GENDER PATTERNS IN HOUSEHOLD HEALTH EXPENDITURE ALLOCATION IN NIGERIA

BY

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ABSTRACT

Healthcare seeking behaviour among household members often depends on the decision-making structure and headship of the household. In Nigeria, the male is assumed to be *de-facto* head who takes daily socio-economic household decisions that relate to financial allocations. The implication of this is a possible gender bias in the decision-making and outcomes. While gender bias has been examined within households in Nigeria generally, its incidence and influence on healthcare needs, utilisation and spending have received little or no attention. This study, therefore, analysed gender patterns in household health expenditure allocation in Nigeria through the decision-making processes preceding the expenditure.

A non-cooperative bargaining theory of household was applied. It permits individuals to control his or her resources while ensuring they contribute toward the welfare of other members. A combination of the Hurdle model and Engel curve approach was used. The Hurdle model involved healthcare needs, utilization, spending decision and healthcare (conditional) expenditure. The first three stages of the model were estimated through probit technique, while the last stage was estimated through Ordinary Least Squares (OLS) technique. The Engel curve (unconditional healthcare expenditure) was also estimated using OLS. The models were estimated at both household and individual levels. They were structured to take care of life-cycle implications of gender patterns by examining effects of age in years and age groups (0-9, 10-19, 20-39, 40-59 and 60+) on healthcare decisions. Data were drawn from the 2010 Harmonised Nigeria Living Standard Survey (HNLSS) conducted by the National Bureau of Statistics (NBS). The survey covered 332,938 individuals drawn from 73,329 households in the six geo-political zones. Analyses were conducted nationally, for urban and rural households and data were analysed at $p \leq 0.05$.

Significant differences in gender patterns of household health expenditure allocation were observed at both household and individual levels. Females reported a high incidence of illness ($\beta=0.038$), utilised more healthcare ($\beta=0.038$) and got more conditional health expenditure allocation ($\beta=0.043$). At the household level, female groups significantly exhibited more healthcare needs than their corresponding male

groups, except in age 0-9 where males exhibited more needs. Also, a similar pro-female pattern was exhibited at utilisation and spending decision stages but different with the pattern of health expenditure. While more spending was allocated to male 0-9, and beyond age 19, the pattern was reversed as females got significant allocations more than their male counterparts at the adult life-cycle. Urban and rural households also followed the pro-female pattern. Generally, health expenditure increased at younger age, declined as individuals grew but later increased at old age. Expenditure by females increased more rapidly compared to males at old age.

It was remarkable that females got more allocation than males in household health expenditure by age and location in Nigeria. Therefore, health expenditure allocation, particularly by government, should reflect this pattern and difference.

Keywords: Health seeking behaviour, Non-cooperative bargaining, Household health expenditure allocation, Probit technique.

Word count: 461

DEDICATION

To

THE GOD ALMIGHTY
(Omnipresent)

Who made this vision to become a reality

And to

My beloved
OLAYINKA
The strength behind this venture

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So then it is not of him that willeth, nor of him that runneth, but of God that sheweth mercy. Romans 9:16 KJV

To God the Father, Son and the Holy Spirit be all glory, honour and adoration for being faithful to His promise to be with me at every phase of this doctoral voyage. I say thank You Lord.

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There are so many others who contributed in diverse ways towards bringing this vision to reality, whose names are missing, most especially, you, the reader. Honestly, words cannot express my heartfelt gratitude to you.

CERTIFICATION

We certify that this work was carried out by Noah Adeoye Olasehinde under our supervision in the Department of Economics, University of Ibadan, Nigeria.

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CHAPTER ONE

INTRODUCTION

1.1 The preamble

A household is a collection of individuals who behave as if in agreement on how best to combine time, goods purchased in the market and goods produced at home to produce commodities that maximize some common welfare index (Hjortsberg, 2000). Decisions such as: accommodation, income generation, investment and consumption expenditure, as well as children composition, constitute common dilemmas households face. The intra-household dynamics of decision making and resource allocation have greatly impacted on the well-being of its members and the community it belongs. Though many factors influence this dynamics within households, whoever controls household resources determines the household behaviour given the diverse preferences among the composing members (Angel-Urdinola and Wodon, 2010).

Haviland (2003) defined the household as "the basic residential unit in which economic production, consumption, inheritance, child rearing, and shelter are organized and carried out". The household is the basic unit of analysis in many social, microeconomic and government models which refers to all individuals sharing the same dwelling. In economics, a household is a person or a group of people living in the same residence, though most economic models are silent on whether the household members are traditionally family members (Sullivan and Sheffrin 2003). Therefore, the household is seen as individuals or groups living together under the same roof with joint cooking facility, or living separately, but under the control of one domestic head.

It has been widely established and acknowledged that, a healthy populace is inevitable in achieving meaningful developments in any nation. Health is seen as a function of the overall integrated development of socio-cultural, economic, educational and political factors whose performance affect people's lives and livelihood (Rout, 2006b). The increasing utilization of health care services has become the prime goal for many developed and developing countries. Provision of medical and related services is aimed at maintaining good health, especially through preventive and curative health care services. Therefore, health status and quality of life are the characteristics of individuals and the households in which they reside.

Bloom and Canning (2003) have shown the following four ways through which healthier individuals might affect the economy: they might be more productive at work and so, earn higher incomes; they may spend more time in the labour force, as less healthy people take sickness absence or retire early; they may invest more in their own education which will increase their productivity; and they may save more in expectation of a longer life (for retirement), increasing the funds available for investment in the economy. This implies that, health is indeed closely intertwined with economic growth and sustainable development.

There is further evidence that, investment in health brings huge benefits for the economy. The growth rates of several developing countries during the period 1965 to 1994 show that each 10 percent improvement in life expectancy at birth (LEB) is associated with a rise in economic growth of at least 0.3 to 0.4 percentage points per year, holding other growth factors constant. The difference in annual growth therefore, accounted for, by LEB between a typical high income country (LEB = 77 years) and a typical least-developed country (LEB = 49 years) is about 1.6 percentage points per year, which cumulates to enormous effects over time. Conversely, ill health is a heavy financial burden as 50% of the growth differential between rich and poor countries is due to ill-health (Commission on Macroeconomics and Health, 2001).

Underscoring the globally acknowledged impact of health in September 2000, 189 countries ratified the United Nations Millennium Declaration consisting of a set of goals, targets and indicators. These goals (known as the Millennium Development Goals or MDGs), have three among the eight directly linked with health[1]. In fact the other five are health enhancing.

All over the world, government has a responsibility to provide for the health of its population, and most importantly, poor households. There should be financial protection (safety net) for those who could not adequately afford to pay for their health. This is because, ill health costs can be substantial in countries where people are not financially protected. Such costs include both direct expenses, such as out-of-pocket payments (OOP) for medical treatment, and indirect costs, such as the loss of income from an inability to work or travel to a healthcare facility. These expenses often constitute a large share of a household disposable income and drive many into poverty the more (Leive and Xu, 2007). In addition to these, there are differences in intra household consumption of health as in other goods, and one basic area of difference is gender.

Gender implies economic, social and cultural attributes and opportunities associated with being a male or a female all through the ages. These far-reaching variations have stirred high level of curiosity since they behaved in different ways, (UN-Habitat 2003). Though, sexual differences in biological terms basically cannot be changed, gender differences which means social disparity in roles and relationships between males and females vary, depending on time and place and they can change, since they are defined by people's way of thinking and sense of values (JICA, 2011). Therefore, gender analysis entails having a knowledge of both males' and females' roles and responsibilities, as it is the comparative analysis between these that will highlight the gender inequalities of any society.

[1] The three are Goal 4 (reduce child mortality), Goal 5 (improve maternal health) and Goal 6 (combat HIV/AIDS, malaria and other diseases).

Interestingly, household economics has been closely linked to gender issues, especially the work and status of women within the family and the household (Sen, 1987) with health as one of the most striking and continually documented differences between men and women or boys and girls (even children versus adults). Studies have investigated the factors responsible for the differences to include different experiences, behaviour, social norms and status (power) of men and women (Rout, 2006a and Braido *et al*, 2012). In emphasising the role of gender in achieving the MDGs, Doyal (2005) chronicled the gender issues underlying each goal and gender-sensitive indicators developed for each target.

1.2 The problem

Man is naturally assumed to be de facto household head and saddled with the responsibility of taking daily socioeconomic household decisions with the attendant financial implications; however, early death, economic realities as well as some ambiguous behavioural differences often serve as imperatives for the existence of female-headed households (Braido *et al*, 2012). Thus, the gender pattern of a household is often determined by the roles and responsibilities of the respective head. However, that gender is an important social division characterized by inequality, does not imply that either males or females are worse off than each other, rather, it influences people's perspectives and their social expectations (Sen, 1987).

Resource allocation within household has always relied on market value hypothesis which ensures that, resources are allocated to members according to their expected returns in the labour market (Gao and Yao, 2004). This allocation is affected by many cultural, religious and traditional norms and laws. This hypothesis, no doubt, leads to unequal allocation of resources within a household due to the preferences shared by all household members that support this inequality. A growing body of literature on developing nations is challenging the appropriateness of the market value hypothesis, due to the fact that, its inherent intra-household inequality is a major setback for public policy that

aims to promote the welfare of individuals[2] (Mattila-Wiro, 1999). In fact, the hypothesis has constrained children and female members to a lesser position.

The vast literature documenting the allocation of household resources confirms the existence of gender biasedness (Pitt, Rosenzweig and Hassan, 1990; Strauss and Thomas, 1995; Alderman and Gertler, 1997, Kingdon, 2005 Dauphin *et al*, 2011 and Kirchberger, 2012) manifested majorly through nutrition, health and education. Also, by examining the coefficients of household age and gender groups, intra-household resource allocation shows how household expenditure on particular types of goods and services vary with the age and gender composition of the household (Lina, 2008).

However, taking the household data as a block often neutralises gender differences in consumption, because it does not allow for studying the relationship between household composition and household consumption patterns. Deaton (1997) illustrated that "if the consumption of (say) food relative to non-food depends on the ratio of males to females in the household, then we have established that allocations depend on gender, … and in particular, whether they are the result of tastes or of discrimination". Some goods, by their very nature, are only consumed by a subset of family members, that is, they are exclusively used by some members or some groups and not others, such as men versus women or adults versus children (adult clothing, women's clothing, alcohol, tobacco, or baby formula and lots more are in these categories). In health expenditures, intra-household gender differences could be as a result of value of health in household production (specifically, child bearing and rearing), the opportunity cost of foregone wages when consulting a healthcare provider (Kingdon and Irving, 2008).

It has been confirmed that household is the major financial organ of health care in Nigeria (more than 60 percent of total healthcare expenditure) in spite of the introduction of National Health Insurance Scheme (NHIS), a federally funded social health insurance scheme (Onwujekwe *et al*, 2010).

[2] The welfare of the individual is usually equated with the average welfare of the household assuming that the household allocate resources according to needs.

However, with the lopsided income distribution among these households, coupled with high poverty incidence, poor households are definitely more adversely affected resulting in no medication (only result to prayer), self-medication and some consult quacks among the already poverty-stricken households, who are unfortunately in the majority. This calls to question, the stewardship role of Nigerian governments at all levels towards reducing the OOP expenditures. This is reinforced in Abuja declaration of committing 15 percent of government total expenditure to health and considering the fact that, key health issues like immunisation, malaria, HIV/AIDS are largely funded by development partners. Hitherto, at various levels of government, expenditure on health is still significantly small. This situation is inimical for the health status of the country where households bear the burden of health care expenditure through OOP expenses, thereby reducing access, especially by the vulnerable groups.

Low household health expenditure, as observed in many developing countries, depends not only on accessibility factors (proximity and cost), but also on patterns of health seeking behaviour, defined as a constellation of activities and beliefs exhibited by individuals and their social circle in response to bodily indications perceived as symptoms (Jegede and Odumosu, 2003). In developing countries, especially in Africa, the centrality of household health production and delivery is a reflection of the gendered division of labour. This gendered division of labour assigns the task of household reproduction and maintenance to women as the main caretakers (especially for children and the aged). Studies have shown that with more empowerment, women direct household resources toward improving their caring capabilities, skills and practices which ultimately stimulates the health and nutritional status of household members (Thomas, 1997; Smith and Byron, 2005). However, despite this effort, household expenditures within the developing nation contexts commonly reflect patterns of female discrimination.

The market value hypothesis which predicts higher spending on male health is bound to fail in a largely informal economy like Nigeria, due to men's

higher opportunity cost of reporting sickness. It is possible that women (mostly of childbearing and maternal ages) receive higher health expenditures relative to their (higher-earning) male counterparts if women's non-market work is valued and if the opportunity cost of their time (for consulting a medical practitioner) is lower than that of men (Kingdon and Irving 2008).

Given different roles and contributions of men and women at different ages, it is pertinent to explore the extent and nature of gender patterns by age in household health expenditure allocation in Nigeria, so as to know who actually benefits more in household resource allocation towards health care expenditures.

The kernel of this study, which is curative health expenditure, has some decision stages preceding the expenditure stages. Though, this expenditure should not be gender discriminating since it is illness that determines expenditure allocation but evidence abound that several households are gender-biased in the allocation (Gao and Yao, 2006). Kingdon and Irving (2008) held that there could be gender differentials in morbidity, consultation practises and medical expenses while the candidate factors accounting for these observed disparity are culture/social factors; nature of illness men and women are particularly vulnerable; and economic realities. This disparity could also manifest in the stages preceding the when actual healthcare spending is done.

1.3 The research questions

As observed by Kingdon and Irving (2008), the four sequential mechanisms through which gender differences may occur in medical expenditure represent the stages to be examined in this study. To this extent, the following questions are to be answered by this research:

i. What is the effect of gender patterns of household members on their healthcare needs?

ii. What is the effect of gender patterns of household members on their healthcare utilisation?

iii. What is the effect of gender patterns of household members on their healthcare spending decisions?

iv. What is the effect of gender variations on both conditional and unconditional healthcare expenditure allocations in Nigeria?

1.4 The objective

Broadly, this study examines gender patterns in household health expenditure allocation, so as to derive a more vivid understanding of household decision-making processes regarding health seeking behaviour. Specifically, it empirically assesses the effects of:

i. gender patterns of household members on their healthcare needs;

ii. gender patterns of household members on their healthcare utilisation;

iii. gender patterns of household members on their healthcare spending decisions; and

iv. gender variations on both conditional and unconditional healthcare expenditure allocations in Nigeria.

1.4 The justification

Faced with lower contribution of social insurance to healthcare financing in Nigeria, households bear the heaviest burden of health expenditure at the national, state and local levels. With high incidence of poverty in the land, the burden of this health care expenditure would be exacerbated for poor households (Soyibo, 2005). Also, since Soyibo *et al*, (2009) asserted that health expenditure in Nigeria almost neglected preventive care and other services that have potential to save cost substantially in favour of curative care; it is justifiable to examine expenditures on curative services.

The multiplier effect of healthcare expenditures on the level of health of the population in both short and long run and its potential for economic

development compelled researchers to pay particular attention to health expenditure allocation at household level in developed countries (Culyer, 1988; Hitiris and Posnett, 1992; Rous and Hotchkiss, 2003; Su *et al*, 2006; Gül and Çağatay, 2009) and developing countries (Parker and Wong, 1997; Hjortsberg, 2000; Case and Deaton, 2002; Rout, 2006b; Leive and Xu, 2007). But only few have researched into the gender issues (Verbrugge, 1985; Gao and Yao, 2006; Rout, 2006a). While some of the studies found gender discriminations in household health expenditure allocation, others did otherwise. However, this variance in the literature formed the thrust of this study.

Although, a study similar to this has been done for South Africa by Kingdon and Irving (2008), the structure of economy, population and ethnic diversity, the health structure and host of other national features of South Africa are extremely different from those of Nigeria. Hence, this study attempts to examine the Nigerian case.

Studies on health care and health expenditure utilization in Nigeria have been conducted up to the recent period (Jegede and Odumosu, 2003; Bassey *et al*, 2010; Angel-Urdinola and Wodon, 2010; Olaniyan and Lawanson, 2010; Onwujekwe *et al*, 2010, 2011; Bakare and Olubokun, 2011; Odubunmi, 2013), these studies did not capture gender issues while some of them covered few states of the federation. For instance, Jegede and Odumosu (2003) focussed on Yoruba-speaking South-Western Nigeria while Onwujekwe *et al*, 2010 focussed on Igbo-speaking South-Eastern Nigeria. These studies are limited in scope and coverage. However, a Nigerian study close to this thesis is Mbanefoh *et al*, (1997) which assessed the level of healthcare utilization and expenditure using household survey conducted in 1991 in six (out of the then existing thirty) states, one from each geo-political zones to represent the whole nation. The Nigerian population in 1991 stood at a little below 89 millions, which is about 55 percent of the 2011 population estimate. This, therefore, necessitated the conduct of a study using updated and recent data which covers the entire country and confirm how gender situation has reflected in the outcome of health care decisions of individuals and households in Nigeria. However, earlier

studies did not investigate both household and individual levels, and to this extent, this study adds to the existing empirics.

Furthermore, the unconditional ordinary least square (OLS) has been widely used for empirical analysis in the literature (Duan *et al*, 1983; Mbanefoh *et al*, 1997; Case and Deaton, 2002; Gao and Yao, 2006). However, this technique has been plagued with few constraints which include its inability to reveal how gender differentiation evolves through various stages leading to the household healthcare behaviour. Also, it only explains the households' decisions for incurring healthcare expenditure through households' aggregate data which in most cases includes zero medical expenditure. Thus, to overcome these challenges, this study adopts hurdle model method of Kingdon and Irving (2008) by constructing the sequence of decision stages preceding determination of healthcare expenditure, using individual-level data in detecting gender differentiated behaviour within the household, regarding illness report, treatment consultation and positive medical expenditure. This is examined within the framework of household health expenditures using recent data in Nigeria. This is imperative because it will help to enhance the possibility of reducing the intra-household inequality and promote the welfare of individuals and households in general.

1.5 The scope

The study utilises the Harmonized Nigeria Living Standards Survey (HNLSS), a cross-sectional data collected by National Bureau of Statistics (NBS) in 2010 to explore a better understanding of the current health care system. It is the most recent national household survey conducted in Nigeria. The units of analyses in the study are households and individuals, which geographically covers national, urban and rural populations. Also, the health expenditure considered is payments on the following curative services - consultation fees, medication (consultation, laboratory and drugs or injections), hospitalization, transport to hospitals, vaccination, therapeutic equipment as well as other expenditures on curative health not easily captured.

1.6 The plan

The study is organsed into six chapters. In addition to chapter one, chapter two presents some stylized facts on gender and Nigerians' household health expenditure, while chapter three reviews the related literatures on economics of households. Chapter four contains the theoretical framework and the research methodology for the study. Chapter five shows the empirical analysis, while chapter six includes summary, conclusion and recommendations.

CHAPTER TWO

STYLIZED FACTS ON GENDER AND NIGERIANS' HOUSEHOLD HEALTH EXPENDITURES

2.1 Introduction

This chapter presents the background to the study. It provides explanation on the Nigerians' household and its composition, healthcare system, governance, policy structure and healthcare financing in Nigeria.

2.2 Household composition in Nigeria

Nigeria is a West African country along the eastern coast of the Gulf of Guinea, just north of the equator. It is bordered on the west by Benin, on the north by Niger and Chad, and on the east by Cameroon and covers an area of 923,768 square kilometres.

Pre-independent Nigeria consists of various separate cultural, ethnic, and linguistic groups, who live in kingdoms and emirates with traditional but sophisticated systems of government. The country has three main environmental regions: savannah, tropical forests, and coastal wetlands. These environmental regions greatly affect the cultures of the people who live there. The dry, open grasslands of the savannah make cereal farming and herding a way of life for the Hausas and the Fulanis. The wet tropical forests to the south are good for farming fruits and vegetables – main income producers for the Yorubas, Igbos, Ijaws and others in this area. The small ethnic groups living along the coast,

such as the Ijaw and the Kalabari, are forced to keep their villages small due to lack of dry land. Living among creeks, lagoons, and salt marshes makes fishing and the salt trade part of everyday life in the area.

Though, Nigeria comprises three regions of the North, East and West at independence in 1960, it currently operates a federal structure with three tiers of government - federal, states and local governments. It comprises 36 States and the Federal Capital Territory (FCT), as well as 774 Local Government Areas (LGAs) with total population of about 162.5 million (2011 World Bank estimate). Also, the country is presently structured into six geo-political zones of North-Central, North-East, North-West, South-East, South-South and South-West.

Economically, Nigeria's history and development have been directly linked to its agricultural sector. The country depends almost entirely on agriculture for food and agro industrial raw materials provided gainful employments to over 75 percent of the country's labour force and satisfactory livelihood to over 90 percent of the population at the time of the country's independence (AHWO 2008). Over the years, this sectoral dominance, especially in terms of the country's foreign exchange earnings, gave way to petroleum upon the discovery of oil. Since early 1980s, oil production has accounted for more than two-thirds of the gross domestic product (GDP) and more than 80 percent of total government revenue. The country is the 12th largest producer of petroleum in the world and the 8th largest exporter. It has the 10th largest proven reserves and is also a founding member of Organization of Petroleum Exporting Countries (2010 Annual Report of Central Bank of Nigeria).

A social structure that is very vital to most Nigerians is household, which is usually made up of people who are related by blood, marriage, or adoption. Culturally, most Nigerian ethnic groups practice patrilineal descent and have patriarchal authority[3]. They have patrilocal rule of residence, and are

[3] In patrilineal family pattern, the blood line or consanguinity is traced through the father while it is traced to the mother under matrilineal pattern.

generally patricentric in outlook. The children are socialized with this arrangement in mind, and female children are consciously socialized to serve and be subordinate to males. This hierarchical structure has sometimes led to dissolution of marriages on the grounds of the birth of only or mostly female children (Omokhodion 1996).

The three recognised forms of marriage in the country are marriages performed under any of the three registered laws; these are civil, customary and Islamic laws. The major striking difference among them is that, civil marriage law accommodates only monogamous marriage, while polygamy is authorised under customary and Islamic laws (CEDAW, 2003). The 2008 Demographic and Health Survey (DHS) found that 33 percent of married women are in polygamous unions.

In civil marriages, parental authority is shared by the mother and father, but husbands alone make decisions about the health and education of their children in two-thirds of Nigerian households (WACOL, 2008) while about 56 percent of women report that their husbands make decisions concerning their wives' health care in the 2008 DHS. Under a civil marriage where a deceased man leaves a will, widows are guaranteed the right to inherit at least one-third of the couple's property. However, in cases where husbands have left no will, customary law dictates inheritance rights, but daughters' inheritance rights vary considerably across the country and does not grant female equal inheritance rights with males (CEDAW, 2006).

Until recently in Nigeria, bearing many children was a status symbol, despite that, it poses enormous economic burdens on the households. Urbanization and migration with the attendant economic factors are redefining the household structures in Nigeria, and this is becoming notable through the gradual reduction of the household size. However, the traces of the extended family system (*of being our brothers' keepers*) ensure that households still function slightly differently from the typical Western countries. In most parts of Nigeria, family linkage and consanguinity are very important. Thus, people have fourth, fifth, or sixth cousins and may even refer to people from the same

village or town with them as brothers or sisters and create associations to sustain the linkage. As at 2008, a process of reviewing existing family laws was undertaken by the Nigerian Law Reform Commission, with a view to eventually proposing a new, comprehensive family law (CEDAW, 2008).

Table 2.1. Percentage distribution of household size by residence, zone and gender

Size	1	2	3 – 6	7 and Above	Average
National	2.9	5.3	51.8	40	4.7
Urban	4.2	6.1	53.8	35.9	4.3
Rural	2.4	5	51.2	41.4	4.8
North Central	2.8	4.4	52.2	40.6	4.7
North East	1.5	3.8	44.4	50.3	5.2
North West	0.9	3.7	47.4	48	5.3
South East	3.5	7.3	57.4	31.8	4.2
South South	5.4	6.6	53.9	34.1	4.0
South West	6	8.4	62.3	23.3	3.7
Gender of household members					
Male	3.6	4.7	51.8	39.9	4.7
Female	2.0	5.8	51.9	40.3	4.6

Source: NBS Harmonized Nigeria Living Standards Survey (HNLSS), 2010

Nationally, the composition of household size (see table 2.1) shows that households with family members between 3-6 people are very high and closely followed by households with 7 people or more, affirming that, households in Nigeria are relatively large. Sectorally, rural households are larger than urban households, confirming that Nigeria is a predominant rural setting. Distribution of household size by gender reveals that there are more females than males in the household composition nationally; this has implication on the economy where men are seen as the de facto household heads.

Though, World Bank has classed Nigeria as a lower-middle income country, so many households are considered poor averagely, since most of them live below 1 dollar per day and predominantly scattered in rural areas with very little or no infrastructural facilities to make life meaningful. The National Bureau of Statistics (NBS) put 2004 poverty level at 54.4 percent in its 2009 Annual Abstract of Statistics with the tendency to become worse in future.

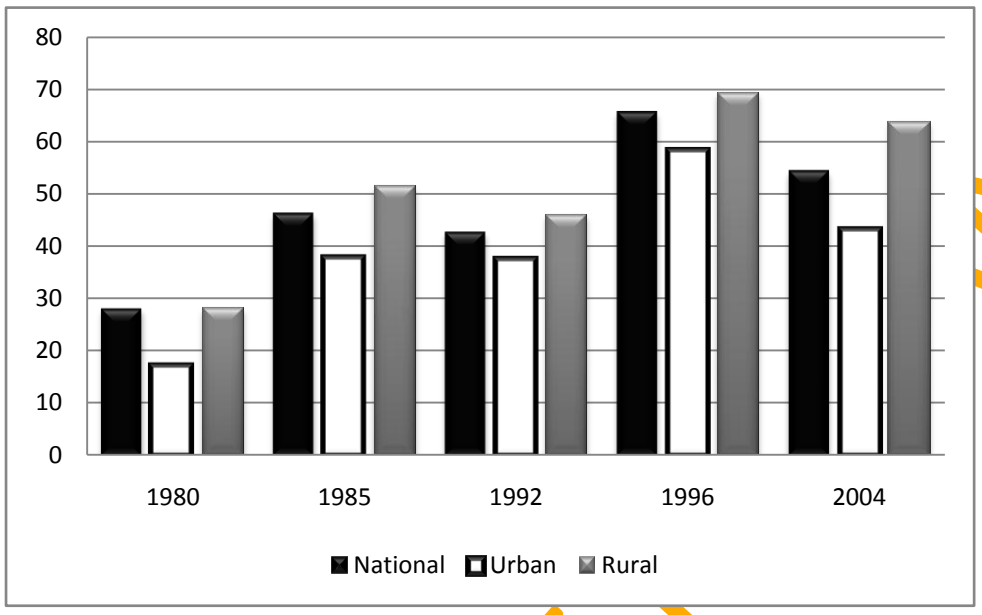
Table 2.2. Percentage spread and trend in poverty levels

Year	North Central	North East	North West	South East	South South	South West
1980	32.2	35.6	37.7	12.9	13.2	13.4
1985	50.8	54.9	52.1	30.4	45.7	38.6
1992	46.0	54.0	36.5	41.0	40.8	43.1
1996	64.7	70.1	77.2	53.5	58.2	60.9
2004	67.0	72.2	71.2	26.7	35.1	43.0

Source: NBS Annual Abstract of Statistics, 2009

More so, poverty in Nigeria is region-specific and generally worse in the North than in the South (see table 2.2). This portends the image of households in Nigeria. Also, there is predominance of poverty in rural areas than in urban centres (figure 2.1).

