Tanzanian Economic Review, Vol. 12 No. 1, June, 2022: 18–34

Effect of Out-of-Pocket Health Expenditure on Household Welfare: Evidence from Uganda National Household Survey: 2016–2017

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Abstract

Out-of-Pocket health expenditures (OOP) in Uganda are increasingly rising due to the limited share of the national budget allocation to the health sector. Using Uganda National Household Survey data (UNHS) 2016/17, this study investigates the effect of OOP health expenditures on household welfare in Uganda. Due to the presence of endogeneity, the study employs a robust sampling instrumental variable technique to control for simultaneous causality between household welfare and the OOP health expenditure variable in the model. The findings show that a unit increase in OOP health expenditure reduces household food consumption expenditure by 9% and the household asset base by 2%, respectively. This study thus recommends the effective implementation of the Uganda National Health Insurance Scheme (NHIS), increased investment in preventive care services, and promotion of activities aimed at empowering health beneficiaries in Uganda to improve their household welfare.

Keywords: out of pocket, welfare, food consumption expenditure, asset index, Uganda.

1. Background

A country without universal health insurance coverage exposes its citizens to catastrophic health service expenditure (Rono, 2017). This is due partly to the need for households to pay for the health services received directly from their limited resources (Aregbeshola and Khan, 2018). The cost of healthcare includes both direct and indirect expenses, such as out-of-pocket health expenditures[1]. Some households will not earn income because their members will be unemployed, also they will incur transport costs while seeking medical care. According to (Krishna, 2011), direct and indirect health expenditure normally constitutes a large proportion of a household's total expenditure that may push them into income poverty.

The households thus adopt various strategies to cope with such high health costs, depending on the intensity and severity of such health costs. For example, some households may use their life savings or sell their assets, if the current income is not enough. Whereas others may borrow from either informal or formal financial institutions provided collateral is available to them (Sangar and Thakur, 2020).). Households may also reduce their consumption of non-medical goods such as food,

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[1]Out-of-pocket healthcare expenditures are the costs incurred by the health care seeker to the healthcare provider at the point of accessing a service.

housing and education to pay for their healthcare services. This might reduce household's living standards especially if the goods that were sacrificed were supposed to pull households out of poverty (Wagstaff, 2009).

The Sustainable Development Goals (3) seek to ensure that people have good health and well-being, and it is key to the achievement of the rest of the goals (UNDP, 2015). And to achieve these goals, measures should be put in place to protect individuals and households from health-related expenditures that could impact their ability to access health care and their financial stability (Kiros et al 2020). Such actions are often referred to as financial risk protection (FRP) measures. Thus, when designing a healthcare financing reform strategy, the primary goal should be to protect households against high OOP health expenditures. High levels of OOP for healthcare violate vertical equity, which requires that payments should be progressive (World Health Organization, 2010). This will help to ensure that the richer bear the larger proportion of health expenditure.

The major challenge that developing countries experience in the health sector is designing an equitable health financing system (Rono, 2017). When households pay from their pockets at the point of receiving health services, this can lead individuals to spend high proportions of their income on healthcare thus reducing the number of resources available for non-medical expenditures. Sometimes individuals avoid seeking healthcare services because they cannot afford them (Cavagnero *et al.*, 2001).

The World Health Organization (2021) has emphasized the need to protect households from catastrophic healthcare expenditure. This can be achieved by ensuring that there is universal health coverage (UHC) that monitors the availability of resources for health and the extent of their efficient and equitable use. OOP health expenditure poses adverse effects on households like hindering access to health services which is likely to result in death. It also pushes households into vicious cycles of poverty leaving them unable to enjoy the basic standards of living (World Health Organization, 2000). The WHO also calls for health financing systems to ensure that healthcare costs do not prevent people from receiving the necessary health services (World Health Organization, 2005).

Catastrophic OOP healthcare expenditure occurs both in the rich and poor countries, but over 90% of the people affected are from low-income countries (*Xu* et al., 2006). Catastrophic OOP healthcare expenditure occurs, regardless of the amount of money paid for healthcare services. Rich households may incur high OOP expenditure without experiencing the economic burden of it, while the poor can spend less on healthcare and experience significant negative implications on their livelihoods (Xu *et al.,* 2006; Chuma *et al., 2007*).

In many Sub-Saharan African countries, Uganda not being an exception, healthcare is funded majorly by direct OOP expenditure. The OOP health expenditure does not offer any financial risk protection, therefore, many households are impoverished in the process (Xu et al., 2006). OOP health

expenditure discourages some households from seeking medical care because they cannot afford to pay and thus leading to continuous spells of illness and poverty (Preker *et al.,* 2002). Several coping mechanisms are normally adopted by households to meet the cost of seeking medical care such as borrowing and selling the household asset. These strategies can be useful in the short term but might drive households into poverty or deepen poverty levels for the already poor households (Leive and Xu, 2008).

