



IMPACT OF SUBSTANTIAL OUT-OF-POCKET HEALTHCARE EXPENDITURE ON CITIZENS WELFARE IN NIGERIA

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ABSTRACT

Nations typically employ a combination of health-care funding mechanisms, including tax-based finance, private medical insurance, social insurance, out-of-pocket (OOP) payments, and donor funds. Meanwhile, in many emerging nations, lopsided health finance towards private healthcare funding jeopardizes progress toward the third Sustainable Development Goal of Universal Health Coverage (SDG Target 3.8). Households who are particularly vulnerable to catastrophic health spending may experience income/wealth loss as a result of excessive spending on unwell/ailing household member(s). To that purpose, the current study looked into the welfare implications of higher out-of-pocket spending among Nigerian households. Using multiple catastrophic out-of-pocket health spending thresholds (20 percent of total household spending and 40 percent of non-food household expenditure), the study found that poverty risks are higher in Northern Nigeria and rural settlements than in Southern Nigeria and urban centres. Surprisingly, this study found that the chance of Nigerian households facing catastrophic out-of-pocket health spending increases with household size. The report advises reducing the impact of excessive out-of-pocket spending on households by investigating alternate health financing systems such as health insurance, as well as increasing public spending on healthcare in Nigeria.

Keywords: Hazardous Level; privately expenditures; impoverishment; household; welfare.

INTRODUCTION

One crucial aspect of human capital is health. Economic growth benefits from health (Barro, 2016). Because a healthy population is more productive, which raises per capita income, investments in human capital more especially, the health component are essential for labor productivity and economic growth (WHO, 2015; Adekunle et al., 2023). Countries typically use a combination of funding sources for health care, such as tax-based financing, donor funding, private health insurance, social insurance, and out-of-pocket expenses. Nonetheless, governments now play a significant role in subsidizing healthcare due to the recognized significance of favorable health conditions for both human and economic development.

According to some, it is more practical to collect taxes, enhance tax administration, and broaden the tax base rather than requiring non-salaried employees and those who are unable to pay to pay out-of-pocket for health insurance or medical services (Aregbeshola, 2018). Many developed economies use both public and private health insurance programs to finance healthcare in addition to tax-based financing. For instance, in the UK, health insurance accounts for around 20% of total healthcare spending, while the majority of healthcare funding comes from general taxes (Thorsby and Aurora, 2020). Under the meantime, the attainment of the third Sustainable Development Goal, Universal Health Coverage (SDG Target 3.8), is under jeopardy due to the lopsided health finance towards private healthcare funding in many emerging nations. According to Edeme et al. (2017), there is typically a high rate of poverty and wealth disparity in nations where private funding dominates the healthcare system. According to the authors, OOP payments have a devastating and impoverishing impact on households and are progressive and unfair. Furthermore, prior research has demonstrated that increased household exposure to catastrophic health spending has increased the likelihood of poverty in Nigeria and other countries (see Chuma and Maina, 2012; Mchenga et al., 2017; Aregbesola and Khan, 2018). When households spend at least 10% of their entire consumption expenditures or 40% of their non-food expenditures on health, OOP spending are deemed catastrophic (Kawabata et al., 2002; Xu et al., 2003; Wagstaff and van Doorslaer 2003; Karami et al., 2009; Odunyemi, 2021). As a result, impoverished Nigerians would greatly benefit economically from basic health care investments as well as the expansion of coverage for interventions related to malaria, maternity and child health, and reproduction. Due to the high costs of caring for an unwell household member or members, households who are especially vulnerable to catastrophic health spending may experience a loss of income or wealth. In order to do this, the current study assesses the welfare impact of Nigerian households' catastrophic out-of-pocket medical expenses. The results of the research are also intended to guide healthcare reforms, such as reversing the current patterns of low public health spending and high out-of-pocket spending. In Nigeria, out-of-pocket expenses accounted for 75.1 percent of total spending between 2000 and 2016, according to the World Bank (2021). However, from 2000 to 2016, public healthcare spending accounted for an average of 17.1 percent. Therefore, reversing this tendency is still safe. Furthermore, the results of the current study will influence potential changes to the NHIS in order to improve health insurance coverage in Nigeria. This report may also encourage Nigerian governments at all levels to fully adopt NHIS.

