The Determinants of Household Expenditures on Education and Health in Nigeria

Hope Amala Anyabolu

Submitted to the
Institute of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy
in
Economics

Eastern Mediterranean University
September 2019
Gazimağusa, North Cyprus

Approval of the Institute of Graduate Studies and Research

Prof. Dr. Ali Hakan Ulusoy
Acting Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Doctor of Philosophy in Economics.

Prof. Dr. Mehmet Balcılar
Chair, Department of Economics

We certify that we have read this thesis and that in our opinion it is fully adequate in scope and quality as a thesis for the degree of Doctor of Philosophy in Economics.

Prof. Dr. Glenn Paul Jenkins
Supervisor

Examining Committee

1. Prof. Dr. Glenn Paul Jenkins
2. Prof. Dr. Murat Anıl Mercan
3. Prof. Dr. Murat Taşdemir
4. Prof. Dr. Sevin Uğural
5. Assoc. Prof. Dr. Hasan Güngör

ABSTRACT

Household expenditures on education and healthcare have become an increasing share of total education and healthcare financing in Nigeria. Households commit more of their expenditures despite the government knowing the importance of a healthy, educated workforce and the financial burden on households and the economy. This study examined the determinants of household expenditures on education and healthcare in Nigeria. The Nigerian Household Survey of 2012/2013 was used, and a double-hurdle model was employed for the analysis of each expenditure.

The results suggest household income, age, education, gender of household heads and urban versus rural residence have a significant impact on the decision to spend on education. Such expenditures are income elastic overall but are very different in magnitude for low compared to higher income families. It was found that the income elasticity of education expenditures are approximately four times greater for households in the bottom two-thirds of the income distribution than for those in the top one-third.

Similarly, for healthcare, it was found that the key variables are the level of their total expenditures, gender of the household, size of the household and whether household member include those aged over 60. Moreover, we found that the marginal propensity to spend on healthcare is larger for female-headed households and for households with either a head or other member of the household who is over 60.

Keywords: Human Capital, House Hold Expenditure, Health Expenditure, Education Expenditure, Double Hurdle, Nigeria

ÖZ

Nijerya'da eğitim ve sağlık hizmetlerine yapılan hanehalkı toplam harcamaları, eğitim ve sağlık finansmanının artmasına neden olmuştur. Hükümetin, sağlıklı ve eğitimli bir işgücünün önemini ve ekonominin hane halkı üzerindeki mali yükünü bilmesinden dolayı, hükümet harcamalarının çoğunu taahhüt etmiştir. Bu sebepten dolayı, bu çalışma Nijerya'daki hanehalkı harcamalarının eğitim ve sağlık hizmetleri konusundaki belirleyici rolünü incelemiştir. Bu çalışmada, 2012-2013 yılları arasında Nijeryada yaşayan Hane Halkına yönelik anket ve hanehalkının her bir harcama analizi için çift engelli bir model kullanılmıştır.

Araştırmanın sonuçları gösteriyor ki, hanehalkı gelirinin, yaşının, eğitiminin, cinsiyetinin, kentsel ve kırsal ikamet yerlerinin, eğitim harcanması kararında önemli bir etkisi olduğunu göstermektedir. Genel olarak, bu tür harcamalarda gelir esnekliği vardır ancak, yüksek gelirli ailelere kıyasla düşük olduğu için farklılık çok büyüktür. Eğitim harcamalarının gelir esnekliğinin, hanehalkı gelir dağılımı oranının üçte ikisinin, yaklaşık üçte birinden daha yüksek olduğu görülmektedir.

Benzer bir şekilde, bu çalışmada, sağlık hizmetleri için temel değişkenlerin toplam harcama düzeyi, hanenin cinsiyet, büyüklüğü ve 60 yaş üzerindeki hanehalkını içerip veya içermediği tespit edilmiştir. Bu tespit, sağlık hizmetlerinin hanelerde yer alan kadınlar, hanede 60 yaşın üstünde yer alan veya başka bir üyesi olan haneler için daha büyüktür.

Anahtar Kelimeler: Beşeri Sermaye, Hanehalkı Harcamaları, Sağlık harcamaları,Eğitim Harcamaları, Çift Engel, Nijerya

To My Lovely Parents

ACKNOWLEDGMENT

I give glory to almighty God for his grace upon my life and for guiding me through this lonely path. I am sincerely grateful to my supervisor Prof. Dr. Glenn Jenkins for his support, encouragement, advice and suggestions for the improvement and finishing of this work and also in the program. Special thanks to Dr. Ikechukwu Nwaka and Dr. Pegman Bahramian for their support. I appreciate the advice and encouragement of my course advisor Prof. Dr. Sevin Uğural throughout this program and Prof. Dr. Mehmet Balcilar for his advice and encouraging words during this program. My sincere gratitude goes to Assoc.Prof. Dr. Çağay Coşkuner for his support in my course work. My gratitude goes to Eastern Mediterranean University for providing an enabling and safe environment for study and to the department of economics for ensuring standards in all the programs.

l am grateful to my parents without whom l could not have gotten to this level in my life for their unconditional love and for providing financial and emotional stability and to my siblings and brother in-law Dr. Geoffrey Ezepue for their love, support and encouragement, we were in this program together. My sincere appreciation goes to friends for their encouragement and l appreciate all the staff of Prof. Dr. Glenn Jenkins for their friendship.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

INTRODUCTION

Education and health are the major constituents of human capital due to their importance in the formation of it. A healthy and educated workforce will be more productive which will subsequently promote economic growth, Wong and Yusoff, (2015). Improving education and health remains a focal point of many nations as seen in the Millennium Development Goals of 2000.

The majority of the provision and funding of education and healthcare has been a public sector social responsibility over decades because of their importance in the accumulation of human capital. These are major keys in the improvement of standards of living, economic growth and the development of a nation. Health determines the number of working or non-working hours a person completes according to Grossman (1972). A healthy population is necessary for a desired change to be accomplished. This has been universally attested, while education improves an individual's performance through the acquisition of skill and knowledge. It also improves their earnings as well as raising better informed citizens.

Gupta, Clement and Tiongson (1998) state that funding by governments on education and healthcare is effective for human capital formation, bringing about a reduction in poverty and inequality. It improves quality of life and total well-being, raises productivity and national incomes and other externalities such as a reduction in crime

and a healthy populace. Education and healthcare delivery is the main path advocated as it assists decision -makers in lowering impoverishment and increasing equity. Decision -makers are making an effort in government financing to attain it. Amakon (2012).

Besides government funding, households also make contributions. This is possible due to receiving higher earnings as a result of the benefits of education and healthcare, Chi and Qian (2016). These also provide a principal route out of poverty, Huy (2012), improved living standards, Gakusi (2010) and a healthy life, Schultz (1999). Issues surrounding these expenditures have become a spotlight for scholarly works and development agencies both internationally and locally.

Table 1: Nigeria Population, Income and Government Expenditures

Year	Population (Approximation) (Millions)	Annual Population Growth (percent)	GDP current US$(000s)	Annual Real GDP growth (percent)	GDP per capita US$ Current prices	Gov. Educ. Expend. as % of total Gov. Expenditure	Gov. Health Expend. as % of total Gov. Expend.
1990	95.2	2.6	54,035,795,388	11.5	477	NA	NA
2000	122.3	2.7	69,448,756,932	5.0	568	NA	2.1
2010	158.5	2.7	263,359,886.20	8	2,292	7.1	2.7
2011	162.8	2.7	410,334,575.16	5.3	2,520	9.3	2.8
2012	167.2	2.7	459,376,049.76	4.2	2,747	9.9	3.9
2013	171.8	2.7	514,966,287.33	6.7	2,998	10.2	3.7
2014	176.5	2.7	568,498,937.16	2.7	3,223	10.5	3.5
2015	181.1	2.6	494,583,180.77	2.7	2,730	10.8	5.3
2016	186.0	2.6	404,649,527.53	-1.6	2,176	7.9	5.0
2017	190.9	2.6	375,745,486.52	0.8	1,969	7.4	NA
2018	195.9	2.6	397,269,616.08	1.9	2,028	7.0	NA

Source: Worldbank.org, Macrotrends.net/countries/NGA/Nigeria

In Table 1, the basic data, population, income and government expenditures on education and healthcare are presented for Nigeria. Population growth since 1990 has

been quite steady at 2.7% per year with no indication of decline. The growth in real GDP has been highly variable from over 11percent to -1.6 percent.

The percentage of government expenditure allocated to education and healthcare shows the priority a government assigns to these areas relative to other public investment and also in alleviation of financial burden on households. Periodic financial crises in Nigeria have created challenges in government financing and have resulted in the deterioration of level of funding and standards of public sectors including education and healthcare. This has led to the implementation of market driven Structural Adjustment Program reforms in all sectors of the economy. As a result of this, households have acquired a greater burden on their finances to meet their needs for education and healthcare.

The level of government expenditure on education and healthcare has fluctuated widely. From 2000 to 2015, expenditure on education fluctuated between 7.1% and 10.8% and between 2.1% and 5.3% for healthcare of total government expenditures (Table1, column 7 and 8). Private healthcare expenditure fluctuated between 71% and 83% of total expenditure with the government's contribution from GDP varying between 0.33% and 0.85%. Many countries in Africa experienced similar trends during this time period, WHO (2015).

In developing nations, including Nigeria, inadequate funding has affected the quality of education and healthcare. This has increased the demand for private education and healthcare, resulting in increased costs for households. A concern is the willingness, or otherwise, of households to pay for it.

Households have no choice other than to raise their spending to compensate for the shortfall in government financing. Research has concluded this has devastating consequences as it affects spending on other household consumption as well as increasing inequality across socio-economic groups, Wagstaff (1986); Preston and Green (2003); Ichoku (2005); Van Doorslaer et al (2006); Knaul et al (2006); Chi and Qian (2016). Lack of access to healthcare for the poor was found to be the case in many African countries; Ghana - Waddington and Enyimayew (1989), Zambia - Forsberg et al., (1992), Kenya - Mbuga (1993) and Nigeria - Ichoku and Fonta (2006), Omotosho and Ichoku (2016).

The disastrous consequences are that there are households that turn to God's divine healing, self-administered treatment and the use of impostor medical personnel with catastrophic outcomes on predominantly poor families, Olasehinde and Olaniyan (2016). In addition, such families have high school drop-out rates, resort to child labor and fall further into the poverty trap.

Table 2: Nigeria Education Sector Performance

Year	Percentage age of school Children out of school	percentage Drop Out Rate for not completing Primary Education	Percentage Survival Rate to last Grade of Primary Education	Year	School Enrollment Secondary, as % of all Secondary School aged children	School Enrollment Secondary, Female (% of total)	School Enrollment Secondary Male, (% of total)
1999	37.1	13.7	86.3	1990	24.7	27.9	27.9
2000	34.0	NA	NA	2000	24.6	22.4	26.7
2004	32.4	27.0	73	2010	44.2	NA	47.1
2005	31.9	22.3	77.7	2011	45.5	41.9	49.1
2006	31.5	50.3	49.7	2012	47.2	41.9	49.3
2007	28.6	52.9	47.1	2013	56.2	NA	58.8
2008	35.4	20	80	2014	45.6	42.9	NA
2009	34.3	35.6	64.4	2015	46.8	44.6	44.0
2010	34.3	NA	NA	2016	41.9	39.8	NA
NA	NA	NA	NA	2017	NA	NA	NA
NA	NA	NA	NA	2018	NA	NA	NA

Source: Worldbank.org

In Table 2, the performance of the education sector is described. In the period from 1999 to 2000 on average 33 percent of school children were out of school. Since 2010 of these secondary school age children, approximately half were out of school (Table 2 column 6).

Approximately one million children in Nigeria who should be attending primary school are not doing so, World Bank WDI, (2016). Since 2010 of the secondary school aged children, approximately total number of half have been attending school (Table 2 column 6). An Education Policy and Data Centre (EPDC) report found that approximately 27% of men and 47% of women over 15 years of age have no formal education.

Budget support and Sector-Wide Approaches (SWAPs) for education in the 1990s, Family Economic Advancement Program in 1992, National Commission for Mass Literacy (NCML) in 1997, Universal Basic Education (UBE) Program in 2000 provided a lot of support for Education For All (EFA) since 1990s. The reintroduction of free school fees in primary school in 1999 UNESCO recommended 20% of the national budget (6% GDP) to be spent on the Education for All (EFA) program, however, Nigeria has not met these targets.

Similarly, the healthcare system was found to be unable to deliver affordable care for the majority. Many households had difficulty in paying healthcare bills and required a safety net which is regarded as fundamental in nations where households do not hold health insurance. Either direct expenses such as spending on healthcare or indirect, such as the lack of income due to disabilities can be counted as expenditures. Some costs can be catastrophic and disastrous. Asafu-Adjaye (2004); Leive and Xu (2007)

and lchoku, Fonta and Araar (2010) that most of the population were not covered by health insurance.

Table 3: Nigeria Demographics Indicators

Year	Urban Population. Annual Growth (%)	Fertility Rate Total Births Per woman	Infant mortality rate Deaths per 1,000	Mortality rate under 5 Deaths per 1,000 live birth	Maternal Death Rate Per 100,000 birth	Life expectancy At Birth Total years	Annual Deaths Per 1,000 Population
1990	5.4	6.5	125.9	211.9	1,350	45.9	18.6
2000	4.1	6.1	112.7	1,86.2	1,170	46.3	17.8
2010	4.7	5.8	83.6	129.6	867	50.8	14.5
2011	4.7	5.8	80.7	124.7	824	51.3	14.7
2012	4.6	5.8	77.8	119.9	819	51.7	13.8
2013	4.6	5.7	74.9	115.6	821	52.1	13.5
2014	4.5	5.7	72.4	111.6	820	52.5	13.2
2015	4.5	5.6	69.8	107.5	814	53.0	12.9
2016	4.4	5.5	67.3	103.8	NA	53.4	12.6
2017	4.3	5.5	64.7	100.2	NA	53.9	12.3
2018	4.2	NA	62.1	NA	NA	54.5	11.9

Source: Worldbank.org/country/Nigeria, Macrotrends.net/countries/NGA/Nigeria

Table 3 presents information on the basic demographic statistics for Nigeria. From Table 1, we learned that the population growth rate has been approximately 2.7 percent per year. This is a result of each woman giving birth on average to 5.5 children. The average life expectancy has increased since 1990 from 45.0 years to 54.5 years by 2018.

