Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.13, No.20, 2022

Disparity in Catastrophic Healthcare Expenditures Across Households' Income Groups in Nigeria: The Lens of Foster-Greer-Thorbecke Poverty Indices

John C. Onyia[1]; Emmanuel Onwuka[1]; Amaka Metu[1]; Uju R. Ezenekwe[1]; Henry T. Asogwa,[2]* & Ezebuilo R. Ukwueze[3]
1.Department of Economics, Nnamdi Azikiwe University Awka, Anambra State, Nigeria
2.Institute for Development Studies, University of Nigeria Enugu Campus
3.Department of Economics, University of Nigeria Nsukka, Nigeria
*Email of the Corresponding author: henry.asogwa@unn.edu.ng

Abstract
The Nigeria health care system seems to have continue in the downturn trend as a result of the decay in public health care system and this have continued to drive the rising health care financed by out-of-pocket expenditure health hence, the study examined the disparity in Catastrophic Healthcare expenditures across Households income groups in Nigeria using the Nigeria Health and Demographic Survey 2018. The study employed the Foster-Greer-Thorbecke indices and the logit model. Findings from the study showed that some household and individual characteristics are associated with catastrophic health expenditure in Nigeria. Many households experience catastrophic health payments due to factors such as age, education of household head, health insurance status, geo- political zone, type of health facilities visited, and type of illness suffered. Governments are yet to find fair and innovative ways of financing the health system so as to reduce the financial burden of out-of-pocket payments on households and individuals in Nigeria. There is also urgent need for increased financial protection as well as insurance coverage through small credit and rural households' contribution scheme as an alternative to the National Health Insurance Scheme to enhance health financing option that could reduce the huge private health cost of out-of-pocket expenditure. There is need for pressure on the legislature to provide a bill that disallow health care tourism for public office holders abroad as way of checkmating the better health care system in Nigeria.
Keywords: Health care, Inequality, Income groups, private health cost, households
DOI: 10.7176/JESD/13-20-03
Publication date: October 31st 2022

1. Introduction

In countries where out-of-pocket expenditure is the most important source of health care financing, the effect of health expenditure on household economic status can be severe, particularly among the poor (Baeza & Packard, 2006). However, in the case of Nigeria, this method of financing health care has continued to persist despite the introduction of the National Health Insurance Scheme (NHIS) in 2005. Unfortunately, the World Health Organization (WHO) (2000), argued that direct out-of-pocket payment for health at point of service is considered an inequitable means of financing a health system, since there is danger of burdening different social sub-groups unequally, especially the poor and the elderly.

Yet, not much attention was given to this considering the consistent rise in out-of-pocket expenditure among households in Nigeria as continued to deepen poverty level due to the pressure on most households in meeting up with their health care demands and needs. Interestingly, there is no doubt as to the level of estimated level of poverty incidence this trend has generated. For example, evidence revealed by Aregbeshola and Khan (2018) demonstrate how out-of-pocket expenditure health payments deepened poverty headcount by 0.8 per cent implying that about 1.3 million Nigerians are pushed below poverty threshold. According to Word bank report (2018) between 2004 and 2018, real expenditure on health of Nigeria grew substantially from 9,702 to 16,405 million US dollars rising at an increasing annual rate that reached a maximum of 9.81% in 2015 and then decreased to 5.57% in 2018.

Interestingly, the Nigeria health care system seems to have continue in the downturn trend as a result of the decay in public health care system in the last three decades which have continue to drive the rising health care tourism abroad most financed by privileged households and those unable to finance health care needs abroad purchase health care needs through the available private health care markets as such both trends have been responsible for the growing out-of-pocket expenditure health. Sadly, many households in Nigeria have not been able to finance their health care needs abroad or through privately accessed markets in Nigeria as result of health are cost.

This no doubt has continued to widen the disparity level of out-of-pocket expenditure health in Nigeria. In addition, that most public health care lack the requisite health care facilities and personnel to the match the

growing population of health needs in Nigeria. Studies have also demonstrated how many avoidable deaths have been associated with lack health care goods and poverty incidence in Nigeria.

Government efforts in the past two decades in Nigeria has been very disheartening to meeting up with its constitutional responsibilities that concerns wellbeing and welfare provision for her citizens. The economic downturn seems to have increased the burden level as many households' members have continued to struggle through to provide health care goods through out-of-pocket expenditure health on the basis that the economic realities have resulted in large outflow of health workers abroad as a result of the economic reality in Nigeria. Nigeria government have also not demonstrated the political will to maintain the health care system with a low 4 per cent of GDP in health investment in 2018.

This no doubt explains the reason for the inequality in catastrophic health expenditures concentrated among the poor, as well as poor universal health coverage all her citizens despite several policies repositioning strategies initiated by development partners, and government at all levels such as the National Primary Health Care Development Agency (NPHCDA) established as a parastatal of the FMOH with the mandate to develop national primary health care policy which is implemented at the state level by State Primary Health Care Development Agencies (SPHCDAs) in 1992, the National Health Insurance Scheme (NHIS) officially launched in 2005, the National Health Act entitling all Nigerians to a Basic Minimum Package of Health Services (BMPHS) and specifying the Basic Health Care Provision Fund (BHCPF) in 2014 among other policies yet, out-of-pocket expenditures had remained high at 76.6 % in 2018 while access to adequate health care system has constituted a huge challenge across different income groups in Nigeria. It is against this background that this study examined the extent to which catastrophic health expenditures have deepen poverty across different income groups in Nigeria.

