resident in rural area. The rural residents constitute the largest proportion of the sample population with value of 59.7% (33,618) while the urban population is 40.3% (22,689). With respect to categorical variable of marital status, the married population has the highest proportion which constitutes 63.64% of the sample population. The single sample population also has a significant proportion of 32.59%. Furthermore, marital status is represented as a dummy variable comprising of 36.36% single and while 63.64% are married. From the original data set, the marital status categories of single, separated, widowed and not living together were merged to represent the single status, because in all the case, individuals are not married. The categorical variable of wealth index describes the wealth quintile of the sample population. It is divided in to quintiles 1 to 5 ranging from poorest to the richest. The poorest constituted of 16.42%; poorer 18.73%; Middle 20.19%; richer 22.16% and richest 22.16%. Total number of observations is 100% (56,307). Utilization of health care services is also influences by having means of transport to the nearest health facility. The three identified means from the data set are ownership

of a Bicycle, Motorcycle or Car. Bicycle ownership is 20.68 % (8,054), motorcycle 36.16 % (14,085) and car has 10.66 % (4,150). This implies that cumulatively, 67.5% of the sample proportion has one means of transport or another. On the national level, the variable region is categorical and ranges from 1-6 regions. North-West has the highest individuals involved in the study comprising of 24.53% of the sample. NC and NE have 16.46% and 16.82% respectively while SE, SS and SW have 10.91%, 16.15% and 15.14% respectively. Sum total of observations in all the 6 geo-political regions is 56,307(100%).



Chapter 6.

RESULTS

This chapter shows binary logit and multinomial logit results of the five (5) different measures of health care utilization according to the data set. The presentation of the results is in the following sequence:

First is Antenatal and Post natal care, which consist of results of choice of professional antenatal care, choice of facility antenatal care and choice of professional for post-natal care. The second category is the result of family planning which consists of logit result of family planning visit and multinomial logit result of facility of choice for family planning. The third category is the result of fever with respect to health care utilization. This consists of the logit result of treatment sought for fever and the multinomial logit result of facilities of choice for the treatment of fever. The fourth category of result is for diarrhoea which also has results of treatment sought for diarrhoea and choice of facility for the treatment of diarrhoea. The fifth result category is for treatment sought for STI as well as choices of facility for the treatment of STI. The results are as described in the tables below:

6.1 Antenatal/Post-Natal Care and Health Care Utilization

6.1.1 Choice of medical professional for antenatal care: A binary logit model

The reference for this group is being attended by a medical professional for antenatal care.

Table:

Table 6.1. Choice of professional for antenatal care: A binary logit model

	coeff	Std. Err.	z	P> z	Marginal effect
CovHI	0.5631	0.2669	2.11	0.0350**	0.0861
Age	0.0014	0.0025	0.56	0.5740	0.0002
Employment	0.3511	0.0407	8.62	0.0000***	0.0537
<u>Education</u>					
Primary	0.9005	0.0512	17.58	0.0000***	0.1377
Secondary	1.4511	0.0638	22.76	0.0000***	0.2219

Higher	2.8158	0.2324	12.12	0.0000***	0.4306
<u>Place of Residence</u>					
Urban	0.4764	0.0540	8.83	0.0000***	0.0728
<u>Marital Status</u>					
Married	0.0249	0.0807	0.31	0.7580	0.0038
<u>Wealth Quintiles</u>					
Poorer	0.6556	0.0482	13.6	0.0000***	0.1002
Middle	1.2385	0.0588	21.06	0.0000***	0.1894
Richer	1.6996	0.0757	22.44	0.0000***	0.2599
Richest	2.2520	0.1147	19.64	0.0000***	0.3443
<u>Means of mobility</u>					
Bicycle	0.1312	0.0434	3.03	0.0020***	0.0201
Motorcycle	0.2196	0.0384	5.72	0.0000***	0.0336
Car	0.0416	0.0913	0.46	0.6490	0.0064
<u>Region</u>					
North-east	0.3444	0.0648	5.31	0.0000***	0.0502
North-west	-0.6053	0.0596	-10.15	0.0000***	-0.0946
South-east	0.5129	0.1122	4.57	0.0000***	0.0733
South-south	-1.3216	0.0742	-17.82	0.0000***	-0.2104
South-west	0.0773	0.0905	0.85	0.3930	0.0116
Constant	-1.1508	0.1227	-9.38	0.0000	

Number of obs = 20026

***Significant at 1% significance level

Prob > chi2 = 0.0000

** Significant at 5% significance level

* Significant at 10% significance level

level

Table 6.1 above shows the logit result and marginal effect of health care utilization with respect to antenatal care choice of professional. The coefficient and marginal effects health insurance coverage are statistically significant at $P < 0.05$ and it showed that for individuals that have health insurance coverage, the predicted probability of obtaining antenatal care from a professional relative to from a non-professional/self-medication would increase by 8.3 percent, given that other variables are held constant. It is expected because health insurance is associated with decrease in the cost of seeking for antenatal care, and as such more willingness by individuals to attend antenatal care from professionals. The Being employed was also found to be statistically significant at $P < 0.01$ and the result showed that for individuals being employed, the predicted probability of obtaining antenatal care from a professional relative to from a non-professional/self-medication would increase by 0.02 percent, given that other variables are held constant. This could be because of the income of

the individuals and well as insurance, because as one is employed, health insurance is mandatory for such individuals. The coefficient and marginal effects of educational attainment for primary, secondary and higher education are statistically significant at $P < 0.01$. For primary school as the highest educational attainment, the predicted probability of seeking antenatal care from a professional relative to from a non-professional/self-medication would decrease by 14% percent given that other variables are held constant. Having attained secondary education, the predicted probability of obtaining antenatal care from a professional relative to from a non-professional would increase by 22 percent, given that other variables are held constant. For individuals having attained higher education level, the predicted probability of seeking antenatal care from a professional relative to from a non-professional would increase by 43 percent given that other variables are held constant. This implies that education is a significant determinant of health care utilization because it makes individuals become aware of their health and the need to seek for care. This Being a resident in the urban area has statistical significance at $P < 0.01$ with positive sign of coefficient and marginal effect, which is interpreted that for urban resident, the predicted probability of seeking antenatal care from a professional relative to from a non-professional would increase by 10 percent given that other variables are held constant. Furthermore, the coefficients and marginal effects of wealth index for poorer, middle, richer and richest quintiles are all statistically significant at $P < 0.01$ and have positive coefficients and marginal effect. These are interpreted that the predicted probability of utilization of antenatal care from a professional relative to a non-professional for individuals of wealth quintiles of poorer, middle, richer and richest would increase by 10%; 19%, 26% and 34 percent respectively, given that other variables are held constant. Additionally, ownership of bicycle and motorcycle as a means of mobility were found to be statistically significant at $P < 0.01$ and has a positive coefficient and marginal effect. The interpretation of this is that for individuals having bicycle or motorcycle as a means of mobility, the predicted probability of seeking antenatal care from a professional relative to from a non-professional would increase by 2% and 3.4% respectively, given that other variables are held constant. Furthermore, all the coefficients of region are statistically significant at $P < 0.01$. For regions of North-West and south-

south, the coefficients and marginal effects are negative which means that for individuals that reside in these regions, the predictive probability of seeking antenatal care from a professional relative to from a non-professional/self-medication would decrease by 9.5% and 21% respectively compared to other regions, given that other variables are held constant. On the other hand, a positive sign was observed for the coefficient and marginal effect of regions of North-east, South-East, and South-west implying that for individuals who reside in these regions, the predicted probability of seeking health care from a professional relative to from a non-professional would increase by 5 percent for NE, %7.3 percent for SE and 1.2% for SW, compared to other regions, given that other variables are held constant.

6.1.2 Choice of facility for antenatal care: A binary logit model

The two facilities under this category are formal public and the formal private facilities. The base group (1) is the formal private facility.

Table 6.2. Choice of facility for antenatal care

	Coef.	Std.Err.	P value	Marginal
covHI	0.128538	0.132396	0.332	0.0177
Age	-0.00196	0.004008	0.625	-0.0003
Employment	-0.03406	0.06249	0.586	-0.0047
<u>Education</u>				
Primary	0.445695	0.086532	0.000***	0.0612
Secondary	0.324711	0.087845	0.000***	0.0446
Higher	0.244727	0.107962	0.023**	0.0336
<u>Place of Residence</u>				
Urban	0.233153	0.057153	0.000***	0.0320
<u>Marital Status</u>				
Married	0.186825	0.136031	0.170	0.0249
Widowed	0.356178	0.218611	0.103	0.0488
Separated	0.347131	0.213506	0.104	0.0475
<u>Wealth Quintiles</u>				
Poorer	-0.14066	0.137279	0.306	-0.0193
Middle	-0.13218	0.132712	0.319	-0.0182

Richer	-0.07927	0.135851	0.560	-0.0109
Richest	0.381326	0.144134	0.008***	0.0524
<u>Means of Mobility</u>				
Bicycle	-0.09055	0.070165	0.197	-0.0124
Motorcycle	-0.16453	0.051029	0.001**	-0.0226
Car	0.241456	0.072968	0.001**	0.0332
<u>Region</u>				
North East	-1.82922	0.111439	0.000***	-0.2087
North West	-2.61487	0.148412	0.000***	-0.2387
South East	0.923162	0.075126	0.000***	0.2022
South South	-0.66027	0.084222	0.000***	-0.1056
South West	0.453158	0.069139	0.000***	0.0932
Constant	-1.5377	0.216998	0.000	
<hr/>				
Number of obs =	12915	*** Significant at 1% significance level		
Prob > chi2 =	0.0000	** Significant at 5% significance level		
		* Significant at 10% significance level		