Figure 2.1. Percentage of urban, rural and national poverty rate



Source: *Plotted from NBS Annual Abstract of Statistics, 2009*

This mortifying scenario has been persistently linked to the high household size which connotes high dependency burden, especially when the age structure is reflected. Also, from a gender perspective, household size with age distribution would indicate the domestic burden of women who are charged with household welfare. In 2009, the national average dependency ratio was 0.72, higher in rural (75 percent) than in urban (65 percent) (see table 2.3).

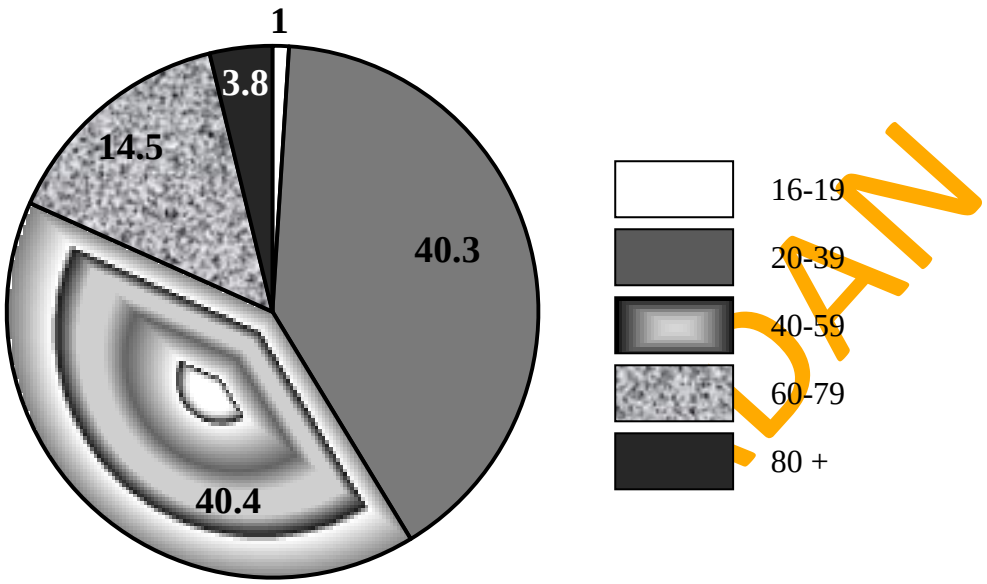
Table 2.3. Percentage distribution of dependency ratio by residence, zone and household size, 2006

	Age Group			Dependency Ratio
Household	***0 -14***	***15-64***	***65 +***	
National	37.2	58.2	4.7	0.72
Urban	33.9	60.7	5.4	0.65
Rural	38.3	57.3	4.4	0.75
North Central	36.6	59.6	3.8	0.68
North East	41.6	55.5	2.9	0.80
North West	43.2	53.9	2.9	0.86
South East	29.8	61.7	8.5	0.62
South South	30.2	64.8	5.0	0.54
South West	32.1	59.6	8.3	0.68

Source: NBS Harmonized Nigeria Living Standards Survey (HNLSS), 2010

The age distribution shows that 15-64 years accounted for 58.2 percent of the national population, 37.2 percent for those less than 15 years, while 4.7 percent represents those aged 65 years and above (table 2.3). The potential income earners (15-64) are much lower in rural areas than in urban areas, confirming higher dependency ratio of the rural area. This implies that, efforts of those who constitute the active working population may not be good enough to ameliorate the household poverty in Nigeria.

Figure 2.2. Percentage distribution of heads of household by age groups, 2006



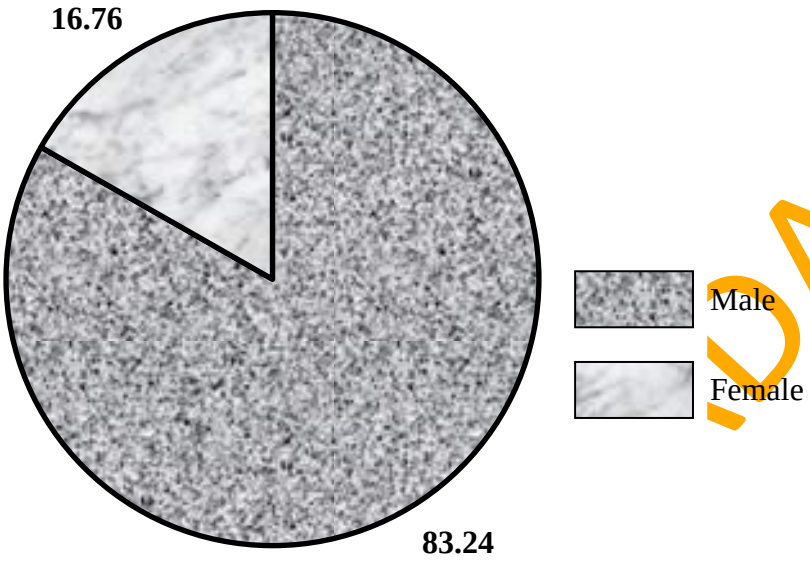
Source: Drawn by the author from NBS Annual Abstract of Statistics, 2009

Most Nigerian households are headed by working age group (age 20-59) representing 80.7 percent while the remaining 19.3 percent is headed by dependants (figure 2.2), this may be a single-person household who directly fends for himself or herself, while making decisions will be largely determined by the income earning capacity of such individuals.

Another unique feature of Nigerians' households is the existence of a loose matrilineage and use of various terms to describe households and unions. For instance, households headed by women may be because the women are widows or have been divorced, while some might even be *outside wives*[4]. The men involved are mobile husbands who move among their numerous partners, support them financially and sometimes stay with them for some days. In many instances, these outside wives are known to the original wives. Not only that, some might eventually be brought in to cohabit with the original wives while some might not. Though, those who are not part of the culture may find this practice confusing, those involved appear to manage it well. However, the Nigerian legal system is improvising ways of accommodating such women and their children (CEDAW, 2008).

[4] Women who function as wives to married men who live with their original wives and have extra wives outside their homes.

Figure 2.3. Percentage distribution of gender composition of the household heads, 2006



Source: Drawn by the author from NBS Annual Abstract of Statistics, 2009

The fact that emanated from figure 2.3 above is that the male-headed households outnumber the female-headed households in Nigeria. The female-headed households include widows and single mothers who might prefer re-marriage which if eventually succeeds could reduce the already smaller proportion of the female-headed households.

Table 2.4. Percentage distribution of the relationship to the household head by gender, 2006

Relationship	Gender in Household		Total
	Male	Females	
Spouse	0.3	14.1	**14.4**
Child	28.0	25.3	**53.3**
Parent	0.1	0.8	**1.0**
Brother/Sister	1.8	1.6	**3.4**
Other Blood Relation	2.2	2.3	**4.6**
Non- Blood Relation	1.0	0.8	**1.9**
Institutional Household	2.4	1.3	**3.7**
Total	**50.8**	**49.2**	**100.0**

Source: Computed by the author from NBS Annual Abstract of Statistics, 2009

Though there are more male-headed households than female-headed ones (14.9 percent to 3.0 percent respectively), table 2.4 depicts that the distribution of the relationship of the heads to other family members are almost equal in number except for spouse, parent and institutional household (a legal body for the purpose of long-term inhabitation and provision of institutionalised care given to a group of persons) where the margins are wide. An important implication here is that, female-headed households accommodate more parents than their male-headed counterparts do, underscoring their caring capabilities and skills.

2.3 Gender situation in Nigeria

The gender composition in Nigeria reveals a little dominace of men over women (51.0 percent and 49.0 percent respectively). However, when this is viewed from age composition, females outnumber males among the 20 – 39 years old group (see table 2.5).

Table 2.5. Percentage distribution of gender by age composition, 2006

Gender	Age groups				Total
	0-19	20-39	40-59	60 and above	
Male	52.7	44.8	52.0	61.7	**51.0**
Female	47.3	55.2	48.0	38.3	**49.0**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Computed by the author from NBS Annual Abstract of Statistics, 2009

It is obvious from the table that there are more male dependants (0-19 and 60 and above) than female ones. However, among the working-age group, females are relatively higher than males in number, notwithstanding, evidence abounds that gender differentials, especially with regards to employment and access to resources tend to favour the male gender (JICA, 2011).

In addition, data from the 2008 DHS show under-five mortality rates are higher for boys than for girls, which also apply to the rates of malnutrition. 30 percent of women, aged 20-24, do not acquire education, compared to 13.7 percent of men in the same age bracket. Secondary school completion rates for women in this age bracket are 27.4 percent, compared to 37.9 percent of men. All these confirm existence of some pro-male preference.

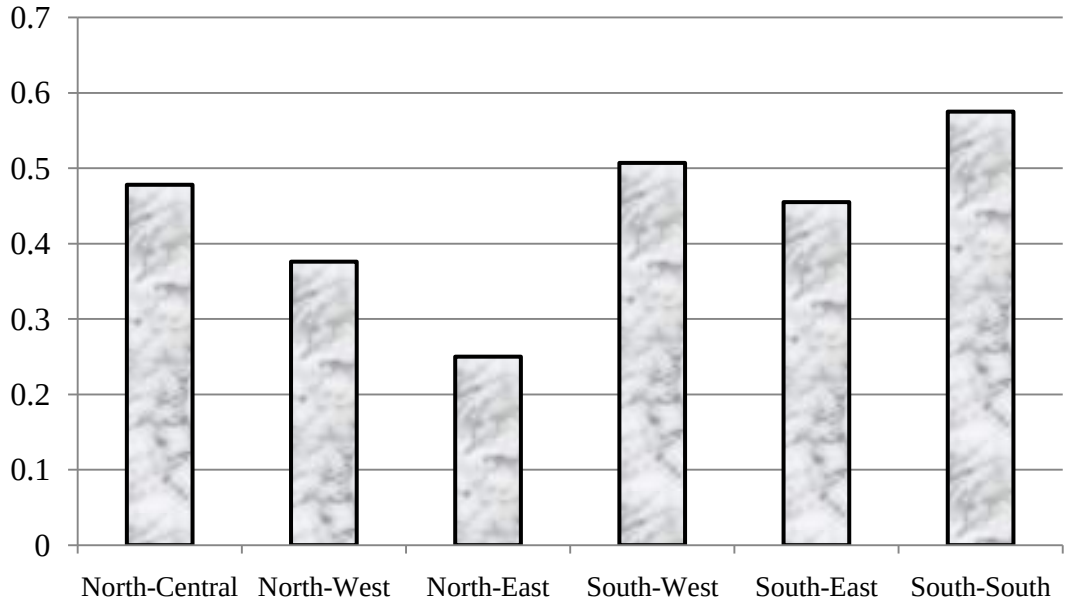
Moreover, women have very limited ownership rights. Civil law entitles women to have access to land, and a few states have enshrined equal inheritance rights into law, but certain customary laws stipulate that only men have the right to own land (CEDAW, 2003). For women without the means to purchase land on their own, in practice, their ability to obtain land flows solely through marriage or family. Under civil and Islamic laws, married women have right and access to property other than land. Conversely for livestock, expensive cows or draught animals are more likely to belong to males than females. In daily life in Nigeria, men generally make decisions regarding property. About 62 percent of women reported that men make most, or all of the decisions about major household purchases, while 83.5 percent of men reported control over these decisions in the 2008 DHS.

In CEDAW (2008), women's access to bank loans is restricted by their limited financial resources and the difficulties they have obtaining the necessary guarantees. In certain cases, financial institutions demand prior consent of the woman's husband before granting a loan. The National Poverty Eradication Programme and other micro-credit schemes offer low-interest, business-oriented loans and other micro-credit and vocational training programme for women, but access is still low. Occasionally, women receiving loans have to turn the control of the resources over to their husbands, and this dilutes their effectiveness.

Public Service Rules (PSR) of the Federal Republic of Nigeria in Section 03301 provides the employed women a maternity leave of twelve weeks at the state level, and up to four months at the national level, even during this time, they are entitled to full wages. However, a number of discriminatory practices still exist in Nigeria in the private sector where many employers force young single and married women to sign job contracts stipulating that they will not get pregnant for the first three years of their employment (CEDAW, 2008).

From the international perspective, OECD Development Centre ranked Nigeria 86 out of 102, 79 out of 86 in the 2009 and 2012 Social Institutions and Gender Index (SIGI) respectively, while the country was ranked 120th out of 135 countries in the 2011 Global Gender Gap Index with a score of 0.6011, (Hausmann *et al* 2011). The geographical division between the North and the South is an important dimension of the struggle for gender equality and this is much portrayed in figure 2.4.

Figure 2.4. Nigeria gender development measure, 2008



Source: Drawn by the author from UNDP (2011)

2.4 National gender policy in Nigeria

The National Gender Policy has always focused on women empowerment while making a commitment on basic education towards the elimination of traditional and/or discriminatory practices against women (Federal Ministry of Women Affairs and Social Development - FMWASD, 2009). The aim is to reduce gender bias that arises from traditional and cultural customs. The goals of the National Gender Policy, as articulated by Japan International Cooperation Agency (JICA) in 2011, include the following:

i. Eliminate cultural/religious gender-based biases and harmful cultural and religious practices which raise to inequalities in gender-role relations in the Nigerian society. A culture which is amendable to development must be dynamic;

ii. In order to tap the potential of women for development, a gender policy which entrenches equity between men and women for development is the key. All forms of gender-based violence must be eliminated;

iii. Women education is a priority, because it is the key to gender equity, justice and poverty reduction, improved skills and technological knowledge, as well as the general socio-economic development of the nation. A major policy goal is to ensure equal access to women, boys and girls of both formal and informal education;

iv. Women empowerment is a key entry point to gender equality in the society. A major policy goal is to ensure that, women have access to critical resources and invest in their human capital as a means of reducing extreme poverty in families; and

v. Although, the government is undertaking a number of health reforms, including laws against harmful traditional practices (female genital mutilation, widowhood rites and child marriage), many cultural practices still put the health of women at a very high risk. Efforts in these areas still need to be intensified. There is therefore, the need for improved health services and better reproductive health care for all.

All these goals notwithstanding, Hausmann *et al* (2011) believes that the observed and significant gender gaps in health, education, economic empowerment and political participation will remain for a long time in Nigeria. Though, progress towards parity in primary school education has been made, there remains a significant wage and labour force participation gender gap. Up till this moment, the country has maintained a particularly high maternal mortality rate, and females' access to quality health care is limited, with particular reference to rural females.

2.5 Nigerian healthcare system

The World Health Organization (WHO) defines health systems as follows:

> "A health system consists of all organizations, people and actions whose primary intent is to promote, restore or maintain health. This includes efforts to influence determinants of health as well as more direct health-improving activities. A health system is therefore more than the pyramid of publicly owned facilities that deliver personal health services. It includes, for example, a mother caring for a sick child at home; private providers; behaviour change programmes; vector-control campaigns; health insurance organizations; occupational health and safety legislation. It includes inter-sectoral action by health staff, for example, encouraging the ministry of education to promote female education, a well known determinant of better health". (WHO 2007 pp 2)

Also, Odubunmi (2013) affirmed that the healthcare system is made up of all personal healthcare services including prevention, diagnosis, treatment of diseases, illnesses, injuries and other physical and mental impairments in humans and rehabilitation towards a holistic restoration of health. It also includes institutions and workforce that provide these services as well as individuals, government, private organizations and other agencies that finance different services. Summarily, the healthcare system can be classified according

to the sources from which a typical Nigerian seeks health care and upon which payments are usually made accordingly. In this case, it can be divided into orthodox, traditional and other religious systems.

Before the advent of colonialists in Nigeria, healthcare was provided basically by traditionalists[5] who were trained through apprenticeship under a boss who sometimes might be a relative but possessed the talent and ability to heal, and till date, the practice still remains a viable part of the healthcare system in Nigeria (Malu, 2010). In 1988, a casual survey in Benin City revealed that, for every sign-post that indicated a Western-style clinic or office, there were three that indicated a traditional doctor (Scott-Emuakpor, 2010). However, Christians and Muslims also believe that healing occurs supernaturally as a result of prayer or divine intervention, rather than the use of medicines or the involvement of physicians. Regrettably, these two sources, which used to promise cheaper and sometimes free alternatives to orthodox healthcare, have their present services being paid for. It is worthy of note that only the orthodox system is formalised while the alternative and spiritual sources are still currently undergoing processes to make them formal (Odubunmi, 2013).

Since the country is a federation with three tiers of government (federal, state, and local), the concurrent responsibility for health service provision in the public sector is built on the basis of the three-tier responsibilities (Akhtar, 1991). The three tiers are involved in the organisation, management and financing of health care delivery through primary, secondary and tertiary health institutions. These institutions are controlled by federal, state and local governments respectively. Also, private sector practitioners in the health system include for-profit providers, non government organisations (NGOs), community-based organisations (CBOs) and faith-based organizations (FBOs) (AHWO, 2008).

[5] These include herbalists, divine healers, soothsayers, midwives, spiritualists, bone-setters, mental health therapists and surgeons.

Under public health sector, primary health care (PHC) serves as the entry point of the community into the health care delivery system in Nigeria. Its facilities include health centres, clinics, dispensaries, and health posts. They provide general preventive, curative, promotive, and pre-referral cares to the population (Olaniyan and Lawanson, 2010). Facilities at these institutions are usually manned by nurses, community health officers (CHOs), community health extension workers (CHEWs) and environmental health officers (EHOs). The management and finances are borne by the local government under the supervision of the respective state government.

At secondary level, the facilities include general hospitals that provide general medical laboratory and specialized health services (surgery, paediatrics, obstetrics and gynaecology to patients referred from the primary level). Most private sector practitioners also provide health care at both levels. These facilities are normally staffed by medical officers (physicians), nurses, midwives, laboratory and pharmacy specialists as well as those mentioned under primary care. A secondary health institution is expected to be located in each zone, district or local government area.

Tertiary health care is at the highest level in the country. It renders highly specialized services and care for specific disease conditions or specific group of patients. These include specialist and teaching hospitals with federal medical centres. They manage patients on referral from lower levels through abundant special expertise and full-fledged technological capacity. Health officers of various categories are trained in tertiary health institutions. Each state of the federation is expected to have, at least, one tertiary health facility.

Table 2.6. Functions of the three tiers of health care in Nigeria

Federal Ministry of Health	State Ministry of Health	Local Government
The Federal Ministry of Health is responsible for health care services and for training institutions or other services of common usage among the states or of national concern or character. Such services and institutions include: ➢ Special Hospitals (Eye, Orthopaedic) ➢ Teaching Hospitals ➢ National Laboratories ➢ Communicable and endemic Diseases Control ➢ International Health and quarantine ➢ Regulation and Surveillance of Standard Training of Health Personnel ➢ Regulation and Surveillance of Health Care Standards ➢ External Health Relations, ➢ Drugs and Poison Control, ➢ National Intersectoral Health Care Linkages and ➢ Primary Health Care Supports (national planning, training, technical assistance, programme support).	The State Ministry of Health shall be responsible for the health care system and training institutions as required for the well being of the state. To avoid overlapping of responsibilities, the state government provides: ➢ Specialist care in wards of general hospitals, especially for acute service. ➢ General hospitals care services including out-patient care. ➢ Training institutions especially for sub-professional level such as technologists, technicians, assistants and aid levels. ➢ Public health programme. ➢ Intersectoral health care linkage at state level; state public health laboratories ➢ Any health programme of particular relevance to the state. ➢ Primary health care support (State planning, training, financial, programming and operational support).	With the support of the State Ministry of Health, the Local Government shall be responsible for : ➢ Community organized health, and health related services. ➢ Provision and maintenance of infrastructures to provide health services. ➢ Improvement of the local community in support of the primary health care.

Source: Odubunmi, 2013.

The Federal Ministry of Health is the government organ that provides leadership on health issues in the country. The Federal Public Health System provides technical supports, specifies guidelines and standards for State Public Health System. The State Public Health System provides technical back stopping to Local Government Department of Health in development of health plans, policy implementation, monitoring and evaluation of health programmes. International agencies, donors and NGOs are being coordinated through regular partners' forum meetings organized by the Federal Ministry of Health and chaired by the Minister of Health. In addition to the decentralisation of the health service management at the three tier levels, some states have Health Management Boards which are responsible for direct service delivery, while the Ministry of health focuses on policy formulation, standard setting, monitoring and evaluation. Community Participation is strengthened through Village Health Committees (VHC) System. The establishment of VHC is emphasized in the Health Sector Reforms.

Although the nation health sector is dominated by public health care facilities, the private facilities, nonetheless, play significant roles in the provision of health care across the country, though, the speedily growing, but largely uncoordinated private sector has limited information on its size and structure. In the profile of Nigeria health system in 2004, about 38 percent of the total health care facilities in the country are privately owned while a whopping 62 percent are public health care facilities (WHO 2004). Curiously however, these few for-profit and non-profit private facilities provide almost 80 percent of health services to Nigerians (AHWO, 2008).

Like the situation in public healthcare facilities, private facilities also provide a wide range of preventive and health promotion services, training of human resources for health, manufacturing of pharmaceuticals as well as curative services. This sub-sector is not very well regulated and supported as manifested in fewer opportunities for refresher training for the workers coupled with weak policies, guidelines and manuals. This nonetheless possesses serious implication on the quality, access, efficiency, and the service availability of

health care system in Nigeria (Odubunmi, 2013). Current efforts are on for increased public private participation through the development of a public-private partnership policy in health care delivery. The tables below summarise the number of healthcare facilities in Nigeria by services rendered as well as types and ownership.

Apart from these, there are also traditional medicine practitioners and informal medicine vendors. It is expected that activities of traditional health practitioners will be regulated upon the appointment of a Registrar as being currently proposed in government circle.

Table 2.7. Number of healthcare facilities by type in the six Geo-Political Zones in Nigeria, 2007

Zone	Number of LGAs	Teaching hospital	General hospital	Maternity hospital	Clinic	Psychiatric hospital	Orthopaedic hospital	Others	Total	Percentage distribution
North – East	112	10	95	526	1175	6	1	624	2437	*14.28*
North – West	186	5	115	39	405	1	1	2134	2700	*15.82*
North – Central	121	6	97	241	4100	2	1	144	4591	*26.90*
South – East	95	8	552	798	744	3	7	646	2758	*16.16*
South – West	134	10	95	526	1175	6	1	624	2437	*14.28*
South – South	126	9	152	143	761	3	0	1077	2145	*12.57*
Total	774	48	1106	2273	8360	21	11	5249	17068	*100*
Percentage		*6.50*	*13.31*	*48.98*	*0.12*	*0.06*	*30.75*	*100*		

Source: NBS (2008)

Table 2.8. Number of healthcare facilities by type and ownership in Nigeria, 2004

Zone	Type			Ownership		Total
	Primary	Secondary	Tertiary	Public	Private	
North Central	4,983	401	9	3,316	2,077	5,393
North West	2,460	111	7	2,225	353	2,578
North East	4,129	154	11	3,874	420	4,294
South West	2,140	1,180	10	912	2,418	3,330
South East	2,417	699	10	1,841	1,285	3,126
South South	4,149	758	13	2,439	2,481	4,920
Total	**20,278**	**3,303**	**60**	**14,607**	**9,034**	**23,641**
% of Total	*85.8*	*13.9*	*0.3*	*61.8*	*38.2*	

Source: NBS (2010)

Tables 2.7 and 2.8 reveal the zonal spread of health care facilities in Nigeria along the ownership and types of services rendered. It is obvious that different location factors could possibly impact on the quantity and/or quality of the services available in a location. Consequently, the health care system in Nigeria has shown spatial variation in terms of availability and quality of facilities in relation to need (Odubunmi, 2013).

Several indices have shown that the overall performance of health system in Nigeria is abysmally poor, characterized by inequitable distribution of resources, decaying infrastructures, poor management of human resources for health, negative attitude of health care providers, weak referral systems, poor coverage with high impact cost-effective interventions, lack of integration and poor supportive supervision (Olaniyan and Lawanson, 2010). According to the National Strategic Health Development Plan for 2010 to 2015, health status indicators for Nigeria are among the worst in the world. It also fares poorly when compared with other countries with similar income per capita. Health outcomes are also unequal between rural and urban areas, between northern and southern regions, and across income groups. These poor outcomes are not only due to large increases in poverty, but are also due to weaknesses in the health sector, especially in the primary health care services.

As evidenced in the Demographic and Health Survey of 2008, in spite of the improvement on some care interventions (such as few nutritional programmes and child health services, such as, treatment of diarrhoea and ARI symptoms), maternal, newborn and child mortality rates remain high in the country, especially in the northern regions of the country. Though communicable diseases have been confirmed as major causes of mortality and morbidity in the country, there is fear that non-communicable diseases (NCDs) represent an increasing share of Nigerians' burden of diseases. Major NCDs in Nigeria include: hypertension, diabetes mellitus, coronary heart disease, sickle cell anaemia disease, cancer, mental health, road traffic injuries and violence, oral health, blindness, rheumatic heart disease, stroke, osteoporosis.

In the same vein, life expectancy at birth was 52 years according to the 2012 UNICEF State of the World's Children report. This figure is below the Sub-Saharan Africa average of 56 years and below the least developed countries (LDCs) average of 61 years. The disability adjusted life expectancy at birth stands at 48.3 years; vaccine-preventable diseases and infectious and parasitic diseases continue to exact their toll on health and survival of Nigerians, remaining the leading causes of morbidity and mortality, while Nigeria has the highest number of HIV infected persons in the African continent and the fourth highest tuberculosis burden in the world.

It is also observed that the low health status in Nigeria is region specific, with the North as the worse hit. For instance, in 2008, total fertility rate was 6.5 and 4.3 in the Northern and Southern parts of the country respectively, the infant mortality rate for North-Central, North-East, North-West, South-East, South-South and South-West was 103, 125, 114, 66, 120 and 69 per 1,000 live births respectively (AHWO, 2008).

In order to rectify the deteriorating healthcare system, government at various levels formulate policies and make considerable investments in the health sector over the years purposely to stimulate the supply side of the healthcare system. The effort includes the availability and distribution of functional health facilities and other health infrastructures across the country.

Though, every state currently has at least one tertiary health facility, WHO hold that, most are not functioning at optimal capacities in the provision of quality specialist care, while majority of the PHC centres are in a state of disrepair (WHO, 2004).

Consequently the health care system is unable to provide basic, cost-effective services for the prevention and management of common health problems, especially at the LGA and Ward levels. For example, the proportion of PHC facilities providing immunisation services range from 0.5% in the North-West zone to 90% in the South West and South East Zones. Also the capacity to provide basic emergency obstetric services is very limited as only 20% of the facilities are able to provide this service. This limited coverage of

basic health services, which results from poor access to information and services, results in under utilisation of services. Only 58% of women receive antenatal care from professionals, with coverage levels ranging from 31% to 87%, and deliveries under the supervision of trained birth attendants (TBAs) ranging from 9.8% to 81.8%. The lowest figures are from the North East and North West zones, (NDHS, 2009).

According to WHO, most services provided by private and public providers are clinic-based, with minimal outreach, home and community-based services. The services are fragmented, with many vertical disease control programmes. Referral systems are weak and even, tertiary facilities are used for the provision of primary care, thus diminishing the continuum of care and making the system inefficient. Also, despite that the private sector delivers 60% health care in the country, private-public partnership is very weak. Other confounding factors that further limit quality of care include dearth in the skills and, quantity of available human resources for health with poor attitude of health care providers. In addition the country is confronted with lack of emergency preparedness to respond to epidemics.