Empirical results from several studies in various countries that have estimated the relationship between out-of-pocket health care expenditure and household welfare have been inconsistent. Most of these studies found a negative and significant effect between OOP and household welfare (Ssewanyana and Kasirye 2020; Kiros et al 2020; Rono, 2017; Aregbeshola and Khan, 2018; Leive and Xu, 2008; Xu et al., 2006). However, none of the studies estimated the effect of OOP health expenditure on household welfare with a focus on household food consumption expenditure and asset base as welfare indicators, particularly in Uganda. This research gap motivates further investigation into the relationship between OOP and household welfare.

Thus, this paper examines the effect of OOP health expenditure on household welfare in Uganda. It employs a robust more robust two-stage sampling instrumental variable technique (2SLS) to control for simultaneous causality between household welfare and the OOP variable in the model. The paper measures welfare using two unique indicators: first, it estimates the effect of OOP on food consumption expenditure. This is based on the assumption that, in the event of an illness in a household, the share of the family income to food consumption reduces (rotates inwards) in the short term; secondly, the paper examines the effect of OOP on household asset base using the asset index, constructed using the principal component analysis (PCA).

Using the instrumental variable techniques (2SLS), we find that OOP affects negatively household food consumption expenditure and asset base. The effect of OOP is found to be highest on food consumption expenditure compared to the asset base, which implies that poor households are bound to suffer more in the event of OOP health expenditure.

2. Health Care Expenditure in Uganda

The health system in Uganda is divided into two components; the public health sector and the private health sector. The public health sector is composed of the district health system (communities, Village Health Teams (VHTs) or health centres: HCs I, II, III and IV and general hospitals, Regional Referral Hospitals (RRH) and National Referral Hospitals (NRH)). In public health facilities, the healthcare services are either free or require that individuals pay a subsidized fee to access healthcare services. The RRH and NRH are semi-autonomous institutions. District health services are managed by local governments. The district health system is further sub-divided into Health Sub-Districts (HSDs). Each HSD is supposed to have a referral facility either an HC4 or a general hospital

(MOH, 2010b). The private health sector is composed of hospitals, clinics, pharmacies and drug shops. Under private health facilities, health services are usually accessed at a fee.

The ministry of Health Facility Inventory of 2011 reported 2,679 public health facilities in Uganda [1,588 (59%) were HC IIs, 859 (32%) were HC IIIs, 166 (6%) were HC IVs and 66 (2%) were hospitals]. There was a 16.4% increase in the number of public health facilities from 2,301 in 2006 to 2,679 in 2011. The increase was principally driven by the construction of new health centres by the government in its drive to improve access to health services. Although the health infrastructure has expanded, the vast majority of health centres are not fully functional. They lack equipment and staff and are poorly maintained. This is because of dismal, untimely funding that makes the health system unable to provide expected services to the community effectively.

Due to the poor public health system in Uganda, the private actors fill the gap but offer healthcare services to the public at a higher cost. This is because the private health actors are profit-driven and relatively more efficient in offering their services. Therefore, all these attributes are factored into the costs that consumers pay to access such medical services. This makes OOP healthcare expenditure the most convenient means of accessing health services.

According to National Health Accounts (NHA) reports 2016/17 and 2017/18, there has been a 2.7% increase in private sector contribution to current health expenditure in 2015/16. This was attributed mainly to an increase in household OOP expenditure from UShs. 1,925 billion in 2014/15 to UShs. 2,108 billion in 2015/16 in absolute terms. The allocation between public, private and development partners for current health expenditure (CHE) from 2014/15 to 2015/16 is as follows: the contribution of public funds increased from 13.8% to 15.3%, whereas private funds increased from 41.4 to 42.6%, development partner funds decreased from 43.4% to 41.7% and the trend has been falling since the financial year 2013/14 from 46.7% of the CHE. The 2.7% increase in private sector contribution to current health expenditure in 2015/16 was mainly due to an increase in household OOP expenditure from UShs. 1,925 billion in 2014/15 to UShs. 2,108 billion in 2015/16 in absolute terms. The percentage of household out-of-pocket expenditure to the current health expenditure increased from 33% in 2014/15 to 37% in 2015/16 owing to the increase in population spending on healthcare outside the public health facilities. Household expenditure was generally reduced as a percentage of current year health expenditure from 41% in the previous National Health Accounts to 37% in the present study. This is attributed to the increased levels of poverty (UBOS, 2016. UHDS report).

Out-of-pocket health expenditures have had adverse effects on the utilization of healthcare services in Uganda (WHO, 2010). OOP health expenditures have become a global topic of concern and the arguments placed are three; first of all, poor households are forced into deeper poverty due to the exorbitant healthcare

costs. Secondly, OOP expenditure forces households into cutting back expenditures on other important basics such as food, clothing and housing and finally, it forces households to shy from necessary healthcare services due to the impoverishing impact it would have on welfare.

The share of OOP expenditures in total health expenditures in Uganda has been increasing over time from 4% in 2012/2013 to 5% in 2016/2017 (UNHS, 2016). These expenses that are being financed by households are relatively high, given the high poverty levels in Uganda. In 2012/13, 19.7% of the population was estimated to be living in poverty. However, according to UNHS 2016/17, the poverty level has shot up to about 21.4% (UNHS, 2016).

