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Research Article

Gender Analysis of Healthcare Expenditures in Rural Nigeria

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Health inequities have significant social and economic costs to both individual and societies. These inequities are largely due to gender based differences which influence health conditions, access to and utilization of health services. The study therefore carried out a gender analysis of healthcare expenditures in rural Nigeria. Secondary data from 2009 Harmonised National Living Standard Survey was employed in the study, from which 24,941 rural households were taken as the study sample. Analysis was done using descriptive statistics, Triple Hurdle Model, and Generalised Structural Equation Model. Findings from the study showed that mean monthly expenditure on health per person was higher for male adults (₦7,256.40±₦629.00) than female adults (₦5,115.40±₦503.90) whereas the female youths spent more (₦4,433.60±668.10) on healthcare than male youths (₦3,857.90±₦671.30). Although, adult females reported more illness and had higher medical consultation rate than males, their medical budget share of total household income was 1.95 % lower than that of adult males. Estimation of the Generalised Structural Model revealed that household size, per capita expenditure, marital status, years of education, occupation and health decision are the major factors influencing the health status of youths and adults in rural Nigeria. Since female adults spent less on their health than male adults despite reporting higher cases of sickness, efforts should be made to encourage increased women's participation in productive activities so as to enable them to contribute more to household cash income thereby increasing their influence on household spending. Policy intervention options should also focus on literacy level, household size, type of occupation, per capita expenditure and marital status.

Key words: Gender, health care, medical expenditure, rural households

INTRODUCTION

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 where high levels of poverty exist (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 healthcare services (UN 2009; Baeten et. al., 2013; Joe *et al.* 2008). These differences in healthcare utilization, particularly in developing countries with deep-seated custom and cultural inclinations, 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 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 heath 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

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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. 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 (JICA 2011). 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, the BCN report 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 more 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. 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 Healthcare 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 were 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). Also, involvement in more dangerous agricultural activities (harvesting of palm kernel, operation of heavy farm equipment e.t.c) and occupations have been found to be male dominated. For the reason that 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 attempts to investigate the exact gender pattern in health seeking behaviour of rural households in Nigeria. A realization that such gender disparities exist will help policy makers and programme managers to understand the cause of these differences and offer entry points for designing policies and programmes that will engender equitable outcomes. Specifically, the study intends to:

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

Theoretical Framework

Health Capital Theory

The study hinges on the health 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:

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

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:

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

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

The total time budget Ω_t

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

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 the biological 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:

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

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 τ_{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):

$$I_t = I[m_t, \tau_t; E], \quad (6)$$

$$C_t = C[X_t, \tau_{C_t}; E] \quad (7)$$

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 spent working τ_{W_t},

$$Y(H_t) = w_t[\Omega_t - \tau_{\tau_t} - \tau_{C_t} - s(H_t)] \quad (8)$$

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:

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

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.

METHODOLOGY

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 a nationally representative household expenditure survey that records both household income and expenditure pattern on health in details. 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 activities were used.

Method of Data Analysis

The study employed a number of analytical techniques. These include Descriptive statistics (Mean, percentages, frequencies etc), Generalized Structural Equation Model (GSEM) and Hurdle model. The study differentiates a

youth from an adult following the definition provided by National Youth Policy (2009) which defines a youth as a male of female whose age falls in the range 18-35 years and are nationals of the Federal Republic of Nigeria. Accordingly, an adult is regarded as someone who is older than 35 years.

