

Healthcare Expenditures Across Household Headship and Expenditure Quintiles: Insights from a Household Survey

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Received: 14 February 2023; Revised: 25 February 2023; Accepted: 03 March 2023; Published: 28 March 2023

ABSTRACT

Using the nationwide cross-sectional 2016 Household Income and Expenditure Survey data compiled by the Department of Census and Statistics of Sri Lanka, this study examines the impact of the heterogeneity induced by gender-based differences in household headship on healthcare consumption expenditure. We separately modeled Out Of Pocket Health expenditures for male and female household head decision-makers across the richest and poorest expenditure quintiles to avoid endogeneity and self-selection bias. Double-hurdle model is used for the study. Estimation results reveal that key determining factors in deciding whether to spend on healthcare and the level of Out Of Pocket Health expenditure varied between male and female-headed households and also across expenditure quintiles. The presence of members with NCD/NCDs or being disabled, household size, age and educational level of the household are significantly influence on participation decision while the living sector, Wealth Index, healthcare seeking behavior and expenditure quintile are significantly influencing on level of spending on healthcare but this effect differs between male vs female headed households in magnitude. The study's findings highlight the importance of designing separate programs and incentives for males compared with female-headed households in developing countries. This study recommends introducing public health insurance schemes, especially focusing poorest expenditure quintile households and also separate health insurance schemes for female headed households in poorest expenditure quintile.

Keywords: Out Of Pocket Health Expenditure, Household-head, gender, Expenditure quintiles

INTRODUCTION

The incidence of female headed households is believed to be increasing worldwide with the global trends of execution of women empowerment policies, provision of educational and working freedom, the effort of safeguarding gender equality, marital disruptions and changes in social cultures and traditions. Headship of the household is defined as the primary decision maker within the household and may or may not necessarily the chief wage earner (Osmani,2021). Generally, female household heads bear a dual responsibility of serving as the economic provider of the household as well as dealing with resource allocation for consumption and childcare demands (Jayasinghe.M.,2019). Also, women are considered as the main brokers of health and education in the household. They tend to allocate greater shares of common resources to health, food, and nutrition that promote the general welfare and well-being of others in the household (Duflo 2012; Onah and Horton 2018). This rapid expansion of female household headship has increased the global interest in analyzing how household headship influenced household decisions and the level of spending on consumption and investments within the household. Empirically, preferences of women in treating the human capital allocations are differed from men. This is consistent with heterogeneous preferences in consumption which exhibits gender bias especially in healthcare payments (Chiappori et al. 2009; Schünemann et al. 2017). Econometric studies of Croson et.al. (2009), have found that women are more risk averse, and their social preferences are more situational and malleable than men. Also, male and female household heads interpret the health risks differently. However, majority of the households in developing countries spend at least half of their monthly current income on health and households in poorest quintile have to bear a significantly higher financial burden (Grigoli and Kapsoli 2018). Thus, Out Of

Pocket Health (OOPH) expenditure is one of the highly burdening and unbearable non-food consumption expenditure for households in middle-income countries. Especially, fees to be incurred for public and private healthcare impose a higher financial burden on households than other household expenditures (Lara 2016; Fan et al., 2021). It is interesting as well as important to identify key determining factors for OOPH expenditure and its variations between household-gendered headship across expenditure quintiles in middle income countries like Sri Lanka. Sri Lanka provides an excellent case study to investigate the variations in taking decisions and allocating resources for healthcare between male and female-headed households due to the existence of higher proportion of households headed by females (Boyagoda et.al.2014). This higher proportion could be mainly due to the increased number of war widows associated with the 30-year-long internal conflict in the Northern and Eastern parts of the country (De Silva 2005). As per the statistics, about 17.4 percent of Sri Lankan households were headed by women, compared to 9.5 percent in Bangladesh and 1.8 percent in Pakistan in 1981 (Folbre 1991). In 2015, this rate has gone up to 23 percent, recording 1.2 million female-headed households in the country. Simultaneously, with the increasing female heads households, existing literature statistics have witnessed that the OOPH expenditure incurred by households in Sri Lanka has increased substantially despite of free public health care services (Pallegedara et al., 2017; Ranneeliya et al., 2015; Kumara A.S et al., 2016). Although there are several studies have examined the determinants of OOPH expenditure in both developed and developing countries, few studies have assessed the heterogeneity effect induced by household headship gender differences on healthcare consumption within households. As per the authors' knowledge, no study has studied this area using the double hurdle model in Sri Lankan context. Thus, this study contributes to the existing literature in several folds. This study assesses the variations of the key determinants of participating decisions and level of spending on OOPH expenditure relying on heterogeneous preferences of male compared with female household heads in healthcare consumption across expenditure quintiles. The contributions of our work are insightful for improving econometric models for household healthcare spending in the context of developing countries. The remainder of this paper is organized as follows. "Theoretical Framework" section includes the underlying theory for the study. The "Empirical review" section describes the past literature related with the study. Next the "Methodology" section describes the methodology of the study including data, statistical methods, and variables. The "Results" section presents the results while the "Discussion" section provides a discussion on results with some policy implications. The "Conclusion and recommendation" section concludes the paper.