2. LITERATURE

Catastrophic expenditure is "any health expenditure that threatens a household's financial capacity to maintain its subsistence needs and does not necessarily equate to high health care costs. Even relatively small expenditures on health can be financially disastrous for poor households" (Su et al., 2006), forcing them to reduce expenditure on basic items. Likewise, large health care expenditures can lead to financial catastrophe and bankruptcy even for rich households (Xu et al., 2007).

This no doubt has shared similarities with the Structural Theory of Poverty advanced by Bradshaw in 2006. The theory provides connecting framework on the basis of its emphasis that poverty is caused by economic, political, and social system which causes people to have limited opportunities and resources with which to achieve income and well-being. The theory further demonstrates that within a market-based competitive economic system, unequal initial endowments of talents, skills and capital have significant implication on health and impact more on productivity and poverty levels.

Interestingly studies have come to identifies some important determinants of catastrophic expenditures as aging, chronic illnesses, low levels of insurance coverage, health financing system, rural/urban differences, socio-economic status, types of illness, demographic composition of the household, and the characteristics of household head such as age, sex, education (Kawabata, Xu, and Carrin, 2002; Xu et al., 2003). The study by Su et al., (2006) further provider empirical explanation through economic status as a key determinant of catastrophic health expenditures in Burkina Faso.

Whereas, in Georgia, Gotsadze et al., (2009) demonstrated that that households in the richest quintile were four times less likely to face catastrophic expenditure when compared with the poorest quintile. In other, evidence revealed by their study showed that catastrophic health expenditures were positively associated with the change in poverty in Mexico, implying that households had more income to spend on health as poverty declined (Knaul et al., 2006) unlike evidences provided by several studies in Nigeria.

There are a number of studies which have explored how health financing systems impact on the incidence of poverty across households through health expenditures. For example, Xu, et al., (2003; 2007) found that rates of catastrophic spending are higher in poorer countries and those with limited prepayment systems. As such, for Xu, et al., (2007), operating a tax-financed system or a social health insurance system makes no difference to the incidence of catastrophic expenditures. Malaysia and Thailand reflect the low reliance on out-of-pocket expenditures in financing health care and the limited use of user fees in the public sector. By contrast, the high rate of incidence in Korea reflects the high co-payments in the country's social insurance system and the partial coverage of inpatient care (Lee, 2011).

Health insurance reduces the risk of catastrophic health spending (Gakidou, et al., 2006; Knaul, et al., 2006; Lamiraud, Booysen, and Scheil-Adlung, 2005; Limwattananon, Tangcharoensthien, and Prakongasi, 2007; Xu, et al., 2006). Gakidou, et al., (2006), Knaul, et al., (2006) argued that the introduction of the Popular Health Insurance Scheme (PHIS) in Mexico from 2001 led to a reduction in the incidence of poverty caused by catastrophic health expenditures. Limwattananon, et al., (2007) maintained that rates of catastrophic spending in Thailand were lower after the universal health care scheme was introduced in 2001 to reduce the implication of

health care cost on households' financial burden. Lamiraud, et al., (2005) found that in South Africa, social health protection can help to reduce incidence of poverty caused by catastrophic health expenditures. Similarly, Xu et al., (2006) agreed that those insured had a low financial burden than the uninsured.

There is no doubt as to the effect of health insurance on catastrophic health expenditures among households. Interestingly, the introduction of insurance in reducing and eliminating catastrophic health expenditures have continue to address huge health care financing burden as found in several studies. Though, according to Wagstaff (2007) that even with the introduction of social health insurance scheme in Vietnam in 1993 and the subsequent extension of the scheme to the poor, poor households were still spending a high proportion of their income on health care and at considerable risk of catastrophic spending. However, Xu, et al., (2006) still insist that with the introduction of health insurance in Vietnam, the rates of catastrophic expenditure for the non-poor declined between 2000 and 2003, while it surprisingly remained at the same level for the poor. They argue that this could be due to the frequent unavailability of drugs at government facilities after the removal of user fees, forcing patients to purchase drugs from the private sector. In Kenya, health insurance was not significant in explaining catastrophic health expenditures (Xu, et al., 2006). The authors argued that this could be due to limited insurance coverage both in terms of population and benefit package.