Table 6.2 above shows the logit result of choice of facility for antenatal care. The coefficients and marginal effects of educational attainment for primary and secondary education are statistically significant at $P < 0.01$ while higher education is statistically significant at $P < 0.05$. The interpretation of this is that for individuals having primary and secondary education, the predictive probability is utilizing formal private facility relative to formal public facility would increase by 6.12 percent for primary and 4.5 percent for secondary, given that other variables are held constant. In the case of individuals with higher educational attainment, the predictive probability of using formal private facility relative to formal public facility increases by 3.4 percent, given that other variables are held constant. Being resident in urban area was found to be statistically significant at $P < 0.01$ and has positive sign for coefficient and marginal effect. The interpretation if this is that for individuals residing in urban area, the predictive probability of using Formal private facility for antenatal care relative to formal public facility would increase by 32 percent, given that other variables are held constant. In wealth index, only the richest wealth quintile was found to be statistically significant at $P < 0.01$ and this implies that the predictive probability of utilizing formal

private facility for antenatal care relative to formal public facility would increase by 5.24 percent, given that other variables are held constant. Means of mobility for motorcycle and car are statistically significant at $P < 0.05$. Motorcycle has a negative coefficient and marginal effect and this implies that for individuals having motorcycle as means of transport, the predictive probability of using formal private facility for antenatal care relative to formal public facility would decrease by 2.3%. On the other hand, car has a positive coefficient and marginal effect implying that for ownership of car as means of mobility, the predictive probability of using formal private facility for antenatal care relative to formal public facility would increase by 3.32 percent given that other variables are held constant. This variation for means of mobility could be explain by viewing that house-holds that own car are more likely to have higher income and thus could be able to afford the services at the formal private facilities, while the negative coefficient of ownership of motorcycle may be that house-holds having motorcycle may have relatively low income, and thus will utilize more of the public facility than private facility for antenatal care. With respect to the regions of the country, all the regions were found to be statistically significant at $P < 0.01$. Regions of NE, NW and SS have negative sign for coefficient and marginal effect, which means that the predictive probability of attending a formal private facility for antenatal care relative to formal public facility would decrease by 21 percent for NE, 24 percent for NW and 11% for SS, given in each case that other variables are held constant. On the other hand, the regions of SE and SW have positive coefficient implying that the predictive probability of utilizing formal private facility for antenatal care relative to formal public facility would decrease by 20.2 percent for SE and 9.3% for SW, given that other variables are held constant. The reason that could be attributable to the increase in utilization of formal private facilities in SE and SW could be due to more economic activities that take place in those two regions, and the regions have been known to have higher literacy level, thus more tendencies to use private facilities.

6.1.3 Choice of medical professional for post natal care: A binary logit model

The reference group is being attended to by a medical professional for post-natal care.

The result is as shown below:

Table 6.3. Choice of professional for post natal care

pnatal_CP	Coef.	Std.Err.	z	P> z	Marginal effect
covHI	0.5378	0.3271	1.64	0.1000*	0.0528
Age	0.0167	0.0049	3.4	0.0010***	0.0016
Employment	0.1283	0.0804	1.6	0.1110	0.0126
<u>Education</u>					
Primary	0.5252	0.0968	5.43	0.0000***	0.0516
Secondary	1.2061	0.1083	11.14	0.0000***	0.1184
Higher	2.5363	0.2789	9.09	0.0000***	0.2490
<u>Place of Residence</u>					
urban	0.7731	0.0931	8.31	0.0000***	0.0759
<u>Marital status</u>					
Married	0.2597	0.1218	2.13	0.0330**	0.0255
<u>Wealth Quintile</u>					
Poorer	0.3632	0.1147	3.17	0.0020***	0.0357
Middle	0.6428	0.1246	5.16	0.0000***	0.0631
Richer	0.7765	0.1400	5.55	0.0000***	0.0762
Richest	1.4334	0.1820	7.88	0.0000***	0.1407
<u>Means of mobility</u>					
Bicycle	-0.0333	0.0875	-0.38	0.7040	-0.0033
Motorcycle	0.3303	0.0726	4.55	0.0000***	0.0324
Car	0.3797	0.1597	2.38	0.0170**	0.0373
<u>Region</u>					
North-east	-0.9153	0.1245	-7.35	0.0000***	-0.0762
North-west	-0.4200	0.1355	-3.1	0.0020***	-0.0297
South-east	0.2453	0.2059	1.19	0.2330	0.0137
South-south	-2.2906	0.1222	-18.74	0.0000***	-0.2708
South-west	-0.3502	0.1505	-2.33	0.0200**	-0.0242
_cons	-0.00079	0.2229	0	0.997	

Number of obs = 8929

Prob > chi2 = 0.0000

*** Significant at 1% significance level

** Significant at 5% significance level

* Significant at 10% significance level

Table 6.3 above shows the binary logit result indicating the coefficients and marginal effects of Choice of medical professional for post natal care. Covered by health Insurance (covHI) was statistically significant at $P < 0.1$ and has a positive

coefficient and marginal effect. This means that for individuals that have health insurance coverage, the predictive probability of seeking post-natal care from a professional relative to from a non-professional would increase by 5.3 percent, given that other variables are held constant. Age was found to be statistically significant at $P < 0.01$ with a positive coefficient and marginal effect. This means that for one year increase in age, the predictive probability of being attended to by a professional for post-natal care relative to a non-Professional would increase by 0.16 percent, given the other variables are kept constant. Educational attainments of primary, secondary and higher are all statistically significant at $P < 0.01$ and all have positive coefficients and marginal effects. The interpretation of these is that for the predictive probabilities of individuals to seek for post-natal care from a professional, relative to a non-professional would increase by 5.2 percent for primary, 12 percent for secondary and 25 percent for higher educational attainment. This showed that the higher the educational attainment of individuals, the more likely it is for them to seek the services of professional for post-natal care. Being a resident in urban area is associated with 8 percent increase in the predictive probability of individuals to be attended to by a professional relative to a non- professional for post-natal care. This implies that individuals who live in urban areas have higher chances of being attended to by a professional, compared to those who live in rural areas. Being Married is statistically significant at $P < 0.05$, and the interpretation showed that for married individuals, the predictive probability of seeking post-natal care from a professional relative to from a non-professional would increase by 3 percent, given that other variables are held constant. The result further showed that all the four quintiles of wealth index are statistically significant at $P < 0.01$ and all have positive coefficients and marginal effects. The interpretation of these is that the predictive probability of being attended to by a professional relative to by a non-professional for post-natal care would increase by 4% for poorer, 6.3% for middle, 7.6% for richer and 14.11% for richest wealth quintiles, given that other variables are kept constant. This shows that with increase in wealth level, it is increasing less likely for individuals to seek for post-natal care services from a non-professional relative to a professional. Regions of NE, NW, SS and SE were found to be statistically significant. The interpretations is that the predictive probability of being attended to by a professional relative to a non-

professional for post-natal care would decrease by 7.6% in NE, 3% in NW, 26% in SS and 2.4% in SW, given that other variables are held constant. However, region of SE was found to be statistically insignificant.

6.2 Family Planning and Health Care Utilization

The variable of family planning relates also to only females, and for this category, we use the facilities that individuals used to seek for family planning services to make our analysis. The categorization of the facilities here includes formal public facility, formal private facility, and Informal facilities. The results are as described below:

6.2.1 Family Planning Visit: A binary logit Model

This variable shows the people that reported having had a visit for family planning, with 1 indicating yes and 0 indicating no. The result is as shown below:

Table 6.4. Had a family planning visit

FP_visit	Coef.	Std.Err.	z	P> z	Marginal effect
covHI	0.430774	0.079043	5.45	0.0000***	0.0668
Age	-0.01778	0.001914	-9.29	0.0000***	-0.0028
Employment	0.337431	0.032094	10.51	0.0000***	0.0523
<u>Education</u>					
Primary	0.62409	0.042439	14.71	0.0000***	0.0968
Secondary	0.871651	0.043791	19.9	0.0000***	0.1352
Higher	1.181745	0.057967	20.39	0.0000***	0.1832
<u>Place of Residence</u>					
Urban	0.36468	0.032876	11.09	0.0000***	0.0565
<u>Marital Status</u>					
Married	1.705075	0.046942	36.32	0.0000***	0.2219
Widowed	1.298635	0.09697	13.39	0.0000***	0.1501
Separated	1.200095	0.096345	12.46	0.0000***	0.1344
<u>Wealth Quintiles</u>					
Poorer	0.508629	0.054374	9.35	0.0000***	0.0789
Middle	0.879027	0.056482	15.56	0.0000***	0.1363
Richer	0.896187	0.061034	14.68	0.0000***	0.1390

Richest	0.895854	0.068528	13.07	0.0000***	0.1389
<u>Means of Mobility</u>					
Bicycle	0.00486	0.034556	0.14	0.8880	0.0008
Motorcycle	0.113448	0.027853	4.07	0.0000***	0.0176
Car	-0.00656	0.042818	-0.15	0.8780	-0.0010
<u>Region</u>					
North-east	0.092223	0.048131	1.92	0.0550*	0.0145
North-west	0.082205	0.045739	1.8	0.0720*	0.0129
South-east	-0.11713	0.050374	-2.33	0.0200**	-0.0176
South-south	-0.16012	0.046405	-3.45	0.0010***	-0.0238
South-west	0.159868	0.045275	3.53	0.0000***	0.0254
_cons	-3.72211	0.086585	-42.99	0.0000	

