GENDER ANALYSIS OF HEALTHCARE EXPENDITURES IN RURAL NIGERIA

BY

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ABSTRACT

Heath inequities have significant social and economic costs to both individuals and societies. These inequities are largely due to gender based differences which influence health conditions, access to and utilization of health services. However, information on gender dissimilarities in health seeking behaviour, especially in rural Nigeria, is limited. Therefore, gender pattern in healthcare expenditure in rural Nigeria was investigated.

Secondary data from 2009 Harmonised National Living Standard Survey (HNLSS) were used for the study. Information on 24,941 rural households [Agricultural Households (AH) and Non-agricultural households (NAH)] in Nigeria was used. Data used were socio-economic and demographic characteristics (sex, age, marital status, household size, educational level, farm size and occupation), health condition, water sources and sanitation facilities, occupation, education and access to training. Other variables used in the study were household expenditures, involvement in agricultural activities, access to credit and savings status. Four major health decision variables: Health Status (HS), Medical Consultation (MC), Treatment Costs (TC) and Actual Medical Expenditure (AME) representing the four stages of health seeking behaviour were used. Rural households were grouped into youths [Female Youths (FY) and Male Youths (MY)] and adults [Female Adults (FA) and Male Adults (MA)] for gender analysis. Data were analysed using descriptive statistics, inequality measures, Engel curve and Generalized Structural Equation Model (GSEM) at $\alpha_{0.05}$.

Mean monthly expenditure on health per person was higher for MA (₦7,256.4±629.0) than FA (₦5,115.4±503.9). The FY spent more (₦4,433.6±668.1) on health care than MY (₦3,857.9±671.3). For AH, MY (76.7%) and MA (68.8%) contributed more to health expenses than their counterparts (23.3% and 31.2% for FY and FA, respectively) while FY (60.3%) and MA's (57.3%) contributions were higher than that of MY (39.7%) and FA (42.7%) for NAH. Among AH, FA accounted for the largest proportion (61.2%) of households' total health expenditure while FY (4.6%) had the least. The corresponding figures for NAH are 46.1% and 28.7% for MA and MY, respectively. Men were 33.4% less likely to report being sick than women and the degree of inequality in AME was almost equal for both male (0.59) and female (0.55). Income elasticity of AME was 0.234 which implies that a 1% change in income will lead to less than 1% change in medical expenditure of an individual. Gender analysis was done at HS and MC stages as sex and age disparities were only significant for these stages. Per capita expenditure (β=0.774), health decision (β=1.226) and household size (β=0.350) increased HS, while sex (β=-0.334), marital status [monogamous (β=-0.725), polygamous (β=-5.807) or once married (β=-0.594)], education (β=-0.012) and personal care (β=-0.008) reduced HS. Health decision (β=0.336), household size (β=0.484), training (β=0.850) and per capita expenditure (β=0.334) increased MC while sex (β=-0.309) and dependency ratio (β=-0.152) decreased MC.

Although rural women in Nigeria have a higher likelihood of being sick, which creates the need for higher health seeking behaviour, they do not spend as much on health care services as men. Investment in health increased with age irrespective of the sex of the household members.

Keywords: Health, Gender, Triple hurdle model, Generalized structural equation model, Rural Nigeria.

Word count: 495

DEDICATION

This project is dedicated to the Lord Jesus for keeping me in the centre of His will.

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All hail the Alpha and Omega who foreknew me even before my conception. From cradle, through infancy to adulthood, the Lord Jesus has been my sustaining grace. Right from the initiation of this thesis to its completion, His presence and involvement have been perceptible. Lord, I am so grateful and words can't express how beholden I am to you.

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Finally, I give all glory back to my lord and saviour, Jesus Christ. He alone is to be praised.

CERTIFICATION

I certify that this research work was carried out by Tolulope Rachael JERUMEH under my supervision in the Department of Agricultural Economics, University of Ibadan

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CHAPTER ONE

INTRODUCTION

1.1 Background

Health as a basic human right guarantees the highest possible standard of physical and mental health to everyone at all times. However, health inequities persist between and within countries particularly in developing countries with high levels of poverty (Batra *et al.*, 2014). Research shows that there is substantial variation in the population in terms of health status, health investments undertaken, access and utilization of health care services (UN 2009; Baeten *et. al.*, 2013; Joe et. al., 2008). These differences in health care utilization, particularly in developing countries where custom and tradition predominate, are influenced by gender-based differences (Buor, 2004). Gender discrimination and bias do not only affect differentials in health needs, health seeking behaviour, treatment, and outcomes, but also pervade the component and the process of health research. Sen and Ostlin(2007) identified three dimensions of gender imbalances in health research content. These are:prolonged recognition of health related issues that essentially affect women; addressing females' and males' health needs using misapplied or bias strategies by different fields of health research; and no prompt recognition of the link between gender and other social indicators.

Sex and gender are increasingly recognized as important determinants of health for women and men (WHO, 2010; UN, 2010). The ease of access to health services and the response of health systems to the diverse needs of individuals (women and men, girls and boys) depend not only on sex or biological differences but also on gender norms, identities and values. Gender differences arise from the perceived roles and responsibilities of women and men of which there exists significant heterogeneity across culture, regions or countries. For example, in some cultures, particularly in some African countries, women do not have property rights, take active part in politics or participate in critical household decision making. While this is acceptable in some regions, it may appear barbaric in other cultures. Though, sexual differences in biological terms basically cannot be changed, gender differences which mean social disparity in roles and relationships between men and women vary depending on time and place and they can change, since they are defined by people's way of thinking and sense of values (Japan International Cooperation Agency, 2011). The concepts of sex and gender are often confused. Whereas gender refers to socially assigned roles and behaviours of men and women (Oluwatayo, 2009), sex refers to biological differences between women and `men in terms of reproductive organs and functions based on chromosomal complement and physiology(Abegunde, 2014; KI,2016). Where sex is fixed (male or female), gender is subject to change.

Unbalanced distribution of power and productive assets as well as the reality of stringent gender norms constitute the focal point of any debate on gender and sex (DeCola, 2012). This becomes more important with the realization that gender differences affect the distribution of resources and ownership of assets (Edet and Etim, 2014).For example, women continue to face marginalization in many parts of the world in terms of land titles, properties, housing and other productive assets with restricted access to technologies and facilities that could help reduce their work burden (United Nations, 2009). In Nigeria, women have limited access to land due to the patrilineal structure of the country where land inheritance is principally through male descent. For example, only 7.2% of women own the land they farm and this limits their access to credit and constrains entrepreneurship and business activity (British Council Nigeria, 2012).Asset ownership is an essential component of women's empowerment as such ownership facilitates their ability to take active part in household decision, respond to opportunities and other competencies as well asincrease their range of choices(Deere and Unidos, 2010). Unequal access to productive assets and inputs negatively affects the productivity of women relative to men and thus involve costs in terms of lost output, income and ultimately welfare (health) of households, communities and nations (FAO, 2011). Besides limited access to productive resources, gender norms require women to be responsible for the unpaid care of children, older persons and sick family members despite the fact that men and women are both involved in agricultural production and other income generating activities. They are also expected to act as buffers - urged to look for jobs to meet family needs and suffer most from the decline in food resources by eating least and last (GSDRC, 2009).These deprivations have been shown to have far reaching consequences on women's health and this include risk of poor pregnancy outcome, maternal death as well as the long term effect on the food security of the households (UNAIDS, 2012).

However, the preceding situation raises an interesting question as to why men die earlier if truly women are the hardest hit by gender discrimination. Contrary to the common perception that only women and girls are discriminated on the basis of sex, discrimination against men and boys can also happen, and in some cases, it can be even more evident (Benatar, 2012). Traditionally, men are expected toact as the household head by being the main economic provider for the family- from putting food on the table to providing shelter for the household. The main role for men is the one of primary income-earner and breadwinner in the family (World Development Report,2012). In the face of high poverty and unemployment, such financial burden can lead to frustration, depression,and in more common cases, violence.Men with the worst psychological well-being and the worst health are those who earn significantly more than their partners(Best,2016). Also, Cultural conditioning which requires that men be emotionally strong poses serious threat on their health seeking behaviour. As early as the boy child can comprehend things around him, he is thought according to Legato (2008) to suck up pain, not wimping or showing any form of weakness. Men are expected to brazen up and only seek medical treatment when their health situation has become critical and failing or when pressure is being mounted by their spouses or other family members. Many men define unhealthy and risky behaviour as masculine while they see health care use and health promoting behaviours as feminine (Conversation Africa, 2017). Deep rooted negative gender norms and unequal access to productive resources have been found to reduce the health-seeking tendencies of individuals which consequently predispose them to higher health risk.

1.2 Statement of the Research Problem

Health is demanded and consumed because it affects the total time available for the production of income and wealth, (James, 2011; David and Heather, 2007) and in itself is a source of utility. Despite its central role in the overall national economic performance in terms of possible increase in GNP due to more working hours, the health situation in Nigeria has been on a downward trend placing Nigeria among countries with poor health statistics with the female population being somewhat more affected. The United Nations Population Fund (2014) disclosed that in 2010, maternal mortality rate was 840 per 100,000 live births which is more than double that of the global average. Maternal mortality has been observed to be increasing from 608.3 in 2008 to 814 in 2015(World Bank, 2016). Infant mortality per 1,000 live births was 72.7 in 2015 which puts Nigeria in the tenth position in comparison to the world (CIA, 2015) and under-5 mortality rate per 1,000 births was 109 in 2015 (World Bank, 2016). As of 2012, the HIV prevalence rate among people aged 15–49 was 3.1 % making Nigeria a country with the second-largest number of people living with HIV (CIA, 2012). As documented by NBS (2014), more women are being infected and dying from the epidemic than men. The NBS document further revealed that of all those who had HIV/AIDS infection in the period 2010-2013, 63.5% were women while the rest were men. This resulted in 59.3% of documented female deaths and 40.7% male deaths in Nigeria. Also, life expectancy at birth for male and female put at 53 years and 55 years, respectively have been found to be below the global average (WHO, 2012). These health statistics have been shown to be much worse in rural areas (Health Policy Institute, 2003; Mberu et al, 2016)

Albeit the worrisome health statistics for Nigeria, government's spending and implementation on health have been generally low. There has been little investment in infrastructure or service improvement with the health sector being largely underfunded. The three main agencies that are recipients of health allocation by the Federal Government of Nigeria are the National Primary Health Care Development Agency (NPHCDA), Federal Ministry of Health (FMOH), and the National Health Insurance Scheme(NHIS). Compared to 2014, the Federal Ministry of Health's allocation to integrated Maternal Newborn and Child Health (MNCH) in 2015has reduced by 37 percent with no allocation provided for fistula repair service, care for pregnant women, newborn care, nutrition and the programme designed to Save One Million Lives(FGN, 2015). In other words, contraception is the only MNCH area that is still funded by FMOH. The NPHCDA budget allocations for MNCH services have been decreased by 42% (Asogbon, 2015) and a 77% reduction in NHIS allocations for maternal and child health insurance.In 2014, health expenditure per capita was US$118 putting Nigeria in 139th position in the world (World Bank, 2017). Also, out of the ₦6.06 trillion budget for 2016, only about 4 per cent (₦221.7billion) was allocated to the health sector which is about one fifth of that of United States (Figures 1&2). The 4 % budget allocation to health in Nigeria is way below the 15 % threshold recommended during the Abuja declaration summit. By implication, health expenditure in Nigeria is mainly privately funded. In 2014, private spending accounted for 74.9 % of total health expenditure with out-of-pocket payments (OOPs) accounting for more than 95.7% of private health expenditures (World Bank, 2016). Invariably, the burden of health care payment has shifted significantly to consumers who have to pay a fraction of their incomes to receive health services. With this type of situation, there is a chance of having catastrophic health expenditure which results when out of pocket payments (OOP) accounts for about 65% of total payment of health expenditures (Petu and Soyibo, 2006). With the burden of health care payment being more on the households, whose incomes are subjected to wide variability particularly in the rural areas with climate dependent agricultural livelihood, people would have to make a dire choice of either dying without treatment or save a life by crossing the poverty line- that is, moving from being non-poor to being poor.

Besides high out of pocket payments, health care utilization is also affected by stringent and unbalanced gender norms. On the basis of income distribution, Nigeria has been globally ranked as one of the thirty most unequal countries where only 10 percent of the National income is only being scrambled for by the poorest who constitute more than half of the population (BCN,2012). The British Council of Nigeria report also shows that out of the 80.2 million women population in Nigeria, 54 million live and work in rural areas, where they provide 60-79% of the rural labour force. Therefore, dissimilarities in income between rural and urban settlers will have more significant impact on women than men. Although, we have greater representation of women in subsistence farming and non-agricultural activities, women are five times less likely than men to own land. In general, high proportions of women do not own a house (82 %) or own land (85 %) in Nigeria (NPC and ICF, 2014). All these, in addition to women's culturally and socially determined roles (caring for the sick, older persons and those who cannot fend for themselves), affect their access to financial capital and ability to earn income outside the home thereby reducing their contribution to household cash income. Consequently, their ability to influence spending at household level will be curtailedand the incomes generated by them, more often than not, are in the custody of the men (Buor, 2004).Thus, the ability to purchase health resources is mostly dependent upon the man. This situation puts at risk the utilisation of health services by women given the general low level of incomes in Nigeria where 69 % of the total population live in poverty (BCN, 2012).

Equally, men have been shown to suffer from the same gender stereotypes that hurt and limit women. For example, the lower utilization of health services among men owes a great deal to cultural and societal norms traditionally attached to masculinity. As revealed by the Agency for Health care Research and Quality, men are far more likely to skip routine health screens and far less likely than women to have seen a doctor of any kind (Shmerling, 2016). Men and boys have been conditioned by socially learned construct not to show signs of weakness expressed in terms of frequent visit to hospitals or reporting being sick as these are considered to be effeminate. The pressure on men to be the main economic provider in the household places a lot of stress on their mental and physical wellbeing. Evidence exists to show that, on the average, men had lower health statistics and psychological wellness in periods where they were the sole bread winner of the family than in years where their spouses or partners contributed fairly to household income (Best,2016). Also, parents' treatment of their children depends on their gender which in turn informs how they behave in certain ways, as dictated by societal beliefs, values, attitudes and examples (Conversation Africa, 2017). For example, many cultures encourage or condone men's heavy drinking, but discourage it in women in addition to not working outside the home while men are expected to be part of the labour force (Yin, 2007). Also, involvement in more dangerous agricultural activities (harvesting of palm kernel, operation of heavy farm equipment etcetera) and occupations have been found to be male dominated. Because women suffer less from the depredations of work, their health deteriorates less quickly (Case and Deaton, 2003) which explains to a reasonable extent their higher life expectancy (55 years against 53 years for men).In the light of the foregoing, the study raises the following research questions:

- What type of health services by gender are being utilized by the households?
- What fraction of household total budget is spent on health?

- Who spends more on health expenditure in the households?
- What are the factors driving health care decisions?

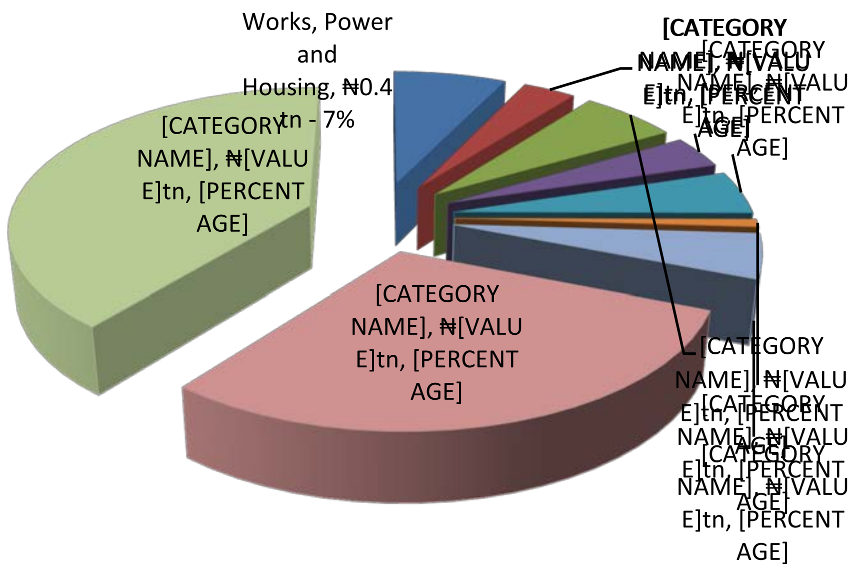

Figure 1: Nigeria's National Budget for 2016

Source: FGN, 2016

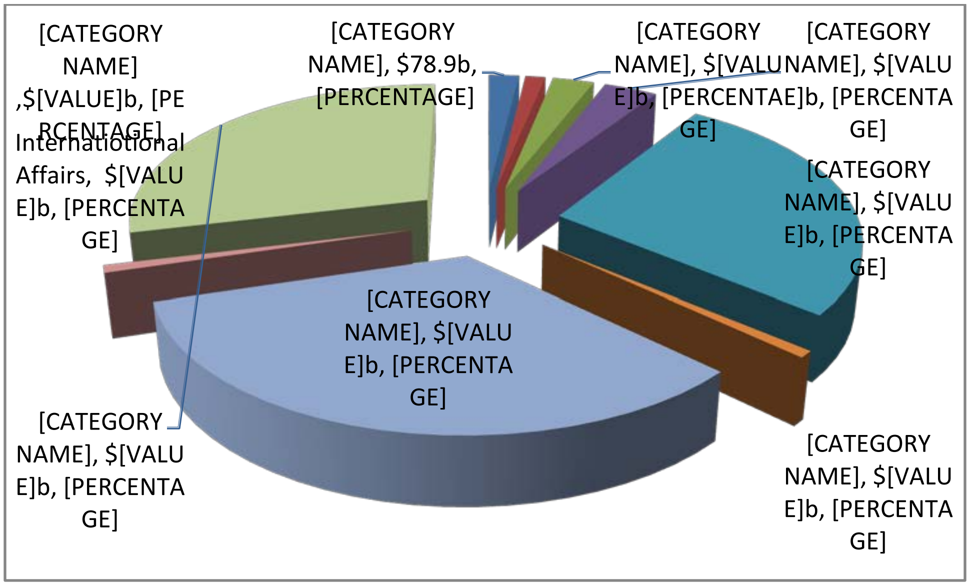

Figure 2: US 2016 Budget

Source: Congregational Budget Office (2017)

1.3 Research Objectives

The main objective of the study is to investigate gender patterns in health care expenditure allocation in rural Nigeria. The specific objectives of the study are to:

i. Establish gender differentials in the utilization of health services;
ii. Assess gender-based differences in the control of household resources;
iii. Determine the magnitude of out-of-pocket payments of households for health care services by gender;and
iv. Examine the determinants of health care decisions;

1.4 Justification of the study

The study is gender centric as men and women have been shown to be affected by harmful gender norms which negatively impact their health seeking behaviour. Women are significantly under-represented in secure wage employment both in the private and public sectors and globally have lower wages than men (22% pay gap) (UNAIDS, 2012). Regardless of the marginalization in wage and income opportunities, rural women are expected to provide a bulwark during financial crisis- scouting for jobs and nurturing the sick, older persons and children in their households which consequently exerts a lot of societal demand on women for the sake of others. Conversely, while programmes on female advocation which validates and addresses women health needs abound, men's concerns have been greatly shelved in many countries including Nigeria. Based on the foregoing, there is a need for a study that will help reveal the exact gender pattern in health seeking behaviour showing whether or not cultural and social roles negatively impact health care expenditures. A realization that such differences exist will help policy makers and programme managers understand the cause of these differences and offer entry points for designing policies and programmes that can effectively address gender disparities.For instance, the approval of the disburse 10ment of about ₦75 billion by the central bank of Nigeria for agricultural lending to farmers in 36 states and FCT under the Nigerian Incentive-Based Risk Sharing in Agricultural Lending (NIRSAL) calls for a complete gender mainstreaming. To achieve equitable results, innovative approaches that will integrate differences in women's and men's concerns and experiences into the projects' design, implementation, monitoring and evaluation are needed. This study will also help to echo realities and trends while contributing to the overall goals of most health policies in Nigeria. For example, findings from this study add up to the main objective of the national health policy which is to strengthen Nigeria's health system particularly in the primary health care sub-system aimed at delivering qualitative, efficient and comprehensive services to all Nigerians.

Many studies have shown that health affects agricultural productivity (Egbetokun et.al, 2012; Adhvaryuy and Nyshadhamz, 2010; Ulimwengu, 2009; and Ajani and Ugwu,2008). In situations where hired and family labour do not constitute perfect substitutes or when the households have financial crisis, a weak health status will lead to a reduction in worker's capability or loss in man days which may likely reduce the quantity of output (Croppenstedt and Muller, 2000). According to Kussa (2012),the negative effect of poor health on the supply of labour is as a result of the reduction in work days used on the farm and by implication it adversely affects labour efficiency as well as agricultural productivity. The studyfurther revealed that health shock does not only affect labour efficiency but likewise reduces farmers' off-farm income which also has negative impacts on agricultural productivity. Good health however increases productivity and effectiveness of an individual through enhanced physical and mental capacities. Egbetokun etal. (2012) in their study on the impact of health on agricultural technical efficiency in Nigeria, found out 1% improvement in the health condition of the farmers will increase efficiency by 21%. The role of health capital on agricultural productivity manifests in the huge opportunity cost of being sick to the farmer(Ajani and Ugwu,2008). The fact that health affects the amount of healthy time available for involvement in agricultural activities and that that rural households provide the bulk of agricultural labour force in Nigeria of which 69% of this workforce comes from the female folks makes a study on the gender patterns of health care expenditures timely and relevant.

While literature is satiated with several works on out-of-pocket payments of health care financing (Oyinpriye and Karimo 2014;Awoyemi and Omoniwa, 2013; Soyibo *et al*, 2009; Petu and Soyibo,2006; Amakom and Ezeneke,2012), few studies have been done on gender patterns in health care spending. Anyanwu et al. (1997) studied gender differences in household health expenditure in Nigeria. Buor (2004) studied gender and the utilization of health services in Ghana while Irving and Kingdon (2008) focused on gender patterns in household health allocation in South Africa. Nonetheless, studies that focused on gender differences in health care expenditure have been faulted on the grounds of not making gender analysis framework an integral part of their analysis. This study therefore intends to add to existing knowledge by introducing the domains of gender analysis framework which will help to reveal the factors contributing to gender imbalances in health care spending by the households. This is important because understanding gender patterns in household payment for health care will increase the likelihood of plummeting the intra-household dissimilarity and also help to enhance the welfare of individuals and households as a whole. Additional knowledge about the group having high health care spending and utilization patterns will help health care providers and policy makers to provide services that are gender specific.

Most studies (Parker and Wong, 1997; Anyanwu et. al, 1997; Gray et. al, 2002; Riman and Akpan, 2012) measured household health expenditure using estimates of utilisation rates of health services, as share of health expenditure in non-food expenditure among others. These procedures have been criticised for not recognising the fact that health seeking behaviours pass through more than two stages to reach four stages revealing the channels through which gender differentiation takes place in health seeking behaviour. The stages are three binary decision stages- health care needs, utilization, incurring treatment cost andthe actual medical expenditure (Irving and Kingdon, 2008). Therefore, this study combines both unconditional health expenditure model and Hurdle Specification (Triple Hurdle Model). The former involves the proportion of total household expenditure on health when household members are ill or not while the latter entails restricted health care expenditures which involve series of binary decision levels preceding the actual medical expenditure at both household and individual levels. The study estimated the Triple hurdle model using the Generalised Structural Equation Model (GSEM) which allows the estimation of likelihood-based models with multiple equations.

In sum, the submission that the extent of health care spending constitutes an essential policy instrument especially in cases where the interest is on how certain vulnerable sub-groups of the population are affected by varying levels of income, makes the research work of utmost significance.

CHAPTER TWO
LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 Theoretical Review

2.1.1 Health Capital theory

The accepted outline for health capital analysis can be obtained from the human-capital theory whose fundamentals were developed by the formative works of Becker (1964), Schultz (1961), Mincer (1974) and Ben-Porath (1967). Although this theory presents in a silhouette the effectiveness of education and on-the-job training on human capital development, it has failed to include the role of workers' health. For example, Becker (1964) notices that investments in human capital should decrease with age as the returns which can be obtained during involvement in active activities declines. However, this assertion does not hold with investments in health as people tend to spend more on their health as they advance in age even after withdrawal from active service when health is no longer relevant in generating incomes. This, and other distinctions between health and other forms of human capital as identified by Mushkin (1962), led to the development of the health-capital model by Grossman (1972a,b; 2000).

Health is treated as a form of human capital (health capital) and individuals derive both consumption (health provides utility) and production benefits (health increases earnings) from it. The demand for medical care is a derived demand: individuals demand "good health", not the consumption of medical care (Galama, 2011). According to Sydsaeter et al. (2005), the discrete optimal control can be employed to maximise individuals' life-time utility function given as:

$$\sum_{t=0}^{T-1} \frac{U(C_t, H_t)}{\prod_{k=1}^{t}(1+\beta_k)}, \qquad (1)$$

where individuals live for T (endogenous) periods, β_k is a subjective discount factor and individuals derive utility $U(C_t, H_t)$ from consumption C_t and from health H_t. Time t is measured from the time individuals begin employment. Utility increases with consumption $\partial U_t/\partial C_t > 0$ and with health $\partial U_t/\partial H_t > 0$.

The objective function (1) is maximized subject to the dynamic constraints:

$$\dot{H}_t = f(I_t) + d_t H_t, \qquad (2)$$

$$\dot{A}_t = \delta_t A_t + Y(H_t) - p_{X_t} X_t - p_{m_t} m_t, \qquad (3)$$

The total time budget $\boldsymbol{\Omega}_t$

$$\Omega_t = \tau_{w_t} + \tau_{I_t} + \tau_{C_t} + s(H_t), \qquad (4)$$

and initial and end conditions: H_0, H_T, A_0 and $A_T$are given. Individuals live for T periods and die at the end of period $T-1$. Length of life T (Grossman, 1972a, 1972b) is determined by a minimum health level $H_{\min}$. If health falls below this level $H_t \leq H_{min}$, an individual dies ($H_T = H_{\min}$). Health (equation 2) can be improved through investment in health $I_t$and deteriorates at thebiological aging rate d_t. The relation between the input, health investment I_t, and the output, health improvement $f(I_t)$, is governed by the health production function $f(\cdot)$. The health production function $f(\cdot)$ is assumed to obey the law of diminishing marginal returns in health investment. For simplicity of discussion, Galama (2011) used the following simple functional form:

$$f(I_t) = I_t^{\alpha}, \qquad (5)$$

where $0 < \alpha < 1$ (DRTS).

Assets A_t(equation 3) provide a return δ_t(the rate of return on capital), increase with income H_t) and decrease with purchases in the market of consumption goods and services $X_t$and medical goods and services $m_t$at prices $P_{Xt}$and Pm_t, respectively. Income $Y(H_t)$ is assumed to be increasing in health $H_t$as healthy individuals are more productive and earn higher wages (Currie and Madrian, 1999; Contoyannis and Rice, 2001).

Goods and services X_t purchased in the market and own time inputs $\tau_{C_t}$are used in the production of consumption C_t. Similarly medical goods and services $m_t$and own time inputs τ_{I_t} are used in the production of health investment I_t. The efficiencies of production are assumed to be a function of the consumer's stock of knowledge E (an individual's human capital exclusive of health capital [e.g., education]) as the more educated may be more efficient at investing in health (Grossman 2000):

$$I_t = I\left[m_t, \tau_t; E\right], \qquad (6)$$

$$C_t = C\left\lfloor X_t, \tau_{c_t}; E\right\rfloor \qquad (7)$$

The total time available in any period Ω_t (equation 4) is the sum of all possible uses τ_{W_t} (work), τ_{I_t}(health investment), τ_{C_t}(consumption) and $s(H_t)$ (sick time; a decreasing function of health). In this formulation one can interpret τ_{C_t}, the own-time input into consumption $C_t$as representing leisure.Income $Y(H_t)$ is taken to be a function of the wage rate $w_t$times the amount of time spentworking τ_{w_t},

$$Y(H_t) = w_t\left[\Omega_t - \tau_{\tau_t} - \tau_{c_t} - s(H_t)\right] \qquad (8)$$

Thus, the following optimal control problem arises: the objective function (1) is maximized with respect to the control functions X_t, τ_{C_t}, $m_t$and τ_{I_t} and subject to the constraints (2, 3 and 4).The Hamiltonian of this problem is:

$$\vartheta_t = \frac{U(C_t, H_t)}{\prod_{k=1}^{t}(1+\beta_k)} + q_t^H H_{t+1} + q_t^A A_{t+1}, \quad t = 0,\ldots T\text{-}1 \qquad (9)$$

where q_t^H is the adjoint variable associated with the dynamic equation (2) for the state variable health $H_t$and $q_t^A$is the adjoint variable associated with the dynamic equation (3) for the state variable assets A_t.

Equilibrium Conditions

Maximization of (9) with respect to the control functions $m_t$and τ_{I_t} leads to the first-order condition for health investment I_t

$$\frac{\pi_{I_t}}{\prod_{k=1}^{t}(1+\delta_k)} = -\sum_{i=1}^{t}\left[\frac{\partial U(C_i, H_i)/\partial H_i}{q_0^A \prod_{j=1}^{i}(1+\beta_j)} + \frac{\partial Y(H_i)/\partial H_i}{\prod_{j=1}^{i}(1+\delta_j)}\right]\frac{1}{\prod_{k=1}^{i}(1+d_k)} + \frac{\pi_{I_0}}{\prod_{k=1}^{t}(1-d_k)}, \qquad (10)$$

where π_{I_t} is the marginal cost of health investment I_t

$$\pi_{I_t} = \frac{P_{m_t} I_t^{1-\alpha}}{\alpha\left[\partial I_t/\partial m_t\right]} = \frac{w_t I_t^{1-\alpha}}{\alpha\left[\partial I_t/\partial \tau_{I_t}\right]} \qquad (11)$$

The first-order condition (10) determines the optimal solution for the control function health investment $I_t$while equation (11) shows the condition for minimizing the cost of producing a givenquantity of gross investment.As deduced from equation (11), total cost is minimized if the increase in total investment accrued from an additional dollar on health care expenditure equates the rise in total cost from an additional investment on time. Given that in the two endogenous inputs, the total investment production function is homogenous of degree one and that the level of expenditures on time and health care does not depend on the two inputs, it can be said that the average cost of total investment is fixed and matches that of marginal cost (Grossman,2000).

2.1.2 The Demand for Health care

The demand for health care considers an individual as demanding a commodity “health”. Hence, it lays much importance on the role of economic factors as determinants of health seeking behaviour (Grossman,1972b). According to Wagstaff (1986), this approach is built up around three concepts: Indifference map, health production function and the budget constraint.

2.1.2.1 The Indifference Map

Williams(1999) proposed the standard utility-maximizing framework which assumes that there are alternative uses for the resources available to an individual. These resources can be used to purchase different units of consumption goods *(c)* or health (h). Health represents the level of good health enjoyed while consumption goods denote the bundle of othergoods consumed by an individual. The utility function derived is thus represented as *u(c,h).*

Figure 3presents quantities of health care services plotted on the X-axis and quantities of other consumption activities on the Y-axis. Points on the curve represent different combinations of health care services and consumption. By implication, at point b, an individual has an improved welfare as he enjoys better health condition and consumes larger quantities of other goods than at point a. The shape of the indifference curve is downward sloping because health and consumption are equally essential to people and as such having good health does not preponderate over the consumption of other necessities. The consumer is therefore said to be indifferent to the different combinations of health and other consumption goods as each combination gives him the same level of satisfaction. Hence, the name "indifference curve”. Although an individual is said to be indifferent to the satisfaction derived from different points on the indifference curve, this assertion does not hold between the indifference curves. For example, as shown in Figure 4, since indifference curve 2 gives him a higher consumption at a fixed level of health, he will choose indifference curve 2 over indifference curve1. Therefore, a rational individual will strive to make consumption on the highest indifferent curve possible. However, an individual cannot determine the indifference curve that will give him the highest satisfaction until other economic indicators which equally determine the demand for health care services are considered.

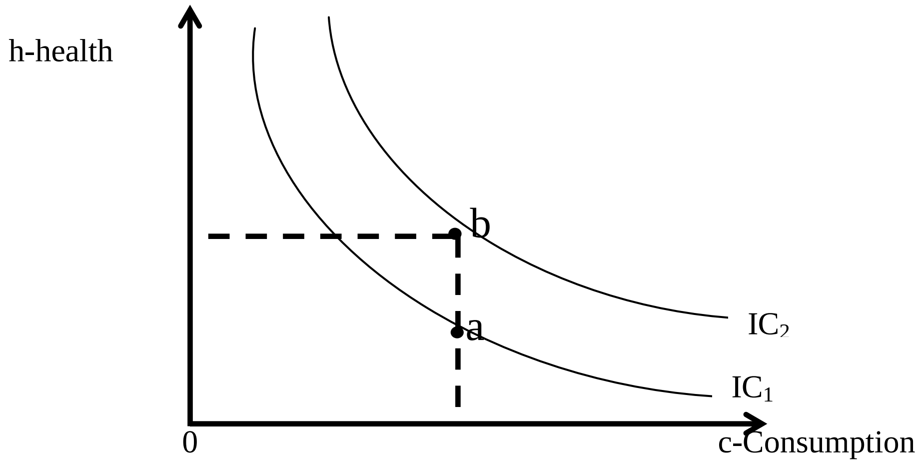

Fig 3: Indifference curves of preferences over health and other consumption goods

Source: Adapted from Wagstaff(1986)

2.1.2.2 The Budget Constraint

The budget constraint is based on the assumptions that health production and other consumption activities are financed from the incomes of individuals which are limited and that both health production and the consumption of other items are done at a cost. This indicates that an individual has a fixed level of income to finance their health and other consumption activities. Appleby (2013)further added to Wagstaff ‘s (1986) third concept on which the economic approach is based by showing that for a particular health status, θ, an individual with income *m* faces a budget constraint $c + \theta h \leq m$, with the assumption that the prices of consumption and medical care are both unity. The budget constraint is illustrated in Figures 6a and 6b.

Given that the price of other consumption activities is assumed to be fixed, an increase in price of health resources, for example when a person reports illness, increases θ and the budget line linked to the horizontal-axis swings inward (Figure 4a). As shown in the diagram, the budget line is seen to twirl around the X-axis. It should be noted that in this model, when a person reports being sick, the effect is taken as being equal to an increase in the price of health and not medical care. However, doubling the price of other consumption goods and health resources generates an equivalent inward shift in the budget line (Figure 4b). Finally, if there is a change in the individual’s income resulting from, say, unemployment, retirement, change of job, among others, it affects the budget constraint by shifting it outwards outrightly with no link with the horizontal as was obtained in Figure 6b .