There are a few other studies which, surprisingly, have found a positive relationship between insurance and incidence of catastrophic health expenditures on poverty. In Zambia, health insurance did not provide financial protection against the risk of catastrophic expenditures; rather it increased the risk (Ekman, 2007). Cavagnero, et al., (2006) revealed that there was no evidence that households with social health insurance coverage are protected against catastrophic health expenditures. More too, that the issue is not so much the presence of health insurance coverage but the depth of the coverage in terms of benefits package. Apart from health insurance, area of residence has also been confirmed as a significant determinant of catastrophic health expenditures. For example, in Botswana, Akinkugbe, et al., (2011) revealed that households in the rural areas were more likely to face catastrophic health expenditures compared to their urban-residing counterparts. Living in an urban area was protective against financial catastrophe in Kenya (Xu, et al., 2006), whereas in Uganda it was protective for the non-poor and not the poor (Xu, et al., 2006). However, in Georgia, the odds of facing catastrophic health spending were almost two times higher for the capital city residents compared to those households that received care in East and West Georgia (Gotsadze, et al., 2009). They attributed this finding to the fact that there were higher costs of more complex health care services available in the capital, and relatively easy access to facilities in the capital city despite its implication on urban poverty rate.

Characteristics of household head (gender, education and working status) have revealed to impact on catastrophic health expenditures. Similarly, employment opportunities or capacities with a higher level of education have provided empirical connection to more opportunities and ways that enhance households copping measures against health care expenditures. This includes, borrowing money or selling assets.

Knaul, et al., (2006) argued that education of the household head has always been associated with a lower probability of catastrophic health expenditures in Mexico. Similarly in Uganda, having a household head with low education increased the odds of catastrophic health expenditures (Xu, et al., 2006). Female headed households and those with an educated household head were found to be less likely to face catastrophic health expenditures in Botswana (Akinkugbe, et al., 2011). On the contrary, female-headed households are more likely to encounter financial catastrophe than households headed by males in Argentina (Cavagnero, et al., 2006). However, the sex of the household head did not influence the probability of catastrophic expenditures among the poor in Uganda, but female-headed households were more likely to encounter financial catastrophe than those headed by males among the non-poor (Xu, et al., 2006).

Nevertheless, studies have demonstrated different perspectives especially, Onwujekwe et al., (2012) estimated the level of catastrophic healthcare expenditures for different healthcare services and facilities and their distribution across socioeconomic status (SES) groups. Evaluating the level of catastrophic healthcare expenditures for different healthcare services and facilities in four Local Government Areas in Southeast Nigeria using interviewer-administered questionnaires administered to 4873 households showed that average total household health expenditure per month was 2354 Naira ($19.6), while, outpatient services, average monthly expenditure was 1809 Naira ($15.1). In addition, that inpatient services were 610 Naira ($5.1) leading to huge health care burden among households which showed that higher health expenditures were incurred by urban residents as overall, 27% of households incurred catastrophic healthcare expenditures, higher for poorer socioeconomic groups and for rural residents with only 1.0% of households' household member enrolled in health insurance scheme as such that the worse-off households (the poorest SES and rural dwellers) experienced the highest burden of health expenditure.

Akinkugbe et al., (2011) argued that health financing and catastrophic payments for health care in Botswana showed that the proportion of households facing catastrophic health expenditure at the 20% and 40% thresholds was 11% and 7%respectively, and the share of out-of-pocket health payment during the survey period was about0.93%. For Lesotho the proportions of those facing catastrophic health expenditure at the 20% and

40%thresholds were 3.22% and 1.25%, and the share of out-of-pocket payment in total monthly expenditure was 1.34%. finding also showed having at least one senior member in the household imposes a higher risk for catastrophic health expenditure for the household in Lesotho; for Botswana gender and education status of households' head influence the probability of facing catastrophic health expenditure. In designing health systems, policy makers need to ensure that households are not only able to access health services when needed, but that they are also protected from facing financial catastrophe by reducing out-of-pocket payments.

Also, Onoka et al., (2011) measured catastrophic healthcare expenditure in Nigeria and examined its implications for financial risk protection. Data were collected from 1128 households (4988 individuals). Households were randomly selected from four Local Government Areas in Enugu and Anambra states, Southeast Nigeria (1 rural and 1 urban area in each state). Designed Instrument were used to gather information on illness, expenditure on health, transportation, food, education, entertainment, clothing, cooking and fuel over a one-month period. Findings showed high incidence of catastrophic expenditure on healthcare and that 15% of households studied experienced catastrophic health financing where threshold level was set at 40% of non-food expenditure among those classified under the poorest households.

While, Kronenberg and Barros (2014) assessed the extent of catastrophic healthcare expenditure, leading to impoverishment, even in a country with a National Health Service, such as Portugal. The level of catastrophic healthcare expenditure from the Portuguese Household Budget Surveys of 2000 and 2005, and then analyzed using logistic regression models. The results showed that catastrophic healthcare payment from out-of-pocket are a sizeable issue in Portugal as vulnerable groups are among the highest group facing catastrophic healthcare spending. These vulnerable groups include children, people with disabilities and individuals suffering from chronic conditions. Disability proxies offer straightforward policy options for an exemption for the elderly with recognized disabilities.