Generalized 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 models and item-response theory (IRT) models. The Generalised Structural Equation Model (GSEM) has however been added to the SEM to allow for the estimation of binary, count, categorical, and ordered variables, which is applicable to this study. GSEM allows for the 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:

$g\{E(y|X)\} = x\beta$ (10)

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:

$\phi^{-1}\{E(x_1|X)\} = \alpha_1 + X\beta_1$ (11)

$\phi^{-1}\{E(x_2|X)\} = \alpha_2 + X\beta_2$ (12)

$\phi^{-1}\{E(x_3|X)\} = \alpha_3 + X\beta_3$ (13)

$\phi^{-1}\{E(y|X)\} = \alpha_4 + X\beta_4$ (14)

Equivalently, the above can be written as

$Pr\ (x_1 = 1|X) = \phi(\alpha_1 + X\beta_1)$ (15)

$Pr\ (x_2 = 1|X) = \phi(\alpha_2 + X\beta_2)$ (16)

$Pr\ (x_3 = 1|X) = \phi(\alpha_3 + X\beta_3)$ (17)

$Pr\ (y = 1|X) = \phi(\alpha_4 + X\beta_4)$ (18)

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

$E(x_4|X) = X\beta_4$ (19)

Or

$y = \alpha + X\beta_4 + e.y_4$ (20)

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:

$Pr\ (D = 1|X) = \phi(\alpha_1 + X\beta_1)$ (21)

$Pr\ (C = 1|X) = \phi(\alpha_2 + X\beta_2)$ (22)

$Pr\ (M = 1|X) = \phi(\alpha_3 + X\beta_3)$ (23)

$A = \alpha + X\beta_4 + e.x_4$ (24)

Where D, C and M represent the probabilities of reporting sick, seeking medical attention and making positive expenditure 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 healthcare decision stages.

Hurdle Model

According to Irving and Kingdon (2008), health seeking behaviour, passes through four decision stages – reporting sickness, consultation, incurring medical expenditure and the actual amount of health expenditure. This study used the Triple Hurdle Model (estimated using GSEM) 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:

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

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

θ is the Probit estimate of the parameter vectors in the healthcare 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:

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

η is the Probit estimate of the parameter vectors in the healthcare 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:

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

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

Estimation of the regression equations

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 healthcare expenditure with a continuous dependent variable, was estimated using ordinary least squares (OLS). The dependent variables for the four decision stages are defined as follows:

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 incurring medical payments conditional on seeking medical attention (incur medical payment=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 1). 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 making health expenditures is reduced thereby cutting back medical payments.

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

Variables	Measurement
Individual Level Variables	
Age of household member	Years
Sex	Male=1, Female = 0
Education	No of years of formal education
Marital Status	Single=1(base category); Monogamous=2;Polygamous=3;andWidowed/Divorced/Separated=4,
Occupation	Farming=1, 0 if otherwise
Access to credit	Access=1, 0 if otherwise
Training participation	Participation=1, 0 if otherwise
Personal Care	Hours
Household Level Variables	
Household size	No. of individuals living in the Household
Gender of Household head	Male=1, Female = 0
Per capita expenditure	Naira
Dependency ratio	Ratio of non-workers to workers in the household
Professional association	Member=1, 0 if otherwise
Asset ownership	No of assets owned by the household
Sanitation Variables	
Type of toilet used	Unimproved facilities=1(basecategory);Flush toilet=2; VIP latrine/lartrine(slab)=3;and Composting toilet=4
Access to improved drinking water	Access=1, 0 if otherwise

RESULTS AND DISCUSSION

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, most of whom are adults (over 35yrs). With a mean age of about 42 years, it can be 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 were widowed, divorced or in polygamous marriages were marginally represented. 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 educational qualification. Only a paltry proportion of the respondents had tertiary education (3.33%). 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%). The mean size of farm land was approximately 5 hectares which implies that majority of the rural dwellers are small holder farmers (86.14 %). 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 to 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

Characteristics	**Percentage (%)**
Sex Male Female	50.97 49.03
Male ≤35yrs	36.05
>35yrs	63.95
Female ≤35yrs	44.79
>35yrs Mean 42.4(±19.4)	55.21
Marital Status	
Single	29.31
Monogamous	65.15
Polygamous	0.53
Divorced	1.29
Widowed	3.72
Educational level	
None	53.67
Primary	29.77
Secondary	13.23
Tertiary	3.33
Household size	
1-4	30.26
5-9	58.46
≥10	11.29
Mean	5.9(±2.4)
Farm size(ha)	
<5	86.14
6-10	9.80
>10	4.06
Mean	4.50 (±29.82)
Occupation	
Farming	61.26
Non-Farming	38.74