STATEMENT OF PROBLEM

Out-of-Pocket (OOP) healthcare spending on ailing member have exposed most households to catastrophic loss of wealth and affected their living standards. Most households suffer income loss while

trying to finance and care for an ailing member such that they are exposed to poverty risks. Further to this, households in the rural areas and Northern Nigeria are mostly affected by this out-of-pocket expenditure than their counterparts in urban and Southern Nigeria respectively. This is not unconnected to the fact that those in the rural and Northern parts of Nigeria are not well enlightened about some governmental and non-governmental healthcare funding schemes; and as such. They are exposed to poverty risks. The catastrophic welfare impact of increased out-of-pocket spending in Nigeria prompted this study.

AIM AND OBJECTIVES

This study aimed at assessing the extent to which out-of-pocket healthcare spending has affected the welfare of households in Nigeria.

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Empirical Review

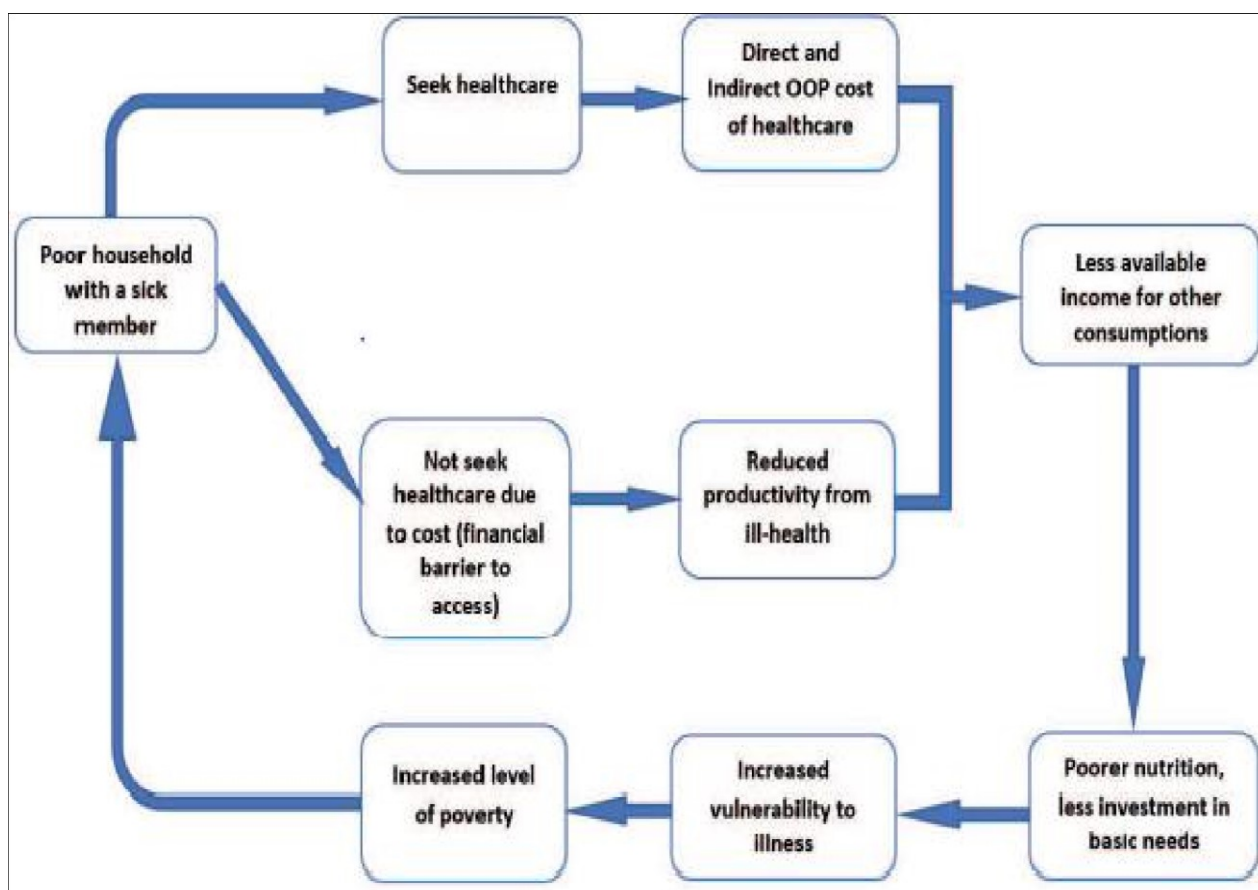
Numerous earlier studies have demonstrated that OOP has a detrimental and noteworthy impact on household welfare in a variety of national contexts (Sewanyana and Kasirye, 2020; Kiros et al., 2020; Rono, 2017; Aregbeshola and Khan, 2018; Mitra et al., 2015; Leive and Xu, 2008; Xu et al., 2006; Duflo, 2005). When living standards fall below the poverty line, households are at risk of becoming vulnerable to poverty. Because impoverished households lack certain necessary strategies to defend themselves from shock, they are also more vulnerable to it. According to Bonfrer and Gustafsson-Wright (2017), this puts individuals at danger and restricts their access to resources. They also run the risk of seeing their out-of-pocket medical expenses rise (Morudu and Kollamparambil, 2020). Séne and Cissé (2015) used a system of Tobit regressions using seemingly unrelated equations to determine the connection between poverty and catastrophic health spending in Senegal. According to the report, catastrophic health expenses put household welfare at risk because they cause some people to fall into poverty by putting a strain on their disposable earnings and upsetting the material living conditions of Senegalese households. Aregbeshola and Khan (2018) used the 2009/2010 Harmonized Nigeria Living Standard Survey to investigate the financial burden of OOP health payments across Nigerian households. Catastrophic health spending was defined as OOP health payments that exceeded a threshold of 10% of total consumption and 30% of non-food expenditures, respectively. At the 10 percent threshold of total consumption expenditure, 16.4 percent of households experienced catastrophic health payments, while 13.7 percent of households experienced catastrophic health payments at the 30 percent threshold of non-food expenditure, according to the authors. Amos et al. (2016) investigated how OOP health spending affected rural households in Nigeria's Kwara state. The authors demonstrated that OOP health spending significantly reduces both per