Theoretical Framework

This study was guided by the Grossman model (1972) which provides a solid foundation for the study of health inequalities across different socioeconomic demographic groups. This model is an influential statistical tool for the modeling of OOPH expenditure. Grossman constructed a theoretical model for analyzing the healthcare demand, which named as the human capital model of the demand for health based on the assumption that individuals simultaneously optimize health and wealth. Grossman tailored the model to suit the healthcare context. Several attempts have been made to optimize the model. With the extensions proposed by Ehrlich and Chuma (1990), Case and Deaton (2005), and Galama and Van Kippersluis (2010), health-capital theory can explain important stylized facts on healthcare expenditure inequalities under different socioeconomic contexts (Galama et.al. 2010). In addition, two-stage decision theory are widespread in health economics. First stage is used to control for participation decision and the other to control for the quantity of healthcare consumed. These models are well motivated by most healthcare data and data sets are often zero-inflated. That is, some consumers choose not to consume a good that behaves as technical necessity in the first place (Osmani et.al.2021). This theory also provides a strong foundation for healthcare consumption.

Empirical Review

The past literature has enlarged the vision for the study of the gender of the household head and healthcare consumption. The resource allocation within the households differs greatly with the gender of the

household headship. It is empirically revealed that women treat human capital inputs very differently from men. (Owens 2008; Woolhandler et al 2003;). Also, Tolhurst et. al. (2008) found that in Ghana, household head gender-biased authorization for healthcare expenditure is an important contributor to gender differentials in healthcare utilization and expenditure. Khaid (2012), has revealed that when resources are under the control of female heads, it is more likely to be allocated for productive purposes that promote family welfare as compared to resource allocation under the control of male household heads. This heterogeneous nature of preferences could be seen specifically in healthcare spending within the household. (Tolhurst et. al.2008; Chiappori et al. 2009; Schünemann et al. 2017). As per Onah and Horton (2018), the preference of female heads to allocate a relatively greater share of household resources for healthcare is theoretically attributable to the utilities of other family members entering into her own utility function. This could be through altruism, inequality aversion, or reciprocity (Osmani et al.2021). Female heads tend to be more risk-averse and therefore they are more concerned with the health of their household members (Croson and Gneezy 2009). Analysis by Owens (2008), has revealed that women have a higher contribution to medical spending in U.S.A and women represent the majority of Medicare beneficiaries. This has been further confirmed by the study of Woolhandler et.al. (2013), showing that women are significant contributors to the total medical costs of the country. But on contrary, some studies have found that male headed households have allocated more resources for healthcare spending than female headed households in some developing countries. A study by Maharana and Ladusingh (2014) has found that there is considerable variation in food and health spending made by different gendered household heads and they have found that a compositional shift of gender in households (from male-dominated to female-dominated) leads to the reduction of household expenditure on health and food. A study conducted by Saikia et. al. (2016) has shown that mean health expenditure spending by female household heads is lower than that of male heads irrespective of survey rounds. Also, Handa (1996) has revealed that the presence of a female decision-maker generally increases the share of the household budget allocated to child and family goods, female headed households also spend more on adult wear but less on health care. Moreover, several studies have found variations in healthcare expenditures between male and female household heads across expenditure quintiles. That is, preferences over healthcare expenditure differ not only by gender but also by income. Jakovljevic et al. (2017) has revealed that household OOPH expenditure in most developing countries, can heavily burden poor households. According to Khalid (2012) consumption expenditures including healthcare expenditures of male and female headed households differed across five expenditure quintiles. This revealed that in the first three expenditure quintiles, the consumption expenditures (including healthcare) of male headed households are higher than those of their female counterparts, while in the highest two expenditure quintiles, the consumption expenditures (including healthcare) of female headed households are, on average, slightly higher than those of male headed households. Also, many studies have shown that female headed households are poorer compared to male-headed households and therefore healthcare burden is higher in female headed households than male headed households (Osmani et.al 2021).