In order to improve the functionality, quality of care and utilization of healthcare services to positively impact the health status of the population, universal access to a package of cost-effective and evidence-based interventions are essential to transform the way the health care system is resourced, organized, managed and services delivered.

Improving the health status of Nigerians through a series of national development plans and annual budgets has been the focus of the successive governments in the country. Realising that PHC serves as the entry point into the health care system, efforts have been made to ensure that PHC facilities are evenly spread among the 774 local government areas in the country. Activities and funding of PHC are channelled at the federal level through National Primary Healthcare Development Agency (NPHCDA).

British Council (2012) collated some excellent policy initiatives that have been introduced in response to gender-based health challenges. These include:

i. The National Health Policy of 1988, which adopted the Primary Health Care approach was revised in 2004 to provide a link to New Partnerships for African Development (NEPAD), the Millennium Development Goals (MDGs), and the National Economic Empowerment Development Strategy (NEEDS).

ii. The National Policy on Population for Development, Unity, Progress and Self Reliance, developed by the National Population Commission in 1998.

iii. The National Reproductive Health Policy and Strategy 2001, which aimed to reduce peri- and neo-natal morbidity by 30 percent.

iv. The National HIV/AIDS and PMTCT30 Policy and Strategic Plan 2003, which provided an integrated approach to addressing transmission of the HIV virus from mother to child, among other measures.

v. The National Guidelines for Women's Health developed in 2002 by the Government with help from UNICEF to establish services friendly to women.

vi. The National Strategic Framework and Plan for Visco-Vaginal Fistula, developed by the Federal Government in 2005.

vii. The road map for accelerating achievement of the MDGs that cover maternal and newborn health, 2006. This set out priorities and strategies for reducing infant and maternal mortality.

viii. The National Health Promotion Policy, developed by the Ministry of Health in 2006.

ix. The Policy on the Health and Development of Adolescents and Young People in Nigeria, 2007. This aimed to reduce by 50% unwanted

pregnancies and marriages among people younger than 18, and by 75% maternal mortality among young women.

x. The National Health Bill, proposing the introduction of a National Health Insurance Scheme (decreed in 1999, implemented in 2005).

xi. An Integrated Maternal Newborn and Child Health Strategy, developed by the Ministry of Health in 2007. It sought to build synergy among the many programmes designed to reduce maternal, neonatal and child mortality in Nigeria.

The National Health Policy and Strategy[6] seek to achieve health for all Nigerians. The process of review has been consultative, incorporating views from stakeholders and reflecting new realities and trends in the National Health Situation including regional and global initiatives such as National Economic Empowerment Development Strategy (NEEDS), New Partnership for Africa's Development (NEPAD) and Millennium Development Goals (MDGs). In 2004, the federal government adopted a robust poverty reduction strategy document tagged NEEDS, which targeted areas including creation of wealth; job creation; poverty reduction; and value-added direction. Later in 2007, Seven Point Agenda was established while the National Vision 20:2020[7] is being implemented till date. All these initiatives include, efforts to address the gender gap, equality as well as women's empowerment.

The thrust of the National Health Policy are: revitalised National Health System and its Management; Improved National Healthcare Resources; National Health Interventions and Services Delivery; National Health Information Systems; Partnership for Health Development; Health Research and Health Care Laws. A National Health Reforms Agenda is being implemented to carry forward the health strategies as developed in the policy. For example, Primary Health Care continues to be the cornerstone of health development in Nigeria. A working document has been developed for the revitalization of the

[6] This was promulgated in 1988 and has been revised in 1996 and 2004
[7] The document focused on transforming Nigeria into one of the top 20 global economies by year 2020.

implementation of primary health care as part of the government stewardship role to reach the MDGs. It reads thus:

Specific sub-sector policies and plan of actions on HIV/AIDS; Roll Back Malaria; Mental Health; Immunization; Control of Onchocerciasis; Control of Tuberculosis and Leprosy (TBL); Blood Transfusion; Elimination of Female Genital Mutilation; Emergency Preparedness and Response to Epidemics/Care Management; Reproductive Health; Maternal and Child Health; Adolescent Health; Food and Nutrition have been developed as integral part of the National framework in the health sector. The main constraints which the country faces and mitigates improve quality and generally safety of the environment includes a fluctuating economic fortune which has largely constrained implementation of the policies. For example, the high foreign debt portfolio and the desire to service the debt leaves little resources for Government to invest in health development. Furthermore, industrialization and in particular, oil spillage leading to water pollution and environmental degradation in oil producing states, draught and desert encroachment for Northern Nigeria and erosion and land slide in Southern Nigeria poses great challenge (WHO, 2004).

In a uniquely combined and fully participatory national process, all the key stakeholders in health, led by the Federal Ministry of Health, recently evolved a uniform national health development framework which was used to articulate National Health Plan with an associated Result (Targets/Indicators) Framework that is consistent and elaborate on the National Vision 20: 2020 in Human Capital Development aspirations. Among the targeted area of emphasis are improvement for Female Facilitation of Literacy for health (FFLH) and mainstreaming of gender issues in the health field. Achieving these requires collaboration among the Federal Ministry of Health, Federal Ministry of Women's Affairs and World Health Organisation to improve female health conditions, economical independence and literacy (British Council 2012).

2.6 Health care expenditure in Nigeria

Healthcare, as one of the basic necesities of life, needs proper financing for achieving robust health status outcomes. Health care financing in Nigeria is done by Federal, State, Local Governments, Firms, Donor Agencies (local or foreign) and Households. The functions to which these finances are meant to accomplish include curative care; rehabilitative care; preventive care; capital formation for provider institutions; education, training, research and development in health. The main challenge of healthcare financing in Nigeria involves absence of intermediation and insurance mechanisms to manage risk, as well as inefficient resource allocation and purchasing practices (Onwujekwe, *et al* 2010). In spite of several reports that suggest that governments have a stewardship role to play in guiding the improvement of health system performance, Soyibo (2005) reveals private sources as dominants among the various sources of healthcare financing in both the North and the South of the country. Therefore, beneficiaries' contribution towards the cost at the time of use of a particular healthcare service is referred to as OOPs expenditure.

In order to improve the overall health system performance, National Health Accounts (NHA) concept was developed to capture expenditure on health. NHA has been internationally accepted as a tool for summarizing, describing and analyzing the financing of health systems generally at the local, state and national levels. The document supports stewardship and decision-making by both policy makers and stakeholders. The Federal Government of Nigeria formally launched the nation's first National Health Policy (NPH) in 1988 in an attempt to resolve the resource allocation challenges of the health sector.

National Health Accounts of Nigeria for 1998-2005 (Soyibo, 2005 and Soyibo *et al*, 2009) show a mixed result over the seven-year period. They reveal that Total Health Expenditure (THE) increased nominally from N157.1 billion in 1998 to N179.9 billion in 1999; and to N215.2 billion in 2000. It also grew between 2000 and 2001 when it became N256.3 billion. However, between 2001 and 2002 growth of THE was albeit slowed down to N278.7 billion, it

increased steadily to N661.66 billion in 2003 and to N788.72 billion in 2004 culminated to N976.69 billion in 2005.

Table 2.9. Percentage distribution of healthcare expenditure in Nigeria

Year	1998	1999	2000	2001	2002	2003	2004	2005
Federal	9.7	9.4	10.6	17.6	12.4	7.1	14.6	13.4
State	3.9	3.6	6.3	8.0	7.4	7.3	7.2	8.1
Local	1.4	3.6	1.9	1.7	1.8	4.3	4.6	4.6
Firms	2.7	3.5	4.7	5.7	6.4	3.1	3.3	3.0
Household	69.2	66.0	60.3	61.5	65.9	74.0	65.7	67.2
Donors	13.1	13.8	16.2	5.6	6.1	4.2	4.6	3.7
Total Health Expenditure	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Computed by the author from Soyibo et al, 2009, Pages 16, 18

A close look at table 2.9 confirms household as the major financial organ of health care in Nigeria. Household contribution to the total health expenditure was more than 60 per cent during the period. Although, World Bank revealed in 2005 the general belief that Nigeria spends more on health than it has always been thought. This situation is inimical for the health status of the country whose income is asymmetrically distributed among households that bear the burden of health care expenditure through out-of-pocket expenses, thereby reducing access, especially, to the vulnerable groups. Due to high poverty incidence in the country, definitely, poor households are adversely affected.

In 2005, the Federal Government of Nigeria, in an effort to minimise the burden of health care expenditure on household, officially inaugurated the National Health Insurance Scheme (NHIS), which is a federally funded social health insurance scheme. The scheme is designed to facilitate fair financing of health care costs through risk pooling and cost-sharing arrangements for individuals. It was expected that NHIS would improve access to healthcare for majority of Nigerians, particularly, persons in the public service and the private sector. It is specifically meant to bridge an existing gap and widen opportunities for access to qualitative healthcare with strong private sector participation, and with government defining policy and framework. Employees are supposed to pay 5% of their salary and employers 10% of their employees' salaries as a premium. The benefits packaged cover both out-patient visits and some in-patient services. The insurance covers the spouse and up to four other members of the beneficiaries' households under the age of 18.

However, its introduction has not significantly altered the situation, since as presently operated; it covers a minority comprising only federal and few states civil servants who are only about 5% of Nigeria's population (Onwujekwe *et al*, 2010). Since health is on the concurrent list, NHIS is exploring collaboration with other state governments for enrolling their employees in the scheme and initiating community-based schemes to cover people employed in the informal sector as well as the vulnerable groups in Nigeria.

Moreover, the prevailing excessive private share of expenditures in Nigeria is all the more alarming as most of it takes place via non-pooled out of pockets, which has been noted as the most regressive form of payment (Onwujekwe *et al*, 2010). With prevalent poverty in the nation, heavy dependence on out –of- pocket spending made many Nigerians compromise their health with self-medication and quackery consultation with their potential tragic consequences. Even the educated ones often make uninformed choices based on ignorance or expediency.

Table 2.10. Percentage distribution of working population (age 15 years and above) by type of employment and residence, 2006

	National	Urban	Rural
Self non-agricultural	10.3	12.2	9.7
Self with employees	0.7	1.0	0.5
Self with no employees	6.9	11.1	5.5
Employer	0.2	0.2	0.2
Unpaid family business	25.7	23	26.6
Paid employment	0.3	0.4	0.3
Other	10.3	10.7	10.2
Total	**100.0**	**100.0**	**100.0**

Source: NBS Harmonized Nigeria Living Standards Survey (HNLSS), 2010

Agriculture remains the highest employer of labour in Nigeria and less that 1 percent are involved in paid jobs (table 2.10). This affirms that the impact of NHIS in relieving the burden of household health care expenditure may after all be a far cry from the solution.

However, it is worthy of note that apart from the social health insurance, all levels of government are displaying the capacity to subsidize health expenditure of poor families through incentives or cash transfer approaches. Some of these recent initiatives by state governments to reduce out-of-pocket expenditure include; medical re-imbursements within specified rates to the formal sector employees, establishment of targeted exemption schemes or free health services for vulnerable populations, such as; pregnant women, children under five years, elderly people and lots more.

CHAPTER THREE

LITERATURE REVIEW

3.1 Introduction

This chapter contains the review of the existing related literature. It presents the review along three strands – theoretical, methodological and empirical reviews. It concludes with the identified gap in the reviewed literature.

3.2 Review of theoretical issues

As one of the major inputs of health, healthcare has been shown in the literature to extend life and enhance its quality. Determination of health care expenditure is done by individuals and the households in which they belong, given their resources and the prices that they face. Hence, the family has been viewed as the producer of health, rather than the individual (Hjortsberg, 2000). Studies that use household as the fundamental unit of analysis are often accused of implicit gender bias (Darity, 1995; McElroy, 1997; Haddad *et al*, 1997; Mackinnon, 1998). All economic models assume that, the household is a rationally behaving unit, while the value of time of household members, value of consumption and production of goods are determined by market mechanisms (Mattila-Wiro, 1999). The theoretical foundation on household resources allocation is based on two models of household behaviour - the unitary model and the collective model. They are thus presented:

3.2.1 Unitary model of household behaviour

Traditionally, the unitary model originates from Becker (1964) when he extended the neoclassical model of consumer theory to family as the most essential societal institution. His proposition, known as the new household economic theory, was adopted to describe resource allocation, decision-making and utility maximization processes of households in the developed countries. The theory was later applied to developing countries with particular reference to the analysis of agricultural households. He introduced the household production model (HPM) into the traditional consumer (individual) behaviour analysis where he modelled households as both consumption as well as production units[8]. The essence of Becker's approach was that, in accordance with a single set of preferences, the household combines time, goods purchased in the market, and goods produced at home to produce commodities that generate utility for the household (Becker, 1965). This holds that, family members maximise a single utility function sometimes called the "common preference" or the "altruism" or the "benevolent dictator" model, based on the notion that, either all household members share the same preference function, or that a single decision-maker acts for the good of the entire household (Quinsumbing and Maluccio, 2000).

In this model, the function being maximised is a joint utility function, where all household members are assumed to maximise a household level welfare function. Income is allocated in such a way that, the marginal rate of substitution between any two consumption goods is the same as for any other pair, and all available resources are first pooled and reallocated depending on a common rule (Thomas, 1990). This approach that initially originates in standard demand analysis has been extended to include the determinants of education, health, fertility, divorce, child fostering, migration, labour supply, home production, land tenure and crop adoption (Haddad *et al*, 1997).

[8] The main assumptions of the unitary model of the household are that: household decision-makers have similar preferences or are able to aggregate different preferences; and resources are pooled so that household decision-makers with an 'aggregate' preference are able to maximize a common household welfare index. All these have been traced to Samuelson (1956).

On a variety of data sets, several studies have tested the idea of income pooling between household members[9]. All these studies test the principal implication of the pooling hypothesis underlying the unitary model, namely, that the sum of the husband's and wife's incomes, not their individual incomes, separately affect household outcome (Maitra and Ray, 2000).

Haddad *et al* (1997) proposed the assumption that, the existence of a welfare function that reflects parental preferences, defined over their own consumption, the adult income of each child, and the size of transfers made to each child which is maximized, subject to two constraints: a parental budget constraint and the earnings production function for each child itself, a function of human capital investments made in that child by parents and that child's initial endowment. This general framework has been referred to as the *parental altruism model*, and placing restrictions on this general approach yields two models of intrahousehold resource allocation under unitary theory (Behrman, 1997). The two models are wealth and separable earnings-transfers (SET) model.

3.2.1.1 Wealth model

This restriction assumes that parents are concerned solely with their children's total level of wealth and exhibit equal concern for each child by making all children to receive equal weight in their utility function, so that the utility function is symmetric in the space of children's wealth. Investments in human capital are made in children with potential to generate a higher rate of return. This implies that parents invest in their children in such a way as to reinforce differences in child endowments, thereby increasing the difference in siblings' earnings beyond that, due to endowment differentials alone. This also implies that parents equalize the wealth of their children, despite differences in their earnings. Transfers are made to more poorly endowed offspring in order to equalize children's wealth, thereby offsetting earnings differences (Behrman,

[9] Behrman, 1997; Maitra and Ray, 2000 and the volume edited by edited by Haddad, Hoddinott and Alderman, 1997 contain robust argument in this regard.

1997). This ensures that the human resource investments in the children are socially efficient (Pareto optimal) and privately efficient (wealth-maximizing).

3.2.1.2 Separable earnings-transfers (SET) model

This assumes that, children's income and parental transfers to children are separable within the parental welfare function with the focus on the determinants of investment in children. Haddad *et al* (1997) gave two concerns that guide this model. "First, parents may be interested in ensuring that all children are equally well off. Alternatively, they may have preferences for particular children; for example, boys over girls, firstborn over latter borns, their own children over those whom they raise as foster children. These can be called "equity" concerns, though it is entirely possible that parents prefer unequal outcomes among their children. As in the wealth model, parents also desire to maximize the return on the investment in their children. These are "efficiency" concerns. Suppose parents care only about equity and have no concerns regarding efficiency, such preferences imply that they will seek to equalize their children's future earnings, but do not imply that all children will be treated equally".

A concise case in Haddad *et al* (1997) is of the parents who want their daughter and son to obtain equal earnings, but realize that the daughter will face discrimination in the labour market and her wages will be less than those of her comparably qualified brother in the same profession. Hence, parents will likely devote more resources to the daughter (possibly, by providing her with more education) for future earnings balancing. Conversely, where parents seek to maximize the total future earnings of their offspring, they invest relatively more in those children with the best future prospects. Thus, parents would invest more in the son than in the daughter, thereby reinforcing the existing inequalities in child endowments. Consequently, allocations to one household member affect the allocations to others.

Conceptually, demand for each good (including; home-produced goods such as health) for each individual can be treated as demand equations

conditional on the demand for goods allocated to other individuals (Pitt, 1997). However, identification of such models is impeded since there are more person-specific goods and identification restrictions are required. Pitt (1997) advances two outlooks: the first involves cross-individual restrictions on parameters, while the other estimates individual endowments that assist in identification of individual caloric demand if the errors in health production functions are uncorrelated with those in the reduced-form demand equations.

Formalising the unitary model (Quinsumbing and Maluccio, 2000) illustrates through a household that consists of two individuals, m and f who consume vectors of goods x_m and x_f at a price vector p, and scalars of domestically produced goods z_m and z_f which are produced by domestic labour h_m and h_f through a production function $f(h_m, h_f)$.

The household also produces a cash crop, using its own labour l_m and l_f through a production function assumed to have diminishing returns and to be increasing in both parties' labour. It is also assumed that the cross-partial derivatives are negative, so that male and female labours are (not necessarily perfect) substitutes.

Each individual's time endowment is normalised to unity and distributed across h, l, L, which is leisure, and labour supplied to the market for the exogenously set wage w_m and w_f. Thus wages received are $w_m(1\ \ h_m\ \ l_m\ \ L_m)$ and $w_f(1 - h_f - l_f\ \ L_f)$. Individual unearned income is given by y_m and y_f. The total consumption must satisfy the following equations.

$$C \equiv p'x_m + p'x_f = w_m(1 - l_m - h_m - L_m) + w_f(1 - l_f - h_f - L_f)$$

$$+ p_c g(l_m, l_f) + ((h_m, h_f) + y_m - y_f) \quad - \quad (1)$$

$$z_m + z_f = f(h_m, h_f) \quad - \quad - \quad - \quad (2)$$

Individual welfare is measured by a self-interested utility function, assumed cardinal and interpersonally comparable, given by

$$u_i = u_i(x_i, z_i, h_i L_i),\ \frac{\delta u_i}{\delta x_{ij}} > 0,\ \frac{\delta u_i}{\delta z_i} > 0,\ \frac{\delta u_i}{\delta L_i} > 0 \quad (3)$$

The first derivatives of the utility with regard to l, h and L represent the marginal utility from substituting these forms of time used for wage labour, these first derivatives are ambiguous in sign for h and l, but must be positive for L. The matrix of second derivatives is assumed negative definite. It is assumed that $\delta u_i/\delta z_i$ and $\delta u_i/\delta L_i$ tend to infinity as z_i and L_i respectively tend to zero. Defining individual cash expenditure C_i as $p'x_i$, indirect utility v_i is defined as

$$v_i(C_i, p, z_i, h_i, l_i, L_i) = \max_{xi} u_i(x_i, z_i, l_i, h_i, L_i) \quad (4)$$

subject to

$$p'x_i = C_i \quad - \quad - \quad - \quad (5)$$

Equation (4) is increasing and concave in the pooled income, assuming that $\delta v_i/\delta C_i$ tends to infinity as C_i tends to zero.

The major strength of unitary model is its ability to explain two vital areas of household behaviour – decisions regarding the quantity of goods consumed and equality of allocation of those goods among household members, thereby explaining the differences in individual well-being and consumption patterns within a household, even when these differences are exhibited systematically by gender, age, or relation to household head grouping (Becker, 1981).

Haddad *et al.* (1997) further articulates four types of policy failures that result from using the unitary model as a baseline for policy preparation. "First, the effect of public transfers may differ depending on the identity of the income recipient. If this is so, targeting transfers to the household may not result in the desired consequences, if transfers directed to the husband or the wife have different impacts. Second, the response of non-recipients of the income transfer must also be considered. If households reallocate resources away from the transfer recipient to compensate for the non-transfer receipt, the intended effect of the income transfer may not be realized. Third, at the project level, the unitary model predicts that, it does not matter whom policy initiatives are addressed to, since information, like other resources within the household, will

be shared. Lastly, adherence to a unitary model of the household disables many policy levers that could be brought to bear on development problems".

Even with assumptions of similar preferences and a common welfare index, the unitary model, notwithstanding, allows for differences in individual consumption and welfare. Yet, there are many more fundamental differences, and. Indeed, conflicts within household decision-making that the unitary model does not address. So, when it comes to expenditure on health care, each household member would focus on his or her own utility of health care consumption and not the benefits for the household as a unit. Moreover, whenever extreme gender inequalities are present, household decision-makers with different levels of bargaining power may have highly contrasting preferences that will not be reflected in some aggregate preference function or a common welfare index. Aside the unitary household model, other approaches have attempted to account for these crucial discrepancies.

3.2.2 Collective models of household behaviour

A number of approaches that focus on the individuality of household members which explicitly address the question of how individual preferences lead to a collective choice were developed due to the apparent weaknesses of the theoretical underpinnings of the unitary model (Haddad *et al*, 1997). These approaches do not require any unique household welfare index to be interpreted as a utility function. Prominent among these approaches are collective models[10]. The collective models can be distinguished along the hypothesis about preferences, interdependence and resource allocation within the household and the assumptions about social norms and socio-cultural factors (Gul and Çagatay, 2009). The two common features of collective models apparent in the literature are that they allow different decision makers to have different preferences, and, they do not require a unique household welfare index to be interpreted as a

[10] Others approaches include aggregate household weights, Sen (1966); assortative mating and internal household market equilibria at implicit pricing, Becker (1973); rotten-kid theorem, Becker (1981)

utility function, thereby allowing the index to be dependent on prices and incomes as well as tastes (Chiappori, 1992).

It is worthy of note that much of the description of the collective models are in common with that of unitary models, because, both permit existing intra-household resource allocation rules to affect household responses to public policy. However, the point of departure is the rule governing this allocation. While both models allow public policy to change intra-household allocations of a good, only the collective models permit public policy to affect the *rules* of intra-household allocation (Quinsumbing and Maluccio, 2000). Three broad categories of collective models currently evident in the literature are thus presented.

3.2.2.1 The cooperative bargaining models

The cooperative approach (as proposed by Manser and Brown, 1980; McElroy and Horney, 1981) holds that individuals form a household when the benefits derivable therein exceed those obtainable from remaining alone. This is due to the existence of economies of scale associated with the production of certain household goods[11], or because there are some goods that can be produced and shared by married couples, but not single individuals (Haddad *et al.* 1997). This, therefore, reveals that, household formation breeds a surplus that is in turn distributed across the members. These models assume that, husband and wife have separate utility functions and bargaining power, and hence observed expenditure patterns are typically assumed to depend on options outside the marriage[12]; the household behaviour described by Gul and Çagatay (2009) as the outcome of a Nash-bargaining game.

Proposing the models, Manser and Brown (1980) characterizes the sources of potential gains to marriage with two individuals who are considering forming a household. They both have a neoclassical utility function assumed to

[11] The household good is defined as a pure public good within the household which consumption by one household member does not reduce the amount available to the other.
[12] This implies that tastes do not change as a result of, or in anticipation of, the formation of a new household.

be strictly quasiconcave and monotonically increasing in all its arguments and possess continuous, second partial derivatives. The incentive to form a household requires reaching an agreement on the choice of household public goods, leisure and, jointly with this, the distribution of the gains from marriage.

The cooperative game approach usually employed to solve the allocation puzzle necessitates the specification of the threat point[13] for each individual and non of the individuals will agree to an outcome that yields less utility than her/his threat point in the bargaining process. Importantly, their personal utility before marriage reflects both their endowments and extrahousehold environmental parameters (EEPs), which shift individuals' threat points. The identified EEPs in the literature include measures of the relevant marriage and remarriage markets, laws concerning access to common property, prohibitions on women working outside the home, alimony[14] and child support, changes in tax status associated with moving between marital states, and the ability of each person to receive assistance from his or her own family (Chiappori, 1992). Manser and Brown's model analyzes some bargaining rules and attempts the empirical distinctions among them as well as between them and the neoclassical demand system. Also, it analyzes the demand for marriage.

Henceforth (McElroy and Horney, 1981) incorporates Nash solution upon which the vast majority of bargaining models rely on subsequently. Specifically, they focuse on the Nash household model, a detailed and explicit analysis of the comparative statics, empirical implications, and specification of tests of the hypothesis that the Nash model collapses to the neoclassical demand model.

In their work, the resultant Marshallian demand functions include, as arguments, all prices, non-labour income, and EEPs (Quinsumbing and Maluccio, 2000). However, McElroy and Horney views the unitary model as a special case of the Nash model with the parameters on non-labour income and EEPs set equal to zero. A married couple is not essentially different from two

[13] The utility level which is guaranteed to the individual if no agreement or bargain is achieved.
[14] Amount of money ordered by a court to be paid by one spouse to the other - usually by the husband to the wife - for some period, limited or indefinite, after a divorce

single individuals on legal grounds, but rather on the basis of pooling resources and allocating them jointly. They assume that bargaining over the allocation of market goods achieves the Nash solution to a two-person, nonzero-sum game and each person has a well defined continuous, strictly quasiconvex indirect utility function, giving the maximum attainable utility level as a function of prices and non-labour income. This utility is assumed to depend not only on own goods, own leisure, and the household good, but also upon the nonmarket time and the consumption of the spouse.

Thus, the couple is assumed to choose household goods subject to full income (total expenditures on the household good, own goods and leisure), to maximize the utility-gain product function - a special case of the Nash product function (McElroy and Horney, 1981).

Innovatively, they derive the comparative statics of the Nash model, including the Nash generalizations of the Slutsky equation, of substitution symmetry and of Engel aggregation. In the comparative statics of a bargaining model, changes in prices and non-labour incomes change the objective function itself, and these changes in the objective function are easily characterized as twists and shifts in the iso-gain product curves (IGPC)[15]. The twists were changes in the "family rate of substitution" (the bargaining analogue of neoclassical marginal rates of substitution); the shifts are changes in the level of the value attached to an IGPC.

Through some systems of equations, McElroy and Horney, (1981) shows that the effects that lead naturally to a Nash generalization of Engel aggregation, of the Slutsky equation, and of substitution symmetry are the uncompensated effects of price changes, the compensated effects of price changes, and the effects of income changes on both the optimal bundle of household market goods and the Lagrange multiplier. It was noted that the Nash and neoclassical Cournot aggregation conditions are identical because Cournot aggregation is unaffected by compensated price effect. In contrast, the income

[15] The locus of bundles of household market goods for which the utility-gain product function is constant which is assumed to be the bargaining analogue of neoclassical indifference curves

effects ensure the Nash generalization of Engel aggregation reduce to neoclassical Engel aggregation and conclude that "when price and income effects are null, the generalized Nash comparative statics and restrictions collapse to their neoclassical counterparts".