capita income and calorie intake by using a two-stage sampling technique to choose 180 rural households for the survey. Rashad and Sharaf (2015) investigated the devastating economic effects of healthcare payments and how they affected estimates of poverty in Jordan, Palestine, and Egypt. The findings demonstrated that OOP tends to deteriorate household living situations, particularly in Egypt compared to other nations, propelling 3% of the population into extreme poverty and more than one-fifth of the population into financial ruin in 2011. Nonetheless, the disruptive effect of OOP seems to be minimal in Jordan and Palestine. Moreover, Bredenkamp, Mendola, and Gragnolati (2011) evaluated the influence of catastrophic OOP on Malawi's incidence and depth of poverty. By raising the OOP threshold from 10% to 40%, the authors of the study—using data from Malawi's Integrated Household Survey (IHS-3)—discovered that OOP exposed 9.4% to 0.7% of families to a catastrophic health spending pattern. The study also discovered that when OOP is taken into account when estimating the poverty model, the poverty gap increases by roughly 2.5 percent and an additional 0.9 percent of the population is classified as poor. According to Edeh (2022), the percentage of Nigerian households experiencing catastrophic health expenses ranges from 27% using the 2010/2011 GHS data (Wave 1) to 48% using the 2015/2016 GHS data (Wave 3). The study determined that economic status and geographical zone were the main determinants causing catastrophic health expenses. Additionally, it was discovered that the poor were disproportionately affected by the disparity in catastrophic health expenses. Therefore, by investigating the welfare impact of the prevalence of catastrophic out-of-pocket spending among Nigerian households, the current study adds to the body of knowledge already in existence. All of the analysis in this paper is based on the most recent General Household Survey.

Devastating Out-of-pocket Medical Expenses and the Perpetual Poverty Cycle

"If a household spends 40 percent or more of its discretionary (non-food) or 20 percent or more of its overall expenditure on healthcare," it is considered to be experiencing catastrophic expenditure. Household members may become impoverished as a result of excessive out-of-pocket medical expenses, creating a vicious cycle of poverty (see Figure 1 below). The graphic shows that poor consumption, malnutrition, vulnerability to illness, low productivity, and poverty are the main causes of catastrophic OOP health spending on household welfare.

Figure 1: Cycle of impoverishment due to excessive out-of-pocket spending on healthcare



Source: Adapted from Odunyemi (2023)

METHODOLOGY AND DATA

Model Specification

Since the dependent variable is a dummy variable that takes the value of 1 if a household is poor (below the NBS poverty line of N137,430, which is the sum of food and non-food expenditure per household) and 0 if a household is not poor or above the poverty line, this study depends on qualitative response models like Logit and Probit. In contrast to earlier research that examined welfare in terms of consumption, this serves as the study's proxy for household welfare.