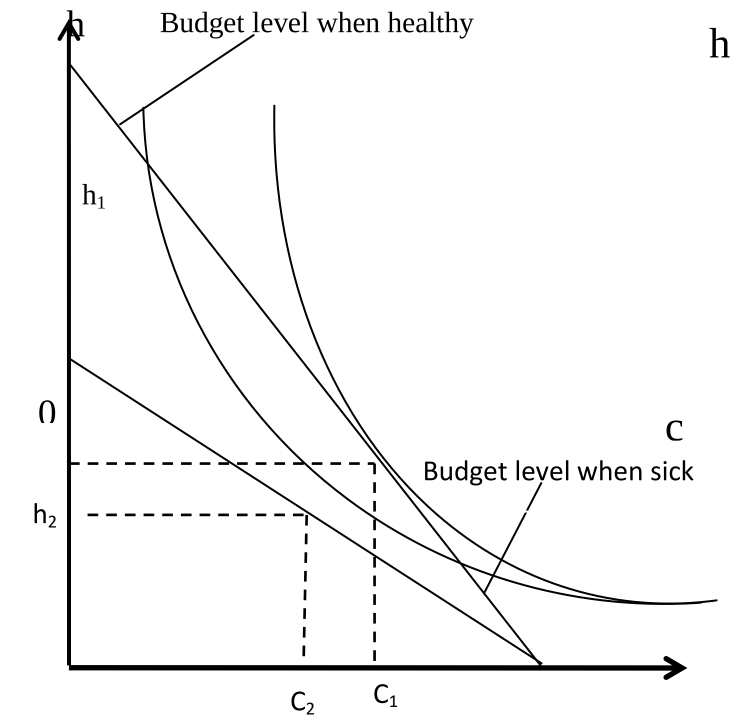

Fig 4a: Budget constraints and optimal consumption sets for different individuals with different health status

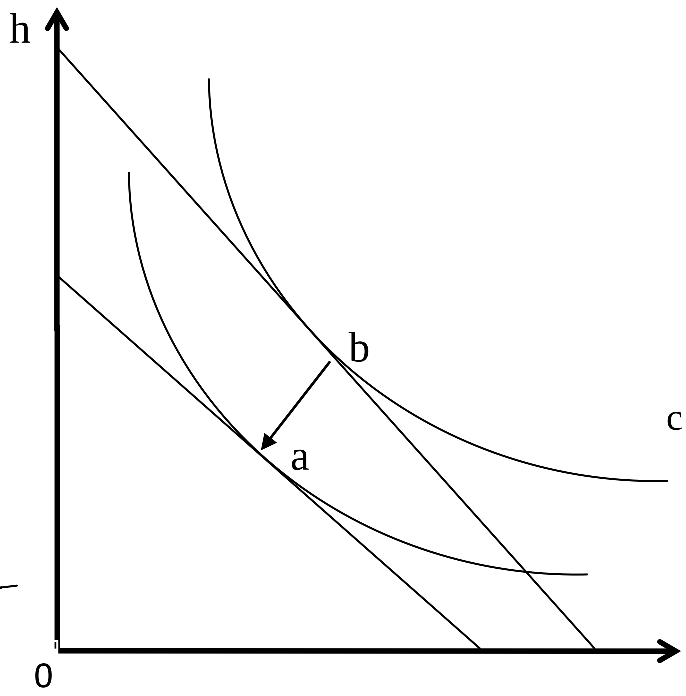

Fig 4b: Effect of consumption and health input prices on budget constraint

2.1.2.3 The Health Production Function

The second assumption, as revealed by Wagstaff (1986), assumes that individuals tend to regulate their health by controlling their environment, their utilization of health care services and other consumption activities affected by health. The health production function is considered to be appropriate for the clear and precise representation of this assumption. As used in the indifference curve illustration, this section focuses on the use of basket of health resources consisting of good diet, exercise, medical care, heating among other resources. The health production function serves as a connection between these resources and health considered here as the output. Figure 5 gives an illustration of the health production function and as shown, the consumption of more quantities of health resources produces more units of good health for an individual. Also, as depicted in Figure 5, successive consumptions of more units of health resources produce smaller additions to improved health. At this stage, the law of diminishing marginal product is said to be in full operation. The addition to output as a result of an extra unit of input is called marginal physical product.

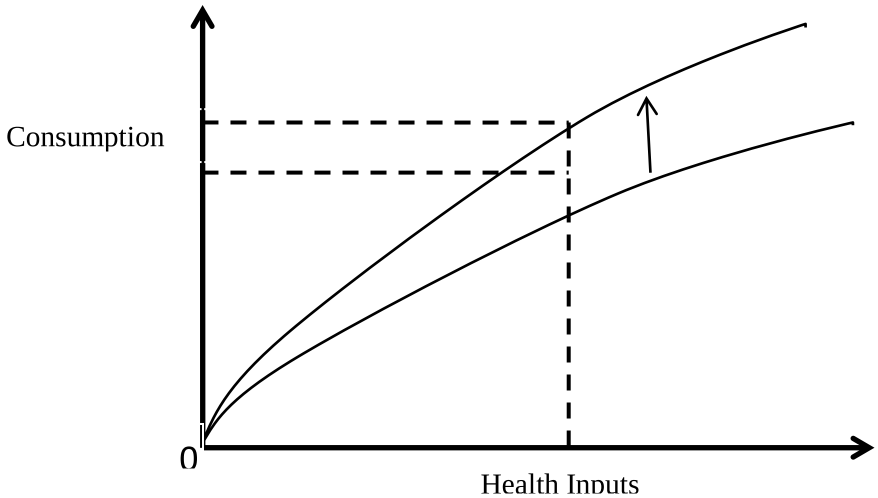

Fig 5: Health production function

Source: Adapted from Wagstaff (1986)

2.1.3 Health Behaviour Theories

A reconnaissance of literature revealed that no single theory fits all research activities or health promotion practices. Most studies focus on few models that describe health related behaviour of an individual or group of people. These are health behaviour model, social cognitive theory, the theory of reasoned action and planned behaviour theory and the protection motivation theory. These theories focus on cognitive variables as part of behaviour change, and share the assumption that attitudes, beliefs and expectations of future events and outcomes, are major determinants of health related behaviour (Stroebe 2000; Gebhardt and Maes, 2001; and Munro *et al, 2007.*). In most cases, they are condemnedon the basis of their parochial view on outcome behaviour of interest (e.g. alcohol consumption) and its exemption of factors (socioeconomic characteristics, sex and race) believed to have great effect on health seeking behaviour (Lakhan,2006). However, the model dynamics in explaining certain types of behaviour cannot be ruled out.

2.1.3.1 Health Belief Model (HBM)

The HBM views health behaviour change as based on a rational appraisal of the balance between the barriers to and benefits of action (Blackwell, 1992). The HBM submits that an individual's perception of his vulnerability to a sickness or other health related issues and his views on advantages of taking steps to prevent it determines their willingness to take a decisive step (Champion and Skinner, 2008; Glanz and Rimer, 1995; and Rosenstock, 1974). The model has five main constructs: perceived susceptibility and perceived severity, perceived benefits and perceived barriers and cues to action (Sutton, 2001). The first two constructs relate to an individual's perception of contracting a disease and the gravity of the disease if contracted while the next two constructs refer to the actions taken to reduce the negative consequence of the disease. Cue to action are events that triggers an individual to act when a disease threat is perceived (Lakhan, 2006). The HBM has been applied most often for health concerns that are prevention-related and asymptomatic, such as early cancer detection and hypertension screening, where beliefs are as important or more important than overt symptoms. However, the model has been criticized on the grounds of only applicable in forecasting straightforward, one-time or restrictedhealth behaviours (e.g. immunization) rather than routineactions (Lakhan, 2006).

2.1.3.2 Social Cognitive Theory

Social coginitve theory (SCT), which evolved from the social learning theory, explains human behaviour in terms of a three-way, dynamic, joint model which constantly shows the interaction between human behaviour, environmental impacts and personal factors (McAlister et al., 2008). According to Munro (2007), the social cognitive theory explains that an observation of an individual affects his or her behaviour through two modes of modelling: Direct modeling involves learning certain behaviours (i.e mediated learning) by observing from other people in one's social circle while symbolic learning explains how people tend to pattern their behaviour in a manner similar to that of a prominent personality usually depicted in the media. In clearer terms, it can be said that individuals do not just learn from their own actions or experiences but also from the action of others.

The major aspects of SCT which are related to health behaviour change strategies are self-efficacy, observational learning, self -control and reinforcement (Will et al., 2004). Self-efficacy theory (SET) is a subset of Bandura's (1986) social cognitive theory and according to this approach, the two key determinants of behaviour are perceived self-efficacy and outcome expectancies. Self-efficacy is a person's firm resolve to take action or make a particular decision without yielding to whatever obstacles or challenges that might result from the action or decision (Bandura, 1997) while outcome expectancies refer to the conceived advantages and shortcomings of taking a given action.In other words, the theory suggests that behaviours are learned and executed if people observe there are few challenges, perceive that they can influence the outcome and are fully capable of carrying out the behaviour (Armitage and Conner, 2000). Due to its wide-ranging focus, this theory is difficult to operationalize and is often used only in part (Stone, 1999), thus raising questions regarding its applicability to intervention development.

2.1.3.3 The Theory of Reasoned Action and Planned Behaviour Theory

Lakhan (2006) conceives that the theory of reasoned (TRA) action recognizes the fact that individuals are rational and also underlines the importance of an individual's firm resolve to prompt behaviours which are influenced by three concepts- attitudes, subjective norms and perceived behavioural control. Attitude is an individual's positive or negative feelings about engaging in a given behaviour while subjective norms are standards or influences established by the individual's larger context, for instance, familial beliefs, media conceptions, and societal models. The TRA was however modified to embraceperceived behavioural control due to external influence on behaviours and the effect an individual’s earlier behaviour has on the present behaviours (Stroebe, 2000).

Perceived Behavioural Control refers tothe degree to which the individual could perform abehaviour. According to Sutton (2001), perceived behavioural control may also have a direct predictive effect on behaviour, through two different mechanisms: First, given that intention is constant, the level of perceived behavioural control plays a central role in determining the degree to which an individual can endure. Second, there is a possibility that people can conceive in quantitative terms the amount of influence they have over their behaviour. Explicitly, these theories are largely dependent on rational processes (Mullen et al.,1987) but are limited to discrete sample populations and does not includerecords of previous behaviours or consider a situation where positive intentions are not sufficient to carry out an individual’s behaviour (e.g. cues of action) (Lakhan,2006).

2.1.3.4 Protection motivation theory

Protection motivation (PM) theory is concerned with how people perceive threats and how they devise coping strategies to handle the dangers that results from such threats(Tunner, 1989). The theory is based on the assumption that health threats that instil fear in people can bring about drastic change in health related behaviours. It explains how an individual makes decision on health when faced with a life threatening illness. For example how will a person with high risk of diabetes respond to an advice to reduce sugar intake? The theory postulates three components of fear arousal: the gravity of the danger associated with a portrayed event; the likelihood of that event happening; and the potency of protective strategy (Rodgers, 1975). Therefore, an individual is better stirred to protect himself or herself (i.e. a stronger will to accept the suggested action) to a level where the individual is certain that the threat is probable if he or she persists in the present course of action, that the threat will have dire consequences if it occurs, that the suggested action is potent in decreasing the probability or sternness of the threat, and that the individual can execute the suggested action (Sutton, 2001).

However, this theory has been criticised on the ground of not considering cognitive and environmental factors such as the effect of social values and norms. As a result, the health belief model is considered more superior to the protection motivation theory (Shaw, 2012). However, in recent times, the theory assumes that the decision of an individual to protect himself or herself from danger is a linear function of factors like: the severity of the threat, individual's vulnerability, ability to execute the coping strategies (self-efficacy) and the effectiveness of the coping strategy (strategy efficacy) (Stroebe, 2000).

From the review of the health behaviour theories, social cognitive theory and protection motivation theory were found to be more relevant to the study. The protection motivation theory provides a guide to the study viz-a-viz the factors influencing decision making by the households on health related behaviour- i.e the decisions to report sick, consult a doctor and incur treatment costs. Also, interaction through observing others in their social network, a model in Social Cognitive Theory, was conceptualized in the study using rural households' participation in entrepreneurial training.

2.1.4 Feminist Theories

Renzetti (2009) defined feminist theories as a set of interlinked theories which have in common a number of principles and ideas. According to her, feminist theories assert that gender related issues are the focal point of social life which encompasses oppression, criminal offending, and criminal fairness procedures and that as a result of patriarchal sexism which attaches more importance to men and maleness than women and femininity, girls and women are stealthily and systematically exempted or side-lined in criminology both as a profession and as an area of study.Quite a number of approaches to the feminist ideology have emerged in recent times, and the common ones are the radical feminism, postmodern approach and the materialist feminism.

2.1.4.1 Radical Feminism

Radical feminism is a viewpoint which accentuates the patriarchy as the root cause of inequality between women and men, or more precisely, socially conditioned beliefs of male superiority over female (Lewis, 2017). Radical feminism is **a**imed at reshaping society and restructuring its institutions, which is inherently patriarchal (Brunell and Burkett, 2009). Radical feminists' beliefs are coined from the understanding that male dominance over women originates from the institutional structures and social values which are based on patriarchy and male sovereignty (Matuska, 2016). They therefore confront existing gender norms and related institutions to dismantle patriarchy.In a bid supress male ascendency, efforts were made to depose traditional and hierarchical power interactions and they also attempted to create antiauthoritarian and non-hierarchical strategies to organizational structures and politics (Brunnel and Burkett, 2009**).**

Sarpong (2015) revealed that based on the type of views held, radical feminists are divided into two groups: radical-libertarian feminism and radical-cultural feminism. Radical-libertarian feminists believe that femaleness and involvement in reproductive labour restrict women's ability to contribute significantly to their households and the society at large and they therefore posit that women should have absolute control over their bodies are being used and these include the use of contraceptives and other birth control methods, simulated techniques of reproduction and abortions. Radical-cultural feminism on the other hand involves the belief that women should encompass their femininity because it is better than masculinity as sex which is male dominated is a form of female subordination. The position of the radical feminists have been criticized for putting too much emphasis on reproduction and sexuality as it gives the impression that women are subordinated mainly because of their role of giving birth to children (Makama,2013). Jackson (1999) pointed out that capitulating to such blatant biological determination is questionable.

2.1.4.2 Material Feminism

Material feminists argue that women subordination and oppression are rooted in capitalism and patriarchy. Materialist Feminism is basically a theoretical structure for understanding group, feminist awareness, economic power, government/state power, division of labour, national identity, gender identity, sexual identity and racial identity (MacNevin, 2007). Materialist feminism is concerned specifically with socially learned constructs which restricts women's roles to reproduction, care and maintenance of the households thereby bringing to the fore a need to analyse gender issues which promote women's marginalization (Hennessy and Ingraham, 1997).The issue raised by this group is that women are under-represented in high paying jobs and spend an appreciable fraction of their time on unpaid reproductive activities, an act considered not to be part of capitalist relations of production (Makama, 2013).

Benston (1969) argued that women's reproductive labour are not incorporated into capitalist system and hence their secondary status in the society should first be attributed to economic factors before psychological or personal factors can be considered. The author believes that classifying housework as a productive labour is an important requirement in suppressing private production systems and service economy which reinforce capitalism. Materialist Feminism has however being criticized for not considering cultural politics as non-materialist (Hennessy and Ingraham, 1997). In which case, the approach to feminism gives hypotheticalimportance to women’s reproductive labour over women's leisurelinesswhere women’s productive tendencies are considered to be more important than their consumption activities.

2.1.4.3 Postmodern feminism

Postmodern feminismis a school of thought that integrates post-structuralist and postmodern theory in which case it extends its coverage beyond the modernist divergences of radical and liberal feminism(Appignanesi and Garrat,1995). It is considered as the most recent arm of feminism with a sole aim of promoting equality for all. It tries to correct the opinion that feminism only seeks to impose female domination in the society whereas it only campaigns for gender equality. The overall view of the postmodern feminists essentially generalizes that the problem experienced in the world today affect not just the women but everyone in the society(Ashba,2008).

The approach’s major departure from other approaches of feminist theory is based on the submission that sex, or gender as the case may be, originates from language differences (Butler,1990)- what is conventionally considered as 'feminine' is basically a replication of what is regarded as masculine (Gutting, 2002). This discourse does not necessarily condone the slide back to a patriarchal dominated society again, but that the stanch contribute to the negative views of women by over-stepping their bounds from their stances with general societal issues (Ashba, 2008). The postmodernist theorists have been criticized on the grounds of failing to recognize the central role played by the social aspect of power relations as a major factor in the reasons why women are oppressed and also neglecting the equally important role of class, gender and race (Walby,1992).

2.2 Methodological Review

Health sector variables are often non zero and fully observed. For example, they can be discrete (e.g., death), censored (e.g., medical care payment), integer counts (e.g., frequency of visits to the physician), or durational (e.g., time to death or recovery) (World Bank, 2003).

Nonlinear estimation are therefore needed for multivariate analysis of dependent variables such specified, although linear regression can be used in cases where we have a discrete dependent variable. Hence, this section lays more emphasis on the main parametric non- linear models for medical and health expenditure. However, linear regression models are described briefly below.

2.2.1 Linear regression models

Linear regression model, also called one-part model, can be estimated using available data for people regardless of whether they seek medical services or not. Following the realization that data on health care expenditures are more often than not characterized by a large cluster at zero, i.e non-normal, highly skewed, heterosedastic and with variance that increases with the mean (Oyinpreye and Karimo, 2014; Diehr et. al, 1999), the dependent variable is often transformed to logarithm or square root before estimation. According to Jones (2010), the regression model is specified on the “natural” cost scale, measured directly as costs in naira, dollars, pounds, etc., and no prior transformation is required. The effect of the response cost variable is a linear function of the regressors (Hutcheson, 2011):

$$y_i = x_i^T \beta + \varepsilon_i, \qquad (12)$$

where β is a p×1 vector of unknown parameters; ε_i's are unobserved scalar random variables (errors) which account for the discrepancy between the actually observed responses y_i and the "predicted outcomes" $x_i^T \beta$; and $^{\mathbf{T}}$ denotes matrix transpose, so that $\mathbf{x}^{\mathbf{T}}\boldsymbol{\beta}$ is the dot product between the vectors x and β. The model can be estimated by ordinary least squares (OLS) and predictions of the conditional mean of costs are as follows:

$$\hat{\mu}(x_i) = x_i^T \hat{\beta} \qquad (13)$$

Using individual level data on health care costs , Jones (2010) established that there will be a high degree of hetroscedasticity in the error term as indicated by relevant diagnostic tests (Breusch-Pagan, 1979; Godfrey, 1978; Koenker, 1981; White, 1980). Hence, the need for the transformation of health costs using logarithm or square root.

Merits of Linear Regression Models

i. Linear regression models showing the level of costs provide the right platform to structure health care costs.

ii. It is common and its estimation is direct.

Limitation of Linear Regression Models

Due to excess kurtosis and high degree of skewness, linear regression performs poorly when used for the estimation of health care costs (Jones, 2010). This is as a result of a large convergence at zero characteristic of health care expenditure data which results in a right clustering of the remaining observations.This situation results when factors which are correlated to a person's view on his or her health status and medical care spending are unobserved thereby producing coefficients that are bias in the health care expenditure model (Rous and Hotchkiss, 2003).

2.1.1.1 Log Transformation

Logarithmic transformation of OLS models helps in reducing skewness and non-normality, characteristic of health cost data, by making data more evenly distributed and closer to normality. However, in a situation where the data set being used is large, OLS regression of the unchanged data which contains the large cluster of zeros will produce estimates of the regression parameters which are unbiased (Diehr et al, 1999). This claim is further substantiated by Ellis and Ash (1996) both of whom opines that non-normality and skewness might not constitute serious problems in situations where the data set is large and as a resultincreasing the value of the standard errors of the parameter coefficients, which may be minimal with very significant hypothesis tests, would have small effect on the inferences that can be drawn as significant effects are generally very strong.

The procedural steps in the log square root transformation of the OLS model as explicated by Jones (2010) takes the form:

$$\ln(y_i) = x_i^T \beta + \varepsilon_i, \qquad (14)$$

The error term is assumed to have the standard properties:

$$E(\varepsilon) = 0 \quad E(x'\varepsilon) = 0 \qquad (15)$$

Basu et al (2006) shows that interest lies in predicting costs on the original scale given *E(ln(y)) ≠(E(y))*andthisrelies on retransforming to give:

$$y_i = \exp(x_i^T \beta + \varepsilon_i) = \exp(x_i' \beta)\exp(\varepsilon_i) \qquad (16)$$

Then

$$E(y_i / x_i) = \exp(x_i^T \beta) E(\exp(\varepsilon_i) / x_i) \qquad (17)$$

If the error term is normally distributed, with variance σ_{ε}^{2} , then it is possible toestimate the conditional mean for the log-normal distribution using the OLS estimates of β and σ:

$$\hat{\mu}(x_i) = \exp(x_i^T \beta + 0.5\hat{\sigma}_{\varepsilon}^2) \qquad (18)$$

If the error term is not normally distributed, but is homoskedastic, then the estimatebased on log-normality will be bias. This can however be solved by employing the Duan (1983) smearing estimator. In this case the conditional mean is estimated using:

$$\hat{\mu}(x_i) = \hat{\varphi} \times \exp(x_i^T \beta) \qquad (19)$$

where $\hat{\varphi}$ is the estimated smearing factor:

$$\hat{\varphi} = (n-k-1)^{-1} \sum \exp(\hat{\varepsilon}_i),\ \hat{\varepsilon}_i = \ln y_i - x_i' \hat{\beta} \qquad (20)$$

where n is the sample size and k is the number of parameters in the regression.Typically this smearing factor lies between 1.5 and 4.0 in empirical applications withhealth care costs, illustrating the fact that ignoring the retransformation can lead tosubstantial underestimation of the OLS.

2.2.1.2 Square root transformation

Square-root transformations of OLS have been favoured over log transformations in someapplications. The square root model outlined in Partha et. al (2013) is as follows:

Assume that $\sqrt{y}$ is linear in β and additive in ε

$$\sqrt{y_i} = x_i^T \hat{\beta} + \varepsilon_i \qquad (21)$$

With $E(\varepsilon) = 0\ and\ E(x'\varepsilon) = 0$. Then,

$$E(\hat{\beta}_{OLS}) = \beta \qquad (22)$$

Thus, OLS or least squares becomes unbiased on square root

In addition, Jones (2010) reveals that the smearing estimator can be adapted to the square root transformation to giveestimates of the conditional mean:

$$\hat{\mu}(x_i) = \hat{\varphi} \times \exp(x_i' \hat{\beta}) \qquad (23)$$

The smearing factor, assuming homoskedastic errors, is:

$$\hat{\varphi} = N^{-1}\sum_{i}\hat{\varepsilon}_{i}^{2} \tag{24}$$

In the heteroskedastic case, predictions take the form:

$$\hat{\mu}(x_i) = \rho(x_i) \times (x_i^{'}\hat{\beta})^2 \tag{25}$$

Here the smearing factor can be estimated by running a regression of the squaredresiduals on functions of *x*, such as the fitted values of the linear index.

Merits of OLS Transformation

i. It reduces skewness thereby making the distribution more symmetric and closer to normality
ii. It reduces robustness problem by focusing on symmetry.
iii. Heteroscedasticity may be reduced but not eliminated.

Demerits

i. Interpreting the parameter estimates of the square root equation is difficult and the transformations produce bias estimates in situations where reporting results on the original dollar measure is required.
ii. Log transformation requires subjectivesupplementarytransformations in cases where there are zero observations or where two-part specifications are needed to handle the zeros.
iii. The fact that the OLS regression estimates provide on the log scale the forecasted cost makes it less attractive as analysts prefer results to be offered in terms of real costs.
iv. The log scale transformation poses serious threat as the result obtained may be an ambiguous, partial and biased estimate of the unchanged scale which happens to be the scale of utmost concern (Manning, 1998).

2.2.2 Nonlinear Regression Models

As earlier mentioned, most variables in health analysis are seldom continuous and fully observed. Hence, most multivariate analysis of such dependent variables is implemented using nonlinear estimation. In this section, nonlinear models that can be applied to binary, limited and count dependent variables are expounded.

2.2.2.1 Binary Dependent Variables

In health analysis, there are numerous variables that can only assume two values- visits a physician/ doesn't visit a physician, purchase drugs/ do not purchase drugs, in-patient/out-patient, pays in kind/pays in cash and so on. A detailed representation of a binary dependent variable, as outlined in World Bank (2003), is illustrated below.

Let y_i be the characteristic of interest and two categories are to be considered- ill/not ill. Conventionally, y_i= 1 indicates that observation i possesses the characteristic, for example, illness, and y_i= 0 indicates that it does not. In general, a model of binary response can be defined by the following:

$$E\lfloor y_i / X_i \rfloor = \Pr(y_i = 1 / X_i = F(X_i'\beta) \qquad (26)$$

Where E[ ]and Pr ( ) indicate expected value and probability, respectively. Different functional forms for F( ) define different specific models. For example, in the linear case, $F(X_i \beta) = (X_i \beta)$, we have the linear probability model (LPM). However, the problem that arises with the use of the LPM is that the probability model for the binary response is not constrained to the (0, 1) range which is only possible range with the LPM. A common solution to this problem is the use of the two most popular models- the probit model and the Logit model.

Probit Model

Winkelmann (2011), used bivariate probit model to estimate the effect of an endogenous binary regressor (the treatment) on a binary health outcome. Although the study modified the model by introducing an alternative general class of structural probit models called copula bivarate probit model (CBP), it still maintained the probit assumption of constant treatment effect,the presence of exclusion restriction, and the absence of simultaneity. As shown by Winkelmann (2011), the structural model consists of two latent equations. The first equation describes the health outcome variable (y_1) as a function of a binary treatment (y_2) and latent error ε_1, whereas the second equation determines whether or not treatment is received.

$$y_1^* = x\beta + \alpha y_2 + \varepsilon_1 (27)$$

$$y_2^* = z\gamma + \varepsilon_2 \qquad (28)$$

where the stochastic errors that are independent of x and z but not necessarily independent of each other. Moreover, the observed binary outcomes are

$$y_1 = 1(y_1^* > 0). \qquad y_2 = 1(y_2^* > 0)$$

where 1(·) is the indicator function. The main interest is in the structural treatment parameter α or the average treatment effect $E_x[P(\varepsilon_1 - x\beta - \alpha) - P(\varepsilon_1 > -x\beta]$. The joint distribution of y_1 and y_2 (conditional on x and z) has four elements:

$$P(y_1 = 0, y_2 = 0|x, z) = P(\varepsilon_1 \leq -x\beta, \varepsilon_2 \leq -z\gamma) \quad (29)$$

$$P(y_1 = 0, y_2 = 0|x, z) = P(\varepsilon_1 > -x\beta, \varepsilon_2 \leq -z\gamma) \quad (30)$$

$$P(y_1 = 0, y_2 = 0|x, z) = P(\varepsilon_1 \leq -x\beta, \varepsilon_2 > -z\gamma) \quad (31)$$

$$P(y_1 = 0, y_2 = 0|x, z) = P(\varepsilon_1 > -x\beta, \varepsilon_2 > -z\gamma) \quad (32)$$

The distribution is fully determined once the joint distribution of ε_1 and ε_2 is known. In the bivariate probit model, it is assumed that ε_1 and ε_2 have joint distribution function $F(\varepsilon_1,\varepsilon_2) = \Phi_2(\varepsilon_1, \varepsilon_2, \rho)$, where $\Phi_2$denotes the cumulative density function of the bivariate standard normal distribution, and ρ is the coefficient of correlation. In this case, the joint probability function f (y_1, y_2|x, z) can be written compactly as

$$f(y_1 y_2|x, z) = \Phi_2[s_1(x\beta + \alpha y_2), s_2(z\gamma), s_1 s_2 \rho] \quad (33)$$

Where s_j=2y_j-1, j=1, 2.

The joint probabilities of the copula bivariate probit model depend on the selected copula as well as on four parameters,$\xi = (\beta, \gamma, \alpha, \theta)$, where θ is the dependence parameter of the copula function.

Merits of CBP

i. It offers a relatively simple and parsimonious compromise between the standard bivariate probit model and other semiparametric alternatives.
ii. It works well in practice and provide a viable and simple alternative to the standard bivariate probit approach.

Limitation of CBP

i. The practical implementation may be very difficult and it does not control for sample selection bias.

Logit Model

The use of Logit model in health care analysis has been employed by a number of studies (Riman and Akpan, 2012; Sekyi and Domanban 2012; and World Bank, 2003). The Logit model is often desired because y^* may be defined to be an unobserved latent variable, which represents the propensity that an event will occur or not. For example, World Bank (2003) assumed the latent variable y^* indicate propensity to contract illness and when this crosses some threshold, say $y^* > 0$, the individual is ill. The structural model specifyingthe latent variable as a linear function of observable and unobservable factors as adopted from Burkey and Harris (2003) is given as

$$y_i^* = x_i\ \beta + \varepsilon \qquad (34)$$

and is linked to the observed dependent variable y by the measurement equation:

$$y_i = \begin{cases} 1 & if \quad y_i^* > \tau \\ 0 & if \quad y_i^* \le \tau \end{cases} \qquad (35)$$

where τ is the threshold value.

Letting P_i and $1-P_i$ be the probabilities that the dependent variable (for example the probability of being sick) equals 1 and 0, respectively. The probability of observing y_i may be expressed as:

$$P(y_i|x_i) = P_i^{y_i}(1-P_i)^{1-y_i} \qquad (36)$$

The probability of observing all n values for the probability of being sick (y), given the values of the explanatory variables X_{ik}, is the product:

$$L = \Pi\left(\frac{e^{\hat{b}_o + \Sigma \hat{b}_k X_{ki}}}{1+e^{\hat{b}_o + \Sigma \hat{b}_k X_{ki}}}\right)^{y_i}\left(\frac{1}{1+e^{\hat{b}_o + \Sigma \hat{b}_k X_{ki}}}\right)^{1-y_i} \qquad (37)$$

The log-likelihood function is therefore:

$$\ln L = \sum y_i \ln\left(\frac{e^{\hat{b}_o + \Sigma \hat{b}_k X_{ki}}}{1+e^{\hat{b}_o + \Sigma \hat{b}_k X_{ki}}}\right) + (1-y_i)\ln\left(\frac{1}{1+e^{\hat{b}_o + \Sigma \hat{b}_k X_{ki}}}\right)^{i} \qquad (38)$$

The GAUSS program can be used in the maximization of the log-likelihood function which employs the Berndt, Hall, Hall and Hausman (1974) (BHHH) estimator in a Newton-Raphson optimization and includes a derivation of the marginal effects.

Merits of Logit Model

i. It provides a functional form that constrains estimated probabilities to lie in (0,1) range which is a problem encountered with the use of OLS to estimate linear probability model.
ii. The Logit analysis is simple to analyse and provides results which can be easily interpreted.

Demerits of Logit Model

i. Parameters obtained with the Logit model are only estimable up to a scaling factor, equal to the unknown. Hence, only the relative, not the absolute, effect of explanatory variables are estimable.
ii. As in case of LPM, the disturbance term in Logit model is heteroscedastic, though it can be partially fixed with the use weighted least squares.

2.2.2.2 Count Dependent Variables

Many of the variables of interest in the health sector assume positive counts of events (Nonlinear) (World Bank, 2003). For example, frequency of visits to health centre, number of days ill, amount spent on drugs, and so on. Often, as with most health count variables, negative values are not possible. Oyinpreye and Karimo (2014) revealed that in developing countries, people generally seek medical attention and therefore spend on their health when they perceive they are sick. By implication, people who report sick but seek no medical attention and those who do not experience any illness during the time period of interest spends zero and even those that spend on health expend varying amount. As a result, such data tend to have a large cluster of zeros, often skewed with a rather long right hand tail. The characteristic nature of the resulting dependent variable and the outline of its distribution requires the use of certain estimators (World Bank, 2003). For instance, the use of least squares estimation would not give an assurance that the estimated values are not negative. This therefore necessitates the assumption of a Poisson distribution to explain the recording of a particular count of outcomes over a given interval.

Poisson Model

Poisson model is basically the model employed for handling integer value count data. The model alongside its other modifications (e.g negative binomial model)are usually employed in health studies to structure the frequency of visits made to a doctor and the model can also be extended to analyse continuous measures of medical care costs (Jones, 2000). In the Poisson model the dependent variable y_i is assumed to follow a Poisson distribution, with mean μ_i, defined as a function of the covariates x_i. Thus, the model as shown by Jones (2010) is defined by the distribution:

$$P(y_i) = \frac{e^{\mu_i} \mu_i^{y_i}}{y_i^!} \qquad (39)$$

Where the conditional mean μ_i is specified by:

$$\mu_i = E\langle y_i | x_i \rangle = \exp(x_i' \beta) \tag{40}$$

A peculiarity of the Poisson distribution is that its mean and its variance are both equal to its one parameter, μ_i. This is often restrictive.

In health applications, for example, the conditional variance is usually greater than the conditional mean leading to a condition known as overdispersion (World Bank, 2003). The dispersion, which is the difference between the variance and mean can be stated as a proportion of the mean (Neg Bin I) or as quadratic function of the mean (NegBin II) (Cameron and Trivedi 1986). In order to generalize the model, the difference between the variance and the mean can be allowed to differ across the entries with a group of explanatory variables.

Limitations of Poisson Model

i. The Poisson model may not predict accurately the observations with zero counts due to overdispersion. Resultantly, the mean of the zero count is less than its conditional variance.

ii. Apart from overdispersion, zero values can be produced from a certain process which may be different from that producing other observations of the count variable.

2.2.2.3 Limited Dependent Variable

A limited dependent variable is mainly continuous over its distribution but has a large cluster of entries at one or more exact values, for example there could be a mass of values at zero (World Bank, 2003). A common example in health analysis is out-of-pocket spending on health services by the households, which can be zero for many individuals if the survey period covers, say, 12months. Limited variables can be modeled using a number of statistical techniques such as the Tobit model, two-part model, hurdle model, sample selection model and the finite mixture models. However, this study is limited to common approaches for measuring health expenditures.

Tobit Model

Censored normal regression model or the Tobit model is used when we have incompletely observed data (Wooldridge, 2002). These data can either be Truncated or censored. In health analysis, the Tobit model comes in handy as medical expenditures may be zero for some individuals in the sample over a survey reference period. The Tobit model assumes a single decision lie behind the medical expenditures. World Bank (2003) reveals that an individual selects the level of health care expenditure that maximizes his or her wellbeing. When health expenditures are positive, they translates to desired expenditures while a corner solution results when there is zero payment on health, in which case choices are made not to spend nothing at all on health when individuals are faced with low level of income. The model can be described using the concept of a latent, desired level of expenditure (Wooldridge, 2002):

$$y_i^* = X_i \beta + \varepsilon_i, \; \varepsilon_i \sim \mathrm{IN}(0, \sigma^2). \qquad (41)$$

The observed *y* is defined by the following measurement equation

$$y_i^* = \begin{cases} y^*, x > \tau \\ \tau y, x \le \tau \end{cases} \qquad (42)$$

In Tobit model, it is assumed that the censoring point, $\tau = 0$ i.e. the data are censored at 0. Therefore, $y_i^* = \begin{cases} y^*, x > 0 \\ y, x \le 0 \end{cases}$ (43)

The assumption of a single decision making assumed in the Tobit model implies that both the doctor and the patient influence the decision made on the cost of given treatment as the patient is aware of the cost of alternative courses of treatment (World Bank, 2003). This therefore eliminates the likelihood of sole decision to seek medical services by an individual.

The likelihood function for the censored normal distribution as shown by (Wooldridge, 2002) is:

$$L = \Pi_i^N \left[\frac{1}{\sigma} \phi \left(\frac{y - \mu}{\sigma} \right) \right] di \left[1 - \varphi \left(\frac{\mu - \tau}{\sigma} \right) \right] 1 - di \qquad (44)$$

where τ is the censoring point. In the traditional Tobit model, τ is set at 0 and μ is parameterized as $X i \beta$ where φ ( ) and Φ( ) are the standard normal probability density and cumulative density functions,respectively. This overall likelihood function for the Tobit model is:

$$\ln L = \sum_i^N \left\{ di(-\ln \sigma + \ln \phi \left(\frac{y_i - X_i \beta}{\sigma} \right) + (1 - di) \ln \left(1 - \varphi \left(\frac{X_i \beta}{\sigma} \right) \right) \right\} \qquad (45)$$

The above equation is made up of two parts. The first part corresponds to the classical regression for the uncensored observations, while the second part corresponds to the relevant probabilities that an observation is censored.

Merit of Tobit Model

The Tobit model helps in eliminating bias from estimates resulting from analysing health care expenditure data which are censored at zero.

Restraint of Tobit Model

It presupposes that a single mechanism drives both the choice of incurring medical cost and the choice of how much to spend conditional on having treatment costs.