METHODOLOGY

Data

This study is based on data extracted from the Household Income and Expenditure Survey (HIES) in 2016 compiled by the Department of Census and Statistics of Sri Lanka (DCS). This HIES was started in 1980 and currently is conducted once every three years (DCS, 2015). Also, this is a cross-sectional survey that collects data primarily on income, expenditure, demographic characteristics, health, education, access to infrastructure facilities, inventory of durable goods, housing, sanitation, and exposure to natural disasters covering all districts of the country. Approximately there are 20 756 household respondents in the HIES 2016 in which two-stage random stratified sampling is used to select households. Primarily this study has used monthly per household total non-food consumption expenditure and OOPH expenditure data in the survey which has been recorded at the household level. OOPH expenditure is comprised of several health expenses including

payments for medical consultation, laboratory tests, nursing homes, medicine, and pharmaceutical items that have been incurred within a month. Monthly per household total non-food expenditure is comprised of housing, fuel and light, non-durable goods and services and consumer durables (DCS, 2015). It is a better proxy than earned income for healthcare measurements in developing countries (Deaton et.al. 1980). Furthermore, the modified OECD equivalent scale has been used to create the expenditure quintiles for a precise comparison among households with different household sizes. The equalized monthly non-food consumption is the total monthly non-food consumption of a household divided by the number of household members, converting into equalized adults by weighting each according to their age.

Covariates

Several covariates have been used for this study including the demographic and socio-economic characteristics of the households. These covariates were selected based on past literature around the world (Osmani et al.2021; Rahman et al. 2013; Garin et al. 2018; Kumara et al. 2016). Residential sector dummies (urban, rural and estate) are used to capture heterogeneous differences in access to medical facilities and any other geographical variations affecting healthcare utilization and prices. Household wealth is another important factor in determining household consumption. This study has used data on household ownership of durable goods as a measure to use for calculating wealth index (Garin et al. 2018; Osmani et al.2021). Wealth Index is calculated by using the Principal Components Analysis (PCA). In addition, size of the household, presence of one or more members suffering from NCD/NCDs or being disabled, expenditure quintile and care seeking behavior of households are also included. Moreover, household head-related covariates including, education dummy variables, age and gender are also considered.

Statistical Analysis

Descriptive statistics were calculated using the mean, median, frequency and proportion as appropriate. It is common to have zero consumption expenditures – especially in relation to health utility consumptions- at both individual and household levels in household income and expenditure surveys. Nearly 43.86 percent (9,542) of households in the survey reported zero consumption in total OOPH expenditure. Also, participation in expenditure (whether to spend on healthcare or not), and the magnitude of expenditure may not be statistically independent, and the same stochastic process may not affect participation and consumption level decisions (Rahman et al.2013). Thus, this study used the double-hurdle model to assess the relationship between gender, expenditure quintiles, and OOPH expenditure. In this model, it is required to pass a participation decision hurdle before modeling the level of consumption. That is, the first hurdle involves the decision about whether or not to participate in healthcare consumption (the participation decision, modeled with a Probit function). And the second hurdle concerns the level of health expenditure (the consumption decision, handled with a Tobit function). The dependent variable for the Probit model is a dichotomous variable that indicates whether OOPH expenses were incurred or not (the participation decision). The Tobit regression model analyses the natural logarithm of OOP expenditures as a function of the covariates (the consumption decision).