The Logit Regression

There is a logistic distribution in the Logit regression. According to the current example, the likelihood that a household will live below the poverty line is a non-linear function of the explanatory factors, which include household size, settlement, geopolitical zone, and OOP spending. To distinguish between households with and without the potential for catastrophic payments, this study uses the OOP health spending thresholds of 10% of total consumption expenditure and 40% of non-food expenditure. As a result, a dummy variable appears with a value of 1 for households that are exposed to catastrophic

payments and 0 for those that are not. (1) where the logistic distribution function (cumulative) is defined as $Z_i = \beta_0 + \beta_1 X_i$ (Eq. (2)). One can calculate the likelihood that a household will not be below the poverty line as follows: (3) The odds ratio is then calculated by dividing the chance of success (P_i) by the chance of failure ($1 - P_i$); in other words, (4) obtaining the odds ratio's natural log gives As a linear function of a few covariates, such as household size and dummy variables for households' exposure to catastrophic payments, settlements (rural and urban), and geopolitical zones (South-West, South-East, South-South, North Central, North East, and North West), (5) where L_i is known as the logit.

The Probit Regression

It uses the probit regression to produce a reliable analysis. The probit technique uses a linear combination of predictors to approximate the probability's inverse standard normal distribution. For instance, let us say a response variable is binary, meaning it can only have two possible values, which we would represent as 1 and 0. As previously stated, the poverty status of families categorized as poor or non-poor is the response variable in this instance. It is also believed that a vector of explanatory variables will affect the result Y .

We specifically assume that the model has the following form: $(Y = 1|X) = \Phi(XT\beta)$ (6) where Φ is the standard normal distribution's cumulative distribution function and Pr stands for probability. The parameter estimations are the. Motivating the probit model as a latent variable model is feasible. Assume that an auxiliary random variable exists: $Y^* = XT\beta + \varepsilon$ (7), where $\varepsilon \sim N(0,1)$. It is thus possible to consider Y as a measure of whether this latent variable is positive: $Y = 1$ if $Y^* > 0$, (8) where variables and the response variable is the probability that a household would experience poverty

Are there any potential factors that could influence the likelihood of poverty in Nigerian households?

Description of the Data, Sources, and Estimation Method

After ten (10) years, a collaborative team from the National Bureau of Statistics (NBS) and the World Bank performed the 2018/19 NLSS, the first large-scale household survey in a decade that measures the living conditions of the population. The methodological improvements in the 2018–19 NLSS are superior to those in previous General Household Surveys (GHS, Waves 1, 2, and 3). In order to investigate the welfare impact of OOP healthcare spending on household wellbeing in Nigeria, the current study used data from the 2018–19 NLSS. This study seems to be the first to incorporate the most recent NLSS data on the topic. Furthermore, the Maximum Likelihood (ML) approach is an estimation technique

appropriate for such non-linear models, yielding the regression coefficients in the logit and probit models in eqs. 5 and 8, respectively.

EMPIRICAL RESULTS AND DISCUSSION

Preliminary Analysis

Tables I, II, III, and IV include descriptive analysis and demographic information for 4,077 households whose data came from the NLSS 2018/2019. According to Table I, Nigerian households typically consist of six people. A household's average spending is N206,876.6. Non-food expenses account for 52.5% of total household spending, with an average of N107,685. However, the average food expenditure is N 99,199.92, which represents 47.5 percent of the total. Additionally, the average out-of-pocket medical expense was N13, 873.59.

Table I: Summary Statistics of Sampled Households in Nigeria

Variable	Obs.	Mean	Std. Deviation	Minimum	Maximum
Household size	4,077	5.5529	3.3749	1	29
Food expenditure (N)	4,077	99,199.92	104,884.6	2,013.58	3,000,000
Share of food in total household expenditure (percent)	4,077	47.4572	14.6402	4.0449	95.2491
Non-food expenditure (N)	4,077	107,685	98,435.45	4,320.9	1,900,000
Share of non-food in total household expenditure	4,077	52.5428	14.6402	4.7509	95.9551
Total Household expenditure (N)	4,077	206,876.6	176,109.1	24,410.74	3,206,739
Out-of-pocket health spending (N)	4,077	13,873.59	34,758.26	55.5556	1,300,000

Source: Author's computation. 2024.