Source: Author's computation from HNLSS data, 2009

Gender Disparities in Health Care Decisions

Gender analysis is centred on decision making 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 healthcare expenditures in rural Nigeria, there is a need first to establish who picks up health expenditure bills as well as ascertain whether age has any correlation with taking up household responsibilities.

Results from Table 3 show that significant pro-male bias exists in the ability to influence and control rural households' resources in making decisions on health. For both the youths and adults, health decisions were taken more by the males than the females, although gender discrepancies were more pronounced and significant among the youths. The table also reveals that adult males had the highest share (66%) of the total medical expenditures, followed by the adult females (23%) while the female youths were observed to have the least contribution (4%). From the foregoing, 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 largely influence economic decisions at the household level, women's decisions to make health purchases, to a reasonable extent, are being conditioned by men.

Table 3: 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

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

In addition to determining who controls household resources with respect to making health care expenditures, there is also a need to consider gender disparities in reporting different health decisions. As shown in Table 4, in both youth and adult categories, women were more likely to report illness or injury than men. Having reported illness, medical consultation rate was also higher for the young and adult females than their male counterparts, though the result was significant for only the youths. The difference of the sexes in terms of incurring medical expenditure was not significant in both the youth and adult categories. Although, adult females reported more illness and had higher consultation rate than males, their medical budget share was 1.95 % lower than that of men. This implies that adult women rarely seek treatment from such sources where medical charges are quite high. In most cases, especially, during periods of financial hardship, they tend to 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). However, medical expenditure for female youths was higher than those of the male youths. The result could be due to the fact that women in the youth category are in their reproductive age. Hence, in addition to the regular diseases that affect both male and female in all age groups, women in the reproductive age class tend to have more health needs arising from child bearing associated treatments such as antenatal, deliveries, immunization among others.

Gender Disparities in the utilization of health care services

The section focuses on the utilization of different health care services and the resulting out-of-pocket payments for rural households in Nigeria. The out-of-pocket payments cover expenditures arising from drug purchases and utilization of health care services. Results presented in Table 5 shows that the 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 not significant, female youths were observed to spend more on health (₦4,434) than male youths (₦3,858). This result is consistent with that of Sarker *et al.* (2014) who revealed that among individuals in the reproductive age, medical health expenditure was higher among the female than the males (US$ 14.2 against US$ 11.3).

In all, inpatient stays (hospital admissions) accounted for the largest fraction of health expenditures by type of service and this was more utilized by adult members of the household. Majority of the youths (0.36% and 0.53%, for male and female, respectively), however, had at least a record of using medicine and medical supplies to meet their health needs. Individuals who received ambulatory care (out-patient treatment) or incurred drug expenses were observed to be marginally represented in both adult and youth categories.

Table 4: Gender Differences in health decisions

	Percentage	Difference	Pr>Chi2
% reporting sick			
18-35			
Male	8.07		0.062
Female	10.65	-0.32*	
>35			
Male	14.13	-5.03***	0.000
Female	21.18		
% reporting consultation			
18-35			
Male	76.84	0.32*	0.079
Female	87.50		
>35			
Male	80.11	2.41	0.501
Female	82.24		
% reporting medical expenditure			
18-35			
Male	95.89	1.24	0.773
Female	96.83		
>35			
Male	92.72	-2.29	0.231
Female	95.31		
Medical Expenditure (% of household per capita expenditure			
18-35			
Male	2.68	-2.25***	0.002
Female	4.93		
>35			
Male	6.09	1.95***	0.000
Female	4.14		

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

Table 5: Distribution of mean out-of-pocket (OOP) expenditure for health services