Number of obs = 38784

Prob > chi2 = 0.0000

***Significant at 1% significance level

** Significant at 5% significance level

* Significant at 10% significance level

Table 6.4 above shows the logit result with coefficients and marginal effects of family planning visit. Age has statistical significance at $p < 0.01$ and both the coefficient and marginal effect have negative coefficients. The interpretation of this that for one unit increase in age, the predictive of attending a formal private facility relative to formal public facility decreases by 0.3 percent, given that other variables are held constant. Covered by health insurance (covHI) is also statistically significant at $P < 0.01$ and has positive sign of coefficient and marginal effect. The interpretation is that for individuals that have health insurance coverage, the predictive probability of making a visit for family planning increase by 0.03 percent. This is expected because with health insurance coverage, people are more willing to utilize health care services. With regards to employment, it has statistical significance at $P < 0.01$ and a positive coefficient and marginal effect. The interpretation of this is that for individuals who are employed, the predictive probability of having a family planning visit would increase by 5.2%, given that other variables remain constant. Furthermore, primary, Secondary and higher school educational attainment has statistical significance at $P < 0.01$ with marginal effect having a positive coefficient and marginal effect. The interpretation of this is that the predictive probability of individuals to have a family planning visit would increase by 9.7 percent for primary, 13.5% for

secondary and 18.3% for higher educational attainment. This is an indication that the more individuals are educated, the more they become enlightened about reproductive health and more tendencies to visit the health facilities to obtain family planning services. Being a resident in urban area is associated with 5.7 percent increase in the predictive probability of having a family planning visit, that those who live in rural areas, given that other variables are held constant. All the categories of marital status were found to be statistically significant and have positive coefficients and marginal effects indicating increase in predictive probabilities of having family planning visit. All the categories of wealth index for poorer, middle, richer and richest are statistically significant at $P < 0.01$ with positive sign of coefficient and marginal effect. The interpretation of these is that for the predictive probabilities of having a family planning visit would increase by 7.9% for poorer; 13.6% for middle; 13.9% for richer and 14% for richest, given that other variables are held constant. This shows that as wealth level increase, the tendency for having a visit to seek for family planning visit increases. Ownership of motorcycle as means of mobility confers an increase in predictive probability of having a family planning visit by 1.8 percent, given that other variables are held constant. Motorcycle is statistically significant at $P < 0.01$. Regions of NE, NW and SW have positive coefficients and marginal effects indicating increase in regional predictive probability of making a family planning visit by 1.5% for NE; 1.3% for NW and 2.5% for SW. On the other hand, regions of SE and SS have negative coefficients and marginal effects implying that the predictive probability of having a family planning visit would decrease by 2.4% for SS; and 2.5% for SW, given that other variables are held constant.

6.2.2 Choice of facility for family planning: multinomial logit model

Table 6.5. Choice a facility for family planning (multinomial logit)

FP_source	Coef.	Std.Err	z	P> z	Marginal effect
Formal public vs. Informal					
covHI	-0.3156	0.3141	-1.0	0.3150	-0.0068
Age	0.0951	0.0114	8.4	0.0000***	0.0070
Employment	0.4145	0.1669	2.5	0.0130**	0.0682
<u>Education</u>					
Primary	-1.0205	0.6201	-1.7	0.1000*	-0.0075

Secondary	-1.4175	0.6088	-2.3	0.0200**	-0.0716
Higher	-1.3595	0.6216	-2.2	0.0290**	-0.0503
<u>Place of Residence</u>					
Urban	0.6049	0.1728	-3.5	0.0000***	0.0282
<u>Marital Status</u>					
Married	2.0511	0.1842	11.1	0.0000***	0.2630
<u>Wealth Index</u>					
Poorer	0.1872	0.8341	0.2	0.8220	0.0763
Middle	0.4466	0.8111	0.6	0.5820	0.0945
Richer	0.5211	0.8111	0.6	0.5210	0.1128
Richest	0.4509	0.8193	0.6	0.5820	0.0839
<u>Means of Mobility</u>					
Bicycle	0.3340	0.2431	1.4	0.1690	0.0181
Motorcycle	-0.0068	0.1471	-0.1	0.9630	0.0270
Car	0.4652	0.1984	2.3	0.0190**	0.0585
<u>Region</u>					
North-east	1.7922	0.5021	3.6	0.0000***	0.1771
North-west	0.8310	0.3231	2.6	0.0100**	0.1065
South-east	-0.1877	0.2258	-0.8	0.4060	-0.0361
South-south	1.1555	0.2522	4.6	0.0000***	-0.0462
South-west	-0.8677	0.1892	4.59	0.0000***	-0.1012
Constant	2.18766	1.0226	2.14	0.0320**	

Formal private vs Informal					
covHI	-0.3005	0.2870	-1.05	0.2950	-0.0164
Age	-0.0570	0.0106	5.36	0.0000***	-0.0021
Employment	-0.0073	0.1341	-0.05	0.9570	-0.0626
<u>Education</u>					
Primary	1.0703	0.6161	-1.74	0.0820*	0.0737
Secondary	1.0718	0.6038	-1.78	0.0760*	0.0155
Higher	1.1529	0.6128	-1.88	0.0600*	0.0410
<u>Place of Residence</u>					
Urban	0.4733	0.1521	-3.11	0.0020***	0.0100
<u>Marital status</u>					
Married	0.4699	0.1558	3.02	0.0030***	0.2039
<u>Wealth Quintiles</u>					
Poorer	-0.3118	0.7971	-0.39	0.6960	-0.0929
Middle	-0.1503	0.7749	-0.19	0.8460	-0.0973
Richer	-0.1924	0.7741	-0.25	0.8040	-0.1171
Richest	-0.0737	0.7795	-0.09	0.9250	-0.0819
<u>Means of Mobility</u>					
Bicycle	0.2444	0.2227	1.1	0.2720	0.0020

Motorcycle	-0.1906	0.1326	-1.44	0.1500	-0.0389
Car	-0.1146	0.1795	0.64	0.5230	-0.0446
<u>Region</u>					
North-east	0.8879	0.4915	1.81	0.0710*	0.1097
North-west	0.2638	0.3075	0.86	0.3910	0.0758
South-east	0.0275	0.1922	0.14	0.8860	0.0348
South-south	1.5144	0.2310	6.56	0.0000***	0.1251
South-west	0.2717	0.1689	-1.61	0.1080	0.0627
Constant	1.497721	0.982942	1.52	0.128	
Number of obs = 4026	***Significant at 1% significance level				
Prob > chi2 = 0.0000	** Significant at 5% significance level				
	* Significant at 10% significance level				

Table 6.5 above shows the multinomial logit result with coefficients and marginal effects Choice of facility for family planning, formal public relative to formal private, and table 6.6b showing formal private relative to informal facility. Informal facility was used as the base outcome.

For formal public vs. informal facility, age was shown to have statistical significance at $p < 0.1$ and both the coefficient and marginal effect have positive sign. The interpretation of this that for one unit increase in age, the predictive of attending a formal public facility relative to informal facility decreases by 0.7 percent. For employment status, it has statistical significance and positive coefficient and marginal effect. The interpretation of this is that for individuals who are employed, the predictive probability of attending a formal public facility relative to informal facility for family planning would increase by 6.8%, given that other variables remain constant. Primary, Secondary and higher educational attainment have statistical significance with coefficients and marginal effects having a negative sign meaning that the predictive probability would decrease by 0.8% for primary, 7.2% for secondary and 5% for higher education, given that other variables are held constant. Being resident in the urban area has is statistically significant at $P < 0.01$, meaning for urban resident, the predictive probability of attending a formal public facility relative to informal facility for family planning would increase by 2.8%, given that other variables remain constant. Being married is statistically significant at $P < 0.01$, and both the coefficient and marginal effect have negative sign which means that the predictive probability of attending a formal private facility relative to public facility for family planning decreases by 26% given that other variables are held constant.

Means of mobility of car was also found to be statistically significant at $P < 0.05$ and has a negative sign of coefficient and marginal effect showing increase by 6%, given that other variables are held constant. For region, NE and NW are statistically significant at $P < 0.01$ and have positive sign of coefficient and marginal effect. On the other hand, SS and SW have negative coefficients and are statistically significant at $P < 0.05$.

For formal private vs. informal facility, age was shown to have statistical significance at $p < 0.01$ and both the coefficient and marginal effect have negative sign. The interpretation of this that for one unit increase in age, the predictive of attending a formal private facility relative to informal facility decreases by 0.2 percent, given that other variables are held constant. Primary, Secondary and higher educational attainment have statistical significance with coefficients and marginal effects having a positive sign meaning that the predictive probability would increase by 7.4% for primary, 1.6% for secondary and 4.1% for higher education, given that other variables are held constant. This variation could be attributed to the behavior of seeking for family planning not in an open manner. Being resident in the urban area has is statistically significant at $P < 0.01$, meaning for urban resident, the predictive probability of attending a formal private facility relative to informal facility for family planning would increase by 1%, given that other variables remain constant. Being married is statistically significant at $P < 0.01$, and both the coefficient and marginal effect have positive sign which means that the predictive probability of attending a formal private facility relative to public facility for family planning decreases by 21% given that other variables are held constant. For region, NE and SS are statistically significant and have positive sign of coefficient and marginal effect, showing increase in predictive probability of formal private relative to formal public by 11% and 13% respectively.