According to the National Bureau of Statistics, the 2019 poverty line was N137,430. The classification of a household as poor or non-poor is based on whether they fall below or over this poverty level. As a result, roughly 40% of households are categorized as poor, with the remaining 60% being non-poor (refer to Table II). The percentage of households classified as urban poor is 6 (6), while the percentage of families classified as rural poor is 34.2%. In a similar vein, roughly 25% of households in urban settlements and 35% of households in rural settlements fall into the non-poor group.

Table II: National Poverty Estimate and Poverty Status of Nigerian Households by Settlement Type

NBS Poverty Line (₦)	137,430	
National Estimates	Headcount	Percent share of Respondents
Poor/Below the poverty line	1,641	40.3
Non-poor/Above the poverty line	2,436	59.7
Sample size	4077	100.0
Estimates by resident type	Headcount	Percent share of Respondents
Urban Poor	246	6.0
Urban Non-poor	1,010	24.8
Rural Poor	1,395	34.2
Rural Non-poor	1,426	35.0
Sample size	4077	100

Source: Author’s computation 2024

Regarding the geopolitical zone, Southern Nigeria has a lower population of poor households relative to the Northern part of Nigeria (see **Table III**). However, the reverse is the case concerning non-poor households in Nigeria.

Table III: Poverty status of Nigerian Households by Geo-Political Zone

Zone	Headcount	Percent share of Respondents	Percent share of zone total
North Central	654	16	100
Poor	311	8	48
Non-poor	343	8	52
North East	700	17	100
Poor	525	13	75
Non-poor	175	4	25
North West	677	16	100
Poor	422	10	62
Non-poor	255	6	38
South East	699	17	100
Poor	142	3	20

Non-poor	557	14	80
South-South	716	17	100
Poor	135	3	19
Non-poor	581	14	81
South West	631	16	100
Poor	106	3	17
Non-poor	525	13	83

Source: *Author’s computation 2024.*

The study used three thresholds for catastrophic out-of-pocket spending on healthcare in Nigeria (see Table IV). The results showed that using the 10 percent of non-food threshold, a total of 786 households (representing a 19.3 percent share of total respondents) are exposed to catastrophic spending. Increasing the threshold from 10 to 20 percent suggests a decrease in the household count exposed to catastrophic health payments to 274 (representing a 6.7% share).

Table IV: Intensity of Catastrophic Out-of-pocket spending using multiple thresholds.

	10 percent threshold (for total household expenditure)		20 percent threshold (for total household expenditure)		40 percent Threshold (for non-food expenditure)	
	Headcount	Percent of sample	Headcount	Percent of sample	Headcount	Percent of sample
Exposed	786	19.3	274	6.7	207	5.1
Not exposed	3,291	80.7	3,803	93.3	3,870	94.9
Sample size	4,077	100	4,077	100	4,077	100

Source: Author’s computation 2024

Regression analysis: Nigerian out-of-pocket medical expenses' effects on welfare Tables V and VI present the findings of the Logit and Probit regressions, respectively, that looked at the welfare impact of out-of-pocket expenses in Nigeria. The study established two spending thresholds for catastrophic households: 20% of overall consumption and 40% of non-food expenditures. Given that the South West dummy variable served as the reference variable, households in Northern Nigeria are considerably more vulnerable to poverty risks than their counterparts in the South West, according to the positive and significant coefficients on the corresponding Northern zone dummy variables. The South East and South dummy variables, on the other hand, have substantial negative coefficients, indicating that the two Southern Nigerian zones are less likely to experience poverty than their South Western counterparts. The two regression specifications (logit and probit models) used in this investigation, as

well as the two catastrophic health payment levels, produced comparable results (see Tables V and VI). This result is consistent with a World Bank study that found that in 2019, in comparison to 2.9 percent of southern Nigerians, around 31.9 percent of northern Nigerians were disadvantaged in all three areas: monetary poverty, education, and basic infrastructure (World Bank, 2022). The urban dummy variable's negative and significant coefficients imply that urban households are less vulnerable to poverty hazards than their rural counterparts, regardless of the thresholds and regression specifications chosen (see Tables V and VI). This result is consistent with a World Bank study that found that in 2019, over 26.3 percent of rural residents experienced deprivation in all three dimensions, while just 3.3 percent of urban residents did the same (World Bank, 2022). The probability of a household falling below the poverty line also rises with household size, according to the positive and significant coefficients on the household size variable. The poverty effect of catastrophic out-of-pocket spending is of particular relevance. Although the study's findings indicated that exposure to catastrophic out-of-pocket health spending lowers the likelihood of poverty risks across both thresholds and regression specifications, the expected positive impact is reversed when the incidence of catastrophic spending is correlated with household size (see Tables V and VI).