Over the years, the Nigerian government has introduced several interventions to reduce the burden of high household expenditure and improve access and quality. The National Health Account was introduced in 1988 to resolve resource allocation challenges and improve performance. This account assisted policy makers by capturing sources, patterns, flows and fund usage. In 2001, the Abuja Declaration was signed whereby African governments agreed to spend 15% of their budget on

healthcare. This was designed to meet the Millennium Development Goals (MDGs) for Health by 2015. The National Health Insurance Scheme (NHIS) commenced in 2005 to fund healthcare costs through a combination of risk and cost sharing arrangements to lessen the burden of major healthcare expenditure. In 2006, the NHIS was broadened to provide universal protection. However, according to Dutta and Hongoro (2013), in mid-2012 only 3% were covered. In 2015, less than 5% were covered according to the World Bank (2016) and neither did Abuja declaration met.

Despite additional international donor interventions ranging from immunization, treatment for malaria and HIV/AIDS and primary healthcare, there has not been a significant effect on household healthcare expenditure due to a lack of commitment. Given the importance of household expenditure on education and healthcare and also in the formation of human capital, the objective of this study is to have an explicit knowledge of the nature and constraints of these expenditures followed by the determinants affecting an individual's household decision to spend.

To attain these objectives, this thesis was separated into two major sections:
Family decision making for education expenditure and for healthcare expenditure. The following chapters will assist in further identifying the nature and determinants of these expenditures. Chapter 1 provides the background of the study. Chapter 2 discusses family decision making for educational expenditure using new evidence from survey data for Nigeria. Chapter 3 discusses family decision making for healthcare expenditure using new evidence from survey data for Nigeria and Chapter 4 provides the conclusions.

Chapter 2

FAMILY DECISION MAKING FOR EDUCATION EXPENDITURES: NEW EVIDENCE FROM SURVEY DATA FOR NIGERIA.

2.1 Introduction

In Nigeria, around one million children of primary school age are out of school (World Bank WDI, 2016) and only approximately one half (49%) of secondary school age youth attend school. When considering the population over 15 years of age, approximately 27% of men and 43% of women have no formal education (Education Policy and Data Center (EPDC[1]).

According to Babatunde (2018), the level of government expenditure on education has fluctuated wildly between 3% and 10% of total government expenditure. According to Obi and Obi (2014), government spending on education has been declining over time. It can be inferred, therefore, that households are required to raise their expenditure for the education of their children to compensate for this shortfall in government financing. These low levels of expenditure also result in public schools being of a

[1]EPDC provides education data and visuals globally and also policy orientated analysis in developing countries.

lower quality than private schools. Hence, for some families, a quality education has largely become an investment by them in a private school education.

Formulation of education policies necessitate an explicit knowledge of the nature and determinants of household educational expenditure given the value of it in the formation of human capital in Nigeria. The very high level of learner dropouts makes it imperative to understand the impact of variables such as household income, gender of the household head and household size and the willingness of families to make private education expenditure according to the Nigeria National Population Commission (Nigeria) and RTI International (2016).

There is substantial literature dealing with the drivers of household educational expenditure, for example, Tansel and Bircan (2006); Aslam and Kingdon (2008); Qian and Smyth (2011). However, Ogundari and Abdulai (2014) point out that limited research has been carried out for sub-Saharan African countries. Conventional research by Pushkar (2003); Sackey (2007) and Iddrisu et al., (2016) have used educational level acquisition or a child's attendance at school as a proxy for household demand. Whereas, according to Qian and Smyth (2011), the level of school accomplishment is considered the only sectorial consideration for households' requests for education and the personal acquired level of education is highly dependent on their own innate abilities. Against this backdrop, this research attempts to examine the important determinants of a household's demand for education in Nigeria using their expenditure on schooling as a proxy.

The layout of the remainder of this chapter is as follows: Section 2 reviews empirical literature, Section 3 data and methodology, Section 4 methodology, Section 5 empirical results and Section 6 provides the conclusion.

2.2 Literature Review

In the household production model proposed by Becker (1965), a theoretical basis was provided for analyzing the factors that determine a household's educational demand. Becker and Tomes (1986) state that the desire of parents for their children to be successful encourages them to make investments in their health and education. Along with the quality-quantity trade-off model, a household attempts to maximize a double-recognizable efficiency function subject to its production functions, budget and time constraints. The efficiency of the function depends on the household and the community's characteristics with unobservable arguments such as the number of children, quality of children, leisure and consumption of market goods.

The quality of children refers to the production function of a household with family members' time spent on assisting the child as well as the purchase of goods and services. It also implies that parental satisfaction may increase as more resources are devoted to the child. The related level of child quality may also be attained with various combinations of time and goods. Tansel (1997) claims that child quality enhanced by education leads to an increase in the production of child quality.

Some theoretical frameworks have been used in the examination of a household's demand for education; the recognition of the household and family as a principal social entity whose rationales are mainly driven by economic gain is regarded as an important feature in the analysis.

By employing the household production model, Becker and Lewis (1973) illustrate that the shadow price of children is greater, with respect to their number (i.e. the cost of an additional child, holding quality constant), the higher the child's quality is. Similarly, the shadow price of their quality (i.e. the cost of a unit increase in quality, holding quantity constant) is greater, the greater the number of children. It should be taken into consideration that raising child quality will be more expensive in cases where there are more children in the family because any increase will be applied to more units.

Zimmerman (2001) and Jayachandran (2002) identified the determinants of the household's demand for education as being the level of income of the household. Glick and Sahn (2000) and Schaffner (2004) considered parent educational level with Lloyd and Blanc (1996) considering the family head's gender. Connelly and Zheng (2003) analyzed the effect of urban versus rural living.

Glewwe and Patrinos (1999) found that the willingness of the household to pay for education is increased in line with its income. Additionally, that urban households were willing to spend more compared to rural dwelling households. Gender discrimination against girls is another issue studied with respect to household educational expenditure. Aslam and Kingdon (2008) investigated the intra-household allocation of educational expenditure in Pakistan and questioned whether the household found it more desirable to educate males than females. They found a clear desire for males to be schooled with the amount spent conditional on middle school enrolment. A bias was observed in primary school enrolment but not on how much to spend conditional on registration.

Tansel and Bircan (2006) in their study of household expenditure on education in Turkey found that urban households tend to make greater investments compared to rural households. Qian and Smyth (2011) analyzed the determinants of both local and foreign educational expenditures in China. They found that household income had a glaring impact on the degree of local and foreign educational expenditure and that the possibility of funding study abroad is also greatly affected positively by the household's income. In a similar study, Huy (2012) investigated the factors that influence educational expenditure in Vietnam utilizing the 2006 Vietnamese Household Living Standards Survey. He found that household income and parents' education have a positive significant effect. In addition, it was found that households with primary and secondary school age children spend more on education compared to those with preschool or college age children.

Ogundari and Abdulai (2014) dealt with the analysis of determinants for a household's education as well as health care spending in Nigeria by using the 2004 General Household Survey Data for Nigeria. They illustrated that the greater the household's income, its size, and the level of the household head's education increases the household's decision to spend on education. In addition, they found that households headed by females tend to spend more (*ceteris paribus*) on education than households headed by males.

While there are a number of studies exploring the determinants of household educational expenditure, there is scant literature that has focused on sub-Saharan Africa. Thus, this research attempts to provide evidence for quantifying the factors influencing household spending in the context of Nigeria. The economic factors

determining the decision of families to begin making educational expenditure followed by how much they spend on education are examined in detail. The findings will provide policy makers with important information on the expenditure patterns and socio-economic determinants of private education expenditures.

We contribute to the existing studies by using a recent data set; Nigeria General Household Survey, Panel 2012-2013, Wave 2 covering rural and urban regions. Additional variables have been captured in this survey which were not included in the 2003-2004 data used by Ogundari and Abdulai (2014). This survey provides a more recent and comprehensive picture of expenditure patterns and socio-economic characteristics in household education expenditure in Nigeria. In addition, we generated a set of cohort variables, specifying the number of household members in four age groups from age 0 to 30 years to enable us to examine the magnitude of the effect of the number of children in each category on the education expenditures of the household.

2.3 Data and Methodology

2.3.1 Data

The General Household Survey (GHS), Panel 2012-2013, Wave 2 was carried out by the National Bureau of Statistics, Nigeria with financial and technical support from the Bill and Melinda Gates Foundation and the World Bank (NBS, 2015)[2]. The observations were selected randomly from GHS to form a sample GHS-Panel made up of 5000 households. It is representative of the national and zonal (urban/rural) levels of Nigerian households. The enumeration areas were chosen in the first stage proportional to the population of each state in Nigeria. Households were then selected

[2] Available on http://microdata.worldbank.org

randomly in the second stage and 4,986 households with 29,533 household members were administered questionnaires. Three sets were administered; household, agricultural and community. Two surveys were carried out. The first was carried out post-planting September-November 2012 and the second post-harvest February-April 2013. The survey is carried out every two years for the same set of households.

Expenditure on education consists of school fees, registration, school repairs, parent or teachers association, school uniform/sports clothes, books and school supplies, transportation to and from school, food, boarding and lodging at school and extra tuition (extra classes) and other expenditure not categorized. The expenditures for education were recorded at household and individual levels. For uniformity, all were aggregated to the household level. After a data cleaning process our sample was limited to 4,729 observations.

The total income of the household, as reported in the survey, is difficult to measure accurately. However, the aggregate expenditure of the household can be calculated for the year and, in any case, is a good proxy for the permanent income of the family. Education is an investment that is made over several years with significant losses if interrupted. Hence, in estimating the determinants of the household demand for education, it is permanent income rather than current income that is the more relevant income measure. In this study, when reference is made to family income, what is being referred to is aggregate household expenditure during that period. No distinction is made as to whether these expenditures have been made from the spending of current income, by drawing down savings, or through borrowing.

In 2012, the average annual income of the 4,729 households in our sample was 262,631 NGN[3]. These households, on average, make an annual educational expenditure on education related items equal to 42,334 NGN. This accounts for 16.1% of total household income. Of the total number of households, 4,013 (85%) are headed by males and 716 (15%) by females. However, some households do not spend any of their income on education. Perhaps they are too poor, do not have children or do not desire to contribute to the financing of people outside of the immediate household. The household educational expenditure profile in Nigeria is shown in Table 4.

Table 4: Household educational profile in Nigeria 2012/2013

	# of Families	% Of Families	Average Household Income (NGN 2012 Values)	Average Educational expenditure (NGN 2012 Values)	% Ratio of Educ. Expend. to Household income
	4,729		262,631	42,334	16.1
Families with Female Head	716	15	157,864	37,861	24
Families with Male Head	4,013	85	281,323	43,132	15.3
Families in Urban Areas	1,479	31.3	336,662	70,316	21
Families in Rural Areas	3,250	68.7	228,941	29,600	13
Household Head with Non-Agricultural Occupation	3,431	72.6	297,660	51,300	18
Household Head with Agricultural Occupation	1,298	27.4	170,038	18,632	11
	Families with Positive Educational Expenditure				
Total	3,147		342,757	63,615	18.5
Families with Female Head	413	13	201,490	65, 639	32.5

[3] 1 USD = 160.8325 Nigerian naira (NGN) in 2012.

Families with Male Head	2,734	87	364,097	63,309	17.3
Families with No Children (0-30 Years of Age)	351	11	357,408	74,170	20.8
Families only with Children 0-5 Years of Age	86	2.7	324,565	97,784	30
	Families with Zero Educational Expenditure				
Total	1,582		103,240	---	
Families with Female Head	303	19	98,400	---	
Families with Male Head	1,279	81	104,386	---	
Families with Female Head who have Children 6-18 years	164	54	130,581	---	
Families with Male Head who have Children 6-18 years	908	78	100,200	---	

Source: Author's Calculations

Looking more closely at the zero expenditure households, we found that they constitute 1,582 families (33.4% of our total sample) and have an average income of 103,240 NGN. This contrasts with the 3,147 households who do spend on education whose average income is 342,757 NGN with an average education expenditure of 63,615 NGN or 18.5% of total income. From this information, we can see that those families making zero education expenditure have, on average, incomes of only 30.12% of those making such expenditure.

Of those 1,582 zero education expenditure households, 1,279 (81%) are headed by males and 303 (19%) are headed by females. Their average annual incomes were 104,386 NGN and 98,400 NGN respectively. Out of this total, 1,072 families (67.7%)

have children between 6 and 18 years of age. Of the households headed by males, a total of 908 or 78% contained children between 6 and 18 and for female-headed households 164 or 54% of this cohort had children in the same age bracket. Overall, male-headed households not spending on education were poorer and had relatively more children than female-headed households.

Turning now to the 3,147 households that did spend on education, we found that 2,734 (87%) are male-headed and 413 (13%) are female-headed. Families headed by males had, on average, annual incomes of 364,097 NGN and made educational expenditure of 63,309 NGN or 17.3% of their income, while the 413 female-headed households had an average income of only 201,490 NGN yet were spending 65,639 NGN or 32.5%. Despite having only 55.33% of the income of male-headed households they were spending, on average, a greater absolute amount.

Of the families making educational expenditures, we found that only 351 families (11%) have no children less than 30 years of age. These families were either making expenditure on adults older than 30 years of age or for the education of others living outside of the household.

It is interesting to consider the families (86) who only have children less than 6 years of age. Primarily they will be attending private nurseries or kindergartens. We found that this group spent on average 97,784 NGN per year on education expenditures which is greater than any other household group. Such kindergartens also provide an element of daycare, hence families are willing to pay more.