<Table 01 will be inserted here >

The descriptive statistics of the full sample and the subsamples of male and female-headed households are shown in Table 1. The study sample includes 25.82 percent and 74.18 percent of female and male-headed households respectively. The statistics have shown that there are significant differences between the socioeconomic characteristics of male-headed and female-headed households in the sample. The mean monthly non-food expenditure (including OOPH expenditure) of Male-headed households is higher than female-headed households. Similarly, OOPH expenditure is also higher among male-headed households. But female headed households have to bear more burden of OOPH expenditure. Moreover, it is assumed

that household utility is derived from welfare and therefore presence of members suffering from NCD/NCDs or being disabled and age of the household head is used for the model. Presence of members suffering from NCD/NCDs or being disabled is higher among female-headed households. Also, the mean age of the female household heads is older than male heads while the wealth index takes a negative value for female heads. This could be due to the fact that still Sri Lankan traditional society has male dominance in possession of fixed assets. Moreover, there are some considerable differences between male and female heads across household sizes, expenditure quintiles, residential areas, and the level of education. Thus, these variations between male and female household heads have major implications for designing effective public policy and programmatic interventions in developing countries.

Empirical results

In this section, first (Probit) and second (Tobit) stage regression estimates of the double hurdle model identify the determinants of OOPH expenditure for whole sample households and in between male and female-headed households (**Table 02**). These estimates enable in identification of the variations in the magnitudes and directions of the determinants across the gender of household heads.

<Table 02 will be inserted here >

First-stage model estimates have given several interesting insights on key determining factors of the decision to spend on health care in general as well as male vs female household heads. The decision to spend on healthcare is insignificant across the household living sector (base: estate sector) and this effect is the same for both male and female-headed households. The presence of members suffering from NCD/NCDs or being disabled has a statistically significant impact on decision to spend on healthcare. This effect is higher for male headed households. Household size and age of household head are also another significant influencing factors in determining decision to spend on OOPH expenditure. Households with more family members tend have a positive impact on the decision to spend on health expenses and this is the same with the age factor too. However, effect of household size and age of head is considerably higher among female-headed units. The educational level of the household heads significantly influences on the decision to spend on OOPH expenditure. That is, household heads with lower education (base: completed secondary school and above) are significantly less likely to spend OOPH expenditure. This could be because households with lower educational levels might not have sufficient knowledge of the type of disease that they suffering from and tend to use free homecare treatments rather than seeking outside medical care. Conditional on deciding to spend on healthcare, household head's decision on the amount of expenditure spent is shown in the second stage equation of the double hurdle model. The consumption hurdle in the study includes some economic and healthcare variables: Wealth Index, expenditure quintile, health care seeking behavior in addition to the demographic determinants of the first stage decision equation. Even though Sri Lanka has free health care policy, the majority of households who received inpatient and outpatient care either in public or private hospitals incurred even a small amount of OOP payments, thus care-seeking behavior could not be included as a determinant of the decision to spend, but it was included in the second stage equation. In the second stage equation, living sector has become a significant factor in determining the spending level of OOPH expenditure. OOPH expenditure levels across residential sectors are significantly higher compared with the estate sector (base). Also, these spending levels vary across sectors for male and female household heads. The effect of the living sector is higher on male-headed households. Simultaneously, OOPH expenditure rises significantly with the Wealth Index. This effect is higher in male-headed households. OOPH expenditure level increases with increasing expenditure quintile

(proxy for earned income quintile) regardless of headship gender. That is, households with higher quintile tend to spend more on health care than lower quintile households. However, this spending across the quintiles is greater in magnitude for female-headed households. The estimates of the healthcare seeking behavior have shown that spending on healthcare differs across the type of healthcare facility used and institution from which healthcare has been sought. The care-seeking behavior including utilizing public or /and private sector healthcare facilities for outpatient and inpatient services is also significantly and positively associated with households' level of spending on healthcare. The effect of inpatient and outpatient healthcare services sought in public hospitals is lower than the services offered by private hospitals and medical centers both in general and between headship genders. But the effect varies in magnitude between female and male heads. It could be seen that female-headed households have a higher effect of private outpatient care and public inpatient care services on their OOPH expenditure while male-headed households have a higher effect from public outpatient care and private inpatient care services. Separate models fitted to data of richest and poorest quintiles with the intention of yielding richer insights on variations of OOPH expenditure in direction and magnitude between male and female household heads (**Table 03**).