Sample Selection Model

According to Heckman (1978, 1979), a sample selection is made up of two equations: the regression equation and the selection equation. The regression equation focuses on the methods for identifying the outcome variable while the selection equation studies the observed components of the sample and procedures for establishing the selection process. In the context of health analysis, these two equations can represent the willingness to seek medical treatment and the decision on the exact amount to spend which is believed to be determined by different but correlated observable and unobservable variables. Depending on whether the error terms from the two equations are jointly and normally distributed, estimation of the sample selection model is done either by Maximum likelihood or Heckman two-step technique (World Bank, 2003). Based on the Heckman selection model, which assumes that there is an association between medical care spending and its covariates, the model is specified as follow (Oyinpreye and Karimo, 2014):

$$y_{ji}^{*} = X_{ji}\beta_j + \varepsilon_{ji}, \qquad j = 1,2 \qquad (46)$$

$$y_i^{*} = \begin{cases} y_{21}^{*}, if\ y_{1i}^{*} > 0 \\ 0 \quad otherwise \end{cases} \qquad (47)$$

Where: y_{ji}^{*} is health care expenditure of the jth household; X_{ji} is health expenditure covariates and ε_{ji} is the error term. Heckman selection Model involves estimating a probit for the probability of nonzero expenditure, using the results to estimate the inverse Mill's ratio

(IMR), $\lambda_i = \frac{\phi\left(x_i\beta/_\sigma\right)}{\Phi\left(x_i\beta/_\sigma\right)}$, and then running OLS on the non-zeros with the estimated IMR included to correct for selection bias (World Bank, 2003). In other words, estimation in the second stage is as shown below:

$$y_i = X_{2i}\beta + \rho\sigma_2 \frac{\phi\left(X_{1i}\hat{\beta}_1\right)}{\Phi\left(X_{1i}\hat{\beta}_1\right)} + e_{2i} \qquad (48)$$

where ρ is the correlation coefficient of the errors; σ_2 is the standard deviation of ε_{2i}(σ_z= 1).

Merits of the Sample Selection Model

i. Estimates obtained from Heckman selection model have been shown to be asymptotically efficient and consistent for all the parameter estimates.
ii. It helps in controlling for sample selection bias.

Limitation of the Sample Selection Model

Although the sample selection model, in an informal sense, is more general, it comes at the cost of making greater demands on the data with respect to identification.

Hurdle Model

Since the Tobit model presupposes that a single mechanism drives both the choice of incurring treatment cost and the choice of how much to spend conditional on having incurred medical treatment cost, which is a strong restriction to impose, an alternative is to use a hurdle model, which essentially separates out these two decisions. It should however be noted that in the case of health care analysis, quite a number of decision phases precedes the determination of the level of medical expenditure (Irving and Kingdon, 2008). The hurdle approach as outlined in Wooldridge (2002) and extended by Irving and Kingdon (2008) to allow for four stage decision model is as stated:

i. Does an individual report being sick (S=1 or S=0)
ii. Conditional on reporting sick (S=1), does the individual seek treatment (D=1 or D=0)?
iii. Conditional on having sought treatment (D=1), does the individual report any positive medical expenditure (M=0 or M>0)?

iv. Conditional on whether an individual incurs medical treatment cost, how much is spent on medical care (E(M)) ?

Conditional on x, independence between the decision to report sick, the consultation decision and the medical cost decision can be assumed. Thus,

$$P(S = 0|x) = 1 - \phi(x^{'}\gamma) \qquad (49)$$

$$P(D = 0|x) = 1 - \phi(x^{'}\theta) \qquad (50)$$

$$P(M = 0|x) = 1 - \phi(x^{'}\eta) \qquad (51)$$

$$log(M|x, S = 1, D = 1, M > 0)\ N(X, \beta, \sigma^2) \qquad (52)$$

where Φ represents a standard normal distribution function, Equation (49) represents the probability of being sick by an individual, Equation (50) the probability of getting medical treatment after an episode of illness, Equation (51) the probability of incurring medical cost and Equation (52) represents conditional health expenditure which depends on whether an individual report being sick, seek medical treatment and incur medical treatment cost.The general form of the hurdle model likelihood function is (Mcdowell, 2003):

$$L = \prod_{i \in \Omega_0} \{1 - F_1(\beta_1)\} \coprod_{i \in \Omega_1} \frac{\{f_2(y, \beta_2) F_1(\beta_1)\}}{F_2(\beta_2)} \qquad (53)$$

where $\Omega_0 = \{i|y_i = 0\}$, $\Omega_1 = \{i|y_i \neq 0\}$, and $\Omega_0 \cup \Omega_1 = \{1, 2, . . . ,N\}$.

Since the likelihood function can be separated from the parameter estimates $\beta_2$and β_1, the log likelihood can be expressed as the total of individual log likelihoods of two distinct equations: a count model truncated at zero and binomial probability model. As a result, maximizing the two models separately can help maximize thee log likelihood of the hurdle model without losing any information.

Advantages of Hurdle Model

i. It can be estimated in stages
ii. The presence of same variables at different stages is not a problem
iii. Numerically well behaved

Limit of Hurdle Model

One of the shortcomings of hurdle model is the assumption there is independence between the different health decision stages of the model. However, this problem can be addressed by introducing sample selectivity corrected model for each stage of the hurdle model.

2.3 Empirical Review

This section entails an empirical assessment of past literatures on health care systems, health care financing, and gender inequality issues in Nigeria. It also covers the sensitivity of the demand for health care to changes in income and gender differentials in household health expenditures. The outcome of this section will help ascertain whether or not results obtained from this study agree with previous research findings.

2.3.1 Health care systems in Nigeria

Health is an important aspect of any society as it affects the time available for the creation of wealth and income. Therefore, the citizens of a country should have access to improved health care system at all times. This is relevant becauseinvestment in good health have a long term impact on the health of the whole population given that overall health condition influences, to a great extent, economic development as the population is able to take advantage of new opportunities and adopt technologies while making use of other forms of human capital development (e.g. on-the-job training, education).

In Nigeria, the three tiers of government, federal, state and local government, are largely responsible for the delivery of health care. Oyibocha et al. (2014) revealed that 774 local governments in Nigeria are mainly responsible for the management of the primary health care system but are however supported by state ministries of health and private health practitioners while the ministry of health represented at the state level are in charge of secondary health care. In the case of tertiary health care system, specialist hospitals and teaching hospitals are responsible for its administration. The secondary and tertiary health care system are so designed to meet the health needs of urban dwellers while primary health care health facilities are mainly found in the rural areas. In Nigeria, there are about 34,000 health care centres of which about 66% are owned and managed by the three level of government earlier mentioned (Federal Ministry of Health, 2011). According to Okon (2016), Nigeria currently has twenty FMCs, twenty one federal teaching hospitals and thirteen specialist hospitals located in different regions in the country. The study further revealed that these health centres were built when Nigeria's total population was about 80 million. At the moment, Nigeria has a population of about 182 million with a forecast of reaching 210 million by 2021 (NPC, 2017), and there hasn't been commensurate increase in the number of health facilities. The available ones are being overstretched and this has led to increase in the number of death cases. Health facilities (medical equipment, health workers and health centres) are not sufficient in the country, particularly in the primary health care system (HERFON, 2006) which was introduced primarily to take care of the rural areas.

The National Primary Health Care Development Agency (NPHCDA) was used by the federal government of Nigeria to achieve overall policy objectives, ascertain quality of health services, organization of work programmes as well as training and implementation of health sector activities such as campaigns and immunization (Awoyemi and Adigun, 2016). However, allocation of health care resources is predominantly in favour of tertiary and secondary health care at the expense of primary health care (Oyedeji and Abimbola 2014; Abimbola et al.2015)**.** The current state of primary health care (PHC) system is a far cry from its original function of being the core of health care policy in the country as it only accommodates the health needs of less than 20 percent of its expected patients' capacity with most of their facilities in an appalling state and infrastructures being either inadequate or out-dated (Awoyemi and Adigun, 2016). As a result, primary care is sought at secondary and tertiary facilities due to the poor state of primary health care facilities and health practitioners, whose performances would have been remarkable, are being overstrained by health cases which should have been taken care of at the primary health care centres. Hence, the disturbing state of some health indicators in Nigeria. Maternal mortality per 100,000 live births has been observed to be increasing- 608.3 in 2008 to 814 in 2015(World Bank, 2016). Infant mortality per 1,00 live births was 72.7 in 2015 which puts Nigeria in the tenth position in comparison to the world (CIA, 2015) and under-5 mortality rate per 1,000 births was 109 in 2015 (World Bank, 2016)

Provision of health services, ordinarily, should be the responsibility of public sector, however, the health sector in Nigeria is poorly funded. Health care financing system in Nigeria is still fraught with the problem of low government spending on health, low insurance coverage, high out-of-pocket expenditures and low donor funding (Olakunle, 2012). Coverage by the social security system depends largely on employment in the public sector which marginalizes farmers who are majorly resident in rural areas and other such categories of people not working in a formal organization.NHIS and private insurance companies only have sufficient coverage of federal government workers while their families and other workers in the private sector, who are in the great majority, seem to have been widely neglected by social security system (Okpani and Abimbola, 2015). As revealed by World Bank in one of their surveys conducted in 2008, only 0.8% of Nigeria's total population have been covered by NHIS (World Bank,2008).

The low coverage of social welfare system in Nigeria therefore promotes out-of-pocket expenditures for public sector health services. This contributes to the rise in user fees at the public sector and cost of patronising private clinics or doctors to be very high (Awoyemi and Adigun, 2015). By implication, this reduces access of the poor to good quality health services or shove households into poverty following a catastrophic health care expenditure. This therefore calls for an urgent need to shift attention from activities that promote solely user fee for health services by all socio-economic groups, especially among the rural dwellers and concentrate effort on employing other risk-pooling mechanisms in health care financing.

2.3.2 Health care financing in Nigeria

Health care financing represents funds gathered from private and public sources as well as donor agencies which are used to pay services rendered by health care providers (Osungbade et al., 2015). Public health care payment include: capital and recurrent health spending from government budgets including federal, state and local government budget; borrowing and grants from external sources as well as supports received from nongovernmental agencies and international organizations; and compulsory or social health insurance funds (WHO,2011). Revenues at the national level received from petroleum exports, taxes and other sources are distributed between federal, state and local government and in which case, states determine the fraction of their budget that goes to health depending on how important allocation to health is considered important in each state (Okpani and Abimbola,2015). However, due to the teeming Nigerian population and the dwindling economic condition, the government alone cannot shoulder the responsibility of health care provision and there is therefore dependence on donor agencies such as World Bank, UNDP, UNIADS, UNICEF etc. The federal government also relies on social health insurance as a means of financing health care in Nigeria. Social health insurance, as conceived on a national level, is a form of compulsory insurance scheme which provides the resources needed to pay for the cost of medical care services and also function as a type of social security by removing barriers to receiving quality health services as at when needed particularly for the marginalized group (Adinma and Adinma, 2010). It is however unfortunate that the scheme does not have a wide coverage in Nigeria especially in the rural areas where majority are agricultural workers and hence not participating in formal labour market.

Private financing is made up of firms and households' out-of-pocket payments on health, medical spending by different sections of private organizations, private health insurance and development associates or donor agencies' expenditures on health (Osungbade et al., 2015). Out-of-pocket (OOP) payment, which is the most prominent type of private health care spending in Nigeria, could be an admixture of health material costs, medicine and medical supplies, consultation fees and admission charges (Yunusa et al, 2014). These OOP (often referred to as user fee) does not follow a definite pattern as the demand for medical care is highly erratic and in cases where the proportion of OOP in household's total budget exceeds an acceptable threshold, it can have devastating effect on household consumption pattern and may eventually result in medical impoverishment if households formerly living above poverty line becomes poor following payment for health care (Garg and Karan,2005).

Health care financing in Nigeria is characterized by declining budgetary allocation to health. WHO (2015) revealed that government's allocation to health as a fraction of government's total expenditure has been pegged at an average value of 7.2% from 2008 to 2012 while a value of 5.3% was recorded for health funds obtained from external sources expressed as a percentage of total expenditure. The WHO report also showed that in 2012, out of pocket spending expressed as a percentage of total expenditure on health was approximately 70% while the private prepaid plans as a percentage of private expenditure on health was only 3%. In 2013, the Nigerian Government allocated 5.6% of the total government budget on health at the federal level (Federal Ministry of Finance, 2013) while allotting an average of $10.90 (₦1,709) per person on health which was $11.50 or ₦ 1,782 in 2012 (Federal Ministry of Finance, 2012). From 2010 to 2017, the highest budget allocation to health has been 5.8% which falls short (61.33 % deficit) of the Abuja declaration of allocating 15% of the national budget to health (Babaranti, 2017). By implication, health expenditure in Nigeria is mainly privately funded. In 2014, private spending accounts for 74.9 % of total health expenditure with out-of-pocket payments accounting for more than 95.7% of private health expenditures (World Bank, 2016). Invariably, the burden of health care payment has shifted significantly to consumers who have to pay a fraction of their incomes to receive health services. As a result of high out-of-pocket payments, most households have remained entangled in the viscous cycle of poverty especially during period of high illness burden (Obansa, 2013). There is therefore a need for the promotion of universal health coverage where everyone can access good quality health service without having to forgo the consumption of other basic household items necessary for their wellbeing.

2.3.3 GENDER INEQUALITY ISSUES IN NIGERIA

Gender inequality can be used to describe a situation where there is structural marginalization, preferential or unbalanced treatment on the grounds of sex differences which is usually motivated by administrative, social and institutional arrangements.(Boyi, 2013). It has remained a global phenomenon which has been observed to be more predominant in developing countries and more palpable in rural areas when compared to urban settings.In Nigeria, though women constitute about half of the population, they are still considered underclass with limited access to developmental opportunities. This situation has been shown to be significantly worse among the 80.2 million girls and women in Nigeria than that of the males and their counterparts in other similar societies (BCN, 2012). Women have been passing through series of neglects that ranged from cultural practices to socio-political and economic constraints (Danlad, 2012) despite their central roles in productive and reproductive activities. The discriminations at the societal level, as shown in cross-cultural studies, are attributable to male domination and taking decisions at the household level, stringent and unbalanced gender roles, socially conditioned definition of masculinity which connects it to supremacy or male worship, differences between men and women in terms of access to productive resources and the utilization of force for conflict settlement (Ezeh and Gage 1998; Morrow 1986). Discriminations against women in Nigeria have been shown to be in terms of education, property rights, political participation, health status as well as cultural and religious bias (UNESCO, 2008;BCN, 2012).

As opposed to the general notion that discrimination is only against females, males also have their fair share of discrimination, and in some situations, it is even more severe among the males (Benatar, 2012). Definitions of being man or woman in many societies are based on unbalanced ideas which in most cases are not favourable to women with more consequences for men and their association with women and their households (Voices4Change,2015). Right from an early age, males are being taught conventional gender roles to “man up”, “don’t wimp” and “suck it up”. Research have shown that conformism to inflexible and prejudiced social values and norms which defines masculinity utterly impact men’s behaviour ranging from physical violence within or outside the home, health seeking tendencies, household chores, caregiving, use of birth control methods, STI and HIV prevention among others (Barker and Ricardo,2005; Barker et. al,2011; and Kimmel,2000).Following the realization that thereare rigid expectations of being member of a particular gender, the study therefore explored the various forms of gender discrimination experienced by men and women.

2.3.3.1 Men and Emotions

In most part of the world, men are frequently discouraged from expressing any form of physical or emotional weakness. As early as the boy child can comprehend things around him, he is thought according to Legato (2008) to suck up pain, not wimping or showing any form of weakness. Right from birth, boys have loving tendencies but these tend to change as they grow up as they are taught to learn the socially accepted definition of what it means to be a man(Olson,2015).Parents' treatment of their children depends on their gender which in turn informs how they behave in certain ways, as dictated by societal beliefs, values, attitudes, and examples (Conversation Africa, 2017). Men are expected to brazen up and only seek medical treatment when their health situation has become critical and failing or when pressure is being mounted by their spouses or other family members.Men are believed to be the primary cause of their own problem as they are alleged of being reluctant to be involved in traditional mental medical services, for example, participating in private counselling (Behan,2016). Constantly proving manhood and concealing emotions have never being more burdensome to men. Because of socially conditioned behaviour which requires that men should conduct themselves in certain ways to be considered real men, men are being taught from an early age to 'man up' and be ready to face challenges life throw at them (Behan, 2016).

2.3.3.2 Men and Violence

Although the precise causes are not well known, male violence considered as a gendered action, is a well-studied phenomenon (Omar,2011).Gender stereotype which associates masculinity with physical violence and femininity with weakness and emotional mien stimulate sympathy, encourage dominance, and link respect with great a deal of fear (Olson,2015). While some schools of thought are of the opinion that masculine violence is as result of the tenuous grip that the patriarchal system has on the society (Carrigan et al. 1985), others believe that violence and masculinity are thought of as being symbolic of gender socialization (Omar,2011).The link between masculinity and violence was first made by individuals who claimed that manliness was inculcated and learnt by males right from adolescents and this explains, to a high degree, the reason why more boys than girls are involved in the criminal justice system (Krienert, 2003).

The culture of violence tied tomasculinity relies on a sense of superiority and enactments of dominance (Bridges and Tober, 2017). However, men should not only be seen as perpetrators of violence, violence can also happen to men. An example is domestic violence against men which are largely unreported as violation of a man by a woman is considered condescending. Although higher cases of physical or sexual assaults are recorded for females, men also face similar ordeal.In Nigeria for example, we have cases of women slapping, striking, kicking, and beating their husbands as well as depriving them of sex and in extreme cases claiming their lives (Watt and Zimmerman, 2002). Another form of violence against men as revealed in the study by Benatar (2012) is military conscription in which case men and hardly women areforcibly conscripted into a country's armed forces. The study further revealed that men are also more often the target of aggression and violence of a non-sexual kind as both male and female are more likely to inflict violence on males than on females.

2.3.3.3 Men and financial burden

Traditionally, men are expected toact as the household head by being the main economic provider for the family- from putting food on the table to providing shelter for the household. Men have been conditioned by socially learned construct to take financial responsibility. Men are considered primarily as income earners and therefore saddled with the responsibility of providing for the needs of their families (World Development Report,2012).Even though these genderexpectations have undergone some cultural transformation, with more female breadwinners, the burden is still mainly borne by male household heads. In the face of high poverty and unemployment, such financial burden can lead to frustration, depression,and in more common cases, violence.Since psychological wellness and health status have been linked to an individual's level of income, hence men who earn considerably more than their spouses are the hardest hit(Best,2016). Incidence of suicide has been shown to be higher among men as a result of the heavy financial burden placed on them(Alini,2017). Knapton (2016) also revealed that man's physical and mental health have been affected by the thought of being the sole provider in the household and his wellbeing has been found to be improved when the financial burden is being shared by his partner or other members of his household.In periods where men were the sole bread winners, health scores and psychological wellness were found to belower than in periods where they contributed their fair share to total household's income(Best,2016).

2.3.3.4 Women and Education

Women in Nigeria, particularly those in the rural areas receive little or no western education (Olawoye, 1994). Based on gender balance in terms of access to education, Nigeria has been ranked as a country with low development (UNDP, 2005). Nigeria was classified as a low development country in respect of equality in educational accessibility. The UNESCO report (2008) revealed net enrolment rate in primary schools was higher among the boys (68%) than the girls (59%) and similarly, the completion rates was lower for the girls when compared to the boys. Very low completion rates were recorded in some States in the North particularly Jigawa state where the completion rate was as low as 7.8%. Also, the likelihood of attending school has been found to be least among children and girls from rural areas or poor households (United Nations, 2007). Although, attempts have been made to reduce the gender gap in primary school enrolment, the disparity has been observed to persist and even increase in secondary and tertiary education (BCN,2012). In Nigeria, the major factors responsible for the low literacy rate among female are: early marriages arising from social pressures, social structures which attaches more importance to male education over females, and some backward religious practices prominent in some parts of the country (Makama,2013).

2.3.3.5 Women and property Rights

Beside women's low level of education, they also have limited access to productive assets and as a result they are susceptible to all forms of violence with restricted influence over household resources. Despite the fact the Nigerian constitution recognises women's property right, their access to and ownership of assets are still limited by tradition and their low economic and social position (NPC and ICF, 2014). In rural areas, land ownership is mainly mediated through the patriarchal system, a practice which supports land inheritance should be through a male descent (Aluko and Amidu, 2006). A high proportion of women do not own a house or own land (82 percent and 85 percent, respectively) in Nigeria and these categories of women have been shown to be more predominant in North (95 percent and 94 percent, respectively) (NPC and ICF, 2014). Access to land by women have constituted a serious challenge particularly in Southern Nigeria where land are owned and transferred to their male progenies in patriarchal dominated ethnic groups (BCN,2012). Women's lack of access and entitlement to land have serious implication on their ability to create wealth and use the essential resources which are needed to be productive actors of the society.

2.3.3.6 Women and Politics

Gender discriminations are also witnessed in terms of weak political representation of women in Nigeria. Despite taking active part in virtually all the global conventions on humans and women's right, including the Africa Charter on women, Protocol on the Rights of Women in Africa (The Maputo Protocol) and Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), Nigeria's political system is still dominated by males especially for elective offices and at local levels. Oloyede (2016) revealed that women's political participation nationally has persisted on 6.7% on the average in both appointive and elective position and this has been shown to be far from averages for West Africa sub region, Regional Africa and the world at large (15percent, 23.4 percent and 22.5 percent, respectively). The study also showed that from the results of the 2015 elections, only six(6) female winners emerged out of the 36 ministerial positions; women represent only 5.6 percent of the members of the house of representatives and 6.5 percent of senators in the national assembly.From the above results, it can be inferred that women are under -represented at all levels.Therefore, if women are not to remain marginalised in Nigeria's political sphere even with the effort of political parties to adopt the 35% women inclusion in politics, they should begin by having a strong influence at the local level, where it is much easier to garner and build support for their current and subsequent political aspirations (BCN,2012).

2.3.3.7Women and Health

In assessing the health condition of a given population, it is a general practice to consider the adult and maternal mortality rates. Evidence showing that Nigeria has one of the worst maternal mortality rates in the world is well documented (BCN 2012; NPC and ICF (2014); UNPF (2014). The maternal mortality rate in Nigeria is 543 deaths per 100,000 live births which is nearly double the global average with the corresponding figure for rural North-East being as high 1,549 (BCN,2012). Maternal deaths account for 32 percent of all deaths among women age 15-49 (NPC and ICF (2014). Makama (2013) showed that Nigeria is ranked second among countries with high maternal mortality rates where about 37,000deaths have been found to result from causes associated with pregnancy. His study further revealed that majority of the maternal deaths are not really caused by illnesses or diseases but result from pregnancy complications which are now globally known as the principal cause of infirmity and mortality among women at child bearing age in developing countries. In addition, BCN (2012) identified poor access to good quality child birth services, low adoption of family planning methods, and lack of adequate and inexpensive emergency obstetric care (EmOC) as the major causes of high maternal mortality.

2.3.3.8 Women and cultural/Religious bias

Despite decades of civilization following her colonization, Nigeria remains a country where cultural and religious tenets are still well appraised especially in the rural areas. Although, majority of these cultural and religious beliefs have been shown to structure the lives of her citizens towards a socially acceptable one, quite a number have been found to be harmful particularly towards the female gender.In Nigeria, there are records of discrimination against girls and women in terms of property title due to the widespread practice of patrilineal system of land ownership (Adekeye,2003). Gender disparities in land access and ownership in Nigeria result from patrilineal system of land inheritance which exclusively allows men to pass land titles to their male descendants. However, there are some parts of the country where women can have claims on their fathers properties , for example, this is common among the Yoruba tribe but this is however not an acceptable practice in most part of South East and North East where women are not allowed to have a share of their father's properties (Abegunde, 2014).

Widowhood rites represent another cultural act in Nigeria which subject women to agonizing and demeaning treatments following the death of their husbands. In most cultures, women are held responsible for their husband's death and they are therefore subjected to dangerous and unhealthy procedures (wearing rags and not washing hands after meals for weeks) to prove their innocence. In some cases, the widows are inherited as properties by their brothers-in-law. Some harmful norms are still being upheld in some parts of Nigeria, for example in certain parts of Northern Nigeria, particularly Benue State, it is not an uncommon practice for husbands to offer their wives to special guest for sexual gratification as this is seen as a form of appreciation and entertainment (Abegunde,2014). Women should have rights over their sexuality and who they desire to have sex with. They shouldn't be compelled to do so.

Female genital cutting (FGC), also known asfemale genital mutilation (FGM) or female circumcision, which is the removal of some parts of the female genitalia, is still being practiced in many parts of Nigeria. In Nigeria, the incidence of female genital cutting have been shown to be highest in the South-East and South-West where about 50.4 percent and 60.7 perccent of women, respectively have been shown to be subjected to genital mutilation (NBS,2009). FGC is propagated in many cultures to curb promiscuity among women and to prepare them for marriage. This practice is being campaigned against because it is considered as an infringement to women's right, possible complications on the health of the victims both in the short term and long term as well as constituting a threat to women's reproductive health. FGC has drawn considerable criticism because of the potential for both short- and long-term medical complications, as well as harm to reproductive health and infringement on women's rights (Toubia, 1995).

Religious constraint is another major challenge to the women emancipation and equity crusade. Generally, religion is considered as a veritable tool used by a patriarchal and class society to defend themselves, an act which results in discrimination against women (Makana, 2013). An example is the keeping of women in seclusion (purdah) which is practiced widely by Muslims particularly in Northern Nigeria. Here, strict laws are enacted to restrict married women to the confines of their homes and are only given permission by their husbands to attend important outings such as marriages, funerals or seeking medical treatment (Hugo,2012). Religious discrimination is not just exclusive to Muslim women, Christian women are also discriminated against in terms of occupying ecclesiastic positions (e.g Pastors, Bishops)and this claim is more evident in the catholic faith where no record of female pope has ever been made (Abegunde, 2014). This belief is based on the instruction given by Paul in first Timothy 2:12-13 “"But I do not permit a woman to teach or exercise authority over a man, but to remain quiet. For it was Adam who was first created, and then Eve."Another aspect is polygyny, which allows men to have multiple wives. Olusanya (1970) opined that the practice of polygyny by men simply and purely lead to exploitation of females in societies where they are practised.

The review of gender inequality in Nigeria has shown that there is persistent gender imbalance at all levels and this has been attributed to the religious, cultural and patrilineal structure of the country. Boyi (2013) suggests that the situation can be reversed by instituting women empowerment programmes, gender balance educational opportunities for all, a nationwide crusade on the importance of gender equality, a movement against child labour and misuse of women and an intense promotion of gender equality by religious and traditional leaders in Nigeria.

2.3.4 Gender Analysis

Gender analysis is an umbrella term used to describe different approaches that are employed to explain the interactions between men and women, the type of activities they engage in, their access to productive resources and the challenges confronting them in relation to each other.March *et al.* (1999) revealed that gender analysis seeks to recognize and underscore the type of relationship men and women have in a given society and the existence of inequalities in their relationship by trying to understand: Who owns what? Who takes decisions? Who performs what? How is it achieved? Who benefits? Who is the most disadvantaged? It examines cultural and social attitudes which combine to profile and determine the life and experiences of men and women, the outcome of which is used to develop policies and deliver services. The six domains of Gender analysis framework in health area as developed by Gender Working Group (IGWG) and cited in USAID (2011) are discussed below:

Access

This domain refers to an individual's capacity to utilize resources which are necessary to be a productive and active actor (socially, economically, and politically) in society. It involves access to resources, information, income, employment, services and benefits.

Knowledge, Beliefs, and Perception

Knowledge, beliefs and perception domain seek to know forms of knowledge that women and men have; their beliefs which inform their gender behaviour and identities and people's notion which directs their understanding of themselves which is largely determined by their gender identity.

Practices and Participation

The domain explains peoples' behaviours and the different actions they take. It is concerned with what people essentially do and how their responsibilities and roles vary by gender. Practices and participation domain focus not only on the present forms of actions but also attempt to know whether there exists variations in the development activities engaged by men and women. Examples of these actions include participation in training activities, attendance at meetings, accepting or scouting for services. It should however be noted that involvement in these activities can both be inert and active.

Time and Space

The domain seeks to address gender variations in terms of time allocation and availability. In other words, it tries to answer the following questions: How is time spent? How available is it? and Where is it spent?. It studies how people allocate time between reproductive and productive labour; determine how time is used during a given period of time (day, week, month or year); and considers the different contributions of women and men to the wellbeing of their immediate household, community and the society at large. The general objective of this domain is to know how time is allocated by women and men and the implications the decisions have on their availability and involvement in productive activities.

Legal Rights and Status

The domain tries to understand how the judicial systems, customary and formal legal codes consider and treat people. Legal right and status domain represents local documentation of specified items such as property rights, voter registration process and identification cards.

Power and Decision Making

This domain relates to the extent to which people are capable of influencing, directing, deciding and imposing both governmental and personal authority. It involves the ability to make express decisions and have unrestricted control over one's self without fear of being challenged, starting from the individual's immediate household, community and society as a whole. The domain also refers to the ability of adult household members to make economic decisions for themselves or the household as a whole and this includes the allocation of individual and household financial resources, employment choice and their income. The domain can also be extended to include the choice to vote and to be voted for, bidding for legal contracts e.t.c.

2.3.5 Income and Health Care Utilization

Apart from gender related issues, a key predisposing factor to health services utilization is the income of the household which is usually gender structured. Incomes are largely low in Nigeria. As at 2010, 46% of Nigerians lived below the national poverty line (only 28% for urban areas, and near 70 % in the rural areas (OPHI, 2016). In the absence of full health insurance, changes in the level of income affect the demand for health care (Ringel *et al.*, 2002). This is particularly more pronounced amongst rural households whose incomes are subjected to wide variations arising from weather uncertainty, price changes, epidemics or sickness, government policies, loss of job etc. (Lustig 2001).

Rural households in Nigeria constituting about 53 percent of Nigeria's total population in 2014 (World Bank, 2016) face unexpected changes in income and its attendant consequences because of the prevalence of factors frequently affecting their incomes (Oluwatayo, 2004). There are already cases of insufficient income for food and other necessities, increasing malnutrition and susceptibility to illness and disease. For example, the values of the three interlinked hunger-related indicators for Nigeria as incorporated by Global Hunger Index are shown in Figure 6. These indicators are: proportion of undernourished in the population, prevalence of underweight in children and the mortality rate of children. Although, the incidence of underweight (% of children under 5) and stunting in children under five years (%)have been dwindling over the years, the values are still high reaching an all-time high of 35.1 %and 50.5%, respectively in 1990 and at their lowest values in 2014 (19.1% and 32.9 %, respectively). Similar trends have also been observed for the proportion of undernourished and under five mortality except for the former whose value decreased initially from 21.3 % to 5.9% between the period 1993 and 2008 but later increased to 6.2% in 2011 and has subsequently been rising.

In an environment where the above situation is being experienced, households may suffer from inadequate health care and diet, forced to sell assets on which their livelihoods depend, and/or pull their children out of school (World Bank, 2009). The long term implication is that of nutritional and health status deterioration, learning gaps and loss of means of support (World Bank, 2009).

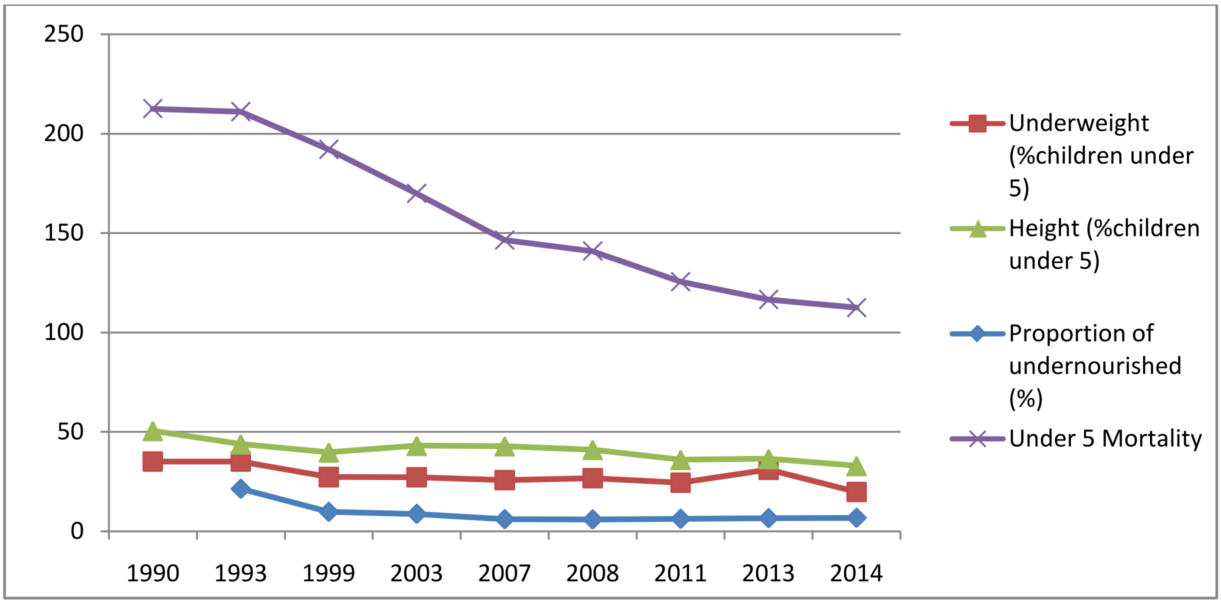

Figure 6: Global Hunger Indicators for Nigeria

Source: World Bank,2016

2.3.6 Income Elasticity of Demand for Health Care

Theoretically, with full insurance, any change in the level of income is expected to have little or no effect on the demand for medical care. If health services are offered at no cost, varying levels of income should leave the consumption of medical care unaffected. A number of empirical findings have been shown to strengthen this assertion. Phelps (1992) calculated income elasticities based on results from the Health Insurance Experiment (HIE). He found that the changes in the level of income did not affect the demand for health care. This result also agrees with a number of observational studies which were carried out based on HIE (Taylor and Wilensky, 1983; Holmer, 1984).Parker and Wong (1997) examined the effect of household income on health care spending in Mexico, evaluating the income elasticity of health care expenditures for different income class with varying levels of health insurance. The results from the study revealed that changes in level of income had significant impact on the health care expenditures of Mexican households and the low income uninsured households were found to be the most sensitive to changes in the level of income. In other words, income elasticity of health for Mexican households ranged between 0.09 and 0.23. This indicates that in times of financial hardship, lower income and uninsured households will reduce health care expenditures than the highand insured household.

Ourti, *et al*. (2006) explored the effect of inequality in incomes on health inequality. Utilizing pooled interval regressions and inequality decompositions on panel data from European Community Household Panel surveys, all elasticities were shown to be below one with the exception of Austria where the confidence intervals of the various income groups matched. In other nations, point estimate of income elasticity of health care expenditures plummeted at the highest income group while the decline was found to be only statistically significant for Ireland and Greece. With the elasticities only affecting the signs of the parameter estimate, the results from the study show that proportional income growth has the tendency to increaseincome-related health inequalities (IRHI) and average health.

A reconnaissance of literature revealed thatin cases where income elasticities are obtained from long time series data, the demand for health care services is more responsive to changes in the level of income. DiMatteo and DiMatteo (1998) utilized time series data from1965 to 19991 for ten(10) regions in Canada and the result revealed that income elasticity of healthwas 0.8.The proximity of the elasticity of the time series data to unity is as a resultof the integration of the influence of technical change. Oyinpreye and Karimo (2014) also carried out a study which focused on the factors influencing out- of- pocket health care expenditures in South South Nigeria using the 2009/2010 harmonized national living standard survey data. The study employed Heckman selection two-step model to show that out-of- pocket expenditure on health care was higher (₦2.49 more) for households with large per capita consumption expenditure (representing per capita income in proxy). Omotor (2009) also carried out a similar study focusing on Nigeria's economy for the period 1970-2003 using an error correction model. The study established that health expenditure in Nigeria is income inelastic (0.472) and positive.