Another way to examine the factors that determine educational expenditure is to consider the influence of urban versus rural living locations and also agriculture versus non-agriculture related occupations of the household heads. Out of our total sample of 4,729 households, close to 31.5% of these families (1,479 in total) live in urban areas with an average income of 336,662 NGN while 68.5% of households (3,250 in total) live in rural areas with an average annual income of 228,941 NGN. Families in urban areas spend, on average, 70,316 NGN on education while in rural areas the amount is 29,600 NGN. The average incomes of urban dwellers are approximately 1.5 times that of rural dwellers. In the same vein, the proportion of income spent on education by urban dwellers of 20.8% which is approximately 1.6 times that of rural households which stands at 12.8%.

In this sample of families, 3,431 (72%) of household heads have non-agricultural occupations. On average, they have 291,660 NGN annual income and spend, on average, 51,300 NGN on education. The 28% of families engaged in agriculture (1,298 families) had average incomes of 170,038 NGN, which was somewhat lower than for those in non-agriculture and they spent much less at 18,632 NGN annually. While non-agriculture families spent approximately 18% of their income on education, farming households spent approximately 11%. This may be due to the absence of convenient school infrastructure in farming areas as well as the likelihood that the opportunity cost of child labor is greater for farming families than for non-farming families.

2.4 Methodology

The theoretical model applied here is assumed to be a strictly concave household utility function (Schultz, 1961; Becker, 1965; Ogundari and Abdulai, 2014). The individual household is denoted as i.

$$U_i = U\left(E_i; C_i; L_i; Z_i\right) \quad (1)$$

Households seek to maximize utility, U_i which is dependent upon the consumption of commodities and services, C_i, leisure, L_i, quality of education, E_i, and individual characteristics and tastes Z_i of the respondent.

The quantity of education E_i of the children in each household i is produced by the households' production function as indicated by $E_i = f\left(Z_i \varepsilon_i\right)$, where ε_i shows the unobservable determinants of E_i. In each period there is endowment of time which the household gets and it is assigned between leisure represented by 'L' work's hours represented by 'S':

$$T_i = L_i + S_i \quad (2)$$

As noted by Ogundari and Abdulai (2014), the household spending options are granted to be made conditional on the budget constraint for purchased goods and services as follows:

$$\sum_i P_i C_i = Y \quad (3)$$

Where P_i *is* a vector of exogenous prices and Y is exogenous money income. The characteristics of household heads such as composition of age, educational level, occupation, gender and household location are variables that determine demand. The household is able to solve its utility maximization regarding services and goods that entered into the utility function of the household for optimal consumption. This

maximization will be subject to the nature of the utility function and also for time and budget limitations. The demand for goods and services of households can be expressed as:

$$C_i = c(Z_i, Y_i, P_i, \varepsilon_i) \quad (4)$$

Hence, the reduced-form demand function for education, E, of households may then be expressed as:

$$E_i = e(Z_i, Y_i, P_i, \varepsilon_i) \quad (5)$$

2.4.1 Empirical Specification

Prices are assumed constant across all households; hence, Equation 5 is used for specification of the household demand for education as:

$$lnW_i = \alpha_i + \beta lnY_i + \sum_k \gamma_k Z_{ki} + \xi_i \quad (6)$$

Where W_i denotes education expenditure for household i. β is the estimated elasticity of demand for education expenditures in respect to the total expenditures of the households for that period. γ_k is the set of estimated coefficients corresponding to the vector Z_{ki} of socio economic variables.

One of the major challenges linked with using household survey data for the empirical analysis of expenditure patterns on education is the zero expenditure often reported by households or any particular set of commodities or services. According to Zheng and Zimmer (2008), when there are many observations on a single data point (in this case zero) there would be a significant problem and, as a result, no single standard distribution can fit the data well. The data set used in this analysis is censored in the sense that approximately 34% of the observed values for household expenditure on education have zero values. Hence, applying the conventional Ordinary Least Square

(OLS) method to estimate Equation 6 which considers only non-zero values of expenditure will result in inefficiency. Hence, Maddala (1983) informs us that ignoring the zero outcomes will introduce a bias.

2.4.2 Double-Hurdle Model

A commonly used method for observations with zero value is the Tobit (1958) model. However, Masterson (2012) stated that the Tobit model does not recognize the point that observations of zero and positive values are determined by two distinct decisions. Hence, this study employed a model proposed by Cragg (1971) called double-hurdle (DH). Firstly, it takes into consideration the decision to spend on education and, secondly, the related decision on how much to spend. This model has a lot in common with the two-step approach by Heckman (1979). Both models acknowledge that zero and positive values are controlled by two distinct results as stated below. Unlike Heckman's procedure, the double hurdle model can accommodate zero observations in the second stage (or second hurdle). The household's first hurdle decision, known as the selection equation, is specified as:

$$d_i^* = m_i'\delta + \zeta_i \quad d_i = \begin{cases} 1 & if \quad d_i^* > 0 \\ 0 & if \quad otherwise \end{cases} \tag{7}$$

Where d_i^* denotes the household head's decision to spend on education and is the latent variable associated with the observed variable d_i; m_i' represents vector of regressor or predictor variables postulated to interpret the first hurdle; δ represents vector of coefficients or parameters to be estimated and ζ_i is the error term. The estimates of this relationship are presented in the Table 5 column 2.

The households' second hurdle decision, also known as the magnitude of spending equation, is stated by:

$$W_i^* = x_i'\tau + \xi_i \quad W_i = \begin{cases} W_i^* & if \quad d_i^* > 0 \; and \; W_i^* > 0 \\ 0 & if \quad otherwise \end{cases} \tag{8}$$

Where W_i^* denotes the amount spent by the household and is the latent variable associated with the observed variable W_i; x_i' represents vector of regressor or predictor variables postulated to interpret the second hurdle; τ represents the coefficients for the predictor variables and ξ_i is the error term. The estimates of this relationship are presented in the Table 5 column 3.

Although advantageous, Yen and Jones (1996) and Yen (2005) consider how DH model relates to the interpretation of the effects of the first hurdle on the second hurdle. In this respect, a method to estimate the general impacts of the parameters independent of both hurdles was proposed by Burke (2009). The partial effects of both hurdles are incorporated by calculating the average partial effects (APE) of these variables.

2.5 Empirical Findings

We started our empirical analysis with the application of the Wu-Hausman tests to check for the potential degree of endogeneity of household size and its income variables. According to Himaz (2010), household size has the potential to be endogenous on account that parents who strongly desire to have educated offspring may prefer to have smaller families. At the same time, they are willing to make greater educational expenditure. The result shows that having no potential endogeneity cannot be rejected[4].

The interpretation of DH model require one to combine the results of the estimates determining the probability of making some expenditures (hurdle one, Table 5 column

[4] The result is not presented in the interest of brevity, but available upon request.

2) with the estimate of the amount of expenditure made by people who make expenditure (Table 5 column 3).The unconditional estimate provided in Table 5 column 4 provides us with the combined impacts of the explanatory variables. The unconditional estimate coefficients is complex. This study tries to shed light on their APE. The discussion focuses on these estimations since the APE of independent variables illustrates the total or whole effect of independent variables regarding education spending.

Table 5 reports the results of the study on the determinants of education spending by Nigerian households. Table 5, column 2 shows the likelihood of incurring expenditure on schooling (*probit*) by households while columns 3 and 4 are conditional and unconditional estimations respectively. The focus is on the unconditional estimations because their parameter values consider the impacts of both the decision and the amount to spend. From Table 5, column 2, row 2 it is found that household income (proxied by Income[5]) raises the likelihood of expenditure on schooling. Fundamentally, children from wealthier households are more likely to attend school. As seen from the estimated results below, the gender of the household head significantly affected demand. The negative and significant coefficient on the gender variable implies that households headed by males tend to incur less on schooling (*ceteris paribus*) than those headed by females. This finding is consistent with those of Lloyd and Blanc (1996) and Blackden and Bhanu (1999) which found that female-

[5] Expenditure is used instead of household income because false reporting of income and expenditure fluctuates less than income. This is because income is synonymous with random shock and also due to informal sector prevalence in developing nations and it captures wealth.

heads of families in developing countries are likely to make more investments to educate children than male-headed households in the same situation.

Table 5: Determinants of Educational Spending for Households in Nigeria Dependent variable: Probability (0, 1); conditional (log of education expenditure)

Variables	Probability	Conditional	Unconditional
Income	0.415***	0.755***	1.220***
	(0.022)	(0.023)	(0.053)[6]
Gender#	-.307***	-.350***	-0.848***
	(.064)	(.068)	(0.152)
Educ2	0.264***	0.329***	0.735***
	(0.051)	(0.051)	(0.112)
Educ3	0.229***	0.674***	0.740***
	(0.067)	(0.062)	(0.150)
Sector#	-0.063	-0.355***	-0.248*
	(0.051)	(0.049)	(0.135)
Occup#	-0.144***	-0.160***	-0.396***
	(0.049)	(0.053)	(0.109)
Hhsize	0.127***	-0.065***	0.296***
	(0.010)	(0.008)	(0.024)
Age2	.344***	-.102	0.819***
	(.085)	(.107)	(0.194)
Age3	0.530***	0.314***	1.386***
	(0.088)	(0.106)	(0.182)
Age4	0.423***	0.423***	1.152***
	(0.090)	(0.109)	(0.212)
Age5	0.321***	0.419***	0.898***
	(0.083)	(0.107)	(0.209)
AgeNo0-5	0.011	-0.100***	0.0007
	(0.020)	(0.020)	(0.054)
AgeNo6-10	-0.065***	-0.095***	-0.187***
	(0.022)	(0.022)	(0.057)
AgeNo11-18	0.028	-0.015	0.064
	(0.018)	(0.018)	(0.048)
AgeNo19-30	0.018	-0.022	0.040
	(0.020)	(0.018)	(.045)

*** 0.01, ** 0.05 and * 0.1. #, Effect of the binary variables (dy/dx) are computed for discrete change of dummy from 0 to 1.

[6] As the standard deviations reported by the Craggit command in Stata describe only the data and should not be considered a parameter estimate. Hence, to inference on an APE, we applied the bootstrapping technique with 100 iterations. Bootstrap standard errors provide a valid statistical inference in the presence of heteroscedasticity. Numbers in parenthesis are the bootstrapped standard errors.

Household heads' education has a significant and positive impact on the possibility of its household spending on education. The coefficients for secondary education and post-secondary education are all positive and highly significant. The amounts spent by families with household heads having secondary education and post-secondary education are approximately 74% more than those with primary and below primary education. Those with secondary and post-secondary education know the value of education and will not hesitate in allocating a greater proportion of their income to the education of their families.

Whether a household resides in urban or rural areas, (Sector) has a significant impact on family educational expenditure. Households living in rural areas have a lower probability of spending and the amount they spend is significantly lower than for urban dwellers. The combined result is that rural households spend approximately 24% less than urban households. This result is no doubt reinforced by the fact that most private schools are situated in urban areas.

The results also indicate that households whose heads have farming as their main occupation (Occup) do not spend as much on schooling compared to those in other occupations. This is expected as children who are available to work on the farm may have a greater opportunity cost of their time compared to those from non-farming families. The impact of farming as an occupation is compounded by the fact that farming is a rural occupation. Farming families spend approximately 39% less than their non-farming rural neighbors. When we include the additional impact of living in rural areas, we found that farming families only spend approximately a third as much on education as do Nigerian urban dwellers.

The majority of poor and less educated people live in predominantly rural areas and are unlikely to enroll their household members in quality schools that can provide them with the opportunity to attend tertiary institutions. Studies by Qian and Smyth (2008) on regional and rural-urban education disparity in China have reported consistent findings that children from less developed regions and rural areas are less likely to enter college.

Different categories of the age of household heads have statistically significant effects on household educational spending (Age2-Age5). Accordingly, the possibility of incurring expenses on schooling is more for household heads aged between 41-50 years followed by those aged between 51-60 years. These two groups tend to spend between 138% and 115% more respectively than those with household heads aged under 30. We also found that households whose heads were aged 60 or over spend almost 90% more than families whose heads were aged 30 or under.

The set of new socio-demographic variables introduced in the model covers the number of children 0-5 years (pre-primary), 6-10 years (primary school), 11-18 years (secondary) and 19-30 years (tertiary). 6-10 years is the critical age category for educational expenditure. Significantly less is spent at primary school age than on older children. This result is because primary school is government funded. This finding is crucial in order to understand the impact on families of state educational subsidies. For each child receiving primary education, the empirical results indicate that there is a reduction of 18.7% spent on educational related expenditure. We found that school fees, as a percentage of household total expenditure on education, are 18.9% (2015 Nigeria Education Data Survey (NEDS)-USAID). It appears to be the case that there

is a one for one cutback in household educational expenditures as a result of free primary education. This provides an incentive for children to enter school and, for those who would attend anyway, this also releases income for financing other household expenditure.

The variable measuring household size (hhsize) has a significant and positive impact on the probability that a household will spend on education. However, household size seems also to have a negative effect on the level of expenditure for those willing to make it. Large households, whose demands increase with size, may lack financial resources yet the unconditional impact is both positive and highly significant. The amount spent on each additional child adds on average 29.6%.

According to Table 5, column 4 it is clear that a 10% increase in household income increases education spending by approximately 12%. In Nigeria, education expenditures generally have an income elasticity of demand greater than one. Findings in India by Subramanian (1995) and Sri Lanka by Himaz (2010) support elasticities of education expenditure being greater than one.

It is estimated that the income elasticity of demand for education is approximately 0.75 from the results of the impact of household income increases for those already spending on education (Table 5, column 3). At the same time, income elasticity for the probability of households moving from zero to a positive figure is approximately 0.4. It is the combination of these two impacts which yield a demand elasticity of income for education expenditure of 1.22 (Table 5, column 4). From these results, we can conclude that the impact of increasing income is very important to induce households to start spending on education. These outcomes are consistent with the result of Gao

et.al (2014) who found that providing more income for poor families helps them to spend more on education. This is further borne out when we examine the income elasticities for education expenditure for different income groups. To conduct this analysis, we ranked all households according to their incomes and estimated the income elasticities of demand for the bottom, middle third and top third of households. The results of these estimations are presented in Table 6.