	Mean OOP /person (₦)	Mean Difference	Percent distribution of health expenditure			
			Ambulatory Care	Inpatient Stays	Medicine &supplies	Drug Expenses
All Male	6567.73	1618.89**	0.12	0.42	0.31	0.15
Female	4957.84		0.15	0.38	0.31	0.16
18-35years Male	3857.9(±671.3)	-575.7	0.10	0.36	0.37	0.18
Female	4433.6(±668.1)		0.17	0.20	0.53	0.10
>35 years Male	7256.4(±629.0)	2141***	0.12	0.43	0.30	0.15
Female	5115.4(±503.9)		0.15	0.38	0.29	0.17

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

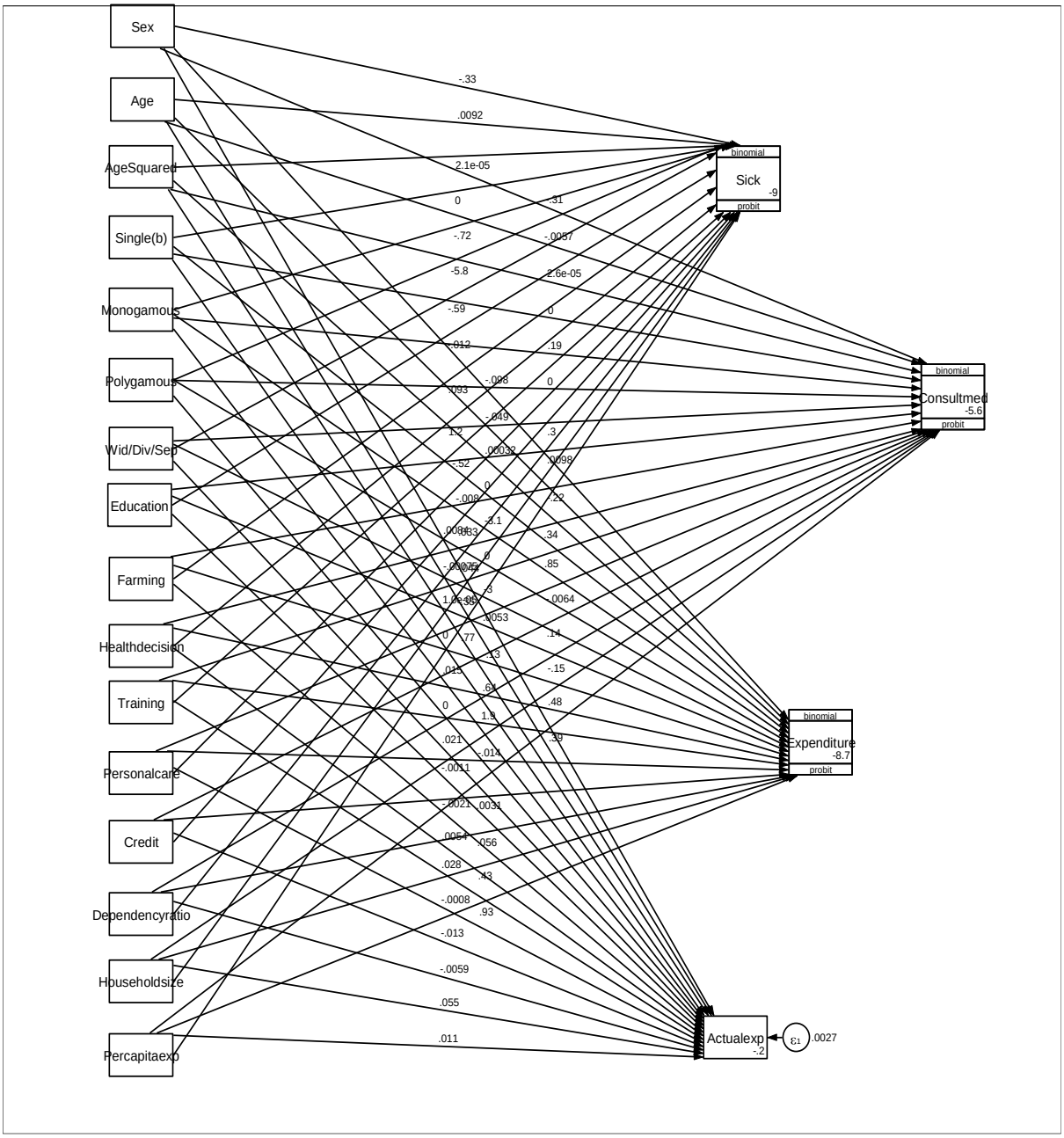

Fig.1 Path Diagram forindividual level analysis: Age Structure of gender disparities
Source: Author's construct based on HNLSS data, 2009

Structuring gender differences in health care expenditures of rural households

Gender disparities in healthcare expenditures of rural households were established by designing a Triple hurdle model which was estimated using GSEM. In GSEM and SEM, 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 16 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 which link the dependent and independent variables.

In addition to path diagrams, GSEM results can also be presented in tabular form, as shown in Tables 6 and 7, to give a clearer presentation of the outcomes. As earlier stated, the decision stages in the hurdle model represents the five components presented in the Tables. 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 health expenditure 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.

Table 6 presents the GSEM results for the individual level regression for pooled data. The regressions were initially ran at the surface to test whether sex and age have significant effect on the different health care decisions. For the first model, the male dummy variable was found to be highly significant in determining the probability of reporting illness. Men were 33.4 % less likely to report sickness than women. In order 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. Results from the second model for consultation reveal weak sex differences ($p<0.1$) which later became insignificant following the introduction 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. Table 6 also show no significant gender disparities in the models for treatment cost and medical budget share.

Table 6: 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-*Z* statistics 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 6(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- *Z* statistics 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.

Determinants of health care decisions by gender