2.3.7 Gender disparity in health care spending

Quite a number of studies on gender differentials in health care expenditure exist. This section provides a brief summary of key findings. Several studies reported that health care utilization was more in female than male (Buor, 2004; Anyanwu et. al 1997; Onah and Govender, 2014). In general, women have more tendencies to utilize diagnostic and precautionary health services than males where males are more likely to go for emergency treatments (Gómez, 2002). Sarker et. al (2014) in their study carried out in Bangladesh used ANOVA and an interactive model to establish the effect of sex and age on health care expenditure. The results showed that for individuals in the reproductive age, medical health expenditure was higher among the female than the males (US$ 14.2 against US$ 11.3) and the total health care spending was marginally higher for males than females (US$ 11.5 against US$ 11.2). Males aged 65-79 were observed to have the highest expenditure (US$ 69.7) while females of age bracket 75-79 years spent more (US$ 23.4) than their male counterparts. Also the cost of hospital admissions was significantly lower for males US$ 21.1) than females (US $23.7).

In studying gender differences in health care-seeking during common illnesses in rural India, Pandey et. al (2002) by employing logistic regression analysis revealed that the chance of spending more money was 4.2 times higher for boys. The boys were 4.9 times more likely to be taken early for medical care and 2.6 times more likely to be seen by qualified allopathic doctors compared to girls. Buor (2004) studying gender utilization of health services in Ghana also observed through a multiple regression model that though the health needs of females are higher than males, their utilization of health care services is not as much. The study also revealed that education, health status, service cost and quality of service had greater influence on males' utilization of health care services while the factors having greater influence on females' utilization were distance and income.

Anyanwu et al (1997) evaluated gender differences in household health expenditure in Nigeria using a linear model of the logarithm of the total monetary cost of an episode of treatment for illness for both males and females. The study revealed that women had special health needs and reported more illnesses than men. The study also established that women's visit to physicians for treatment significantly increase their health care expenditures while such visits had no effect on the treatment cost for men. Onah and Govender (2014) used qualitative and quantitative analysis to investigate the gendered impact of out-of –pocket payments on health care utilization in south-eastern Nigeria. The study revealed that the demographic and socioeconomic vulnerability of households headed by females contributed to gender based differences among the households, preference for health care providers, cost burden, health care financing method and coping strategies. Their findings revealed that female headed households (FHHs) had higher costs from medical treatment and untreated illnesses than households headed by males.

2.4 Conceptual Framework

Research shows that there is substantial variation in the population in terms of health status, health investments undertaken, access and utilization of health care services (UN 2009; Baeten *et. al.*, 2013; Joe et. al., 2008). These differences have been linked to a number of factors. Following Andersen and Newman (2005), factors affecting an individual's decision to seek medical attention can be broadly grouped as predisposing (social and demographic), enabling (economic) and need (health) factors. According to Jang et al (2010) predisposing factors reflect the individuals' propensity to use health services, enabling factors are the resources that may facilitate access to services, and the need factors represent potential needs of health service use, such as self-perceived health, chronic conditions, and restricted activity.

Figure 7 shows that the propensity to use health care services varies among individuals and this propensity can be predicted by individual characteristics such as age, sex, education, marital status among others. Broadly, such characteristics cover demographic, social structural and attitudinal –belief variables. However, predisposition is not enough, as the desire to use health services must be backed by the ability to do so. In other words, it is the enabling conditions that allow the purchase of health resources. Examples of these enabling factors are household income, employment status and region of residence. In addition to predisposing and enabling factors, there is the perceived need for health care services which has also been extended to include health system factors like distance to health facility, quality of service and the availability of health services or providers. For a wider coverage of the determinants of health care use, the study combined the Andersen-Newman model with sanitation factors (access to improved water sources and type of toilet). These variables reveal the sanitary conditions of the household which also serve as important factors influencing the health status of given household as the use of improved sanitation facilities have been shown to reduce the incidence of illness or diseases.

Perceiving illness or realizing one's vulnerability to a particular illness creates a need for the use of health care services. This need is largely influenced by the enabling, predisposing and health care system factors. However, studies have shown that significant gender differences exist in health seeking behaviour and this is evident in all the stages of health care decisions- from reporting illness, through seeking medical treatment to health expenditure incurred following treatments.

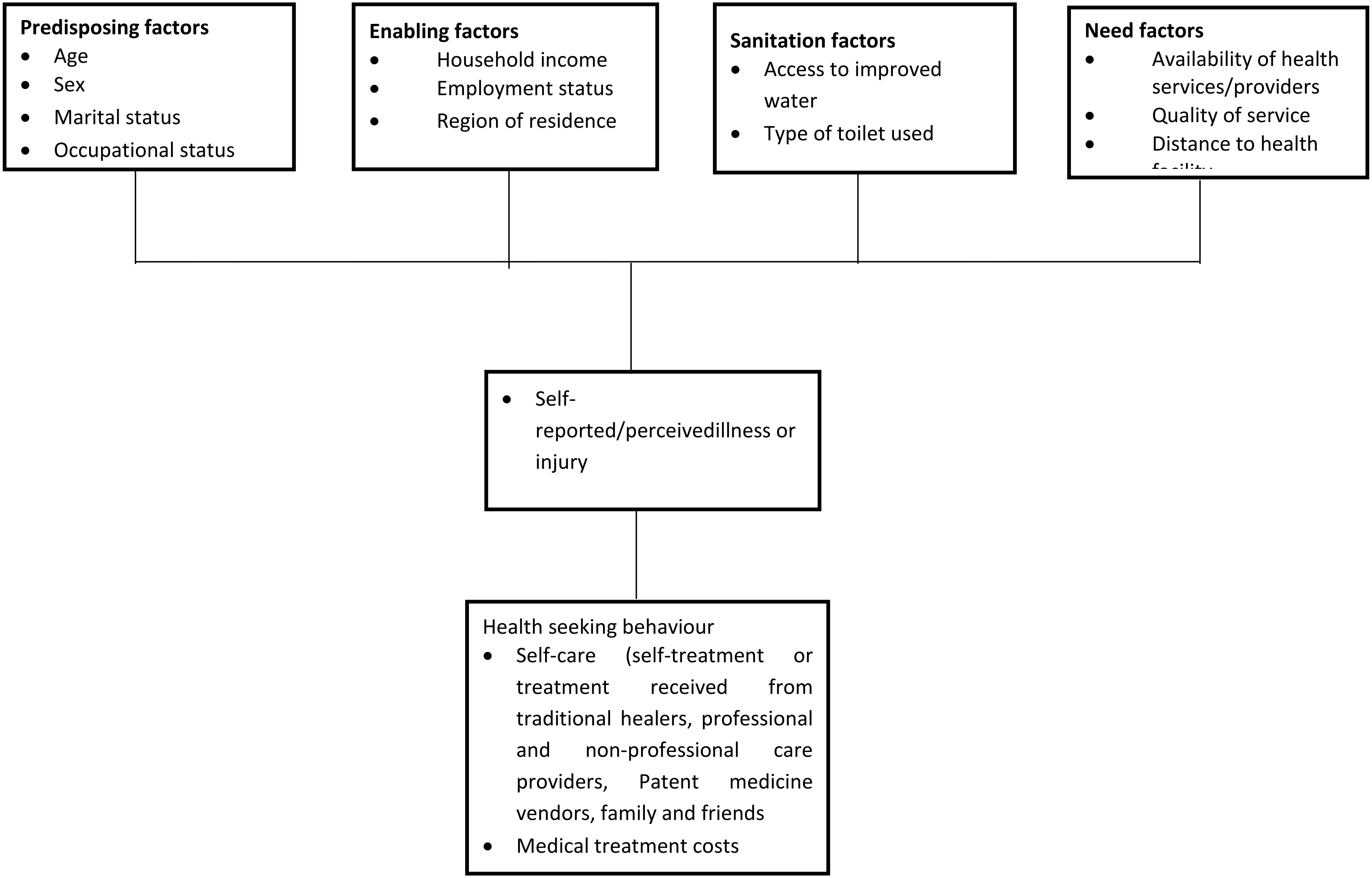

Figure 7: Conceptual framework for the determinants of health seeking behaviour
Source: Modified from Anderson et al (2001)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Source and Type of Data

This study used reliable and rich secondary data set from Harmonised National Living Standard Survey (HNLSS), collected by the National Bureau of Statistics (NBS) in 2009. The HNLSS is anationally representative household expenditure survey that records both household income and expenditure pattern on health in details.

3.2 Scope of the Study

Rural Nigeria is the focus of the study. From the HNLSS data, information from 24,941 households in rural Nigeria on socio-economic and demographic characteristics (sex, age, marital status, household size, educational level, farm size and occupation), health, water and sanitation (type of toilet used and access to improved drinking water),employment and time-use, education and involvement in training activitieswere used. Other variables used in the study werehousehold expenditures, agricultural activities,ownership of durable assets,access to credit and savings.

3.3 Sampling Procedure and Sample Size

The Harmonized Nigeria Living Standard Survey was conducted in two parts. Part A investigated the welfare of Nigerians through measuring access of household members to basic amenities at the sub-national levels (State and Local Government Area) while Part B was a 12 months survey on household expenditures.Based on the design by NBS, 30 Enumeration Areas (EAs) were selected in each Local Government Area(LGA). These EAs were selected from 3 replicates such that each replicate represents a LGA and anyone picked gives the true characteristics of the LGA.

The survey employed a two-stage sampling technique where the first stage involves the selection of the EAs which represents the primary sampling units. The second stage involves the random selection of Households (HHs) which are also known as the secondary sampling units. Random selection involves a complete listing of all housing units and households in the EAs which is then followed by a random draw of households from the list. The HNLSS questionnaires were then administered by the NBS enumerators to the households who were systematically selected from the EAs. In all 100 households were canvassed per LGA while 77,400 HHs were covered nationally.

3.4 Method of Data Analysis

The study employed a number of analytical techniques. These include Descriptive statistics, Engel Curve, Lorenz curve and Gini Coefficient, Generalized Structural Equation Model (GSEM) and Hurdle model. Other inequality indices estimated in the study include Atkinson index, Entropy and Coefficient of Variation.

3.4.1 Descriptive Statistics

Descriptive statistics like tables, charts,frequencies, measures of central tendency (mean, median, mode), and dispersion (standard deviation) were used in the study to describe, organize, summarize and present data representing socio-economic and demographic characteristics of the households, the domains of gender analysis, gender differentials in health services utilization and health care expenditures.

3.4.2 Measuring Inequality in Health Expenditures

The study employed Lorenz curve and four alternative measures to show the extent of inequality in household out-of-pocket health expenditures. The major reason for using these inequality measures is to show how income inequality (using household expenditure as proxy) affects medical expenditure. The Lorenz curve is presented by plotting the proportion of the population recipients on the horizontal axis (representing the cumulative distribution function) against the proportion of the resource distributed along the vertical axis (Jacobson et al., 2004). If the resource is perfectly equal between the groups being considered, the Lorenz curve is represented by a diagonal straight line. The more unequal the distribution is, the more the curve bows out from the diagonal and the greater is the shaded area on the Lorenz curve. This implies a greater inequality in health care expenditure.

The study also presents four common summary measures of inequality namely: Gini Coefficient, Atkinson Index, Coefficient of Variation and Generalized Entropy Measures. These measures have been shown to vary in their sensitivity to changes in the distribution of the population (Omoruyi and Omoyibo, 2014).

3.4.2.1 Gini Coefficient of Inequality

The Gini coefficient is an inequality measure which shows the difference between the actual distribution of a given resource and normal distribution. It is derived from the Lorenz curve or cumulative frequency curve which compares the distribution of a given variable, say health expenditure, with the normal distribution which indicates equality (Haughton and Khandker, 2009). It is the ratio of the shaded area to the area of the triangle under the diagonal. According to Kendall and Stuart (1963), the definition of the measure for the overall distribution is given as:

$$G = 1 - 2\int_0^\infty \Phi(y)dF(y) \qquad (54)$$

Where:

$$F(y) = \int_0^y f(t|\theta)\, dt, and \qquad (55)$$

$$\Phi(y) = \int_0^y t\, f(t|\theta)\ dt / \int_0^\infty t\, f(t|\theta) \qquad (56)$$

F(y) is simply the cumulative distribution function. Given this, one can calculate mean value of a population falling within any resource range, which makes it easy to calculate $\Phi(y)$numerically.

3.4.2.2 Atkinson's Inequality Measures

Atkinson (1970) suggested another measure of inequality which has a weighting parameter ε (a measure of aversion to inequality). The Atkinson index is expressed as

$$A_\varepsilon = 1 - \left[\frac{1}{N}\sum_{i=1}^{N}\left(\frac{y_i}{\bar{y}}\right)^{1-\varepsilon}\right]^{1/(1-\varepsilon)}, \varepsilon \neq 1 \qquad (56)$$

$$= 1 - \frac{\prod_{i=1}^{N}(y_i^{(1/N)})}{\bar{y}}, \qquad \varepsilon = 1 \qquad (57)$$

Where $y_i$represents the fraction of total income made by ith group and $\varepsilon$is the supposed inequality aversion estimate which shows the tendency of a society to strive towards equality. The value of the parameter varies from 0 to ∞ (infinity) i.e., the higher the value of ε, "the higher the society's concern about inequality. $\bar{y}$ represents mean income or consumption.

When ε >0, the society strives towards equality or there is a social aversion for inequality. As ε increases, there is a social preference for income transfers at the lower rung of the distribution than the transfers made at the top rung. Common values of ε are 0.5 and 2.

3.4.2.3 Generalised Entropy Measures of Inequality

Generalised Entropy measures of inequality include the Theil Index, Coefficient of variation and the mean log deviation. The general formula for expressing these measures is given by (Lichfield, 1999):

$$GE(\alpha) = \frac{1}{\alpha(\alpha-1)}\left[\frac{1}{N}\sum_{i=1}^{N}\left(\frac{y_i}{\bar{y}}\right)^{\alpha} - 1\right] \quad (58)$$

Where $\bar{y}$ is the mean income per person (expenditure per capita). GE has values ranging from Zero to infinity. A value of zero implies equal distribution of income while the level of inequality increases at higher values. α denotes the value that measures the difference between different income levels of the income distribution. The values of α represent sensitivity of GE to income distibutition. With high values of α, GE is more sensitive to changes in the lower tail of the distribution while at higher values, GE is more responsive to differences in income at the upper part of the distribution. Frequently used values of α are 0,1, and 2 and these values when substituted in the GE equation gives Mean log deviation, Theil Index and the square of the coefficient of variation, respectively (Pauw, 2003; Omoruyi and Omoyibo 2014).

$$GE(0) = \frac{1}{N}\sum_{i=1}^{N}\log\left(\frac{\bar{y}}{y_i}\right) \quad (59)$$

$$GE(1) = \frac{1}{N}\sum_{i=1}^{N}\frac{y_i}{\bar{y}}\log\left(\frac{y_i}{\bar{y}}\right) \quad (60)$$

$$GE(2) = \frac{1}{\bar{y}}\left[\frac{1}{N}\sum_{I=1}^{N}(y_i - \bar{y})^2\right]^{1/2} \quad (61)$$

3.4.2.4 COEFFICIENT OF VARIATION

The coefficient of variation is expressed as the ratio of the standard deviation of a given resource or variable to its mean (Pauw, 2003).

$$C = \frac{\sqrt{V}}{\mu} \quad (62)$$

Where C is the coefficient of variation, V is the standard deviation and μ is the mean

Graphically, the coefficient of variation describes the peakedness of a unimodal frequency distribution (Hale, 2006). In other words, the more the dataset cluster around the mean, the smaller the coefficient of variation and the higher the peak of the distribution.

The coefficient of variation has been shown to have striking properties. Transfers being made at different levels of incomes are given equal weights by the measure (Pauw, 2003). For example, regardless of the level of *y*, the transfer made from income y of a given household to another household with income (y-d), will have the same effect (Sen, 1997). Also, Haughton and Khandker (2009) showed that in a situation where group data are employed, although measured by population size, outliers whose values are small only have minimal impact on the distribution and as a result of construction, coefficient of variation is not affected by inflation. The study however revealed that the disadvantage of the measure theoretically is that it only assumes values between zero and infinity, and that there is no general criteria which specifies an acceptable value of measure for a given event.

3.4.3 Household and Individual Level Measurement

Regression analyses were carried out at both individual and household levels following Irving and Kingdon (2008). At both levels, extended Engel curve relationship was assumed between health care expenses and household income as originally framed by Working (1934) and extended by Deaton (1997) to allow for the addition of household demographics and other characteristics.

The unrestricted health care expenditure model is specified as follows:

$$H_i = \alpha + \lambda \ln\left(\frac{x_i}{s_i}\right) + \varphi lns_i + \sum_{c=1}^{C-1} \delta(s_{ci}/s_i) + \mu z_i + u_i \qquad (63)$$

where

H_i is the share of household i’s budget dedicated to health expenditure

s_i is the household size (such that x_i /s_i represents per capita expenditure)

x_i is total expenditure of household i;

s_{ci} reflects the number of people in age-sex class c where there are C such classes in total (such that (s_{ci}/s_i) reflects the proportion of household members in each class).

ln (x_i/ s_i) is natural logarithm of household per capita expenditure

$z_i$is a vector of socioeconomic characteristics (such as religion, education, dependency ratio, gender, age and employment status of the household head)

$u_i$is the error term; and

$\alpha\lambda$, φ, δ and μ are the parameters to be estimated and a-priori, it is expected that α> 0, δ>or< 0, λ> 0, φ> 0 and μ>or< 0.

For the individual level model, the dependent variable was defined as an individual's medical expenditure divided by per capita household expenditure to allow evenness with the household level variable.

3.4.3.1 GENERALISED STRUCTURAL EQUATION MODEL

As revealed by StataCorp(2013), Structural equation model (SEM) includes a wide range of models ranging from linear equations to simultaneous equations, measurement models, correlated uniqueness modelsand item-response theory (IRT) models. It also includes confirmatory factor analysis (CFA),multiple indicators and multiple causes (MIMIC) models and latent growth models. In SEM, path diagrams are often used to present the models being estimated (Figure 8).

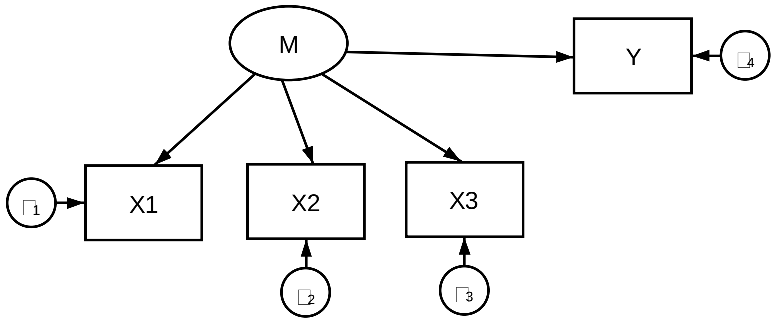

Figure8: Sample of Path diagram for SEM

Source: Adapted from StataCorp, 2013

As shown in Figure 8, path diagrams contain boxes and circles representing observed and latent variables, respectively. The arrows, also called paths, provide the links between the variables in the boxes and circles. For example, variable A affects variable B, if the arrow points from A to B (A $\rightarrow$ B).The path diagram can also include symbols representing variances and correlations between variables. Alternatively, structural equations modelling can be used to estimate models by means of command language. However, the Generalized structural equation model (GSEM) has been added to SEM to allow for the estimation of binary, count, categorical, and ordered variables, which finds its application in this study. The advantage demonstrated in the literature of GSEM is that it allows for estimation of multiple equations simultaneously to enable associations with varying distributions of predictor and outcome variables in the same model (Skrondal and Rabe-Hesketh 2004). The generalized linear model, as described by StataCorp (2013), is given as:

$$g\{E(y|X)\} = x\beta \qquad (64)$$

And in case of Probit, $g\{E(y|X)\} = \phi^{-1}\{E(y|X)\}$, where $\phi(.)$ is the cumulative normal distribution. Thus the equations are:

$$\phi^{-1}\{E(x_1|X)\} = \alpha_1 + X\beta_1 \qquad (65)$$

$$\phi^{-1}\{E(x_2|X)\} = \alpha_2 + X\beta_2 \qquad (66)$$

$$\phi^{-1}\{E(x_3|X)\} = \alpha_3 + X\beta_3 \qquad (67)$$

$$\phi^{-1}\{E(y|X)\} = \alpha_4 + X\beta_4 (68)$$

Equivalently, the above can be written as

$$Pr\ (x_1 = 1|X) = \phi(\alpha_1 + X\beta_1)(69)$$

$$Pr\ (x_2 = 1|X) = \phi(\alpha_2 + X\beta_2)(70)$$

$$Pr\ (x_3 = 1|X) = \phi(\alpha_3 + X\beta_3)(71)$$

$$Pr\ (y = 1|X) = \phi(\alpha_4 + X\beta_4)(72)$$

When the variable is continuous and the model is a linear regression, then $g(\mu) = \mu$, and the fourth equation becomes:

$$E(x_4|X) = X\beta_4 \quad (73)$$

Or

$$y = \alpha + X\beta_4 + e.y_4 \quad (74)$$

Since the GSEM model was used to estimate hurdle model having four decision stages where the first three stages involved binary outcomes and the last stage, actual medical expenditure, has a continuous distribution, the corresponding GSEM model for the entire set of equations is thus specified:

$$Pr\ (D = 1|X) = \phi(\alpha_1 + X\beta_1)(75)$$

$$Pr\ (C = 1|X) = \phi(\alpha_2 + X\beta_2)(76)$$

$$Pr\ (M = 1|X) = \phi(\alpha_3 + X\beta_3)(77)$$

$$A = \alpha + X\beta_4 + e.x_4(78)$$

Where D,C and M represent the probabilities of reporting sick, seeking medical attention and incurring treatment cost and A is the actual amount of health expenditure made by the rural households. X is the vector of explanatory variables and $\beta_1,\ \beta_2,\ \beta_3\ and\ \beta_4$ are estimates of the parameter vectors in the health care decision stages.

3.4.3.2 Hurdle Model

According to Irving and Kingdon (2008), health seeking behaviour, pass through four decision stages – reporting sickness, consultation, incurring treatment cost and the actual amount of health expenditure. This study used the Triple Hurdle Model (estimated using GSEM) and unrestricted health care expenditure model to establish gender patterns in health care spending. Following Irving and Kingdon (2008), the stages in Hurdle model that are involved in health care expenditure when individuals are ill or hurt are as follows:

Stage 1 of the Hurdle: (demand for medical care stage)

This stage focuses on the health care needs of household members. Here, it is considered whether an individual reports being sick or not. This decision is represented by D which assumes a value of 1 if an individual reports illness and takes a value of 0 if otherwise (that is, D=1 or D=0) and the analysis is done through probabilities. The Probit for stage 1 is modelled as follows:

$$P(D = 0|X) = 1 - \Phi(X'\gamma) \qquad (79)$$

where Φ represents a standard normal distribution function;

X is a vector of explanatory variables and γ indicates the Probit estimate of the parameter vectors in the health care needs stage.

Stage 2 of the Hurdle: (Consultation stage)

Household members who reported illness or injury in stage 1 will be included in the consultation stage which is stage 2 of the hurdle model. This stage involves whether or not an individual seeks treatment after reporting sick. The stage of health care utilisation is represented by C, (conditional on D=1), it assumes 1 if the person consults and 0 if otherwise (C=1 or C=0) and its Probit model is given as

$$P(C = 0|X) = 1 - \Phi(X'\theta) \qquad (80)$$

θ is the Probit estimate of the parameter vectors in the health care utilisation stage.

Stage 3 of the Hurdle: (incurring medical expenditure stage)

Based on whether (C=1) in equation 2, M represents the choice of having a positive health cost which is equal to 1 if there is health cost and zero if otherwise (i.e. M=0 or M=1). The Probit model used to define this decision is expresses as follows:

$$P(M = 0|X) = 1 - \Phi(X'\eta) \qquad (81)$$

η is the Probit estimate of the parameter vectors in the health care spending stage.

Stage 4 of the Hurdle: (conditional medical expenditure stage)

This is the last stage of the hurdle which involves the actual medical expenditure made by households whose utilization of health care services was at cost. At this stage, the actual amount of the medical expenditure is modelled as follows:

$$log(M|\,X,R=1,T=1,M=1)=N(X^{'}\beta,\sigma^{2}) \qquad (82)$$

β is parameters to be estimated while σ is the standard deviation of M.

3.5 Estimationof the regression equations

Two models were compared in order to evaluate the study's foremost research objective. The first model focuses on the regression of unrestricted medical expenditure (Engel curve) on a set of explanatory variables. The model is called unrestricted because households reporting zero medical expenditure were also included in the analysis. However, due to the degree of skewness of health costs data, the resulting estimates from the regression may be bias (Jones, 2010). Hence, the need to structure hurdle model to compare results.

The first three stages of the hurdle model were analysed using Probit model because the dependent variables in each stage are binary (taking a value of 0 or 1) while the fourth stage which involves health care expenditure with a continuous dependent variable, was estimated using ordinary least squares (OLS).

3.5.1 Measurement of variables

Dependent Variables

Stage 1-Probability of an individual reporting illness (reports illness=1, 0 if otherwise)
Stage 2- The probability of treatment consultation after reporting illness (treatment consultation=1, 0 if otherwise)
Stage 3- The probability of having incurring medical treatment cost (treatment cost =1, 0 if otherwise)
Stage 4- The logarithm of the medical payments of the household members who were assigned a value of 1 in the preceding stage

Explanatory Variables

The independent variables used in the study were categorized into individual level variables, household level variables and sanitation variables (Table 2). The individual level variables are sex, age, marital status, and occupation. Other individual level variables which were also categorized as the gender analysis variables are years of education, personal care, health decision, access to credit and training participation The household level variables are household size, per capita expenditure,dependency ratio, asset ownership, zone, and professional association. Age was both pooled and categorized by gender.

The two categories of explanatory variables were complemented by sanitation variables representing other measured characteristics of the households. They include: type of toilet owned by each household and the use or otherwise of improved sources of water. The variables reveal the sanitary conditions of the household and they were incorporated into the analysis as control variables because improved sanitary conditions will reduce the probability of an individual getting sick. Hence, the frequency of using health facilities or incurring health expenditures is reduced thereby cutting back medical payments.

Table 1: Specification of the Explanatory Variables for the Hurdle Model

Variables	Measurement	Expected Signs	Literatures
Individual Level Variables			
Age of household member	Years	+	Awoyemi and Omoniwa (2013) [-], Stewart (2004) [+/-]
Sex	Male=1, Female = 0	-	Irvin and Kingdon (2008) [-] Pandey et al (2002) [+]
Education	No of years of formal education	-	Oluwatimilehin (2014) [-], Chou et al. (2007) [-]
Marital Status	Single=1, 0 if otherwise; Widowed/Divorced/Separated =1, 0 if otherwise	+	Bushak (2015) [+]Irvin and Kingdon (2008) [+];Cabrera-Alonso et. al (2003) [+]
	Monogamous=1 , 0 if otherwise; Polygamous=1 , 0 if otherwise;	-	Cabrera-Alonso et. al (2003) [+]; Bushak (2015) [-]Irvin and Kingdon (2008) [-]
Occupation	Farming=1, 0 if otherwise	+	
Access to credit	Access=1, 0 if otherwise	-	Portinga (2006a)(2006b) [-]
Training participation	Participation=1, 0 if otherwise	+	UNAIDS (2012) [+]
Personal Care	Hours	-	
Household Level Variables			
Household size	No. of individuals living in the Household	+	Oyinpreye and Karimo (2014) [+]
Sex of household head	Male=1, Female = 0	-	Irvin and Kingdon (2008) [-] Buor 2004 [-]
Per capita expenditure	Naira	-	Parker and Wong (1997) [+/-],Oyinpreye and Karimo (2014) [+]
Dependency ratio	Ratio of non-workers to workers in the household	-	WHO (2012) [-]
Professional association	Member=1, 0 if otherwise	-	
Asset ownership	No of assets owned by the household		
Zone	North Central=1, 0 if otherwise; North East=1, 0 if otherwise;North West=1, 0 if otherwise;	+	
	South East=1, 0 if otherwise; South South=1, 0 if otherwise; and South West= 1, 0 if otherwise	-	
Sanitation Variables			
Type of toilet used	Unimproved facilities=1, 0 if otherwise;	+	IFRC and Hopkins (2008) [+]
	Flush toilet=1, 0 if otherwise; VIP latrine=1, 0 if otherwise; and Composting toilet= 1, 0 if otherwise	-	IFRC and Hopkins (2008) [-]
Access to improved drinking water	Access=1, 0 if otherwise	-	Hunter et. al(2010)[-], Hutton and Haller (2004) [-]

Source: Author’s compilation from literature review

3.6 Limitations of the study

In achieving the research objectives of this study, it is important to point out some of its limitation. First, due to data paucity, the study only captured households with out of pocket payments for health services and did not involve households who could not afford medical treatments or those who received traditional or native treatment. Second, in using the six domains of gender analysis framework, a number of questions should be raised. However, due to data limitation, the study only considered few of the sample questions suggested by USAID (2011) to assess each domain.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Demographic Characterization of the Sampled Households

The descriptive statistics of the demographic characteristics of the sampled rural households in Nigeria are presented in Table 2. Table 2 shows an almost equal distribution between the male and female members of the households, although the males were observed to be more (about 51%). Similar gender patterns were observed in all the zones except in South East and South West where the number of female household members was noticed to be marginally higher than male members. The mean age of the household members was about 42years and this ranged from approximately 38 years to 50 years across the zones. The modal age category was greater than 50 years. However, this was noticed to vary across the zones. Results from Table 2 further reveal that majority of the adult household members (over 35yrs) were males while most of theyouths (aged between 18 and 35 years) were females. Since only about 33 % of the total sampled respondents were over 50 years, it can be said that majority of the household members are still within their active and productive years and are therefore better able to generate more incomes (both farm and off-farms) to support their households. With an increased share of the non-elderly in the household, utilization of health care services is expected to be lower as investment in health has been found to increase with age, even after retirement. Expenditures on health care are lowest for children after the first year of life, rise slowly throughout adult life, and increase exponentially after 50 years age (Meerding et al.1998).

In terms of marital status, majority of the sampled respondents were married (monogamous)while those that werewidowed, divorced or in polygamous marriages were marginally represented. In all, 29 % were never married and the highest number of single individuals was found in South South (33.8 %) with the least being North West (25%). Low level of education was recorded among rural dwellers in Nigeria. About 54% of the respondents had no form of education and only 30 % had primary school education as their highest qualification. The rate of illiteracy in the North was more than double that of the South with the highest level observed in North West (74.1%) and the least in South East (25.4%). Only a small proportion of the respondents had tertiary education (3.33%) or vocational/ commercial training (0.13%). This result is worrisome as formal education plays a pivotal role in the utilization of health services by household members. Illiteracy has been found to be a major predisposing factor to unemployment, poverty, low utilization of health services, taboos, self-medication, little or no insurance and increasing use of traditional medicine (Buor, 2004). Generally, the mean household size was found to be 6 ±2.4 persons. Households with 5 to 9 members constituted more than half of the sample (58.46%) while those with 10 or more household members were in the minority (11.29%). Across zones, North East had the largest household size representing about one fifth of the sample while South West had the highest number of households with less than 5 members (50.5 %). Although larger households were observed in the North, they may not utilize health services as much due to the higher illiteracy level in the Zone.

In general, the mean size of farm land was approximately 5 hectares which implies that majority of the rural dwellers are small holder farmers (86.14 %). Large scale farms (>10 hectares) were observed to be more in the North than in the Southern part of rural Nigeria with the highest average farm size recorded in North East (6 hectares). Also, a greater part of the sampled rural respondents owning land between 5 to 10 hectares or above 10 hectares were found in North central, North East and North West . This proportion of the sample was found to be marginally represented in the Southern zones. This result is expected as Northern zones have been shown to cover a greater land mass in Nigeria. Since land is the most productive asset for households in the rural areas, households owning more lands are expected to direct more of their resources to more sophisticated services. Hence, the fraction of the household budget allocated to health services may not necessarily increase with the ownership of more farmland given that most households in Nigeria prefer curative care to preventive medicine. About 61 % of the sampled respondents revealed farming as their main occupation while only 39 % were shown to be involved in other income generating activities while considering farming as a secondary source of income.

Table 2: Distribution of Households by Socioeconomic characteristics

	NC(%)	NE (%)	NW (%)	SE (%)	SS (%)	SW (%)	All (%)
Gender							
Male	51.85	52.05	51.91	47.30	50.16	49.38	50.97
Female	48.15	47.95	48.09	52.70	49.84	50.62	49.03
Age(years)							
<30	26.18	22.49	19.21	17.60	26.26	38.86	25.77
30-40	27.71	32.90	35.19	14.77	26.43	18.88	24.38
41-50	18.51	19.52	21.55	16.89	17.89	11.90	17.21
>50	27.60	25.09	24.05	50.75	29.42	30.36	32.64
Mean	41.1(±18.4)	41.0(±17.8)	41.3(±15.9)	49.7(±19.9)	41.5(17.7)	38.0(±22.4)	42.4(±19.4)
Male							
18-35yrs	49.89	48.00	41.84	45.70	52.20	39.69	46.41
>35yrs	50.11	52.00	58.16	54.30	47.80	60.31	53.59
Female							
18-35yrs	54.87	57.78	58.96	41.75	51.92	37.74	52.91
>35yrs	45.13	42.22	41.04	58.25	48.08	66.26	47.09
Marital Status							
Single	33.21	29.17	24.73	29.29	33.81	28.57	29.31
Monogamous	62.50	67.88	73.26	59.55	56.89	60.83	65.15
Polygamous	0.30	0.55	0.70	0.34	0.51	0.74	0.53
Divorced	1.15	1.00	0.61	0.83	2.57	3.18	1.29
Widowed	2.83	1.41	0.70	9.99	6.23	6.69	3.72
Educational level							
None	47.30	68.76	73.60	24.69	26.89	40.86	53.53
Vocational/ Commercial	0.06	0.05	0.07	0.33	0.30	0.12	0.13
Primary	35.17	20.18	19.51	45.76	43.82	37.46	30.09
Secondary	13.99	8.71	5.39	23.91	24.09	16.95	13.13
Tertiary	3.49	2.30	1.43	5.31	4.90	4.61	3.11
Household size							
1-4	27.23	23.77	25.14	38.69	38.35	50.5	30.26
5-9	60.52	59.4	60.72	57.07	55.67	46.94	58.46
≥10	12.25	16.83	14.14	4.24	5.98	2.56	11.29
Mean	6.1(±2.4)	6.5(±2.5)	6.3(±2.4)	5.39(±2.3)	5.3(±2.4)	4.6(±2.2)	5.9(±2.4)
Farm size(ha)							
<5	84.31	80.31	85.54	94.74	95.38	91.80	86.14
6-10	10.04	14.44	10.76	3.67	2.92	7.68	9.80
>10	5.66	5.25	3.69	1.60	1.70	0.53	4.06
Mean	3.3(±17.84)	6.0(±26.02)	4.5(±26.84)	5.6(±46.74)	5.0(±54.57)	1.95 (±2.0)	4.50 (±29.82)
Occupation							
Farming	61.39	72.37	77.56	64.14	56.27	50.59	61.26
Non-Farming	38.61	27.63	22.44	35.86	43.73	49.41	38.74

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively

Source: Computed from HNLSS data, 2009

4.2 Gender Analysis

A gender analysis is a methodical analytical procedure which is used to explain the relationship between women and men in term of access to productive resources, rights, responsibilities and the challenges they face relative to each other. The six domains of gender analysis framework developed by USAID's Interagency Gender Working Group(IGWG) are explored in this section. These domains are access to resources; knowledge, beliefs, and perception; practices and participation; time and space; legal rights and status; and power decision making. These domains were measured using the youth and adult population of the rural households. According to the Nigerian national youth policy(2009), a youth shall be considered as a male of female whose age falls in the range 18-35 years and are nationals of the Federal Republic of Nigeria.