Table 6: Elasticities of Demand for Education Expenditures with Respect to Total Expenditures by Households

Quantiles of total expenditure[7]	B	Bootstrapped. S.Es	No of households
Lowest (1/3)	1.54***	(0.13)	1577
Middle (1/3	1.40***	(0.31)	1576
Top (1/3)	0.36**	(0.16)	1576

Expenditure is expressed in Nigerian currency, naira (US$1=160.8325 naira). *** 0.01 and ** 0.05.

The findings show that household demand for education is elastic (1.54 and 1.40) for the poorest families (the bottom two thirds of the income groups). On the contrary, income elasticity of demand is less than one for the top one third of income distribution. The estimated income elasticity shows there is a significant difference in the magnitude of expenditure elasticities across income quantiles with elasticities decreasing as the level of income increases. Microeconomic theory would suggest that as income increases beyond a certain point, a smaller proportion of any increase of total income would be spent on education. The high income elasticities of demand for the bottom two thirds of income distribution are a consequence of a significant number of households beginning to spend on education who previously made no such

[7] This study considered three different classes of income; the first class (quantile-1) denotes families having the bottom 33% of household income in our sample, quantile-2 those families with the middle 33% of incomes and quantile-3 the top 33% of household incomes.

expenditure. This component of the income elasticity of demand is much smaller for those with the highest one third of incomes.

These results are quite different from that found Ogundari and Abdulai (2014) where they found an income elasticity of expenditures on education that is greater than one in all income levels of urban dwellers but approximately 0.7 for rural residents.

2.6 Conclusion

This research explored the determinants of expenditure patterns for education using the Nigerian General Household Survey, Panel 2012-2013, Wave 2. The findings showed that household income, education of the household head, rural versus urban household location, occupation, age and gender of the household head all have significant effects on educational spending. Moreover, it can be inferred that overall, the income elasticity of demand for education is greater than one. The estimated elasticity of demand for educational expenditure of 1.54 for households with incomes in the bottom third of the income distribution is very much larger than the 0.36 of the estimated income elasticity of demand for those with incomes in the top third of the income distribution.

These results would suggest that Nigerian households, at every income level, have a very strong desire to educate their youth. For the poorest families, however, they do not have sufficient income to even start making such expenditure. At the same time, if the real income of the poor increases, expenditure on the education of the family becomes a priority.

Another significant determinant is related to the educational status of the household head. Those with post-secondary education are willing to spend almost 74% more on schooling.

The results of the study also reveal that household size has a positive and significant effect on the extent of spending, but the relationship between these two variables is less than proportional. The negative effects of gender (male) on household educational expenditure shows that households who are female-headed are likely to expend more (*ceteris paribus*) on education than male-headed. These discoveries are in line with those reported by Lloyd and Blanc (1996) and Blackden and Bhanu (1999), who illustrated that offspring of female-heads' households in Sub Saharan Africa have greater enrolment rates than those of male heads. Moreover, household heads engaged in agriculture tend to spend less on education than those in other occupations.

Nigeria faces a challenge in the education of its rural youth whose families are engaged in agriculture. Because Nigeria is a major oil producing country with problematic macroeconomic policies, the naira often becomes overvalued when oil prices rise. This causes the terms of trade to move against agriculture and reduces the income of farmers. This in turn reduces the affordability of education for their children. Perhaps in this situation direct expenditure programs that reward poor families who send their children to school might be effective.

If Nigeria is going to achieve a higher level of economic development, the education of its youth, both male and female, is likely to be prerequisite. This study provides an improved empirical understanding of the determinants and constraints of the private financing of education in the country.

Chapter 3

FAMILY DECISION MAKING FOR HEALTHCARE SPENDING: NEW EVIDENCE FROM SURVEY DATA FOR NIGERIA

3.1 Introduction

Healthcare spending by both government and households is regarded as a priority. The health of the population is an important component of the overall socio-economic development of a society. In most developed and developing countries, the provision of healthcare services that are both preventive and curative are considered essential for a country's advancement.

Over the last decade, there has been a deterioration in the quality of the public healthcare system in Nigeria. Ogundari and Abdulai (2014) point out that this has persuaded Nigerian households to demand the use of private healthcare services to a greater extent. Nwosu (2000) observed that most families do not possess health insurance, hence their healthcare expenditures are made from their personal income. Consequently, investigations into factors affecting individuals' decisions on the extent and amount they need to spend on healthcare are important for the design of public healthcare policies.

An array of studies has been conducted on issues related to healthcare expenditures in developing and developed countries. They are both microeconomic and macroeconomic in focus with different methodological approaches, (Aregbeshola and Khan, 2018; Ogundari and Awokuse, 2018; Baltagi et al. 2017; Novignon and Lawanson, 2017; Brinda et al, 2014; Lee et al, 2014; Abbas and Hiemenz, 2011; You and Kabayashi, 2011; Ke et al, 2011; Anyanwu and Erhijakpor, 2009; Nixon and Ulmann, 2006; Hiltiris and Possnett, 1992).

Considering previous studies on Nigeria, the main focus has been on the trend of healthcare expenditures. Although some studies investigated what influences healthcare expenditure at the macro level, (Ogundipe and Lawal, 2011; Bakare and Olubokun.2011; Olaniyan and Lawanson, 2010; Nurudeen and Usman, 2010; Amaghionyeodiwe, 2009), very little research has considered the micro aspects (at household level) of healthcare expenses and related determining factors.

Using the household level data for 2003-04 for Nigeria, Ogundari and Abdulai (2014) found the level of education of the household head, household size and household income had a positive and significant effect on healthcare spending. In addition, by comparison of the behavior of male-headed with female-headed households, they detected that female-headed households (ceteris paribus) contribute more.

In another study, Olasehinde and Olaniyan (2017) examined what influences expenditure on healthcare in Nigeria at household level with special emphasis on individual and household distinctive features using the Harmonized Nigeria Living Standards Survey (HNLSS, 2010). They pointed out that age, religion, education of individual and household headship, income and size significantly affect healthcare

expenditure. However, the data only considered people injured or sick two weeks prior to the survey. Consequently, it does not proffer a comprehensive picture of determinants of household healthcare expenditure.

Against this backdrop, this study attempts to contribute to related works using more recent household level data (2012-13) to assess the variables affecting healthcare expenditures and explore expenditure patterns across households in order to inform policymakers.

Given that healthcare expenditures by poor households in Nigeria are often zero, the focus of many past studies has been on a household's decision whether to spend on healthcare. Not so much attention has been placed on determining the level of spending on healthcare after the decision was made to spend. A double-hurdle model proposed by Cragg (1971) was used to account for data censoring as well as to examine the decision process. This model is regarded as a parametric generalization of the Tobit (1958) model[8].

The uniqueness of the proposed double-hurdle model has two aspects; firstly, it can calculate unbiased estimates of explanatory variables on spending; secondly, it has the ability to separate two distinct decisions. The first is the decision to spend and the second on the amount to spend.

[8] The Tobit model is not properly successful in the analysis of factors that make a respondent more or less likely to pay for healthcare. More generalization enables the model to appear differently based on the characteristics of respondents. This fact lead us to use the Double Hurdle model whose underlying assumption in this setting is that individuals may make two decisions considering their willingness to pay for healthcare.

The remaining sections in this chapter examine the healthcare system in Nigeria, healthcare financing and healthcare outcomes, literature review, data and methodology, empirical results and lastly, the conclusion and policy implications will be discussed.

3.1.1 Healthcare System

In Nigeria, the national health care system consists of public and private providers of services. Primary, secondary and tertiary healthcare are the major components that provide the basis for the development and expansion of this modern healthcare system. Federal, state and local government are responsible for public sector provision (Akhtar, 1991), providing leadership, management and funding. Private healthcare providers include for profit, non-profit, faith-based and community-based organisations (Africa Health Workforce Observatory (2008) and, additionally, medical practitioners and medicine vendors.

Health centers, maternity clinics, dispensaries and health posts are the first port of call in communities for their primary needs. They provide pre-referral care, preventive treatment and promote health awareness in the community, (Olaniyan and Lawanson, 2010). These facilities employ nurses, community health and environmental health officers. The facilities are managed and financed by local government with state government supervision. 79% of primary care facilities are public sector, 10% are private and 4% are faith-based.

General and district hospitals, comprehensive health centres and specialist hospitals provide specialized and laboratory services, employing physicians, nurses, midwives, laboratory scientists, pharmacists and other medical personnel

to treat referrals from primary healthcare facilities. 32% are public facilities, 28% are private and 4% are faith-based, (PharmAccess (2016). Private practitioners provide both primary and secondary healthcare.

Tertiary healthcare provides highly specialized services on referral from public and private hospitals. They care for specific disease conditions (Akpomuvia, 2010). This includes specialist hospitals, teaching hospitals and federal medical centers. 85% are public facilities, 9% are private and 4% are faith-based.

The Federal Ministry of Health provides direction while the Federal Public Health System gives technical support and sets standards and rules to develop plans and implement policy, monitor and evaluate healthcare programs. There are some healthcare management boards which are in charge of direct delivery of service (Olasehinde and Olaniyan, 2017). The public sector has a well-defined structure and is the first port of call compared to the private healthcare sector which is loosely organized.

Every state has at least one tertiary institution, according to the WHO (2004) which observed that they are not functioning at optimal level in the provision of quality care and that primary healthcare centers are in poor condition. As a result, the healthcare system is unable to provide basic, cost-effective services for the prevention and management of common health problems, especially at local government level.

According to Barnes, Chandani and Feeley (2008), a large proportion of the population patronized the private sector and paid large sums for mainly low quality products and services courtesy of drug counterfeiting and quality control problems. However, the

National Agency for Food and Drug Administration and Control (NAFDAC) has made a lot of progress.

There is no strict regulation and or enforcement of standards and the upper income groups use the best of private facilities with well-trained medical personnel and access to the best doctors in both public and private facilities. Alternatively, they travel abroad for their medical needs while a greater number of the populace are left behind with loosely regulated private sector care, traditional birth attendants, patent medicine vendors, traditional healers, community health workers, impostor doctors and prayer houses.

The National Health Insurance Scheme (NHIS) was introduced to encourage higher quality services, increase financial access to consumers for healthcare services and to pool risk across a larger number of the population. It has been estimated that less than 5% benefit from health insurance for primary care and referrals to accredited healthcare facilities. The majority of beneficiaries (3% to 4%) are federal government workers and their families. Employers contribute 10% and employees 5% of their basic salary. State-supported health insurance has less than 0.25% cover. This has taken off in one Kwara state and offers access to affordable, quality healthcare services (PharmAccess, 2016).

Community based health insurance is designed to target poor people in rural areas. Coverage of the scheme varies, however, the scheme operated by NHIS which was designed to cover preventive and curative components and promote healthcare has less than 0.1% coverage. Additionally, urban, self-employed workers must pay a flat rate monthly pre-payment. Finally, private insurance schemes run by health maintenance

organisations (HMOS) are designed for clients who can afford it and it mainly covers primary, some secondary and tertiary healthcare. Both private and public organisations such as these are responsible for the collections of contributions and payments.

The challenges of NHIS is in getting providers and consumers to understand how the scheme works and also in training stakeholders, for example, providers, HMOS, insurance regulators and enrollees (PharmAccess, 2016).

3.1.2 Health Financing and Health Outcomes

Healthcare is financed by the government, the private sector, donor agencies (local and foreign) and households. Between 2000 and 2015, expenditure by governments and households fluctuated as is shown in the figures below. The WHO target is 5-6% of GDP to deliver basic healthcare, however, in 2015, Nigeria's total healthcare expenditure was 0.59% of GDP. The percentage of public healthcare expenditure to total government expenditure is 6.29% while public healthcare expenditure to total healthcare expenditure amounts to 16.53%. Out-of-pocket payments account for 72.2% of total healthcare expenditure. According to WHO (2015), external healthcare resources account for 6.7% of total healthcare expenditure. This demonstrates that households pay more from their personal income because of lack of insurance coverage. Reliance on out of pocket payments is regressive and has shown the negative impact on access to services and it also affects health outcomes (WHO, 2013). Nigeria ranked very low in most health outcomes compared with other African countries.

The following graphs show healthcare financing in selected African countries whose expenditures also fluctuated between 2000 and 2015. It can be seen that Nigeria lagged behind in almost all categories which demonstrates the priority it has given to

healthcare compared to other countries. Only Cameroon can compete with Nigeria with regard to out of pocket payments by households.