Table V: Logit Regression on the Welfare Impact of Out-of-pocket spending in Nigeria

Catastrophic Threshold	20 percent of Total consumption	40 percent of Non-food expenditure
Dependent Variable	POV_i	
<i>North Central</i>	0.5687***(0.1533)	0.5743***(0.153)
<i>North East</i>	1.3988***(0.1605)	1.4099***(0.1604)
<i>North West</i>	0.5732***(0.1566)	0.6011***(0.1568)
<i>South East</i>	-0.5574***(0.1626)	-0.5443***(0.5443)
<i>South – South</i>	-0.8657***(0.1688)	-0.8485***(0.1686)
<i>Urban</i>	-1.3191***(0.1041)	-1.3162***(0.1037)
<i>ln(hhsize)</i>	1.6209***(0.0817)	1.6031***(0.0809)
<i>Cat_hs_nf</i>		-1.8509***(0.5794)
<i>Cat_hs_tcons</i>	-0.8882*(0.5104)	
<i>ln(hhsize) * Cat_hs_nf</i>		0.6816**(0.5794)
<i>ln(hhsize) * Cat_hs_tcons</i>	0.2124(0.3045)	

<i>Constant</i>	-2.8256***(0.1766)	-2.8098***(0.1738)
<i>Chi – square stat</i>	997.13[0.0000]	1012.32[0.0000]
<i>Pseudo R – squared</i>	0.2993	0.3004

Source: Author’s Computation from STATA 15.0

Note: The reference dummy variable is created by suppressing the dummy variable for the South Western area in order to escape the dummy variable trap; Urban = dummy variable, which is equal to 0 otherwise and 1 for city dwellers; *In* = natural log; *cat_hs_nf* = dummy variable that equals 1 for households exposed to catastrophic out-of-pocket health spending, and 0 otherwise (based on the percentage of total household expenditure threshold); *hh size* = household size; The figures in parenthesis () represent the standard errors of regression coefficients, whereas the figures in block bracket [] represent probability values. ***, **, * indicate statistical significance of regression coefficients at the 1, 5, and 10% levels, respectively. According to the null hypothesis of the chi-square test statistic, at least one partial slope coefficient should not differ significantly from zero.

Table VI: Probit Regression on the Welfare Impact of Out-of-pocket spending in Nigeria

Catastrophic Threshold	20 percent of Total consumption	40 percent of Non-food expenditure
Dependent Variable	<i>POV_i</i>	
<i>North Central</i>	0.2386***(0.0879)	0.333***(0.0879)
<i>North East</i>	0.8329***(0.0918)	0.8397***(0.0918)
<i>North West</i>	0.3521***(0.0907)	0.3694***(0.0908)
<i>South East</i>	-0.3410***(0.0922)	-0.3328***(0.0922)
<i>South – South</i>	-0.5003***(0.0952)	-0.4902***(0.0952)
<i>Urban</i>	-0.7559***(0.0589)	-0.7545***(0.0588)
<i>In(hhsize)</i>	0.9377***(0.0463)	0.927***(0.0457)
<i>Cat_hs_nf</i>		-1.1379***(0.3339)
<i>Cat_hs_tcons</i>	-0.4949*(0.2958)	
<i>In(hhsize) * Cat_hs_nf</i>		0.4225**(0.1992)
<i>In(hhsize) * Cat_hs_tcons</i>	0.1028(0.1768)	
<i>Constant</i>	-1.6376***(0.1008)	-1.6284***(0.0991)
<i>Chi – square stat</i>	1137.43[0.0000]	1158.48[0.0000]

<i>Pseudo R – squared</i>	0.2987	0.3001
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Source: Author’s Computation from STATA 15.0

Note: The reference dummy variable is created by suppressing the dummy variable for the South Western area in order to escape the dummy variable trap; Urban = dummy variable, which is equal to 0 otherwise and 1 for city dwellers; The variables *ln* = natural log; *cat_hs_nf* = dummy variable that equals 1 for households exposed to catastrophic out-of-pocket health spending, and 0 otherwise (based on the percentage of total household expenditure threshold); *hhsz* = household size; The figures in parenthesis () represent the standard errors of regression coefficients, whereas the figures in block bracket [] represent probability values. ***, **, * indicate statistical significance of regression coefficients at the 1, 5, and 10% levels, respectively. According to the null hypothesis of the chi-square test statistic, at least one partial slope coefficient should not differ significantly from zero.