In addition, Özgen, Şahin, and Yıldırım (2015) examined the prevalence of catastrophic health payments, the determinants of catastrophic expenditures, and the poverty impact of out-of-pocket payments. Data came from the 2004 to 2010 Household Budget Survey Turkey was employed. Findings showed that the percentage of households that catastrophically spent their consumption expenditure and capacity to pay increased from 2004 to 2010, regardless of the threshold used. Households with a share of more than 40 % health spending in both consumption expenditure and capacity to pay accounted for less than 1 % across years. However, when a series of potential confounders were taken into account, the study found statistically significantly increased risk for the lowest threshold and decreased risk for the highest threshold in 2010 relative to the base year. Household income, size, education, senior and under 5-year-old members, health insurance, disabled members, payment for inpatient care and settlement were also statistically significant predictors of catastrophic health spending.

While, Myint, Liabsuetrakul, Htay, Wai, Sundby, and Bjertness (2018) assessed the levels of impoverishment and catastrophic expenditure due to out-of-pocket payments for antenatal care (ANC) and delivery care in Yangon Region as well as the determinants of impoverishment and catastrophic expenditure created need for investigation. Employing a community-based cross-sectional survey among women giving birth within the past 12 months in Yangon, Myanmar, using three-stage cluster sampling procedure. Findings showed out of pocket payments were made by 75% of the women for antenatal care and 99.6% for delivery care. Also, evidence demonstrated how poverty headcount ratios after payments increased to 4.3% among women using the antenatal care services, to 1.3% among those using delivery cares and to 6.1% among those using both antenatal care and delivery care. The incidences of catastrophic expenditure after payments were found to be 12% for antenatal care, 9.1% for delivery care and 20.9% for both antenatal care and delivery care in Yangon, Myanmar.

Similarly, Aregbeshola and Khan, (2018) analyzed the out-of-pocket payments, catastrophic health expenditure and poverty among households in Nigeria 2010. Secondary data from the Harmonized Nigeria Living Standard Survey (HNLSS) of 2009/2010 was utilized to assess the catastrophic and impoverishing effects of out-of-pocket health payments on households in Nigeria. Finding showed that a total of 16.4% of households incurred catastrophic health payments at 10% threshold of total consumption expenditure while 13.7% of households incurred catastrophic health payments at 40% threshold of nonfood expenditure. Using the $1.25 a day poverty line, poverty headcount was 97.9% gross of health payments. Out-of-pocket health payments led to a 0.8% rise in poverty headcount and this means that about 1.3 million Nigerians are being pushed below the poverty line. Better-off households were more likely to incur catastrophic health payments than poor households.

Hailemichael et al., (2019) examined the catastrophic health expenditure and impoverishment in households of persons with depression in rural Ethiopia. The study adopted a comparative cross-sectional survey with 128 households of persons with depression and 129 households without. Depression screening was conducted using the Patient Health Questionnaire, nine item version (PHQ-9). Linear probability model. Interestingly, findings showed that catastrophic payments at any threshold level for households with depression and high disability recorded high ratio of outcomes occurrence among households leading to high incidence of health expenditure and impoverishment.

Whereas, Koch and Setshegetso, (2020) examined catastrophic health expenditures and the potential for

such payments to impoverish South African households. Despite the differences in measurements, findings showed limited incidence of health care expenditure catastrophe, although larger shares of capacity are being devoted to health care in more recent years. Also, that very few households are subsequently impoverished, because of health care costs among households in South Africa.

Obembe, Levin, Fonn (2021) examined the prevalence, factors and predictors of catastrophic health expenditure amongst selected slum and non-slum communities undergoing emergency surgery in Southwestern Nigeria. Having adopted cross sectional sample design through its multistage sampling technique and the Multiple logistic regression models revealed that although catastrophic health expenditure was higher among the slum dwellers, substantial proportions of respondents incurred catastrophic health expenditure irrespective of whether they were slum or non-slum dwellers across examined households.

Sato (2022) evaluated the household risk of catastrophic health expenditure (CHE) due to measles, according to regions and wealth quintiles in Nigeria using secondary data sources for health-care utilization, OOP expenditures, and consumption expenditures. Interestingly, the findings showed that large variation in CHE risk according to regions and wealth quintiles exist among the poorest households, as those in the northeast and northwest had the highest risk of CHE, up to 17%, while those in the southwest had the lowest risk of 5%.

However, studies reviewed showed different limitation and perspectives which failed to investigates health financing incidence of catastrophic health expenditures across income groups and geopolitical region in Nigeria. Attempts by previous studies to explain the determinants catastrophic health care expenditure affects health care utilization and poverty have been made on specific segment of the population such as region, maternal health, child health and infants health in Nigeria, example; Onwujekwe et al., (2012) focused their study on south east region only; Onoka et al., (2011) focused only on two states of the country. Adeoti and Awoniyi (2014) concentrated on the health status of children while Salihi et al., (2012) used only HIV as variable as such examined the disparity in Catastrophic Healthcare expenditures across households' income groups in Nigeria.