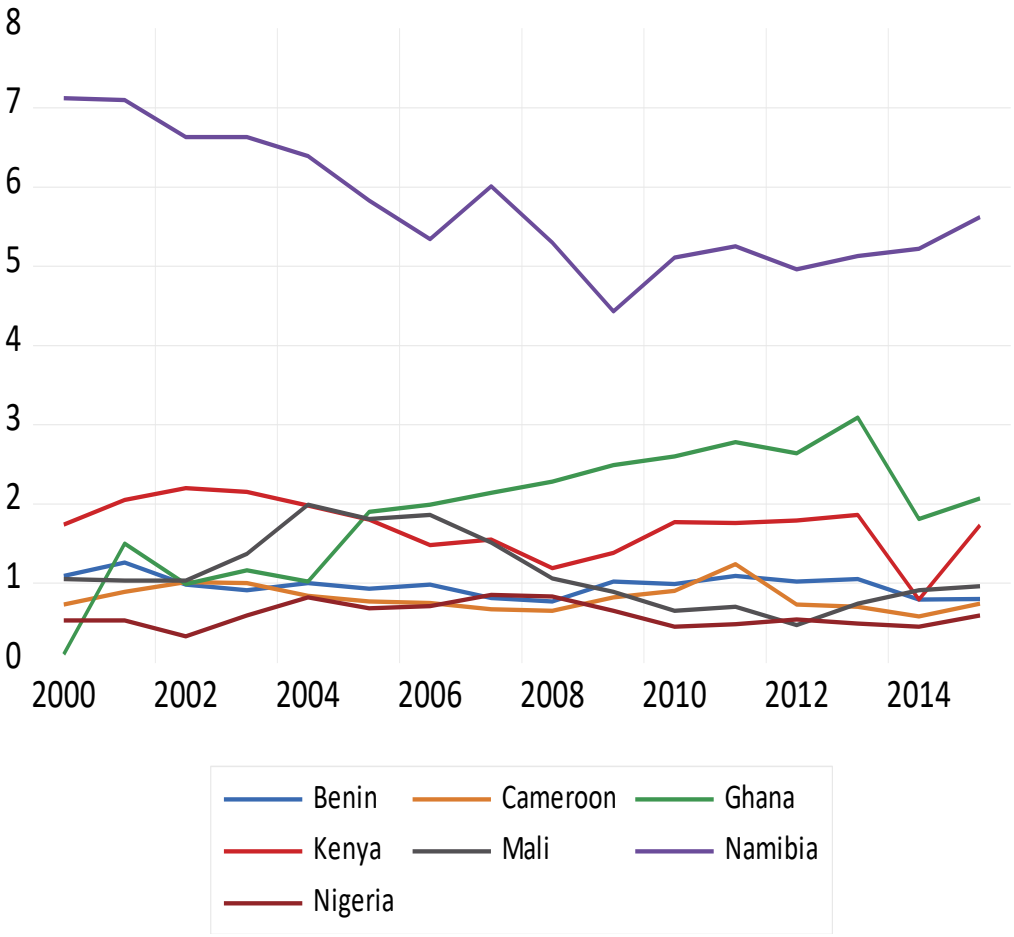

Figure 1: Domestic General Government Health Expenditure (% of GDP)
World Bank, 2015

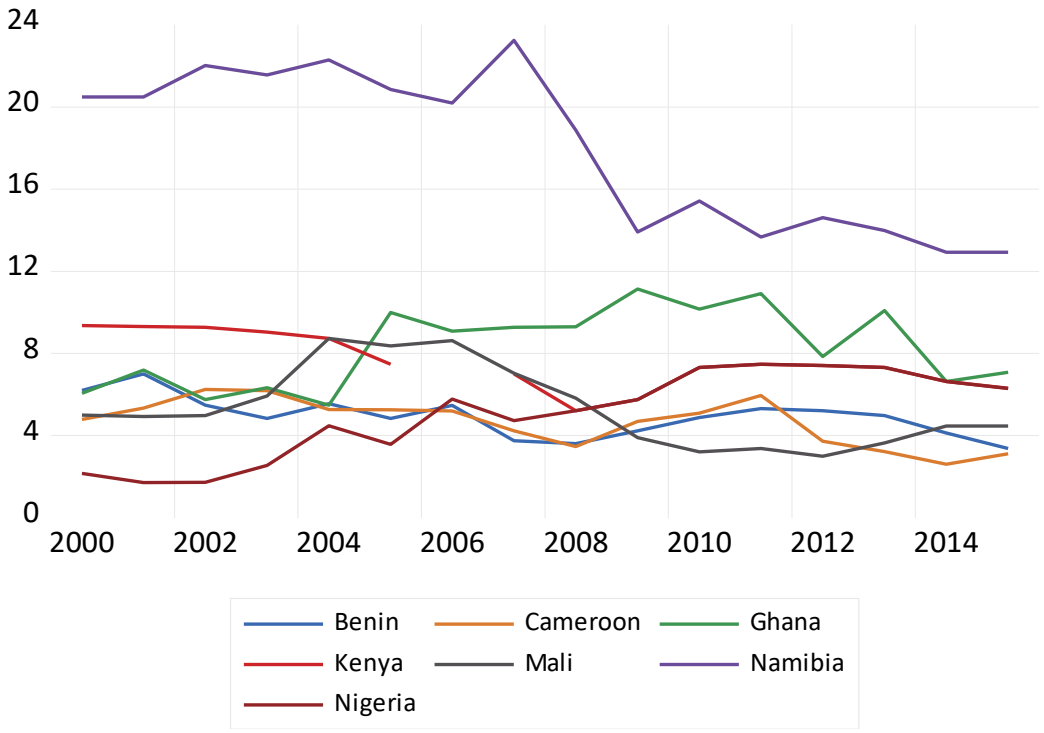

Figure 2: Domestic General Government Health Expenditure (% of general government expenditure)
WHO, 2015

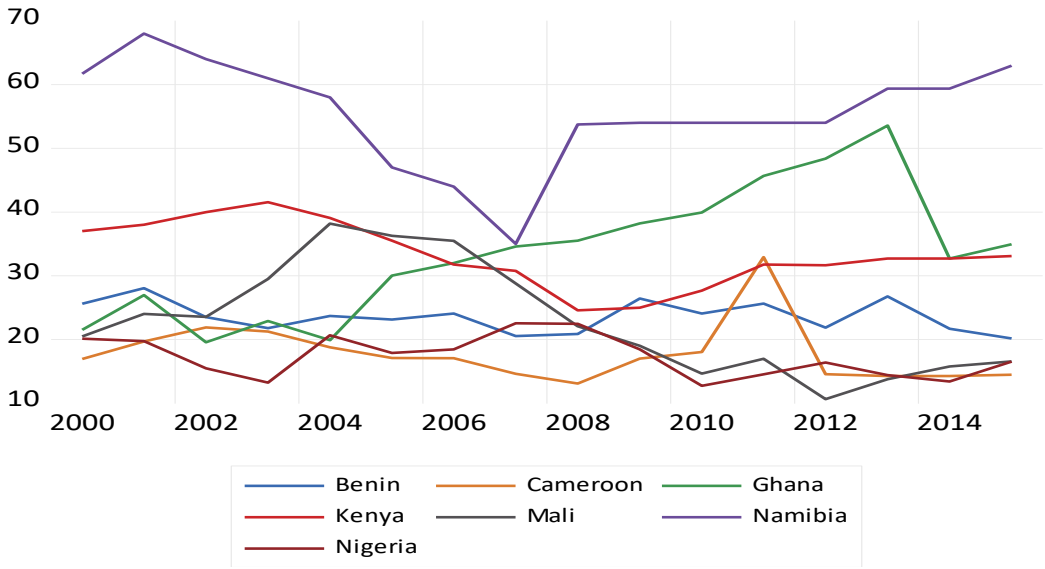

Figure 3: Domestic General Government Health Expenditure (% of Current Health Expenditure)
WHO, 2015

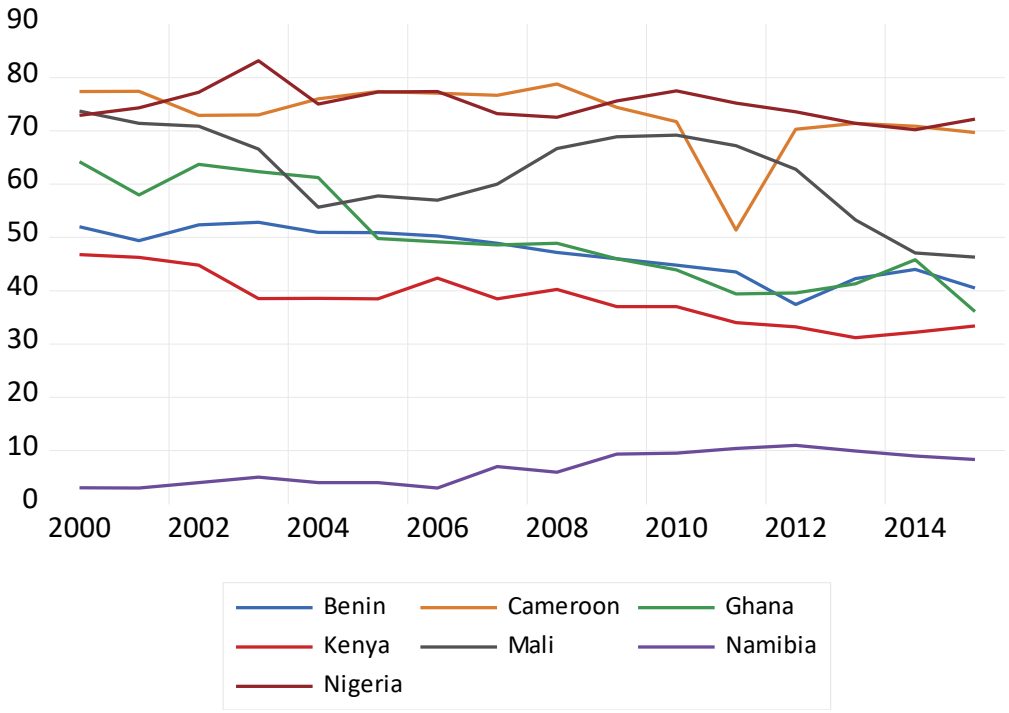

Figure 4: Out of Pocket Expenditure as a % of Current Health Expenditure
WHO, 2015

The majority of the population cannot afford the cost of healthcare because they live below the poverty line. Despite modest improvements in health outcomes, communicable diseases such as tuberculosis, flu, cholera, hepatitis A and B etc. remain a major health problem. Malaria is endemic in Nigeria and makes up a large share of all consultations. Malaria accounts for 27% of consultations globally with a rate of 323 per 100,000 of the population compared to HIV/AIDS which stands at 3.2%. Widespread malnutrition accounts for 43.6% of consultations.

Non-communicable diseases such as kidney disease, hypertension, cancer, diabetes, and heart disease are on the increase. In 2015, high alcohol consumption accounted for 9.1% of consultations and in 2016, tobacco use accounted for 17.4%. Air pollution stood at 99 per 100,000 of the population and road accidents also affected figures. Ke,

X et al (2010) observed that highly infectious outbreaks such as Ebola, Yellow Fever, Monkey Pox and Lassa fever are frequently experienced in Nigeria.

In 2017, Nigeria had a low ranking for health outcome indicators compared to other Sub-Saharan Africa (SSA) nations. World Bank records for 2017 indicated that life expectancy was 54 years compared to 60.8 years for other SSA nations. The maternal mortality ratio stood at 814 per 100,000 live births, (SSA 547) and the infant mortality rate at 65 per 1,000 live births, (SSA 51). Births per woman were 5.7, (SSA 4.78). The mortality rate for under-fives was 100.2 per 1,000 live births in comparison to the UN inter-agency group total of less than 40 per 1,000 live births. This is 4% above the annual average rate reduction for 1990-2008. According to the 2013 WHO report based on WHO, UNICEF, the United Nations Fund for Population Activities (UNFPA) and the World Bank (WB) records on maternity mortality trends, maternal deaths of 300 or more per 100,000 is considered very high and above 1,000 per 100,000 is extremely very high. Ke, X et al, (2010) state that there are significant disparities in health status across geographical zones, rural/urban locations, education and social status factors. Poverty remains widespread throughout Nigeria with the poverty rate standing at 53.3% of the population living on less than $1.9 USD per day. According to the WHO (2013) report, it will be challenging for Nigeria to achieve its sustainable development goals (SDG) for health particularly as one of its targets is to reduce maternal and child mortality rates to less than 70 per 100,000 live births by 2030.

3.2 Literature Review

Rout, (2006) maintains that a healthy populace is associated with meaningful development in almost all nations. Health status is not only about health care but also

transforms socio-economic, cultural and political factors as well as other aspects of life referred to as “development”. These factors improve the quality of life and health status will bring about an overall development.

The OECD (2010) report highlighted that many factors determine the level of household expenditure and that level differs greatly between developing and developed countries because of public sector spending, quality, stability and government efficiency plus health insurance coverage. It concluded that out of pocket household expenditure does not vary greatly in developed counties compared to developing countries.

The assessment of healthcare services from out of pocket payments or health expenditure depends on different socio-economic factors of individuals and households. Using a US Consumer Survey, Fan et al (2000) found that household size, composition, financial constraint and the level of health insurance coverage influences out of pocket expenditure after controlling for demand and supply factors with variables that affect this expenditure. Mondal et al (2014) found that when the number of illnesses, pervasiveness of chronic conditions and child birth were investigated, there was a strong indication that household size and location have an important impact on spending levels. Malik and Syed (2012) examined out of pocket (OOP) payments on healthcare using the Pakistan Household Integrated Economic Survey (HIES) and Pakistan Standard of Living Measurement (PSLM). They found that non-food expenditure was the highest and sole determinant of health expenditure and also that the educational level of the household head and spouse, at least one obstetric delivery in the last three years, unsafe water, unhygienic toilets and households located in

Khyber Pukhtonkhwa province spend significantly more on OOP while male-headed households, residing in brick built houses, households with no elderly and at least one child and household heads in a white collar profession are negative predictors of OOP payments.

3.3 Data and Methodology

3.3.1 Data

The General Household Survey (GHS) Panel 2012-13, Wave 2 carried out by the National Bureau of Statistics, Nigeria with financial and technical support from the Bill and Melinda Gates Foundation and the World Bank (NBS, 2015) [9] is the same data used in Chapter 2 but the expenditure on healthcare consists of consultation fees, medication, hospitalization, transport to and from hospital, health insurance, therapeutic equipment, and other expenditure not categorized. The expenditures were collected in the post-harvest visit. After a data cleaning process our sample was limited to 4,683 observations. The household health expenditure profile in Nigeria is shown in Table 7. The total income of the household, as reported in the survey, is difficult to measure accurately. We treated household income as we treated household income in Chapter 2 by using aggregate expenditure as a proxy for permanent income of the family. The average annual income of the 4,683 households in our sample was 261,446 NGN in 2012[10]. These households, on average, make annual expenditures on health-related items equal to 22,673 NGN. Their health expenditure accounts for 9 % of total household income. Of the total number of households, 3,976 (85%) are headed by

[9] http://microdata.worldbank.org
[10] 1 USD = 160.8325 Nigerian naira (NGN) in 2012.

males and 707 (15%) are headed by females. However, some households do not spend any of their income on health.