4.2.1 Access to Resources

This domain focuses on gender differences in access to essential resources which are needed to be active and industrious actors in a society. In conceptualizing this domain, the study considered access to credit, labour force participation and asset ownership of the rural households.

4.2.1.1 Access to credit

Although there is a low level of access to credit in rural Nigeria (Table 3), female youths and adults have been shown to be more disadvantaged and are about 6% and 4 %, respectively less likely to obtain credit than male youths and adults (Table 3). Data from the NBS (2009) which established that women are twice less likely to obtain loans when compared to men lends more credence to this finding. Similar distribution was noticed across the zones with the greatest gender disparity in access to credit observed in North West (12.2 % and 14.8% for youths and adults, respectively). Significant gender differences were found in all the zones except in North Central and North East.

The evidence shows that credit markets in Nigeria are not in the slightest gender neutral. The wide gender gap and low credit utilization are increasingly becoming a matter of great concern as lack of access to credit impedes the ability to make upfront investments which are needed to boost productivity and increase farmers' income. Limited access of rural women to finance have been found to limit their abilities to harness non-agricultural or nonfarm opportunities (Izugbara, 2008). This situation arises as many commercial banks in Nigeria deny women loans due to lack of collateral (usually landed property), and even in cases where women own land, they demand that their husbands be used as guarantors before they are considered (Bonat,2005).

Table 3: Percent distribution of households based on access to credit

	18-35yrs (%)		> 35yrs (%)			
	Male	**Female**	**P-Value**	**Male**	**Female**	**P-Value**
ALL	8.07	2.37	0.000***	11.32	7.28	0.000
NC	6.57	3.53	0.306	7.54	9.02	0.596
NE	3.25	2.08	0.608	4.48	3.85	0.839
NW	14.36	2.17	0.022**	14.81	0.00	0.057*
SE	5.17	2.13	0.252	12.14	8.62	0.084*
SS	3.69	7.61	0.047**	11.44	6.82	0.014**
SW	9.14	0.00	0.000***	15.73	6.43	0.001***

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively

Source: Computed from HNLSS data, 2009

The gender gap in access to credit is further established by other evidences. Results from Table 4 show that majority of the adult females depend largely on informal sources (local lenders, Esusu, fellow traders, friends e.t.c) for their credits with only about 6.9 % (as opposed to 12.9 % for male adults) receiving loans from the formal financial sector (deposit money Banks). This finding corroborates the work of Halkias *et al. (*2011), who revealed that women entrepreneurs have not received sufficient supports from formal financial institutions and this act has been shown to be more evident among commercial banks. However, a contrasting result was obtained for the female youths who were found to be more represented than their male counterparts in terms of getting loans from formal sources (Deposit banks and Microfinance institutions).There were no credit records for female youthsin South West and North East and the only significant gender difference in terms of the different sources of loan was observed in South East for household members older than 35 years.

Table 4: Distribution of households by sources of loan

	Source of loan						P-Value
	Deposit Money Banks (%)	Microfinance institutions (%)	Esusu (%)	Local lenders (%)	Relative /friend/ neighbour (%)	Others (%)	
ALL 18-35yrs							
Male	6.67	0.00	26.67	0.00	53.33	13.33	
Female	12.05	3.61	4.82	8.43	54.22	16.87	0.085
>35yrs							
Male	12.90	2.15	16.85	3.58	47.31	17.20	
Female	6.90	1.15	20.69	5.75	37.93	27.59	0.123
NC 18-35yrs							
Male	46.15	7.69	-	-	46.15	0	
Female	33.33	0.00	-	-	33.33	33.33	0.191
>35yrs							
Male	48.15	3.70	11.11	0.00	22.22	14.81	
Female	18.18	0.00	0.00	9.09	54.55	18.18	0.131
NE 18-35yrs							
Male	-					100.00	
Female	-					-	
>35yrs							
Male	37.50			25.00		37.50	
Female	100.00			0.000		0.000	0.495
NW 18-35yrs							
Male	0.00			100.00		0.00	
Female	3.45			82.76		13.79	0.902
>35yrs							
Male	3.64	1.82	1.82		72.73	20.11	
Female							
SE 18-35yrs							
Male		20.00		80.00			
Female		50.00		50.00			0.427
>35yrs							
Male	4.29	2.86	20.00	2.86	64.29	5.71	
Female	0.00	3.03	33.33	0.00	36.36	27.27	0.009***
SS 18-35yrs							
Male	5.56	5.56	11.11		50.00	27.78	
Female	0.00	33.33	0.00		55.56	11.11	0.248
>35yrs							
Male	4.35	1.45	34.78	5.80	37.68	15.94	
Female	0.00	0.00	23.08	11.54	42.31	23.08	0.577
SW 18-35yrs							
Male	25.00		12.50	31.25	12.50	18.75	
Female	-						-
>35yrs							
Male	24.00	2.00	10.00	8.00	26.00	30.00	
Female	18.75	0.00	6.25	6.25	25.00	43.75	0.925

Others include loans obtained from trader, farmers and business firms;*** =significant at 1%

Source: HNLSS data, 2009, author’s calculation

Also, Table 5 shows that the volume of the loan received by majority of the rural households was less than ₦80,000 with the male adultsrecording the highest average amount of credit (₦78,776). Significant pro-male bias in terms of volume of loan received was observed among the youths and adults in rural Nigeria with the greatest gender gap observed among the adults (₦34,456). This implies that more females (youths and adults) were micro-loan borrowers and this is expected to have serious implications on their health expenditures. In all the geopolitical regions, similar gender pattern was observed in North West and South South among the youths and in North Central among the adults. The gender disparity was more striking in North central where the loan gap was about ₦91,000. This result is not surprising as gender discrimination, in terms of more stringent gender values and norms, is more pronounced in Northern Nigeria where women are scarcely allowed to participate in activities "outside the kitchen and the other room".

Table 5: Distribution of households by volume of loan received

	Average volume of loan (₦)	Difference
ALL 18-35yrs		18,478.97*
Male	37,780.30	
Female	19,301.33	
>35yrs		
Male	78,776.38	36,456.03*
Female	42,320.35	
NC 18-35yrs		
Male	58,175.00	23,175
Female	35,000.00	
>35yrs		
Male	106,700.00	91,063***
Female	15,636.36	
NE 18-35yrs		
Male	5,005.00	
Female	-	
>35yrs		
Male	63,060.00	
Female	-	
NW 18-35yrs		18,093***
Male	19,093.1	
Female	1,000.00	
>35yrs		
Male	19,160.19	
Female	-	
SE 18-35yrs		
Male	10,200.00	-2,300
Female	12,500.00	
>35yrs		
Male	101,946.5	71,571.48
Female	30,375	
SS 18-35yrs		
Male	67,391.67	49,778.33*
Female	17,613.33	
>35yrs		
Male	72,639.99	27,304.8
Female	45,335.19	
SW 18-35yrs		
Male	37,806.25	
Female	-	
>35yrs		
Male	107,910.00	36,476.67
Female	71,433.33	

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively

Source: Author's computation from HNLSS data, 2009

4.2.1.2 Labour Market Participation

Access of rural households to non- farm employment has been found to guarantee stable streams of income which ordinarily is subject to wide variation due to rain-fed agriculture widely practiced in Nigeria. With additional wage income, rural population are better able to cushion their consumption against income variability, predict their income streams with utmost precision, and have access to loan. However, evidence showing that Nigeria's Labour market is highly gendered is well documented (UNAIDS, 2012; Bonat, 2005; BCN, 2012). For the pooled data, 10.1 % of the male household members had a wage employment while this was only 6.3% for the female members (Table 6). The gender wage gap for the pooled data was found to be 16.5%. In other words, women earn 83.5 % of every one naira received by men. Similarly, male dominance was observed in all the zones with the greatest gender disparity witnessed in North East (32.5 %). Following age disaggregation, for both youth and adult categories, males were seen to have higher labour market participation than females. This was however only significant for the rural adults. The proportion of males with wage employment was 28% higher than that of the females for the rural youths while the corresponding figure for adult males was more than double (51%) that of the females. The gender wage gap estimates for the age groups 18-35 years and >35years show that female youths and adults earned 16.0 % to 13.7%,respectively less than men. Higher male participation in labour market was observed in all the zones and age categories except inNorth East and North Central where there was no record of female earnings from wage employment.

An important part of the gender pay gap is that women and girls may be less likely to utilize health services as expenditures have been shown to be influenced by people's health needs and their capacity to pay. Upon reporting being sick, women in many parts of Africa are finding it increasingly difficult to pay for health care services, particularly in cases where incomes within the households are not combined or are only partly pooled (Haddad *et al.*, 1997).

Table 6: Distribution of households based on their labour market participation and average earnings

	Male	Female	Difference
Age 18-35 yrs			
ALL	**2.88**	**2.27**	**0.61**
	5221.1(±339.9)	4391.4(±631.3)	829.7
NC	**1.64**	**2.10**	**-0.46**
	6457.5(±695.9)	-	-
NE	**6.18**	**8.68**	**-2.5**
	5420(±1267.4)	**-**	-
NW	**0.93**	**0.34**	**0.59**
	5627.0(±812.9	1500	***
SE	**2.13**	**1.82**	**4.6**
	3900.0(±638.8)	4389.0(±823.2)	-489.0
SS	**5.18**	**0.00**	**5.18*****
	4086.4(±645.4)	4858(±1185.7)	-772.4
SW	**0.00**	**3.70**	**-3.70**
	-	-	-
Age >35yrs			
ALL	**2.94**	**1.95**	**0.99*****
	5487.7(±290.7)	4737.7(±424.8)	750.0
NC	**0.72**	**1.31**	**0.59**
	5943.1(±697.8)	4777.0(±1318.1)	1181.1
NE	**9.06**	**8.06**	**1.06**
	4147.4(±1199.2)	7680.0 (±434.9)	3532.6***
NW	**0.95**	**0.37**	**0.58**
	5977.7(±432.5)	7300.0(±1054.5)	1322.3
SE	**2.28**	**1.38**	**0.9**
	5563.6(±820.3)	3967.3(±508.3)	1596.4*
SS	**2.91**	**1.28**	**1.63****
	4779.1(±5836)	3435(±798.0)	1344.1
Pooled age (18-64)			
ALL	**10.07**	**6.27**	**3.80*****
	4780.6(±300.6)	3990.1(±355.3)	790.5
NC	**9.05**	**4.83**	**4.22*****
	5294.1(±836.5)	5700(±916.5)	-405.9
NE	**8.92**	**4.74**	**4.18*****
	4515.8(±900)	3670(±2970)	845.8
NW	**7.26**	**4.93**	**2.33*****
	5262.3(±538.7)	3295.3(±1107.3))	1967
SE	**12.71**	**8.91**	**3.8*****
	4447.1(606.5)	3809.6(±375)	637.5
SS	**16.30**	**10.34**	**5.96*****
	4025(±608.3)	3701.7(±916)	323.3
SW	**9.25**	**5.11**	**4.14*****
	-	-	

Figures in bold represent labour force participation while figures not in bold represent average earnings of the household members; Figures in parenthesis are standard deviations;***, ** and*= Significant at 1%, 5% and 10% levels, respectively

Source: Author's computation from HNLSS data, 2009

4.2.1.3 Access to and Ownership of Assets

In rural Nigeria, which is basically agrarian, land remains largely a principal productive asset. Agricultural activities hinge primarily on access to land and control over it is believed to be a measure of an individual's power, wealth or status (SOFA Team, 2011). There is striking evidence on the existence of gender inequalities in terms of access to land in rural Nigeria. The structure of land access in rural Nigeria shows that whereas almost all the female youths (99%) have access to farm lands below 10 hectares in size, approximately 97 % of the males are in this category. The distribution in terms of access to land was found to be similar among the adults (98% versus 97 % for male and female, respectively). The proportion of the rural households having access to land greater than or equal to 10hectares was shown to be less than 4% for both adults and youths, though access was still observed to be higher for males (Table 7). Gender disparity in house ownership by rural dwellers was however noted to be significant among the adults. While 80%of those who own a house were male adults, only 20 % of women were in the category.

Regional differences were also observed as youths and adults in the North were seen to have more access to land than their counterparts in the south and access was found to be virtually higher for males. This result is not unexpected as the North occupies about 80 % of the total land mass in Nigeria. Also, wide gender gap was noticed in all North Central, South South and South West with the highest significant difference observed in North Central, where only 20% of those who own a house were female adults. These data are consistent with evidence reported by BCN (2012) which established that although subsistence agriculture and non-farm activities are mainly female dominated, women are five times less likely than men to own land. In Nigeria,for example, a large percentage of women do not own a land or a house (85% and 82%, respectively (NPC and ICF, 2014)). The large discrepancies observed in land access and ownership in Nigeria is as a result of the patrilineal system of land inheritance widely practiced in Nigeria which only allows men to pass land titles to their male descendants. Without land titles, a precursor for credit access, it becomes difficult for women to raise finance needed to take advantage of productive but more expensive technologies which can bring about higher agricultural output and food. Financial emancipation constitutes an important component of any women's empowerment initiation (BCN, 2012). Limited access to credit will definitely have far reaching consequences on the health seeking behaviour of women.

Table 7: Percentage distribution of households based on their access to land and house ownership

	Access to land (%)	P-value	Average land size (ha)			Own house	P- Value
			<10	≥10	P-Value		
ALL 18-35yrs							
Male	81.77		96.69	3.31		63.64	0.553
Female	68.31	0.000***	99.00	1.00	0.002***	35.36	
>35yrs							
Male	85.94		97.18	2.82		79.72	0.000***
Female	72.80	0.000***	98.33	1.67	0.003***	20.28	
NC 18-35yrs							
Male	85.57	0.001***	93.43	6.57	0.284	71.61	0.921
Female	74.42		96.12	3.88		28.39	
>35yrs							
Male	86.23	0.000***	94.61	5.39	0.021**	82.24	0.008***
Female	65.56		97.99	2.01		17.76	
NE 18-35yrs							
Male	92.35	0.223	96.02	3.98	0.014**	71.78	0.843
Female	89.54		100.00	0.00		28.22	
>35yrs							
Male	92.17	0.000***	95.46	4.54	0.017**	94.40	0.273
Female	85.39		999.00	1.00		5.60	
NW 18-35yrs		0.000***					
Male	91.84		98.96	1.04	0.316	81.86	0.282
Female	77.78		100.00	0.00		18.14	
>35yrs		0.597					
Male	91.42		99.08	0.92		92.21	0.611
Female	90.20		98.66	1.34	0.598	7.79	
SE 18-35yrs							
Male	92.41	0.307	99.07	0.93	0.943	58.27	0.275
Female	89.09		98.98	1.02		41.73	
>35yrs							
Male	95.58	0.486	97.97	2.03		73.85	0.254
Female	96.18		97.65	2.35		26.15	
SS 18-35yrs							
Male	51.81	0.244	98.50	1.50	0.475	56.54	0.050*
Female	47.56		99.29	0.71		43.46	
>35yrs							
Male	71.34	0.000***	98.96	1.04	0.741	78.74	
Female	62.30		99.14	0.86		21.26	0.015**
SW 18-35yrs							
Male	50.12	0.003***	97.38	2.62	0.475	44.98	0.000***
Female	29,09		100.00	0.00		55.02	
>35yrs							
Male	59.92	0.000***	98.91	1.09	0.763	62.91	0.009***
Female	36.02		98.62	1.38		37.09	

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively

Source: Author's computation from HNLSS data, 2009

4.2.2 Knowledge, Beliefs and Perception

The core of this domain lies in determining whether men and women have equal education or knowledge in areas required for successful entrepreneurship. It is also concerned with whether there is gender neutrality in people's understanding of and their access to markets which are responsible for the services or output they produce. These were covered in the study through a careful examination of the educational level of the rural household member, their professional association as well as their participation in microenterprise development programme. An analysis of the educational status of the household members (Table 8) shows that about 56 % of the female adults had no form of education while the corresponding figure for the males was 42%. Regardless of the sex, an almost equal distribution in terms of no formal education was observed among the youths. With the exception of those with tertiary education, educational attainment was higher for the rural female youths, though this relationship was shown to be insignificant. However, male dominance was observed as investment in education increases for rural adults in Nigeria. The result also revealed that level of literacy was higher among the youths than the adults especially at the secondary school level. This may be as a result of the several initiatives by the federal government to make education more attractive particularly at the grassroots. As a result enrolment and completion rate have been shown to increase in the last two decades.

Significant internal regional disparities were noticed in all the zones except in North East and North West. Illiteracy level in Northern regions was significantly higher and when compared to that of the South and in all the zones, there were more uneducated female adults and youths than males. Tertiary education attainment was greatest in South South and South East for adult males (15.9%) and youth females (9.8%), respectively.Also, the level of literacy was higher among rural women in the South than in the North and this may be as a result of cultural and religious extremities in the region which restricts females' involvement in activities outside the home. Although gender gap was narrower in primary schools, secondary schools and tertiary institution completion across the zones, significant disparity still exists in illiteracy level in rural Nigeria.

Gender inequality in educational levels is of significant importance as it has been shown to affect a number of wellbeing and economic variables such as health, malnutrition, technology adoption and employment opportunities, all of which ultimately affect incomes of households and the economic growth of a given country (SOFA Team,2011). Wide gender disparity in educational attainment has serious implication. For example, female education has significant positive impact on child mortality reduction and nutritional outcomes, a strategy which is more effective than increasing public health spending on health.Cutler and Lleras-Muney (2011) revealed that an extra year of education reduces five-year mortality by 0.45percent, reduces the incidence of heart related disease by 0.54 percent and the threat of diabetes disease by 0.33 percent. The authors also presented data that showed that the more educated are less likely to suffer from most widespread chronic and severe illnesses like emphysema, stroke, heart disease, diabetes, ulcer, asthma, hypertension, high cholesterol and asthma. Educated women have higher tendencies of utilizing health care services, have less and healthier children who are better able to survive childhood diseases and disorders(BCN,2012). If the effect of education on health is this enormous, what then happens to the health status of rural women who have been shown to have much lower level of education than men? What will be the fate of children raised by this category of women who are in the great majority?

Participation in microenterprise development programme had more female representation for both youth and the adult categories. This reason for this outcome is not far-fetched as a large percentage of microenterprises programmes are undertaken by women e.g soap making, tie and dye, bead making, mat weaving et.c (Bonat, 2005). Table 8 also shows that professional association, a precondition for wider access to resources and increased market share, was highly male dominated for youths and adults. There were almost thrice as many male youths in professional association as there were women in this age group. Also across the zones, similar patterns were seen to emerge.

Table 8: Percent distribution of households by their educational status and involvement in entrepreneurial training

	Educational Level					Micro prog	P-Value	Professional ass.	P-Value
	None	Primary	Secondary	Tertiary	P-Value				
ALL 18-35yrs									
Male	30.90	24.81	36.39	7.90		0.18	0.004***	12.12	0.004***
Female	29.69	28.04	36.88	5.40	0.126	0.40		3.36	
>35yrs									
Male	42.24	32.93	18.47	11.37	0.000***	0.19	0.000***	12.13	0.005***
Female	56.13	28.81	8.23	6.83		0.36		2.88	
NC 18-35yrs									
Male	35.68	21.13	30.99	12.21		0.25		11.31	0.476
Female	49.41	27.06	21.18	2.35	0.007***	0..27	0.932	0.00	
>35yrs									
Male	53.28	18.25	16.09	13.38	0.000***	0.08	0.834	11.05	0.542
Female	75.41	13.93	5.74	4.92		0.09		0.00	
NE 18-35yrs									
Male	68.29	13.82	13.82	4.07		0.27		10.00	0.638
Female	73.33	13.33	8.89	4.44	0.855	0.00	0.512	0.00	
>35yrs									
Male	76.49	10.82	4.10	8.58	0.421	0.15	0.234	11.83	-
Female	75.00	17.31	3.85	3.85		0.00		-	
NW 18-35yrs									
Male	65.28	17.10	15.54	2.07	0.255	0.13	0.675	11.81	
Female	80.00	11.11	6.67	2.22		0.00		-	-
>35yrs									
Male	73.77	14.81	6.23	5.19	0.728	0.14	0.012**	10.00	
Female	80.95	14.29	4.76	0.00		0.49		0	-
SE 18-35yrs									
Male	6.09	43.48	40.00	10.43	0.002***	0.81	0.233	9.52	0.222
Female	16.30	20.65	53.26	9.78		1.36		2.94	
>35yrs									
Male	28.42	53.60	9.76	8.22	0.000***	0.57	0.576	8.00	0.318
Female	53.95	29.74	7.89	8.42		0.50		2.94	
SS 18-35yrs									
Male	7.20	28.24	53.60	10.95	0.e004**	0.02	0.000***	1.89	
Female	12.03	35.68	47.30	4.98	*	0.40		9.21	0.072*
>35yrs									
Male	16.89	43.32	23.94	15.86		0.13	0.002***	10.19	0.096*
Female	44.76	38.87	11.00	5.37	0.000***	0.36		2.33	
SW 18-35yrs									
Male	24.14	26.14	45.40	4.02	0.372	0.15	0.606	4.17	0.064*
Female	27.04	30.19	36.48	6.29		0.09		19.47	
>35yrs									
Male	40.65	32.34	12.46	14.54	0.000***	0.15	0.003***	19.77	0.092*
Female	61.85	22.49	6.83	8.84		0.35		4.76	

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively

Source: Author's computation from HNLSS data, 2009

4.2.3 Practices and Participation

Practices and participation domain of gender analysis considerswhat people do and how it varies by gender roles and responsibilities. It raises a question as to whether men and women engage differently in development activities. The activities covered in this section are training participation and involvement in public work or employment programmes. Results from Table 9 show that male youths and adults were 0.12% and 0.06%,respectivelymore likely to be involved in public work or employment programme than their female counterparts. Similarly, participation in training programmes had more male representation, although female adults were seen to be in the majority when the type of training received was formal.

The distribution of youths and adults in development activities was observed to vary across the geopolitical zones. However, low level of participation was seen in all the regions with the highest participation rate found in North West (2.0 % and 1.9 % for male and female, respectively). In general, Table 9 shows that the youths were more involved in training activities and public work than the adults. This may be as a result of their relative strength and dynamism characteristic of their age. By implication, they may be better able to withstand the thoroughness and rigours which accompany sometrainingactivities. Participation in training and other such activities creates avenues for households to generate more income with attendant effect on their health seeking behaviour.Hence, the need to provide more training opportunities for rural households.

Table 9: Percent distribution of households based on their participation in Development Activities

	Public work/employment programme		Training participation				
	(%)	P-Value	Received Training	P-Value	Formal	Informal	P-Value
ALL 18-35yrs							
Male	0.89	0.517	9.86	0.001***	18.65	81.35	0.520
Female	0.77		7.92		14.29	85.71	
>35yrs							
Male	0.69	0.469	9.10	0.000***	20.38	79.62	0.083*
Female	0.63		7.77		26.09	73.91	
NC 18-35yrs							
Male	0.72	0.000***	11.73	0.125	35.16	64.84	0.144
Female	3.06		8.85		0.000	100.00	
>35yrs							
Male	0.56	0.548	10.75	0.071*	21.88	78.13	0.557
Female	0.45		9.37		16.67	83.33	
NE 18-35yrs							
Male	0.32	0.432	8.78	0.466	16.13	83.87	0.329
Female	0.00		7.32		0.00	100.00	
>35yrs							
Male	0.35	0.400	7.75	0.717	21.90	78.10	0.455
Female	0.54		8.11		0.00	100.00	
NW 18-35yrs							
Male	2.42	0.009***	11.19	0.306	10.45	89.55	
Female	6.31		8.11		-	-	
>35yrs							
Male	1.49	0.000***	10.59	0.206	16.48	83.52	0.764
Female	4.25		9.06		12.50	87.50	
SE 18-35yrs							
Male	0.61	0.561	7.65	0.961	12.00	88.00	0.202
Female	0.86		7.58		30.00	70.00	
>35yrs							
Male	0.53	0.885	7.56	0.222	23.17	76.83	0.556
Female	0.51		6.99		26.76	73.24	
SS 18-35yrs							
Male	0.11	0.943	5.94	0.462	22.22	77.78	0.242
Female	0.11		5.34		0.00	100.00	
>35yrs							
Male	0.29		5.06	0.423	26.53	73.47	
Female	0.50	0.069*	4.73		16.67	83.33	0.401
SW 18-35yrs							
Male	0.36	0.258	11.19	0.772	9.88	90.12	
Female	0.12		10.85		18.18	81.82	0.406
>35yrs							
Male	0.37	0.448	11.01	0.037**	19.32	80.68	
Female	0.46		9.93		34.43	65.57	0.016

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively

Source: Author's computation from HNLSS data, 2009

4.2.4 Time and Space

This domain reflects gender disparities in the availability and apportionment of time. It is concerned with how and where time is spent as well as bringing to the fore the contribution of men and women to the wellbeing of the family, community and the society at large. This gender domain makes a distinction between the productive (production) and reproductive (reproduction) roles of men and women. Table 10 shows that a higher proportion of males in the rural areas (both youths and adults) were involved in agriculture and other income generating activities while the rural women were observed to spend significantly more time on reproductive activities which involve the care and maintenance of the households and its members. The results alsoreveal that the youths dedicated more hours to reproductive activities than the adults. This is so given that the age bracket also include unmarried individuals who may still be leaving with their parents and as a matter of obligation, they are expected to participate more in household chores and other related activities. It is therefore not surprising that the adults participated more in agriculture and other income generating activities than the youths as they have at their disposal extra time to participate in more productive undertakings. It should however be noted that even among the youths, female have been shown to spend significantly more time on reproductive activities.

Stark gender discrepancies in time allocation between reproductive and productive works were also apparent in all the geopolitical zones. Although both males and females are almost equally likely to be involved in productive activities, women tend to be more involved in care and maintenance of the household (March *et al.*, 1999). By implication, the pattern of females' time commitments moderates their availability for income activities and engenders involuntary preference for low quality and poorly paid jobs. This gender norm coupled with asset complementarity problems (limited access to land which reduces access to credits as well as purchased inputs), reduce rural women's contribution to household cash income. Consequently their ability to influence spending at the household level is restrained thereby making the decision to purchase health services to be mostly dependent on the man. This therefore puts at risk the utilization of health services by women. However, in situations where women decide to combine involvement in informal economy with active participation in productive activities (including frequent travels or working at anti-social hours), their workload may be increased to an unsustainable level which may have far reaching consequences on their health as well as the wellbeing of their families.

Table 10: Distribution of households based on time allocation to reproductive and productive activities

	Productive Activities (%)				Reproductive activities (hrs)	P-Value
	Agriculture	P-Value	Income Activity	P-Value		
ALL 18-35yrs						
Male	68.47		13.67		7.31(±2.8)	0.000***
Female	42.02	0.000***	8.14	0.000***	9.89 (±3.8)	
>35yrs						
Male	81.66	0.000***	7.50	0.000***	6.59(±2.2)	
Female	66.50		14.01		8.82(±3.1)	0.000***
NC 18-35yrs						
Male	73.81	0.000***	13.94	0.066*	7.0 (±2.1)	0.000***
Female	39.51		6.17		10.07(±3.2)	
>35yrs						
Male	80.15	0.000***	16.42	0.024**	6.10(±1.35)	0.000***
Female	37.29		8.20		9.20(±2.7)	
NE 18-35yrs						
Male	86.78	0.000***	15.70	0.240	7.78 (±2.4)	0.011**
Female	23.91		8.70		9.29(±3.8)	
>35yrs						
Male	93.89	0.000***	9.62	0.394	7.28(±2.1)	
Female	30.00		5.88		9.06(±2.8)	0.000***
NW 18-35yrs						
Male	92.55	0.000***	6.91	0.647	8.1(±3)	0.000***
Female	20.45		8.89		10.62(±4.1)	
>35yrs						
Male	89.79	0.000***	8.66	0.169	7.30(±2.6)	
Female	40.00		0.00		9.71(±3.1)	0.000***
SE 18-35yrs						
Male	59.29	0.103	12.39	0.241	7.52(±2.6)	0.000***
Female	70.21		7.45		6.61(±2.1)	
>35yrs						
Male	85.22	1.000	11.21	0.049**	10.32(±3.5)	0.000***
Female	85.22		7.37		9.22(±3.2)	
SS 18-35yrs						
Male	56.14	0.024**	19.94	0.003***	6.93(±3.4)	0.000***
Female	46.61		10.73		9.8(±4.4)	
>35yrs						
Male	73.28	0.774	21.20	0.000***	6.30(±2.6)	0.000***
Female	72.47		9.16		8.40(±3.5)	
SW 18-35yrs						
Male	53.22	0.000***	5.26	0.387	7.08(±2.1)	0.000***
Female	30.46		7.65		9.64(±3.0)	
>35yrs						
Male	75.15	0.000***	11.18	0.022**	6.20(±1.6)	0.000***
Female	51.84		5.71		8.54(±2.2)	

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively

Source: Author's computation from HNLSS data, 2009

4.2.5 Legal Rights and Status

Here, the legal right and status domain only covers political participation and ownership of durable assets which was evaluated in terms of expenditure made in the last 12 months during the reference period. The latter category considers whether women and men are equally likely to be owners of durable assets which are important indicators s of household welfare, economic conditions and living standards. (e.g. land, house, stove,livestock e.tc). Although at varying levels and virtually consistent across zones in rural Nigeria, significant gender differences exist in terms of the purchases on household durable assets (Table 11). Significant pro male bias (₦12,324 against ₦10,748) was noticed in terms of large investment expenditure in rural households in Nigeria among the adults. Although the reverse was observed among the youths, the relationship was however shown to be insignificant. Similar significant gender differences were also observed in North West, North Central and South South with the greatest difference observed in North West with a gender gap of ₦7,403. This outcome further validates the male super-ordinate and female subordinate typecasts in asset ownership in rural Nigeria.

Though political participation was found to be minimal for both youths and adults in rural Nigeria, the study area still had more male ascendency in politics. Also similar pattern in political participation was noticed following regional analysis and this relationship was only shown to be significant among adults in South East and youths in South South. In both cases, males were seen to be more into politics than female. The highest significant level was found in South East, where the number of adult males involved in politics was more than double that of the females. The underrepresentation of women in politics is disturbing given the overwhelming number of women voters in Nigeria. For example, it has been observed that politicians in Nigeria have failed to recognise the central position of women in politics despite the overwhelming number of women voters (Mahdi, 2011). The marginal participation of rural women in politics typifies lower representation of their interest at all levels especially in areas where crucial resources are allocated.

Table 11:**Property ownership and political participation**

`	Expenditure on Durable asset(₦)	Mean Difference	Political participation (%)	P-Value
ALL 18-35yrs				
Male	11,538.31		16.23	
Female	11,642.22	-103.91	13.02	0.076*
>35yrs				
Male	12,323.84		13.42	
Female	10,748.24	1575.60***	9.51	0.001***
NC 18-35yrs				
Male	12,414.89		13.79	0.544
Female	14,253.45	-1,838.56	11.11	
>35yrs				
Male	13,815.88		15.82	
Female	10,890.28	2,925.60***	12.61	0.391
NE 18-35yrs				
Male	13,130.79		21.82	
Female	11,078.9	2,057.90	17.07	0.521
>35yrs				
Male	12,079.3		13.58	
Female	10,664.06	1,415.24	8.33	0.319
NW 18-35yrs				
Male	11,539.5		21.82	
Female	12,994.49	-1,454.99	17.07	0.521
>35yrs				
Male	14,117.14		17.98	
Female	6,713.4	7,403***	15.79	0.808
SE 18-35yrs				
Male	9,872.73		8.26	0.930
Female	10,036.22	-163.49	8.60	
>35yrs				
Male	10,629.19		8.39	
Female	10,241.12	388.06	3.81	0.006***
SS 18-35yrs				
Male	12,068.89		15.44	
Female	11,881.91	186.98	9.95	0.071*
>35yrs				
Male	12,376.71		11.74	
Female	10,076.63	2300.08***	10.76	0.652
SW 18-35yrs				
Male	10,159.97		14.37	
Female	10,835.21	675.24	19.74	
>35yrs				0.202
Male	12,277.06		16.92	
Female	12,578.26	-301.20	14.58	0.453

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively

Source: Author's computation from HNLSS data, 2009

4.2.6 Power and Decision Making

This domain details gender differences in making household and individual economic decisions as well as the use of economic resources, income, and choice of employment. Gender analysis is centred on decision making. Thus, this domain happens to be the focal point of gender analysis as it clearly shows the channel through which gender differentiation takes place. Traditionally, especially in Africa, men are expected to direct, influence and control household resources while providing the needed resources to meet their household needs. Women on the other hand are being culturally conditioned to provide support needed to keep the household running. Since the study is aimed at establishing gender differentials in health care expenditures in rural Nigeria, this section therefore seeks to know who picks up health expenditure bills as well as ascertain whether age has any correlation with taking up household responsibilities. What percentage of health care expenditures is paid by male and female household members and how does this vary by educational attainment and occupation of the young and adult members of the households?

The above concerns were addressed from the results on Tables 12-14. Significant pro-male bias exists in the ability to influence and control rural households' resources in making decisions on health (Table 12). For both the young and adults, health decisions were taken more by the males than the females. Gender discrepancies in health decisions were more pronounced in northern regions where females' representations were very low. The ability to purchase health resources was also shown to be higher for adult males and females.

Table 12: Distribution of households based on control over household resources

	Expenses on health(%)	P-Value	Proportion of total health expenditure
ALL 18-35yrs			
Male	67.33	0.002***	0.07
Female	32.67		0.04
>35yrs			
Male	65.44	0.115	0.66
Female	34.56		0.23
NC 18-35yrs			
Male	888.24	0.496	0.21
Female	11.76		0.00
>35yrs			
Male	73.17	0.193	0.67
Female	26.83		0.12
NE 18-35yrs			
Male	90.91	0.094*	0.00
Female	9.09		0.00
>35yrs			
Male	82.76	0.980	0.86
Female	17.24		0.14
NW 18-35yrs			
Male	60.00	0.067*	0.00
Female	40.00		0.04
>35yrs			
Male	100.0		0.96
Female	0.00	0.003***	0.00
SE 18-35yrs			
Male	43.75	0.257	0.04
Female	56.25		0.03
>35yrs			
Male	51.41	0.277	0.56
Female	48.59		0.36
SS 18-35yrs		0.007***	
Male	65.22		0.08
Female	34.78		0.06
>35yrs			
Male	61.79	0.200	0.64
Female	38.21		0.22
SW 18-35yrs			
Male	66.67	0.016**	0.07
Female	33.33		0.01
>35yrs			
Male	72.07	0.032**	0.76
Female	27.93		0.16

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively

Source: Author’s computation from HNLSS data, 2009

The result on Table 12 shows that adult males had the highest share (66%) of the total medical expenditures of the rural households. Adult females were seen to be next to the adult males (23%) in terms of their contribution to health care expenditures while the young females were marginally represented(4%). Significant gender differences were also observed in the zones as rural women (young and adult) in the South were more likely to make health care decisions than their Northern counterparts, though men were seen to be in the majority in all the zones. This outcome may be linked to the higher literacy level observed among the rural males in the south which allows the female to have some leverage in making household decisions (Table 8). Educational level has been shown to increase influence on health decisions in the households with the exception of adult females whose share of health care expenditures appear to decrease with increase in their level of education (Table 13). This may be due to the fact that majority of the adult females, regardless of their educational attainment, are still being conditioned by social and cultural norms which requires that men be responsible for the control of household resources.