Later, McElroy (1997) demonstrates how the partial-equilibrium Nash bargaining models complement with general-equilibrium marriage market models based on predictions. He opines thus "specifically, if an increase in women's ability to maintain themselves outside marriage does not come at the expense of the ability of men to maintain themselves outside marriage, it generally increases and never decreases the income of married women. However, when the increased ability of women to maintain themselves comes at the expense of men, this generally increases (never decreases) women's income and generally decreases (never increases) men's income". In this model, the threat of marital dissolution is a possibility in the context of long-term decisions but, as she notes, "In the context of small daily decisions, it is not credible for either spouse to threaten to leave the marriage." She suggests that decisions regarding short-run issues can be motivated by time preferences (the loss associated with delays in settling disagreements).

3.2.2.2 The non-cooperative bargaining models

In contrast to the cooperative bargaining models, this category of collective models does not assume that members necessarily enter into binding and enforceable contracts with each other. This is done by using non-cooperative game theory to characterise the behaviour within the household[16].

This model, as orchestrated by Kanbur and Haddad (1994) and Lundberg and Pollak (1994), reveals that at the micro level under certain conditions, a general improvement in household resources leads to first an increase and then a decrease in intra-household inequality. It assumes that individuals within the household not only have differing preferences, but also

[16] This approach has been extensively discussed by Leuthold (1968), Ashworth and Ulph (1981), Ulph (1988), Woolley (1988), Kanbur (1991), Carter and Katz (1997).

act as autonomous sub-economies. The household is depicted as a site of largely separate gender-specific economies linked by reciprocal claims on members' income, land, goods, and labour. They consider a two-person household in which each individual controls his or her own income and purchases commodities, subject to an individual (non-pooled) income constraint. That is, the husband and wife do not enter into binding, costlessly enforceable agreements, but focuse on self-enforcing agreements, that is, on agreements that correspond to strategies that the husband and wife would choose to carry out with a net transfer of income as the only established link between them. Each individual has a utility function of goods he or she exclusively consumes as well as those consumed in common, conditional on the level of net transfers[17]. When making decisions, each person takes net transfers as given and chooses the goods he or she will exclusively consume in order to maximize his or her own utility, subject to the constraint that purchases are less than own-income plus net transfers. This yields a demand function for the goods consumed, which is a function of prices and net transfers. Here, the basic structure is one of offers and counter-offers and at each point, the player whose turn it is to respond, either accepts the offer previously made, or rejects that offer and makes a counter offer. The driving force behind reaching an agreement is an exogenous risk at every point that the bargaining opportunity will vanish and the bargainers be thrown back on their own devices as well as impatience of the player(s).

The leading non-cooperative solution concept, the Nash equilibrium, is a profile of strategies, one for each player, such that each player's strategy is a best response to the other player's strategies in the profile (Lundberg and Pollak, 1994). This Nash equilibrium is the level of goods consumed by both individuals that satisfies both demand functions simultaneously[18]. Meanwhile, the attractive aspect of this approach is that income pooling is not assumed and intra-household inequality is entwined with the efficacy of targeting individual, disadvantaged members of a household. For the developed countries, this

[17] These transfers are assumed not to alter the security levels of the two players in the game but are merely an addition to the overall household benefit.

[18] No household member has an incentive to deviate from his or her set of actions given that no other member deviates.

concerns whether child benefit should be paid through the father's pay cheque, or whether it should be an allowance that the mother picks up at a government office while the efficacy of instituting special supplementary feeding programmes for mothers and children are reflected in developing countries. This will ensure that some nourishment does indeed reach the disadvantaged within a household (Kanbur, 1991).

Unlike household welfare maximization models, where the transfer is seen as an additional household resource to be distributed according to the rules of the household welfare function. Haddad and Kanbur, (1994) stressed that bargaining models tend to lead to a greater emphasis on targeting disadvantaged members of a household which often make the household allocation inefficient.

3.2.2.3 The Pareto-efficiency model

This is a generic approach which avoids specifying a particular model of intra-family allocation, but assumes that family allocations obey a pareto-efficient sharing rule satisfying certain regularity conditions. A Pareto optimal allocation is reached when one individual within the household cannot be made better off at the expense of another household member. Chiappori (1988) modified the cooperative bargaining model with the assumption that allocations are Pareto efficient. Efficiency in household operations is achieved by dividing available income among household members on the basis of a certain sharing rule. Once the income is allocated, each member is constrained by an individual budget; each chooses his/her own consumption and labour supply through a limited utility maximization process (Chiappori 1992).

Specifically, it assumes husband and wife have distinct utility functions, with little care about one another. For instance, the husband does not care what his wife consumes, only that her consumption makes her happy and vice versa. This way, husband and wife choose an efficient allocation of resources. Nothing is assumed a priori about the nature of the decision process and about the location of the final outcome on the household Pareto frontier.

Chiappori characterised the household with individual consumptions and labour supplies given the market wage rates they face. He shows that the household's decisions can be modelled as though the individuals first shared their combined non-labour income and then maximized their individual utilities subject to separate budget constraints.

Under same assumptions, Browning and Chiappori (1998) exhibited a set of theoretical properties that have to be fulfilled by household demands, and thus seen as a generalization to the multi-person setting of Slutsky symmetry in the unitary framework. They cited household as one of the pre-eminent examples of a repeated "game" where each person knows the preferences of the other people in the household. Given that the game is repeated with this symmetry of information, agents plausibly find mechanisms to support efficient outcomes and confirmed the notion that cooperation often emerges as a long-term equilibrium of repeated non-cooperative frameworks.

Table 3.1. Summary of theoretical literature

	Unitary model	Efficient cooperative models	Bargaining models	Non-cooperative bargaining models
Members	Individuals with own preferences, one individual has altruistic preferences	Individuals with own preferences	Individuals with own preferences	Individuals with own preferences
Utility	Derived from the consumption of 'basic commodities'	Depend on the member's own consumption	Depend on individual consumption plus the consumption of household public goods	Depend on individual consumption plus the consumption of household public goods
Utility functions	One	More than one	More than one	More than one
Intra-household behaviour	Members' own preferences cause conflicts which are resolved through the altruistic behaviour of one household member	Decision are Pareto efficient, the sharing rule divides the resources between household members	Bargaining process through cooperative game, solution depends on the bargaining power of the participant, the result is Pareto efficient	Household has separate gender-specific economies, there is income transfers between wife and husband, bargaining is described by non cooperative game, not all equilibria are Pareto efficient
Threat point			Outside option, divorce	Non-cooperative equilibrium within marriage from which bargaining proceeds, equilibrium is based on traditional gender roles and specialisation to certain tasks.
Key references and studies	Becker (1964), (1965); Thomas(1990); Behrman (1997); Pitt (1997)	Haddad *et al* (1997); Chiappori (1988), (1992); Browning and Chiappori (1992)	Becker (1973); Manser and Brown (1980); McElroy and Horney (1981); Chiappori(1992); McElroy (1997)	Kanbur (1991); Kanbur and Haddad (1994); Lundberg and Pollak (1994)

Source: Compiled by the author.

3.3 Review of methodological issues

Close insights into the methodological review of the household health expenditure allocation in the literature reveals unresolved debates on the choice of methodologies. Since the chances are minimal for families to have two or more sick persons seeking treatment consecutively, the distributions of health expenditures will generally be skewed and may contain a proportion of zero observations. Hence, the estimators obtained will have poor properties (Albouy *et al*, 2009). However, major methods identified in the literature to handle this are categorised along the individual and household level analyses. These include descriptive analysis, the Engel curve; standard Tobit Model; the Sample Selection Model (SSM) and the Two Part Model (2PM).

3.3.1 Descriptive analysis

This is the primary focus of household health expenditure. Empirical analysis in this regard was pioneered by Thomas (1997) and applied more recently by Fuwa *et al* (2006) and Lina (2008). It involves tables, charts, measures of central tendencies, dispersions and associations. Notwithstanding the simplicity of this method does not permit modelling the decision to either seek treatment or not. In other words, it only reveals the characteristics of the variables, but fails when impacts are to be appraised. Also, very few multivariate household level analyses could be done since the available data cannot fulfil the criteria for achieving an unbiased estimation in econometric analysis (Su *et al*, 2006).

3.3.2 Engel curve

Household (not individuals) becomes the unit of analysis here. An Engel curve explains the relationship between consumer expenditure on a particular individual good with the total income or expenditure and to the socioeconomic and demographic characteristics (the genders and ages) of the household, holding prices constant. Better put, the Engel curve method seeks to detect differential treatment within the household indirectly, by examining how

household expenditure on a particular good changes with household gender composition (Kingdon, 2005). Among several variants of functional forms for the Engel curve linking expenditure on a good to total expenditure, the specification proposed by Working (1943) appears robust, due to its theoretical advantage of being consistent with a utility function and its postulation of a linear relationship between budget share of a good and the logarithm of total expenditure. The transformation of expenditures to budget shares and of total outlay to its logarithm induces an approximate normality in the joint density of the transformed variables, so that the regression function is approximately linear (Deaton, 1997). Deaton had expanded Working's Engel curve to include household demographics and other characteristics.

In addition to this, the model has been fitted on the sample of all households, irrespective of whether they incurred zero or positive expenditure on healthcare (dependent variable) while it is possible to have so many households with zero healthcare expenditure at the time of data collection and this is expected to ensure that the resulting estimates are biased. Equally, studies have found that Engel curve methodology failed to detect gender discrimination even where it is known to exist. Prominent among them are Deaton (1997) and Kingdon (2005). This result has been attributed to the fact that, the Engel curve technique estimates a single budget share equation encompassing two different mechanisms of bias (participation and expenditure decisions). Aslam and Kingdon (2005) affirm that averaging across the two may dilute biases if gender bias occurs through only one channel rather than both, or if the biases in the two channels are in opposite directions. Also, the nature of the data constrained the Engel curve approach for. It uses aggregated household data to infer differentiation. In a situation whereby expenditure data on health in household surveys is unavailable separately for each individual member, the Engel curve technique attempts to deduce differential treatment from household-level aggregated data which somehow makes it more difficult to detect gender biases in intra-household allocations.

3.3.3 Standard tobit model

This model, initially incorporated into household allocation by Amemiya (1973), was conventionally adopted to censor the zero health care expenditure so as to achieve normal distribution of the medical expenditure (often used as dependent variable). It assumes that the determinants of seeking health care and the determinants of positive health expenditure are the same, and the coefficients linked to these determinants are also the same. Tobit regression models the mean of expenditures conditional on a positive value of expenditures as a linear function of the control variables. However, the model exhibits few limitations: it presupposes that a single mechanism drives both the choice of positive expenditure and the choice of the amount to spend conditional on positive medical expenditure and also it can only estimate limited dependent variables (Su *et al,* 2006). Kingdon and Knight (2008) suggested that the Tobit model should be applied carefully because the assumptions may be strong to impose. Also, Madden (2008) confirmed that once the participation hurdle has been passed, then standard Tobit type censoring (whereby zero, or even negative participation, could be a utility-maximising choice) is not relevant.

3.3.4 Sample selection model (SSM)

This is otherwise known as generalized Tobit Model and is another method of dealing with the problem of zero-expenditure first introduced by Heckman (1979). It was developed to overcome the bias and inconsistency associated with estimating regression equations when values of the dependent variable(s) are only observable for a non-random subset of the available data. Full-information and limited-information estimation techniques have been developed for this model under specific distributional assumptions for the residuals; these techniques are simple consistent estimation methods that eliminate the specification error for the case of censored samples. SSMs have been used in a variety of contexts in which sample data are truncated or nonrandomly censored.

Let I_i be a dichotomous indicator of whether or not individual *i* has positive healthcare expenditures. Let y_i be individual i's level of healthcare expenditures. Then the SSM is thus presented below

$$\begin{aligned} I_i &= 1 \quad \text{iff} \quad v_i < Z_i\gamma \\ &= 0 \quad \text{iff} \quad v_i \geq Z_i\gamma \end{aligned} \tag{6}$$

and

$$y_i = X_i\beta + \mu_i, \tag{7}$$

where y_i is observed if and only if $I_i = 1$. X_i and Z_i are row vectors of exogenous observable variables, and β and γ are column vectors of unknown coefficients. It is assumed that

$$\begin{aligned} E(\mu_i) &= E(v_i) = 0, \\ E(\mu_i\,\mu_j) &= \sigma^2_{\mu}, \quad i = j \\ &= 0, \quad \text{otherwise}, \\ E(v_i\,v_j) &= \sigma^2_{v}, \quad i = j \\ &= 0, \quad \text{otherwise}, \\ E(\mu_i\,v_j) &= \rho\sigma_{\mu}\sigma_{v}, \quad i = j \\ &= 0, \quad \text{otherwise}, \\ E(\mu_i \mid v_j) &= \rho(\sigma_{\mu}/\sigma_{v})v_i \end{aligned}$$

As long as $\rho \neq 0$, OLS estimates of β will be biased and inconsistent.

Maximum likelihood estimates of β and γ have been derived under joint normality assumptions (Hay and Olsen 1984). Limited information estimates of β have been obtained under alternate assumptions about the distribution of v_i. The adjusted Tobit model (ATM) is a special case of the SSM in which y_i is replaced by $\ln(y_i)$ and μ_i, v_j are assumed to be joint normal with $\sigma_v = 1$, $\rho \neq 0$. It is written as

$$I_i = 1 \quad \text{iff} \quad v_i < Z_i\gamma$$
$$= 0 \quad \text{iff} \quad v_i \geq Z_i\gamma \qquad (8)$$

and

$$\ln(y_i) = X_i\beta + \mu_i, \quad \text{iff} \quad I_i = 1$$
$$\ln(y_i) = -\infty \quad \text{iff} \quad I_i = 0 \qquad (9)$$

where $v_i \sim N(0, 1)$ and $u_i \sim N(0, \sigma \mid I_i = 1)$.

Because of the distributional assumptions on u_i and v_i, the likelihood function factors conveniently into two terms, one depending only on the parameters γ and one depending only on the β, σ parameters. The ATM calculate expected expenditures as

$$E(\text{expense}) = \Pr(\text{expense} > 0) \times E(\text{expense} \mid \text{expense} > 0) \qquad (10)$$

However,

$$E_{ATM}(\log \text{expense} \mid \text{expense} > 0) = X_i\beta^* + \delta\lambda(Zi\gamma) \qquad (11)$$

where λ is the reciprocal Millis ratio and $\delta = \rho\sigma_\mu$.

Also, if D denotes individual's participation (such that D = 1 for participation and D = 0 otherwise) and M as the amount of expenditure. X^D indicates all the covariables related to D and X^M for those related to M. It was not necessarily assumed that $X^D \neq X^M$, though the expense is deduced from the data (D_{it}; M_{it}). Since common factors could simultaneously affect health care use and the amount of care (vectors D and M will have many variables in common), classical distributional assumption was made so as to take into account the correlation between the residuals of the two equations and the estimation greatly depends on this assumption in the case where the covariates for D and M are the same. In this model, in order to separately identify the decision regarding participation and the spending decision, it is vital to have variables which enter D but do not enter M (for instance Z such as $Z \in X^D$ and $Z \notin X^M$); this is known as exclusion restrictions. If Z cannot be found, then separate identification depends upon the non-linearity of the extra term (known as the Inverse Mills Ratio, IMR) which appears in the level equation. Some

studies have supported SSM modelling (Hay and Olsen, 1984; Maddala, 1985 and Puhani, 2000).

In addition to sample selection, endogenity (or unobserved heterogeneity) as another potential bias in SSM need to be controlled in modelling health care expenditure. In a study on household health expenditure in Nepal by Rous and Hotchkiss (2003) where the amount of health care expenditure, choice of providers and reporting illness were simultaneously determined, they developed a full information maximum likelihood model to control endogenity of sickness and provider choice.

However, Albouy *et al* (2009) affirms that the robustness of SSM estimators is often considered poor for lacking exclusion variables, while Madden (2008) cautions that the IMR is frequently an approximately linear function over a wide range of its argument, and so, estimates from the spending equation may be non-robust. Also, Leung and Yu (1996) stresses that, if the variables are jointly omitted in the two equations, the residuals are necessarily correlated, which implies that SSM is subject to multi-collinearity problems between the regressors in M and the IMR. This problem usually limits the power of the t-test for sample selectivity on the coefficient of the IMR.

3.3.5 Two part model (2PM)

This is modelled as a function of the decision to demand treatment as well as finding out if the household decreases or increases its absolute spending on health care. In a 2PM, separate processes are used to model the censoring mechanism and the outcome of interest which is particularly useful when there is strong reason to believe that certain observed values occur with either too large or too small a frequency for a simpler model to estimate (Cameron and Trivedi, 2005). Consequently, 2PM assumes that individuals must pass two stages (participation decision and expenditure decision) before being observed with a positive level of expenditure, and both stages are the outcome of individual choices, and then two distinct equations were developed to determine

the participation and expenditure decision, though, the precise form of the 2PM to adopt depends on some crucial assumptions.[19] (Madden, 2008).

Following conditional probability theory, the general form of a 2PM can be written as:

$$E[y \mid x] = Pr(y > 0) \times E[y \mid y > 0, x] \quad (12)$$

where y is the dependent variable of interest and x is a set of covariates

The first part of the model, also known as the participation decision, is estimated using a probit/logit regression to determine the probability of observing a positive expenditure. The dependent variable is a binary outcome, corresponding to whether positive expenditure on a good is observed or not. The second part of the model, also known as the level specification, uses either Ordinary Least Square (OLS) or Generalized Linear Modelling (GLM) on the set of positive observations. However, studies have found two-part model performing better than the Tobit and Sample Selection Models (Jones, 2000; Gao and Yao, 2006).

However, researchers have also combined Engel curve and Two Part models (Aslam and Kingdon, 2005; Gao and Yao, 2006; Leive and Xu, 2007; Kingdon and Irving, 2008). In a study of household out-of-pocket payments for health care in Burkina Faso, Chad, Kenya, Senegal, Zambia and Zimbabwe, Leive and Xu (2007) estimated Engel curves in the general Working-Leser form given below:

$$\omega_{ih} = \alpha_{ih} + \beta_{ih} \log x_h \quad (12)$$

where ω_{ih} is the expenditure share of good i for household h, x is total expenditure, and α_i and β_i are parameters to be estimated. On the other hand, they estimated the two-part models for food, education, and housing expenditure in each country to determine if households decrease absolute spending on these goods.

[19] the assumptions are the degree of independence between the error terms in the participation and expenditure equations and the issue of dominance (whether the participation decision dominates the expenditure decision)

Table 3.2. Summary of methodological literature

S/N	Methodology	Estimation techniques	Econometric issues	Key references and studies
1.	Descriptive analysis	tables, charts, measures of central tendencies, dispersions and associations.	None	Thomas (1997) Fuwa *et al* (2006) Lina (2008)
2.	Engel curve	Ordinary Least Square	skewness and proportion of zero observations	Working (1943) (Deaton, 1997) Kingdon (2005) Aslam and Kingdon (2005)
3.	Standard tobit model	Logit model	heterogeneity	Amemiya (1973) (Su *et al*, 2006)
4.	Sample selection model (SSM);	Instrumental variable with minimal support	state dependence and heteroskedasticity	Heckman (1979) Hay and Olsen, (1984); Maddala, (1985) and Puhani, (2000) Albouy *et al* (2009)
5.	Two part model (2PM)	Instrumental variable with large support	Endogeneity heterogeneity	Jones (2000); Gao and Yao (2006); Cameron and Trivedi, (2005)
6.	Engel curve and two part models	Probit, Logit, OLS Generalized Linear Square (GLS)	Marginal value	Aslam and Kingdon, (2005); Gao and Yao, (2006); Leive and Xu (2007); Kingdon and Irving (2008)

Source: Compiled by the author

3.4 Review of empirical issues

Several researchers have conducted empirical investigations into the intra-household expenditure allocation with emphasis on health expenditure. While some treated health expenditure on its own, others included it as a subset of the whole expenditure. The following empirical review contains the latter.

Quisumbing and Maluccio (2000) use available household data to investigate theory and empirical evidence, testing unitary versus collective models of the household in four regionally-diverse countries (Bangladesh, Indonesia, Ethiopia, and South Africa) with very different social and economic conditions. They indicate that bargaining power determines the share of resources allocated to an individual within the household. The variables used include the budget share of the good; total per capita expenditures, and household size; assets owned by the husband and wife, demographic group in the household as well as variables indicating location and survey round. Their findings reject unitary model as a description of household behaviour. This result was stronger in the Asian countries than in their African counterparts, in the sense that, the unitary model is rejected in more expenditure share equations in the former.

Exploring further the gender inequality in household health expenditure **(**Rout, 2006) studies urban Orissa in India with the sample size as one hundred and twenty one households. He specifically tries to see the impact of biologically determined sex and socially constructed gender on the household out-of-pocket health expenditure. Three variables used are Per Capita Health Expenditure (PHE) – division of total annual health expenditure of the household and household size; per male health expenditure (PMHE) – division of total annual male healthcare expenditure of the household by number of male members and per female health expenditure (PFHE) – dividing total annual female healthcare expenditure of the household by number of female members. In a comparative study of influence of sex and gender on health expenditure in rural and urban Orissa, he finds that the influence of male on the PHE in rural areas is more than in urban areas and the influence of female on it is higher in

urban areas than in rural areas. This signifies a more gender consciousness in urban areas than in rural areas in respect of health expenditure.

Maitra and Ray (2000) test the two major implications of the unitary household model. Each individual pools the various components of her/his non-labour earnings; men and women pool their non labour earnings among themselves, using South Africa and Pakistan as case studies. Household income is subdivided into earned income of men and women; unearned income of men and women; social pension (unemployment insurance) received by the household in South Africa (Pakistan), disaggregated by the gender of the recipient; and private transfers, and similarly disaggregated by gender of the recipient. All these serve as endogenous variables. For South Africa, 9,000 households are drawn randomly from 360 clusters while the Pakistan covers 4,800 households residing in rural and urban communities. The study finds that though the social pension scheme in South Africa transmit large sums of public funds to households via the pensioners living in them, it discriminates against the black (poor) households (possibly due to the legacies of apartheid). Likewise, the unemployment insurance scheme in Pakistan, did not reach poor households, but female headed households were being effectively targeted by female unemployment insurance. Nonetheless, the study reveals gender differences between the results on testing the hypothesis that an individual pools all the different components of non labour income, which also confirms the general notion that men and women are much less likely to pool their transfer income than other types of income, thus rejecting pooling hypothesis.

Gao and Yao (2006) observed the age structure of the gender gap in 48 villages of eight Chinese provinces with data sourced from March 2003 health survey on 1,428 rural households (8,414 persons) and the National Fixed-Point Survey which has a random sample of 34,000 households drawn from all the provinces. Five categories of variables used include dependent (probability of treatment, probability of spending, curative expenditure); individual (education–in years); household (per capita income in 2002, per capita land, education of the head–in years, number of household members and dependent ratio–the

number of children under age 15 and the elderly older than 60 divided by the number of household members); village (drinking water safety, flushing toilets installed, distance to township site, distance to county site, topology–hilly, mountainous) and age group by gender–in 14 groups. The treatment decision and curative expenditure for illnesses happening in the 2 weeks prior to the survey date. Since a family may not have two or more sick persons within two weeks, the identified gender gap was attributable to cross-family heterogeneities which makes the study to rely on studying the whole sample rather than exploring within-family gender gaps. They show that women get preferential treatment between the ages of 20 and 34, and this, in their opinion, being the childbearing period, they must be hale and hearty to raise healthy children. High market value of men in their prime age rationally reduces their hospital trips to exchange for more current income. This implies that they respond to specific household and village characteristics differently. While women are more mindful about saving family income, men are more mindful of the time spent on consulting a doctor, that is, "women do not generate as much income as men do, so they strive to save the income already earned, while men strive to avoid the loss of working time so they can earn more income".

However, they realised that girls are discriminated against in getting health care because girls' curative expenditures appear sensitive to parents' education, family income and wealth, and village sanitary conditions, while boys' curative expenditures do not respond to any of these factors. The family solution to its dynamic planning problem also explains this discrimination thus: future family contribution by girls dwindles after marriage, which necessitates the cut in their health expenditures. These two major findings reveal a strong evidence of intertemporal substitutions. "Prime-age adults have significantly lower chances of seeing a doctor than children and old-age adults, who spend significantly less than old-age adults. Clearly, the family is engaging in intergenerational planning that tends to trade prime-age adults' health for higher current income so that it has money to raise children's health and provide health care for the elderly".

In a South African study, Kingdon and Irving (2008) examine the channels through which gender differentiation takes place in healthcare behaviour by constructing a sequence of decision stages which include reporting sickness, consulting medical practitioners, incurring positive medical expenditure, and the conditional amount of expenditure. Applying the South African Integrated Household Survey (SAIHS) of 1993, which is the first survey to cover the entire South African population sampling 43,984 individuals in 8,854 households, the sample was split into five age cohorts, the young (0 - 5); the intermediate juvenile (6 - 15); the prime age working group (16 – 40) which also incorporates women of child-bearing age; a middle-aged working group (age 41 - 64); and the elderly age 65 and above. This research was spectacular in examining the relationship between gender and health expenditure through the individual level and household level analyses applied. After controlling for observable heterogeneity, individual level variables include gender, age, years of education and employment status (dummy variables for unemployment, casual employment and regular employment, the base category being those out of the labour force).

Household variables in their study were household per capita expenditure, household size, dependency ratio (ratio of members aged 0-14 and over 64, to members aged 15 to 64) and gender of the household head. Community characteristics were also included in some specifications. In the research, a unitary model of the household allocation was applied and at the household level, an extended Engel curve relationship between medical expenditure and household income was assumed to allow for the inclusion of household demographics and other characteristics. Modelling a sequence of the above health behaviour decisions, the study observed a clear pro-female gender differentiation particularly in the binary decision stages: reporting sick and incurring positive medical expenditure, conditional on consulting a medical practitioner. However, they found strong evidence suggesting that women are favoured in the treatment decision, the positive medical expenditure decision in particular for prime age women (16 - 40) which confirms that household health allocation favours women over men in the child rearing period.

Non-documentation the leisure consumption (mainly due to the lack of information on household chores); and potential endogeneity of bargaining power proxy variables were the two notable data limitations in the literature in 90s that Fuwa *et al* (2006) set out to rectify. Earlier studies of unitary models tested the income pooling assumption by using information on non-wage incomes, which have been persistently claimed as non-exogenous. Few developed countries studies used samples limited to couples of full–time employed workers, assuming that labour supply decisions are largely fixed for them. And in developing countries, applying this same approach will fail given the relatively small population of such couples.[20] Fuwa *et al* (2006) collected detailed time use data and went back in time (premarital; parental generation); and gathered information on extra-household linkages, such as existence or absence of parents of the couple so as to remedy the debacles. Surveying a total of 400 households from 32 agricultural villages in two *mandal*s in 2005, they found that child labour was a major phenomenon in the surveyed region, which affirms that less educated parents and poorer parents are more likely to send their children out to work with clear and strong gender discrimination against girls. Because of the evidence that the recipient of a transfer of resources will increase his/her bargaining position in the household. They advised that the transfer be directed to those who care about the weak and vulnerable household members. On the whole, the study is supportive of the collective models.[21]

Estudillo, *et al* (2001) assessed the existence of gender bias in the intrahousehold allocation of resources in the rural Philippines by including intergenerational transfers of wealth in the analysis because such transfers directly affect the lifetime income of individuals. The data used were from three household surveys conducted in 1989 and 1997–98 in five rice-growing villages in the Philippines. These data were household income as well as the incomes of individual children regardless of their civil status and place of residence, detailed data on household expenditure items (divided into food, housing,

[20] Many jobs are unstable and self-employment is more important in developing nations

[21] The estimation of expenditure patterns where certain characteristics of the surviving father of the spouse increase female and child consumption, but those characteristics have no effect where the spouse's father is deceased and is the only identified exception.

clothing, schooling and health among family members by gender); the predicted values of per capita expenditure; household size; inherited landholdings and schooling of fathers and mothers as indicators of exogenously-determined bargaining power of spouses.