Table 7: Household Health Profile in Nigeria 2012/13

	# of Families	*Average Household Income (NGN 2012 Values)*	*Average Health expenditure (NGN 2012 Values)*	*Ratio of Health expenditure on Household income*
Total	4,683	261,446	22,673	9%
Families with Female Head	707	153,377	18,425	12%
Families with Male Head	3,976	280,662	23,429	8%
Families in Urban Areas	1,464	337,724	25,696	8%
Families in Rural Areas	3,219	226,755	21,299	9%
Household Head with Primary Education or below	2,517	196,392	21,099	11%
Household Head with Secondary Education	1,380	245,361	20,877	9%
Household Head with Post-Secondary Education	786	498,006	30,869	6%
Families with Positive Health Expenditure				
Total	4,109	277,471	25,841	9%
Families with Female Head	638	157,543	20,418	13%
Families with Male Head	3,471	299,515	26,837	9%
Families with Household Head more than 60 Years	1,333	301,487	28,690	10%
Families with No Household Member more than 60 Years	2,001	262,529	23,157	9%
Families with Zero Health Expenditure				
Total	574	146,727	---	---
Families with Female Head	69	114,857	---	---
Families with Male Head	505	151,082	---	---

Source: Author's Calculations

To have a closer look at the zero expenditure households, we found that they constitute 574 families (12.2 % of our total sample) and have an average income of 146,727 NGN. This contrasts with the 4,109 households who do spend on health and who have an average income of 277,471 NGN with an average health expenditure of 25,841 NGN or 9% of total income.[11] From this information, we can see that those families making zero health expenditure have, on average, incomes of only 52.8% of those making such expenditure.

Even with the establishment of the National Health Insurance Scheme (NHIS) in 2004, many households continue to trade off their health without health services, resigning themselves to praying to God for a cure and self-administered treatment. This appears to be due to the very low income of a number of these families (Onwujekwe et al, 2010). Of those 574 zero health expenditure households, 505 (88%) are headed by males and 69 (12%) are headed by females. Their average annual incomes were 151,082 NGN and 114,857 NGN respectively.

Turning now to the 4,109 households that did spend on health, we found that 3,471 (84.5%) are male-headed and 638 (15.5%) are female-headed. Families headed by males had, on average, annual incomes of 299,515 NGN and made health expenditures of 26,837 NGN or 9% of their income, while the 638 female-headed households had an average income of only 157,543 NGN yet were spending 20,418 NGN or 13% of their income on healthcare expenditure. These female-headed households have, on

[11] It is of interest to compare the proportion of health expenditures made by households in Nigeria with this proportion in developed countries. For example, in the USA, in 2014, the proportion of household income on healthcare is 8% (Foster, 2016). Or for the Canada, UK and Japan at 2009, the shares are 4.2%, 1.4% and 4.3% respectively (U.S. Bureau of Labor Statistics March 2012 Volume 2, Number 16).

average, only 52.6% of the income of male-headed households yet were spending, on average, a greater absolute amount on health expenditure. It has been suggested that this arises because male-headed households prefer to spend more on food rather than on health (Nurudeen and Usman, 2010).

It is interesting to consider the families (1,333) whose heads are above 60 years of age. These families have an average income of 301,487 NGN with an average health expenditure of 28,690 NGN or 10% of total income. This is greater than any other household group. It arises because of the higher level of income of this group and, because of their age, they will have physical and other health related conditions which stimulate their desire to make healthcare expenditures. It shows an inter-temporal substitution of household healthcare spending over the individual's lifetime. This is important for designing the healthcare system in Nigeria. The country is currently in the middle of a demographic transition and in the next few years the proportion of elderly within the population will increase.

Of the families making healthcare expenditures, we found that 2,001 families (approximately 43% of total) have no member(s) more than 60 years of age. Our results indicate that this group spends on average 23,157 NGN per year on healthcare with an average income of 262,529 NGN. Of this group of families, the majority reside in rural areas (1,391 families (70%)).

Another way to examine the factors that determine healthcare expenditure is to consider the influence of urban versus rural living locations. Out of our total sample of 4,683 households, close to 31.3% of these families (1,464 in total) live in urban areas with an average income of 337,724 NGN while 68.7% of households (3,219 in

total) live in rural areas with an average annual income of 226,755 NGN. Families in urban areas spend, on average, 25,696 NGN on healthcare while in rural areas the amount is 21,299 NGN despite the average incomes of urban dwellers being approximately 1.5 times that of rural dwellers. The proportion of income spent on healthcare by urban dwellers of 8 % whilst rural households spend on average 9%. It appears that in rural areas households are responsible for a larger share of their own medical costs than in the case of urban areas (Osungbade and Oladunjoye, 2012).

In this sample of families, 2,571 (55%) of household heads have primary or below primary educational levels. On average, they have 196,392 NGN annual income and spend, on average, 21,099 NGN on healthcare. Close to 30% of household heads (1,380 families) who had secondary education had average incomes of 245,361 NGN, which was greater than for those household heads with primary or below primary level education. However, on average, they spent much less on healthcare at only 20,877 NGN annually. Household heads with post-secondary education have on average 498,006 NGN, while they spend approximately 6% of their income on health (30,869 NGN). This may be due to the presence of health insurance that is available, particularly to government employees and those working for large companies. These employees tend to have a higher level of education. Even with a higher level of income the proportion they spend on healthcare is less.

3.4 Methodology

The theoretical model applied here is similar to the model in Chapter 2. It is assumed to be a strictly concave household utility function (Schultz, (1961); Becker, (1981); Yen, (2005); Ogundari and Abdulai, (2014).

$$U_i = u(H_i; C_i; L_i; Z_i) \tag{9}$$

Households seek to maximize utility, U_i which is dependent upon the consumption of commodities and services, C_i, leisure, L_i, quality of health, H_i, and individual characteristics Z_i of the respondent. The household health production function is signified as, $H_i = f(Z_i \varepsilon_i)$ where ε_i shows the unobservable determinants of H_i. The household demand for goods and services can be expressed as:

$$C_i = c(Z_i, Y_i, P_i, \varepsilon_i) \tag{10}$$

Hence, the reduced-form demand function for health, H, of households may then be expressed as

$$H_i = e(Z_i, Y_i, P_i, \varepsilon_i) \tag{11}$$

3.4.1 Empirical Specification

Equation 11 is used for specification of the household demand for health as:

$$lnW_i = \alpha_i + \beta lnY_i + \sum_k \gamma_k Z_{ki} + \xi_i \tag{12}$$

Where W_i denotes the expenditure for healthcare for household i. β is the estimated elasticity of demand for healthcare expenditures in respect to the total expenditures of the households for that period. γ_k is the set of estimated coefficients corresponding to the vector Z_{ki} of socio economic variables.

The data set used in this analysis is censored in the sense that approximately 12.2% of the observed values for household expenditure on healthcare have zero values. We applied double hurdle for the analysis as we did in Chapter 2.

3.5 Empirical Findings

We applied a Wu-Hausman test as we did in Chapter 2 to check for potential degree of endogeneity of size and income of the household variables. The findings of having no endogeneity cannot be rejected.

It is usually hard to interpret the estimated coefficients in the DH model. This study tries to shed light on their average partial effects. The discussion focuses on these estimations since the APE of independent variables illustrates the overall effects of independent variables on healthcare spending.

Table 8 reports the results of the study healthcare spending determinants for Nigerian households. Table 8, column 2, shows the possibility of spending on healthcare services (probit) by households. Both conditional and unconditional estimations are provided in columns 3 and 4, respectively. The focus is on the unconditional estimations because their parameter values include the impacts of both the decision to spend and the amount to spend. From Table 8, column 2, row 2, it is found that Income raises the probability of a household's healthcare expenses. Fundamentally, households with more funds have a tendency to spend more. As was seen from the expenditure profile discussed above, the gender of the household head significantly affects the demand for healthcare expenditure. The negative and significant coefficient on the gender variable (Gender) suggests that households headed by males tend to spend less on health (ceteris paribus) than those headed by females.

This finding is consistent with that of Nnamdi et al (2015) which found that households with female heads in developing countries are likely to spend more on healthcare services than households with male heads. The households with male heads tend to make greater expenditures on food.

The household head's education has a significant and positive effect on the probability of spending on healthcare. The coefficients for secondary education are positive and significant and positive and insignificant for post-secondary education. The amounts spent by families whose household heads have secondary level education are approximately 73% more compared to those with primary and below primary education.

In order to capture the effect of post-secondary education and the greater availability of subsidized health insurance, an interaction term was constructed where the dummy variable for post-secondary education is multiplied by the log of the level of total expenditure. The significant negative coefficient of 0.063 tells us that the income elasticity of this group is less than the average income elasticity of 0.689 by -0.063. This gives an income elasticity for healthcare expenditures of this group equal to 0.626.

Table 8: Determinants of healthcare spending for households in Nigeria:
Dependent variable: Probability (0, 1); Conditional (Log of health expenditure)

VARIABLES (1)	Probability (2)	Conditional (3)	Unconditional (4)
Income	0.336*** (0.044)	0.795*** (0.041)	0.689*** (0.077)[12]

[12] As the standard deviations reported by the Craggit command in Stata describe only the data and should not be considered a parameter estimate. Hence, to inference on an APE, we applied the bootstrapping technique with 100 iterations. Bootstrap standard errors provide a valid statistical inference in the presence of heteroscedasticity. Numbers in parenthesis are the bootstrapped standard errors.

Gender#	-0.315*** (0.0795)	-0.233*** (0.0628)	-0.550*** (0.100)
Educ2	0.414* (0.230)	0.357 (0.247)	0.73** (0.338)
Educ3	0.572 (0.464)	0.585 (0.508)	1.028 (0.664)
Inter	-0.0356* (0.0200)	-0.0312 (0.0214)	-0.063* (0.034)
Sector#	0.0669 (0.0545)	0.177*** (0.0488)	0.140 (0.87)
Agehh#	0.0835 (0.0666)	0.0946* (0.0561)	0.151* (0.091)
AgeNo_60	0.0279 (0.0269)	0.0545*** (0.0202)	0.055 (0.039)
Hhsize	-0.0307*** (0.00941)	-0.0453*** (0.00973)	-0.057*** (0.016)

**** 0.01, ** 0.05 and * 0.1. #, Effect of the binary variables (dy/dx) are computed for discrete change of dummy from 0 to 1.*

Whether a household resides in urban or rural areas, (Sector) has a significant impact on healthcare spending. Households living in rural areas spend more on healthcare than urban dwellers. However, the combined results show a positive but insignificant effect for household location.

The age of household heads has a statistically significant effect on household healthcare spending (Agehh). Accordingly, the amount available to spend on healthcare is higher for household heads aged over 60. Overall, we find that this group will spend almost 15% more than families with household heads under 60.

The new socio-demographic variable introduced in the model covers the number of household members over 60. In the sample, we find this variable ranges between 0 - 6. Those families who spend on healthcare and have members over 60, spend significantly more on health than those with only younger family members.

The variable measuring household size (hhsize) has a significant and negative impact on the probability that a household will spend on healthcare. However, household size seems also to have a negative effect on the level of expenditure for those willing to make it. Large households may not have the resources to spend as much on healthcare after other higher priority expenditures (such as food and education) are made whose demand will increase with household size. The unconditional impact is both negative and highly significant. The amount spent on healthcare for each additional child reduces by an average of 5.7%.

According to Table 8, column 4, it is clear that if household income is increased by 10%, healthcare spending will increase by approximately 6.8%. Healthcare expenditures generally have an income elasticity of demand less than one in Nigeria. The impact of increases in household income on healthcare expenditure for those who are already making such expenditure (Table 8, column 3) is estimated to be approximately 0.79. At the same time, income elasticity for the probability of households moving from zero is approximately 0.33. It is the combination of these two impacts that give an income elasticity of demand for health expenditure of 0.68 (Table 8, column 4). From these results, we can conclude that the impact of increasing income to induce households to start spending on healthcare is very significant but not large in magnitude

These results are very different from that of Ogundari and Abdulai (2014) where they found that the income elasticity of demand for health expenditure by rural households is greater from 2.0 for all income levels and greater than 1.3 for all group levels of urban residents. The values obtained by Ogundari and Abdulai do not appear to be

realistic. They also found households with large families spend more on health but the reverse situation is found in this study. Households with a large family size spent less on healthcare.

3.6 Conclusion

The findings of this study show that household healthcare expenditures are essentially determined by five factors. The level of total expenditures (permanent income) of the household, the gender and age of the household head, the size of the household and the number of members over 60. The coefficient on the log of total expenditures is highly significant, however the elasticity demand for healthcare expenditures with respect to total expenditures is less than one (0.683). This means that as income grows the proportion of total expenditures made on healthcare can be expected to rise a little. The results clearly show that female-headed households have a greater propensity to spend on healthcare than do families headed by males. This is understandable as a healthy family will be important from the perspective of the female head in reducing the overall risk of the family's well-being particularly in her old age. Hence, providing low cost, easily accessible healthcare facilities will be important. The significantly negative relationship between family size and healthcare expenditures is an important empirical finding. Reducing the number of children in the family through providing easy access to birth control knowledge and devices will allow for increased expenditures on healthcare and, hence, healthier children.

It is not a surprising finding that families with heads of households over 60 spend relatively more on healthcare as this need tends to rise with age. Not only do families with older household heads have more income and hence make more expenditures on healthcare, but also the marginal propensity to spend on healthcare increases with age.

As with female-headed households, access to healthcare services is very important to the social well-being of families headed by older individuals. Likewise, our results found that families with older members also tended to spend more on healthcare. This finding further emphasizes the relative importance of access to affordable healthcare services to the elderly.

Chapter 4

CONCLUSION AND POLICY RECOMMENDATIONS

The Nigerian economy is highly dependent on oil which provides the majority of public sector revenues. Periodic financial crises, a large informal sector and a high incidence of poverty have created challenges in financing education and healthcare thus causing a deterioration in these sectors. Households have responded by making private contributions. The level of government expenditures has also fluctuated widely. As a result, households acquired a greater financial burden to meet their needs. The problem of inadequate funding and its effect on the quality of the public provision of education and healthcare has resulted in an increased share of household investment. Another concern is the willingness to pay for them.