6.3 Fever and health care utilization

6.3.1 Treatment sought for fever: A binary logit model

Table 6.6. Treatment sought for fever

	Coef.	Std.Err.	z	$P > z $	Marginal effect
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covHI	0.145428	0.163528	0.89	0.3740	0.0176
Age	0.000	0.003385	-0.11	0.9150	0.0000
Employment	0.021186	0.047976	0.44	0.6590	0.0026
<u>Education</u>					
Primary	0.147293	0.063211	2.33	0.0200**	0.0179
Secondary	0.177979	0.070261	2.53	0.0110**	0.0216
Higher	0.244969	0.114258	2.14	0.0320**	0.0297
<u>Place of Residence</u>					
Urban	0.078635	0.056237	1.4	0.1620	0.0095
<u>Marital Status</u>					
Married	0.00635	0.135721	0.05	0.9630	0.0008
Widowed	0.139938	0.215804	0.65	0.5170	0.0176
Separated	0.156646	0.193872	0.81	0.4190	0.0198
<u>Wealth Quintiles</u>					
Poorer	0.021893	0.062462	0.35	0.7260	0.0027
Middle	-0.00195	0.072612	-0.03	0.9790	-0.0002
Richer	-0.20293	0.086332	-2.35	0.0190**	-0.0246
Richest	-0.47261	0.109583	-4.31	0.0000***	-0.0573
<u>Means of Mobility</u>					
Bicycle	0.072401	0.050453	1.44	0.1510	0.0088
Motorcycle	0.028923	0.044333	0.65	0.5140	0.0035
Car	0.026114	0.084234	0.31	0.7570	0.0032
<u>Region</u>					
North-east	1.227434	0.079924	15.36	0.0000***	0.1565
North-west	0.360273	0.08231	4.38	0.0000***	0.0328
South-east	1.130818	0.092916	12.17	0.0000***	0.1393
South-south	0.649582	0.09058	7.17	0.0000***	0.0665
South-west	-0.04366	0.10325	-0.42	0.6720	-0.0034
_cons	-2.32908	0.18187	-12.81	0.0000	

Number of obs = 2572

Prob > chi2 = 0.0000

*** Significant at 1% significance level

** Significant at 5% significance level

* Significant at 10% significance level

Table 6.6 above shows the logit result of the dependent variable of having had a fever at least 2 weeks prior to the conducted survey. The variables of education for primary, secondary and higher education are all statistically significant at $P < 0.05$ and have positive coefficients and marginal effect. These means that the predictive probability of reporting to have had fever would increase by 1.8% for having primary education as the highest educational attainment, 2.2% increase for secondary and 3.0% for higher educational attainment, given that other variables are held constant. Wealth index has only richer and richest quintiles showing statistical significance at $P < 0.05$ and $P < 0.01$ respectively. The interpretation of these is that for individuals of the wealth quintiles of richer and richest, the predictive probability of reporting having had fever would decrease by 2.5% and 5.7% respectively, given that other variables are kept constant. This could be due to the fact that the richer and richest have less contact with pathogens that could cause fever such as mosquitoes, and have better health prevention and health care. Regions of NE, NW, SE and SS were found to be statistically significant at $P < 0.01$ and all have positive coefficients and marginal effects indicating and increase in the predictive probability of reporting to having fever.

6.3.2 Choice of facility for the treatment of fever: A multinomial logit model

Table 6.7. Choice of facility for the treatment of fever (Multinomial logit)

	Coef.	Std.Err.	z	P> z	Marginal effect
Public vs Informal facility					
covHI	0.2409	0.3201	0.02	0.9820	0.3304
Age	0.0187	0.0113	1.66	0.0960*	0.0020
Employment	0.0573	0.1825	0.31	0.7540	0.0041
<u>Education</u>					
Primary	0.5072	0.2315	2.19	0.0280 0.0000**	0.0508
Secondary	1.3288	0.3228	4.12	*	0.1094
Higher	2.1589	1.0870	1.99	0.0470**	0.1953
<u>Place of Residence</u>					
Urban	0.7006	0.3032	2.31	0.0210**	0.0085
<u>Marital Status</u>					
Married	0.1085	0.4215	0.26	0.7970	0.0654

<u>Wealth Quintile</u>					
Poorer	0.6758	0.2028	3.33	0.0010** *	0.0573
Middle	1.7334	0.2986	5.81	0.0000** *	0.1128
Richer	1.9887	0.4311	4.61	0.0000** *	0.1247
Richest	2.5320	0.7488	3.38	0.0010** *	0.0958
<u>Means of mobility</u>					
Bicycle	0.1206	0.1848	0.65	0.5140	0.0026
Motorcycle	0.1954	0.1753	1.12	0.2650	0.0310
Car	0.0174	0.4626	0.04	0.9700	0.0049
<u>Region</u>					
North-east	0.5358	0.2969	1.8	0.0710 0.0000**	0.0533
North-west	1.3154	0.3192	4.12	*	0.2195
South-east	0.4843	0.4431	1.09	0.2740	-0.1497
South-south	0.6538	0.5095	1.28	0.1990	-0.0894
South-west	0.7314	0.4874	-1.5	0.1330	-0.0311
Constant	1.3518	0.607014 7	- 2.23	0.026	
Private vs. Informal facility					
covHI	0.0114	0.3201	0.02	0.9820	0.4907
Age	0.0100	0.0107	0.94	0.3470	-0.0012
Employment	0.0424	0.1733	0.24	0.8070	-0.0008
<u>Education</u>					
Primary	0.2953	0.2198	1.34	0.1790 0.0040**	-0.0258
Secondary	0.9031	0.3136	2.88	*	-0.0380
Higher	1.3711	1.0824	1.27	0.2050	-0.0837
<u>Place of residence</u>					
Urban	0.7444	0.2947	2.53	0.0120**	0.0410
<u>Marital status</u>					
Married	-0.2341	0.3985	0.59	0.5570	-0.0732
<u>Wealth Quintile</u>					
Poorer	0.4503	0.1867	2.41	0.0160** 0.0000**	-0.0214
Middle	1.3409	0.2859	4.69	*	-0.0125
Richer	1.5643	0.4182	3.74	0.0000**	-0.0085

				*	
				0.0020**	
Richest	2.3351	0.7361	3.17	*	0.0674
<u>Means of mobility</u>					
			-		
Bicycle	-0.1505	0.1754	0.86	0.3910	-0.0121
Motorcycle	0.0515	0.1682	0.31	0.7590	-0.0241
			-		
Car	-0.0074	0.4564	0.02	0.9870	-0.0049
<u>Region</u>					
North-east	0.3237	0.2813	1.15	0.2500	-0.0223
					-
North-west	0.4003	0.3055	1.31	0.1900	0.1660341
South-east	0.4437	0.4209	1.05	0.2920	0.170468
South-south	1.2292	0.4956	2.48	0.013**	0.1591176
			-		-
South-west	-0.6815	0.4731	1.44	0.1500	0.0436336
	0.43613	0.568935			
Constant	1	7	0.77	0.443	
Number of obs = 2572	*** Significant at 1% significance level				
Prob > chi2 = 0.0000	** Significant at 5% significance level				
	* Significant at 10% significance level				

Table 6.7 above shows the multinomial logit result of choice of facility for the treatment of fever where the first part of the tables showed the results of formal public Vs. Informal facility; and the second part of the table showed result of formal private vs. informal facility. Informal facility was used as the base outcome.

From the first part of table 6.10 (formal public vs. informal facility), it can be seen age is statistically significant at $p < 0.1$ and both the coefficient and marginal effect have positive sign. The interpretation of this that for one unit increase in age, the predictive of attending a formal public facility relative to informal facility for the treatment of fever increases by 0.2 percent, given that other variables are held constant. Educational attainments of secondary and higher are both statistically significant and have positive coefficient and marginal effect. The interpretation of these is that for individuals who have secondary or higher educational attainment, the predictive probability of attending a formal public facility relative to informal facility would increase by 11 percent for secondary and 20% for higher education. Being resident in the urban area has is statistically significant at $P < 0.05$, and has a positive sign of coefficient and marginal effect. This means that for urban resident, the

predictive probability of attending a formal public facility relative to informal facility for the treatment of fever would increase by 0.9%, given that other variables remain constant. Wealth quintiles of poorer, middle, richer and richest have statistical significance at $P < 0.01$ and have a positive signs of coefficient and marginal effect. This means that for individuals of wealth quintiles of poorer, middle richer and richest the predictive probability of attending a formal public facility relative to informal facility would increase by 5.7%; 11.3%; 12.5% and 10% respectively, given that other variables are held constant. Only region of North-west was found to be statistically significant at $P < 0.01$ with a positive sign of coefficient and marginal effect. This implies that for individuals who live in the North-west region of Nigeria, the predictive probability of attending a formal public facility relative to informal facility would increase by 22%, given that other variables are held constant.

The second part of Table 6.10 above describes the multinomial logit result of formal private vs. informal facility in the treatment of fever.). An educational attainment of secondary school was found to be statistically significant and have positive coefficient and marginal effect. The interpretation of these is that for individuals who have secondary educational attainment, the predictive probability of attending a formal private facility relative to informal facility would decrease by 3.8 percent, given that other variables are held constant.

Being resident in the urban area has is statistically significant at $P < 0.05$, and has a positive sign of coefficient and marginal effect. This means that for urban resident, the predictive probability of attending a formal private facility relative to informal facility for the treatment of fever would increase by 4.1%, given that other variables remain constant. Wealth quintiles of poorer, middle and richer have statistical significance at $P < 0.01$ and have a negative signs of coefficient and marginal effect, while the richest has a positive sign. This means that for individuals of wealth quintiles of poorer, middle and richer, the predictive probability of attending a formal private facility relative to informal facility would decrease by 2.1%; 1.3% and 0.9% respectively while it would increase by 6.7% for the richest quintile, given that other variables are held constant in each of the respective case. It can be deduced based on wealth quintile that the more individual's wealth index increase, the chances for using informal facility increase, as can be seen from the result described above. In terms of

region, only region of SS was found to be statistically significant at $P < 0.05$ with a positive sign of coefficient and marginal effect. This implies that for individuals who live in the SS region of Nigeria, the predictive probability of attending a formal private facility relative to informal facility would increase by 16%, given that other variables are held constant.