The drivers of the increase in household expenditure include; inflation, population growth, poor/limited accessibility of private healthcare services, sickness treated as an emergency in households and private wing establishments in public facilities. The government may need to improve the quality of services in public facilities by increasing health financing to the health sector. There is need also to consider the mobilization of an alternative financing scheme such as the National Health Insurance Scheme. This would ensure that OOP healthcare expenditure reduces to a maximum of 15% of the CHE. This is the maximum household health expenditure percentage acceptable, according to WHO, to reduce catastrophic impoverishment within households (WHO, 2010).

However, the majority of Ugandans still do not have access to affordable healthcare. Preventable diseases like HIV/AIDS, malaria and tuberculosis as well as road carnage cases continue to affect a large part of the population. In addition, poor health imposes a heavy burden on society and slows down economic growth. Illness in the family is one of the major causes of the reductions in incomes and assets, increased dependency ratio, and closure of businesses. Moreover, resources are diverted from investment to curative services. In education, there is a high dropout rate due to caring for a sick family member or lack of school fees (Ministry of health, 2015).

Catastrophic health payments primarily explain the cause of impoverishment in Uganda and some other least developed countries (Ssewanyana and Kasirye, 2020), which implies that poverty can be prevented by reducing the burden of catastrophic payments, whose primary determinant is out-of-pocket healthcare expenditure. The linkage between high OOP, catastrophic payment, and poverty is prevalent in developing countries, which do not have well-developed social institutions such as social insurance or tax-funded healthcare systems.

The health sector in Uganda relies heavily on OOP payments or expenditures. OOPs, are charged for health services sought from both the public and private sectors. The OOP payment for health in Uganda depicts a steadily increasing trend from 2014/15 to 2015/16, as shown in the figure below.

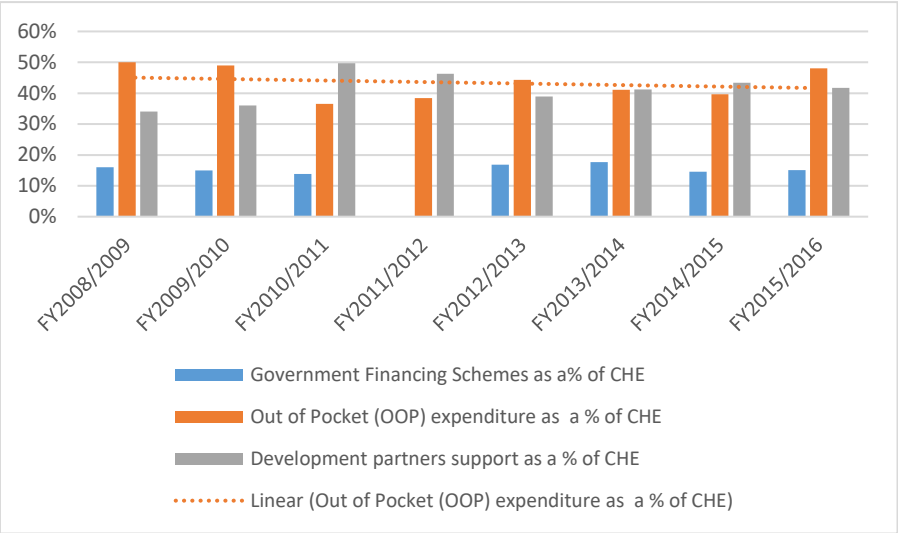

Figure 1: Showing the Health Financing Schemes in Uganda
Source: UBOS 2016/17, NHA Reports

3. Literature Review on the Impact of OOP on Household Welfare

A large number of studies have employed different methodologies to investigate the effect of Out of Pocket healthcare expenditure on household welfare in different settings. Much of the reviewed literature on the effect of OOP health expenditure on household welfare indicates negative findings (Ssewanyana and Kasirye 2020; Kiros et al 2020; Rono, 2017; Aregbeshola and Khan, 2018; Leive and Xu, 2008; Xu et al., 2003). In Senegal, Séne and Cissé (2015) use a seemingly unrelated equations system of Tobit regressions to identify the relationship between catastrophic health expenditure and poverty. They found that catastrophic health expenditures jeopardize household welfare for some people that fall into poverty as a result of negative effects on disposable income and disruption of the material living standards of households.

Kwesiga, *et al* (2015). Assessed catastrophic and impoverishing effects of health care payments in Uganda. The study used data from the Uganda National Household Survey 2009/10. The paper measured the catastrophic impact of OOP payments using thresholds that vary with household income. The impoverishing effect of OOP health care payments was assessed using the Ugandan national poverty line and the World Bank poverty line of ($1.25 per day). Results revealed that OOP payments led to a high level and intensity of financial catastrophe and impoverishment. When using an initial threshold of 10% of household income, the findings show that about 23% of Ugandan households face financial ruin. Based on both the $1.25 per day, about 4% of the population was indicated to be further impoverished by such payments. This represents a relative increase in poverty headcount of 17.1% and 18.1%, respectively.