This study examined the determinants of household expenditures on education and healthcare in Nigeria. The study employed the Nigerian Household Survey Panel Data of 2012/2013 and a double hurdle model for analysis. The study contributed to existing literature by using the more recent, improved Nigerian Household Panel Survey Data. It provided an improved empirical understanding of the patterns, constraints and determinants of private financing of Nigeria's household education and healthcare.

For education, the empirical result suggested household income, urban residence, education, age, occupation and gender of household heads have a positive and important impact on the decision to spend on education. Such expenditures are income

elastic overall but different in magnitude for lower as compared to higher income households. The income elasticity of demand for education is approximately four times greater for households in the bottom two-thirds of the income distribution than those in the top one-third. This may be due to households in this high income level already having enrolled their offspring in elitist schools and, therefore, do not need to invest so much incrementally on education as income increases. This income can then be diverted to other needs. The bottom two-thirds will be making adjustments to improve the quality of education of their households thereby investing more of their income as it increases. Most of the households are in the first- and second-income distribution which has a great implication as their welfare will be affected to a greater extent.

From the educational expenditure profile households spent 42,334 NGN or 16.1% of their total income (262,631 NGN) on education with male-headed households earning 281,323 NGN or 1.8 times more than female-headed households, however, female-headed households spent 37,861 NGN or 24% of their income (157,864 NGN) on education while the male-headed spent 43,132 NGN or 15.3% of their income on education.

Of the 3,147 households that spent on education, we found that 2,734 (87%) are male-headed and 413 (13%) are female-headed. Families headed by males had, on average, annual income of 364,097 NGN and made an educational expenditure totaling 63,309 NGN or 17.3% of their income, while the 413 female-headed households had an average income of only 201,490 NGN yet were spending 65,639 NGN or 32.5% of their income on education. These female-headed households had, on average, only 55.33% of the income of male-headed households yet were spending, on average, a

greater absolute amount on educational expenditure. Females give priority to their homes and children and spend more on education. The earnings of women have been proven to have more impact on the welfare of their households compared to men. This may be why female-headed households spent more on education compared to male headed households.

Of the families making expenditure, we found that only 351 families (11%) have no children less than 30 years of age. These families were either making expenditure on adults over 30 years of age or for the education of others living outside of the household or may well be paying for others in the extended family which is common in Nigeria. Another finding was that 86 families have children under 6 who are primarily attending private nurseries or kindergartens. This group spends on average 97,784NGN per year on education which is greater than any other household group. Such kindergartens also provide an element of child daycare services. Pre-school education is provided by the private sector and families are willing to pay more for this.

Some households did not spend on education due to their impoverished circumstances or did not want to contribute to the financing of people outside their immediate households. We observed that 1,582 households have zero educational expenditure and have lower income compared to those with positive expenditure. 1,279 (81%) of households from 1,582 that have zero expenditure are headed by males and 303 (10%) by females with an average annual income of 104,386 NGN and 98,400 NGN respectively. 1,072 (67.7%) of families have children between 6 and 18 years of age. Of the households headed by males, a total of 908 or 78% have children between the

ages of 6 and 18 and for female-headed households it is 164 or 54%. Overall, male-headed households not spending on education had relatively more children than female-headed households who did.

Urban households earn 336,662 NGN or 2.4 times that of rural households (228,941 NGN) and spend 70,316 NGN or 21% of their income compared to 29,600 NGN or 13% respectively. The majority of the poor and less educated live in the rural areas, earn less and are unlikely to send their household members to quality schools that can provide them with the opportunity to attend higher institutions or they may be sent to work on the farm. The probability of spending and the expectation of spending is less in rural compared to urban areas. As previously noted, studies on regional and rural-urban education disparity in China have reported consistent findings that children from less developed regions and rural areas are less likely to attend college (Qian and Smyth, 2008). Furthermore, non-agricultural households earn 1.8 times more than agricultural households and spend 18% of their income while agricultural households spend 11% of their income on education. They are mainly not educated, earn less, live in rural areas and have few public schools nearby. Most cannot afford quality education that can guarantee their households higher levels of education that will enable them to earn higher incomes.

Similarly, it was found that the key variables determining healthcare expenditure by households are the level of their total expenditure (income), the gender of the household head, the size of the household and whether the age of the household head and other members of the household are over 60 years. It is also found that the income elasticity of demand for healthcare is inelastic. Female households' heads have a larger

marginal propensity to spend on healthcare as do households with either heads or other members of the household who are more than 60 years of age. The size of the household has a significant and negative effect. Large households may not have the resources to spend as much on healthcare after other higher priority expenditures (such as food and education) are made and resource demands will increase with household size. The unconditional impact is negative and highly significant. The amount spent on each additional child reduces on average 5.7%. According to Barnes, Chadani and Feeley (2008), the demand for contraceptives is in a market building stage despite the large population and only 8.9% use modern contraceptive methods. The World Bank (2016) reported the fertility rate to be 5.7 live births.

In the healthcare expenditure profile, households spent 9% (261,446 NGN) on healthcare. The 574 families (12.2%) that did not, have a mean income of 146,727 NGN (52.8%) of income of those with positive expenditure. Households with positive expenditure have an income of 277,471 NGN with an average expenditure of 25,841 NGN (9%). For households with positive expenditure, those headed by males have on average annual income of 299,515 NGN and healthcare expenditure of 26,837 NGN (9%) while female headed households have an average income of 157,543 NGN, (52.6%) of earnings of male-headed households, yet they spent 20,418 NGN (13%) on healthcare. This has both positive and negative implications; the positive is that the health of their households is taken care of but they bear more financial burden compared to the male-headed households. Household heads over 60 years of age making positive expenditure (1,333 families) have an average income of 301,487 NGN and spend 28,690 NGN (10%) of total income. This is greater than any other group as there is greater likelihood of age-related health issues. This is important in planning

the healthcare system in Nigeria. The majority of other families making expenditure, minus those whose heads are over 60, are rural families with an income of 262.529 NGN who spend 23,157 NGN (8.8%) of total income on healthcare.

With regard to urban versus rural locations, out of the total sample of 4,683 households, 31.3% are urban dwellers earning 337,724 NGN while 68.7% of rural dwellers earn 226,755 NGN. Families in urban areas spend on average 25,696 NGN on healthcare while in rural areas the amount is 21,299 NGN despite the average incomes of urban dwellers being approximately 1.5 times more. This proportion is 8% which is less than rural households who spent on average 9%. It appears that in rural areas households are responsible for a larger share of their own medical bills than those in urban areas or due to the cost of transportation to hospitals in the cities.

The 2,571 (55%) of the household heads who have not attained secondary education earn 196,392 NGN and spend on average 21,099 NGN. 30% of household heads (1,380 families) with secondary education have average incomes of 245,361 NGN and spend 20,877 NGN annually. The household heads with post-secondary education on average earn 498,006 NGN but only spend 30,869 NGN (6%) on healthcare. This may be due to having health insurance for government employees and those working for large companies. These employees tend to have higher levels of education. Even with a higher level of income, the proportion they spend on healthcare is less. When below secondary educational level heads are compared to all other household educational categories, they spend a greater percentage of their income on health (10.7%, 8.5% and 6% of their total incomes of each category of educational level respectively).

The key variables for both education and healthcare expenditure determinants are almost positive and significant when the same variables are used for both analyses. Some variables were not significant or significant and negative as in household size which is negative and significant for healthcare but positive and significant for education. The variable denoting the rural sector is significant and negative in education but positive and insignificant in healthcare. Male-headed households in both education and healthcare are significant and negative. Likewise, the post-secondary level educated household heads are positive for both and significant only for education. While income is generally significant and positive for both, income in education is elastic overall and inelastic in healthcare. Educational attainment is one of the key factors that influences reproductive health and healthcare, especially for women. Education is a major challenge in Nigeria where there is a significant gap between literacy and educational attainment. In the survey, we found that 55% of the household heads have below secondary education, secondary education heads are 30% and post-secondary education heads are 15% while according to the World Atlas in 2015, adults above 15 years of age (59.6%) are literate while 61.4% of females are illiterate.

The percentages of total income spent on education and healthcare are high for every socio-economic group, which has a great implication for all households as this has the effect of crowding out spending on other needs. All socio-economic groups spend more on education than healthcare, demonstrating that Nigerian households pay great attention to education. The higher socio-economic groups spent more on education compared to lower groups which means there will be inequalities in educational outcomes. Higher expenditure is related to quality thereby depriving the lower groups of higher earnings.

We observed in the empirical findings that the role of income is important in education and healthcare expenditures. As income increases, expenditure also increases and also in the absolute amount spent. Families with zero expenditures in education and health all have low incomes compared to those with positive expenditures. According to the World Bank, poverty is still pervasive with 53.3 % of the masses living on less than $1.9 USD per day. The implication is that due to lack of funds the poor will be alienated from quality education since they cannot afford it or lack access to it. Therefore, they will not be able to attend higher education due to the poor quality of primary/secondary education or no education. In this global economy, the majority of the rural population in the country will be left isolated as illiterates resulting in a poor quality labor force and thereby greater inequality in household income and low productivity for the nation.

Similarly, low-income earning households will not have access to healthcare as they are unable to pay for it and this lack of care will affect individual lifetime stock of health capital resulting in an inability to earn income and thereby perpetuating poverty. When they do pay for education and healthcare it will be at a great opportunity cost and these long-term effects will also be a burden and devastating. Additionally, the percentages of spending on education and healthcare compared to their total income is high for every socio-economic group. This will be a financial burden with the lower socio-economic groups; rural dwelling, less-educated, female-headed and households with an agricultural occupation head affected to a greater extent. Female-headed households spend more than the male-headed households in the empirical results and also a greater percentage of their total income on education and healthcare spending despite male-headed households earning more. This has both positive and negative

implications; the positive being that the education and health of their households are taken care of but they will bear a comparatively higher financial burden.

Providing an enabling economic environment by increasing government funding significantly on education and healthcare in particularly low income areas will go a long way towards maximizing households' abilities for income generating activities. A well-developed healthcare financing system would improve financial risk protection against out of pocket expenditure. Targeting education for those with lower than post-secondary level would raise levels and be an indirect way of improving health as well. This will be an indirect way of raising incomes. The implication is that the majority of the poor reside in rural areas and have a tendency to spend a higher proportion of their income on healthcare. A functional community healthcare center for primary healthcare should be established or revitalized to enable a fast, medical response for the poor and to reduce transportation costs of visiting healthcare facilities in the cities for minor illnesses. The significantly negative relationship between the number of family members and healthcare expenditures is an important empirical finding. Reducing the number of children in the family through provision of easy access to birth control knowledge and devices will allow for increased expenditure on healthcare and, hence, healthier children. Households with more members aged 60 or over, spent more and should be targeted for affordable healthcare service or health insurance.

Perhaps, for education, direct expenditure programs that reward poor families who send their children to school might be effective in this situation. The government should target its spending on education relevant to the number of years of education

and the size of the population in that age cohort. The education of females should be targeted to enable them to earn higher incomes.

Finally, health and education have been observed across countries to be positively related and this relationship is strong (Grossman and Kaestner, 1997). Investment in schooling by the government might be a cost- effective way of achieving better health given the significant positive effects of education.

REFERENCES

Abbas, F., & Hiemenz, U. (2011). Determinants of public health expenditures in Pakistan. *ZEF-Discussion Papers on Development Policy*, (158).

Ahamefule Amaghionyeodiwe, L. (2009). Government health care spending and the poor: evidence from Nigeria. *International Journal of Social Economics*, *36*(3), 220-236.

Africa Health Workforce Observatory 2008

Akpomuvie, O.B (2010), Poverty, Access to Healthcare Services. African Research Review. An International Multi-Disciplined Journal, Ethiopia. Vol. 4(3a).pp.41-55

Amakon, U (2012). Public Expenditure on Education and Healthcare in Nigeria: Who Benefits and Why? International Journal of Business and Management 7(12), 48

Anyanwu, J. C., & Erhijakpor, A. E. (2009). Health expenditures and health outcomes in Africa. *African Development Review, 21*(2), 400-433.

Aregbeshola, B. S., & Khan, S. M. (2018) Determinants of catastrophic health expenditure in Nigeria. The European Journal of Health Economics. 19 (4), 521-32

Asafu-Adjaye, J. (2004). Income inequality and health: a multi-country analysis. *International Journal of Social Economics*, *31*(1/2), 195-207.

Aslam, M., & Kingdon, G. G. (2008). Gender and household education expenditure in Pakistan. *Applied Economics*, *40*(20), 2573-2591.

Babatunde, S. A. (2018). Government spending on infrastructure and economic growth in Nigeria. *Economic research-Ekonomska istraživanja*, *31*(1), 997-1014.

Bakare, A. A., & Olubokun, S. (2011). Health care expenditure and economic growth in Nigeria: An empirical study. Journal of Emerging Trends in Economics and Management Sciences (JETEMS). 2(2), 83-7

Baltagi, B. H., Lagravinese, R., Moscone, F., & Tosetti, E. (2017). Health care expenditure and income: a global perspective. *Health economics*, *26*(7), 863-874.

Barnes, J., Chandani, T., & Feeley, R. (2008). Nigeria private sector health assessment.

Becker, G. S. (1965). A Theory of the Allocation of Time. *The economic journal*, 493-517.

Becker, G. (1981). S. (1981). A Treatise on the Family. *Cambridge, MA, Harvard University Press*.

Becker, G. S., & Lewis, H. G. (1973). On the Interaction between the Quantity and Quality of Children. *Journal of political Economy*, *81*(2, Part 2), S279-S288.

Becker, G. S., & Tomes, N. (1986). Human capital and the rise and fall of families. *Journal of labor economics*, *4*(3, Part 2), S1-S39.

Blackden, C. M., & Bhanu, C. (1999). *Gender, growth, and poverty reduction: special program of assistance for Africa, 1998 status report on poverty in Sub-Saharan Africa*. The World Bank.

Brinda, E. M., Andrés, R. A., & Enemark, U. (2014). Correlates of out-of-pocket and catastrophic health expenditures in Tanzania: results from a national household survey. *BMC international health and human rights*, *14*(1), 5.

Burke, W. J. (2009). Fitting and interpreting Cragg's tobit alternative using Stata. *The Stata Journal*, *9*(4), 584-592.