Table 13: Contribution to health expenditure based on educational level

	Educational Level			
	None	Primary	Secondary	Tertiary
ALL 18-35yrs				
Male	0.017	0.056	0.195	0.194
Female	0.027	0.059	0.232	0.033
>35yrs				
Male	0.482	0.666	0.401	0.670
Female	0.444	0.193	0.134	0.103
NC 18-35yrs				
Male	0.118	0.203	0.815	0
Female	0.021	0.078	-	0
>35yrs				
Male	0.607	0.680	0.185	0.102
Female	0.253	0	0	0.898
NE 18-35yrs				
Male	-	0.180	-	0
Female	0.055	0	-	0
>35yrs				
Male	0.930	0.246	-	1.00
Female	0.043	0.575	-	0
NW 18-35yrs				
Male	0.043	0.070	0.393	-
Female	0.052	0	-	-
>35yrs				
Male	0.770	0.676	0.607	-
Female	0.134	0.220	-	-
SE 18-35yrs				
Male	0.003	0.052	0.211	0.217
Female	0.011	0.004	0.477	0.047
>35yrs				
Male	0.436	0.691	0.163	0.693
Female	0.502	0.221	0.148	0.134
SS 18-35yrs				
Male	0.002	0.032	0.170	0.347
Female	0.038	0.075	0.084	0.044
>35yrs				
Male	0.306	0.727	0.589	0.536
Female	0.621	0.166	0.158	0.073
SW 18-35yrs				
Male	0.011	0.047	0.277	0.132
Female	0.029	0.300	0.284	0
>35yrs				
Male	0.516	0.364	0.434	0.868
Female	0.428	0.180	0.005	0

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively. Vocational training as an educational level was excluded because there was no record of individuals with such educational acquisition contributing to household health expenditure.

Source: Author’s computation from HNLSS data, 2009

Based on occupation, percent contribution to health care expenditures among non-agricultural households was observed to be highest for adult males and least for the male youths (Table 14). For the agricultural households,the percent contribution to household expenditures was highest among the young males (76.7%) while the corresponding figure for the female youths in non-agricultural households was 60.3%. For those who were famers, the male youths and adults accounted for the largest share of health care expenditures. Whereas males had the largest part of health care decisions for adults, health care decisions were dominated by young females in the non- agricultural households. Significant gender differences were only noticed in the southern zones.

Table 14: Contribution to health expenditures based on occupation

	Agricultural Households			Non-Agricultural Households		
	Percent contribution	P-Value	Proportion of THEX	Percent Contribution	P-Value	Proportion of THEX
ALL 18-35yrs						
Male	76.71		0.057	39.68	0.023**	0.099
Female	23.29	0.065*	0.046	60.32		0.153
>35yrs						
Male	68.83	0.117	0.612	57.31	0.872	0.461
Female	31.17		0.284	42.69		0.287
NC 18-35yrs						
Male	-	-	0.208	75.00	0.540	0.025
Female	-		0	23.00		0.209
>35yrs						
Male	86.96		0.717	50.00	0.596	0.185
Female	13.04	0.171	0.075	50.00		0.540
NE 18-35yrs						
Male	88.89	0.943	0	100.00	0.156	0.090
Female	11.11		0.026	0.00		0.035
>35yrs						
Male	94.74	0.603	0.910	71.43		0.649
Female	5.26		0.064	28.57	0.421	0.226
NW 18-35yrs		-				
Male	100.00	-	0.094	40.00	0.439	0.013
Female	-		0	60.00		0.226
>35yrs						
Male	100.00		0.863	-	-	0.657
Female	-		0.043	-		0.057
SE 18-35yrs						
Male	14.29	0.102	0.013	62.50	0.842	0.073
Female	85.71		0.087	37.50		0.063
>35yrs						
Male	50.00	0.411	0.533	47.73	0.085*	0.515
Female	50.00		0.352	52.27		0.248
SS 18-35yrs						
Male	68.97	0.218	0.059	66.67	0.010**	0.144
Female	31.0		0.027	33.33		0.149
>35yrs						
Male	63.64	0.093*	0.590	58.21	0.778	0.421
Female	36.36		0.324	41.79		0.287
SW 18-35yrs						
Male	92.86	0.008***	0.114	36.36	0.407	0.044
Female	7.14		0.024	63.64		0.368
>35yrs						
Male	75.95	0.424	0.621	61.29	0.039**	0.270
Female	24.05		0.240	38.71		0.301

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively; THEX-Total Health Expenditure

Source: Author's computation from HNLSS data, 2009

However, it becomes increasingly clear that an overwhelming majority of men had control over household resources. By implication, a high proportion of women depend on men for their survival and this tendency has been debated by the theorists of collective bargaining to restrict their participation in household decision making (Manser and Brown, 1980). The fact that men are more likely to influence economic decisions at the household level, women's decisions to make health purchases have been shown, to a reasonable extent, to be conditioned by men. Increasing women's access to and control over productive resources improves investment in human capital which ultimately culminates in improved children's nutrition, health, education and future growth (BCN, 2012).

In passing, although rural Nigeria is marked with pronounced gender disparities in terms of opportunities and allocation of resources, the discrimination is worse in the North where substantial evidence on the extent and nature of gender discrepancies abound. For example, the rate of illiteracy among rural women (both youth and adults) in the North is more than double parts of the South. Figures on land or house ownership were almost one-tenth of that reported in the South and their labour market participation was equally lower (about 50 % less). The marked regional differences may be due to cultural and religious beliefs in Northern Nigeria which limit female participation in productive activities. This is expected to negatively impact the health care expenditures of girls and women in rural North.

4.3 Gender Disparities in Health Care Decisions

This section lays emphasis on the different health care decisions made by rural households in Nigeria. These include the percentage of the households who reported illness or injury in the last two weeks (2009 being the reference period), those who consulted a health practitioner following illness, percentage of the households who incurred medical expenditure and the medical budget share of the household total expenditure. Here, gender analysis was done along differentbut somewhat similar age categories. The five age groups to be used in health analysis, as modified from Irvin and Kingdon (2008) are:-the young group (0 - 5 years); an intermediate/adolescent group (6 - 15 years); a prime age working group (16 - 40 years) which includes women of child-bearing age; a middle-aged working group (41 - 59 years), and the elderly (60 years and above). This classification was however done to isolate health seeking behaviour of different age groups to avoid aggregation bias which may result from merging age groups with different health demands. This is particularly true for the child bearing age, where women in this category are seen to utilize more health care services than their male counterparts due to their special health demands at this age. These include antenatal, child delivery, post-natal, immunization, and other maternal concerns.

Across the pooled sample (all ages) (Table 15), women were 1.8 times more likely to report illness or injury than men and similar differences were observed in all the zones except in North East and North West, though not significant. Having reported illness, consultation rates for women were also significantly higher than that of men and the greatest significant gender disparity was noticed in North West (9.71%). The difference of the sexes in terms of incurring medical treatment cost was not significant in the total sample as well as across the zones. In terms of medical expenditure, the percentage of total expenditure of the rural households allocated to health was found to be significantly higher for males ($P<0.00$) than females. Although, females reported more illness and had higher consultation rate than males, their medical budget share was 3.57 % lower than that of men. This implies that women rarely seek treatment from such sources where medical charges are quite high. In most cases, especially, during periods of financial hardship, women will rather relinquish better and improved health services for the conventional and cut-rate ones to ensure continued supply of food and other basic items to their households discounting the consequence of such decisions on their health (better health outcome). Gender stereotype which requires women to be self-sacrificing lowers their health seeking tendencies which is evident in the relinquishment of vital medicines that are needed for treatment during periods of illness and risking their lives in times of financial crisis (Pearson and Sweetman, 2010).

Table 15: **Pooled Gender differences in health decisions (all ages)**

	Male	Female	Difference	Pr>Chi2
Sample size	59,794	57,525	2,269	
% reporting sick				
ALL	8.68	9.35	-1.8***	0
NC	5.89	6.55	-1.62**	0.048
NE	7.32	7.13	5.4	0.588
NW	8.63	8.78	2.94	0.611
SE	12.42	14.72	-13.82***	0
SS	12.08	13.07	-1.38*	0.056
SW	6.9	6.87	-1.04	0.963
% reporting consultation				
ALL	76.75	80.57	-4.22***	0
NC	81.6	82.04	-1.9	0.839
NE	73.26	77.72	2.44**	0.037
NW	70.71	80.42	-3.48***	0
SE	86.04	85.93	-13.76	0.948
SS	77.6	76.33	-2.8	0.496
SW	81.25	80.41	-0.52	0.814
% incurring treatmentcosts				
ALL	91.91	92.34	-4.46	0.473
NC	94.61	95.55	-2.38**	0.478
NE	85.87	86.33	2.18	0.816
NW	91.12	90.83	-3.32***	0.802
SE	95.74	95.93	-13.86***	0.841
SS	91.99	92.31	-2.98	0.818
SW	94.36	93.91		0.85
Medical expenditure(% of household percapita expenditure)				
ALL	50.17	49.85	0.31***	0
NC	6.02	5.89	0.13	0.62
NE	6.91	5.31	1.60***	0.003
NW	10.74	8.37	2.37***	0
SE	12.53	16.13	-3.6	0.509
SS	11.39	11.6	-0.2	0.421
SW	2.54	2.58	-0.03	0.102

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively

Source: Author’s computation from HNLSS data, 2009

The proportion of the sampled rural households consulting patent medicine vendors, midwife, medical assistant and nurses were significantly higher for females while the males were more likely to consult Doctors and Pharmacists (Table 16). This distribution was only significant for North East and North West with slight variations observed for the total sample.

As expected, health seeking behaviour was observed to be lower among rural women in the North. This outcome can be connected to a number of factors of which the foremost is the widespread illiteracy level among rural households in Northern Nigeria (Tables 2and 9). This result is not surprising as formal education has been shown to play a pivotal role in the utilization of health services by household members. Another possible cause for the lower health utilization rate is the more stringent cultural and religious beliefs in the region which have serious implications on the general well-being of rural women. For instance, most women will require the permission of their husbands, as well as being dependent for financial assistance, before they may be allowed to visit health clinics and facilities (Dodo, 2016). In most cases, women are not permitted to speak or relate with male health care providers. The foregoing situation can reduce the independence of women and their ability to make decisions relating to their health (Ganle, 2015 and Newbrander *et al.*, 2014).

Table 16: Distribution of households based on Types of Practitioner consulted

		NC	NE	NW	SE	SS	SW	All
Traditional	M	10.02	12.67	16.37	10.04	9.82	6.72	12.15
Med practitioner	F	9.44	12.99	14.22	8.74	9.35	6.49	10.94
Patent Medicine	M	12.83	19.81	18.66	38.37	34.04	30.43	25.01
Vendor	F	13.66	17.22	16.75	41.21	36.08	29.01	26.05
Pharmacists	M	2.11	7.28	5.46	6.48	8.07	1.98	5.81
	F	3.04	8.76	4.99	3.65	5.94	4.20	5.11
Doctor	M	45.17	35.44	39.27	35.64	32.87	45.06	37.86
	F	42.83	30.21	33.28	35.45	32.23	42.75	34.86
Nurse	M	17.75	6.33	7.47	4.70	9.82	9.09	8.61
	F	19.39	9.06	12.81	5.09	11.66	8.78	11.00
Medical	M	8.26	11.86	9.40	1.27	2.46	1.19	6.52
Assistant	F	7.93	17.52	14.89	1.34	1.21	1.91	8.17
Midwife	M	0.18	0.40	0.29	0.38	0.47	0.00	0.33
	F	0.51	0.45	0.15	0.77	0.99	0.38	0.54
Others	M	3.69	6.20	3.09	3.30	2.46	5.53	3.72
	F	3.20	3.78	2.90	3.55	2.53	6.49	3.33
Significance (P-Value)		0.870	0.005	0.000	0.165	0.170	0.790	0.000

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively
Source: Author’s computation from HNLSS data, 2009

Further analysis of the households in terms of age disaggregation reveals rather striking results. The probability of reporting illness was observed to follow a U-shaped distribution for both male and female- there was a sharp decline from the young group to the intermediate/adolescent group which was observed to gradually increase as the population advances in age (Tables 17a and b). With the exception of the age categories 0-5 and 6-15, females were more likely to report being ill. The elderly age group (60+) recorded the highest percentage of reporting illness and this was observed to be significantly higher for females than the males. This result is not unexpected as females are known to have a higher life expectancy than men, a situation which predisposes then to more medical complications which is characteristic of this age group. Within the zones, more significant gender differences were observed in age cohort 16-40 with South East having the widest gender gap. The probability of consulting a medical practitioner following an episode of illness did not follow a definite pattern across the age groups. The proportion of women who consulted health practitioners was higher than that of men in all the age groups except in age group 6-15 which was however not significant. In virtually all the geopolitical zones, the females were shown to seek more treatment than males for the different categories and the leading significant difference was observed in North West for age group 60+. Following consultation, there was no significant gender gap in the probability of incurring medical costs across the different age classifications. As observed with the pooled sample, the share of medical expenditure in the household per capita expenditure was higher for males in virtually all the age categories (except in the working age group/childbearing age) and this relationship was only significant in the young age group. Across the zones, significant pro male bias was observed in age groups 41-59 and 60+ while gender pattern in actual medical expenditure was female dominated in age group 16-40 years with only significant relationship noted in the South.

Table17a: **Gender differences in health decisions by age group**

Age		**% Reporting sick**			**% consulting MP**			**% incurring ME**			**Actual medical expenditure (%)**		
		Male	Female	Diff.	Male	Female	Diff	Male	Female	Diff	Male	Female	Diff
0-5	**ALL**	13.06	13.04	0.02***	78.32	84.42	-6.1***	90.85	89.37	1.48	6.12	5.88	0.24***
	NC	10.69	10.31	0.38	85.21	85.07	0.14	95.04	94.74	0.3	0.78	0.7	0.08
	NE	12.01	11.69	0.32	70.78	81.77	-10.9***	85.81	81.93	3.88	1.07	0.77	0.3
	NW	13.83	14.44	-0.61	75.82	86.05	-10.2***	91.38	90.54	0.84	1.97	1.78	0.19
	SE	15.17	12.91	2.26	91.43	88.3	3.13	92.71	91.57	1.14	0.69	0.73	-0.04
	SS	16.53	17.34	-0.81	79.14	81.55	-2.41	89.92	88.32	1.6	1.31	1.69	-0.38
SW		7.11	7.28	-0.17	89.29	80	9.29	92	95.83	-3.83	0.3	0.21	0.09
6-15	**ALL**	6.32	6.01	0.31	77.05	76.69	0.36	89.26	90.48	-1.22	6.56	6.28	0.28
	NC	4.47	4.8	-0.33	80.26	77.37	2.89	92.62	97.17	-4.55	1.08	1.26	-0.18
	NE	6.27	5.48	0.79	75.22	68.42	6.8	84.97	84.62	0.35	1.19	1.12	0.07
	NW	6.87	6.59	0.28	73.38	75.08	-1.7	90.2	88.52	1.68	1.88	1.43	0.45
	SE	7.87	8.65	-0.78	84.56	84.4	0.16	93.91	92.44	1.47	1.1	1.31	-0.21
	SS	8.16	6.69	1.47*	78.05	80	-1.95	86.72	91	-4.28	1.18	0.91	0.27
SW		2.71	2.21	0.5	88	94.74	-6.74	81.82	100	-18.2*	0.14	0.26	-0.12
16-40	**ALL**	5.97	7.59	-1.6***	77.24	80.23	-2.99	93.24	93.06	0.18	11.5	17.34	-5.84
	NC	4.17	5.66	-1.5***	76.54	83.54	-7*	96.64	94.39	2.25	1.5	2.4	-0.9
	NE	4.48	5.98	-1.5***	76.4	81.72	-5.32	86.82	88.89	-2.07	1.56	2.39	-0.83
	NW	5.24	7.53	-2.3***	75.67	79.06	-3.39	89.91	92.79	-2.88	1.95	3.45	-1.5

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively

Source: Author's computation from HNLSS data, 2009

Table 17b: **Gender differences in health decisions by age group**

Age		**% Reporting sick**			**% consulting MP**			**% incurring ME**			**Actual medical expenditure (%)**		
		Male	Female	Diff.	Male	Female	Diff	Male	Female	Diff	Male	Female	Diff
16-40	**SE**	27.68	35.23	-7.6***	87.32	85.67	1.65	96.68	96.52	0.16	5.05	5.73	-0.68
	SS	26.09	27.24	-1.15	73.05	67.14	5.91	91.8	94.68	-2.88	2.49	1.9	0.59
SW		15.09	17.01	-1.92	74.7	73.17	1.53	98.39	90	8.39**	1.08	0.77	0.31
41-59	**ALL**	10.21	12.47	-2.3***	75.68	82.07	-6.39***	93.5	95.38	-1.88	12.7	10.53	2.17
	NC	6.76	6.64	0.12	80.65	78.95	1.7	93.33	98.33	-5	1.53	1	0.53
	NE	8.43	8.1	0.33	72.27	78.89	-6.62	88.37	88.73	-0.36	1.71	0.67	1.04
	NW	10.11	10.17	-0.06	61.67	81.7	-20.0***	94.29	94.4	-0.11	2.85	1.17	1.68
	SE	13.17	19.27	-6.1***	83.33	89.49	-6.16*	97.14	97.17	-0.03	2.8	4.29	-1.49
	SS	15.29	19.36	-4.07**	85.8	75.55	10.25**	94.48	95.95	-1.47	3.43	2.97	0.46
	SW	8.14	7.68	0.46	87.18	82.61	4.57	88.24	92.1	-3.87	0.38	0.42	-0.04
60+	**ALL**	18.09	23.75	-5.7***	74.82	78.88	-4.06*	93.24	93.62	-0.38	13.23	9.84	3.39
	NC	11.6	16.14	-4.54**	88.51	83.58	4.93	94.81	94.64	0.17	1.13	0.53	0.6
	NE	13.73	15.87	-2.14	70.18	67.5	2.68	82.5	92.59	-10.09	1.39	0.36	1.03
	NW	15.02	12.85	2.17	57.66	78.43	-20.8***	91.41	75.01	16.4**	2.1	0.54	1.56
	SE	27.68	35.23	-7.6***	87.32	85.67	1.65	96.68	96.52	0.16	5.05	5.73	-0.68
	SS	26.09	27.24	-1.15	73.05	67.14	5.91	91.8	94.68	-2.88	2.49	1.9	0.59
	SW	15.09	17.01	-1.92	74.7	73.17	1.53	98.39	90	8.39**	1.08	0.77	0.31

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively

Source: Author’s computation from HNLSS data, 2009

4.3.1 Gender Differentials in the Utilization of Health Services

Following the knowledge of the different health decisions taken by households, this section describes differences in the use and the distribution of various health services utilized by individuals who sought medical attention given an episode of illness. The classification of the health services was done by gender and geopolitical zone. The various health services considered in the study are ambulatory care visits, inpatient hospital stays, and use of prescribed drugs. An individual is said to make use of a health care service if he or she has at least a record of using any one of the identified health services in the period covered by the study. This excludes over the counter medications and alternative medicine. Ambulatory care treatments or out-patient stays include treatments given by physicians and non-physicians in an office based setting, hospitals or health centres but does not involve an overnight admission while in-patient stays include any form of hospital admissions (night or day) of the patients. Prescribed drug expenses include the costs incurred from purchasing medicine or medical supplies by households in the last 4 weeks (using 2009 as the reference period).

Table 18 shows that women (7.5 %) were more likely to record at least one event per type of medical service than men (6.7 %). Similar trends were also observed across the zones with only significant differences seen in North Central, North West and South East. The probability of having ambulatory care visits, in-patient stays or purchasing prescribed drugs was also found to be higher among women, though the relationship was not significant for inpatient stays. Also across the zones, similar gender pattern in health care utilization emerge with slight variations observed in some zones. However, the deviation from the usual gender pattern in the utilization of health services was only significant in North East where 4.82 % of male had in-patient stay and the corresponding figure for female was 4.2 %.As expected, health seeking behaviour was observed to be lower among rural women in Northern Nigeria. A higher percentage of rural women in the south used prescription drugs and had higher ambulatory care visits and inpatient stays than did women in the North. This result may be connected to the higher literacy level of rural women in the South (Table 8) as women's education has been found to play a central role in the utilization of health care services. This result is consistent with that BCN (2012) where it was reported that a woman's educational status correlated closely with her health seeking behaviour and better health outcomes. Also, differences in medical utilization among rural women in the Northern and Southern Nigeria may be faith related. Since Nigeria has evolved into a Christian-dominated South (with 84.4% Christians) and a Muslim-dominated North (with 81.8% Muslims) with the North-Central middle belt having a more equitable distribution of the major religious faiths (42.0% Muslims, 56.0% Christians, and 2% other religions) (Federal Ministry of Health,2013 and Kavita *et al*.,2011), rural women in North, who are mainly Muslims, are less likely to utilize health care services due to religious and cultural tenets which require maintaining the sanctity of the female body. In other words, Muslim women are not supposed to reveal their nakedness to people to whom they have no familial relationship. Also, women's utilization of health care services in most parts of Northern Nigeria have been shown to be constrained by cultural practices such as the Purdah system – a practice which secludes or confines women to their husbands' home (Wall 1998 and Hugo, 2013). Such cultural belief requires that women remain indoors, an act which restricts their interaction with people outside their households including professional caregivers especially males. Another possible barrier to health care utilization is the lack of decision making autonomy by Muslim women. Men are considered as the primary decision makers in the society and any health care need, regardless of its urgency or severity must be placed on hold until the husband or any of his elderly relativesauthorizes the woman and this can have devastating consequences (obstetric complication and death in some cases) even with women's understanding of the implication of such decisions on their health (Yar'Zever and Said, 2013).

Table 18: Use of health care services by household members (utilization of health services)

	Gender		Significance (P-value)
	Male(n=59,791)	Female(n=(57,522)	
Percent with any use of health care services			
ALL	6.66	7.53	0.000
NC	4.81	5.38	0.061
NE	5.36	5.54	0.548
NW	6.10	7.06	0.000
SE	10.68	12.65	0.000
SS	9.37	9.98	0.193
SW	5.61	5.53	0.882
Percent with ambulatory care visits			
ALL	4.96	5.41	0.002
NC	4.27	4.70	0.269
NE	4.17	4.29	0.324
NW	5.29	5.71	0.152
SE	5.79	7.04	0.000
SS	5.80	6.08	0.180
SW	4.49	4.42	0.614
Percent with any inpatient stays			
ALL	1.14	1.23	0.159
NC	0.87	1.19	0.022
NE	0.98	0.83	0.222
NW	1.05	1.10	0.598
SE	1.83	1.92	0.682
SS	1.53	1.52	0.978
SW	0.75	1.01	0.236
Percent with prescription drug expenses			
ALL	5.97	6.27	0.032
NC	3.96	4.39	0.124
NE	4.82	4.23	0.035
NW	5.59	5.20	0.099
SE	9.16	11.26	0.000
SS	8.82	9.43	0.176
SW	5.36	5.26	0.861

Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively

Source: Author’s computation from HNLSS data, 2009

Following decomposition by age group, the exact pattern of health expenditure by gender becomes more apparent and differentiated (Figure 9). Based on theoretical expectation, the number of the sampled rural households who used at least one form of health care service was found to increase with age irrespective of the sex though slight variations were observed in males for inpatient stays and ambulatory care for age transition less than 16years to 16-45 years(0.9 to 0.8% and 6.0 to 4.4 %, respectively). Older household members were more likely to use health facilities than their younger counterparts. Unlike what was observed using the pooled age data, virtually all the males who were less than 16 years of age were found to utilize more health services than women with the exception of drug expenses which were slightly higher for females (5.3 % against 5.0 %). Utilization of all the heath care service classifications was higher for females aged 16 and above. This result is plausible as women aged 16-45 years, for example, are in the reproductive age group and consequently they are predisposed to higher health care utilization stemming from the characteristic nature of this age class. In addition to the regular illnesses that affect both males and females in other age groups, women aged 16 years and above tend to have more health needs resulting from child bearing associated treatments such as antenatal, deliveries, immunization among others. Also, for women aged 45 years and above, medicare expenditures are likely to rise relative to that of the men, given the demographic trend of an aging population and an increased risk for chronic conditions and menopausal symptoms in aging women (Taylor *et al.*, 2005). The onset of menopause in women has been associated with a number of diseases such as breast cancer, osteoporosis as well as the increased incidence of cardiovascular disease (Owen, 2008).

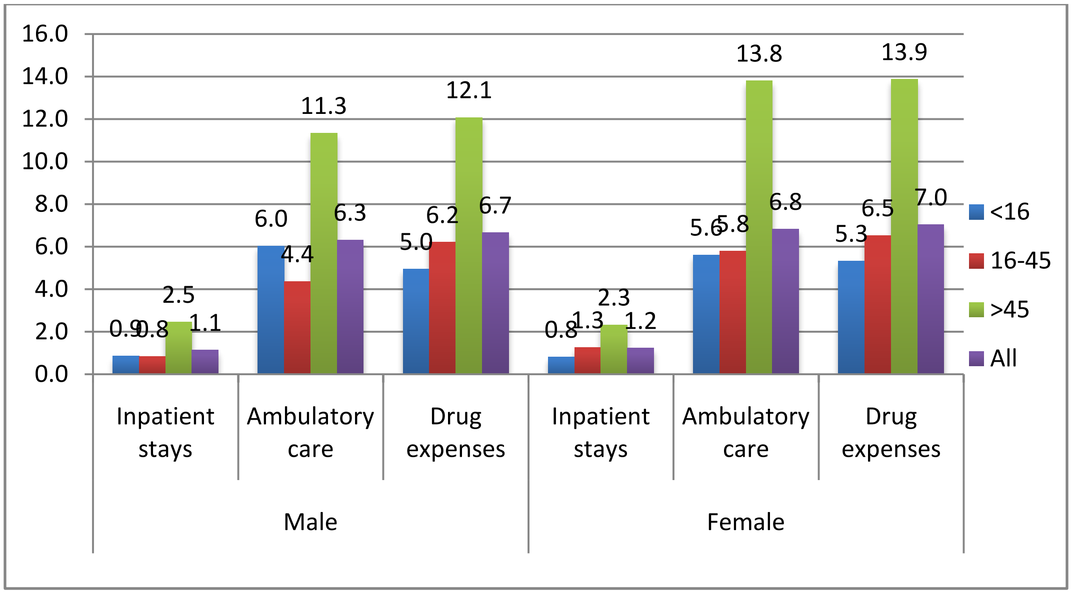

Figure 9: Percent distribution of health expenditures by age group

Source: Author's computation from HNLSS data, 2009

From foregoing, it can be said that age disaggregation allows gender differentiation to be more detectable thereby validating the claim that the use of household level data leads to aggregation bias veiling the real situation experienced by households.

4.4 Out-of-Pocket Payments for Health Care Services

Out-of-pocket payments (OOP) refer to direct and immediate payments by individuals for health services received. These out-of-pocket payments cover expenditures arising from drug purchase and utilization of health care services. It should however be noted that indirect costs such as income or wages lost and man-days are not considered as OOP. About 90 percent of private health expenditure in Nigeria, which in itself represents approximately 70 percent of the total health spending, is accounted for by out of pocket expenditure (Onoka *et al.*, 2010). By implication, the burden of health care payment has shifted households who have to pay a significant fraction of their incomes to receive health services. Hence, the study assessed rural households' out of pocket payment by gender and geopolitical zones. Although the age classification adapted form Irving and Kingdon(2008) was used, the study also considered the magnitude of OOP for youth and adults along the age classifications 18-35yrs and ≥35yrs, respectively.This was however preceded by the types of illness suffered by rural households, a precondition for the volume of OOP expenditure on health.

4.4.1 Sicknesses suffered by rural households

A quick glance at the results from Table 19 shows that malaria is the most widely suffered illness in rural Nigeria making it topmost among public health problems in Nigeria. Similar results were observed within the zones with malaria being more prevalent in the South than the North. With the exception of North West, though with a marginal difference of 0.08 %, women were seen to be more likely to suffer malaria than men. The result above is consistent with evidence reported by NPC and ICF (2009) and Noland *et al*. (2014) where malaria was found to account for 30 % of under-five mortalities, 11 % of maternal mortalities, 60 % of outpatient hospital visits in Nigeria, 25 % of infant mortalities and 30% hospitalization. Also, a recent report by the United States revealed that there about 100 million cases of malaria and death tolls have reached about 300,000 per year and this result in ranking Nigeria first in terms of countries with high incidence of malaria fatalities in the world. The prevalence of malaria in the rural area, particularly among the women, has austere implication on their health and overall productivity. Ukoli (1990) reported that malaria, being the foremost cause of illness in rural areas, limits efforts to generate more incomes and moderates agricultural productivity, as the period with the highest malaria transmission (rainy season) most times coincides with period when agricultural production and labour activities are at the peak.

The incidence of cough, cold and catarrh was also observed to be next to malaria and higher for females (24.2%) than males (23.3%). Parallel trend was also noticed in terms of gender differences across the geopolitical zones. The highest gender disparity was reported in North West while none was noticed in South South. The prevalence of typhoid disease was also found to be more among females with lowest incidence rate observed for both sexes in south west. Ailments scarcely experienced by rural households were hypertension, diabetes, diarrhoea and dysentery. However males were more likely to suffer from Hypertension and Diabetes.

Table 19: Distribution of households based on the type of illness

	Illness suffered most frequently in the past 12 months								
	Cholera	Malaria	Typhoid	Hypertension	Diabetes	Diarrhea	Dysentery	Cough, common cold and catarrh	Others
ALL									
Male	3.95	38.91	6.24	1.45	0.88	1.66	2.77	23.30	20.84
Female	3.46	39.34	6.33	1.32	0.82	1.67	2.10	24.22	20.74
NC									
Male	1.95	31.33	7.65	1.36	0.72	1.73	3.56	28.71	22.98
Female	1.28	31.28	6.91	1.60	0.59	2.26	3.38	29.17	23.53
NE									
Male	2.70	33.91	6.18	2.39	0.51	2.66	2.09	28.71	20.84
Female	2.21	34.20	6.87	1.47	0.46	2.64	1.73	29.67	20.74
NW									
Male	5.02	30.55	6.52	1.33	1.07	2.32	5.22	25.55	22.42
Female	4.44	30.63	6.04	1.21	0.83	2.36	3.74	28.69	22.05
SE									
Male	5.70	44.13	5.82	1.59	1.41	0.51	0.88	18.82	21.13
Female	5.17	42.69	7.44	1.63	1.63	0.74	0.93	18.84	20.92
SS									
Male	4.16	56.83	7.04	0.73	0.46	1.10	0.57	14.60	14.51
Female	3.33	56.93	7.20	1.10	0.69	0.94	0.65	14.60	14.57
SW									
Male	1.61	49.71	3.44	1.22	0.82	0.46	0.97	20.32	21.45
Female	1.77	49.76	2.74	0.91	0.27	0.41	0.68	21.31	22.14

Note: Other illnesses include guinea worm, scabies, ring worm, flu, trachoma, headaches, hepatitis B, streptococcus, tuberculosis and onchocerciasis.
Legend: ***, ** and*= Significant at 1%, 5% and 10% levels, respectively
Source: Author's computation from HNLSS data, 2009

4.4.2 Out-of pocket Expenditure on health

The mean monthly OOP expenditures of the individual members of the rural households are reported in Table 20. This includes the OOP payments made by households who reported being ill in the reference period covered by the study.Total mean monthly expenditure per person, ranging from ₦2586 to ₦6929, was higher for males than females in age categories 16-45years and above 45 years. However, females younger than 16 years old were observed to spend more on health care services than males (₦2,701 against ₦2,586). Though not much variation was observed for out-patient expenses (ambulatory physician contacts), it was noticed to account for the largest percentage of the total amount spent on health services by male household members younger than 16 years old (25%). Inpatient- admission was found to be higher among individuals aged 16 years and above (0.18% to 0.20%) accounting principally for health expenditures made by men above 45 years. Medicine and medical supplies expenses constituted the highest fraction of the total expenses for males younger than 16 years (0.55 %) and this happens to be the highest fraction of health expenditure by type of service in all the age cohorts.

Drug expenses cover the cost incurred from purchasing drugs from Patent Medicine Vendor (PMV) or over the counter kiosks. Drug expenses accounted for the utmost part of total health expenditure by females less than 16 years (34 %) with males being scarcely represented in this health service category. This therefore implies that rural households display male preference in giving quality health care as more boys were seen to use prescription drugs than girls who majorly depended on PMVs for their health treatment. Patent Medicine Vendors, as defined in the HNLSS Interviewers manual, are drug vendors who sell their drugs in public bus or hawking in the market or motor parks. In the actual fact, they are similar to medicine vendors who sell drugs over the counter in kiosks. They are drug vendors whose activities are unregulated, with no trained personnel and are therefore unlikely to render quality health services to people who consult them (Onah and Govender, 2014). By implication, girls are at a higher risk of having health complications as the activities of PMVs are considered harmful by formal health establishment. This result is similar to the findings of Pandey et al. (2002) who found out that relative to girls, Indianboys were 4.9 (CI 1.8-11.9) and 2.6 (CI 1.2-6.5) times more likely to receive health care services and be treated by competent allopathic doctors.

Regional analysis shows further differentiation on health expenditures as women in the South aged 16-45 years incurred more medical expenses than men unlike their counterparts in the North who were observed to spend less than men despite the health care requirements of this age class. Physician contacts were observed to be more prevalent in North West among female younger than 16 years (35 %) while the least hospital admissions were reported among females and males younger than 16 years in North West and South West, respectively. Pro female bias in the use of prescription drugs for age category less than 16 years was higher in the South than in the North. As earlier predicted in section 4.13, mean OOP health expenditure was lower among rural women in the North as access to predisposing factors of health services utilization was observed to be more among their southern counterparts.

Table 20: Distribution of mean out-of-pocket (OOP) expenditure for health services

	Mean OOP expenses/person (₦)				**Percent distribution of health expenditure**											
					Ambulatory care			Inpatient stays			Medicine & Supplies			Drug Expenses		
	All	<16	16-45	>45	<16	16-45	>45	<16	16-45	>45	<16	16-45	>45	<16	16-45	>45
ALL																
M	4372	2586	4307	6929	0.25	0.20	0.21	0.11	0.18	0.20	0.55	0.33	0.30	0.09	0.28	0.29
F	3980	2701	4191	5356	0.24	0.21	0.23	0.13	0.18	0.19	0.29	0.30	0.32	0.34	0.30	0.27
NC																
M	3925	2618	4050	5906	0.23	0.17	0.15	0.10	0.15	0.26	0.23	0.33	0.26	0.45	0.35	0.33
F	3655	2967	3955	4701	0.17	0.23	0.22	0.19	0.18	0.25	0.30	0.26	0.23	0.34	0.34	0.30
NE																
M	4973	2569	4153	7145	0.27	0.21	0.22	0.18	0.27	0.20	0.21	0.30	0.23	0.34	0.22	0.34
F	3267	2558	3924	3902	0.27	0.25	0.30	0.17	0.18	0.15	0.26	0.25	0.34	0.31	0.32	0.21
NW																
M	3272	2064	3177	6522	0.32	0.28	0.32	0.10	0.16	0.11	0.23	0.26	0.24	0.36	0.30	0.33
F	2391	1859	2722	3731	0.35	0.25	0.29	0.08	0.15	0.12	0.23	0.29	0.32	0.33	0.32	0.27
SE																
M	5749	2902	5962	7389	0.21	0.22	0.22	0.09	0.21	0.24	0.32	0.33	0.28	0.38	0.24	0.25
F	5598	3497	6293	6063	0.25	0.19	0.23	0.13	0.22	0.20	0.28	0.32	0.31	0.34	0.27	0.26
SS																
M	5182	3509	4461	7830	0.17	0.15	0.14	0.11	0.15	0.19	0.34	0.39	0.40	0.37	0.30	0.27
F	4971	3918	4798	5788	0.17	0.19	0.18	0.11	0.16	0.16	0.38	0.33	0.36	0.34	0.32	0.30
SW																
M	4408	3467	3869	5133	0.17	0.22	0.17	0.08	0.12	0.12	0.49	0.35	0.43	0.26	0.31	0.28
F	4464	3582	5182	4489	0.08	0.13	0.22	0.13	0.22	0.21	0.36	0.39	0.31	0.43	0.26	0.25

Source: Author’s computation from HNLSS data, 2009

Consistent with the foregoing results, mean monthly expenditure on health per person was higher for the male adults (₦7256.4) than the female adults (₦5,115.4) in rural Nigeria (Table 21). Though not significant, female youths were observed to spend more on health (₦4,434) than male youths (₦3,858).