Xu *et al.*, (2006) investigated the impact of eliminating user fees; utilization and catastrophic health expenditures in Uganda. The study explores the impact on health service utilization and catastrophic health expenditures using data from Uganda National Household Surveys of1997, 2000, and 2003. The results show that utilization increased for wealthier households, but at a slower rate than it had in the period immediately before fees were abolished. Utilization among the poor increased much more rapidly after the abolition of fees than before. However, the incidence of catastrophic health expenditure among the poor did not fall. The most likely explanation is that the frequent unavailability of drugs at government facilities after 2001 forced patients to purchase them from private pharmacies. Informal payments for healthcare may also have increased to offset the lost revenue from fees.

Chuma and Maina, (2012), investigated the catastrophic health care spending and impoverishment in Kenya, specifically to estimate the burden of OOP payments on Kenyan households. The study used data that was drawn from a nationally representative health expenditure and utilization survey (n=8414) conducted in 2007. The results show that each year, Kenyan households spend over a tenth of their budget on health care payments. The burden of OOP payments is highest among the poor. The poorest households spent a third of their resources on health care payments each year compared to only 8% spent by the rich households. About 1.48 million Kenyans were found to have fallen below the national poverty line due to health care payments.

Aregbeshola & Khan (2018) explored OOP payments, catastrophic health expenditure and poverty in Nigeria in 2010 to examine the financial burden of OOP health payments among households in Nigeria. The study utilized secondary data from the Harmonized Nigeria Living Standard Survey (HNLSS) of 2009/2010 to assess the catastrophic and impoverishing effects of OOP health payments. It was found that a total of 16.4% of households incurred catastrophic health payments at the 10% threshold of total consumption expenditure, whereas 13.7% of households incurred catastrophic health payments at the 40% threshold of non-food expenditure. Using the $1.25 a day poverty, the poverty headcount was 97.9% gross of health payments. OOP health payments led to a 0.8% rise in poverty headcount, which implied that about 1.3 million Nigerians are being pushed below the poverty line. However, well-to-do households were found to be more likely to incur catastrophic health payments than poorer households.

Mugisha, *et al* (2002) examined OOP expenditure on health care in Nouna, Burkina Faso. Their objective was to examine the household OOP expenditure on health care, particularly malaria treatment in rural Burkina Faso. They used a comprehensive analysis of OOP expenditure on health care through descriptive analysis and a second, multivariate analysis using the Tobit model with emphasis on malaria, based on 800 urban and rural households in the Nouna health district. The results showed that households spend less on malaria, either in or outside the health facility if given the choice to do so because they felt confident to self-treat

malaria. Seeking health care from a qualified health worker introduced higher OOP expenditure than self-treatment and traditional healers. In extreme cases, households sold off their assets to offset the expenditure. The study showed that more than 80% of household OOP expenditure was allocated to medicine.

Nwakuso *et al*, (2016) carried out a study to examine the effect of OOP health expenditure on rural households of Kwara state in Nigeria. The study used a Two-stage sampling technique where 180 rural households were sampled, out of which 175 households were used for the analysis. The study employed descriptive statistics and ordinary least squares (OLS) regression in analyzing data collected for the study. The result of the descriptive statistics shows that on the average, the household head in the study area was 42 years of age with 7 years of schooling, 22 years of farming experience, about a household size of 5 in adult male equivalent, a per capita income of N4,960, calorie consumption of 3151.46kcal/AE/day and monthly health expense of N676. The result of the analysis carried out to examine the effect of health expenditure on per capita calorie intake and income of households, shows that OOP health expenditure had a negative significant effect on both per capita calorie intake and income at 10% statistical significance.

Rashad & Sharaf (2015) studied the catastrophic economic consequences of healthcare payments and their effects on poverty estimates in Egypt, Jordan, and Palestine. The study used nationally representative surveys from the three countries to assess the incidence, intensity and distribution of catastrophic health payments, and the poverty impact of OOP health payments. The OOP for health was considered catastrophic if it exceeded 10% of a household's total expenditure or 40% of non-food expenditure. The poverty impact was evaluated using poverty headcounts and poverty gaps before and after OOP. The results showed OOP to exacerbate households' living conditions, severely so in Egypt than in the other countries, pushing more than one-fifth of the population into a financial catastrophe and 3% into extreme poverty in 2011. However, in Jordan and Palestine, the disruptive impact of OOP was found to be modest. In the three countries, the catastrophic health payment was found to be problematic among better-off households.

Arsenijevic *et al* (2013)) examined the catastrophic and impoverishing effects of OOP healthcare expenditure in Serbia using different approaches. They used household data from the Serbia Living Standard Measurement Study. The data was collected in 2007 and consisted of 17,375 participants living in 5,557 households. They found out that irrespective of the approach applied, OOP expenditure had a catastrophic effect on poor households in Serbia. They also found out that those households that were above the absolute, relative and subjective lines respectively, after the subtraction of OOP health payments fell below those poverty lines. The probability of catastrophic OOP health payment was higher in the rural areas, in larger households, and among households with chronically sick members (namely, people with diabetes and mental diseases, as well as cardiological diseases in some instances).

Tomini, *et al* (2013) investigated the extent to which OOP healthcare expenditure impoverished households in Albania. The study used 2002, 2005 and 2008 data from Albania Standard Measurement Survey. It was found that OOP increased in real value throughout the years. Even though their catastrophic effect had decreased due to declining absolute poverty, the results showed that the effect for the poorest expenditure quintiles remained high. OOP was found to deepen the poverty headcount and enlarge the poverty gap, with the effect being larger for the poorest quintiles.