The study finds that daughters receive less land but are compensated by more schooling, that is, higher investment in daughters' schooling neutralize the existing gender bias in land inheritance in favour of sons. This situation is a reflection of increased returns on female human capital in non-farm jobs, which is consistent with the efficiency concerns of parents. Therefore, the research concludes that there was no evidence that daughters and wives are discriminated against in expenditure allocation compared to sons and husbands.

Angel-Urdinola and Wodon (2010), articulated the extent to which income generation affects decision making within households in Nigeria, using the 2003 Core Welfare Questionnaire Indicator (CWIQ) surveys implemented in eight Nigerian states. With the predicted probability of decision making as dependent variable, the set of exogenous variables are age of the individual; household size; religion of the household; education of the individual; a number of employment-related variables for the individual; and several other variables such as: whether the household owns a house; has access to electricity, water, and sanitation; whether the household head is a temporary migrant; and regional dummies to control for geographic effects. They finds out that in Nigeria, as in other Sub-Saharan nations, men make most of household decisions as de facto household heads. This decision-making power covers the use of productive assets (land use, crop sales, and shelter). Though women participate more often in decisions on some expenditures (food, heath, and education), this power is especially low among poor households, partly because the likelihood that women will be the main contributor of household income is much lower in such households.

Table 3.3. Summary of empirical literature

S/N	Study	Scope	Variables	Findings
1.	Quisumbing and Maluccio (2000)	Bangladesh, Indonesia, Ethiopia, and South Africa	Budget share of the good; total per capita expenditures, and household size; assets owned by the husband and wife, demographic group in the household; as well as variables indicating location and survey round	Reject unitary model as a description of household behaviour especially in the Asian countries than in their African counterparts.
2.	Rout (2006)	Urban Orissa, India	Per Capita Health Expenditure (PHE) and household size; per male health expenditure (PMHE) and per female health expenditure (PFHE)	The influence of male on the PHE in rural areas is more than in urban areas and the influence of female on it is higher in urban areas than rural areas.
3.	Maitra and Ray (2000)	South Africa and Pakistan		The social pension scheme in South Africa transmit large sums of public funds to households via the pensioners living in them, it discriminates against the black (poor) households. Unemployment insurance scheme in Pakistan did not reach poor households, but female headed households are being effectively targeted by female unemployment insurance. Men and women are much less likely to pool their transfer income than other types of income, thus rejecting pooling hypothesis.
4.	Gao and Yao (2006)	China	Probability of treatment, probability of spending, curative expenditure education; per capita income in 2002, per	Women get preferable treatment between the ages of 20 and 34. High market value of men in their prime age rationally reduces their

			capita land, education of the head, number of household members and dependent ratio; drinking water safety, flushing toilets installed, distance to township site, distance to county site, topology–hilly, mountainous and age group by gender–in 14 groups.	hospital trips to exchange for more current income. Girls are discriminated against in getting health care (girls' curative expenditures appear sensitive to parents' education, family income and wealth, and village sanitary conditions, while boys' curative)
5.	Kingdon and Irving (2008)	South Africa	Gender, age, years of education and employment status, household per capita expenditure, household size, dependency ratio and gender of the household head.	Pro-female gender differentiation in the decision stages. Household health allocation favours women over men in the child rearing period.
6.	Angel-Urdinola and Wodon (2010)	Nigeria	Probability of decision making; age of the individual; household size; religion of the household; education of the individual; a number of employment-related variables for the individual	Men make most of household decisions as de facto household heads, women participate more often in decisions on some expenditures (food, heath, and education)

Source: Compiled by the author

In the theoretical literature, there was a consensus on the formation of household, that is, household is formed by coming together of just two individuals (husband and wife) in a binding agreement. In Nigeria, however, existence of polygamy implies that household can be formed by two or more individuals, husband and wife(ves).

Moreover, this study combines both Engel Curve and Hurdle Specification (Modified Two-Part Models). The former aggregates household data (unconditional medical expenditure) while the latter disaggregates them (conditional medical expenditure through the sequence of the binary decision stages preceding determination of the level of healthcare expenditure). This choice is imperative because the thrust of this study, which is the gender disparity in the household health expenditure allocation in Nigeria, actually exists in the healthcare decision stages preceding expenditure stage and this is totally missing in the Engel Curve.

CHAPTER FOUR

THEORETICAL FRAMEWORK AND METHODOLOGY

4.1 Introduction

This chapter discusses the theoretical framework upon which this study is based and the adopted methodology. The study focuses on gender patterns in household health expenditure allocation, and household in most developing nations reveal a lopsided gender-balance in every decision that affects its members.

4.2 Theoretical framework

From the reviewed theories, the most applicable to the Nigerian context is the non-cooperative bargaining theory of the collective household behaviour model pioneered by Kanbur and Haddad (1994) and Lundberg and Pollak (1994). This theory adequately depicts household as a collection of largely separate gender-specific economies linked by reciprocal claims on members' assets (human or physical) with their respective threat points. Specifically, it acknowledges the theory that distribution between spouses in a two-parent family depends on which parent receives extra income, such as child allowance and contrary to standard bargaining approaches; the threat point is the non-cooperative equilibrium within the marriage and not divorce as canvassed by the efficient cooperative model.

The theory focuses on self-enforced equilibrium, hence, the absence of binding agreements in household allocations within the family. If participants in the marriage market could negotiate without transaction costs and make binding, costlessly enforceable agreements, then the marriage market would determine, not only who marries who but also distribution within marriage and that the division of any surplus is determined by bargaining within marriage.

Lundberg and Pollak (1994) called this non-cooperative approach to distribution a *separate spheres bargaining model*.

Mattila-Wiro (1999) defined the non-cooperative equilibrium in terms of the traditional gender roles and their expectations. In a non-cooperative marriage, the division of labour based on traditional gender roles, emerges without explicit bargaining. In the separate spheres bargaining models, this voluntary contribution equilibrium acts as a threat point from which bargaining evolves. It is more beneficial for both spouses to maintain the non-cooperative equilibrium than to initiate bargaining, which would bring high anticipated transactions costs and low expected gains.

Furthermore, household has a pluralistic way of making decisions, (each member acts as an individual with a single utility function and also contributes to the collective decisions). In particular, expenditures are affected both by an individual's needs and such person's ability to pay for them.

The public goods of a household and the mutual consumption economies are what keep spouses together, which also distinguish a non-cooperative marriage from independently optimizing individuals and the interdependence in the marriage operates only through consumption of the public goods. However, in a non-cooperative equilibrium, public goods are undersupplied and thus potential cooperation offers the possibility of gain, and its provision is not only inefficient, but also fails to provide the anticipated well-being to household members (Mattila-Wiro, 1999). Remarkably, many public goods, like child and home care, rely on well functioning human relations (mutual support and affection) in order to be beneficial for all household members.

Browning and Chiappori (1998) and Browning *et al* (2004) reel out some procedures to open up the household and apply a sharing rule to estimate member's allocation. These procedures explicitly reveal who gets what, either the data are collected in like manner (men and women separately) or that the good is consumed only by one or a subgroup of household members (*adult or children*). In spite of its wide application, the results have not produced much evidence of discrimination in its initial context (Deaton, 1997).

Formats for splitting up an observed aggregate into its components have also been proposed in the literature (Deaton, 1989; Bidani and Ravallion, 1997; Deaton and Paxson, 2000). This, in principle, offers a clear-cut way of disaggregating household expenditure and this approach that has recently been implemented by gender-based studies. Hjortsberg (2000) modified the theory to include household composition (the number of adult females, males and children within the household) and more importantly, individual characteristics of members. The characteristics include education, income and gender.[22]

Concerning expenditure on health care, each member primarily focuses on his or her own utility of health care consumption while the benefits for the household as a unit become secondary. Health care has an opportunity cost (time) and direct cost (money). Thus, with less possibility of participating in the labour force, women face a lower opportunity cost in health care consumption on the average.

Also, some other unique characteristics of households in Nigeria that informed this theoretical choice includes the practice of polygyny[23], existence of nuclear and extended-family type side by side as well as patrilineal family pattern. In most cases, cooperation of the wife(ves) with the husband in allocation possesses much suspicion and all these have implications on the household health expenditure allocation.

The framework of the non-cooperative bargaining theory of the collective household behaviour model pioneered by Kanbur and Haddad (1994), as amended to reflect the Nigerian context, proceeds from the following assumptions:

i. There are two or more individuals, husband and wife(ves), indexed *h* and w_i

ii. They consume vectors of private goods x_h and x_{wi} at a price vector *p*

[22] These characteristics, usually of the head of household, influences health care consumption.
[23] A form of polygamy whereby a man is legally married to more than one wife simultaneously, the other form is polyandry which is legal marriage of one woman to several men at the same time.

iii. There is a household public good, q, jointly produced and consumed by the husband and wife(ves).

iv. The quantity of q is equal to the sum of the individual contributions made by all parties.

v. Husband and wife(ves) decide simultaneously on the levels q to contribute, subject to the constraints that the expenditures of each spouse do not exceed the spouse's private resources.

vi. Husband and wife(ves) are imperfect altruists[24].

vii. Individual, disadvantaged members (children and aged) of a household are emphatically targeted in allocation process.

viii. Relationship lasts forever and is subject to a household production function.

In constructing the model, a simple repeated game in which the spouses voluntarily contribute to the supply of a single household public good gave the husband's objective function as

$$\beta_h u_h + \beta_{wi} u_{wi}, \quad \beta_h > \beta_{wi} \tag{13}$$

and the wife's objective function is

$$\gamma_h u_h + \gamma_w u_{wi}, \quad \gamma_h > \gamma_{wi} \tag{14}$$

where

h and w_i represent husband and wife(ves) respectively

U represents the utility of members

In equations (13) and (14) above, a compensated parameter change is defined as one which produces no change in the sum of utility, $u_h + u_{wi}$. As with the

[24] Those who believe that acting for the benefit of others is right and good

Pareto-efficient models, this implies that if a compensated change benefits one party, it hurts the other.

The household problem can thereafter be written as:

$$\text{Max}\ \theta U_h(x_h, x_{wi}) + (1-\theta)U_{wi}(x_h, x_{wi}) \qquad (15)$$

subject to the full income constraint

$$\sum_{i=h,w} p' x_i \leq \sum_{i=h,w} w_i T_i + I \qquad (16)$$

where

x_i represents the vectors of private goods consumed by individual i

p and w_i, stands for price vector and wage rate of individual i

T_i and I represent the time endowment of individual i and total household unearned income[25].

$\theta \in [0,1]$, which, represents the welfare weight of the members depends on prices, household income and other variables, such as: the distribution of income and bargaining strength.

The decisions which allocate purchased and domestic goods, follow from the choice of transfers to maximise (13) and (14) subject to (15) and (16) yields the following first-order conditions;

$$\beta_{wi} u_{xwi} \leq \beta_h u_{xh} \qquad (17)$$

and

$$\gamma_h u_{xwi} = \gamma_w u_{xwi} \qquad (18)$$

The restrictions on the utility functions imply that there must be transfers of household output from husbands to wives, otherwise, husband's marginal utility from domestic output would be infinite. But when wives earn wages, the same argument does not apply to transfers of purchased goods. Hence, equations (17),

[25] Prices and wages are assumed to be exogenous to the model.

but not (18), can hold with inequality. This gives two regimes: with and without cash transfers, whose comparative static properties differ.

When equations (17) and (18) are set up and solved optimally, it then leads to the individual's share of the healthcare expenditure as follow:

$$m_h^g = \alpha_h^g + \beta_h^g(\theta\mu) + \varepsilon_h^g \quad (19)$$

and

$$m_{wi}^g = \alpha_{wi}^g + \beta_{wi}^g[(1-\theta)\mu] + \varepsilon_{wi}^g \quad (20)$$

where

m is the healthcare expenditure, ε_h^g and ε_{wi}^g connote stochastic errors In the instance that gender specific expenditure on specific commodities are not observable in the survey data, m_h^g and m_{wi}^g are alternatively weighted and an average healthcare expenditure will be applied for both spouses. Thus, it becomes

$$m^g = \theta m_h^g + (1-\theta)m_{wi}^g \quad (21)$$

Substituting for m_h^g and m_{wi}^g obtained from equations (19) and (20) in equation (21) and including household demographic variables as additional explanatory variables gives the theoretical model for this study stated below:

$$m^g = \alpha_0^g + \alpha_1^g\theta + \beta_h^g\theta^2\mu + \beta_w^g(1-\theta)^2\mu + \gamma^g \log(n) + \sum_{i=h,w}\sum_{k=1}^{K}\varphi_{ki}^g\left(\frac{n_{ki}}{n_i}\right) + \varepsilon^g \quad g = 1, \ldots G \quad (22)$$

where n_{ki}/n_i is the proportion of household members in the k[th] age-gender group while $k = 1 \ldots K$ refers to the K[th] age-gender group within household *i*.

Since incomes are not usually pooled within the African household context (Haddad *et al*, 1997), household disadvantaged members' ability to pay for medical care conditional on reporting sick are on average lower due to their relative lower incomes. But by recognising non-market contribution of members (child-rearing and maternal care) to household welfare, expenditure on their health becomes a vital household investment notwithstanding their little contribution to the household monetary resource base.

4.3 Methodology

Deaton's household composition methodology has been widely employed in the literature on household-level discrimination generally and specifically in evaluating the extent of gender differentiation in household expenditures. However, household literatures on gender pattern have severally revealed obvious riddle that expenditure patterns generally fail to demonstrate significant gender differences, even where measured results show clear differences between male and female groups (Kingdon, 2005).

Following Kingdon and Irving (2008)[26] the methodology adopted for this study combines both Engel Curve and Hurdle Specification (Modified Two-Part) Models. The difference between the two is as follows:

i. Hurdle models accommodate the stages preceding expenditure stage while Engel Curve does not.

ii. Engel Curve uses aggregated data and might aggregate the disparity while Hurdle models uses disaggregated data thereby making it possible to see which of the stages that the disparity emanates from.

[26] They examined the gender question at both the individual and household levels so as to determine the existence or otherwise of some forms of aggregation bias and found that gender differentiation is more noticeable with individual level than with household level data.

4.3.1 The model

Two groups of models were utilised for this study. They are the hurdles model and unconditional healthcare expenditure model. The hurdle model involves the sequences of the decision stages preceding determination of the level of healthcare expenditure, while the unconditional healthcare expenditure model involves the proportion of total expenditure household spent on healthcare, whether its members are ill or not. Since healthcare expenditure decisions are made at household and individual levels, both models examined the effects of household and individual variables on healthcare expenditure. The estimation explicitly takes into consideration the gender patterns of healthcare expenditure decision making at the household and individual levels.

4.3.1.1 Hurdle models for health care decisions

This is a four-stage decision model that examines the sequential process that individuals follow when they fall ill or get injured. The assumption is that, different factors affect the decision of the individual at different levels of health seeking activities. It also assumes that members of the households are adults who can decide on their own, conversely, the existence of disadvantaged members who cannot decide on their own is a reality in every household. Therefore, household headship is included at every stage of the analyses whose decision is assumed to influence the choice of other members of the household. This thesis examines four stages of the health seeking behaviour as contained in the specific objectives.

Stage 1 of the hurdle: (healthcare needs stage) – objective i

This is the first stage in the healthcare seeking behaviour. It examines the healthcare need of the individual household members. At this stage, those who are ill make the decision whether or not to report the illness / injury. This decision is represented by R which takes on 1 if illness (or injury) is reported and takes on 0 if otherwise (that is, R=1 or R=0) and it is examined through probabilities. Stage 1 is modelled as follows:

$$P(R = 0 \mid x) = 1 - \Phi(x'\gamma) \quad . \quad . \quad . \quad (23)$$

where Φ represents a standard normal distribution function;

x is a vector of explanatory variables categorised along individual and household characteristics (as fully described in equations (27) and (28) below);

γ indicates the estimate of the parameter vectors in the healthcare needs stage.

It should be noted that equation (23) indicates the probability of an individual reporting illness and the variable of interest in its estimation is the gender of the individual that reports illness.

Stage 2 of the hurdle: (healthcare utilisation stage) – objective ii

Household members that have cleared the first stage of the hurdle are expected to be included in the second stage. At this stage, individuals who reported illness in stage 1 goes through further different decision-making criteria. The stage involves healthcare utilisation and the available options are to decide to seek treatment and consultation[27] from competent source or decide to not to consult. This stage of consultation is represented by T, (conditional on R=1), it assumes 1 if the person consults and 0 if otherwise (T=1 or T=0) and is modelled as

$$P(T = 0 \mid x) = 1 - \Phi(x'\theta) \quad . \quad . \quad . \quad (24)$$

θ is the estimate of the parameter vectors in the healthcare utilisation stage.

Also, equation (24) represents the probability of seeking consultation, while the variable of interest is the gender of the individual that seeks treatment.

Stage 3 of the hurdle: (healthcare spending stage) – objective iii

[27] Consultation implies seeking medical advice from health officials within or outside hospitals (orthodox, traditional or spiritual) but not from friends and family members who are not health officials.

Individuals who have successfully passed through stage 2 of the hurdle are then assumed to take further decisions conditional on healthcare utilization. At this stage, it is a possibility that, individuals utilising healthcare can either be advised to take certain precautions that may not attract any monetary cost or receive healthcare treatment with monetary cost. Consequently, conditional on utilisation (T=1) in equation (24), decision to incur positive expenditure is therefore represented by M, which takes on 1 if medical cost is incurred and 0 if otherwise (M=0 or M=1). This decision is expressed in the model below.

$$P(M = 0 \mid x) = 1 - \Phi(x'\eta) \quad . \quad . \quad . \quad (25)$$

η is the estimate of the parameter vectors in the healthcare spending stage.

Again, equation (25) specifies the probability of positive medical expenditure and the gender of the individual that who incur positive expenditure is the variable of interest.

Stage 4 of the hurdle: (conditional medical expenditure stage) – part of objective iv

This is the last stage of the hurdle. Household members who have cleared the first three stages take further decisions regarding the expenditure incurred in assessing healthcare. At this stage, the actual amount of the medical expenditure is determined, assuming independence among decision stages in equations (23) – (25). Conditional on reporting positive medical expenditure, the stage is modelled as follows:

$$\log(M \mid x, R = 1, T = 1, M = 1) = N(x'\beta, \sigma^2) \quad . \quad . \quad (26)$$

β is the parameter to be estimated while σ^2 is the variance of M.

Since studies have found that, the kernel density of M shows it is log-normally rather than normally distributed, the estimator of β in equation (26) is the estimator from a regression of log M on x, using only the observations where individuals report positive healthcare expenditure.

Equations (23) – (26) are analysed at both individual and household levels.[28] The unconditional expenditure is thus included to allow for comparison between the results for all samples and the censored (conditional) samples.

4.3.1.2 Unconditional healthcare expenditure models – part of objective iv

This is the extension of the conventional Engel Curve function proposed by Working (1943) and expanded by Deaton (1997). It links expenditure on a good to total expenditure and it is called Unconditional Healthcare Expenditure because it incorporates household members that report zero healthcare expenditure in the analysis. In the same vein, this is fitted on both the household and individual level data.

a. Household level specification

The household unconditional healthcare expenditure model is specified below:

$$m_i = \alpha + \beta \ln\left(\frac{x_i}{n_i}\right) + \eta \ln n_i + \sum_{k=1}^{K-1} \gamma_k \left(\frac{n_{ki}}{n_i}\right) + \tau . \boldsymbol{z}_i + u_i \quad . \quad . \quad (27)$$

where

m_i is the household *i's* medical expenditure;

n_i is household size;

$\ln (x_i / n_i)$ is natural logarithm of household per capita expenditure;

n_{ki} / n_i is the proportion of household members in the kth age-gender group while $k = 1 \ldots K$ refers to the Kth age-gender group within household *i*;

$\mathbf{z}_i$ is a vector of other household characteristics (religion, education, gender and employment status of the household head); and

u_i is the error term

[28] A household is included in the analyses if, at least, a member of such household observes any of the health seeking behaviours.

The γ_k coefficients represent the effects (on medical expenditure) of changing the composition of household *k* holding household size constant, for example, by replacing a child in a younger age group with one in an older age group or replacing a man by a woman in a given age category and testing for gender differences simply involves testing the hypothesis that $\gamma_{km} = \gamma_{kf}$, where the subscripts *km* and *kf* are the age-gender groups (male and female). Thus, testing for gender difference in healthcare expenditure in a specific age group will involve testing whether the coefficients of male and female in such age groups are significantly different from each other.

b. Individual level specification

The individual unconditional healthcare expenditure model is specified as follows:

$$m = \alpha + \beta \ln\left(\frac{x_i}{n_i}\right) + \eta \ln n_i + \tau \boldsymbol{w}_i + u \quad . \quad . \quad (28)$$

where

m is the individuals' medical expenditure;

w is a vector of individual regressors that includes religion, gender, age, education and employment status; and

other variables as previously described in equation (27).

Individual level analyses are estimated with age as an explanatory variable in two separate ways to reflect the age structure of gender patterns. These are:

i. through pooling all ages together which tries to find the linearity of the age effect on the healthcare seeking behaviour; and

ii. through gender-differentiated age cohorts, which examines the possible inter-temporal substitution of the healthcare seeking behaviour over both individual's life cycle and among different generations.

4.3.2 A-priori expectation

Since Working (1934) has defined goods as necessities or luxuries whose consumption declines as income rises, the positive and negative household expenditure coefficients imply a necessity ($\beta_i < 0$) and luxury ($\beta_i > 0$) respectively. Therefore, α, β, η, and τ are the parameters to be estimated and on the a-priori, it is expected that $\alpha > 0$, $\beta \lessgtr 0$, $\eta \lessgtr 0$ and $\tau \lessgtr 0$. However, the a-priori expectation of each of the variables is contained in detailed variables' descriptions in Appendix A.

4.3.3 Estimation technique

4.3.3.1 Probit regression

Multivariate regression has been generally used when the response variable is continuous and has an unbounded range (Gujarati 2004). However, the response variable may sometimes be discrete rather than continuous. These groups are often referred to as the qualitative dependent variables. In some instances, the qualitative dependent variable can only take two categories or values, thereby becoming binary dependent variables. Such regression can only be modelled to estimate the probability that, an observation with particular characteristics will fall into a specific one of the categories (Maddala 1985).

Considering a binary dependent variable y_i, which indicates whether individual *i* belong to either of two groups of outcome, Jones (2000) affirms that in health economics, binary dependent variables have been used to model an extensive range of phenomena which include the use of health care services, purchase of health insurance, and lots more. If the outcome depends on a set of regressors, x, the conditional expectation of y is

$$E(y_i \mid x_i) = P(y_i = 1 \mid x_i) = F(x_i). \quad . \quad . \quad . \quad (29)$$

To estimate (25), F(·) could be specified as a linear function, giving the linear probability model. The linear probability model is easy to estimate, using weighted least squares to allow for the implied heteroskedasticity of the non-normal error term, and may be a reasonable approximation if F(·) is

approximately linear over the range of sampled observations. However, the possibility of predicted probabilities outside the range [0, 1] creates a problem of logical inconsistency, which a nonlinear specification of F(·) can avoid. Most common nonlinear parametric specifications are called generalized linear models (GLMs).[29]

The GLMs are discrete choice (binary response) models for modelling categorical dependent variable. They are often used to model situations where the observed variable takes values between 0 and 1. Supposing response variable Y is binary, that is it can have only two possible outcomes which we will denote as 1 and 0, there is a vector of regressors X, which are assumed to influence the outcome Y. Specifically, the model is assumed to take the form

$$\Pr(Y = 1 \mid X) = \Phi(X'\beta) \qquad (30)$$

where Pr denotes probability, and Φ is the Cumulative Distribution Function (CDF). The parameters β are typically estimated by maximum likelihood. With categorical data, GLMs generalize ordinary regression models in two ways: It first allows y to have a distribution other than the normal and then allows modelling some functions of the mean. Probit and logit models are prominent among the GLMs with their slight difference being the distribution of y. The logit model specifies that the CDF of the F(·) follows the logistic distribution while under the probit model, it follows the standard normal distribution (Cameron and Trivedi 2009). The latter is applicable for this thesis.

It could also be motivated as a latent variable model. Supposing there exist an auxiliary random variable

$$Y = X'\beta + \varepsilon \qquad (31)$$

where $\varepsilon \sim N(0, 1)$. Then Y can be viewed as an indicator for whether this latent variable is positive:

[29] Its strength is the normality assumption underlying its distribution.

$$Y = \begin{cases} 1 & \text{if } Y^* > 0 \quad i.e. \quad \varepsilon < X'\beta, \\ 0 & \text{otherwise} \end{cases} \tag{32}$$

The use of the standard normal distribution causes no loss of generality compared with using an arbitrary mean and standard deviation, because adding a fixed amount to the mean can be compensated by subtracting the same amount from the intercept, and multiplying the standard deviation by a fixed amount can be compensated by multiplying the weights by the same amount. To see that the two models are equivalent, note that

$$\begin{aligned} \Pr(Y = 1 \mid X) &= \Pr(Y^* > 0) = \Pr(X'\beta + \varepsilon > 0) \qquad (33) \\ &= \Pr(\varepsilon > -X'\beta) \\ &= \Pr(\varepsilon < X'\beta) \quad \text{(by symmetry of the normal distribution)} \\ &= \Phi(X'\beta) \end{aligned}$$

As stated earlier under the methodology, the study combines a hurdle model (derived from two-part models) involving four stages (healthcare needs, utilizations, spending decision and actual healthcare expenditure) and the Engel curve approach. The first three stages of the hurdle (needs, utilizations and spending decision stages) have qualitative (limited) dependent variables while the last (healthcare expenditure) stage has continuous dependent variables. The first three stages of the hurdle were estimated through probit modelling for the probability of observing a positive value of dependent variables, while the last stage of the hurdle which is the sub-sample of positive observations (conditional healthcare expenditure) and unconditional healthcare expenditure were thereafter estimated through OLS. There is no latent variable representation for the hurdle model. Instead it is motivated by a conditional mean independence assumption (Cameron and Trivedi 2009).

The literature has shown that when model with limited dependent variable (binary) and continuous explanatory variable(s) is being estimated, the coefficients obtainable will be better estimates if they are calculated as mean (expected) values of such coefficients. This is done through calculation of the

marginal effect on the variables in the estimations. The marginal effects of the gender variable in the regressions were derived by evaluating the unconditional expectation of medical expenditure for *one gender*=1, and then for *other gender*=0, substituting in mean values for the remaining dependent variables, and take the difference between the two[30]. Precisely, it reports the derivative of the probability with respect to each independent variable (marginal values) of hurdles instead of the coefficient. Hence, the marginal effects were reported for all the probit estimates. Other estimation issues like endogeneity, heterogeneity and sample selectivity biases were tested for appropriately using generalised method of moment (gmm) and were found to be insignificantly related to the data.

4.3.4 Description of variables

Household and gender variables are operationalised thus, household in the context of this research implies the people who live together in a single house and connect together under the authority of a resident head who may or may not be the breadwinner, while gender refers to the male and female classification of individuals, this could not be extended to the roles and responsibilities performed by the individuals due to data constraints.