CONCLUSIONS

This study used the 2018/2019 NLSS Database to examine how the prevalence of catastrophic out-of-pocket spending affected household welfare in Nigeria. The current study demonstrates, using Logit and Probit regressions, that households residing in Northern Nigeria are more vulnerable to poverty than those in the South. In a similar vein, urban households are less likely than their rural counterparts to be at risk of poverty. Finally, this study found that households are more likely to experience poverty risks when they have a combination of bigger family sizes and vulnerability to catastrophic health payments, regardless of the kind of dwelling or the geographical zone in which they reside.

RECOMMENDATIONS

The results of this study point to the need for immediate legislative actions, such as the introduction of health insurance and the extension of NHIS coverage to all Nigerian demographic groups. By putting the following into practice

- i. **Establish a Universal Healthcare Coverage (UHC) System:** Nigeria ought to implement a UHC system that offers all of its residents, especially the elderly, the impoverished, and children, full healthcare coverage. This would guarantee that everyone has access to necessary healthcare services and lessen the financial burden of out-of-pocket medical expenses on people and households.
- ii. **Implement a Co-Payment System:** The government can implement a co-payment system in which patients pay a tiny portion of the medical bill out of pocket in order to lessen the financial burden of out-of-pocket expenses. This will ensure that healthcare providers have an

- incentive to deliver high-quality services while simultaneously lessening the financial burden on individuals and households.
- iii. **Raise Public Spending on Healthcare:** To enhance the infrastructure and standard of healthcare services, the government should raise public spending on healthcare. This would guarantee that everyone has access to high-quality healthcare services and lessen the need for out-of-pocket medical expenses.
 - iv. **Encourage Private Sector Involvement in Healthcare Delivery:** By offering financial incentives to private healthcare providers, the government can encourage private sector involvement in healthcare delivery. This will lessen the financial burden of out-of-pocket medical expenses on people and households while also improving access to healthcare services.
 - v. **Put Financial Protection Mechanisms in Place:** In order to shield people from financial disaster in the event of unforeseen medical bills, the government should put in place financial protection mechanisms such catastrophic health insurance. This would guarantee that everyone has access to necessary healthcare services and lessen the financial strain that out-of-pocket medical expenses place on people and households.

REFERENCES

- Adekunle, W., Collins, O. and Omo-Ikirodah, B. (2023). Analysing the Nexus Between Public Health Spending, Health Outcomes, Labour Productivity and Economic Growth: Evidence from Nigeria. Research Square PREPRINT (Version 1), DOI: <https://doi.org/10.21203/rs.3.rs2714100/v1>
- Adekunle, W., Oyolola, F., Atolagbe, O., Abdulbasit, A., Odugbemi, T. and Ashiru, Y. (2021). Modelling the Global Prevalence of COVID-19: An Econometric Approach. *Growth*, 8(1): 27-38.
- Adekunle, W., Oyolola, F., Atolagbe, O.A., Abdulbasit, A.A., Odugbemi, T.H. and Ashiru, Y.O. (2022). Modelling the global prevalence of COVID-19: evidence from multiple wave scenarios. *International Journal of Sustainable Economy*, 14(3): 217–253.
- Amos, O.O., Nwakuso, U.M., Baba, M.A. and 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), DOI: 10.11648/j.hep.20160101.11
- Aregbeshola, B. S., and 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.
- Aregbeshola, B.S. (2018). A Tax-based, Non-contributory, Health-Financing System Can Accelerate Progress towards Universal Health Coverage in Nigeria. *MEDICC Review*, 20(4): 4045.