Chi, W., & Qian, X. (2016). Human capital investment in children: An empirical study of household child education expenditure in China, 2007 and 2011. *China Economic Review*, *37*, 52-65.

Connelly, R., & Zheng, Z. (2003). Determinants of school enrollment and completion of 10 to 18-year olds in China. *Economics of education review*, *22*(4), 379-388.

Cragg, J. G. (1971). Some statistical models for limited dependent variables with application to the demand for durable goods. *Econometrica (pre-1986)*, *39*(5), 829.

Dutta, A., & Hongoro, C. (2013). Scaling up national health insurance in Nigeria: learning from case studies of India, Colombia, and Thailand. Washington, DC: Futures Group. *Health policy project*, *1*.

Fan, J. X., Sharpe, D. L., & Hong, G. S. (2000). Household out-of-pocket health care expenditure patterns: a longitudinal study of 1980-1995. *Consumer Interests Annual*, *46*, 170-176.

Forsberg, C. B., Musambo, B., Soeters, M., Mulambwa, R., & Joy, D. (1992). Health expenditures and attitudes in sub-Saharan setting. *Stockholm, Sweden: Karolinska Institute. Processed*.

Foster, A. C. (2016). Household healthcare spending in 2014.

Gakusi, A. E. (2010). African education challenges and policy responses: Evaluation of the effectiveness of the African Development Bank's assistance. *African Development Review*, *22*(1), 208-264.

Gao, Q., Zhai, F., Yang, S., & Li, S. (2014). Does welfare enable family expenditures on human capital? Evidence from China. *World Development*, *64*, 219-231.

Glewwe, P., & Patrinos, H. A. (1998). *The role of the private sector in education in Vietnam: Evidence from the Vietnam Living Standards Survey*. The World Bank.

Glick, P., & Sahn, D. E. (2000). Schooling of girls and boys in a West African country: the effects of parental education, income, and household structure. *Economics of education review*, *19*(1), 63-87.

Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of Political economy*, *80*(2), 223-255.

Grossman, M., & Kaestner, R. (1997). Eifects oi education on health. *The social benefits of education*, *12*, 69.

Gupta, S., Clements, B., & Tiongson, E. (1998). Public spending on human development. *Finance and Development*, *35*, 10-13.

Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica: Journal of the econometric society*, 153-161.

Hitiris, T., & Posnett, J. (1992). The determinants and effects of health expenditure in developed countries. *Journal of health economics*, *11*(2), 173-181.

Himaz, R. (2010). Intrahousehold allocation of education expenditure: the case of Sri Lanka. *Economic Development and Cultural Change*, *58*(2), 231-258.

Huy, V. Q. (2012). Determinants of educational expenditure in Vietnam. *International Journal of Applied Economics*, *9*(1), 59-72.

Ichoku H.E, (2005). The redistributive effect of healthcare financing in Nigeria. A technical report submitted to Poverty and Economic Policy Research Network, University of Laval, Canada.

Ichoku, H. E., & Fonta, W. M. (2006) The Distributional Impact of Healthcare Financing in Nigeria: A Case Study of Enugu State. PMMA Working Paper No. 17: 3-22.

Ichoku, H., Fonta, W. M., & Araar, A. (2010). A distributional analysis of out-of-pocket healthcare financing in Nigeria using a new decomposable Gini index. *CBN Journal of Applied Statistics*, *1*(1), 65-77.

Iddrisu, A. M., Danquah, M., & Quartey, P. (2017). Analysis of School Enrollment in Ghana: A Sequential Approach. *Review of Development Economics, 21*(4), 1158-1177.

Jayachandran, U. (2002). *Socio-economic determinants of school attendance in India* (No. 103).

Ke, X., Saksena, P., & Holly, A. (2011). The determinants of health expenditure: a country-level panel data analysis. *Geneva: World Health Organization*, 26.

Knaul, F. M., Arreola-Ornelas, H., Méndez-Carniado, O., Bryson-Cahn, C., Barofsky, J., Maguire, R. ... & Sesma, S. (2006). Evidence is good for your health system: policy reform to remedy catastrophic and impoverishing health spending in Mexico. *The Lancet*, *368*(9549), 1828-1841.

Lee, W. C., Jiang, L., Phillips, C. D., & Ohsfeldt, R. L. (2014). Rural-Urban differences in health care expenditures: Empirical data from US households. *Advances in Public Health, 2014*.

Lloyd, C. B., & Blanc, A. K. (1996). Children's schooling in sub-Saharan Africa: The role of fathers, mothers, and others. *Population and development review*, 265-298.

Mbugua, J. K. (1993). *Impact of user charges on health care utilisation patterns in rural Kenya: the case of Kibwezi Division* (Doctoral dissertation, University of Sussex).

Maddala, G.S. (1983), Limited Dependent and Qualitative Variables in Econometrics, Cambridge University Press, Cambridge.

Malik, A. M., & Syed, S. I. A. (2012). Socio-economic determinants of household out-of-pocket payments on healthcare in Pakistan. *International journal for equity in health*, *11*(1), 51.

Mamun, S. A. K., Khanam, R., & Rahman, M. M. (2018). The determinants of household out-of-pocket (OOP) medical expenditure in rural Bangladesh. Applied health economics and health policy, 16(2), 219-34.

Masterson, T. (2012). An empirical analysis of gender bias in education spending in Paraguay. *World Development*, *40*(3), 583-593.

Mondal, S., Lucas, H., Peters, D., & Kanjilal, B. (2014). Catastrophic out-of-pocket payment for healthcare and implications for household coping strategies: evidence from West Bengal, India. *Economics Bulletin*, *34*(2), 1303-1316.

National Bureau of Statistics; Basic information Document: Nigeria General Household Survey-Panel 2012-2013, February, 2015.

National Population Commission (Nigeria) and RTI International. 2016. 2015

Nixon, J., & Ulmann, P. (2006). The relationship between health care expenditure and health outcomes. *The European Journal of Health Economics*, *7*(1), 7-18.

Nnamdi, A. C., Sebastine, A. I., & Junior, E. O. (2015). Effects of household expenditure patterns on Nigeria poverty odds. *International Journal of Economics, Commerce and Management*, *3*(4), 1-13.

Novignon, J., & Lawanson, A. O. (2017). Health expenditure and child health outcomes in Sub-Saharan Africa. *African Review of Economics and Finance*, *9*(1), 96-121.

Nurudeen, A., & Usman, A. (2010). Government expenditure and economic growth in Nigeria, 1970-2008: A disaggregated analysis. *Business and economics journal*.

Nwosu, E. J. (2000). The Challenge of Poverty in Africa. Owerri, Skill Mark Media Ltd.

Obi, Z. C., & Obi, C. O. (2014). Impact of government expenditure on education: The Nigerian experience. International Journal of Business and Finance Management Research, 2(2104), 42-48.

Ogundari, K., & Abdulai, A. (2014). Determinants of household's education and healthcare spending in Nigeria: Evidence from survey data. *African Development Review*, *26*(1), 1-14.

Ogundari, K., & Awokuse, T. (2018). Human capital contribution to economic growth in Sub-Saharan Africa: Does health status matter more than education? *Economic Analysis and Policy*, *58*, 131-140.

Ogundipe, M. A., & Lawal, N. A. (2011). Health expenditure and Nigerian economic growth. Eur J Econ Finance Adm Sci. 30, 125-9.

Olaniyan, O., & Lawanson, A. (2010, March). Health expenditure and health status in Northern and Southern Nigeria: a comparative analysis using NHA framework. In *CSAE conference held at St Catherine College, University of Oxford, Oxford, UK* (pp. 1-18)

Olasehinde, N., & Olaniyan, O. (2017). Determinants of household health expenditure in Nigeria. *International Journal of Social Economics*, *44*(12), 1694-1709.

Omotosho, O., & Ichoku, H. E. (2016) Distributional Analysis of Household Health Expenditure in Nigeria. Developing Country studies.Vol.6 No.9

Onwujekwe, O. E., Uzochukwu, B. S., Obikeze, E. N., Okoronkwo, I., Ochonma, O. G., Onoka, C. A., ... & Okoli, C. (2010). Investigating determinants of out-of-pocket spending and strategies for coping with payments for healthcare in southeast Nigeria. *BMC health services research*, *10*(1), 67.

Organisation for Economic Co-operation and Development (OECD). (20100) Value for money in Health Spending, Paris: OECD Publishing

Osungbade, K. O., & Oladunjoye, O. O. (2012). Prevention of congenital transmission of malaria in sub-Saharan African countries: challenges and implications for health system strengthening. *Journal of tropical medicine*, *2012*.

PharmAccess- Nigeria

Preston, J., & Hammond, C. (2003). Practitioner views on the wider benefits of further education. *Journal of Further and Higher Education*, *27*(2), 211-222.

Pushikar, M. (2003). Schooling and educational attainment: evidence from Bangladesh. *Education Economics, 11*(2), 129-153.

Qian, X., & Smyth, R. (2008). Measuring regional inequality of education in China: widening coast–inland gap or widening rural–urban gap? *Journal of International Development: The Journal of the Development Studies Association*, *20*(2), 132-144.

Qian, J. X., & Smyth, R. (2011). Educational expenditure in urban China: income effects, family characteristics and the demand for domestic and overseas education. *Applied Economics*, *43*(24), 3379-3394.

Rout, H. S. (2006). Influence of income and education on household health expenditure: the case if tribal Orissa. The Orissa Journal of Commerce.Vol.XXXIII.No 1, pp.133-144

Sackey, H. A. (2007). The determinants of school attendance and attainment in Ghana: a gender perspective.

Schaffner, J. (2004). The determinants of schooling investments among primary school aged children in Ethiopia. *World Bank Working Paper Series, Washington: World Bank.*

Schultz, T. W. (1960). Capital formation by education. *Journal of political economy*, *68*(6), 571-583.

Schultz, T. P. (1999). Health and schooling investments in Africa. *Journal of economic perspectives*, *13*(3), 67-88.

Subramanian, S., & Deaton, A. (1996). The demand for food and calories. *Journal of political economy*, *104*(1), 133-162.

Tansel, A. (1997). Schooling attainment, parental education, and gender in Cote d'Ivoire and Ghana. *Economic Development and Cultural Change*, *45*(4), 825-856.

Tansel, A., & Bircan, F. (2006). Demand for education in Turkey: A tobit analysis of private tutoring expenditures. *Economics of education review*, *25*(3), 303-313.

Tobin, J. (1958). Estimation of relationships for limited dependent variables. *Econometrica: journal of the Econometric Society*, 24-36.

Van Doorslaer, E., O'Donnell, O., Rannan-Eliya, R. P., Somanathan, A., Adhikari, S. R., Garg, C. C., & Karan, A. (2006). Effect of payments for health care on poverty estimates in 11 countries in Asia: an analysis of household survey data. *The lancet*, *368*(9544), 1357-1364.

Waddington, C. J., & Enyimayew, K. A. (1989). A price to pay: The impact of user charges in Ashanti-Akim district, Ghana. *The International Journal of Health Planning and Management*, *4*(1), 17-47.

Wagstaff, A. (1986). The demand for health: some new empirical evidence. *Journal of health economics*, *5*(3), 195-233.

Wong, S. Y., & Yusoff, R. (2015). An Empirical Study of Education Expenditure, Health Care Expenditure and Economic Growth in Malaysia using Granger Causality Approach. *Malaysian Journal of Business and Economics (MJBE)*, *2*(2).

World Bank data base 2015. (See http://apps.who.int/nha/database)

World Bank (2016). World Development Indicators Database, the World Bank.

World Health Organisation, Africa (WHO, Africa) (2013), State of Health Financing in the African Regions

Xu, K., Saksena, P., Jowett, M., Indikadahena, C., Kutzin, J., & Evans, D. B. (2010). Exploring the thresholds of health expenditure for protection against financial risk. *World health report*, (19).

Yen, S. T., & Jones, A. M. (1996). Individual cigarette consumption and addiction: a flexible limited dependent variable approach. *Health economics*, *5*(2), 105-117.

Yen, S. T. (2005). Zero observations and gender differences in cigarette consumption. *Applied Economics*, *37*(16), 1839-1849.

You, X., & Kobayashi, Y. (2011). Determinants of out-of-pocket health expenditure in China. *Applied health economics and health policy*, *9*(1), 39-49.

Zheng, X. & Zimmer,D.M. (2008). Farmers' Health Insurance and Access to Healthcare. American Journal of Agricultural Economics, 90(1), 267–279.

Zimmerman, F. J. (2001). Determinants of school enrollment and performance in Bulgaria: The role of income among the poor and rich. *Contemporary Economic Policy*, *19*(1), 8

APPENDIX

Variables Description

Variables	Descriptive
Dependent variables:	
Education expenditure	Probability=0,1), Conditional(log of total household education expenditure)
Health expenditure	Probability=(0,1), Conditional(log of total household healthcare expenditure)
Independent variables:	
Income	Log of Real Total Mean Food/Non-food Expenditure Per Year
Gender	=1, If Household Head is Male, 0 otherwise
Occup	=1, If Occupation of Household Head is Agriculture, 0 otherwise.
Sector	=1, if Household lives in Rural area, 0 otherwise
Age1 *(Base category)*	If Age of Household Head is < 30years
Age2	If Age of Household Head is between 31-40years
Age3	If Age of Household Head is between 41-50years
Age4	If Age of Household Head is between 51-60
Age5	If Age of Household Head is above 60years
Agehh	=1 if age of household head is >60years, 0 otherwise
Educ1 *(Base category)*	If Educational level of Household head(Below/primary
Educ2	If educational level of Household Head is secondary
Educ3	If educational level of Household Head is Post-secondary
Inter	Interaction of household educational level and income
hhsize	Number of Members in the Household
AgeNo_0-5	Number of households in this age range
AgeNo6_10	Number of household members in this age range
AgeNo11_18	Number of household members in this age range
AgeNo19_30	Number of household members in this age range

AgeNo0-60(Base category)	Number of household members in this age range
AgeNo-60	Number of household members > 60years of age