4. Methodology

4.1 Emperical Mode

The study employed the nationally-representative one-wave dataset called Uganda National Household Survey data (UNHS 2016/17) due to its completeness and ready availability. The traditional Ordinary Least Squares method was used to estimate the effect of Out-of-Pocket healthcare expenditure on household welfare. However, due to the presence of endogeneity that was confirmed by the Durbin-Wu-Hausman test, a more robust Two-stage sampling instrumental variable technique (2SLS) was used to control for the simultaneous causality between household welfare and out-of-pocket health expenditures. An instrumental variable episode of illness was identified whose validity was confirmed using the over-identifying restrictions test - the Sargan Statistic. The variable episode of illness is defined as the number of times that a household member becomes ill in a month. Household welfare was measured using two indicators, namely, food consumption expenditure and the household asset base, where the asset index was constructed using the principal component analysis (PCA), and the first component was used because of the largest variation in the data.

The intuition behind the two welfare proxies, i.e., food consumption expenditure and the asset base, is that once a household member becomes ill, the food budget aspect is affected first as the household is likely to rotate the resources meant for buying food to the purchase of medical goods. And once the illness becomes critical, especially in the case of non-communicable diseases (NCDs), then a household is highly likely to sell some of the assets it owns to afford medical services for the sick household member since such diseases take time to heal and at times they do not get cured. The data were analyzed using STATA 14 software that produced results for descriptive statistics, Ordinary Least Square (OLS) and a two-stage least squares (2SLS) methodology using the instrumental variable technique.

Econometrically, the effect of OOP on household welfare is as presented below.

Model for analyzing the impact of OOP health expenditure on household Food consumption expenditure in a Ugandan household:

$$FCE = \beta_0 + \beta_{1i}MstatH + \beta_{2i}EduH + \beta_{3i}GenderH + \beta_{4i}Hempstat + \beta_{5i}Hsize + \beta_{6i}Re\,s\,id + \beta_{7i}OOP + \beta_{8i}AgeH + \beta_{9i}Agesq + \beta_{10i}NCDs + \beta_{11i}Eil\,ln\,e\,ss + \varepsilon_i \quad (1)$$

Model for the impact of OOP health payment on household asset holding household assets (Asset Index):

$$HAH = \beta_0 + \beta_{1i}MstatH + \beta_{2i}EduH + \beta_{3i}GenderH + \beta_{4i}Hempstat + \beta_{5i}Hsize + \beta_{6i}Re\,s\,id + \beta_{7i}OOP + \beta_{8i}AgeH + \beta_{9i}Agesq + \beta_{10i}NCDs + \beta_{11i}Pil\,ln\,e\,ss + \varepsilon_i \quad (2)$$

Where:

FCE = food consumption expenditure
HAH = the household asset base (Asset index)
X_{1i}= Marital status of the household head
X_{2i}= Education level of the household head
X_{3i}= Gender of the household head
X_{4i}= Household head's employment status
X_{5i}= Household size
X_{6i}= Residence
X_{7i}= Out-of-pocket health expenditure
X_{8i}= Age of household head
X_{9i}= Age of the household head after retirement
X_{10i}= Non-communicable diseases
X_{11i}= Episode of illness
U_i= Random error term

4.2 Constructing the Asset Index as a Proxy for Welfare

The study used the method of Principal Component Analysis (PCA) to construct the asset index. This is a technique for extracting from a set of variables those few orthogonal linear combinations of the variables that capture the common information most successfully (Filmer and Pritchett, 2001). We use a statistical procedure of principal components to determine weights for an index of the asset variables (Filmer and Pritchett, 2001). The first principal component may be labelled as "long-run household wealth" and it accounts for much variability in the data (Isk, 2006). The scoring factors are normalized by their standard deviation and then used as asset weights in the index.

In computing the asset index for each household, the formula developed by Filmer and Pritchett (1998) was used that household$i$'s value on the index is given by;

$$A_i = \frac{f_1 * (a_{i1} - a_1)}{s_1} + \ldots\ldots\ldots\ldots\ldots + \frac{f_n * (a_{in} - a_n)}{s_n}$$

Where:

f_1 = Scoring factor (asset weight) for the first assets in the index, determined by the PCA.
a_{i1}= the i^{th}household's variable value for the first asset, $a_1$and s_1 are the mean and standard deviation respectively, of the first asset variable over all households.

According to (Kolenikov &Angeles, 2009), the average number of asset variables that can be used to calculate the asset index or Social Economic Status (SES) index is 20, with a range from 11 to 42. The average number of binary variables that can be used is 12, ranging from 5 to 32. The average number of categorical variables is 6, ranging from3 to 17; the average number of categories is 7, with a range of categories from 3 to 17. Some few variables can be truly quantitative, either continuous (i.e. time to get to a source of drinking water) or count (i.e. number of rooms in the house). In most household surveys, the majority of asset variables used to calculate PCA are binary variables. On average, about 60% of the variables are to be binary, the largest percentage is 75%.