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A significant effect of the living sector on deciding to spend on OOPH expenditure could be seen in male-headed households in the poorest quintile. In contrast to prior findings, urban and rural sector male-headed households in the poorest quintile are less likely to make payments on healthcare than the estate sector. Also, both rural and urban male-headed households in richest quintile are likely to spend more on healthcare than estate sector male-headed households in richest quintile. Estimates have shown that no significant effect on OOPH expenditure in rural sector female headed households in both quintiles except urban sector female headed households in richest and poorest quintile. Although there are variations in the magnitudes of both stages estimates across expenditure quintiles, the signs on the determinants are generally consistent with a priori expectations. For example, decisions to spend on the healthcare increases with the presence of members suffering from NCD/NCDs or being disabled, household size while spending on the healthcare increases with the wealth index and seeking private health care services.

DISCUSSION

In this study, the estimates reveal that there are variations in taking decisions on whether to spend and the level of spending on healthcare among gender of the household headship and also across the quintiles.

Living Sector

The estimates have shown that the living sector is not significantly influencing on making the decision whether to spend on health care, but is statistically significant in deciding the level of spending on health care in both male and female households. Also, considerably fewer variations could be seen in their magnitude. The living cost including healthcare cost is higher in urban sector and therefore households living in urban sector have to spend a higher cost for healthcare. Even though Sri Lanka has a free public healthcare service, more than 50 percent of households, (especially in urban sector) seek healthcare services from private medical institutions due to long waiting queues and lack of quality medicines in public medical institutions (Russel 2005). This incur a higher cost for healthcare services. Moreover, approximately 5% of rural sector households frequently use traditional and Ayurveda treatments (Kumara et al.2016). The total cost of a visit for Ayurveda treatment center is also higher due to the high cost of drugs and other supplies (Weerasinghe and Fernando 2009). In considering the living sector effect on level of healthcare spending in between gendered household headship across expenditure quintiles, higher impact could be seen in richest quintile urban and rural sector male-headed households. Richest quintile households have the access to more quality and costly medical services offered by private medical institutions and /or ayurvedic treatment

centers which would increase their level of spending on healthcare (Rubin et al.,1993).

Household Head Characteristics

It is quite interesting that the household head's education level has made a significant impact on deciding whether to spend on healthcare but not in deciding the level of spending on healthcare. Less educated heads are less likely to spend on healthcare than highly educated household heads. This direction is the same for both gendered households, but a considerably small variation could be seen in magnitude. In contrast to our study, an analysis made by Osmani et.al. (2021) has shown that, household heads with greater education (base: no formal or primary school completion) are significantly less likely to spend OOPH expenditure. Still, Sri Lankan society values homemade healthcare treatments for diseases, and especially low-educated households are reluctant to visit formal healthcare treatments unless the disease gets worse. In considering the impact of gendered headship across the richest and poorest quintiles, the effect of household head educational level has made a significant and higher impact on decisions made on healthcare by male-headed households in the richest quintile. This could be because, literate heads might have a broader understanding of the consequences of health hazards and therefore richest households tend to incur high cost for healthcare before the disease gets worsen as quality healthcare services are financially affordable.

Expenditure quintile and Wealth Index

The household expenditure quintile is a significant predictor of the likelihood of incurring OOPH expenditures. The level of spending on healthcare rises with the increasing expenditure quintiles in both male and female-headed households (Osmani et al.2021). Also, estimates have shown that Wealth Index has a statistically significant relationship on level of spending on healthcare. This direction of association is same with both type of household heads across richest quintile. Several studies have identified that higher economic status would reflect the need for health, and households with higher economic status usually acquire better medical and healthcare quality by incurring higher OOPH expenditure (Wang et al. 2021). But slight variations could be seen between male-headed vs female-headed households in magnitude. The expenditure quintile has a higher effect on female-headed household's level of OOPH expenditure. This could be because the female-heads tend to allocate more for households' healthcare (Duflo 2012). World countries have taken several strategies to reduce the OOPH expenditure burden of households in poorest expenditure quintile. Medicaid is the largest public health insurance program the USA which covers more than 75 million people. This program provides health coverage for vulnerable populations, including low-income individuals and people with disabilities which assists in reducing the burden of healthcare costs while protecting them from being catastrophic (Brian, B.L et al. 2022). Moreover, countries including Brazil and Thailand have successfully expanded health insurance coverage and access for poor and vulnerable households through its family health strategy, reducing household burden (Couttolenc and Dmytraczenco 2013, Hanvoravongchai 2013).