As earlier indicated, significant sex differences only exists for probability of getting sick and as a result gender analysis was only carried out for the first stage of the hurdle model (Table 7). Regression results for the youths (18-35years) show that common significant variables influencing the probability of reporting sickness for both male and female are household size and per capita expenditure. These are however the only significant variables affecting the health status of the male youths. As the household size increases, the probability of reporting being sick for female and male youth increases by 47.4% and 6.6%, respectively. The corresponding effects of a unit increase in per capita expenditure on the health status of young male and female household members are 91% and 76.1%, respectively. By implication, large sized households with high per capita expenditure have higher tendency of reporting ill. This may be as a result of congestion and the resultant overstretching of the available sanitation facilities which provides a conducive environment for the emergence and easy spread of communicable diseases. In addition to household size and per capita expenditure, years of education, being engaged in farming and taking health decision were also shown to affect the health status of female youths.

An extra year of education was found to significantly reduce the probability of reporting sick by 8.0%. This result is plausible as individuals with more education 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 finding is consistent with that of Cutler and Lleras-Muney (2011) who revealed that an extra year of education reduces five-year mortality, incidence of heart related disease and the threat of diabetes by 0.45%, 0.54 % and 0.33 %, respectively. Female youths who took health decisions were 75.1% less likely to report being sick than their dependent counterparts. Also, being a farmer increases the likelihood of reporting illness by 64.1%. This result hinges on the reasoning that those engaged in agricultural activities tend to suffer more from work depredations which have negative implications on their health status. Although there is a growing debate on this perception, a number of studies have shown that exposure of farmers to occupational hazards (sunlight, ergonomic stress, inorganic dusts, viruses, chemicals) constitute possible risk factors to farmers' health including respiratory diseases, musculoskeletal disorders, injuries, pesticide poisoning, injuries and neurological dysfunctions (Brumby *et al.* 2012; Lee *et al.* 2010; AIHW 2013).