This study considered some of the assets that were used for constructing the wealth index in the Bangladesh report because they are easier to observe than income (Kolenikov &Angeles, 2009). 20 asset variables have been included in the construction of the asset index for this study and these include house, furniture, household appliances, cooker, refrigerator, TV, radio, cassette-DVD-CD, mobile phone, computer laptop, solar panel, motorcar, motorcycle, bicycle, boat/canoe, jewellery, livestock, fixed phone and home theatre. The reason why only durable assets are considered in this study is that in the event of Non-Communicable Diseases that are expensive to treat, durable assets are easy to convert into cash to meet the healthcare costs. All the asset variables considered in this study are used in a dummy form, whereby each of them was assigned the value of 1 if the household owns at least one and 0 if the household does not own the asset.

The asset weights or scoring coefficient in PCA are interpreted as follows: a move from 0 to 1 (i.e. from non-ownership) changes the asset index by (f_1/s_1). An asset variable with a positive factor is associated with higher SES while that with a negative factor score is associated with a lower SES. The higher the score (asset index), the higher the implied SES of the household. Negative asset indices signify extremely low welfare conditions or SES.

4.3 Data Sources

The study used secondary data from the Uganda National Household Survey, UNHS 2016/17 which is the 6th in a series of consumption surveys conducted by UBOS. The survey covered all the 112 districts of Uganda for a period of 12 months, which is from the end of June 2016 to June 2017. A total of 17,450 households were scientifically selected countrywide. For OOP all households were considered since on average, every Ugandan household has incurred OOP expenditures on health. The data were used because they are easily available, accessible and reliable; as well, it is the most recent household survey.

5. Results and Discussion

The results show that the series display a high level of consistency as their mean are perpetually within the minimum and maximum values of the series. For example, the nature of food consumption expenditure has a mean of 12.46 shillings per month. From Table 1, the bigger part of the population is rural-based, with only 29% living in the urban areas. For OOP health expenditure the mean health expenditure in a given month is 9.7941 Ugandan shillings.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
Log Food consumption expenditure	74,076	12.46	0.619	6.060	15.59
Age head	74,327	43.90	14.33	11	110
Residence					
Rural	74,518	0.706	0.456	0	1
Urban	74,518	0.294	0.456	0	1
Gender of the household head					
Male	74,331	0.730	0.444	0	1
Female	74,331	0.270	0.444	0	1
Education of the household head					
No education	74,522	0.633			
Primary	74,522	0.234	0.423	0	1
Secondary and Above.	74,522	0.133	0.340	0	1
Marital status of the household head					
Married	74,327	0.786	0.410	0	1
Not Married	74,327	0.214	0.410	0	1
NCDs					
No NCDs	74,522	0.721	0.186	0	1
NCDs	74,522	0.279	0.186	0	1
Household size	74,076	5.912	2.666	1	23
Log OOP	48,444	9.7941	1.5667	0	15.72

Source: Author's calculations

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Table 2 below shows the OLS results of the effect of out-of-pocket healthcare expenditure on household welfare in Uganda. However, the estimate of the regression coefficient is biased as can be seen in the results table below. Variable OOP the main variable of interest is significant at 1%, but the sign is contrary to expectation, given the theory on Out of Pocket and welfare. Other variables for example episodes of illness, and NCDs cases are also seen to be highly significant but the signs are contrary to one model and consistent with the other model of welfare. Contemporary literature posits that episodes of illness and NCD variables are negatively related to household welfare. Due to inconsistency of results using the Ordinary Least Squares method, a more robust method of estimation which is the two-stage least squares regression technique is used.

Table 3 shows the Two-stage least square regression result of the impact of out-of-pocket health expenditure (OOP) on household welfare. It can be deduced from the table that out-of-pocket health expenditure has a significant negative impact on household welfare proxied by food consumption expenditure and the asset base; where the asset index was constructed using the Principal Component Analysis (PCA). During the construction of the index, the first component was considered due to its largest variation in the data. OOP has a significant impact on household welfare at a 1% level. This may be interpreted that as households spend more on health-related issues, they tend to consume less food and may sometimes sell their household assets to finance healthcare. Furthermore, this could be that as households spend higher proportions of their income on health, they will have less disposable income to spend on food items to augment productivity and asset accumulation.

Table 2: OLS Results of OOP on Household Food Consumption Expenditure and Household Asset Base

	(1)	(2)
	Lnfcexp	***lnAsset Index***
LnOOP	0.0894***	0.169***
	(0.00176)	(0.00856)
Episode of illness	-0.000838	-0.0145***
	(0.00117)	(0.00291)
Marital status of household head		
Unmarried	-0.0757***	-0.281***
	(0.00849)	(0.0423)
Education of household head		
Primary	-0.0130**	-0.202***
	(0.00567)	(0.0350)
Secondary and above	0.146***	0.234***
	(0.00749)	(0.0292)
Gender of household head		
Female	-0.0639***	-0.0603*
	(0.00742)	(0.0365)
Residence	0.240***	0.656***
	(0.00547)	(0.0258)
Age square of household head	-0.000173***	-0.000139**
	(0.0000101)	(0.0000667)
Age of household head	0.0217***	0.0198***
	(0.00100)	(0.00635)
Log household size	0.455***	-0.191***
	(0.00620)	(0.0289)
1. NCDs	-0.0287**	-0.00707
	(0.0123)	(0.0633)
Household head employment status		
Employed	0.0695***	0.0193
	(0.00960)	(0.0446)
_cons	10.15***	-2.124***
	(0.0283)	(0.160)
N	48309	11011
R^2	0.295	0.125
adj. R^2	0.295	0.124