The dependent variables in these analyses vary by different estimation conducted. For equations (23) to (26), the dependent variables are different at each level of the hurdle (stages). At stage 1, it is the probability of an individual reporting illness with individuals that report illness assigning 1, and those who do not are assigned 0. At the second level, the dependent variable is the probability of treatment consultation after reporting illness with those that consult taking on 1 and 0 for those who do not consult. The dependent variable at the third hurdle is the probability of incurring positive medical expenditure, while those that incur positive expenditure takes on 1, those who do not will be assigned 0 and at the last stage, the dependent variable is the logarithm of the medical expenditure of the individual members of the household who have

[30] This becomes the alternative owing to the difficulty in taking derivatives of a binary variable.

successfully passed through the initial stages. As for equation (27), the dependent variable is the household medical expenditure defined as the total out-of-pocket (OOP) expenditure by all members of the household (aggregation of the individual level data). It involves costs of consultation, laboratory, drugs or injections and hospitalisation, while the dependent variable for equation (28) is the individual's medical expenditure.

The explanatory variables are categorised into individual, household and community characteristics. Individual variables are gender, age, both as pooled and as grouped by gender, religion, education and employment status.

Five age groups by gender (males and females in each) were incorporated to examine the intergenerational transfer within the household, these include the young group (0 - 9 years); adolescent group (10 - 19 years); prime age working group (20 - 39 years) which includes women of child-rearing age; middle-aged working group (40 - 59 years), and the elderly (60 years and above). Education (highest qualification obtained from western education) indicates an individual's market value, while employment status captures the opportunity cost of time to be taken for different decision stages. Employment was measured as wage-employed, self-employed, unemployed and those not available for work.[31]

In addition to these, the household variables included are household per capita expenditure, household size and household headship which are meant to capture a household's current spending level, spending capability as well as its consumption preferences. Also, the education and gender of the head play vital roles, because a household with an educated head tends to be more aware of its members' health status.

The individual and household variables are complemented by four control variables which are the proportion of households occupying a whole building, the proportion of households with installed flushing toilet, proportion

[31] Broad definition of unemployment, which includes all those in working age group who claim to want work, actively seeking employment, but not currently employed, is applied. Those younger than 16 and older than 60 are categorised as non-working age group.

of households with safe drinking water and distance to closest clinic (in minute). The first, second and third reflect the household sanitary conditions; enhanced sanitary conditions will likely reduce an individual's chances of getting sick, which consequently tends to reduce the medical bill. The last variable determines the possibility of getting treatment as soon as the need arises with those living far away from the health institution who have a lower chance of getting treatment. Hence, all the analyses will be conducted by controlling for the household effects. The detailed variables' descriptions are presented in Appendix A.

4.3.5 The data and sources

As stated in chapter one, this study utilises the Harmonized Nigeria Living Standards Survey (HNLSS) data collected by National Bureau of Statistics (NBS) in 2010. HNLSS is the latest in a series of poverty survey instruments developed by NBS and its development partners for regular monitoring of welfare and social trends for different population groups of the society, especially the poor.

HNLSS covers 332,938 individuals from 73,329 households across the entire country. From these figures, 178,270 individuals from 38,652 households have incomplete information and were deleted. The analyses were therefore based on 154,668 individuals from 34,677 households. Out of this, 25,623 individuals from 16,136 households reported illness, 24,711 from 15,724 households sought treatment, while 23,774 from 15,336 households decided to incur positive expenditure. However, the sample for the analysis consists of 78,830 males and 75,838 females and at location level, 20.7 percent were recorded for urban, while rural recorded 79.3 percent. All estimations were undertaken using STATA 11 software. The following table shows zonal spread of the HNLSS by location.

Table 4.1. The zonal, location and gender spread of the HNLSS data

		National		Urban		Rural	
		Male	Female	Male	Female	Male	Female
North Central	Number	28,119	26,162	5,810	5,631	22,309	20,531
	Percentage	(8.4)	(7.9)	(1.7)	(1.7)	(6.7)	(6.2)
North East	Number	28,605	26,108	3,493	3,159	25,112	22,949
	Percentage	(8.6)	(7.8)	(1.0)	(0.9)	(7.5)	(6.9)
North West	Number	48,591	44,810	8,506	8,041	40,085	36,769
	Percentage	14.6)	(13.5)	(2.6)	(2.4)	(12.0)	(11.0)
South East	Number	18,124	19,539	3,918	4,132	14,206	15,407
	Percentage	(5.4)	(5.9)	(1.2)	(1.2)	(4.3)	(4.6)
South South	Number	22,998	22,757	5,060	5,077	17,938	17,680
	Percentage	(6.9)	(6.8)	(1.5)	(1.5)	(5.4)	(5.3)
South West	Number	23,374	23,750	7,963	8,006	15,411	15,744
	Percentage	(7.0)	(7.1)	(2.4)	(2.4)	(4.6)	(4.7)
Total	**Number**	**169,811**	**163,126**	**34,750**	**34,046**	**135,061**	**129,080**
	Percentage	**(51.0)**	**(49.0)**	**(10.4)**	**(10.2)**	**(40.6)**	**(38.8)**

Source: Computed from HNLSS, 2010

CHAPTER FIVE

EMPIRICAL ANALYSIS

5.1 Introduction

This chapter discusses the empirical estimations of the study. The descriptive statistics are presented in addition to estimates obtained from the hurdle model and Engel curve, at both household and individual levels.

5.2 Descriptive statistics

The descriptive statistics was examined in three different ways. The first presents the overall sample characteristics (dependent and independent variables); it presents mean and standard deviation along the urban and rural-gender division. This is shown in Table 5.1.

Table 5.1. Descriptive statistics of variables used in estimation

	Urban Male		Urban Female		Rural Male		Rural Female	
Variable	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
ReportIllness	0.146	0.354	0.194	0.395	0.147	0.354	0.183	0.386
SeekTreat	0.143	0.350	0.190	0.393	0.140	0.347	0.176	0.381
PositiveSpend	0.139	0.346	0.187	0.390	0.134	0.341	0.171	0.376
Clnhltexp	6.999	1.564	7.092	1.449	6.967	1.67	7.000	1.517
Lnhltexp	0.970	2.488	1.3172	0.828	0.929	2.445	1.186	2.700
Age	26.314	20.18	26.033	19.34	25.033	20.25	24.05	18.15
AgeSq	1099.7	1488.4	1051.7	1405.5	1036.7	1471.4	907.9	1227.4
Age 0 – 9	0.240	0.427	0.229	0.420	0.270	0.444	0.265	0.442
Age 10 – 19	0.226	0.418	0.214	0.410	0.244	0.429	0.213	0.410
Age 20 – 39	0.280	0.449	0.323	0.468	0.242	0.428	0.315	0.464
Age 40 – 59	0.166	0.372	0.157	0.364	0.156	0.363	0.154	0.361
Age 60 Above	0.088	0.283	0.076	0.266	0.088	0.283	0.052	0.223
Never married	0.531	0.500	0.475	0.499	0.561	0.496	0.474	0.499
Monogamous	0.442	0.497	0.433	0.496	0.416	0.493	0.462	0.499
Polygamous	0.005	0.071	0.004	0.062	0.004	0.063	0.002	0.049
DivSepWid	0.020	0.139	0.082	0.274	0.015	0.123	0.056	2.230
InformaLoose	0.003	0.052	0.005	0.074	0.004	0.059	0.005	0.072
Christianity	0.540	0.498	0.552	0.497	0.461	0.499	0.479	0.500
Muslim	0.453	0.498	0.442	0.497	0.522	0.499	0.507	0.500
Traditional	0.001	0.063	0.004	0.061	0.012	0.111	0.011	0.106
OtherReligion	0.003	0.056	0.002	0.046	0.003	0.057	0.003	0.055
NoEdu	0.280	0.449	0.363	0.481	0.496	0.500	0.578	0.494
PriEdu	0.326	0.469	0.319	0.466	0.308	0.462	0.284	0.451
SecEdu	0.265	0.442	0.231	0.422	0.152	0.359	0.113	0.316
PostSecEdu	0.127	0.333	0.084	0.278	0.043	0.202	0.024	0.151
PaidJob	0.117	0.321	0.069	0.254	0.049	0.217	0.032	0.176
SelfEmpl	0.333	0.471	0.397	0.489	0.271	0.445	0.377	0.485
Unemployed	0.299	0.458	0.303	0.459	0.283	0.450	0.295	0.456
NotAvail	0.309	0.462	0.324	0.468	0.278	0.448	0.304	0.460
MaleHH	0.391	0.488	0.000	0.000	0.367	0.482	0.000	0.000
FemaleHH	0.000	0.000	0.099	0.299	0.000	0.000	0.060	0.237
Lnpcexp	10.882	0.876	10.860	0.848	10.413	0.872	10.41	0.863

lnHHS	1.583	0.571	1.600	0.533	1.675	0.517	1.689	0.491
North Central	0.147	0.355	0.144	0.351	0.181	0.385	0.175	0.380
North East	0.090	0.286	0.081	0.272	0.196	0.397	0.188	0.390
North West	0.195	0.397	0.190	0.392	0.313	0.464	0.302	0.459
South East	0.097	0.295	0.101	0.302	0.115	0.319	0.132	0.339
South South	0.122	0.327	0.122	0.327	0.137	0.343	0.141	0.348
South West	0.349	0.477	0.362	0.480	0.058	0.234	0.062	0.241
Number of Observations	19,024		18,893		59,806		56,945	

Source: Computed from HNLSS, 2010

Examining the descriptive statistics (Table 5.1), the first five variables represent the outcome of interest to this thesis. Starting with three variables, it was discovered that, in both rural and urban areas, females reported illness, sought treatment and even decided to spend on healthcare more than males. However, urban females spent an average of 7.1 and 1.3 naira conditional and unconditional respectively, which were the highest averages. Generally, healthcare expenditures are lower in rural areas. It was also found that males are averagely older than females in both and urban rural areas. On the age cohorts, males averagely outnumber females across board, except for the prime age working group (20 - 39 years), where females are averagely higher than males in both urban and rural areas. Some of the figures (mean and standard deviation) imply that the data of some variable were skewed, that is, they were not normally distributed.

Table 5.2. Individual characteristics by gender and age cohort

	0 – 9		10 – 19		20 – 39		40 – 59		60 +		**Total**		**Total**
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
National	***13.4***	***12.6***	***12.2***	***10.5***	***12.8***	***15.5***	***8.1***	***7.6***	***4.5***	***2.9***	***51.0***	***49.0***	**100**
ReportIllness	13.7	12.6	6.8	6.4	9.5	20.4	7.9	10.0	5.4	7.2	43.4	56.6	**100**
SeekTreat	13.8	12.6	6.7	6.4	9.4	20.7	7.8	10.1	5.4	7.1	43.1	56.9	**100**
PositiveSpend	13.7	12.5	6.5	6.3	9.4	21.0	7.8	10.2	5.4	7.2	42.9	57.1	**100**
clnhltexp	12.9	11.8	6.3	6.2	9.3	21.0	8.1	10.6	5.9	7.8	42.6	57.4	**100**
lnhltexp	13.9	12.7	6.8	6.6	10.0	22.7	8.7	11.4	6.4	8.4	33.5	32.9	**100**
Marital Status													
NeverMarried	26.0	24.4	22.2	17.1	6.6	3.6	0.0	0.0	0.0	0.0	54.8	45.2	**100**
Monogamous	0.0	0.0	1.6	3.5	20.6	29.8	17.6	14.6	9.2	3.0	49.1	50.9	**100**
Polygamous	0.0	0.0	11.5	10.6	11.7	11.7	18.3	9.9	20.0	6.2	61.5	38.5	**100**
DivSepWid	0.0	0.0	0.0	0.6	4.4	9.6	7.7	29.4	9.4	38.8	21.5	78.5	**100**
InformaLoose	0.0	0.0	6.8	9.4	30.2	48.4	2.0	2.1	0.8	0.5	39.7	60.3	**100**
Religion													
Christianity	11.0	10.6	12.2	11.3	14.3	15.7	8.0	8.5	4.6	3.8	50.1	49.9	**100**
Muslim	15.8	14.6	12.3	9.8	11.4	15.5	8.2	6.6	4.2	1.8	51.7	48.3	**100**
Traditional	9.2	8.5	9.8	7.4	11.8	11.1	10.0	11.6	12.8	7.8	53.6	46.4	**100**
OtherReligion	12.2	7.3	9.8	9.0	15.8	12.4	10.0	11.3	6.8	5.3	54.7	45.3	**100**
Education													
NoEdu	18.6	17.8	6.6	6.1	8.1	15.2	7.7	9.4	5.9	4.7	46.9	53.1	**100**
PriEdu	13.3	12.1	23.0	18.8	7.8	9.5	5.7	5.5	3.0	1.2	52.9	47.1	**100**
SecEdu	0.0	0.0	10.3	9.6	34.8	28.0	9.8	5.2	1.7	0.6	56.7	43.3	**100**
PostSecEdu	0.0	0.0	0.0	0.0	31.6	23.5	23.7	11.2	8.2	1.8	63.5	36.5	**100**
Employment													
PaidJob	0.0	0.0	4.9	3.6	25.9	19.8	25.9	12.6	5.9	1.4	62.6	37.4	**100**
SelfEmpl	0.0	0.0	18.3	15.3	14.8	26.4	6.3	12.2	2.9	4.0	42.2	57.8	**100**
Unemployed	0.0	0.0	25.2	22.7	17.0	21.4	6.5	7.3	0.0	0.0	48.7	51.3	**100**
NotAvail	29.1	20.1	11.9	10.8	6.1	8.9	2.4	3.2	4.4	3.0	54.0	46.0	**100**
Sectors													
Urban	12.0	11.4	11.4	10.7	14.1	16.1	8.3	7.8	4.4	3.8	50.2	49.8	**100**
Rural	13.8	12.9	12.5	10.4	12.4	15.3	8.0	7.5	4.5	2.6	51.2	48.8	**100**

Geo-political Zones													
North Central	13.1	12.3	13.0	10.8	14.0	16.0	8.1	7.0	3.6	2.1	51.8	48.2	**100**
North East	15.4	14.4	12.9	10.3	12.7	15.3	7.9	6.4	3.7	1.2	52.4	47.6	**100**
North West	16.5	15.2	12.3	9.7	10.8	15.9	8.4	6.2	4.0	1.1	51.9	48.1	**100**
South East	9.5	9.2	12.3	11.8	11.9	14.4	7.7	10.6	6.5	6.1	47.9	52.1	**100**
South South	10.9	10.4	11.6	11.3	15.9	16.5	8.1	8.5	3.9	3.1	50.4	49.6	**100**
South West	10.6	10.5	10.7	9.9	13.5	14.5	8.0	9.3	6.6	6.5	49.4	50.6	**100**

Source: Computed from HNLSS, 2010

From Table 5.2, the first category shows the proportion of those who reported illness, consulted and decided to incur positive health care expenditure, followed by the conditional expenditure, and the last is the unconditional healthcare expenditure. The nature of the gender pattern shows that females averagely pursue health seeking behaviours more than their male counterparts including conditional expenditure but under the unconditional expenditure, males were slightly higher than females averagely. Across all age cohorts, males slightly dominate both the young (0 - 9 years) and adolescent (10 - 19 years) groups while females' dominance was much more pronounced from the prime working age (20 and above). This trend was observed across all stages of the hurdle.

The marital status shows that there are more married adults in the country, though there exists many prime age adult (20 – 39 years) who engage in informal and loosed union and females outnumber males. There are families in Nigeria, nonetheless, they were averagely fewer than monogamous homes. The gender pattern along the religions divide shows a near balance male-female ratio across the major religions. Obviously, there exists male domination across all education categories. Curiously, the percentage of children with no formal education (0 – 19 years) is alarming, constituting 49.1 percent (though there is male domination), and among the prime and middle age adult, there are more females with no formal education than males. Aggregately, males acquire higher education in Nigeria than females, but there are more females without formal education. Employment variables show that males prefer wage employment, while females have preference for self employment, especially, the prime age and middle-aged working groups of 20 - 39 years and 40 - 59 years correspondingly. Also, there are more unemployed females, and this is driven by the same age groups. It is worthy of note that females still dominate the same age cohorts among those who are not available for employment notwithstanding the attendant and obvious implication for healthcare expenditure.

Regarding the sectors, the pattern is not different as the rural males outnumber the females for other age cohorts apart from the same prime age

working group. The same pattern obtainable in the rural communities replicates itself among the urban dwellers where the only females' dominance over males' is among the prime age cohort. Across the age cohorts in the six geo-political zones where males are more than their female counterparts, except for the prime age working group where females outnumber males, it could be because this is maternal and child-rearing age brackets. However, the middle-aged working females (40 - 59 years) outnumber the males in both South East and South West. Pooling all ages together, it is evident that there are more males aggregately in the three northern zones and the South South, while there are more females in South East and South West.

As noted earlier in chapter 2, the Nigerian health care system can be divided by the sources of healthcare each individual consult and spend accordingly. The identified sources are grouped broadly under orthodox, spiritual and traditional systems. The following table captures an average health care expenditure each gender pays at different places of consultation incorporating individual characteristics mentioned in Table 5.2.

Table 5.3. Average health care expenditure by gender and places of consultation (per 2 weeks preceding HNLSS)

	Traditional		Spiritual		Orthodox		Total	
	Male	Female	Male	Female	Male	Female	Male	Female
National	**6,125.5**	**5,958.3**	**224.8**	**254.6**	**5,971.4**	**4,882.3**	**3,908.1**	**3,382.8**
Marital Status								
NeverMarried	4,042.9	4,002.7	208.7	218.7	4,648.3	3,941.6	2,705.4	2,395.7
Monogamous	7,499.9	5,552.0	245.1	274.9	6,997.0	4,908.0	5,021.0	3,571.9
Polygamous	250.0	3,150.0	236.0	241.7	8,718.4	6,717.0	5,368.2	4,629.5
DivSepWid	10,454.8	12,239.8	280.4	292.7	6,631.9	7,083.0	5,134.6	5,332.7
InformaLoose	3,154.0	1,641.7	192.4	311.7	5,360.0	2,050.2	3,268.2	1,965.2
Religion								
Christianity	9,818.6	9,084.4	233.9	270.4	6,750.6	5,608.9	4,589.8	4,116.8
Muslim	3,221.8	2,896.3	216.0	237.5	4,949.5	3,605.4	3,072.3	2,273.9
Traditional	2,528.2	11,280.0	233.4	234.8	9,308.7	4,884.0	5,952.8	4,395.5
OtherReligion	8,800.0	2,975.0	221.5	199.9	5,947.9	7,007.8	3,337.6	5,332.5
Highest qualification obtained								
NoEdu	4,493.9	4,842.6	217.6	239.1	5,530.3	4,607.4	3,472.6	2,978.4
PriEdu	7,392.9	6,477.5	226.2	270.2	6,234.3	4,980.1	4,165.1	3,544.0
SecEdu	8,835.4	13,929.0	231.4	281.5	5,672.8	5,021.4	3,972.3	4,013.3
PostSecEdu	12,564.0	10,685.7	273.1	261.9	8,085.8	5,793.6	5,783.2	4,406.8
Employment								
PaidJob	4,942.6	5,863.7	250.0	275.1	7,298.6	5,766.9	4,994.3	4,385.5
SelfEmpl	4,599.1	7,060.6	223.8	261.1	5,391.9	4,563.2	3,500.8	3,298.3
Unemployed	8,226.8	8,679.0	214.7	252.4	6,267.0	5,580.4	4,152.7	3,905.0
NotAvail	7,671.3	7,576.8	218.2	254.3	6,569.7	5,491.2	4,260.4	3,767.3
Sectors								
Urban	7,301.4	11,305.0	245.2	275.4	5,696.8	5,021.0	3,774.8	3,590.9
Rural	5,888.7	4,942.8	218.1	247.1	6,073.6	4,824.2	3,952.2	3,307.2
Geo-political zones								
North Central	5,812.6	3,466.4	244.3	274.2	5,123.6	3,822.6	3,185.7	2,638.3
North East	2,604.5	2,972.2	169.8	205.7	5,636.2	4,199.7	2,617.0	2,495.7
North West	3,113.1	3,030.5	221.1	234.1	5,035.8	3,409.1	3,435.2	2,250.7
South East	11,636.9	10,825.4	234.7	275.0	8,012.8	7,033.8	5,629.0	5,407.9
South South	9,806.4	11,293.8	248.9	270.8	6,818.5	6,022.9	4,977.4	4,653.4
South West	10,219.3	3,196.6	288.4	295.6	5,566.1	4,316.8	3,858.7	2,923.6

Source: Computed from HNLSS, 2010

It could be seen from Table 5.2 that nationally, males spend average of ₦6,125.47 on health care through traditional source while females spend ₦5,958.33. Those who consult spiritual sources spend ₦224.83 and ₦254.59 averagely by males and females respectively, while males' average healthcare expenditure is ₦5,971.43 and females' average healthcare expenditure costs ₦4,882.28 on orthodox sources. Pooling the sources together, males and females spend on the average ₦3,908.07 and ₦3,382.83 respectively on healthcare. This implies that males spend more traditional and orthodox sources, while females spend more than males in spiritual centres. The lower average spending in the spiritual sources indicates that only few of those faith homes charge their clients.

Traditional sources

It is obvious that the three northern zones spend below the national average on the healthcare from traditional sources, and separating the expenditure by gender still shows, that the regions could not be classified as highest patron of traditional health practitioners. However, the three zones in the south reveal a mixed outcome; both gender in the South East and South South spend above the national average, while only males spend above national average in the South West, whereas the females spend below the national average. In addition, urban male and female dwellers patronise and spend above national average than their respective rural counterparts. Under the marital status, the divorcees / separated / widows males and females spend above national average, while all others except the monogamous males spend below it. Traditional sources consultation by religious inclinations reveals that both genders under Christianity, females in traditional and males in other religions spend above the national average, while others' spending fall below the national average. Conversely, only those without formal education spend below national average on the traditional sources, while those with one form of education or the other spend above the national average. The self employed females as well as the unemployed and those who are not available for employment find traditional sources of healthcare appealing.

Spiritual sources

The pattern of health care spending under these sources is not substantially different from what obtained from the traditional sources with North East and North West spending below the national average, while other spend above it across both gender. Others who spend below are rural males, those who never married, Muslims, other religion adherents, those without formal education, the unemployed as well as those who are not available for employment.

Orthodox sources

South East and South South dwellers spend above national average on orthodox sources, while the remaining zones spend below it. In the same vein, the urban females and rural males, monogamous males, polygamists, divorcees/separated/widows, Christians, those with formal education, wage earners, the unemployed and those not available for employment also spend beyond the national average on the orthodox sources.

5.3 Econometrics results

The empirical model assumes that healthcare needs, utilisation and expenditure are functions of two broad groups of variables categorised into individual and household characteristics of the respondents. The results are broadly summarised in five tables (Tables 5.4 – 5.8) representing the specific objectives of healthcare needs, utilisation, spending decision, conditional and unconditional expenditure in a 3-column (national, rural and urban) analysis. Each table contains the national, rural and urban estimations. In addition, each objective is estimated at household and two individual (pooling all ages together and considering the age structure of gender differences in order to account for the values in different age periods as well as intertemporal substitutions in a family) levels. Giving the existing gender pattern at the individual level when all ages are pooled together, it becomes imperative to further explore the age pattern of gender differentiation, this is done by constructing each component of the hurdle model in stepwise manner. Household analyses are premised on the

fact that at least, a member indicates a health seeking behaviour in the past two weeks. As stated under section 4.2.5, marginal values (derivatives) are reported.

Tables 5.4a-c are healthcare needs probit equations of those that report illness/injury in the past two weeks; Tables 5.5a-c are healthcare utilisation probit equations of those who decide to seek treatment consultation from health officials conditional on illness reporting; Tables 5.6a-c are positive spending probit equation of households who incur positive health expenditure consequent upon healthcare utilisation; Tables 5.7a-c are the OLS of the natural log of the conditional health expenditure, that is, conditional on having positive health expenditure; and Tables 5.8a-c show Engel curve equations (OLS estimates of the household health expenditure), which is the proportion of total household expenditure spent on healthcare and it included households with zero health expenditure (which makes it unconditional OLS). The conventional test of significance applied were F and t – statistics. However, R^2 (coefficient of determination) is low all through, yet, F-statistics are high. This is due to the nature of probit analysis where the dependent variable is dichotomous.

5.3.1 Operationalization of the variables

The reference categories for the categorical variables are those with highest observations among the relevant categories. These are males, monogamous marital status, Christianity religion, no education as well as self-employed. In the household analysis, it includes male household heads and prime age male (20 – 39 years) cohort. All male cohorts are excluded for the individual level analysis under the age structure of gender patterns. Also, prime age female (20 – 39 years) cohort collinear across all hurdles and was equally eliminated in the result. The last four rows in the household analyses show the F-test results obtained by testing the joint significance of the coefficients on the male and female variables within each age cohort. Original estimation results from Stata 11 software are contained in Appendix B.

5.3.2 Healthcare need stage – objective i

i. **Household analysis (table 5.4a):** At the national household level of analysis, evidence of significant gender difference in this stage abounds across all age cohorts except for both intermediate/adolescent (10 – 19 years) and middle-aged working (40 – 59 years) males. The situation is same for rural households, while urban households also include elderly males (60 and above). Looking at other household variables, though the household headship are pro-male across board, only urban female headed households significantly influence healthcare needs with 7 percent likelihood of any of their members reporting illness, while household size and per capital household expenditure also influence healthcare needs significantly.

Table 5.4a. Determinants of the probability of a household member reporting illness

	National	*Urban*	*Rural*
Household level variables			
female headed households	-0.023(1.52)	-0.070(2.58)**	-0.005(0.29)
log of per capita household exp	0.147(37.15)***	0.126(16.30)***	0.157(33.68)***
log of household Size	0.225(30.13)***	0.190(13.59)***	0.241(27.04)***
polygamous	0.079(2.64)**	0.102(1.93)*	0.068(1.88)*
divorce/separated/widow	0.036(2.93)**	0.059(2.66)***	0.030(2.00)**
informal/loose union	0.033(0.87)	-0.089(1.12)	0.072(1.61)
muslim	-0.036(5.62)***	-0.014(1.18)	-0.040(5.15)***
traditional religion	-0.018(0.83)	-0.009(0.13)	-0.023(0.97)
other religion	-0.048(1.19)	-0.029(0.32)	-0.060(1.33)
primary education	0.064(8.33)***	0.027(1.71)*	0.074(8.44)***
secondary education	0.033(3.72)***	0.024(1.43)	0.037(3.44)***
post secondary education	0.000(0.01)	0.014(0.78)	-0.011(0.81)
paid employment	0.012(1.31)	-0.015(1.12)	0.036(2.91)***
unemployed	0.042(4.14)***	0.058(2.61)***	0.036(3.11)***
not available for employment	-0.018(1.75)*	-0.036(1.64)	-0.011(0.90)
Age-gendered group within household			
proportion of male 0 - 9	0.312(13.02)***	0.348(7.64)***	0.301(10.61)***
proportion of female 0 - 9	0.270(10.98)***	0.354(7.63)***	0.239(8.16)***
proportion of male 10 - 19	0.024(0.98)	0.005(0.11)	0.030(1.03)
proportion of female 10 - 19	0.811(3.19)***	0.103(2.21)**	0.077(2.53)**
proportion of female 20 – 39	0.114(5.15)***	0.169(4.46)***	0.099(3.61)***
proportion of male 40 – 59	-0.013(0.70)	0.020(0.56)	-0.029(1.24)
proportion of female 40 – 59	0.117(4.93)***	0.087(1.99)**	0.129(4.52)***
proportion of male age 60 +	0.093(4.29)***	0.037(0.91)	0.115(4.43)***
proportion of female age 60 +	0.250(11.21)***	0.272(7.02)***	0.240(8.78)***
Observation	33,812	9,102	24,710
R-squared	0.0661	0.0628	0.0714
LR chi^2	3090.71***	788.49***	2439.24***
Joint significant test for male and female			
age 0 – 9	211.82***	88.78***	129.83***
age 10 – 19	10.36**	5.45*	6.41**
age 40 –59	25.21***	4.27	22.87***
age 60 +	140.50***	49.62***	93.46***

Notes: Absolute value of robust t or z statistics in parentheses. *, ** and *** represent 10%, 5% and 1% statistical significant levels respectively.