6.4 Diarrhoea and Health Care Utilization

This category describes the logit result of individuals who sought for the treatment for diarrhoea, and also the multinomial logit result of the choice of facilities for the treatment of diarrhoea. The results are as shown below:

6.4.1 Treatment sought for diarrhoea: A binary logit model

Table 6.8. Treatment sought for diarrhoea

had_DR	Coef.	Std.Err.	z	P> z	Marginal effect
covHI	0.082314	0.195803	0.42	0.6740	0.0086
Age	-0.0154	0.003703	-4.16	0.0000***	-0.0016
Employment	0.155234	0.051523	3.01	0.0030***	0.0161
<u>Education</u>					
Primary	0.064114	0.066305	0.97	0.3340	0.0067
Secondary	-0.02096	0.075369	-0.28	0.7810	-0.0022
Higher	-0.39272	0.138663	-2.83	0.0050***	-0.0408
<u>Place of Residence</u>					
Urban	0.117474	0.063937	1.84	0.0660*	0.0122
<u>Marital Status</u>					
Married	-0.05691	0.16259	-0.35	0.7260	-0.0060
Widowed	-0.51626	0.297336	-1.74	0.0830*	-0.0469
Separated	-0.09313	0.229492	-0.41	0.6850	-0.0098
<u>Wealth Quintiles</u>					
Poorer	0.011852	0.063937	0.19	0.8530	0.0012
Middle	-0.04116	0.076986	-0.53	0.5930	-0.0043
Richer	-0.09716	0.094183	-1.03	0.3020	-0.0101
Richest	-0.20739	0.120642	-1.72	0.0860*	-0.0216
<u>Means of Mobility</u>					
bicycle	0.037589	0.054291	0.69	0.4890	0.0039
motorcycle	0.041338	0.047519	0.87	0.3840	0.0043
car	-0.01357	0.092595	-0.15	0.8830	-0.0014
<u>Region</u>					
North-east	1.268049	0.07952	15.95	0.0000***	0.1679
North-west	0.187875	0.082793	2.27	0.0230**	0.0164
South-east	0.319851	0.10677	3	0.0030***	0.0295

South-south	-0.59802	0.118971	-5.03	0.0000***	-0.0380
South-west	-0.09168	0.103871	-0.88	0.3770	-0.0072
Constant	-1.92751	0.206167	-9.35	0.0000	
Number of obs = 18892				***Significant at 1% significance level	
Prob > chi2 = 0.0000				** Significant at 5% significance level	
				* Significant at 10% significance level	

Table 6.8 above is the logit result showing the coefficients and marginal effects of respondents that reported having had diarrhoea and sought for treatment. Age is found to be statistically significant at $P < 0.01$ and it showed that with one unit increase in age, the predictive probability of having had a diarrhoea would decrease by 0.2 percent, given that other variables are held constant. Covered by Health Insurance (CovHI) is statistically insignificant. Being employed is statistically significant at $P < 0.01$ and has a positive sign of coefficient and marginal effect, meaning that for employed individuals, the predictive probability of reporting to have had sought for treatment of diarrhoea would increase by 1.6 percent, given that other variables are held constant. Being resident in urban area is also statistically significant and has a positive coefficient and marginal effect. Regionally, regions of NE, NW and SE have positive coefficients and marginal effect while region of SS have a negative coefficient and marginal effect.

6.4.2 Choice of facility for the treatment of diarrhoea: A multinomial logit model

Table 6.9. Choice of facility for the treatment of diarrhoea (Multinomial logit)

	Coef.	Std.Err.	z	P> z	Marginal effect
Public vs. informal					
covHI	13.4075	777.9176	0.02	0.9860	0.0038
Age	-0.0157	0.0093	-1.69	0.0910	-0.0005
Employment	0.2570	0.1756	1.46	0.1430	0.0062
<u>Education</u>					
Primary	0.1821	0.2250	0.81	0.4180	0.0027
Secondary	0.1589	0.2855	0.56	0.5780	0.0011
Higher	-0.0684	0.6869	-0.1	0.9210	0.0003
<u>Place of Residence</u>					
Urban	1.0131	0.3079	3.29	0.0010***	0.0041
<u>Marital status</u>					
Married	-0.0508	0.4481	-0.11	0.9100	0.0300
<u>Wealth Quintile</u>					

Poorer	0.7249	0.2012	3.6	0.0000***	0.0052
Middle	1.2898	0.2733	4.72	0.0000***	0.0063
Richer	2.4713	0.4758	5.19	0.0000***	0.0070
Richest	2.4216	0.6712	3.61	0.0000***	0.0037
<u>Means of mobility</u>					
Bicycle	-0.0261	0.1770	-0.15	0.8830	0.0017
Motorcycle	0.3076	0.1654	1.86	0.0630*	0.0038
Car	0.1793	0.4620	0.39	0.6980	-0.0001
<u>Region</u>					
North-east	0.4103	0.2660	1.54	0.1230	0.0249
North-west	0.9344	0.2882	3.24	0.0010***	0.0057
South-east	-0.3093	0.4820	-0.64	0.5210	-0.0035
South-south	0.4060	0.5941	0.68	0.4940	-0.0060
South-west	0.0134	0.4390	0.03	0.9760	-0.0017
Constant	-0.486835	0.5566587	-0.87	0.3820	
Private vs. informal					
covHI	0.3001	0.9175	0.02	0.9860**	0.0768
Age	0.0176	0.0077	2.3	0.0210	0.0006
Employment	-0.1722	0.1455	-1.18	0.2370	-0.0071
<u>Education</u>					
Primary	-0.0036	0.1920	-0.02	0.9850	-0.0027
secondary	0.0849	0.2534	0.33	0.7380	-0.0006
higher	-0.0901	0.6514	-0.14	0.8900	-0.0008
<u>Place of residence</u>					
Urban	0.7365	0.2861	2.57	0.0100**	0.0004
<u>Marital status</u>					
Married	-2.1597	0.4006	-5.39	0.0000***	-0.0427
<u>Wealth Quintile</u>					
Poorer	0.3649	0.1555	2.35	0.0190	-0.0030
Middle	0.8602	0.2310	3.72	0.0000***	-0.0011
Richer	2.0080	0.4427	4.54	0.0000***	0.0052
Richest	2.1922	0.6341	3.46	0.0010***	0.0096
<u>Means of mobility</u>					
Bicycle	-0.1456	0.1474	-0.99	0.3230	-0.0026
Motorcycle	0.0473	0.1414	0.33	0.7380	-0.0034
Car	0.1904	0.4360	0.44	0.6620	0.0013
<u>Region</u>					
North-east	-0.8396	0.2249	-3.73	0.0000***	-0.0317
North-west	0.4982	0.2467	2.02	0.0430**	-0.0035
South-east	0.1006	0.4249	0.24	0.8130	0.0041
South-south	1.2554	0.5440	2.31	0.0210**	0.0101
South-west	0.1871	0.3965	0.47	0.6370	0.0026
_cons	5.7668	0.4826	11.95	0.0000	

 diarrhoea fc private vs informal facility

Number of obs = 1540 ***Significant at 1% significance level
 Prob > chi2 = 0.0000 ** Significant at 5% significance level
 * Significant at 10% significance level

Table 6.9 above shows the multinomial logit result of choice of facility for the treatment of diarrhoea. The first part of the table showed the result of formal public vs. informal facility while the second part of the table showed the result of formal private vs informal facility. Informal facility was used as the base outcome.

The results from the first part of the table (formal public vs. informal) showed that being a resident in the urban area was found to be statistically significant at $P < 0.01$, and has a positive sign of coefficient and marginal effect. The interpretation of this is that for urban residents, the predictive probability of attending a formal public facility for the treatment of diarrhoea, relative to attending a informal facility would increase by 0.4%, other variables being held constant

Wealth index categories of poorer, middle, richer and richest were all statistically significant, with positive signs of coefficient and marginal effect. This means that the predictive probability of attending a forma public facility for the treatment of fever relative to informal facility would increase by 0.5% for poorer; 0.6% for middle, 0.7% for richer and 0.4% for the richest quintiles. With respect to region, regions of North-east and north-west have negative signs of coefficient and marginal effect indicating decrease in the predictive probability of formal public facilities, while the region of south-south have positive coefficient and thus implies increase in formal private facility use for the treatment of diarrhoea.

6.5 STI and Health Care Utilization

This category describes the logit result for individuals who sought for treatment for STI disease, and subsequently the logit result of the choice of facility for treatment of STI. Formal private facility was used as the reference base for the choice of facility.