Source: Author's own computation Standard errors in parentheses *p< 0.10, **p< 0.05, ***p< 0.01

Other significant variables as shown in Table 2 include Marital status (Unmarried negative with food consumption expenditure and negative with asset base at 1%) for both OLS and 2 SLS models, education of the household head (Primary negative at 5% for food consumption and 1% for the household asset base, whereas secondary education and higher, is positive and significant at 1% for both food consumption expenditure and the household asset base). Gender (negative) at 1% for food consumption expenditure, NCDs (negative) significant for both food consumption expenditure and asset base at 10% and 5% respectively. Age - positive and

significant at 1% level and 5% for food consumption expenditure and household asset base respectively. The employment status of the household head (Positive) is significant at a 1% level for food consumption expenditure. Household size (positive) is significant at 1% for food consumption expenditure and (negative) significant at 1% for household asset base. However, Age squared, gender and household head's employment status variables were not statistically significant for the household asset base in the regression analysis.

Table 3: 2SLS Results on OOP Health Expenditure on Food Consumption Expenditure and Asset Base

	Lnfcexp	**lnindex_score**
Log OOP	-0.0800***	-0.126**
	(0.0128)	(0.0492)
Marital status of the household head (if married =0)		
Unmarried	-0.0762***	-0.322***
	(0.0085)	(0.0458)
Education of the household head (if no education =0)		
Primary education	-0.0135**	-0.221***
	(0.0057)	(0.0369)
Secondary and above	0.149***	0.265***
	(0.00814)	(0.0314)
Gender of the household head (if male=0)		
Female	-0.0654***	-0.0038
	(0.0078)	(0.0409)
Residence (if rural=0)		
Urban	0.244***	0.722***
	(0.0072)	(0.0285)
Age of the household head	0.0217***	0.0155**
	(0.0010)	(0.0068)
Age squared of the household head	-0.00172***	-0.0001
	(0.001)	(0.0001)
Log household size	0.458***	-0.100***
	(0.0078)	(0.0304)
NCDs (if no NCDs =0)		
Yes NCDs	-0.0250*	-0.0855**
	(0.0136)	(0.0680)
Employment status of the household head (if unemployed=0)		
Employed	0.0682***	0.0207
	(0.0098)	(0.0451)
_cons	10.99***	0.572***
	(0.0197)	(0.134)
N	74076	16675
R^2	0.265	0.210
adj. R^2	0.265	0.210
Prob>F	0.000	0.000
Durbin-Wu-Hausman test (DWH)	0.078	0.053
Sargan Statistic P-Values	0.385	0.496

Source*:* Author's own computations Standard errors in parentheses
*p< 0.10, **p< 0.05, ***p< 0.01

6. Conclusions

The study has shown that out-of-pocket (OOP) healthcare expenditure has a significant impact on household welfare in Uganda. The analysis of the study has revealed that OOP was a significant variable that affects both household food consumption expenditure and the asset base negatively at a 1% statistical level of significance. Furthermore, the results show the financially harmful welfare impact of OOP in Uganda, thereby adding to the existing literature on the welfare effects of healthcare expenditure in Sub-Sahara African countries and developing countries of the world.

Thus, from the findings, this study derives several policy implications. First, the study proposes that the implementation of the Uganda National Health Insurance Scheme is the best way to protect households against the high OOP health expenditure to relieve ordinary Ugandans from pulling money directly from their pocket to meet their health care costs. Second, policies directed toward promoting awareness for prevention against the NCDs are likely to reduce the upsurge of NCDs cases and hence household welfare will be enhanced. Third, there is a need to promote and subsidize higher education to increase the number of people with tertiary education. This will equip them with labour-market-relevant skills that will make them compete for better wages in the labour market to enhance their household well-being. And finally, there is a need to promote women's empowerment to enable female gender involvement in positions of influence and ensure females earn the same wages to labour supply as men to improve household welfare in Uganda.

References

African Development Bank (AfDB), OECD & UNDP. (2015). *African economic outlook* 2015: Regional Development and Spatial Inclusion.

Amos, O. O., Nwakuso, U. M., Baba, M. A. & Olamide, O. E. (2016). Effect of out-of-pocket health expenditure on the welfare of rural households in Kwara State, Nigeria. *International Journal of Health Economics and Policy*, 1(1): 1.

Aregbeshola, B. S. & Khan, S. M. (2018). Out-of-pocket payments, catastrophic health expenditure and poverty among households in Nigeria 2010. *International Journal of Health Policy and Management*, 7(9): 798.

Arsenijevic, J., Pavlova, M. & Groot, W. (2013). Measuring the catastrophic and impoverishing effect of household health care spending in Serbia. *Social Science. & Medicine*, 78: 17–25.