Health Care seeking behavior

Health care-seeking behavior is another major determinant in deciding the level of OOPH expenditure in Sri Lanka. The effect of seeking private sector outpatient and inpatient care on healthcare spending level is significantly higher than public sector outpatient and inpatient care on both male and female headed households. But private sector inpatient care is not statistically significance among households in poorest quintile because the medical cost is too high and unaffordable for them. But seeking outpatient care in private sector is highly influenced on level of healthcare spending among poorest quintile households. According to Jayawardena R et al. (2013), despite free health care services, households in the poorest quintile spend around 57% of the OOPH expenditure on private outpatient care. This can be mainly because the public sector outpatient service hours are limited and if any one of the family becomes sick then especially the person accompanying the patient (mostly the breadwinner) need to take a day off from their

job. So especially the majority of the breadwinner of the poorest quintile engage in daily wage work and are therefore reluctant to forgo their daily wage for the long queues in the public hospitals. Thus, they seek private outpatient care even though payments are costly.

CONCLUSION AND RECOMMENDATIONS

The findings of our study have shown that male and female household heads have different preferences that influence decisions on financial resource allocation for healthcare. The first stage regression estimates have shown that participation probability is significantly different between genders of the household headship and expenditure quintiles implying that preferences are significantly different. Presence of members with NCD/NCDs or being disabled, household size, age and educational level of the household are significantly influence on participation decision but this effect differs between male vs female headed households and expenditure quintile in magnitude. Simultaneously, second stage regression estimates have also shown that healthcare spending level is also significantly different across genders of the household headship and expenditure quintiles. Our findings suggest that Sri Lanka should formulate more public policies targeting on increasing household healthcare consumption, but should design separate programs and incentives for male compared with female-headed households. One of the strategies used by world countries to overcome the increasing OOPH expenditure burden among households is the introduction of a public health insurance system with a special focus on the households in the poorest expenditure quintile simultaneously with a universal health care system. For instance, Medicaid is the largest public health insurance program in the USA protecting households in the poorest expenditure quintile. Approximately only 7% of Sri Lankans are entitled to an employer's contributed health insurance scheme and only 5% have private health insurance. It is obvious that only among them, a negligible proportion of female headed households in the poorest expenditure quintile are included in these health insurance schemes (Amarasighe et al.2015 cited in Pallegedara A.et al.2018). Consequently, we think it would be better to have a public health insurance system, especially in a developing country like Sri Lanka in addition to its universal health care system. That would improve and strengthen the existing social security system. Thus, the introduction of public health insurance covering especially households in the poorest expenditure quintile in general and introducing some other public health insurance schemes especially targeting female headed households in the poorest expenditure quintile. In addition, immediate allocation of adequate finance for public health is needed to provide a better healthcare service with quality medicines and treatments at zero cost. This would reduce the burden of both male and female headed households. In meantime, implementing new social protection policies, and finetuning existing social protection policies is also needed.

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Table 01: Descriptive statistics

Variable	Total Sample		Male- Headed Families		Female-Headed Families	
Non-food consumption expense	116150.3	(377677.8)	122321.7	(396090)	99910.39	(322984)
Household OOPH expenditure	1583.874	(12764.58)	1662.9	(14402.02)	1352.758	(6216.93)
Log (Household OOPH expense)	3.9049	(3.5913)	3.9466	(3.5998)	3.7963	(3.5603)
OOPH expense as a ratio of non-food Consumption expenditure	2.9476	(6.7560)	2.8408	(6.5291)	3.2115	(7.2508)
Living Sector						
Urban	0.1580	(0.3647)	0.1583	(0.3650)	0.15678	0.3636
Rural	0.7990	(0.4007)	0.7991	(0.4007)	0.7990	0.4008
Estate (Reference)	0.0430	(0.2029)	0.0425	(0.2019)	0.0443	0.2059
Presence of members with NCD/NCDs	0.4792	(0.4995)	(0.4774)	(0.4995)	0.4858	(0.4998)
Expenditure Quintiles						
1 (poorest)	0.2000	(0.4000)	0.1898	(0.3922)	0.2292	(0.4203)
2	0.2000	(0.4000)	0.1968	(0.3975)	0.2093	(0.4068)
3	0.2000	(0.4000)	0.2029	(0.4022)	(0.1915)	(0.3936)