6.5.1 Treatment sought for STI: A binary logit model

Table 6.10. Treatment sort for STI

sti	Coef.	Std.err	Z	P	Marginal effect
covHI	0.535484	0.486145	1.1	0.2710	0.0984

Age	0.00558	0.007009	0.8	0.4260	0.0010
employment	0.075926	0.115889	0.66	0.5120	0.0139
<u>Education</u>					
Primary	0.145452	0.13916	1.05	0.2960	0.0267
Secondary	0.330288	0.151321	2.18	0.0290**	0.0607
Higher	0.580846	0.237788	2.44	0.0150**	0.1067
<u>Place of Residence</u>					
Urban	-0.05981	0.131776	-0.45	0.6500	-0.0110
<u>Marital Status</u>					
Married	-0.0686	0.160925	-0.43	0.6700	-0.0127
Widowed	0.285802	0.34706	0.82	0.4100	0.0494
Separated	0.43979	0.312202	1.41	0.1590	0.0736
<u>Wealth Quintiles</u>					
Poorer	0.246584	0.156821	1.57	0.1160	0.0453
Middle	0.76208	0.172634	4.41	0.0000***	0.1400
Richer	1.051502	0.206621	5.09	0.0000***	0.1932
Richest	1.573949	0.245015	6.42	0.0000***	0.2891
<u>Means of Mobility</u>					
Bicycle	-0.02736	0.121265	-0.23	0.8210	-0.0050
Motorcycle	0.059594	0.10239	0.58	0.5610	0.0109
Car	-0.15713	0.186877	-0.84	0.4000	-0.0289
<u>Region</u>					
North-east	-0.27141	0.158942	-1.71	0.0880*	-0.0513
North-west	-0.41016	0.168422	-2.44	0.0150**	-0.0794
South-east	0.214202	0.188874	1.13	0.2570	0.0368
South-south	0.332967	0.19717	1.69	0.0910*	0.0557
South-west	-0.54848	0.206893	-2.65	0.0080***	-0.1083
Constant	0.033325	0.313455	0.11	0.9150	
Number of obs = 1558		***Significant at 1% significance level			
Prob > chi2 = 0.0000		** Significant at 5% significance level			
		* Significant at 10% significance level			

Table 6.10 above is the logit result showing the coefficients and marginal effects of respondents that reported having had STI and sought for treatment. Secondary education is found to be statistically significant at $P < 0.05$ and it showed that for individuals with secondary or higher educational attainment, the predictive probability of individual to seek for treatment of STI would increase by 6 percent and 11 percent respectively, given that other variables are held constant. Covered by Health Insurance (CovHI) is statistically insignificant. Wealth index of middle, richer and richest were found to be statistically significant at $P < 0.01$ and has a positive sign of

coefficient and marginal effect. The interpretation of these is that for individuals of the wealth quintiles of middle, richer or richest, the predictive probability of reporting to have had sought for treatment of STI would increase by 14% for middle, 19% for richer and 29% for richest, given that other variables are held constant. With respect to region, region of NE is statistically significant at $P < 0.1$ and has a negative coefficient and marginal effect, meaning the predictive probability of seeking for treatment of STI would decrease by 5.1 percent, given that other variables are held constant. Region of NW and SW also have negative coefficients and marginal effects, and this means that the predictive probability of reporting to have had sought for treatment of STI would decrease by 7.9 percent for NW and 11% for SW, given that other variables are held constant. Region of SS has $P < 0.1$ as its significance level and has positive coefficient and marginal effect, implying increase in predictive probability of seeking for STI treatment by 5.6 percent, given that other variables are held constant. This could be attributable to higher rate of sexual activity in this region.

6.5.2 Choice of facility for the treatment of STI: A binary logit model

Table 6.11. Choice of facility for the treatment of STI(Logit)

	Coef.	Std.Err.	z	P> z	Marginal effect
covHI	0.1364	0.3410	0.4	0.6890	0.0289
Age	-0.0089	0.0080	-1.11	0.2660	-0.0019
Employment	-0.1957	0.1407	-1.39	0.1640	-0.0414
<u>Education</u>					
Primary	0.0863	0.1933	0.45	0.6550	0.0183
Secondary	0.0359	0.1957	0.18	0.8540	0.0076
Higher	0.0170	0.2442	0.07	0.9440	0.0036
<u>Place of residence</u>					
Urban	-0.1504	0.1479	-1.02	0.3090	-0.0318
<u>Marital status</u>					
Married	-0.5090	0.1390	-3.66	0.0000***	-0.1077
<u>Wealth quintile</u>					
Poorer	-0.1919	0.2669	-0.72	0.4720	-0.0406
Middle	-0.1602	0.2697	-0.59	0.5530	-0.0339
Richer	-0.0871	0.2898	-0.3	0.7640	-0.0184
Richest	0.0475	0.3131	0.15	0.8790	0.0101
<u>Means of mobility</u>					
Bicycle	0.2419	0.1541	1.57	0.1170	0.0512

Motorcycle	-0.2997	0.1193	-2.51	0.0120**	-0.0634
Car	-0.4392	0.1861	-2.36	0.0180**	-0.0929
<u>Region</u>					
North-east	-1.3247	0.1951	-6.79	0.0000***	-0.3074
North-west	-0.4060	0.2026	-2	0.0450**	-0.0960
South-east	0.3297	0.1935	1.7	0.0880*	0.0724
South-south	0.2705	0.1922	1.41	0.1590	0.0599
South-west	0.6100	0.2299	2.65	0.0080***	0.1278
Constant	1.4822	0.3764	3.94	0	
Number of obs = 1540		***Significant at 1% significance level			
Prob > chi2 = 0.0000		** Significant at 5% significance level			
		* Significant at 10% significance level			

Table 6.11 above shows the logit result of choice of facility for the treatment of STI in formal private facilities relative to formal public facilities. Married was found to be statistically significant at $P < 0.01$ and have a negative sign of coefficient and marginal effect. The interpretation of this is that for individuals who are married the predictive probability of attending formal private facility for the treatment of STI, relative to attending an informal facility would decrease by 11% for married, given that other variables being held constant. This could be due to a lesser tendency of having multiple sexual partners by married individual, as compared to the singles. Motorcycle and car ownership were also statistically significant at $P < 0.05$ and also has a negative sign of coefficient and marginal effect. This means that for individuals who own motorcycle or car, the predictive probability of attending formal private facility for the treatment of STI, relative to attending a informal facility would decrease by 6.3 percent and 9.3 percent respectively, given that other variables are held constant. In the local context, STI disease is more associated with the poor, in which people who own motorcycle or car are not of the poor category, and thus have more protection against STI infection. The regions of NE, NW and SE and SW have statistical significance. Regions of NE and NW have negative coefficient and marginal effect, indicating a decrease in the predictive probability of utilizing formal private facility relative to informal facilities, by 31% for NE and 9.6% for NW. This could be due to lower incidence of STI occurrence in the region due the traditional beliefs and practices. On the other hand, SE and SW regions shows a positive sign of coefficient and marginal effect indicting increase in the probability of using formal

private facilities for the treatment of STI relative to informal facility, given that other variables are held constant.

6.6 Robustness Check

Robustness check was carried out to test the consistency of the result of the thesis. This was grouped in to two major categories of preventive care and curative care. For preventive care, choice of facility for family planning and antenatal care were used, and merged together to form one dependent variable. For curative care, the choice of facility for the treatment of diarrhoea and STI were used and the variables merged together to form one dependent variable. Both have 1 as the choice for attending to a formal private facility, while 0 represent attending a formal public facility. Logit regression model was used to analyze the result and the marginal effects computed. The results of the model are as shown below:

6.6.1 Preventive Care

a. Choice of facility for Family planning

0 = attended formal private facility

1 = attended formal public facility

b. Choice of facility for antenatal care

0 = attended formal private facility

1 = attended formal public facility

The above a and b were merged together and a new variable was generated called “preventive care”.

Note: Family planning has third category, informal, having 6% observation, so it was converted to missing variable

The result is as shown below:

Table 6.12. Preventive Care (Logit Model)

prev_care	Coef.	Std.Err.	z	P> z	Marginal effect
covHI	0.0708	0.1129	0.63	0.5310	0.0114
Age	-0.0012	0.0030	-0.38	0.7000	-0.0002
Employment	-0.0733	0.0524	-1.4	0.1620	-0.0119

<u>Education</u>					
Primary	0.5701	0.0764	7.46	0.0000***	0.0922
Secondary	0.6410	0.0761	8.42	0.0000***	0.1037
Higher	0.6938	0.0921	7.53	0.0000***	0.1122
<u>Place of residence</u>					
Urban	0.1871	0.0491	3.81	0.0000***	0.0303
<u>Marital status</u>					
Married	-1.4823	0.0613	-24.17	0.0000***	-0.2398
<u>Wealth Quintiles</u>					
Poorer	-0.0415	0.1226	-0.34	0.7350	-0.0067
Middle	0.0192	0.1187	0.16	0.8720	0.0031
Richer	0.1461	0.1212	1.21	0.2280	0.0236
Richest	0.5571	0.1282	4.35	0.0000***	0.0901
<u>Means of Mobility</u>					
Bicycle	-0.1602	0.0596	-2.69	0.0070***	-0.0259
Motorcycle	-0.1243	0.0439	-2.83	0.0050***	-0.0201
Car	0.0314	0.0640	0.49	0.6230	0.0051
<u>region2</u>					
North-east	-1.7394	0.0925	-18.8	0.0000***	-0.2608
North-west	-1.8764	0.0957	-19.61	0.0000***	-0.2728
South-east	0.5842	0.0680	8.6	0.0000***	0.1253
South-south	-0.2527	0.0658	-3.84	0.0000***	-0.0501
South-west	0.4087	0.0615	6.64	0.0000***	0.0868
_cons	0.1450	0.1533	0.95	0.3440	
Number of obs = 14970					
Prob > chi2 = 0.0000					
				***	Significant at 1% significance level
				**	Significant at 5% significance level
				*	Significant at 10% significance level

Table 6.12 above shows the logit result of choice of facility for preventive care (family planning and antenatal care). Health insurance coverage (covHI) is statistically insignificant, just as it has been consistently insignificant in the previous models. This model also showed that educational attainments of primary, secondary and higher education are all statistically significant at $P < 0.01$ and have positive sign

of coefficient and marginal effects. This means that the predictive probability of attending a formal private facility for either family planning or antenatal care would increase by 9% for primary, 10% for secondary and 11% for higher educational attainments. This is in consistence with the main results of the models used in this study because most people that have some level of education tend to patronize more of the private facilities for health care, because of the likely ineffectiveness of the public facilities. Also, being a resident of the urban area is statistically significant at $P < 0.01$, and its interpretation is that urban residents would have 3% higher chances of attending a formal private facility relative to formal public facility for preventive care. Furthermore, means of mobility were also found to affect the use of private facilities for preventive care. Ownership of bicycle or motorcycle have negative signs of coefficient and marginal effect, showing decrease in the predictive probability of attending a formal private facility relative to formal public facility. This is expected because for people who own a bicycle or motorcycle, the private hospitals available may be unaffordable to them, and as such will have lower chances of visiting private facilities, thus will opt for public facility in order to reduce cost of care.