3. Methodology

The theoretical framework for this study is anchored on the Structural Theory of Poverty advanced by Bradshaw in 2006 which provides the theoretical basis of its emphasis that poverty is caused by economic, political, and social system which causes people to have limited opportunities and resources with which to achieve income and well-being. The theory further demonstrates that within a market-based competitive economic system, unequal initial endowments of talents, skills and capital have significant implication on health and impact more on productivity and poverty levels. It is against this framework that the Foster-Greer-Thorbecke poverty indices was adopted to provide an estimation connection to the study so as demonstrate the different levels of poverty incidence largely associated with catastrophic expenditure by income group in Nigeria.

Considering that the Foster-Greer-Thorbecke poverty indices are part of the family of poverty metrics designed to puts higher weight on the poverty of the poorest individuals, making it a combined measure of poverty and income inequality and a popular choice within development economics where households income groups indices within the group are derived by substituting different values of the parameter α into the following equation:

$$FGT_{\alpha} = \frac{1}{N}\sum_{i=1}^{H}\left(\frac{z - y_i}{z}\right)^{\alpha} \qquad 1$$

where z is the poverty threshold, N is the number of households in the studied samples, H is the number of poor (those with incomes at or below z), yi is the income of each income group i. If alpha is low then the FGT metric weights all the income of households with incomes below z roughly the same. The higher the value of α, the greater the weight place on the poorest individuals. The higher the FGT statistic, the more poverty there is among the households. However, the FGT estimation technique in this circumstance group the households into different income groups so as to estimate the different levels of poverty incidence largely associated with catastrophic expenditure by income group in Nigeria.

The study also adopts the logit model, responds to the impact of catastrophic health expenditure on health utilization in Nigeria. Therefore, the logit model to be specified is given as:

$$Logit(P) = \ln\frac{p}{1-p} = \beta_0 + \beta_1\delta + ...\beta_n N + \mu \qquad 2$$

The data used for the study is from the 2018 Nigeria Demographic and Health Survey (NDHS). The 2018 NDHS is a national sample survey that provides up-to-date information on demographic and health indicators. The sample was selected using a stratified, two-stage cluster design, with enumeration areas (EAs) as the sampling units for the first stage. The second stage was a complete listing of households carried out in each of the 1,400 selected EAs. The target groups were women age 15-49 and men age 15-59 in randomly selected

households across Nigeria. A representative sample of approximately 42,000 households was selected for the survey.

The 2018 NDHS is unique in a number of ways. For the first time in a Nigeria DHS, the 2018 survey was implemented using computer-assisted personal interviewing (CAPI), allowing more rapid provision of data than in previous surveys. STATA 13 was used for the analysis.

4. Result Presentation and Discussion

Table 4.1: Spreads of Households across Region and area

region	urban	rural	Total
north central	6,554	15,102	21,656
	30.26	69.74	100.00
north east	5,565	20,728	26,293
	21.17	78.83	100.00
north west	10,325	29,603	39,928
	25.86	74.14	100.00
south east	8,890	5,182	14,072
	63.18	36.82	100.00
south south	3,848	8,588	12,436
	30.94	69.06	100.00
south west	8,929	4,231	13,160
	67.85	32.15	100.00
Total	44,111	83,434	127,545
	34.58	65.42	100.00

Source: author's computation

Table 4.1 provide the spreads of households across regions. For example, large concentration of households in North central region in Nigeria more in rural areas which account for 70 per cent. Followed by 79 per cent for those in Northeast, and 74 per cent for those in North west. Similarly, in the south-south region, the concentration of households is more in rural areas accounting for 69 per cent. Whereas, the large concentration of households is found urban areas in Southeast and Southwest accounting for 63 per cent and 68 percent respectively. This clearly, support the increasing statistics of rural poverty as a result of these spreads in Nigeria.

Table 4.2: Educational Level across Regions in Nigeria

	highest educational level				
region	no educat	primary	secondary	higher	Total
north central	9,257	5,480	5,228	1,691	21,656
	42.75	25.30	24.14	7.81	100.00
north east	18,758	3,772	3,002	761	26,293
	71.34	14.35	11.42	2.89	100.00
north west	31,443	4,465	3,125	895	39,928
	78.75	11.18	7.83	2.24	100.00
south east	1,178	4,424	6,973	1,497	14,072
	8.37	31.44	49.55	10.64	100.00
south south	1,244	3,833	6,210	1,149	12,436
	10.00	30.82	49.94	9.24	100.00
south west	1,819	3,337	6,218	1,786	13,160
	13.82	25.36	47.25	13.57	100.00
Total	63,699	25,311	30,756	7,779	127,545
	49.94	19.84	24.11	6.10	100.00

Source: author's computation

Table 4.2 provides demographic characteristics of household level of education by regions. Interestingly, about 43 per cent of household in the region had no formal education. Followed by similar trend in Northeast by 71 per cent, and Northwest by 79 per cent. Compared to southeast region with 8 per cent of households with no formal education, 10 per cent in south-south and 14 per cent in southwest region. This evidence clearly providence evidence on the rise in out-of-pocket expenditure on health and the rising rural poverty partly caused by the prevailing level of no education. This have continued to worsen the economic opportunities in Nigeria.