Dependent variable: Probability of illness reporting in the past two weeks by a household member

Regarding marital status, polygamous and divorce/separated/widow household members significantly report illness than those in monogamous marriages across the three levels. Islamic religion households are significantly less likely to report illness than their Christian counterpart at national and rural levels. Likewise, households whose heads have primary and secondary education are significantly likely to reveal healthcare needs than those with no education at national and rural levels, while the households whose heads have post secondary education do not have a significant relation with illness reporting. Only the households whose heads are unemployed at all levels significantly report being sick more than the households whose heads are self-employed with the exception of those with wage employment in the rural area. Lastly, the joint significant test shows that there is significant gender differentiation in healthcare needs across all age cohorts except the middle-aged working (40 – 59 years) group of the urban area.

ii. **Individual analysis: (taking all ages together - table 5.4b):** The results show that there is a pro-female gender difference across the three levels, but slightly higher in urban areas where females are 4.7 percent more likely to report illness than male. The probability of illness reporting shows a negative linear relationship with age with each 10 years of age resulting in a decreasing probability by about 2 percentage points.

Table 5.4b. Determinants of the probability of an individual reporting illness (age in years)

	National	*Urban*	*Rural*
Individual level variables			
female	0.038(19.03)***	0.047(11.33)***	0.036(15.66)***
age	-0.002(12.39)***	-0.002(7.09)***	-0.002(10.57)***
age squared	0.000(19.23)***	0.000(10.09)***	0.000(16.71)***
polygamous	-0.016(1.07)	-0.003(0.11)	-0.022(1.18)
divorce/separated/widow	0.020(3.20)***	0.011(0.95)	0.025(3.21)***
informal/loose union	0.133(8.37)***	0.102(3.13)***	0.139(7.61)***
muslim	-0.016(7.54)***	-0.005(1.34)	-0.017(6.79)***
traditional religion	-0.021(2.29)**	-0.027(0.82)	-0.022(2.23)**
other religion	-0.006(0.41)	0.071(1.73)*	-0.027(1.45)
primary education	-0.013(5.56)***	-0.028(5.62)***	-0.008(2.99)***
secondary education	-0.021(7.09)***	-0.029(4.93)***	-0.016(4.47)***
post secondary education	-0.021(4.61)***	-0.025(3.29)***	-0.014(2.33)**
paid employment	0.008(1.81)*	0.008(1.13)	0.008(1.46)
unemployed	0.006(1.81)*	0.006(0.98)	0.004(1.22)
not available for employment	-0.036(11.02)***	-0.052(7.89)***	-0.029(7.67)***
Household level variables			
log of household size	0.001(0.63)	0.018(4.23)***	0.004(1.70)*
log of per capita household exp	0.059(48.43)***	0.051(19.86)***	0.062(44.84)***
female household head	0.031(4.45)***	0.020(1.66)*	0.035(4.13)***
Observation	144,300	35,714	108,586
R-squared	0.049	0.048	0.051
LR chi^2	6312.29***	1581.63***	4950.24***

Notes: Absolute value of robust t or z statistics in parentheses. *, ** and *** represent 10%, 5% and 1% statistical significant levels respectively.

Dependent variable: Probability of an individual reporting illness in the past two weeks.

However, the divorced / separated / widow and informal/loosed union marital status significantly report illness more than those in monogamous marriage in all the levels with the exception of urban divorce/separated/widow. Curiously, it was revealed that Islamic and traditional religion adherents are significantly less likely to report illness than their Christian counterparts at both national and rural levels, while religion does not play any significant role in the urban areas. In the same vein, those with primary, secondary and post secondary education are significantly less likely to report illness than those with no education with the secondary education reducing the probability by 2.9 percentage point in urban areas as the highest impact across the three levels. However, those in wage employment and the unemployed are more likely to report illness, while those who are not available for employment are less likely to reveal their health needs compared to the self employed (reference category) with a strong statistical significance than the wage employment and unemployment at national level, but not significant at both urban and rural areas. On the other hand, household variables (size, per capita expenditure and headship) significantly influence illness reporting across the three levels, size does not matter nationally, while members from the households headed by females report illness more than those from male-headed households.

iii. Individual analysis: (the age structure of gender patterns - table 5.4c): Basically, the gender variable is highly significant across the three levels, suggesting females are 3.7, 4.7 and 3.6 percentage points more likely to report illness than male at the national, urban and rural areas respectively. However, after introducing the age cohorts, the age pattern of gender differentiation becomes obvious. The pro-female disparity increases to 6.6, 8.8 and 5.8 percentage points respectively and particularly, both young and intermediate/adolescent groups are significantly less likely to report illness to the tune of 4.3 and 9.8 percentage points than their prime working age (and child-rearing) group counterparts, but the elderly are likely to report 8.3 percentage more than them at the national level and the same pattern is sustained at both urban and rural levels.

When other individual variables are introduced, the gender variable remains stable contributing 6.6, 8.8 and 5.9 percentage points to probability of illness reporting at national, urban and rural areas respectively. The age structure exhibit changes across the three levels with only the elderly reporting illness more than the prime working age group at national and rural levels, while all age cohort report illness less than the prime working age group and the percentage point increasing across board. After the introduction of the household-specific variables, the percentage rose to 6.7 at national level, while the urban and rural levels increased marginally to 8.8 and 6.0 percentage points respectively. The age structure shows that both young and intermediate/adolescent groups are significantly less likely to report illness to the tune of 3.9 and 8.9 percentage points than the prime working age group. However, the middle-aged working and elderly groups are likely to report 2.4 and 1.2 percentage points less than them at the national level. At the urban level, all age cohorts are less likely to report illness than the prime working age group, though the rural level sustains the same pattern with the national level, the probability is less across each corresponding age cohort.

5.3.3 Healthcare utilisation stage – objective ii

i. **Household analysis (table 5.5a):** Nationally, at the household level, evidence of significant gender difference in this stage abounds across all age cohorts except for the middle-aged working (40 – 59 years) males. These other age cohorts consult healthcare provider more than the reference cohort (male 20 – 39 years). Like under the illness reporting stage, the situation is similar for rural households, but there is no significant gender difference among the males of 10 – 19, 40 – 59 and 60 and above years in the urban households. Other household variables show that the household headship significantly influences healthcare utilisation at the urban only, while household size and per capital household expenditure significantly influences healthcare utilization at the national, urban and rural levels.

Table 5.5a. Determinants of the probability of a household member seeking consultation conditional on reporting illness

	National	*Urban*	*Rural*
Household level variables			
female headed households	-0.023(1.55)	-0.065(2.40)**	-0.007(0.42)
log of per capita household exp	0. 153(38.59)***	0. 129(16.57)***	0. 164(35.14)***
log of household Size	0.226(30.27)***	0.193(13.81)***	0.240(27.02)***
polygamous	0.089(2.97)**	0.109(2.06)**	0.077(2.13)**
divorce/separated/widow	0.035(2.81)**	0.054(2.44)**	0.030(1.95)*
informal/loose union	0.018(0.48)	-0.085(1.07)	0.050(1.12)
muslim	-0.042(6.47)***	-0.015(1.28)	-0.048(6.10)***
traditional religion	-0.018(0.81)	0.001(0.02)	-0.024(1.00)
other religion	-0.044(1.08)	-0.022(0.24)	-0.056(1.24)
primary education	0.070(9.19)***	0.033(2.07)**	0.080(9.08)***
secondary education	0.038(4.30)***	0.027(1.61)	0.043(3.93)***
post secondary education	0.003(0.35)	0.018(1.00)	-0.009(0.64)
paid employment	0.013(1.49)	-0.015(1.07)	0.038(3.08)***
unemployed	0.048(4.68)***	0.059(2.66)***	0.043(3.69)***
not available for employment	-0.020(1.90)*	-0.033(1.49)	-0.014(1.17)
Age-gendered group within household			
proportion of male 0 - 9	0.334(13.96)***	0.360(7.91)***	0.329(11.58)***
proportion of female 0 - 9	0.291(11.84)***	0.362(7.81)***	0.266(9.10)***
proportion of male 10 - 19	0.055(2.25)**	0.016(0.34)	0.070(2.41)**
proportion of female 10 - 19	0.101(4.00)***	0.107(2.29)**	0.105(3.45)***
proportion of female 20 – 39	0.134(6.03)***	0.169(4.47)***	0.130(4.69)***
proportion of male 40 – 59	-0.020(1.04)	0.019(0.54)	-0.038(1.61)
proportion of female 40 – 59	0.107(4.50)***	0.075(1.71)*	0.122(4.26)***
proportion of male age 60 +	0.103(4.70)***	0.051(1.26)	0.124(4.74)***
proportion of female age 60 +	0.243(10.90)***	0.261(6.74)***	0.235(8.57)***
Observation	33,812	9,102	24,710
R-square	0.0718	0.0654	0.0782
LR chi^2	3346.37***	820.22***	2662.60***
Joint significant test for male and female			
age 0 – 9	244.09***	93.70***	156.49***
age 10 – 19	16.37***	5.56*	12.88***
age 40 –59	21.80***	3.19	21.75***
age 60 +	136.97***	46.37***	92.29***

Notes: Absolute value of robust t or z statistics in parentheses. *, ** and *** represent 10%, 5% and 1% statistical significant levels respectively.

Dependent variable: Probability of seeking consultation in the past two weeks by a household member

On the marital status, polygamous and divorce/separated/widow household members significantly utilise healthcare upon illness reporting than those in monogamous marriages across the three levels. While Islamic religion households are significantly less likely to utilise healthcare than their Christian counterpart reducing the probability of healthcare utilisation by 4.2 and 4.8 percentages at the national and rural levels respectively, while at the urban centre, the probability reduces to 1.5 percentage. Also, households whose heads have primary education are significantly likely to consult health practitioners than those with no education across all levels. While secondary education of the heads influences consultation at both national and rural levels, post secondary education of the household heads does not significantly relate to healthcare utilisation. With regards to employment variable, households whose heads are unemployed at all levels significantly utilised healthcare more than the households whose heads are self employed, while those with wage employment become prominent only in the rural area. Lastly, the joint significant test shows that there is significant gender differentiation in healthcare utilisation across all age cohorts except the middle-aged working (40 – 59 years) group of the urban area.

ii. **Individual analysis: (taking all ages together - table 5.5b):** The results show that there is a significant pro-female gender difference across the three levels, but slightly higher in urban areas, that is, females are 3.8, 4.6 and 3.7 percentages more likely to utilise healthcare than male at the national, urban and rural levels respectively. Also, healthcare utilisation probability drops significantly as the age increases, indicating an inverse relationship with age.

Table 5.5b. Determinants of the probability of an individual seeking consultation conditional on reporting illness (age in years)

	National	*Urban*	*Rural*
Individual level variables			
Female	0.038(19.60)***	0.046(11.40)***	0.037(16.22)***
Age	-0.001(12.31)***	-0.002(7.01)***	-0.001(10.43)***
age squared	0.000(18.87) ***	0.000(9.97)***	0.000(16.26) ***
polygamous	-0.014(0.91)	0.000(0.02)	-0.020(1.10)
divorce/separated/widow	0.017(2.82)***	0.008(0.76)	0.021(2.85)***
informal/loose union	0.128(8.17)***	0.098(3.04)***	0.133(7.42)***
muslim	-0.016(7.93)***	-0.005(1.25)	-0.018(7.34)***
traditional religion	-0.019(2.12)**	-0.022(0.69)	-0.020(2.08)**
other religion	-0.001(0.09)	0.074(1.83)*	-0.021(1.14)
primary education	-0.012(5.16)***	-0.027(5.50)***	-0.007(2.74)***
secondary education	-0.019(6.53)***	-0.028(4.87)***	-0.015(4.01)***
post secondary education	-0.020(4.30)***	-0.025(3.32)***	-0.012(2.02)**
paid employment	0.009(2.07)**	0.008(1.09)	0.010(1.78)*
unemployed	0.007(2.28)**	0.006(0.96)	0.007(1.76)*
not available for employment	-0.036(11.13)***	-0.052(7.96)***	-0.028(7.75)***
Household level variables			
log of household size	0.001(0.53)	-0.015(3.64)***	0.006(2.63)***
log of per capita household exp	0.059(50.01)***	0.051(20.13)***	0.062(46.35)***
female household head	0.030(4.48)***	0.019(1.66)*	0.035(4.16)***
Observation	144,300	35,714	108,586
R-squared	0.050	0.048	0.053
LR chi^2	6352.62***	1555.04***	4994.23***

Notes: Absolute value of robust t or z statistics in parentheses. *, ** and *** represent 10%, 5% and 1% statistical significant levels respectively.

Dependent variable: Probability of an individual seeking consultation in the past two weeks.

Other individual characteristics react differently, the marital status shows that those in informal/loosed union significantly consult health providers more than those in monogamous marriage at all the levels showing respective 12.8, 9.8 and 13.3 percentages utilisation of healthcare service upon illness reporting. The probability that the divorced/separated/widow exert on healthcare utilisation is only significant at both national and rural areas, representing 1.7 and 2.1 percentages respectively. Major religions significantly affect the utilisation at both national and rural areas, but the Islamic and traditional religion followers are less likely to utilise health care services than their Christian counterparts at both national and rural levels. Though the impact is very minimal with 1.6 and 1.9 probabilities (national) and 1.8 and 2.0 probabilities (rural).

Though, education proved to be significant to healthcare utilisation, those with primary, secondary and post secondary education are significantly less likely to utilise healthcare service than those with no education. As the highest impact, the post secondary education reduces the probability by 2.0 percentage point at the national level; secondary education reduces it by 2.8 and 1.5 percentage points at both urban and rural levels. Employment variable is weakly significant at both national and rural levels with paid employment dominating at both levels. Compared to the self-employed, the unemployed are more likely to consult healthcare provider while those who are not available for employment, though highly significant, are less likely to consume healthcare. In the same vein, household variables (size, per capita expenditure and headship) significantly influence healthcare utilisation across the three levels, with the exception of size at the national level, while members from the households headed by females consult more than those from male-headed households.

iii. Individual analysis: (the age structure of gender patterns - table 5.5c): The gender variable is significant across the three levels, indicating that females are 3.9, 4.7 and 3.6 percentage points more likely to consult than males at the national, urban and rural areas respectively. Upon introduction

of the age cohorts, the age pattern of gender differentiation reveals that the pro-female disparity becomes 6.7, 8.7 and 6.0 percentage points respectively, and among the cohorts, young and intermediate/adolescent groups are significantly less likely to consult than their prime age (and child-rearing) working group counterparts, while the middle age working group and elderly are likely to consult more than them across the three levels of analyses.

When other individual variables are introduced, and the gender variable remains stable contributing 6.7, 8.8 and 6.1 percentage points to probability of healthcare utilisation at national, urban and rural areas respectively, the age structure exhibits changes across the three levels, with the elderly consulting more at the national and rural levels and consulting less at the urban level. When the household-specific variables are introduced, the gender differentiation stabilise nationally at 6.7. While the urban and rural levels increase marginally to 8.8 and 6.1 percentage points respectively, the age structure shows that all the cohorts are significantly less likely to utilise healthcare than the prime working age group.

5.3.4 Positive spending stage – objective iii

i. **Household analysis (table 5.6a):** The decision to spend nationally at the household level reveal significant gender diversity across all age cohorts, except for the middle-aged working (40 – 59 years) males. This trend is also visible among the rural households where only males 40 – 59 decide to spend lesser than males of 20 – 39, other cohorts decide to spend more. However, there is no significant gender disparity among the males of 10 – 19, 40 – 59 and 60 and above years in urban households. When other household characteristics are included, it shows that the household headship significantly affects healthcare spending decision at the urban only, but household size and per capital household expenditure significantly influences the decision at the national, urban and rural levels. Also, marital status and education influence the decision significantly, while religion and employment situation of the household head affect the decision less significantly.

Table 5.6a. Determinants of the probability of a household member deciding to incur medical expenses conditional on consultation

	National	*Urban*	*Rural*
Household level variables			
female headed households	-0.022(1.47)	-0.066(2.46)**	-0.005(0.30)
log of per capita household exp	0.155(39.35)***	0.130(16.82)***	0.165(35.84)***
log of household Size	0.226(30.39)***	0.193(13.79)***	0.241(27.16)***
polygamous	0.093(3.11)***	0.118(2.22)**	0.079(2.18)**
divorce/separated/widow	0.029(2.31)**	0.044(1.98)**	0.025(1.64)
informal/loose union	0.220(0.57)	-0.077(0.98)	0.052(1.16)
muslim	-0.043(6.63)***	-0.013(1.12)	-0.050(6.42)***
traditional religion	-0.027(1.20)	-0.053(0.73)	-0.028(1.19)
other religion	-0.054(1.34)	-0.011(0.13)	-0.071(1.58)
primary education	0.071(9.29)***	0.039(2.42)***	0.079(8.95)***
secondary education	0.041(4.58)***	0.033(1.96)**	0.043(3.98)***
post secondary education	0.006(0.59)	0.022(1.23)	-0.006(0.46)
paid employment	0.014(1.55)	-0.015(1.07)	0.040(3.18)***
unemployed	0.050(4.93)***	0.072(3.24)***	0.043(3.70)***
not available for employment	-0.021(2.00)**	-0.021(1.67)*	-0.014(1.21)
Age-gendered group within household			
proportion of male 0 - 9	0.328(13.76)***	0.362(7.98)***	0.320(11.29)***
proportion of female 0 - 9	0.283(11.55)***	0.363(7.84)***	0.254(8.72)***
proportion of male 10 - 19	0.044(1.80)*	0.028(0.60)	0.050(1.73)*
proportion of female 10 - 19	0.106(4.21)***	0.114(2.44)**	0.109(3.58)***
proportion of female 20 – 39	0.133(5.98)***	0.177(4.67)***	0.125(4.52)***
proportion of male 40 – 59	-0.024(1.25)	0.020(0.57)	-0.045(1.90)*
proportion of female 40 – 59	0.112(4.69)***	0.091(2.06)**	0.121(4.24)***
proportion of male age 60 +	0.100(4.57)***	0.053(1.29)	0.118(4.53)***
proportion of female age 60 +	0.235(10.52)***	0.274(7.06)***	0.216(7.89)***
Observation	33,812	9,102	24,710
R-squared	0.073	0.066	0.079
LR chi^2	3392.06***	833.33***	2700.07***
Joint significant test for male and female			
age 0 – 9	235.17***	95.05***	147.05***
age 10 – 19	17.71***	6.05**	12.83***
age 40 –59	24.12***	4.57	22.86***
age 60 +	127.92***	50.80***	79.56***

Notes: Absolute value of robust t or z statistics in parentheses. *, ** and *** represent 10%, 5% and 1% statistical significant levels respectively.

Dependent variable: Probability of deciding to incur medical expenses in the past two weeks by a household member

ii. **Individual analysis: (taking all ages together - table 5.6b):** Here, the results show that there is a significant pro-female gender bias across the three levels, revealing that females are 3.9, 4.7 and 3.6 percentages, more likely to decide to spend than male at the national, urban and rural levels respectively, and this decision drops significantly with the age. The marital status shows that those in informal/loosed union significantly decide to spend more on healthcare than those in monogamous marriage across all the levels showing respective 13.3, 10.3 and 13.8 percentages upon consultation of healthcare service providers. The divorced/separated/widow is only significant at both national and rural areas, representing 1.6 and 2.0 percentages respectively. Religions significantly affect the decision at both national and rural areas with the Islamic and traditional religion members less likely to utilise health care services than their Christian counterparts at both the national and rural levels with a minimal 1.6 and 2.4 probabilities (national) and 1.8 and 2.4 probabilities (rural).

Also, education proves to be significant to the decision to spend on healthcare but those with primary, secondary and post secondary education are significantly less likely to decide to spend on healthcare service than those with no education. Curiously, education of those at the urban centre have lowest Employment variable, is weakly significant at both the national and rural levels, with paid employment dominating at both levels. Compared to the self-employed, the unemployed are more likely to decide to spend on healthcare services, while those who are not available for employment, though highly significant, are less likely to decide. In the same vein, household variables (size, per capita expenditure and headship) significantly influence healthcare utilisation across the three levels, with the exception of size and headship at the national and urban levels respectively.

Table 5.6b. Determinants of the probability of an individual deciding to incur medical expenses conditional on consultation (age in years)

	National	*Urban*	*Rural*
Individual level variables			
female	0.039(19.98)***	0.047(11.59)***	0.036(16.52)***
age	-0.001(11.35)***	-0.002(6.93)***	-0.001(9.32)***
age squared	0.000(17.99) ***	0.000(9.96) ***	0.000(15.18) ***
polygamous	-0.011(0.77)	0.005(0.18)	-0.019(1.05)
divorce/separated/widow	0.016(2.60)***	0.006(0.55)	0.020(2.70)***
informal/loose union	0.133(8.56)***	0.103(3.21)***	0.138(7.77)***
muslim	-0.016(8.04)***	-0.005(1.36)	-0.018(7.44)***
traditional religion	-0.024(2.68)***	-0.025(0.79)	-0.024(2.61)***
other religion	-0.006(0.39)	0.079(1.95)*	-0.027(1.54)
primary education	-0.011(4.78)***	-0.026(5.35)***	-0.006(2.42)**
secondary education	-0.018(6.23)***	-0.027(4.75)***	-0.013(3.76)***
post secondary education	-0.018(4.05)***	-0.022(3.01)***	-0.012(1.98)**
paid employment	0.008(1.97)**	0.006(0.92)	0.010(1.81)*
unemployed	0.009(2.87)***	0.008(1.22)	0.009(2.29)**
not available for employment	-0.037(11.76)***	-0.052(8.11)***	-0.031(8.40)***
Household level variables			
log of household size	0.001(0.62)	-0.013(3.32)***	0.006(2.52)**
log of per capita household exp	0.059(51.25)***	0.052(20.77)***	0.062(47.33)***
female household head	0.028(4.21)***	0.018(1.54)	0.031(3.92)***
Observation	144,210	35,694	108,516
R-squared	0.052	0.049	0.055
LR chi^2	6482.78***	1572.33***	5092.23***

Notes: Absolute value of robust t or z statistics in parentheses.
*, ** and *** represent 10%, 5% and 1% statistical significant levels respectively.

Dependent variable: Probability of an individual deciding to incur medical expenses in the past two weeks.

iii. Individual analysis: (the age structure of gender patterns - table 5.6c): The result here follows the same pattern with those presented before. There is significant gender variation across the three levels, these pro-female variations stand at 3.9, 4.7 and 3.7 percentage points more likely to consult than male at the national, urban and rural areas respectively. When the age cohorts are incorporated, the age pattern of gender differentiation reveals that, the pro-female disparity rises to 6.9, 8.8 and 6.1 percentage points respectively. Amidst the cohorts, young, intermediate/adolescent and middle age working groups are significantly less likely to decide to spend than their prime age (and child-rearing) working group counterparts. The elderly are likely to decide to spend more than them across the three levels of analyses, but in rural areas, the middle age working group also decide to spend more.

When other individual variables are introduced, the gender variables' stability remain by contributing 6.8, 8.8 and 6.1 percentage points to probability of the healthcare spending decision at the national, urban and rural areas respectively, so, the age structure follows the same trend across the three levels. There is marginal increase in the pro-female gender disparity with the introduction of the household-specific variables. It becomes 6.8, 8.8 and 6.2 percentage points at the national, urban and rural levels respectively and the age structure shows that all the cohorts are significantly less likely to decide to spend on healthcare services than the prime working age group.

5.3.5 Conditional expenditure stage – part of objective iv

i. **Household analysis (table 5.7a):** At the household level of analyses of the conditional healthcare expenditure stage, nationally, the gender difference was significant for two males (0 – 9 and 60 and above) and three females (20 – 39, 40 – 59 and 60 and above) cohorts. At the urban level, the difference was only significant for two males (0 – 9 and 60 and above) and two females (40 – 59 and 60 and above) cohorts while at the rural level, the significant difference was for only elderly (60 and above) males and three females (20 – 39, 40 – 59 and 60 and above) cohorts. Considering other household variables, the household headship significantly influences conditional healthcare expenditure at the national and rural levels with the probability of 12.2 percentage apiece, while household size and per capital household expenditure significantly influence the expenditure at the national, urban and rural levels.

Table 5.7a. Determinants of the household medical expenditure conditional on positive spending decision on a household member

	National	*Urban*	*Rural*
Household level variables			
female headed households	0.122(2.02)**	0.069(0.60)	0.122(1.71)*
log of per capita household exp	0.884(57.58)***	0.620(21.55)***	1.009(55.60)***
log of household Size	1.027(34.15)***	0.752(12.86)***	1.152(32.92)***
polygamous	0.182(1.65)*	-0.142(0.70)	0.338(2.57)**
divorce/separated/widow	-0.033(0.65)	-0.055(0.57)	-0.017(0.29)
informal/loose union	-0.006(0.04)	-0.041(0.11)	-0.010(0.06)
muslim	-0.205(7.94)***	-0.134(2.78)***	-0.204(6.61)***
traditional religion	0.069(0.73)	-0.013(0.04)	0.059(0.61)
other religion	-0.008(0.05)	-0.490(1.31)	0.102(0.55)
primary education	0.065(2.17)**	0.129(1.93)*	0.037(1.13)
secondary education	0.001((0.05)	-0.016((0.23)	0.034(0.82)
post secondary education	-0.060(1.40)	-0.006(0.08)	-0.044(0.82)
paid employment	0.008(0.25)	0.012(0.22)	0.015(0.34)
unemployed	0.018(0.46)	0.142(1.55)	-0.022(0.50)
not available for employment	0.016(0.39)	0.047(0.51)	0.012(0.27)
Age-gendered group within household			
proportion of male 0 - 9	-0.223(2.33)**	-0.346(1.89)*	-0.153(1.36)
proportion of female 0 - 9	-0.014(0.15)	-0.199(1.07)	-0.064(0.56)
proportion of male 10 - 19	-0.148(1.42)	-0.097(0.47)	-0.164(1.36)
proportion of female 10 - 19	0.151(1.42)	0.290(1.43)	0.126(1.01)
proportion of female 20 – 39	0.232(2.34)**	0.128(0.72)	0.331(2.78)***
proportion of male 40 – 59	-0.033(0.37)	-0.129(0.79)	0.016(0.15)
proportion of female 40 – 59	0.366(3.56)***	0.677(3.46)***	0.298(2.48)**
proportion of male age 60 +	0.682(7.08)***	0.477(2.56)**	0.781(6.95)***
proportion of female age 60 +	0.635(6.65)***	0.733(4.25)***	0.623(5.45)***
Observation	15,018	4,043	10,975
R-squared	0.222	0.148	0.263
F-statistic	153.48***	25.07***	139.95***
Joint significant test for male and female			
age 0 – 9	3.22**	3.94*	0.93
age 10 – 19	3.67**	1.70	2.66*
age 40 –59	6.57***	6.44***	3.09**
age 60 +	42.81***	11.39***	35.36***

Notes: Absolute value of robust t or z statistics in parentheses. *, ** and *** represent 10%, 5% and 1% statistical significant levels respectively.