4	0.2000	(0.4000)	(0.2039)	(0.4029)	0.1887	(0.3913)
5 (Richest)	0.1999	(0.3999)	0.2064	(0.4047)	0.1813	(0.3853)
Wealth Index	0.00	(1.9335)	0.0808	(1.9325)	-0.2094	(1.9150)
Care – Seeking Behavior						
Outpatient – Public	0.6174	(0.8910)	0.6243	(0.9105)	0.5979	(0.8356)
Outpatient- Private	0.5391	(0.8521)	0.5604	(0.8749)	0.4807	(0.7800)
Inpatient -Public	0.2963	(0.5623)	0.3044	(0.5740)	0.2770	(0.5307)
Inpatient- Private	0.0188	(0.1447)	0.0192	(0.1443)	0.0177	(0.1462)
Household Size	4.0633	(1.6338)	4.1867	(1.556)	3.7087	(1.7920)
Household Head Characteristics						
Male (Reference)	0.7418	(0.4377)	1.00	(0.00)	1.00	(0.00)
Level of Education						
Do not attend school	0.0340	(0.1813)	0.0221	(0.1469)	0.0691	(0.2538)
Up to primary school	0.2264	(0.4185)	0.2179	(0.4128)	0.2566	(0.4368)
Up to secondary-Reference	0.7330	(0.4424)	0.7599	(0.4271)	0.6743	(0.4687)
Age	52.6057	(14.0425)	51.9996	(13.4473)	54.3469	(15.4968)
Number of observations	21,756		16,033		5,581	

Table 02: Double-Hurdle Regression Results for total sample and sub female and male headed samples

Variables	Total Sample				Male-Headed Households				Female-Headed Househo			
	First Stage		Second Stage		First Stage		Second Stage		First Stage		Second St	
Dependent Variable												
Log (OOPHE)												
Living Sector												
Urban	0.00478	-0.0487	0.764***	-0.0635	0.0647	-0.057	0.770***	-0.074	-0.166*	-0.096	0.760***	
Rural	0.0636	-0.0441	0.442***	-0.0575	0.0933*	-0.051	0.462***	-0.0671	-0.0186	-0.086	0.399***	
Estate (Reference)												

Presence of members with NCD/NCDs	0.703***	-0.0187			0.713***	-0.022			0.678***	-0.037	
Income Quintile											
1											
2			0.177***	-0.0403			0.165***	-0.0473			0.192**
3			0.297***	-0.0407			0.282***	-0.0474			0.319***
4			0.398***	-0.0418			0.390***	-0.0489			0.399***
5			0.433***	-0.0426			0.412***	-0.0496			0.473***
Wealth Index			0.150***	-0.0095			0.154***	-0.011			0.139***
Care Seeking Behavior											
Outpatient – Public			0.0740***	-0.012			0.0783***	-0.0135			0.0576**
Outpatient-Private			0.368***	-0.0117			0.350***	-0.0131			0.431***
Inpatient - Public			0.168***	-0.0184			0.152***	-0.0208			0.224***
Inpatient - Private			1.045***	-0.0681			1.147***	-0.0722			0.853***
Household Size	0.0497***	-0.0055			0.0410***	-0.007			0.0714***	-0.01	
Level of Education											
Do not attend school	-0.378***	-0.0486	-0.0981	-0.0665	-0.441***	-0.071	-0.213**	-0.0984	-0.342***	-0.073	0.00864
Up to primary school	-0.243***	-0.0216	0.0182	-0.0283	-0.238***	-0.026	-0.0072	-0.0331	-0.316***	-0.043	0.0881
Up to secondary school (Reference)											
Age	0.0116***	-0.0007			0.00318***	-8E-04			0.00571***	-0.001	
Constant	-0.549***	-0.06	5.224***	-0.0674	-0.523***	-0.071	5.239***	-0.0781	-0.615***	-0.115	5.188***
Observations	21,614				16,033				5,581		5,581
P value of chi2	0.0000***				0.0000***				0.0000***		