Cavagnero, E., Carrin, G., Xu, K. & Aguilar-Rivera, A. M. (2006). Health financing in Argentina: an empirical study of health care expenditure and utilization. Innovations in Health Financing: Working Paper Series, 8.

Chuma, J. & Maina, T. (2012). Catastrophic health care spending and impoverishment in Kenya. *BMC Health Services Research*, 12(1): 413.

Chuma, J., Gilson, L. & Molyneux, C. (2007). Treatment-seeking behaviour, cost burdens and coping strategies among rural and urban households in Coastal Kenya: an equity analysis. *Tropical Medicine. & International Health*, 12(5): 673–686.

Filmer, D. & Pritchett, L. H. (2001). Estimating wealth effects without expenditure data—or tears: an application to educational enrollments in states of India. *Demography*, 38(1): 115–132.

Kimani, J. K., Ettarh, R., Warren, C. & Bellows, B. (2014). Determinants of health insurance ownership among women in Kenya: Evidence from the 2008–09 Kenya demographic and health survey. *International journal for equity in health*, 13(1): 27.

Kiros, M., Dessie, E., Jbaily, A., Tolla, M. T., Johansson, K. A., Norheim, O. F. & Verguet, S. (2020). The burden of household out-of-pocket health expenditures in Ethiopia: estimates from a nationally representative survey (2015–16). *Health policy and planning*, 35(8): 1003–1010.

Kolenikov, S. & Angeles, G. (2009). Socioeconomic status measurement with discrete proxy variables: Is principal component analysis a reliable answer? *Review of Income and Wealth*, 55(1): 128–165.

Krishna, A. (2011). *One illness away: Why people become poor and how they escape poverty*. Oxford University Press.

Kwesiga, B., Zikusooka, C. M. & Ataguba, J. E. (2015). Assessing catastrophic and impoverishing effects of health care payments in Uganda. *BMC health services research*, 15(1): 30.

Leive, A. & Xu, K. (2008). Coping with out-of-pocket health payments: empirical evidence from 15 African countries. *Bulletin of the World Health Organization*, 86, 849–856C.

Mugisha, F., Kouyate, B., Gbangou, A. & Sauerborn, R. (2002). Examining out-of-pocket expenditure on health care in Nouna, Burkina Faso: implications for health policy. *Tropical Medicine. & International Health*, 7(2): 187–196.

Onah, M. N. & Govender, V. (2014). Out-of-pocket payments, health care access and utilization in south-eastern Nigeria: a gender perspective. *PLoS One*, 9(4): e93887.

Pal, R. (2012). Measuring the incidence of catastrophic out-of-pocket health expenditure: with application to India. *International Journal of Health Care Finance and Economics*, 12(1): 63–85.

Preker, A. S., Carrin, G., Dror, D., Jakab, M., Hsiao, W. & Arhin-Tenkorang, D. (2002). Effectiveness of community health financing in meeting the cost of illness. *Bulletin of the World Health Organization*, 80, 143–150.

Rashad, A. S. & Sharaf, M. F. (2015). Catastrophic economic consequences of healthcare payments: effects on poverty estimates in Egypt, Jordan, and Palestine. *Economies*, 3(4): 216–234.

Rono, G. J. (2017). Out-Of-Pocket Payment for Healthcare and Its Effects on Household Welfare in Rural and Urban Areas of Kenya. Doctoral dissertation, Kenyatta University.

Séne, L. M. & Cissé, M. (2015). Catastrophic out-of-pocket payments for health and poverty nexus: evidence from Senegal. *International Journal of Health Economics and Management*, 15(3): 307–328.

Ssewanyana, S. & Kasirye, I. (2020). Estimating Catastrophic Health Expenditures from Household Surveys: Evidence from Living Standard Measurement Surveys (LSMS)-Integrated Surveys on Agriculture (ISA) from Sub-Saharan Africa. *Applied Health Economics and Health Policy*, 18(6): 781–788.

Tomini, S. M., Packard, T. G. & Tomini, F. (2012). Catastrophic and impoverishing effects of out-of-pocket payments for health care in Albania: Evidence from Albania Living Standards Measurement Surveys 2002, 2005 and 2008. *Health Policy and Planning*, 28(4): 419–428.

Wagstaff, A. (2009). Social health insurance vs. tax-financed health systems-evidence from the OECD. World Bank policy research working paper, (4821).

World Health Organization. (2010). *The world health report* 2010*: health systems: improving performance*. World Health Organization.

—. (2021). Annex to infection prevention and control during health care when coronavirus disease (COVID-19) is suspected or confirmed: Interim guidance, 1 October 2021 (No. WHO/2019–nCoV/IPC/Annex/2021.1). World Health Organization.

World Health Organization. Department of Mental Health, Substance Abuse, Mental Health, Evidence and Research Team. (2005). *Mental health atlas 2005*. World Health Organization.

Xu, K., Evans, D. B., Kadama, P., Nabyonga, J., Ogwal, P. O., Nabukhonzo, P. & Aguilar, A. M. (2006). Understanding the impact of eliminating user fees: utilization and catastrophic health expenditures in Uganda. *Social Science & Medicine*, 62(4): 866–876.