Dependent variable: Household medical expenditure in the past two weeks by at least a household member

For the marital status, only the polygamous households significantly incur healthcare expenditure at 18.2 percent at the national, and to a lesser extent of 33.8 percent at the rural level than those in monogamous marriages. Also, only the Islamic religion households are significantly less likely to spend conditionally on healthcare than their Christian counterpart reducing the probability by 20.5, 13.4 and 20.4 percentages across the three levels. Indeed, education of the household heads have minimal impact on the conditional healthcare spending, because those with primary education are significantly more likely to spend on healthcare than those with no education at both national and urban levels, Lastly, the joint significant test shows that there is significant gender differentiation in the conditional healthcare spending across all age cohorts except adolescent group (10 - 19 years) and the young group (0 - 9 years) at the urban and rural levels respectively.

ii. Individual analysis: (taking all ages together - table 5.7b): The results of the conditional healthcare expenditure show a significant pro-female gender difference at the national level with 4.3 percentage, more likely to spend on healthcare than males, while the spending probability increases, significantly as the age increases suggesting a direct and positive relationship with age.

Table 5.7b. Determinants of the individual medical expenditure conditional on the decision to incur medical expenses (age in years)

	National	*Urban*	*Rural*
Individual level variables			
female	0.043(2.12)**	0.064(1.63)	0.034(1.44)
age	0.010(6.78)***	0.016(5.32)***	0.008(4.81)***
age squared	0.000(1.14)	-0.000(0.58)	0.000(1.56)
polygamous	0.031(0.20)	-0.009(0.04)	0.050(0.25)
divorce/separated/widow	-0.124(2.43)**	-0.124(1.33)	-0.127(2.09)**
informal/loose union	-0.359(3.38)***	0.142(0.63)	-0.523(4.33)***
muslim	-0.163(7.69)***	-0.079(2.04)**	-0.186(7.27)***
traditional religion	0.105(1.10)	0.212(0.67)	0.076(0.76)
other religion	-0.081(0.51)	-0.219(0.76)	-0.030(0.16)
primary education	0.059(2.47)**	0.019(1.91)*	0.039(1.42)
secondary education	0.164(5.20)***	0.167(2.94)***	0.145(3.76)***
post secondary education	0.060(1.29)	0.076(1.05)	0.050(0.79)
paid employment	0.031(0.75)	0.014(0.22)	0.043(0.79)
unemployed	0.001(0.05)	0.164(2.50)**	-0.056(1.44)
not available for employment	0.069(2.03)**	0.015(0.23)	0.096(2.42)**
Household level variables			
log of household size	0.502(24.47)***	0.401(10.42)***	0.502(22.40)***
log of per capita household exp	0.694(54.60)***	0.527(22.32)***	0.694(50.58)***
female household head	0.272(5.13)***	0.248(2.66)***	0.272(4.18)***
Observation	22,412	5,855	16,557
R-squared	0.176	0.147	0.191
F-statistic	217.04***	45.74***	177.10***

Notes: Absolute value of robust t or z statistics in parentheses. *, ** and *** represent 10%, 5% and 1% statistical significant levels respectively.

Dependent variable: Individual medical expenditure in the past two weeks.

Individual variables react the other way because the marital status only affects the conditional healthcare spending at the national and rural levels through the divorced/separated/widow and informal/loosed union significantly, though they both spend lesser (by 12.4 and 35.9 percentages at the national and 12.7 and 52.3 percentages at rural levels) than those in monogamous marriage. Following the household analysis above, only the Islamic religion individuals are significantly less likely to spend conditionally on healthcare than their Christian counterparts across the three levels with the probability 16.3, 7.9 and 18.6 percentages respectively. Education especially at the lower level, proved to be significant to the conditional healthcare spending, as those with primary and secondary education are significantly likely to incur more healthcare expenditure than those with no education across all levels. At the individual levels, employment does not significantly influence the healthcare spending. Conversely, household variables (size, per capita expenditure and headship) significantly influence conditional healthcare spending across the three levels.

iii. Individual analysis: (the age structure of gender patterns - table 5.7c):

The pro-female gender disparity at this level increased significantly to 5.0 and 9.2 percentage points at national and urban levels respectively. The introduction of the age cohorts marginally reduced the disparity to 4.9 percentage points at national level and substantially increases it to 14.1 percentage points at the urban level. Looking at the cohorts, young and intermediate/adolescent groups are significantly less likely to conditionally spend on healthcare services than their prime age (and child-rearing) working group counterparts, while the middle age working group and elderly are likely to outspend the reference category across the three levels of analyses.

When other individual variables are incorporated, the gender difference becomes insignificantly pro-male across the three levels, but the age

structure remains stable relatively across board. However, when the household-specific variables are added, the gender differentiation significantly becomes pro-female and stands at 7.3, 12.0 and 5.6 percentage points respectively at the national, urban and rural levels.

5.3.6 Unconditional expenditure stage – part of objective iv

i. **Household analysis (table 5.8a):** The unconditional healthcare expenditure at the household level of analyses shows a more robust result. At both national and urban levels, two male (10 – 19 and 40 – 59) cohorts do not have significant gender differentiation, while at the rural level; only one male (10 – 19) cohorts do not show any significant gender disparity. When other household characteristics are considered, the household headship significantly influences the unconditional healthcare expenditure only at the urban level with a pro-male heads having the probability of 46.8 percentage points, while household size and per capital household expenditure significantly influences the expenditure at the national, urban and rural levels.

Table 5.8a. Determinants of the household medical expenditure regardless of having a household member reporting illness

	National	*Urban*	*Rural*
Household level variables			
female headed households	-0.107(0.99)	-0.468(2.37)**	0.018(0.14)
log of per capita household exp	1.456(54.32)***	1.173(22.47)***	1.579(50.30)***
log of household Size	2.006(38.81)***	1.641(16.64)***	2.165(35.56)***
polygamous	0.769(3.64))***	0.785(2.06))**	0.746(2.94)***
divorce/separated/widow	0.191(2.17)**	0.278(1.75)*	0.175(1.65)*
informal/loose union	0.232(0.87)	-0.375(0.69)	0.409(1.33)
muslim	-0.400(8.69)***	-0.175(2.05)**	-0.441(8.03)***
traditional religion	-0.171(1.06)	-0.396(0.74)	-0.177(1.05)
other religion	-0.444(1.53)	-0.341(0.52)	-0.526(1.63)
primary education	0.522(9.63)***	0.309(2.66)***	0.568(9.19)***
secondary education	0.282(4.46)***	0.200(1.63)	0.323(4.25)***
post secondary education	0.000(0.00)	0.121(0.93)	-0.073(0.74)
paid employment	0.088(1.34)	-0.109(1.08)	0.265(3.03)***
unemployed	0.360(5.01)***	0.559(3.53)***	0.291(3.61)***
not available for employment	-0.122(1.63)	-0.195(1.23)	-0.085(1.01)
Age-gendered group within household			
proportion of male 0 - 9	2.038(12.08)***	2.278(6.96)***	1.972(9.98)***
proportion of female 0 - 9	1.820(10.49)***	2.601(7.78)***	1.534(7.54)***
proportion of male 10 - 19	0.152(0.88)	0.071(0.21)	0.178(0.88)
proportion of female 10 - 19	0.672(3.78)***	0.853(2.54)**	0.642(3.04)***
proportion of female 20 – 39	0.848(5.51)***	1.144(4.27)***	0.821(4.32)***
proportion of male 40 – 59	-0.173(1.29)	0.053(0.21)	-0.278(1.75)*
proportion of female 40 – 59	0.787(4.73) ***	0.776(2.48) **	0.816(4.13) ***
proportion of male age 60 +	0.912(6.02)***	0.484(1.68)*	1.079(6.02)***
proportion of female age 60 +	1.817(11.66)***	2.133(7.73)***	1.674(8.84)***
Observation	33,812	9,102	24,710
R-squared	0.132	0.107	0.149
F-statistic	184.28***	38.90***	154.32***
Joint significant test for male and female			
age 0 – 9	93.89 ***	41.89 ***	57.23***
age 10 – 19	7.42 ***	3.51 **	4.75 ***
age 40 –59	12.34 ***	3.10 **	10.62***
age 60 +	84.27 ***	30.90***	55.68***

Notes: Absolute value of robust t or z statistics in parentheses. *, ** and *** represent 10%, 5% and 1% statistical significant levels respectively.

Dependent variable: Household medical expenditure regardless of having a household member reporting illness in the past two weeks

The marital status shows that both polygamous and divorced/separated/widow households significantly incur healthcare expenditure than those in monogamous marriage across the three levels. Islamic religion households are significantly less likely to spend than their Christian counterparts reducing the probability by 40.0, 17.5 and 44.1 percentages across the three levels. Likewise, households whose heads have primary and secondary education are significantly likely to also spend more than those with no education at the national and rural levels, while the households whose heads have primary education are significantly related to healthcare spending at the urban level. Only the households whose heads are unemployed at all levels significantly report being sick more than the households whose heads are self-employed with the exception of those with wage employment in the rural area. Lastly, the joint significant test shows that there is significant gender differentiation in the unconditional healthcare spending across all age cohorts of the three levels of analyses.

ii. **Individual analysis: (taking all ages together - table 5.8b):** Following the same pattern under the conditional expenditure stage, the results of the unconditional spending shows a significant pro-female gender bias across the three levels revealing that females are 26.9, 33.0 and 25.4 percentages more likely to spend on healthcare than males, while the spending probability reduces significantly as the age increases, signifying an inverse relationship with age.

Table 5.8b. Determinants of the individual medical expenditure regardless of illness reporting (age in years)

	National	*Urban*	*Rural*
Individual level variables			
Female	0.269(19.49)***	0.330(11.38)***	0.254(16.14)***
Age	-0.015(13.05)***	-0.018(7.30)***	-0.015(11.05)***
age squared	0.000(22.17)***	0.000(11.51)***	0.000(19.13)***
polygamous	-0.100(0.89)	0.057(0.27)	-0.162(1.22)
divorce/separated/widow	0.173(3.55)***	0.085(0.92)***	0.208(3.59)***
informal/loose union	0.911(8.83)***	0.767(3.48)***	0.930(7.99)***
Muslim	-0.119(7.92)***	-0.032(1.09)***	-0.128(7.31)***
traditional religion	-0.155(0.53)	-0.141(0.58)	-0.159(2.26)**
other religion	-0.050(0.56)	0.560(2.00)**	-0.222(1.62)
primary education	-0.045(2.72)***	-0.161(4.37)***	-0.009(0.52)
secondary education	-0.095(4.32)***	-0.152(3.51)***	-0.055(2.13)**
post secondary education	-0.127(3.59)***	-0.135(2.31)***	-0.086(1.84)*
paid employment	0.059(1.86)*	0.036(0.68)	0.080(1.96)*
unemployed	0.060(2.64)***	0.091(1.94)*	0.042(1.60)
not available for employment	-0.239(10.44)***	-0.344(7.32)***	-0.190(7.24)***
Household level variables			
log of household size	0.104(6.66)***	-0.033(1.06)***	0.154(8.55)***
log of per capita household exp	0.567(63.82)***	0.485(25.75)***	0.603(59.52)***
female household head	0.474(9.11)***	0.326(3.51)***	0.541(8.54)***
Observation	144,300	35,714	108,586
R-squared	0.061	0.054	0.066
F-statistic	427.14***	91.90***	348.68***

Notes: Absolute value of robust t or z statistics in parentheses. *, ** and *** represent 10%, 5% and 1% statistical significant levels respectively.

Dependent variable: Individual medical expenditure regardless of illness reporting

Individual variables react other way, the marital status affects the unconditional healthcare spending at three levels through the divorced/separated/widow and informal/loosed union significantly as they both spend more (by 17.3 and 91.1, 8.5 and 76.7 and 20.8 and 93.0 percentages at the national, urban and rural levels respectively) than those in monogamous marriage. However, religion shows a mix result, only Islamic religion individuals are significantly less likely to spend unconditionally on healthcare than their Christian counterparts across the three levels with the probability 11.9, 3.2 and 12.8 percentages respectively. Other religion also is likely to spend more with 56.0 percentage at the urban level, while traditional religion followers are likely to spend lesser with 15.9 percentage at the rural level. Education is also significant to the unconditional healthcare spending as those with different levels of education are significantly likely to incur more healthcare expenditure than those with no education across the three levels, except for the insignificant primary education at the rural level.

Also, those in wage employment are more likely to spend than the self-employed at both the national (5.9 percent) and rural (8.0 percent) levels. The unemployed are also likely to spend more at the national (6.0 percent) and urban (9.1 percent) levels, while those who are not available for employment are less likely to incur unconditional healthcare expenditure with a strong statistical significance at the three levels (23.9, 34.4 and 19.0 percentage respectively). On the other hand, household variables (size, per capita expenditure and headship) significantly influence the unconditional healthcare spending across the three levels.

iii. Individual analysis: (the age structure of gender patterns - table 5.8c):

The pro-female gender differentiation at this level stabilizes significantly at 28.0, 34.7 and 25.8 percentage points at the three respective levels. The introduction of the age cohorts significantly increases the disparity to 52.0, 70.1 and 45.5 percentage points at the three levels. Moreover, the cohorts reveal that young and intermediate/adolescent groups are significantly less

likely to unconditionally spend on healthcare services than their prime age (and child-rearing) working group counterparts, while the middle age working group and elderly are likely to outspend the reference category at the national and rural levels. However, at the urban level, only the elderly are significantly likely to spend more than the prime age group, the young, intermediate/adolescent and middle age working groups are significantly likely to spend lower than them.

When other individual variables are introduced, though the gender variable remains stable, contributing 51.9, 70.1 and 46.1 percentage points to the spending probability at the national, urban and rural areas respectively, the difference becomes pro-male at the national level, hence, the age structure also stabilises with only the elderly spending more than the prime working age group. Others spend less across all levels, but the gender variation becomes slightly lower upon the introduction of the household-specific variables standing at pro-female 50.8, 69.1 and 45.1 percentage points with the same age-structure trend.

When findings of both Hurdle Models and Engel Curve are compared, the gender disparity was more obvious at the decision stages than that of expenditure stage. This confirmed the superiority of more disaggregated Hurdle Models over the Engel Curve.

5.4 Discussion of the results

The results in Tables 5.4a-c imply that there exists gender disparity in the healthcare needs of household members across the different age-gendered groups within the households except for the males 10 – 19 and 40 – 59 age groups, indicating their insignificant likelihood of revealing their healthcare needs. The marital status of the head of the household plays prominent role on the healthcare needs of the members, while religion, education as well as employment status of the head does not feature prominently, most especially at urban centres. Individually, the gender pattern still favours female members of the household when the ages are either pooled or structured.

For the gender patterns of the healthcare utilisation among the household members as shown in Tables 5.5a-c, the existing gender difference is much more notable across different age-gendered groups within the households at the national and rural levels than the urban level. The gender of the household head, which is pro-male (that is, favours males over females), is only important at the urban centres, while the marital status, religion, education as well as employment status of the head does not feature prominently, most especially at the urban centres. Individually, the female members of the household utilise healthcare services more than males when the ages are either pooled or structured.

At the healthcare spending decisions stage within the household, the gender patterns shown in Tables 5.6a-c shows similar result with the utilisation stage with the gender difference equally becoming noticeable across different age-gendered groups within the households at the national and rural levels than the urban level. The household head is pro-male and has significant effect only at urban centres. At the individual level of analyses, the gender disparity was still pro-female this implies that as far as the decision to spend on healthcare services is concerned, female household members outnumber males. Likewise, other individual characteristics (marital status, religion, education and employment status) prove to be relevant at the national and rural levels while only education affects the healthcare needs of urban dwellers. Summarily, the

gender patterns of the household members regarding healthcare needs, utilisation and spending decision, appears pro-female at both household and individual levels. Gao and Yao (2006) and Kingdon and Irving (2008) report similar results for the stages preceding healthcare spending, while the result from Rout (2006a) is different.

With respect to the healthcare expenditure, empirical evidence from the conditional OLS in Tables 5.7a-c reveal that the household spend more on older member-groups, especially elderly males (60 and above) and females, ages 40 and above across three levels. Also, at the national level, households conditionally spend on young males and prime age working females, while rural and urban dwellers spend on young males and prime age working females. It is observed that though, the prime-age females consult healthcare practitioners more often than prime-age males, they spend less. However, while prime-age adults tend not to consult as often as young and the elderly do, they spend more on healthcare than the other two groups, confirming the higher opportunity costs of the prime-age adults, who though, consult less often, they spend more once they do, since they want quick recovery to forestall labour income loss.

Individually, female members of the household spend more conditionally on healthcare services more than males when the ages are either pooled or structured. However, household and individual specific variables that were found to be significant factors with respect to the conditional spending are headship, income (proxied by the per capita household expenditure), household size, polygamous family structure, Islamic religion, primary and secondary education. Employment variable is not found to be a significant factor with respect to the conditional healthcare spending, using the conditional OLS. Conversely, it is obvious from the unconditional OLS as contained in Tables 5.8a-c that the gender pattern of the household healthcare spending became more prominent among the cohorts and the same pattern is sustained at the individual levels. This result also agrees with Verbrugge (1985), Mbanefoh *et al* (1997) and Kingdon and Irving (2008).

In summary, the results show that there is a pro-female gender difference across the three levels of analyses at different stages of the hurdle. This is more clearly shown at the individual level, than at the household level, while it becomes evidently clear across the age groups. The age effect is non-linear, negative and significant in the entire sample result (except for the conditional expenditure stage). Moreover, household health expenditure in Nigeria tilted in favour of the young and elderly age group[32] with slight pro-female disparity among the prime and middle-aged working groups, suggesting that much value is placed on maternal household production which underlies identification of non-market contribution of women (of child-bearing age) to household welfare. This stage may also produce greater ill-health among women whose children are not well-spaced (Strauss *et al* 1993). Obviously, the prime-age adults have significantly lower chances of consultation than children and old-age adults, but they spend significantly less than old-age adults, thus confirming the inter-temporal substitution of the healthcare seeking behaviour over both individual's life cycle and between generations.

The fact that the polygamous family structure proved to exert significant impact on the healthcare expenditure in Nigeria possess obvious implication on the size of the household. The educated could also possibly be prone to take informed decision and thereby engage in preventive measures, due to their suspected higher opportunity cost of illness reporting and consultation procedures since they are likely going to be in regular employment. Therefore, it is obvious that in the Nigerian context, females are not commonly discriminated against, and this is thereby rejecting the market value hypothesis that predicts higher spending on males' health and agree to the valuation of women's non-market work (household production) as an important factor that is driving the healthcare expenditure allocations.

[32] The health care decisions for these groups are taken by the parents and relatives respectively and the impact could be due to the pediatric care or some chronic conditions of the children and the elderly.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter concludes the study. It first highlights the summary of the major findings, followed by the concluding remarks and some policy recommendations. Finally, the limitations encountered are presented as well as areas of possible future research.

6.2 Summary of the study

This study empirically examines the gender pattern in household health expenditure allocation in relation to healthcare seeking behaviours of household members within Nigerian context. The particular interest is the quantitative evidence of the importance of individual and household characteristics on individual's behaviour during the illness incidents. This is achieved through the analyses that provide empirical evidence on how different factors that affect health-seeking behaviour were carried out.

Inadequate resources are prominent among the factors that have contributed to the poor overall performance of healthcare system in Nigeria in spite of the recent effort geared towards the growth of the supply side structure aiming to expand access to health services in the country. This could still be traced to the fact that household remains the major financier of healthcare services in Nigeria. Though, the household income is being contributed by the constituent members, allocation of the resources in so many instances can lead to unequal intra-household distribution among the members and one of the ways to reduce this and consequently promote the welfare of individuals is to

examine the extent and nature of gender patterns in household health expenditure allocation. Specifically, it is necessary to consider how men and women at different ages behave during the incidents of illnesses as well as the factors that affect this behaviour from the 2010 Harmonised Nigerian Living Standards Survey (HNLSS), which shows a substantial increase in the proportion of Nigerians who consulted health practitioners for illness compared to the previous surveys.

The existing literature reviewed are categorised along theoretical, methodological and empirical divides. The theoretical are unitary model of household behaviour, cooperative bargaining models and non-cooperative game approach, while the methodology includes descriptive analysis, standard Tobit Model; the Sample Selection Model (SSM); the Two Part Model (2PM) and the Engel curve. However, the methodology of rendition combines a hurdle model derived from two-part models, involving four stages (healthcare needs, healthcare utilizations, healthcare expenditure decision and actual healthcare expenditure) and the Engel curve approach.

The descriptive statistics of the study are reported in three-fold. All are based on the characteristics of respondents, grouped along the marital status, religion, education, employment status, sectors and geo-political zones. The first part presents data on overall sample characteristics (dependent and independent variables) through mean and standard deviation along the urban and rural-gender division. The second shows the characteristics of respondents grouped along five age cohorts (the young group (0 - 9 years), adolescent group (10 - 19 years), prime age working group (20 - 39 years), middle-aged working group (40 - 59 years) and the elderly (60 years and above)) indicating the gender pattern of each cohort. Though, males dominance is established except for the prime and middle age cohorts, in all, males averagely outnumber females, representing 51 percent and 49 percent respectively. The third and the final one contains the average healthcare spending by Nigerians in three prominent places of consultation. This is also divided by gender and found out that, males spend averagely on healthcare more than females. The average of

out of pocket expenses is ₦3,908.1 per male respondent and ₦3,382.8 per female respondent. Till date, some individuals consult both traditionalists and spiritual houses (Churches and Mosques) rather than the formal healthcare providers. However, these places have also proved not to offer free services to their clients after all.

The empirical analyses are done by modelling a sequence of health seeking behaviours involving the binary decision stages of illness reporting, healthcare utilisation and deciding to incur positive healthcare expenditure conditional on consulting healthcare personnel, while the last stage concerns the actual money spent, and this observed gender pattern is considered vis-à-vis the unconditional model of healthcare expenditure. The three levels of analyses are the national, urban and rural at both individuals and household units.

The analyses further reveal a pro-female gender differentiation across the three levels of analyses at all the stages of the hurdle and the Engel Curve equation of unconditional heath expenditure. This was more obvious at the individual than the household level, and it also becomes evidently clear across the five age groups. Consequent upon exploration of the age pattern of gender differences, the observed pro-female gender disparity is traced to young (below 19 years) and older (above 40 years) groups, which implies that the gender disparity is significantly transmitted over generations. At the household level of analysis, male household heads are prominent, while female heads feature prominently at the individual levels.

In addition, the gender differentiation in the healthcare seeking behaviours is decreasing with age, except for the young and elderly age groups. Among the household specific characteristics, notably is the significantly decreasing healthcare expenditure at increasing education at secondary and post secondary school levels. A polygamous household structure possesses the likelihood of increasing healthcare spending to other forms of marital status which has little or no significant influence on the expenditure. The religious beliefs of individuals are also essential, especially Islamic religion. Notably however, is the fact that, employment is not found to have significant linkages

with healthcare spending, this could be reinforcing the fact that healthcare is not a luxury, but a necessity.

Furthermore, healthcare expenditure allocation increases with the number of household members in the household, while the income elasticity of healthcare expenditure is inelastic and these results are found to be consistently stable across the national, urban and rural levels.

Generally, hurdle models are better able to detect gender bias in household healthcare expenditure as compared to the conventional Engel curve approach, especially when using individual level data. The results also reject the income-pooling model of the household in favour of a model in which households exhibit some aversion to inequality.

6.3 Conclusion

In examining the gender patterns in household health expenditure allocation, this study finds strong evidence that females are particularly favoured in illness reporting, consultation, spending decision as well as in expenditure allocation compared to men across almost all age cohorts as found in most cited literature. This implies that, more women depend on household resources for their health needs and spending. Age in years shows a non-linear relationship with health seeking behaviour while age in dummies (cohorts) shows that households engage in intergenerational transfer among different age groups. The extent and dimensions of gender disparity are more clearly revealed in individual than household level analyses, despite the use of similar specifications and identical data, thereby aligning with the conclusions of Gao and Yao (2006) on China and Kingdon and Irving (2008) on South Africa. But unlike they, in the results for household level analyses, aggregation process does not constrain the gender differences in healthcare expenditure. The universal insight is that the decision of whether and where to seek healthcare and the amount of expenditure depends on how serious the illness is (Su *et al*, 2006). However, our results prove that illness is not the only factor involved,

rather, other influences such as, individual and household characteristics have been identified to determine the magnitude of expenditure incurred.

6.4 Recommendations

From a policy perspective, the findings, as discussed in the previous section, possess diverse implications for Nigerian policy makers in their attempts to reduce the intra-household inequality in healthcare spending and enhance the welfare of individuals and households in general.

- In view of the fact that healthcare spending favours females than males at all decision-making stages in Nigeria, health expenditure allocation, particularly by government, should reflect this pattern and difference.

- Since the female headed households significantly influence the allocation of healthcare spending among the household members, efforts should be geared towards improving the training and education programmes that target women specifically; this can lead to higher investments in the human capital of children, thereby leading to poverty reduction and higher income growth in future.

- Clearly, households are engaging in intergenerational planning that is predisposed to trade prime-age adults' health for higher current income to finance children's health as well as providing healthcare for the elderly. This implies that though, the traditional household-based welfare system still functions relatively well in Nigeria, mechanisms should be designed to mitigate the negative impact of high out-of-pocket spending of the children and elderly on the household in general.

- The increasing level of formal education reduces healthcare expenses significantly while education of the household head influences the probability of members utilizing healthcare services.

- Investing in education could likely promote monogamous household structure as the polygamy proves to increase healthcare spending significantly.

- The income elasticities imply that the poor households are more sensitive to income changes than the rich ones, meaning that, any rise in the healthcare expenditure will adversely affect utilization by the poor more than the rich; but any increase in income levels tend to increase it for the poor more than that of rich. Tactical approaches aiming at increasing the incomes of the poor should be established, while those already in existence be reinforced to ensure adequate involvement of the poor.

- Awareness through health and community education is highly recommended to inform and adequately enlighten those who either do nothing or engage in self-treatment of the inherent danger in their actions.

6.5 Limitations of the study

Certain number of weaknesses identified in the course of this research work are traced to the data challenges of the HNLSS. It is firstly noted that the cultural beliefs suspected to possess strong influence on the healthcare expenditure is difficult to be measured because race/ethnicity is not captured in the survey. Secondly, operationalisation of the gender variables is also limited since the data does not capture the gender that decides and ultimately pays for the household healthcare. Moreover, the survey is only limited to those who are sick or injured in the last two weeks preceding the survey, leaving out those who are currently sick or injured, whose healthcare expenditure is ongoing. Finally, the scope of health expenditure is limited to curative care excluding expenses on preventive care, rehabilitative care as well as other cost-saving services. Yet, it is hoped that improvements could be made if the results obtainable in this study inspire future research.

6.6 Suggestion for further research

Future research is required to explore the performance of the roles and responsibilities expected of each gender vis-à-vis household decision making. This will ensure that policies and programmes aiming at solving different gender-based household problems are issue-specific. Also, further research should incorporate the geo-political zones in order to examine both inter and intra zonal patterns and possible disparities.

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