Table 4.3: Disparity in catastrophic Households Health Expenditure across Income groups using Foster-Greer-Thorbecke poverty indices

Decompositions of catastrophic expenditure on poverty rate by income group				
Wealth index combined	**a=0 proportion poor**	**a=1 (normalized poverty gap)**		**a=2 (poverty gap)**
	1.00000	0.99995		0.99990
	Pop. share	Mean	Mean|poor	Mean gap|poor
poorest	0.24421	1.34503	1.34503	29998.65497
poorer	0.23088	1.42563	1.42563	29998.57437
middle	0.21263	1.49543	1.49543	29998.50457
richer	0.18197	1.60875	1.60875	29998.39125
richest	0.13030	1.71605	1.71605	29998.28395
	Subgroup poverty 'share', S_k = v_k.FGT_k(a)/FGT(a)			
WIC	**a=0 proportion poor**	**a=1 (normalized poverty gap)**		a=2 (poverty gap)
poorest	0.24421	0.24421		0.24421
poorer	0.23088	0.23088		0.23088
middle	0.21263	0.21263		0.21263
richer	0.18197	0.18197		0.18197
richest	0.13030	0.13030		0.13030

Source: author's computation

Table 4.3 showed the Foster-Greer-Thorbecke poverty indices showed the different levels of poverty incidence largely associated with catastrophic expenditure by income group in Nigeria. The table showed the different degree of poverty indices associated with catastrophic expenditure on health which seems to have deepened poverty gap among different income groups in Nigeria. The Foster-Greer-Thorbecke poverty indices showed the different levels of poverty incidence largely associated with catastrophic expenditure by income group in Nigeria. For example, on average poverty incidence largely associated with catastrophic health expenditure for the poorest income group is about 135 per cent under the proportion incidence rate of 0.24421. Also, for the poorer group account for 143 per cent under the proportion incidence rate of 0.23088. While, for the middle-income group the average poverty incidence largely associated with catastrophic health expenditure for the poorest income group is about 149 per cent with a proportion incidence rate of 0.21263.

For, the richer income group, the average poverty incidence largely associated with catastrophic expenditure is about 160 per cent with a proportion incidence rate of 0.18197 and 171 per cent with a proportion of 0.13030 for the richest income group. This clearly demonstrate that despite the average poverty incidence associated with catastrophic expenditure among the rich income group, the proportion incidence rate associated with catastrophic expenditure is distributed more among the poorest, poorer and middle-income groups in Nigeria.

Table 4.4: Catastrophic Healthcare Expenditure across income groups in Nigeria

Variable (health utilization)	Odds Ratio	z	P > |z|
V467c	1.050721	0.69	0.492
Health facility visited (*v394*)	1.556764	6.14	0.000
Income group(V190)poorest group as base cate.			
poorer	1.112619	0.87	0.387
middle	1.369194	2.62	0.009
richer	1.381531	2.55	0.011
richest	1.234505	1.50	0.133
V445	1.000103	1.47	0.141
Health insurance (v481)	.884549	-0.54	0.590
V741	.9495318	-0.80	0.425
V743b	1.073195	2.08	0.038
Region (v101) north central as base cate			
north east	1.424819	2.80	0.005
north west	1.265953	1.89	0.059
south east	1.374601	2.45	0.014
south south	1.782816	4.34	0.000
south west	1.927274	5.50	0.000
_cons	.0614246	-10.99	0.000
Log Likelihood = -2712.4953	LR chi2(17) = 104.37		
Prob> chi2 = 0.0000	Pseudo R2 = 0.0189		

Source: author's computation

Table 4.4 showed the result of impact of catastrophic health expenditure on health utilization in Nigeria. The result also showed that not all the observations were significant however; health facility used or visited impact on health utilization. The result showed that a unit increase in health utilization increases catastrophic health expenditure by 1.556764 9 that is 16 per cent at 5 per cent level of significant given a p-value of 0.000 that is less than 0.05. Similarly, household expenditure on food & nonfood impact on catastrophic health expenditure as the result showed that a unit increase in household expenditure on food & nonfood increases catastrophic health expenditure by 1.073195.

The result further showed that inequality which is demonstrated through the income group also impact on catastrophic health expenditure in Nigeria. For example, those in middle income group and the rich income group increases the odds ratio of household catastrophic health expenditure by 1.369194 and 1.381531at 5 per cent level of significant given a p-value of 0.009 and 0.011 respectively that is less than 0.05. However, treating north central as base category, north east, south east, south-south and south west, increases the odds ratio of household catastrophic health expenditure on health utilization with respect to north central by 1.424819 for north east, 1.374601 for south east, 1.782816 for south-south and 1.927274 for south west in Nigeria.

Results also show that catastrophic out of pocket health payments are disproportionally concentrated among the better-off households in Nigeria possibly due to poor utilization of healthcare service by poor households, free healthcare services and exemption mechanisms; and the by-pass of low quality public primary healthcare (PHC) facilities by better-off households; hence, policy-makers need to design policies that will ensure that resources for healthcare are equitably distributed and benefit both the poor and better-off households.