- Barro, R. (1996). Health and economic growth, Mimeo. Cambridge, MA: Harvard University.
- Bonfrer, I. and Gustafsson-Wright, E. (2017). Health Shocks, Coping Strategies and Forgone Healthcare Among Agricultural Households in Kenya. *Global Public Health International Journal*, 12(11): 1369-1390.
- Bredenkamp, C. Mendola, M. and Gagnolati, M. (2011). Catastrophic and impoverishing effects of expenditures in Malawi. *International Journal for Equity in Health*, 16(25), DOI: 10.1186/s12939-017-0515-0.
- Chuma, J., and Maina, T. (2012). Catastrophic health care spending and impoverishment in Kenya. *BMC health services research*, 12(1), 1-9.
- Duflo, A. (2005). Health Shocks and Economic Vulnerability in Rural India: Break the Vicious Circle. Centre for Microfinance Research Working Paper, retrieved from: <https://www.findevgateway.org/sites/.pdf>
- Edeh, H.C. (2022). Exploring dynamics in catastrophic health care expenditure in Nigeria. *Health Economics Review*, 12(22), DOI: <https://doi.org/10.1186/s13561-022-00366-y>
- Edeme, R. K., Emecheta, C., and Omeje, M. O. (2017). Public health expenditure and health outcomes in Nigeria. *American Journal of Biomedical and Life Sciences*, 5(5): 96-102.
- Karami, M., Najafi, F. and Karami, M. B. (2009). Catastrophic health expenditure in Kermanshah, West of Iran: Magnitude and Distribution. *Journal of Research in Health Sciences*, 9(2): 36–40.
- Kawabata, K., Xu, K., and Carrin, (2002). Preventing impoverishment through protection against catastrophic health expenditure. *Bulletin of the World Health Organization*, 80(8): 612–615.
- Kiros, M., Dessie, E., Jbaily, A., Tolla, M. T., Johansson, K. A., Norheim, O. F. and 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.
- Leive, A. and 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.
- Mchenga, M., Chirwa G.C. and Chiwaula, L.S. (2017). Impoverishing effects of catastrophic health expenditures in Malawi. *International Journal of Equity Health*, 16(1), DOI:10.1186/s12939-017-0515-0
- Mitra, S., Palmer, M., Mont, D. and Groce, N. (2015). Can Households cope with Health Shocks in Vietnam? *Health Economics Journal*, 25(7):888-907.
- Morudu, P. and Kollamparambil, U. (2020). Health Shocks, Medical Insurance and Household Vulnerability: Evidence from South Africa. *PLoS ONE* 15(2): e0228034. DOI: <https://doi.org/10.1371/journal.pone.0228034>

- Odunyemi, A.E. (2021). The Implications of Health Financing for Health Access and Equity in Nigeria. Book Chapter published by IntechOpen, DOI: <http://dx.doi.org/10.5772/intechopen.98565>
- Onisanwa, I.D., Sunday, B.S. and Adaji, M. (2018). Healthcare Financing and Health Status Analysis in Nigeria. *Amity Journal of Healthcare Management*, 3(2): 31–42.
- Rashad, A.S. and Sharaf, M.F. (2015). Catastrophic Economic Consequences of Healthcare Payments: Effects on Poverty Estimates in Egypt, Jordan, and Palestine. *Economies*, 3(4): 216234.
- 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. and Cissé, M. (2015). Catastrophic out-of-pocket payments for health and poverty nexus: evidence from Senegal. *International Journal of Health Economics and Management*, DOI 10.1007/s10754-015-9170-4
- Ssewanyana, S. and 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.
- Thorlby, R. and Arora, S. (2020). The English health care system. International profiles of health care systems, pp. 59.
- Wagstaff A. and van Doorslaer, E. (2003). Catastrophe and Impoverishment in paying for healthcare: with applications to Vietnam 1993-1998. *Health Economics*, 12(11): 921-934.
- WHO: World Health Organization (2005). Making every mother and child count. The World Health Report, retrieved from: <https://apps.who.int/iris/bitstream/handle/10665/43131/9241562900.pdf>
- Xu, K., Evans, D. B., Kadama, P., Nabyonga, J., Ogwal, P. O., Nabukhonzo, P. and Aguilar, A. M. (2006). Understanding the impact of eliminating user fees: utilization and catastrophic health expenditures in Uganda. *Social Science and Medicine*, 62(4): 866–876.
- Xu, K., Evans, D. B., Kawabata, K., Zeramdini, R., Klavus, J., and Murray, C. J. (2003). Household catastrophic health expenditure: A multicounty analysis. *Lancet*, 362: 111–117.
- World Bank (2021). World Development Indicators Database, retrieved from: <https://data.worldbank.org/indicator/SH.XPD.OOPC.CH.ZS?locations=NG>
- World Bank (2022). A Better Future for all Nigerians: Nigeria Poverty Assessment 2022, retrieved from: <https://openknowledge.worldbank.org/handle/10986/37295>.