6.6.2 Curative Care

a. Choice of facility for the treatment of Diarrhoea

0 = formal public facility

1 = formal private facility

b. Choice of facility for the treatment of STI

0 = formal public facility

1 = formal private facility

The above (a) and (b) were merged together and a new variable was generated called “curative care”.

The result is as shown below:

Table 6.13. Curative Care (Logit model)

choice_cc	Coef.	Std.err	z	P> z	Marginal effect
covHI	0.0291	0.1989	0.15	0.8840	0.0008
Age	0.0081	0.0037	2.16	0.0310**	0.0002
Employment	-0.5289	0.0746	-7.09	0.0000***	-0.0154

<u>Education</u>					
Primary	-0.4570	0.0901	-5.07	0.0000***	-0.0133
Secondary	-0.5155	0.0959	-5.37	0.0000***	-0.0150
Higher	-0.6111	0.1368	-4.47	0.0000***	-0.0178
<u>Place of residence</u>					
Urban	-0.1772	0.0786	-2.25	0.0240	-0.0052
<u>Marital status</u>					
Married	-1.0238	0.0960	-10.67	0.0000***	-0.0298
<u>Wealth Quintile</u>					
Poorer	-0.5120	0.1064	-4.81	0.0000***	-0.0149
Middle	-0.5984	0.1163	-5.14	0.0000***	-0.0174
Richer	-0.5277	0.1319	-4	0.0000***	-0.0154
Richest	-0.5387	0.1539	-3.5	0.0000***	-0.0157
<u>Means of mobility</u>					
Bicycle	0.1025	0.0754	1.36	0.1740	0.0030
Motorcycle	-0.2147	0.0629	-3.41	0.0010***	-0.0062
Car	0.0259	0.1037	0.25	0.8030	0.0008
<u>Region</u>					
North-east	-1.2728	0.0995	-12.79	0.0000***	-0.0554
North-west	-0.3761	0.1075	-3.5	0.0000***	-0.0105
South-east	-0.0737	0.1252	-0.59	0.5560	-0.0018
South-south	0.3487	0.1278	2.73	0.0060***	0.0069
South-west	0.6270	0.1349	4.65	0.0000***	0.0110
_cons	5.61156	0.176088	31.87	0.0000	
Number of obs = 38099		*** Significant at 1% significance level			
Prob > chi2 = 0.0000		** Significant at 5% significance level			
		* Significant at 10% significance level			

Table 6.13 above shows the logit result of choice of facility for curative care (diarrhoea and STD). As shown from the table, health insurance coverage is statistically insignificant. With the exception of Age variable which has a positive sign of coefficient and marginal effect, all the other significant variables of employment, primary, secondary, higher, married, wealth quintiles and motorcycle

have a negative coefficients and marginal effects. This shows that individuals prefer to use the formal public facilities for curative care, which in the case of preventive care, private facilities were more preferable. Thus, in order for the government to improve the health care, more awareness and investment has to be done in order to improve the use of public facilities in terms of preventive care, so as to reduce inequity in the access and utilization of health care. As shown in the table, the more individuals have wealth, the greater the probability of individuals to use formal private facilities for curative care. Same trend is observed with educational attainment as well.



6.7 Result Summary

Table 6.15: Summary of Result

VARIABLES	Ante-natal-CP	Ante-natal-CF	Post-natal CP	Family Planning Visit	Family Planning-CF	Fever Visit	Fever-CF	Diarrhoea	Diarrhoea-CF	STI Visit	STI-CF
CovHI	Sig.(0.05) (+)	INS	Sig.(0.1) (+)	Sig.(0.01) (+)	INS	INS	INS	INS	INS	INS	INS
Employment	Sig.(0.01) (+)	INS	INS	Sig.(0.01) (+)	Sig.(0.05) (+)	INS	INS	Sig.(0.01) (+)	INS	INS	INS
<u>EDUCATION</u>											
Primary	Sig.(0.01) (+)	Sig.(0.01) (+)	Sig.(0.01) (+)	Sig.(0.01) (+)	Sig.(0.1) (-)	Sig.(0.05) (+)	INS	INS	INS	INS	INS
Secondary	Sig.(0.01) (+)	Sig.(0.01) (+)	Sig.(0.01) (+)	Sig.(0.01) (+)	Sig.(0.05) (-)	Sig.(0.05) (+)	Sig.(0.01) (-)	INS	INS	Sig.(0.05) (+)	INS
Higher	Sig.(0.01) (+)	Sig.(0.05) (+)	Sig.(0.05) (+)	Sig.(0.01) (+)	Sig.(0.05) (-)	Sig.(0.05) (+)	Sig.(0.01) (-)	Sig.(0.05) (-)	INS	Sig.(0.05) (+)	INS

VARIABLES	Ante-natal-CP	Ante-natal-CF	Post-natal CP	Family Planning Visit	Family Planning-CF	Fever Visit	Fever-CF	Diarrhoea	Diarrhoea-CF	STI Visit	STI-CF
PLACE OF RESIDENCE											
Urban	Sig.(0.05) (+)	Sig.(0.01) (+)	Sig.(0.01) (+)	Sig.(0.01) (+)	Sig.(0.01) (+)	INS	Sig.(0.1) (+)	Sig.(0.1) (+)	Sig.(0.05) (+)	INS	INS
WEALTH QUANTILES											
Poorer	Sig.(0.05) (+)	INS	Sig.(0.01) (+)	Sig.(0.01) (+)	INS	INS	INS	INS	Sig.(0.01) (+)	INS	INS
Middle	Sig.(0.05) (+)	INS	Sig.(0.01) (+)	Sig.(0.01) (+)	INS	INS	INS	INS	Sig.(0.01) (+)	Sig.(0.01) (+)	INS
Richer	Sig.(0.05) (+)	INS	Sig.(0.01) (+)	Sig.(0.01) (+)	INS	Sig.(0.05) (-)	INS	INS	Sig.(0.05) (+)	Sig.(0.01) (+)	INS
Richest	Sig.(0.05) (+)	Sig.(0.01) (+)	Sig.(0.01) (+)	Sig.(0.01) (+)	INS	Sig.(0.01) (-)	Sig.(0.1) (-)	Sig.(0.1) (-)	Sig.(0.01) (+)	Sig.(0.01) (+)	INS
VARIABLES	Ante-natal-CP	Ante-natal-CF	Post-natal CP	Family Planning Visit	Family Planning-CF	Fever Visit	Fever-CF	Diarrhoea	Diarrhoea-CF	STI Visit	STI-CF
MEANS OF MOBILITY											
Motorcycle	Sig.(0.05) (+)	Sig.(0.05) (-)	Sig.(0.01) (+)	Sig.(0.01) (+)	INS	INS	INS	INS	Sig.(0.1) (+)	INS	Sig.(0.01) (-)
Car	INS	Sig.(0.05) (+)	Sig.(0.05) (+)	INS	Sig.(0.05) (+)	INS	INS	INS	INS	INS	Sig.(0.05) (-)

KEY:

Sig. = Significant

INS = Insignificant

CP = Choice of Professional

CF = Choice of facility

CovHI = Covered by Health Insurance

Table 6.14 above describe the summary of the result obtained from the analysis carried out using the set of dependent and independent variables. Different health conditions/health utilization measures were used to assess utilization of health care services. These are antenatal/post natal care, family planning, fever, diarrhoea and STI. The need for care, choices of facility and choice of professional were used as the dependent variables for each of the utilization measures, and the factors affecting each of the dependent variables were analyzed.

The study showed that age affected the health care seeking behavior of choice of professional for post-natal care, family planning visit, choice of facility for family planning, diarrhoea visit and choice of facility for the treatment of diarrhoea. Health insurance coverage affected only post-natal choice of professional and family planning visit.

Being a resident of the urban area have statistically significant influence on choice of facility for antenatal care, choice of professional for post-natal care, family planning visit, diarrhoea visit and choice of facility for the treatment of diarrhoea.

Education was found to have a significant influence of the choice of facility for antenatal care, choice of professional for natal care as well as visits for family planning and for the treatment of fever.

Being resident in the urban area has no much influence of health care utilization as it only affected diarrhoea treatment visit and choices of facility for the treatment of diarrhoea.

Being married was shown to affect the choice of professional for post-natal care, family planning visit and choice of facility for family planning. It has an effect on the choice of facility for the treatment of STI.

Motorcycle was found to be the most important means of mobility and it enhances the utilization of health care services across all the 5 categories of health care utilization measures.

CHAPTER 7

CONCLUSION AND DISCUSSION

This paper analyzed the factors that affect health care utilization in Nigeria according to the most recent 2013 HDS survey. Different health conditions/health utilization measures were used to assess utilization of health care services. Socio-economic and demographic factors were used to determine the variations in the pattern of health care utilization based on the different health conditions.

HEALTH INSURANCE AND ENDOGENEITY

Endogeneity is said to occur when there is a correlation between a variable and the error term. This could arise as a result of measurement error, autoregression with autocorrelated errors, simultaneity and omitted variables. There are two major causes of endogeneity. First is the existence of an uncontrolled confounder affecting both independent and dependent variable of a model and second is a loop of causality between dependent and independent variables in a model.

In Nigeria, Act 35 of 1995 that established NHIS states that health insurance is mandatory for all public sector employees and the organized private sector with the number of employees exceeding 10 persons. The mandatory nature makes health insurance in Nigeria exogenous and simultaneity bias between insurance status and health care utilization at the individual level is, if any, minimal. Therefore the need to control for endogeneity using an instrumental variable does not arrive.