5. Conclusion

The study examined the disparity in Catastrophic Healthcare expenditures across Households income groups in Nigeria using the Nigeria Health and Demographic Survey 2018. The study employed the Foster-Greer-Thorbecke indices and the logit model. Findings from our study showed that some household and individual characteristics are associated with catastrophic health expenditure in Nigeria. Many households experience catastrophic health payments due to factors such as age, education of household head, health insurance status, geo- political zone, type of health facilities visited, and type of illness suffered. Governments are yet to find fair and innovative ways of financing the health system so as to reduce the financial burden of out-of-pocket payments on households and individuals in Nigeria. This implies that many households and individuals still experience inequitable access to quality health care services and face financial hardship.

This study clear demonstrates the how the poorest income class have continued to be lurched into poverty

trap as a result of their private health financing measures due to the failure of public health financing measure across income class in Nigeria. This no doubt, account for the huge spreads of patent medicine store across rural areas where large concentration of the poorest income group seeks their services. Hence, have continue to be the main market for out-of-pocket expenditures on health in Nigeria.

Therefore, there is urgent need for increased financial protection as well as insurance coverage through small credit and rural households' contribution scheme as an alternative to the National Health Insurance Scheme to enhance health financing option that could reduce the huge private health cost of out-of-pocket expenditure since it has continued to be among the major health financing option in Nigeria. In addition, Nigeria government at should as matter of urgency to use legal means to institutionalize access to healthcare as a basic human right considering the several barriers such as financial inequity responsible for health disparities to access healthcare utilization. There is need for pressure on the legislature to provide a bill that disallow health care tourism for public office holders abroad as way of checkmating the better health care system in Nigeria.

References

Abiodun, O. A., and Olu-Abiodun, O. O. (2014). The Determinants of Choice of Health Facility in Shagamu, South-West, Nigeria. *Scholars Journal of Applied Medical Sciences (SJAMS)*, 2(1), 274-282.

Abodunrin, O. L., Bamidele, J. O., Olugbenga-Bello, A. J., and Parakoyi, D. B. (2010). Preferred Choice of Health Facilities for Healthcare among Adult Residents in Ilorin Metropolis, Kwara State, Nigeria. *International Journal of Health Research,* 3(2), 79-86.

Adeoti, A. I., and Awoniyi, O.A. (2014). Demand for Health Care Services and Child Health Status in Nigeria- a control function approach. *African Research Review*, 8(1), 273.

Adegboye, O.D., Rotimi, B.F., and Akande, T.M. (2018). Catastrophic Health Expenditure as a Result of Health Shocks: Challenge to Universal Health Coverage in Nigeria. *Savannah Journal of Medical Research and Practice, 7(1).*

Akinkugbe, O., Chama-Hiliba, C., and Tlotlego, N. (2011). Health Financing and Catastrophic Payments for Health Care: Evidence from household-level survey data in Botswana and Lesotho. *African Economic Research Consortium (AERC*).

Amaghionyeodiwe, L.A. (2008). Determinants of the Choice of Health Care Provider in Nigeria. Health care manage science, 11, 215-227.

Amakom, U., and Ezenekwe, U.R. (2012). Implications of household's catastrophic out-of-pocket (OOP) healthcare spending in Nigeria. *Journal of Research in Economics and International Finance*, 1(5), 136-140.

Andersen, R. (1995). Revisiting the Behavioral Model and Access to Medical Care: Does It Matter? *Journal of health and social behavior*, 1-10.

Aregbeshola, B.S., and Khan, S.M. (2018). Determinants of Catastrophic Health Expenditure in Nigeria. *European journal of Health Economics*, 19(4), 521-532.

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 – 806.

Asfaw, A. (2003). How Poverty Affects the Health Status and the Health Care Demand of Households? The case of Rural Ethiopia. Paper presented at the staying poor: Chronic poverty and Development Policy, Institute for Development Policy and Management, University of Manchester, U.K.

Awiti, J. O. (2014). Poverty and Health care Demand in Kenya. *BMC Health Services Research*, 14(560).

Baeza, C., and Packard, T. (2006). Beyond Survival: Protecting Households from Health Shocks in Latin America.

Bourne, P. A. (2009). Impact of Poverty, not seeking Medical care, Unemployment, Inflation, Self-reported illness and Health Insurance on Mortality in Jamaica. *North American journal of medical sciences*, 1(3), 99–109.

Cavagnero, E. G., Carrin, K., Xu, A. M. and Aguilar-Rivera (2006). Health financing in Argentina: An empirical study of health care expenditure and utilization. Fundación Mexicana para la Salud, A. C. Institution Nacional de Salud publication, Mexico.

Edeme, R. K., Ifelunini, I. A., and Obinna, O. S. (2014). Relationship between Household Income and Child Mortality in Nigeria. *American Journal of Life Sciences*, 2(6-4), 1-12.

Ekman, B. (2007). The impact of health insurance on outpatient utilization and expenditure: evidence from one middle-income country using national household survey data. *Health research policy and systems* 5(6).

Gakidou, E., Lozano, R., Gonzalez-Pier, E., Abbott-Klafter, J., & Barofsky, J. T. (2006). Health system reform in Mexico - Assessing the effect of the 2001-06 Mexican health reform: an interim report card. *Lancet*; 368 (9550):1920-1935.