Table 03: Double-hurdle regression estimation results for male and female household heads (by expenditure quintiles)

Variables	Male headed households (Poorest)				Female headed households (Poorest)			
	First Stage		Second Stage		First Stage		Second Stage	
Dependent Variable								
Log (OOPHE)								
Residential Sector								
Urban	-0.398***	(0.122)	0.462***	(0.155)	-0.297	(0.183)	0.824***	(0.245)
Rural	-0.213**	(0.0954)	0.190	(0.116)	-0.0521	(0.150)	0.313	(0.194)
Estate (Reference)								
Presence of members with NCD/NCDs	0.729***	(0.0510)			0.680***	(0.0777)		
Wealth Index			0.0533*	(0.0301)			0.0743	(0.0461)
Care Seeking Behavior								
Outpatient – Public			0.247***	(0.0331)			0.152**	(0.0600)
Outpatient-Private			0.504***	(0.0432)			0.500***	(0.0749)
Inpatient -Public			0.117**	(0.0516)			0.286***	(0.101)
Inpatient -Private			0.0845	(0.302)			0.0486	(0.277)
Household Size	0.0312**	(0.0135)			0.0851***	(0.0204)		
Level of Education								
Do not attend school	-0.0329	(0.103)	-0.327**	(0.128)	-0.0724	(0.119)	0.0992	(0.141)
Up to primary school	-0.0612	(0.0520)	-0.0360	(0.0651)	-0.258***	(0.0892)	0.177	(0.112)
Up to secondary school (Reference)								
Age	0.00402**	(0.00188)			0.0142***	(0.00299)		
Constant	-0.867***	(0.152)	5.477***	(0.133)	-1.661***	(0.233)	5.205***	(0.229)
Observations	3,044				1,279			
P value of chi2	0.0000***				0.0000***			

Source: Author estimation based on HIES Standard errors in parentheses

*** p<0.01, ** p<0.05, *p<0.1

Table 03: Double-hurdle regression estimation results for male and female household heads (by expenditure quintiles) continued.....

	Male headed households (Richest)				Female headed households (Richest)			
	First Stage		Second Stage		First Stage		Second Stage	
Dependent Variable								
Log (OOPHE)								
Residential Sector								
Urban	-0.204	(0.177)	0.942***	(0.192)	-0.129	(0.292)	0.916***	(0.352)
Rural	-0.173	(0.170)	0.564***	(0.181)	-0.0484	(0.275)	0.351	(0.334)
Estate (Reference)								
Presence of members with NCD/NCDs	0.698***	(0.0503)			0.740***	(0.0938)		
Wealth Index			0.282***	(0.0256)			0.189***	(0.0463)
Care Seeking Behavior								
Outpatient – Public			0.0645**	(0.0326)			0.0478	(0.0631)
Outpatient-Private			0.371***	(0.0260)			0.375***	(0.0540)
Inpatient -Public			0.193***	(0.0471)			0.253***	(0.0901)
Inpatient -Private			1.394***	(0.112)			1.067***	(0.189)
Household Size	0.0672***	(0.0171)			0.0676**	(0.0275)		
Level of Education								
Do not attend school	-0.504*	(0.259)	-0.0183	(0.349)	-0.295	(0.228)	-0.134	(0.284)

Up to primary school	-0.219***	(0.0745)	-0.0495	(0.0902)	-0.131	(0.130)	-0.164	(0.155)
Up to secondary school (Reference)								
Age	0.00236	(0.00197)			-0.000393	(0.00315)		
Constant	0.0210	(0.202)	4.983***	(0.201)	0.00785	(0.328)	5.558***	(0.382)
Observations	3,310				1,012			
P value of chi2	0.0000***				0.0000***			

Source: Author estimation based on HIES 2016

Standard errors in parentheses

*** p<0.01, ** p<0.05, *p<0.1