7.1 Ante-natal/Post-natal care and HCU

This study found that ante-natal and post natal care are significantly affected by educational attainment, being in the wealth quintiles of richer and richest, and means of mobility of motorcycle positively influence the to utilize antenatal and post-natal health care both in terms of choice of facility as well as the type of professional that provide the service. The higher the wealth quintile of individuals, the more they tend to utilize private/public health care facility, and services of a medical

professional are preferred. This is consistent with the study on Wealth and antenatal care use conducted in Ghana (Ahmed et al., 2010; Arthur, 2012).

It was also observed from this study that the utilization of antenatal and post natal care from informal facility is very rare. This was noticed among all the wealth quintiles as well as all the educational attainment levels. Regionally, NE and NW regions sought the services of non-professional more than the other regions. This could be attributed to low levels of qualified health care personnel, health care institutions as well as income level of individuals in those regions.

Health Insurance coverage is positively associated with increase in utilization of ante-natal and post-natal care in public facilities because the families bear no cost on attending to such facilities. This is in consistence with the studies on Insurance and health care utilization conducted by (Manning et al., 1987; Shen, 2013b).

7.2 Family Planning

Family planning visit in both genders was influenced significantly by age, health insurance coverage, employment status, educational attainment, marital status, being richer/richest wealth quintile, and means of mobility. An increase in age is associated with reduced tendency in the chances of making a family planning visit. This could be explained by the fact that the sample population are of the reproductive ages, and thus seek less of family planning services because of the desire to have kids. With respect to health insurance coverage, the study showed increase in the chances of having a family planning visit. As people have health insurance, they face a lower cost and demand for more health care. Educational attainment significantly influences the decision to seek family planning services. Additionally, the higher the educational attained, the higher the chances of seeking for family planning. The study showed that individuals with primary school educational attainment have 9.7% higher chances, secondary school 13.5% and higher educational attainment 18.3%, indicating an upward trend. This can be corroborated with the study on the determinants of Maternal Health Care Utilization in Nigeria, which reported that people who have more educational attainment have more utilization of health care services than less educated people or illiterates(Ononokpono & Odimegwu, 2014). Wealth index is an

important economic factor that significantly influences the decision to utilization of family planning services. All the wealth index quintiles showed an increase in the tendency of utilizing family planning services. This could be associated to the increase in awareness programs on family planning program. Means of mobility of motorcycle was also found to significantly influence individual's decision to seek for family planning. Mobility confers accessibility to the facility that provides the service (Manning et al., 1987).

With respect to choice of facility, the factors that significantly influence the choice of the type of facility to include age, employment status, secondary and higher education, married, single or widowed, richer wealth quintile, means of mobility (car or motorcycle). Age was found to have a positive association with the choice of private facility for family planning. This could be due to the ease of obtaining such family planning services without having to spend long time on queues, which adults prefer. Employed individuals have 5.2% higher chances of seeking for family planning services from private facilities. This is because the people who are employed have income, and could therefore afford to patronize private facilities. Having secondary and higher education also significantly influences utilization of family planning services. Individuals that are more educated are aware of the need for family planning and know of the right place to seek for such services. With respect to wealth quintiles, only the richer wealth quintile was statistically significant. This shows that income level also can influence the level of utilization of family planning services. Only region of SE was found to be insignificant statistically. Region SS shows decrease in the chances of utilizing family planning services.

7.3 Fever and Health Care Utilization

The dependent variable for fever has two (2) sub-categories of incidence of fever and choice of facility for the treatment of fever. With regards to the incidence of fever, significant determinants include secondary and higher educational attainments, wealth quintiles (middle, richer and richest). The study showed that having primary, secondary or higher education leads to higher chances of seeking formal treatment of fever disease. It was discovered that the higher the educational attainment, the higher

the chances of attending a formal facility for the treatment of fever. Richer and richest were statistically significant in the treatment seeking behavior for fever, indicating that individual's income influences the decision to use health care facility for the treatment of fever. Individuals whose wealth quintiles were either middle or richer were found to have utilized more of formal private facilities compared to formal public facilities. This could be due to the low average waiting time in private hospitals/clinics as compared to the average waiting time in public hospitals. The result also showed that the NW region of Nigeria reports less occurrence of fever, as compared to other regions. This could be associated with many factors such as low income level of the region, lack of breeding ground for mosquitoes, intensive prevention programs, which lead to reduction in of fever case. The study showed that even the poorest have low chances of attending informal facility for the treatment of fever. Also, individuals with the lowest level of educational attainment have lower chance of for treatment from informal facilities. Only the region SW shows some significant level of use of informal facility, and this could be due to the tradition of the use of herbalist in that region.

7.4 Diarrhoea and Health Care Utilization

Diarrhoea variable consists of incidence of diarrhea and the choice of facilities for treatment. Age was found to influence the decision to visit a health care facility for the treatment of fever, and is positively associated. However, age does not seem to statistically influence the choice of facility where treatment of diarrhoea is sought for. Being employed influence positively the decision to attend a health care facility, and the study further indicated that formal private facilities are more preferred than formal public facilities. Individuals who are employed are likely to choose formal private facilities for the treatment of diarrhoea to get prompt attention on their illness. These disparity in the utilization of health care services is corroborated with a study title Socio-economic status and utilization of healthcare facilities in rural Ekiti, Nigeria(Owoseni Joseph Sina, 2014) which showed that there is a wide margin in the utilization of health care services among people with different occupation and economic statuses. Residents of urban areas reported more to the health care facilities

for the treatment of diarrhoea, as compared with residents in rural area. Also, urban residents utilize more of formal private facilities and formal public facilities. Informal facilities utilization was low in the urban areas as compared to the rural area. This fact has also been demonstrated in a study conducted in China titled Explaining Urban-Rural Health Disparities in China(Hai Fang, 2009), which reported that significant health disparities exist between urban and rural areas. Most health care providers, such as clinics, hospitals, and specialists, are located in urban areas. As a result, rural residents frequently face difficulties in obtaining health care services due to either limited availability of health care providers or long travel distances to health care providers, compared with their urban counterparts. Furthermore, wealth index as expected affect positively the decision on which type of health care facility to visit for the treatment of diarrhoea, just as it is in the case of all other utilization measures analyzed. This same trend has been observed in a study titled Economic status, education and empowerment: implications for maternal health service utilization in developing countries(Ahmed et al., 2010), which showed that lower level of wealth quintile have 94% less in terms of utilization of health services compared to the group of individuals in the highest wealth quintile. Ownership of motorcycle was also found to influence of the health care seeking behavior of individuals that reported having sought for diarrhoea treatment. It is positively associated increase in the chances of individual's seeking for care. Mobility reduces the distance challenge posed by travel distance to health care facilities. This same trend has been observed in the study titled "distance and health care utilization among the rural elderly" (Nemet & Bailey, 2000).

7.5 STI and Health Care Utilization

The decision to seek for care for STI infected was significantly influenced by secondary as well as higher educational attainment. The study showed that individuals with higher education have 10.7 percent higher chances of seeking health care for the treatment of STI, while secondary education has 6 percent higher chances. This shows that educational attainment is linked to individual's health utilization behavior. This is in line with a study conducted by (Celik & Hotchkiss, 2000) which showed that education level had effects on the utilization of health care in Turkey. Marital status of being married and widowed showed statistical significance for the facility choice in

the treatment of STI. All the wealth quintiles showed significant positive association with the tendency to seek for treatment of STI, but insignificant for the facility of choice for STI treatment. Means of Mobility of Motorcycle was also significant for STI treatment, as it provides faster and easier means to reach out to the desire health center. In terms of region, region SE and SS were found to be insignificant in the choice of facility for the treatment of STI. This could be attributed to the availability of informal places of treatment that could not be captured on record.

From the above, it can be deduced that on the overall that health care utilization is influenced by employment status, educational attainment, place of residence, wealth index and means of mobility. Health insurance was found to be statistically insignificant, as the coverage is very low.

7.6 RECOMMENDATIONS

Based on the research conducted and the findings on the low coverage of health insurance, the following recommendations were made:

1. The national health insurance scheme should be restructured to cover more population in order to minimize financial barriers to health care.
2. The government should reduce barriers to access of health care which include expansion of existing health care structures, building of more facilities in remote areas to facilitate ease of access.
3. The government should increase access to both curative and preventive health care as this study showed that majority of the population seek for both types of care from private facilities through out of pocket expenditure, which poses inequity to the less privileged
4. The government should create awareness programs that educate people on the importance of having health insurance and also improve the awareness and perception of western medicine.

7.7 LIMITATIONS

The data set did not make provision for number of times a patient visited a health care facility, and as such the rate of utilization of health care could not be analyzed. Also, variables which are typically used to assess health care utilization in other studies like health status of patients, inpatient record and out-patient record were not clearly stated in the data set. Future avenues for study could look into a simulation

process to explore for instance, the effects of changes in insurance and wealth on the utilization of health care services.





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APPENDIX



จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

VITA

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Born on 3rd April 1983 in Funtua local government area of Katsina state, Nigeria. Obtained Bachelor of Pharmacy degree from Ahmadu Bello University, Zaria in 2006. Had working experience as an intern Pharmacist in university of Abuja teaching hospital (2007-2008); as a Corper pharmacist in National Defence College hospital (2008-2009); worked as a medical representative to Greenvision Pharmaceutical Nigeria Limited. Also had Community Pharmacy practice experience from 2007 to 2013. Presently a Senior Pharmacist at Defence Intelligence Agency hospital, Asokoro, Abuja. Happily married with one kid.

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