Table 21: Mean out of pocket payments for youths and adults

	Mean (₦)	Mean Difference
18-35yrs		
Male	3857.9(±671.3)	-575.7
Female	4433.6(±668.1)	
>35yrs		
Male	7256.44(±629.0)	
Female	5115.4(±503.9)	2141***

Legend: ***,=Significant at 1%

Source: Author’s computation from HNLSS data, 2009

In sum, though section 4.1.2 shows higher utilization of health services by females, the mean monthly out- of-pocket payment expenditures on health were shown to be lower for females. This dichotomy can be explained to a reasonable degree by the sacrificial tendencies of women which require they forgo treatment or opt for cheaper alternatives following the knowledge of high treatment costs- an act done to ensure efficient management of the relatively scarce household resources at the expense of their own health. It has been shown that a higher proportion of girls and women in the reproductive age prefer over the counter medications to the use of prescribed drugs. Such health service preference suggests the need to reduce health care expenses arising from medical consultation fees and hospital treatments. In other words, a higher proportion of rural women will rather consult PMVs who prescribe their own drugs, popularly called "Akapo" in Yoruba language, at a much cheaper rate without consultation fees. The contrasting situation can also be explicated by results from Table 19 which show that a higher percentage of men are more likely to suffer from Diabetes and Hypertension than women. This could possibly explain the higher health expenditures incurred by men as the treatment of these illnesses are known to be more expensive when compared to other listed diseases.

Looking beyond gender differentials in out of pocket health expenditures, the study also considered disparities in household budget shares of out-of-pocket payments using different thresholds. Table 22 shows that at thresholds 10% and 25%, the highest proportion of health expenditure as share of total expenditure was recorded amongst the female household members (58.6 % and 55.8 %, respectively). However, a further increase in the threshold reveals that more males than females (26 % against 16.6 %) spent in excess of 40% of the total household budget on health needs. Parallel trend in gender distribution was observed in the South while the relationship was noticed to be reversed in the Northern zones. Also, females had been shown to more likely to spend a higher fraction of their total consumption net of food expenditures on health care at different levels with the highest gender disparity observed in South West at 10% threshold. The fact that the result shows female dominance for almost all the different thresholds of OOP as a percentage of total and non-food expenditures, suggests that females have higher tendency of facing catastrophic health expenditures than males. This indicates that in order to meet their health demands, more women than men are sacrificing the consumption of other essential needs (e.g shelter, education e.t.c.) which are equally necessary for their wellbeing.

Table 22: OOP health payments as percentage of non-food and total expenditure

	OOP expenditure as share of total expenditure			OOP expenditure as share of nonfood expenditure		
	10%	25%	40%	10%	25%	40%
ALL						
Male	47.31	45.88	26.02	64.72	26.84	33.06
Female	58.56	55.82	16.61	73.34	39.00	44.12
P-Value	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
NC						
Male	38.65	40.52	12.17	58.42	20.66	29.46
Female	49.65	44.76	14.69	61.54	32.87	30.77
P-value	0.01**	0.320	0.376	0.465	0.001***	0.741
NE						
Male	42.18	42.97	12.98	63.09	22.10	29.69
Female	36.46	37.50	12.50	60.42	18.75	23.96
P-value	0.264	0.287	0.891	0.594	0.436	0.226
NW						
Male	45.03	43.40	12.97	62.50	23.41	29.65
Female	38.33	41.67	10.00	61.67	16.67	23.33
P-value	0.301	0.788	0.497	0.895	0.220	0.287
SE						
Male	62.07	61.35	29.07	76.44	41.47	48.56
Female	67.15	67.31	31.55	81.07	46.93	56.80
P-value	0.027**	0.01**	0.254	0.02**	0.021**	0.001***
SS						
Male	59.02	53.35	25.79	72.44	37.81	40.82
Female	61.67	57.14	30.84	74.04	43.03	46.52
P-value	0.256	0.110	0.017**	0.449	0.024**	0.015**
SW						
Male	41.02	34.71	15.86	56.58	20.67	22.52
Female	47.58	39.65	11.75	66.52	25.55	25.99
P-value	0.073*	0.165	0.095*	0.007***	0.110	0.268

Source: Author’s computation from HNLSS data, 2009

4.5 Measuring Health care inequities among rural Households

This section focuses on the pattern of health care expenditure among households in rural Nigeria. The Lorenz curves presented in Figure 10 show a clear deviation from the line of perfect equality for both male and female household members indicating an unequal distribution in health care spending among the rural households. The chart also shows that the level of inequality in medical expenses was almost equal for both male and female as the Lorenz curves for both sexes can be seen to practically overlap. However, the degree of health careinequality becomes more noticeable with the use of alternative measures of dispersion commonly employed in inequality literatures. These are Gini Coefficient, Atkinson Index, Coefficient of variation (CV) and Entropy Index. These inequality indices differ in terms of their sensitivity to changes in the distribution of the population. Results from the indices in Figure 10show a higher inequality in health care expenditures among men than women. In other words, females have more equitable health spending structure than the males. The utmost disparity was reported by coefficient of variation (1.44 and 1.29 for male and female, respectively) while the least was observed in Gini coefficient (0.59 and 0.55 for male and female, respectively). Taking the household members together, similar pattern in health care expenditure was also observed with the highest inequality value given by coefficient of variation (1.14) and the least presented by the Atkinson index (0.23) (Figure 11). Lorenz curves shown in Figures 12 and 13 also present similar distribution of health care expenditures between the youth and adults.

In passing, from the values provided by the indices, it can be concluded that the incidence of inequality in health spending is quite high in rural Nigeria. This result is however not surprising given the heterogenous nature of the respondents who earn different incomes from their participation in agriculture and other income generating activities and also largely due to demographic conditions to which they are exposed leading to varying capacities in health seeking behaviour.

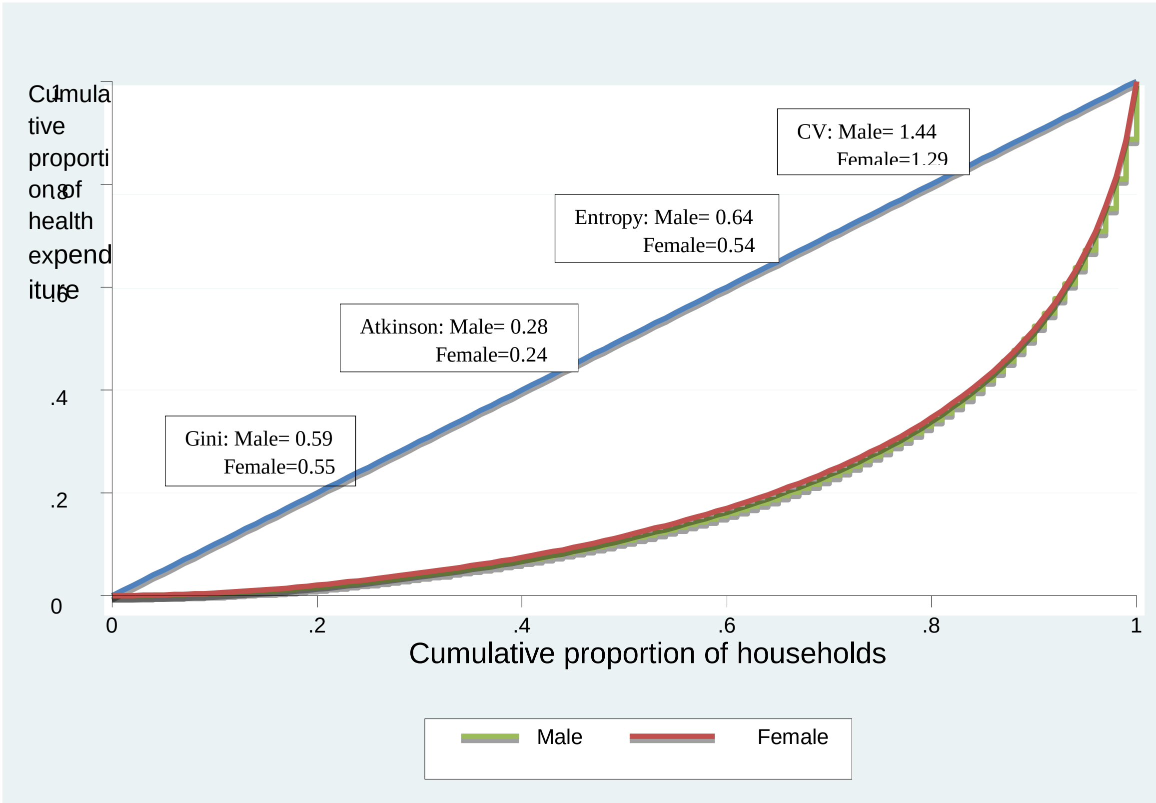

Figure 10: Distribution of inequality indices of health care expenditures by sex

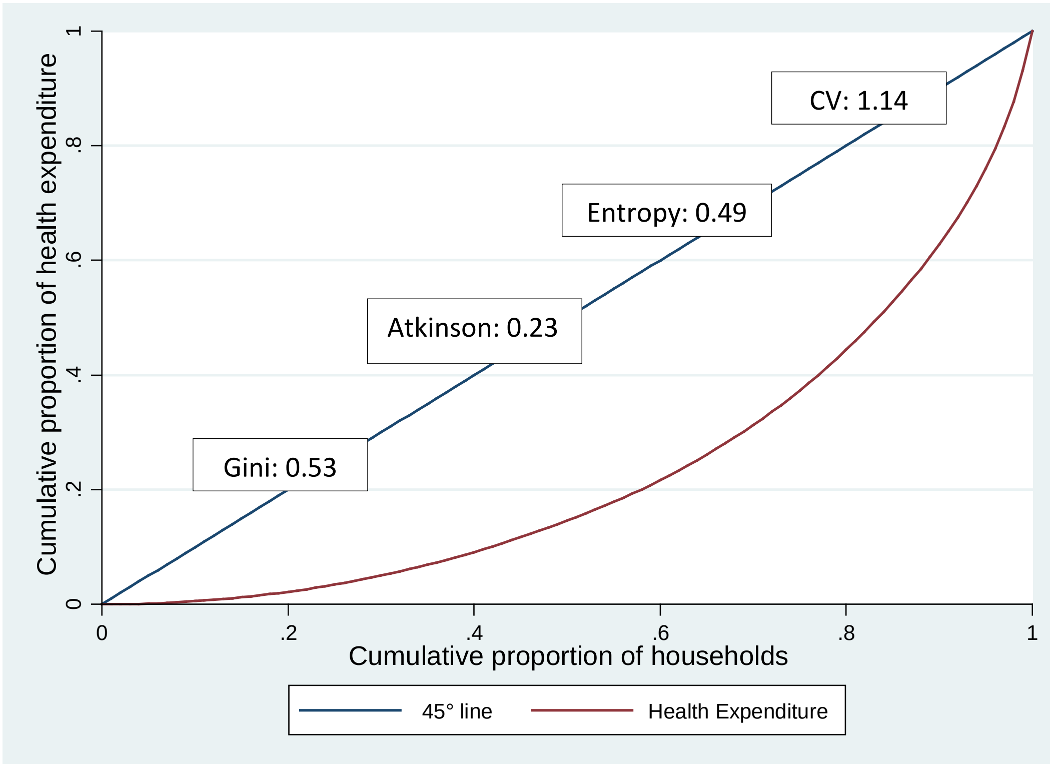

Figure 11: Inequality indices of health care expendituresof rural households

Source: Author’s construct

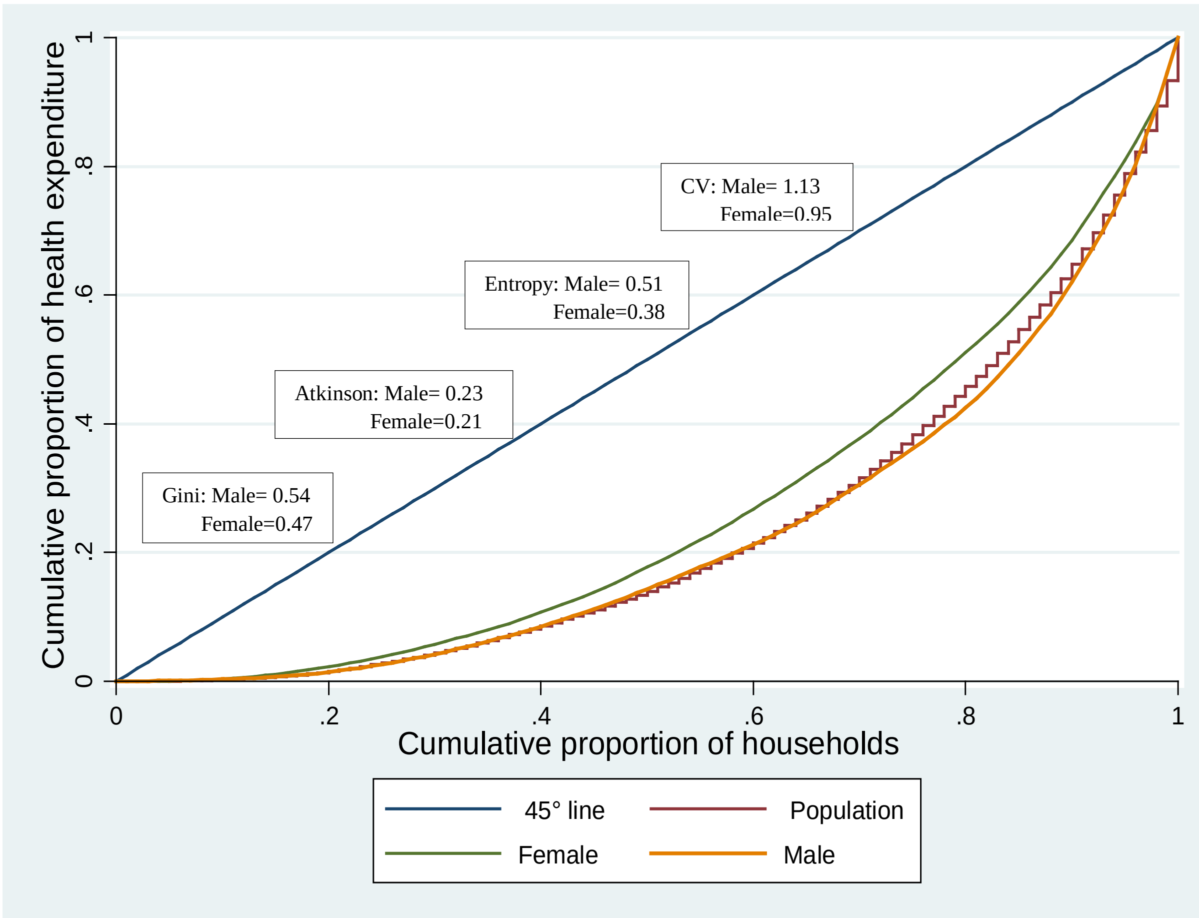

Figure 12: Distribution of inequality indices of healthcare expenditures of the youths

Source: Author's construct

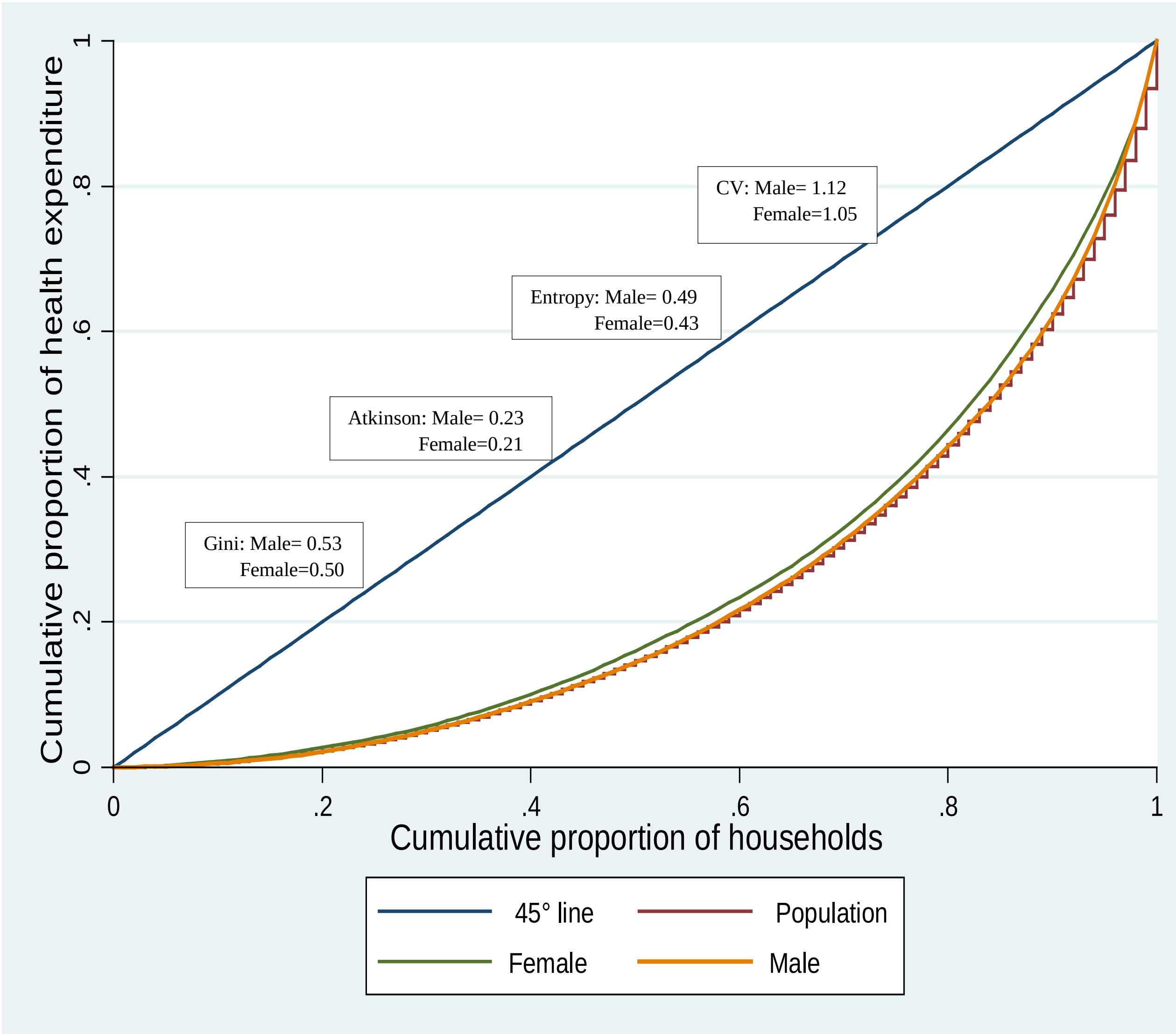

Figure 13: Inequality indices of healthcare expenditures of adults

Source: Author’s construct

4.6 Structuring gender differences in health care expenditures of rural households

Gender disparities in health care decisions of rural households were established by designing a Triple hurdle model which was estimated using Generalized Structural Equation Model (GSEM). GSEM allows the individual hurdle models to be fixed into a single full model. Christ et al. (2008) showed that GSEM permits the simultaneous estimation of multiple equations in such a way that single model can be used to assess the associations between multiple explanatory and dependent variables regardless of whether the dependent variable has an ordinal (e.g health status), dichotomous (e.g medical consultation), Poisson (e.g number of days ill), continuous (Expenditures on hospital admission) or time dependent (e.g deaths) distribution.

Analyses were done at both household and individual level to show the extent of gender disparity among rural households. With individual level data, gender differences in household health care consumption are clearly more evident which therefore upturns the possible aggregation bias obtained with the use of household level data. Regression results are presented in Tables 24-27 with each table having five main components. The leading four components represent regression results of the hurdle model where the first main column denote the binary Probit model of individuals who were sick in the last two weeks (2009 being the reference period). The second component is the Probit equation of anyone who seeks medical attention following reporting any form of illness or injury. This section is succeeded by the Probit regression results of individuals who incurred a positive medical treatment costs conditional on having consulted a medical practitioner while the last column of the hurdle model represent the OLS of the natural log of health budget share of the individual household member. The last phase of the regression result indicates the OLS estimates for the unrestricted model. The model is called “unrestricted” because all household members were included in the regression regardless of whether an individual has a zero health budget share or not. As earlier mentioned, the hurdle models were estimated using GSEM and in structural equation model, models are often illustrated using path diagrams which can vary from a simple to complex representation depending on the number of variables and equations to be estimated. Figure 14 presents a sample of a path diagram for one of the individual level analysis conducted in the study. The coefficient estimates and the corresponding signs are displayed on the arrows called paths, linking the dependent and independent variables. However, the regression results have been shown in tabular forms to give a clearer presentation of the outcomes. Section 4.6.1 models the predictors of health care consumption of the respondents and section 4.6.2 focuses on age structure of gender disparities in health seeking behaviour.

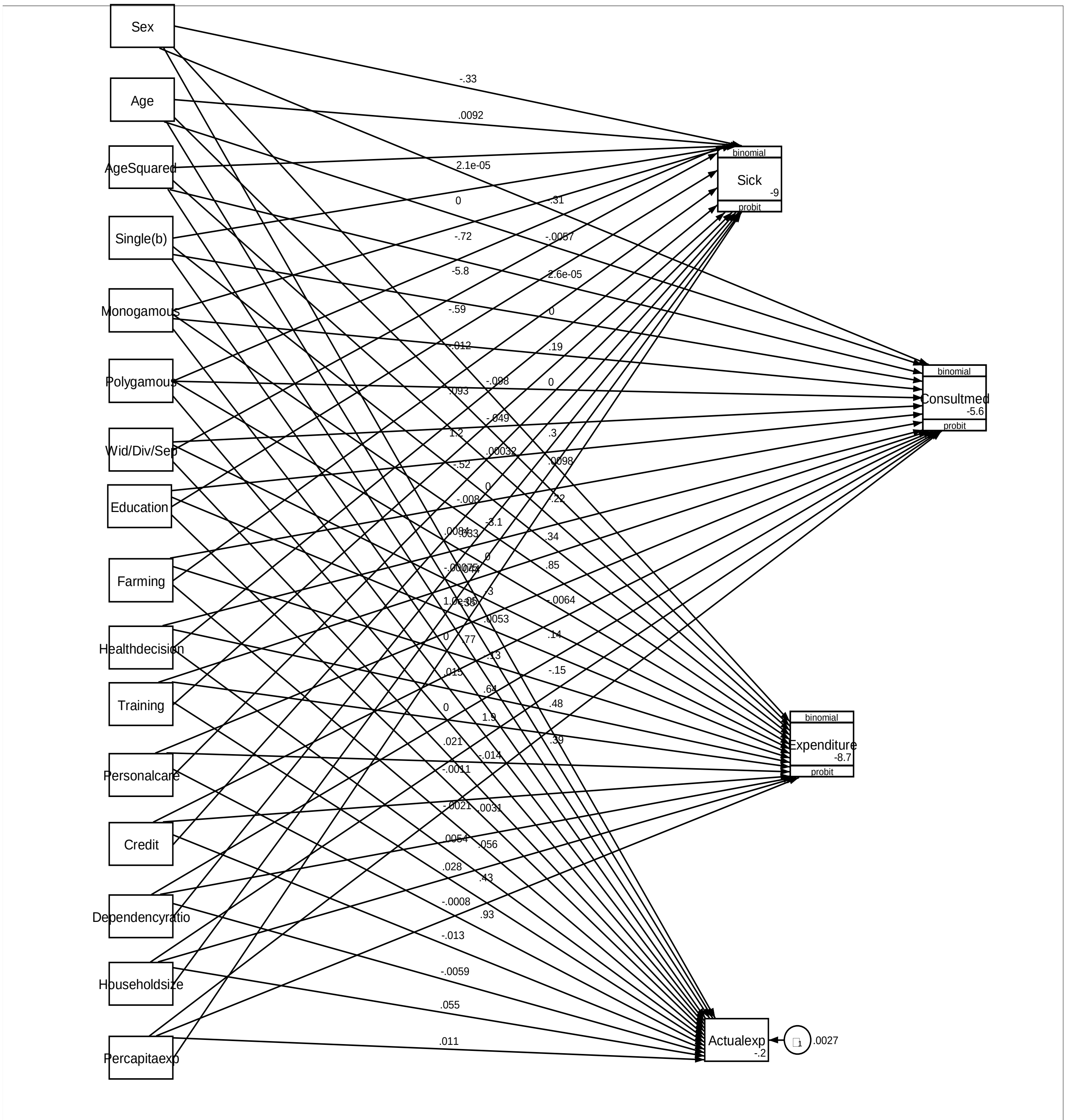

Figure 14: Path Diagram forindividual level analysis: Age Structure of gender disparities
Source: Author’s construct based on HNLSS data, 2009.

4.6.1 Modelling predictors of health care consumption: Pooled Data

It should be noted that GSEM cannot provide statistical tests such as chi-squared, R squared, RMSEA and CFI which can be obtained from SEM estimation.This is because in GSEM estimation, there exists no combined model-implied covariance matrix which can be matched with an observed covariance matrix, as a result GSEM does not measure the covariances and variance of the independent variables with other parameters to be estimated in the model (Roman and Link, 2015). Hence, GSEM cannot provide statistical tests such as chi-squared, R squared, RMSEA and CFI which can be obtained from SEM estimation. However, the study employed a post estimation command, testparm, to test whether the multiple coefficients presented in all the four equations analysed in the GSEM model are significantly different from zero following estimation. The significant Chi-square values of all the GSEM models (Tables 23-26) show that coefficients of the explanatory variables in the health decision equations were not jointly zero.

Table 23 presents the GSEM results for the individual level regression for pooled ages. The regressions were initially run at the surface to test whether sex and age have significant effect on the different health care decisions. For each stage of the regression result as well as the unrestricted model, two regressions were run. The second regression was used to control for the effect of sanitation variables. The sanitation variables include type of toilet used by the household and access to improved drinking water.For the model without the sanitation variables, the male dummy variable was found to be statistically highly significant in determining the probability of reporting illness. Men were 33.4 % less likely to report sickness than women. In other words, women have a weaker health status than men and this can be attributed to biological differences or the inordinate reproductive roles played by women among other factors. However, a reasonable conclusion can yet be drawn given that all the ages of the households were pooled which masks possible variations in illness reporting incidence across the different age groups. This, however, will be considered in the next section. For the marital status variables, compared to household members who were never married, those in monogamous or polygamous marriages were less likely to report illness. This result is expected as being married (a healthy marriage now) has been shown to make people healthier and happier. Results from several studies compiled by Bushak (2015) reveal that married men and women have been shown to have a 5 % lower chance of cardiovascular disease, improved mental health and longevity compared to their single counterparts. Although Doctors have not been able to give medical explanations, marriages allow the pooling of resources, stronger family ties as well as physical and intellectual closeness, all of which culminates in reducing stress and improving overall health. The result also shows that individuals who are widowed, divorced or separated have a lower tendency (59.4%)of reporting sick than their unmarried counterparts. An extra year of education was found to significantly reduce the probability of reporting sick by 1.2 % as the better educated are better able to take preventive measures and are more conscious of healthy practices. Hence a drastic reduction in the incidence of illness and diseases. This result is consistent with the findings of Irving and Kingdon (2008).

Entrepreneurial Training participation, taking health decisions and personal care were also found to influence the likelihood of reporting illness by the rural household members. Entrepreneurial training and personal care were shown to have significant negative relationship with the probability of reporting sick while the reverse was observed for health decision. Also, household size and per capita expenditure were found to be positively and significantly related to the probability of reporting illness. This implies that large sized households with high per capita expenditure have higher tendency of reporting ill and this may be as a result of congestion and the resultant overstretching of sanitation facilities which enhances easy spread of diseases.

There were no significant gender disparities in consultation and incurring medical costs decisions.Implicatively, men and women have almost equal tendencies to seek medical attention and incur health expenditures when ages are pooled. The probability of incurring a cost for health treatment was found to be lower for those who are married (monogamous) or widowed, separated or divorced than those were never married.Health decision was found to be positively related to consultation decision and incurring health expenditure. An increase in the ability of an individual to influence health decisionincreases the likelihood of consulting a medical practitioner and paying for health treatments by33.6% and 64.1%, respectively. This result is plausible given that if an individual has autonomy over the control of his or her resources, then expenditures can be made on the individual’s need unrestricted, all other things being equal. Participation in entrepreneurship training was positively and significantly related to the probabilities of seeking health services and incurring medical costs. A unit increase in dependency ratio will reduce the likelihoodof medical consultation by approximately 15%while an additional household member will significantly increase consultationby 48.4 %. Table 23 also shows that percapita expenditure has significant positive impact on the probabilityof paying for health expenses (92.5%). As shown in the control equation, individuals using composting or flush toilets have lower tendencies of incurring health expenditures than those using unimproved sanitation facilities.

The last stage of the hurdle, actual medical expenditure expressed as a share of the total household budget, showed no significant gender difference. As earlier shown in Table 21, there were no significant differences in the mean OOP expense per person for both male and female in the youth category, hence the result. A unit increase in the years of education has been shown to reduce medical budget share by 0.1 %. Participation in training increases medical budget by 2.8% while personal care and access to credit reduces the proportion of household budget allocated to health care expenditures by 0.1% and 1.3%, respectively. Conditional on getting health treatment at a cost, an additional household member was shown to increase the probability of medical expenditure by 5.5%, a result consistent with that of Oyinpreye and Karimo (2014). Increase in dependency ratio reducesmedical budget share by approximately 0.6% while growth in per capita expenditure increases the share of household income spent on health by 1.1%. Conditional on getting health treatment at a cost, an additional household member was shown to increase the probability of medical expenditure by 4.8 %, a result consistent with that of Oyinpreye and Karimo (2014). The medical budget share of household total expenditure for persons with access to improved drinking water was 0.3% less than those fetching water from unimproved sources. In other words, access to good drinking water helps to prevent,to a large extent, expenses that would have been incurred from water-borne diseases. Also, Individuals using composting toilet willhave their medical expenditure reduced by 4.1% when compared to those using unimproved sanitation facilities. Lack of sanitation predisposes household to communicable diseases especially diarrhoea which according to Black et al. (2010) is the leading cause of under-5 child mortality in sub-Saharan Africa. Of all human excreta, faeces have been identified as the most inimical to health in which case a gram of freshly expelled faeces from an infected individual is made up of 1 million to 10 million bacteria cells, 10 to 10,000 helminth eggs, 1 million virus cells, and 10,000 oocysts or protozoan cysts (Faechem et al., 1983). Hence, the higher medical expenses by individuals without safe waste disposal methods.

Evaluating the results provided in Table 23 at the mean values of medical budget share and natural log of per capita expenditure (0.049 and 1.042, respectively), the estimate of the elasticity of household health expenditures with respect to per capita expenditure(a proxy for total household income) was found to be 0.234. This implies that an individual's medical expenditure has an inelastic relationship with per capita expenditure. i.e a percent change in per capita expenditure leads to less than one percent change in medical expenditure of an individual. This result is similar to Omotor (2009) who established that health expenditure in Nigeria is income inelastic (0.472) and positive.

Similar trends were observed with the introduction of the control variables in virtually all the four stages of the hurdle model with the estimated impacts of the major variables driving health decisions becoming more pronounced. However, the influence of sex was no longer significant after adding the sanitation variables in health consultation stage of the hurdle model.

As was the case with the hurdle model, there exist no significant sex disparities in health expenditures for the unrestricted model (the last component of Table 23). The unrestricted medical expenditure had a significant negative relationship with years of education, health decision and personal care while the relationship was shown to be positive with household size and per capita expenditure.

Table 23: GSEM results for individual level regression (pooled ages)

	Reporting Sick		Consultation decision		Treatment cost		Medical Budget Share		Unrestricted model	
INDIVIDUAL VARIABLES										
Male	-0.334*** (0.093)	**-0.352*** (0.076)**	-0.309* (0.182)	**-0.285 (0.186)**	-0.985 (0.248)	**-0.148 (0.259)**	0.008 (0.005)	**0.008 (0.006)**	-8.927 (13.200)	**-11.830 (13.398)**
Age	0.009 (0.010)	**0.010 (0.01)**	-0.006 (0.024)	**-0.006 (0.025)**	-0.049 (0.032)	**-0.051 (0.035)**	-0.001 (0.001)	**-0.001 (0.001)**	-0.648 (1.862)	**-0.567 (1.888)**
Age squared	2.1e-5 (9.7e-5)	**2.3e-5 (1e-4)**	2.5e-5 (2.1e-4)	**2.7e-5 (2e-4)**	3.1e-4 (2.9e-4)	**3.3e-4 (3e-4)**	1.0e-5 (1.2e-5)	**1.2e-5 (1.2e-5)**	0.019 (0.018)	**0.019 (0.018)**
Monogamous	-0.725*** (0.170)	**-0.746*** (0.171)**	0.188 (0.415)	**0.209 (0.415)**	-3.127*** (0.468)	**-3.181*** (0.496)**	0.015 (0.013)	**0.015 (0.013)**	-27.910 (30.435)	**-29.465 (30.755)**
Polygamous	-5.807*** (0.295)	**-5.879*** (0.303)**	0 -	**0 -**	0 -	**0 -**	0 -	**0 -**	-107.047 (109.978)	**-110.132 (110.585)**
Widowed/Divorced/Sep.	-0.594*** (0.203)	**-0.601*** (0.205)**	0.212 (0.467)	**0.322 (0.469)**	-2.989*** (0.450)	**-3.043*** (0.482)**	0.021 (0.014)	**0.020 (0.014)**	-31.097 (37.215)	**-32.206 (37.585)**
Years of education	-0.012* (0.006)	**-0.010 (0.007)**	0.302 (0.016)	**0.012 (0.016)**	0.005 (0.028)	**0.003 (0.030)**	-0.001** (0.001)	**-0.001* (0.001)**	-3.215*** (1.111)	**-2.480** (1.151)**
Farming	0.093 (0.070)	**0.096 (0.071)**	-0.215 (0.156)	**-0.183 (0.158)**	-0.132 (0.249)	**-0.166 (0.248)**	-0.002 (0.005)	**-0.002 (0.005)**	13.454 (12.011)	**9.223 (12.238)**
Health decision	1.226*** (0.066)	**1.228*** (0.066)**	0.336** (0.140)	**0.306** (0.141)**	0.641*** (0.241)	**0.696*** (0.258)**	0.005 (0.006)	**0.005 (0.006)**	138.037*** (13.513)	**135.677*** (13.676)**
Training	-0.518* (0.276)	**-0.527* (0.279)**	0.850* (0.514)	**0.856* (0.518)**	1.947*** (0.582)	**2..485*** (0.660)**	0.028*** (0.008)	**0.028*** (0.009)**	27.961 (54.145)	**25.404 (55.377)**
Personal care	-0.008* (0.005)	**-0.008* (0.005)**	-0.006 (0.009)	**-0.006 (0.009)**	-0.014 (0.010)	**-0.014 (0.010)**	-0.001*** (2e-4)	**-0.001*** (2e-4)**	-1.693* (0.894)	**-1.774** (0.900)**
Credit	0.033 (0.100)	**0.060 (0.100)**	0.136 (0.226)	**0.152 (0.229)**	0.003 (0.384)	**0.044 (0.410)**	-0.013** (0.006)	**-0.013** (0.006)**	-16.706 (19.659)	**-1.3.579 (20.030)**

Notes- Standard errors in parentheses. ***, ** and*= Significant at 1, 5 and 10% levels, respectively. Base category for marital status is “never married” Figures in bold represent the control equation.. *Source*: Computed from HNLSS data, 2009.