For the adult members of the household (>35years), the common significant variables influencing the probability of reporting sickness were only household size and per capita expenditure with the effect of these variables observed to be greater for males than females. While no other factor affects the health status in female adults, other factors influencing health status in male adults are 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 had significant negative impact on the probability of being ill while the reverse was observed for taking health decision.

Table 7: Determinants of reporting sick

	Reporting Sick			
	Male(18-35yrs)	Female(18-35yrs)	Male(>35yrs)	Female(>35yrs)
INDIVIDUAL VARIABLES				
Monogamous	-0.812 (0.516)	-0.621 (0.454)	0.167 (0.227)	3.204 (0.291)
Polygamous	0 -	0 -	-4.446*** (0.292)	-0.337 (0.321)
WDS	-0.774 (0.772)	-0.154 (0.909)	0 -	3.536 (0.258)
Years of education	0.028 (0.026)	-0.080** (0.032)	-0.028*** (0.010)	-0.028 (0.012)
Farming	0.016 (0.303)	0.641* (0.362)	0.092 (0.111)	0.163 (0.129)
Health decision	0.137 (0.381)	-0.751** (0.347)	1.389*** (0.094)	0.914 (0.122)
Training	-0.106 (0.945)	-	-0.220 (0.394)	-5.279 (0.285)
Personal care	-0.020 (0.021)	-0.169 (11.935)	-0.003 (0.006)	0.003 (0.009)
Credit	-0.276 (0.540)	0.806 (0.979)	0.049 (0.129)	-0.018 (0.210)
HOUSEHOLD VARIABLES				
Dep ratio	0.085 (0.150)	0.066 (0.123)	0.009 (0.039)	0.034 (0.055)
Log household size	0.474* (0.285)	0.066* (0.370)	0.429*** (0.102)	0.269*** (0.109)
Log per capita	0.910*** (0.245)	0.761*** (0.276)	0.894*** (0.085)	0.739*** (0.095)
Constant	-10.538*** (3.619)	-8.235** (3.347)	-11.64*** (1.298	-2.3914 (1.064)
Log Likelihood	-62.339	-40.793	-468.14	-320.780
Chi2 Prob >chi2	21.83 0.0258	20.87 0.0220	775.52 0.0000	1388.75 0.0000

Notes- *Z* statistics in parentheses. ***, ** and*= Significant at 1, 5 and 10% levels respectively. Base category for marital status is “never married”. WDS- Widowed/ Divorced/Separated

***Source*:** Computed from HNLSS data, 2009.

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 actual medical expenditure. Significant gender differences were only observed for the first stage of the model, ‘reporting being sick’. The probability of reporting sickness by the youths was shown to be influenced significantly by years of education, taking health decision, engaging in farming, household size and per capita expenditure. For the adult members of the household, the common significant variables influencing the probability of being sick were only household size and per capita expenditure with the effects of these variables observed to be greater for males than females.

In general, although adult women in rural 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. On the flip side, following an episode of illness, men (both adult and youths) are less likely than women to seek medical attention, a tendency which has been linked to socially learned construct which requires that men should be emotionally strong and show no sign of weakness as health care use or health promoting behaviour is considered effeminate.

RECOMMENDATIONS

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

1. Though adult women have weaker health status, average medical expenditure was observed to be higher for men. Efforts should be made to encourage increased women's participation in productive activities so as to enable them to contribute more to household cash income thereby increasing their influence on household spending.
2. Years of 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 also help liberate women from cultural barriers which restrict their access to productive resources which 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 which promotes girl-child education, should be intensely propagated by both the government and all stakeholders.
3. Men and boys concerns should also be given urgent attention. Lower medical consultation rates among youths and adults suggest the need to obliterate gender norms which require that men be emotionally strong and hide their health status until it gets to a critical level. Programmes addressing men and boys' health and other issues should also be advocated.
4. Making health decision was shown to have significant impact on the health status. 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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