Table 23(contd.): **GSEM Results for Individual Level Regression (Pooled ages)**

	Reporting Sick		Consultation decision		Treatment cost		Medical Budget Share		Unrestricted model	
HOUSEHOLD LEVEL VARIABLES										
Dep ratio	0.044 (0.028)	0.044 (0.028)	-0.152*** (0.058)	-0.148** (0.059)	0.056 (0.114)	0.020 (0.118)	-0.006** (0.003)	-0.006** (0.003)	-7.171 (5.256)	-6.709 (5.362)
Log hhsize	0.350*** (0.065)	0.357*** (0.067)	0.484*** (0.137)	0.509*** (0.140)	0.428 (0.268)	0.463 (0.284)	0.055*** (0.006)	0.056*** (0.006)	126.402*** (11.514)	131.569*** (11.734)
Logpercapita	0.774*** (0.055)	0.782*** (0.056)	0.393*** (0.116)	0.420*** (0.121)	0.925*** (0.240)	0.939*** (0.255)	0.011** (0.005)	0.012** (0.005)	158.566*** (8.981)	165.206*** (9.292)
Improved water		-0.054 (0.066)		0.167 (0.140)		-0.326 (0.234)		-0.003* (0.005)		-10.958 (11.386)
Flush toilet		0.007 (0.109)		-0.192 (0.208)		0.821** (0.347)		-0.004 (0.008)		-52.767 (19.349)
VIP Latrine/ Latrine (slab)		-0.034 (0.074)		-0.169 (0.163)		-0.161 (0.280)		-0.036 (0.006)		-13.570 (13.205)
Composting toilet		-0.107 (0.436)		-0.895 (0.945)		4.009*** (0.475)		-0.041** (0.014)		-22.819 (75.382)
Constant	-9.029*** (0.867)	-9.076*** (0.885)	-5.586 (1.77)***	-5.967 (1.817)***	-8.674 (95.144)	-9.554 (3.302)	-0.196*** (0.072)	-0.197*** (0.074)	-1891.33*** (154.804)	-1954.27 (158.81)***
Log Likelihood	-688.289	-1362.23				Var(e.ME_1) Var(e.ME_2)	0.00266 0.0025		R^2 0.145 Prob>F 0.000	R^2 0.148 Prob>F 0.000
Chi2(57) Prob >chi2	1783.82 0.0000	177.94 0.0000								

Notes-Standard errors in parentheses. ***, ** and*= Significant at 1, 5 and 10% levels, respectively. Base category for type of toilet is those using unimproved facilities. Figures in bold represent the control equation.. *Source*: Computed from HNLSS data, 2009.

4.6.1.1 Determinants of health care decisions by gender for individual level regression

Results from section 4.6.1 reveal that sex only has significant effect on the probability of being sick and consultation decision while age had no effect at all on any of the health decision stages of the hurdle model. Although sex initially affected the probability of consulting a medical practitioner, it however became insignificant following the addition of the control variables. This implies that when sex was significant, it was actually showing the effect of the sanitation variables and with the inclusion of these variables, it provided no additional explanatory power and therefore became insignificant. Since significant sex differences only exists for probability of getting sick, gender analysis was only carried out for the first stage of the hurdle model (Table 24).

Regression results for the youths(those aged 18-35years) show that common significant variables for both males and females are household size and per capital expenditure and these were shown to be the only factors affecting the probability of being sick among the male youths. In both cases, household size and per capita expenditure had positive effect on the probability of an individual getting sick. Other significant factors affecting the health status of female youths are years of education, occupation and health decision. The negative relationship observed between years of education and health status is consistent with the findings of Cutler and Lleras-Muney (2011) who revealed that an extra year of education reduces five-year mortality by 0.45percent, reduces the incidence of heart related disease by 0.54 percent and the threat of diabetes disease by 0.33 percent. Although the effect was observed to be weakly significant, a unit increase in a female youth’s ability to take health decisions reduces the likelihood being ill by 65.9%. Female youths involved in farming were shown to have higher tendencies of getting sick. This result may be due to the use and exposure to pesticides/other harmful substances as well as the work drudgery associated with agricultural activities both of which weaken their health and increase their vulnerability to illnesses and diseases. Women in agriculture, like many other rural workers, have a high incidence of injuries and diseases and they are insufficiently reached by health workers (ILO, 2000).

For the adult members of the household (>35years), the common significant variables influencing the probability of getting sick were only household size and per capita expenditure with the effect of these variables on the probability of getting sick greater for males in both cases. While no other factor influences health status in female adults, other factors affecting health status in male adults were marital status, years of education and health decision. Being in a polygamous marriage, relative to being single, and years of education of the male adults have significant negative impact on the probability of being ill while the reverse was observed for its relationship with health decision.

Table 24: Probitresults for individual level regression

	Reporting Sick			
	Male(18-35yrs)	Female(18-35yrs)	Male(>35yrs)	Female(>35yrs)
INDIVIDUAL VARIABLES				
Monogamous	-0.783 (0.522)	-0.7083 (0.452)	0.167 (0.227)	3.204 (0.291)
Polygamous	0 -	0 -	-4.446*** (0.292)	-0.337 (0.321)
Widowed/Divorced/ Seperated	-0.883 (0.780)	-0.194 (0.910)	0 -	3.536 (0.258)
Years of education	0.016 (0.027)	-0.079** (0.02)	-0.028*** (0.010)	-0.028 (0.012)
Farming	-0.059 (0. 310)	0.644* (0.348)	0.092 (0.111)	0.163 (0.129)
Health decision	0.152 (0.400)	-0.659* (0. 378)	1.389*** (0.094)	0.914 (0.122)
Training	-0.011 (0.463)	0. 301 (0.658)	-0.220 (0.394)	-5.279 (0.285)
Personal care	-0.021 (0.022)	-0.166 (11.877)	-0.003 (0.006)	0.003 (0.009)
Credit	-0.378 (0.546)	0.893 (0.981)	0.049 (0.129)	-0.018 (0.210)
Household Variables				
Dep ratio	0.085 (0.149)	0.061 (0.123)	0.009 (0.039)	0.034 (0.055)
Log hhsize	0.523* (0. 302)	0.706* (0. 368)	0.429*** (0.102)	0.269*** (0.109)
Logpercapita	1.008*** (0.269)	0.779*** (0.279)	0.894*** (0.085)	0.739*** (0.095)
Constant	-11.820*** (3. 373)	-8.552** (3. 365)	-11.64*** (1.298	-2.3914 (1.064)
Log Likelihood	-59.671	-41.004	-468.14	-320.780
LR Chi2 Prob >chi2	22.00 0.024	20. 39 0.0403	775.52 0.0000	1388.75 0.0000

Notes-Standard errorsin parentheses. ***, ** and*= Significant at 1, 5 and 10% levels, respectively. Base category for marital status is “never married”. *Source*: Computed from HNLSS data, 2009.

4.6.3 Household Level Analysis

The household level results for the rural households' health seeking behaviour are shown in Table 25. The study also controlled for sanitation variablesin all the regressions. Male household heads were less likely to be ill (38.2%) and incur treatment costs (50.4%) than female household heads. This finding may be associated with the high opportunity cost of reporting illness for the male household heads. i.e the corresponding cost of taking time off from productive activities. Age was shown to have significant positive impact on household medical budget share. Based on theoretical expectation (Grossman, 1972a and b), investment in health is expected to increase with age.

There was no evidence of sex dissimilarities in the consultation decision and in conditional medical expenditures expressed as a share of household budget. Positive and significant relationships were observed between the four health care decisions and household level variables like household size and per capita expenditure. Membership of a professional association was shown to decrease the proportion of medical expenditure of the total household budget by 0.4%. This result is supported by the social cognitive theory which explains that peoples' observation of others in their social network affects their health behaviour.Hence membership in professional association may help an individual to inculcate healthy habits or learn new ways of improving personal hygiene. Invariably, the incidence of illness is reduced and consequently there is a reduction in medical budget share. A unit increase in asset ownership decreases the probability of consulting a medical practitioner by 27.5%. Health expenditures do not necessarily increase with asset ownership as demand for health care has been shown to be a derived demand. People only demand good health and not the consumption of health care. Thus, the result obtained.

Weak age differences were observed in the decision to incur positive medical expenditure. However, significant pro-female bias in incurring health expenditure was observed among the household heads. There was no evidence of gender dissimilarities in the conditional medical expenditure expressed as a share of household budget. Positive and significant relationships were observed between the four health care decisions and household level variables like household size, per capita expenditure and dependency ratio. Regional differences in health care decisions were also observed among the rural household members. Compared to North Central, rural households in other zones had higher incidence of reporting sickness and this was observed to be highest in South South (36.9%) and least in South West (7.6 %). The result was however significant for North West, South East and South South. Rural households in North East and Northwest were about 57.6 % and 60.4 %, respectively less likely to make medical consultation than their counterparts in North Central. Relative to North Central, living in North West increases the probability of paying for medical treatment. Also, households in North Central were less likely to have a reduced medical budget share when compared to their peers in North West (0.4%) and South East (0.6%). Controlling for the effect of sanitation variables yielded almost similar results with the impact of virtually all the gender variables became more pronounced. Using the mean values of medical budget share and natural log of per capita expenditure of the households (0.014 and 1.04, respectively), results from Table 25 show that the income elasticity of health care expenditure was 0.371.

The unrestricted medical budget share equation showed weak age differences among the rural households in terms of medical budget share. It should be noted that analysing health expenditures using the unrestricted model masks significant gender variations that could be observed in other fundamental health care decisions (reporting illness, consultation and incurring medical costs). In other words, individuals having zero medical expenditure can be thought of as being healthy during the period under review whereas results from the hurdle model might reveal an individual who was sick and decided not to seek treatment or whose treatment was at no cost. Hence, such results obtained using the unconditional model can be grossly misleading. Also, with the large cluster of observations at zero, due to the inclusion of all households in the regression whether reporting being ill or not, the results are likely to be bias (Jones, 2010) Other determinants of health care expenditures in the unrestricted model were shown to be age and zone.

Table 25: GSEM results for Household level regression

	Reporting_Sick		Consultation decision		Incurring treatment cost		Medical Budget Share		Unrestricted model	
Male head	-0.382*** (0.058)	**-0.386*** (0.058)**	-0.120 (0.129)	**-0.120 (0.130)**	-0.504** (0.198)	**-0.561*** (0.197)**	-0.001 (0.001)	**-0.001 (0.001)**	-0.009 (0.109)	**-0.038 (0.108)**
Age	0.005 (0.008)	**0.005 (0.008)**	0.002 (0.019)	**0.001 (0.019)**	-0.057* (0.035)	**-0.059* (0.035)**	3.9e-4** (1.7e-4)	**35e-4** (1.6e-4)**	0.029* (0.016)	**0.027* (0.016)**
Age Squared	9.5e-5 (7.1e-5)	**9.5e-5 (7.1e-5)**	-1.3e-5 (1.7e-4)	**-1.3e-5 (1.7e-4)**	4.5e-4 (3.1e-4)	**4.6e-4 (3.1e-4)**	-2.6e-6* (1.5e-6)	**-2.4e-6 (1.5e-6)**	-2e-4*** (2e-4)	**-2e-4*** (2e-4)**
Log hhsize	0.218*** (0.049)	**0.227*** (0.049)**	0.515*** (0.111)	**0.532*** (0.112)**	0.549*** (0.184)	**0.626*** (0.199)**	0.001 (0.001)	**0.0028* (0.001)**	1.021*** (0.097)	**1.056*** (0.096)**
Logpercapita	0.594*** (0.039)	**0.607*** (0.040)**	0.378*** (0.089)	**0.421*** (0.091)**	0.731*** (0.166)	**0.749*** (0.173)**	0.005*** (0.001)	**0.005*** (0.001)**	1.226 (0.08)	**1.272 (0.08)**
Dependency ratio	-0.003 (0.020)	**-0.001 (0.020)**	-0.074* (0.044)	**-0.054 (0.043)**	-0.046 (0.092)	**-0.056 (0.095)**	-2e-4 (4e-4)	**-1.2e-5 (4e-4)**	0.012 (0.045)	**0.024 (0.045)**
Professional association	0.025 (0.076)	**0.042 (0.076)**	-0.137 (0.182)	**-0.122 (0.182)**	-0.153 (0.270)	**-0.104 (0.270)**	-0.004*** (0.001)	**-0.003** (0.001)**	-0.201 (0.170)	**-0.126 (0.169)**
Asset ownership	-0.068 (0.059)	**-0.070 (0.059)**	-0.275* (0.146)	**-0.294* (0.148)**	-0.036 (0.236)	**-0.064 (0.246)**	0.002 (0.001)	**0.003 (0.001)**	0.025 (0.120)	**-0.019 (0.119)**
North East	0.171 (0.113)	**0.171 (0.113)**	-0.576* (0.298)	**-0.509* (0.301)**	-0.377 (0.394)	**-0.302 (0.406)**	0.001 (0.003)	**0.006 (0.003)**	0.154 (0.305)	**0.202 (0.301)**
North West	0.304*** (0.097)	**0.309*** (0.098)**	-0.604** (0.262)	**-0.524** (0.266)**	4.308*** (0.300)	**4.783*** (0.320)**	-0.004* (0.002)	**-0.004* (0.002)**	-0.546** (0.241)	**-0.534* (0.239)**
South East	0.304*** (0.084)	**0.331*** (0.085)**	-0.183 (0.226)	**-0.112 (0.234)**	0.369 (0.316)	**0.518 (0.328)**	-0.006*** (0.002)	**-0.004** (0.002)**	-0.469** (0.193)	**-0.321** (0.194)**

Notes-Standard errorsin parentheses. ***, ** and*= Significant at 1, 5 and 10% levels, respectively. Base category for zone is North Central. Figures in bold represent the control equation.. *Source*: Computed from HNLSS data, 2009.

Table 25(Contd): GSEM results for Household level regression

	Reporting_Sick		Consultation decision		Incurring treatment cost		Medical Budget Share		Unrestricted model	
South South	0.369*** (0.082)	**0.378*** (0.082)**	-0.327 (0.222)	**-0.283 (0.227)**	0.166 (0.308)	**0.306 (0.310)**	-0.002 (0.002)	**-0.002 (0.002)**	-0.313 (0.193)	**-0.273 (0.192)**
South west	0.076 (0.089)	**0.084 (0.089)**	-0.239 (0.240)	**-0.191 (0.243)**	0.559* (0.330)	**0.707** (0.338)**	-0.002 (0.002)	**-0.001 (0.002)**	-0.269 (0.211)	**-0.211 (0.210)**
Improved drinking water		**-0.043 (0.046)**		**0.229* (0.117)**		**-0.088 (0.179)**		**-0.003 (0.001)*****		**-0.171* (0.097)**
Flush toilet		**-0.083 (0.074)**		**-0.429** (0.169)**		**-0.165 (0.313)**		**-0.006 (0.001)*****		**-0.451** (0.148)**
VIP Latrine/ Latrine (slab)		**-0.053 (0.054)**		**-0.171 (0.130)**		**-0.475** (0.202)**		**-0.002 (0.001)****		**-0.225** (0.110)**
Composting toilet		**0.245 (0.275)**		**-0.029 (0.624)**		**3.589*** (0.349)**		**-0.002 (0.002)**		**0.215 (0.509)**
Constant	-8.373 (0.523)***	**-8.502 (0.535)**	-3.409*** (1.175)	**-3.902*** (1.127)**	-5.492*** (2.066)	**-5.569 (2.163)**	-0.052*** (0.01)	**-0.055 (0.012)**	-7.966*** (1.053)	**-8.305*** 1.047**
AIC1 BIC1	1488-690 2054.973	AIC2 BIC2	1472.124 2145.00	Var(e.it$_1$) Var(e.it$_2$)	0.00014 0.00013				R^2 0.318 Prob>F 0.000	R^2 0.339 Prob>F 0.000
Log Likelihood	-660.065	-636.209								
Chi2(4) Prob >chi2	1913.35 0.0000	2202.31 0.0000								
Observations	5780									

Notes-Standard errorsin parentheses. ***, ** and*= Significant at 1, 5 and 10% levels, respectively. Base category for zone is North Central and for the type of toilet , it is those using unimproved facilities. Figures in bold represent the control equation.. *Source*: Computed from HNLSS data, 2009.

As was the case with individual level regression, regressions were initially run superficially to ascertain whether there exists sex and/or age differences at the household level for the health decision stages. The results reveal significant age differences for the decision to report sick and incur health treatment costs. Results from Table 26 show that household size, per capita expenditure, asset ownership, geopolitical zone, type of toilet and access to improved water are the main factors affecting the probability of being sick among the youth and adult household heads. No definite result was observed for the probability of incurring treatment costs for the youthcategory(Results presented in Appendix III). However, household size, per capita expenditure, zone and access to improved water were shown to the major determinants of incurring medical treatment costs among the adult household heads.

In summary, both theindividual and household level analyses revealed that there were no significant sex differences in the medical budget equation but established that significant sex differentials exist in the probability of being sick. Consultation decision and medical treatment costs were shown to be sex differentiated by the individuallevel regression and household level analysis, respectively.

Table 26: Probit results for household level regression

	Reporting Sick				Treatment Cost	
	Male(18-35yrs)	Female(18-35yrs)	Male(>35yrs)	Female(>35yrs)	Male(>35yrs)	Female(>35yrs)
Log hhsize	-0.191 (0.126)	0.120 (0. 395)	0.269*** (0.063)	0.227** (0.096)	0.406 (0.262)	1.367** (0.588)
Logpercapita	0.479*** (0.102)	0.563** (0.274)	0.656*** (0.049)	0.634*** (0.086)	1.043*** (0.219)	0.291 (0.415)
Dependency ratio	0.049 (0.069)	0.243 (0.168)	-0.007 (0.024)	-0.008 (0.045)	0.157 (0.122)	-0.451*** (0.207)
Professional association	-0.128 (0.209)	-5.004 (333.98)	0.056 (0.089)	0.117 (0.212)	-0.097 (0.363)	-0.156 (0.846)
Asset ownership	-	-	0.012 (0.083)	-0.021 (0.118)	-0.031 (0.346)	-0.556 (0.589)
North East	-0.968** (0.464)	-0.513 (851.811)	0.431*** (0.135)	-0.397 (0.434)	-0.328 (0.421)	3.640*** (0.523)
North West	0.091 (0.220)	-8.100 (577.734)	0.438*** (0.122)	0.716 (0.629)	4.901 (279.526)	2.348*** (0.763)
South East	0.413* (0.248)	4.107 (375.667)	0.564*** (0.111)	0.186 (0.195)	0.501 (0.422)	-0.941 (0.626)
South South	0.419** (0.178)	3.941 (375.667)	0.454*** (0.109)	-0.135 (0.191)	0.170 (0.377)	-0.793** (0.367)
South west	-0.096 (0.220)	4.258 (375.667)]	0.345*** (0.114)	-0.511** (0.205)	1.149** (0.529)	-1.346** (0.545)
Improved water	-0.368*** (0.133)	0.090 (0.339)	-0.011 (0.059)	0.086 (0.103)	-0.077 (0.255)	-0.532 (0.424)
Flush toilet	0.225 (0.199)	0.122 (0.504)	-0.231 (0.096)	-0.04 (0.156)	-0.336 (0.449)	4.896*** (0.988)
VIP Latrine/ Latrine (slab)	0.066 (0.153)	0.478 (0.364)	-0.069** (0.068)	-0.171 (0.118)	-0.460* (0.264)	-0.345 (0.276)
Composting toilet	0.722 (0.647)	-	0.275 (0.332)	0.370 (0.721)	3.030 (651.546)	3.335)*** (0.604)
Constant	-6.722 1.234	-11.942 (375.681)	-9.117*** (0.604)	-7.788*** (0.997)	-10.929*** (2.631)	-0.357 (2.808)
Log Likelihood	-263.044	-42.227	-1261.694	-452.229	-75.050	-20.113
Chi2(13) Prob >chi2	76.88 0.0000	8.21 0.769	252.52 0.000	77.49 0.000	39.56 0.000	10.76 0.631

Notes-Standard errors in parentheses. ***, ** and*= Significant at 1, 5 and 10% levels, respectively. Base category for zone is North Central. *Source*: Computed from HNLSS data, 2009.

CHAPTER FIVE

SUMMARY OF MAJOR FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1. Summary of Major Findings

The study examined gender differences in health seeking behaviour, determined the magnitude of out-of-pocket payments for health care services and profiled the domains of gender analysis framework. The study also structured a schematic model for the determination of the significant factors influencing health care expenditures. The following were the major findings from the study:

Although the study revealed low level of credit access in rural Nigeria, female youths and adults have been shown to be more disadvantaged and are about 6% and 4%, respectively less likely to obtain credit than male youths and adults.

The structure of land access in rural Nigeria shows that almost all the female youths (99%) and male youths (97%) hadaccess to farm lands below 10 hectares in size. The distribution in terms of access to land was found to be similar among the adults (98% versus 97 % for male and female, respectively).The proportion of the rural households having access to land greater than or equal to 10hectares was shown to be less than 4% for both adults and youths. The percentage of household budget allocated to health services may not necessarily increase with ownership of land as demand for medical care has been shown to be a derived demand.

An analysis of the educational status of the household members shows that about 56 % of the female adults had no form of education while the corresponding figure for the males was 42%. This result is worrisome given that formal education plays a pivotal role in the utilization of health services by household members. Male youths and adults were 0.12% and 0.06%, respectivelymore likely to be involved in public work or employment programme than their female counterparts. Similarly, participation in training programmes had more male representation, although female adults were seen to be in the majority when the type of training received was formal.

A higher proportion ofmales in the rural areas (both youths and adults) were involved in agriculture and other income generating activities while the rural women were observed to spend significantly more time on reproductive activities which involve the care and maintenance of the households and its members.

Significant gender differences exist in terms of purchases made on household durable assets. Significant pro male bias (₦12,324 against ₦10,748) was noticed in terms of large investment expenditure among rural households in Nigeria among the adults. Although the reverse was observed among the youths, the difference was however shown to be insignificant.

For both the youths and adults, health decisions were taken more by the males than the females.Adult males had the highest share (66%) of the total medical expenditures of the rural households. Adult females were seen to be next to the adult males (23%) in terms of their contribution to health care expenditures while the young females had the least (4%).Significant gender differences were also observed in the zones as rural women (young and adult) in the South were more likely to make health care decisions than their Northern counterparts, though men were seen to be in the majority in all the zones.

Educational level has been shown to increase influence on health decisions among ruralhouseholds with the exception of adult females whose share of health care expenditures appear to decrease with increase in their level of education. Based on occupation, percent contribution to health care expenditures was observed to be higher among the youths than the adults.

Across the pooled sample (all ages), women were 1.8 times more likely to report illness or injury than men and similar gender differences were observed in all the zones.Having reported illness, consultation rates for women were also significantly higher than that of men and the greatest significant gender disparity was noticed in North West (9.71%) and the least in South East (0.11 %).

As observed with the pooled sample, the share of medical expenditure in the household per capita expenditure was higher for males in virtually all the age categories. Although, females reported more illness and had higher consultation rate than males, their medical budget share was 3.57% lower than that of men.With the exception of the age categories 0-5years and 6-15years, females were more likely to report being ill. The elderly age group (60+) recorded the highest percentage of reporting illness and this was observed to be significantly higher for females than the males.

The proportion of females who consulted health practitioners was higher than that of males in all the age groups except in age group 6-15years which was however not significant.In virtually all the geopolitical zones, the females were shown to seek more treatment than males for the different age categories and the leading significant difference was observed in North West for age group 60+. Following consultation, there was no significant gender gap in the probability of incurring medical costs across the different age classifications.

The number of the sampled rural households who used at least one form of health care service was found to increase with age irrespective of the sex though slight variations were observed in males for inpatient stays and ambulatory care. For age transitionless than 16years to 16-45 years(0.9 to 0.8% and 6.0 to 4.4 %, respectively). Adult household members had higher tendencies to utilize health care services than their younger counterparts.Total mean monthly expenditure on health per person was higher for the male adults (₦7256.4) than the female adults (₦5,115.4) in rural Nigeria. Though the difference was not significant, female youths were observed to spend more on health (₦4,434) than male youths (₦3,858).

While household level analysis only revealed significant differences in sex for the probability of reporting illness and incurring medical costs, the individuallevel regression only revealed significant differences in sex for the former. Estimation of the Triple hurdle model revealed that household size, per capita expenditure, marital status, years of education, access to training, personal care and health decision are the major factors influencing the health status of youths and adults in rural Nigeria.At both individual and household levels, income elasticities of health care expenditures were 0.234 and 0.371 respectively.

5.2. Conclusion

The study focused on gender differentials in the utilization of health services among rural households in Nigeria. It also structured a model of health seeking behaviour involving three binary decision stages (reporting illness, consulting health practitioners and incurring positive expenditure) and the final stage of unrestricted medical expenditure. Significant gender differences were only observed for reporting illness and medical consultation. The probability of being sick among the youths(18-35years) as shown to be influenced significantly by household size, years of education, health decision, occupation, and per capita expenditure. For the adult members of the household (>35years), the common significant variables influencing the probability of getting sick were only household size and per capita expenditure with the effects of these variables observed to be greater for males than females.

Although rural women in Nigeria have a higher likelihood of being sick, they do not spend as much on health care services as men. Hence, lower utilization of quality health services. This dichotomy can be explained to a reasonable degree by the sacrificial tendencies of women which require they forgo treatment or opt for cheaper alternatives following the knowledge of high treatment costs. Other limiting factors to women's utilization of health services have been identified as occupation, taking health decisions, personal care, household size and per capita expenditure. In addition, despitethe higher medical expenditure for adult males, their medical consultation rates following an episode of illness were lower and this has been attributed to factors liketaking health decisions, dependency ratio, household size and per capita expenditure. However, investment in health increased with age irrespective of the sex of the household members.

5.3 Recommendations

Based on the findings of the study, the following recommendations are suggested:

1. Years of formal education reduced the incidence of being ill among rural women in Nigeria. Low level of education among women calls for a multi-level advocacy and re-conscientization which will promote female education as this has been shown to be central to health care utilization.Increased level of education will help liberate women from cultural barriers which restrict their access to productive resources that plays a

fundamental role in improving their health seeking behaviours. As a result, incentives should be provided to keep the girl child in school. Programmes like ONE-campaign, promoting girl-child education, should be intensely propagated by both the government and all stakeholders.

2. Access to credit was shown to have significant impact on medical budget share. Efforts should be made to enhance the operations of Bank of Agriculture and other similar institutions to provide more credit access for rural dwellers so as to increase their ability to make upfront investments which are needed to boost productivity and improve rural households' income.
3. Men and boys concerns should also be given urgent attention. Despite the fact thatboys were more likely to report illness or injury, medical consultation rates were still higher for girls. Gender norms which require that men be emotionally strong and hide their health status until it gets to a critical level should be obliterated. Programmes or organization addressing men and boys' health and other issues, such as "Male Awareness Now (MAN) project" and "Global Action on men's Health", should also be advocated.
4. Individuals using composting or flush toilets were shown to have lower tendencies of incurring health expenditures than those using unimproved sanitation facilities. Lack of sanitation predisposes household to communicable diseases such as diarrhoea and Cholera. More awareness should be provided in the rural areas on the health benefits of using improved sanitation facilities and programmes providing appropriate latrines and education regarding water, sanitation, and hygiene (WASH) which will extend beyond the home, to cover schools and health care facilitiesshould be encouraged.
5. Taking health decisions was shown to have significant impact on medical consultation rates. Since the findings of the study revealed that decision making as regards health care purchases was mainly male dominated, more women participation in household decision making needs to be encouraged so as to improve their utilization of health care services.

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APPENDIX I

Definition/ Glossary of Gender Terms

Sex: Biological differences between women and men (UNESCO, 2009). Sex represents the biological variances between males and females in terms of their reproductive organs, hormones, chromosomes among others which patently help to differentiate girls and boys as well as women and men (WHO, 2010). Although it has been generally believed that biological sex is given, it should be noted that sex, in recent times, is changeable as evident in transgenders. Hence, sex can also be socially and culturally ascribed. However, this claim is still debatable as it is believed that regardless of sex reassignment, the sex related structures of the brain still remain unchanged.

Gender:this refers to societal and constructed differences between women and men's roles and responsibilities which are taught, vary from clime to clime and are subject to change over time (UNESCO, 2009). The definition of gender hinges on social norms and values, behaviours, activities, responsibilities and relationship which are designed by the society and allocated differently on the basis of sex (WHO, 2010). The concept of gender varies across cultures, religions, countries and castes.

Gender roles and relations pertain to socially conditioned activities which are learned and accordingly make men and women to act in certain ways related to their biological sex and this also affects the way they relate to one another(UNICEF, 2011). Gender roles and relations are rooted in education, political and economic systems and religion in any given context. From feminist economics, gender relations are often characterized by power inequities, whereby one gender dominates the other in different spheres of social, economic and/or political life.

Gender equality: To achieve gender equality, men and women should be given equal chances, situations and treatment in order to actualize their full potentials, dignity and civil rights as well as chances to contribute to and gain from social, economic, political and cultural development (UNIGEI, 2012). It is based on the premise that men and women should be treated the same way but it fails to recognize that such equal treatment will not produce equitable results due to differences in their life experiences.

Gender equity attempts to distinguish between sameness and fairness in terms of access to services, benefits, resources and decision making ability(UNICEF, 2011). It considers in essence the differences between men and women's life experiences and also raises a concern for the adoption of different strategies which may be needed to bring about equitable outcomes (CIDA, 2014).

Gender norms, identities and values refer to the fundamental parts of gender roles and relations. In whatsoever context that it is being conceived, gender norms, identities and values highlight the understanding and expectations of men's and women's roles and responsibilities, abilities and characteristics within the given conception (UNIGEI, 2012).

Gender Analysis refers to the critical examination or evaluation of the ways in which an intervention, policy or research project is planned to take into consideration variances in gender relations and roles which represent the attitudes and behaviours of participants with possible effect on its outcomes(Reeves and Baden, 2010). Gender analysis is carried out to establish whether gender disparities exist, know why they exist, examine whether their existence create a threat to the realization of the desired outcome and suggest ways of addressing the identified problems (UNAIDS, 2011).

Gender mainstreamingrepresents the practice of integrating men's and women's issues and life experiences into the design, implementation, monitoring and evaluation of all programmes, legislation and polices (UNIGEI,2012). The end result of this is the provision of equal treatment and opportunities for men and women thereby helping to alleviate or completely terminate the continuance of the prevailing inequality (DFID, 2002).

Gender parity: is a statistical concept which is concerned with the comparative analysis of men, women, boys and girls in terms of numbers and proportion. Conceiving gender parity in terms of education implies that equal number of girls and boys have access to educational services in various forms.

Health care is the maintenance or improvement of health through diagnosis, treatment, and prevention of disease, illness, injury, and other physical and mental impairments in human beings (Saravanan and Kumar, 2016). It simply refers to all actions taken to ensure the maintenance or restoration of an individual's physical, mental or emotional wellbeing by trained professionals and other care providers.

Health care utilization is the quantification o the use of services by persons for the purpose of preventing and curing health problems, promoting maintenance of health and well-being, or obtaining information about one's health status and prognosis (Carrasquillo, 2003). This include the use of hospital facilities and health professionals' resources (providers and practitioners) and personal care home (PCH) resources.

APPENDIX II

Analysis of Objective

S/N	Objective	Meaning	Data Requirement	Proposed tools of analysis
1.	Determine the magnitude of out-of-pocket payments for health care services by gender and by region	To examine the direct payment made by households on the utilization of health services and purchase of drugs	Information on Cash medical expenditures like: consultation fee, hospital bills, medications, laboratory tests and diagnostic expenses.	Descriptive statistics, Lorenz curve, and Gini coefficient
2	To profile the domains of gender analysis framework and establish gender differentials in the utilization of health services;	To outline the important variables in gender analysis and assess the differences in health care spending of the male and female members of the household	Access to resources, time allocation, types of knowledge by male and female, attendance in trainings/meetings, frequency of visits to health care providers.	Descriptive statistics, Lorenz curve, Gini coefficient, Atkinson Index, Generalised Entropy and Coefficient of variation
3.	To examine the determinants of health care expenditure	To know the factors influencing health care spending of the households	Information on household expenditures, individual and household level variables and community health variables	Hurdle model, Generalised Structural Equation Model, Conditional Mixed process and Engel curve
4	Estimate the income elasticity of health care expenditures by gender.	To understand the effect of marginal changes in income on both the probability of making health care payment and on the amount of health care expenditures	Figures on total household expenditure and health expenditure	Hurdle model, Generalised Structural Equation Model, Conditional Mixed process and Engel curve

APPENDIX III

Probit Results for Household Level Regression

	Reporting Sick				Treatment cost			
	Male(18-35yrs)	Female(18-5yrs)	Male(>35yrs)	Female(>35yrs)	Male(≤35yrs)	Female(≤35yrs)	Male(>35yrs)	Female(>35yrs)
Log hhsize	-0.19- (0.127)	0.194 (0.413)	0.269*** (0.063)	0.227** (0.096)	30.235 -	2.65 e-13	0.406 (0.262)	1.367** (0.588)
Logpercapita	0.479*** (0.102)	0.642** (0.292)	0.656*** (0.049)	0.634*** (0.086)	22.819 -	2.16e-13 -	1.043*** (0.219)	0.291 (0.415)
Dependency ratio	0.049 (0.069)	0.217 (0.168)	-0.007 (0.024)	-0.008 (0.045)	-10.103 -	-3.66e-14 -	0.157 (0.122)	-0.451*** (0.207)
Professional association	-0.128 (0.209)	-4.989 (434.565)	0.056 (0.089)	0.117 (0.212)	5.789 -	0 -	-0.097 (0.363)	-0.156 (0.846)
Asset ownership	-0.013 (0.145)	-0.581* (0.340)	0.012 (0.083)	-0.021 (0.118)	25.008 -	-2.66e-15 -	-0.031 (0.346)	-0.556 (0.589)
North East	-0.967** (0.465)	-0.081 (1098.85)	0.431*** (0.135)	-0.397 (0.434)	12.550	-	-0.328 (0.421)	3.640*** (0.523)
North West	0.092 (0.221)	-0.515 (744.836)	0.438*** (0.122)	0.716 (0.629)	86.292 -	-	4.901 (279.526)	2.348*** (0.763)
South East	0.411* (0.248)	-0.4.345 (477.571)	0.564*** (0.111)	0.186 (0.195)	64.043 -	-1.18e-13 -	0.501 (0.422)	-0.941 (0.626)
South South	0.415** (0.178)	4.169 (477.571)	0.454*** (0.109)	-0.135 (0.191)	35.363 -	-3.62e-13 -	0.170 (0.377)	-0.793** (0.367)
South west	-0.097 (0.222)	4.527 (477.571)	0.345*** (0.114)	-0.511** (0.205)	12.283 -	0 -	1.149** (0.529)	-1.346** (0.545)
Improved water	-0.368*** (0.133)	0.070 (0.346)	-0.011 (0.059)	0.086 (0.103)	-10.593 -	-2.52e-15 -	-0.077 (0.255)	-0.532 (0.424)
Flush toilet	0.225 (0.199)	0.110 (0.525)	-0.231 (0.096)	-0.041 (0.156)	-28.404 -	9.77e-14 -	-0.336 (0.449)	4.896*** (0.988)
VIP Latrine/ Latrine (slab)	0.066 (0.153)	0.450 (0.369)	-0.069** (0.068)	-0.171 (0.118)	-29.660 -	-7.33e-14 -	-0.460* (0.264)	-0.345 (0.276)
Composting toilet	0.719 (0.649)	-	0.275 (0.332)	0.370 (0.721)	0	-	3.030 (651.546)	3.335)*** (0.604)
Constant	-6.717 1.235	-12.831** (477.583)	-9.117*** (0.604)	-7.788*** (0.997)	-286.472 -	6.977 -	-10.929*** (2.631)	-0.357 (2.808)
Log Likelihood	-263.251	-41.531	-1261.694	-452.229			-75.050	-19.607
Prob >chi2 Pseudo R2	0.0000 0.160	0.2061 0.126	0.000 0.101	0.000 0.088			0.000 0.264	0.065 0.308

Notes-Standard error in parentheses. ***, ** and*= Significant at 1, 5 and 10% levels, respectively. Base category for marital status is “never married”. *Source*: Computed from HNLSS data, 2009.