Gotsadze, G., Zoidze, A., & Rukhadze, N. (2009). Household Catastrophic Health Expenditure: Evidence from Georgia and its policy implications. *BMC Health Services Research*, 9(69)

Hailemichael, Y., Hanlon, C., Tirfessa, K., Docrat, S., Alem, A., Medhin, G., Lund, C., Chisholm, D., Fekadu, A., and Hailemariam, D. (2019). Catastrophic health expenditure and impoverishment in households of persons with depression: a cross-sectional, comparative study in rural Ethiopia. *BMC public health* 19(930).

Hren, R. (2012). Theoretical shortcomings of the Grossman model. *Bulletin Economics, Organization and Informatics in Healthcare*, 28(1), 63-75.

Knaul, F.M., Arreola-Ornelas, H., Méndez-Carniado, O., Bryson-Cahn, C., Barofsky, J., Maguire, R. & Sesma, S. (2006). Evidence is good for your health system: policy reform to remedy catastrophic and impoverishing health spending in Mexico. *Lancet*, 368(9549),1828–1841.

Knaul, F. M., Arreola-Ornelas, H., Mendez-Carniado, O., Bryson-Cahn, C., and Barofsky, J. (2006). Health system reform in Mexico - evidence is good for your health system. Policy reform to remedy catastrophic and impoverishing health spending in Mexico. *Lancet*, 368(9549),1828-1841.

Koch, S.F., Setshegetso, N. (2020). Catastrophic health expenditures arising from out-of-pocket payments: Evidence from South African income and expenditure surveys. *PLoS ONE* ,15(8): e0237217.

Kronenberg, C., and Barros, P. P. (2014). Catastrophic Healthcare Expenditure - Drivers and protection: The Portuguese case. Health policy (Amsterdam, Netherlands),115(1),44-51.

Limwattananon, S., Tangcharoensathien, V., and Prakongsai, P. (2007). Catastrophic and Poverty Impacts of Health Payments: Results from National Household Surveys in Thailand. *Bulletin of the World Health Organization*, 85(8):600-606.

Myint, A. N. M., Liabsuetrakul, T., Htay, T.T., Wai, M. M., Sundby, J., and Bjertness, E. (2018). Impoverishment and Catastrophic Expenditures due to Out-Of-Pocket Payments for antenatal and delivery care in Yangon Region, Myanmar: a cross-sectional study. *BMJ*, 8:e022380.

Obembe, T.A., Levin, J., Fonn, S. (2021). Prevalence and factors associated with catastrophic health expenditure among slum and non-slum dwellers undergoing emergency surgery in a metropolitan area of South Western Nigeria. *PLoS ONE*, 16(8): e0255354. https://doi.org/10.1371/journal.pone.0255354

Omotosho, O. and Ichoku, H. (2017). Financial Protection and Universal Health Coverage in Nigerian. *International affairs and Global Strategy*, 51:5-14.

Onoka, C. A., Onwujekwe, O. E., Hanson, K., Uzochukwu, B. S. (2011). Examining Catastrophic Health Expenditures at Variable Thresholds Using Household Consumption Expenditure Diaries. *Tropical Medical International Health*, 16(10),1334-41.

Onwujekwe, O., Hanson, K., and Uzochukwu, B. (2012). Examining inequities in Incidence of Catastrophic Health Expenditures on Different Healthcare Services and Health Facilities in Nigeria. *PLoS ONE,* 7(7): e40811.

Onwujekwe, O. E., Onoka, C. A., Nwakoby, I. C., Ichoku, H. E., Uzochukwu, B. C., and Wang, H. (2018). Examining the Financial Feasibility of Using a New Special Health Fund to Provide Universal Coverage for a Basic Maternal and Child Health Benefit Package in Nigeria. *Front public health,* 6:200.

Okedo-Alex, I.N., Akamike, I.C., Ezeanosike, O.B., and Uneke, C.J. (2019). A Review of the Incidence and Determinants of Catastrophic Health Expenditure in Nigeria: Implications for Universal Health Coverage. *International Journal of Health Planning and Management* ,34(7), 1-18.

Özgen Narcı, H., Şahin, İ. and Yıldırım, H. H. (2015). Financial catastrophe and poverty impacts of out-of-pocket health payments in Turkey. *European journal health economics,* 16, 255–270.

Salihi, A. H., Madeline, B., & Norlaila, A. B. (2012). On the Causal Links Between Poverty and HIV in Nigeria, 1990-2009: An Application Of Granger Causality and Co-Integration Techniques. *Malaysia Journal of Society and Space*, 8(1), 50-59.

Sato, R. (2022). Evaluation of catastrophic health expenditure risk due to measles in Nigeria. *Human vaccines & Immunotherapeutics*, 18(5).

Su, T. T., Kouyaté, B., & Flessa, S. (2006). Catastrophic household expenditure for health care in a low-income society: a study from Nouma district, Burkina Faso. Bulletin of the World Health Organization: *The International Journal of Public Health*, 84(1):21-27.

Wagstaff, A. (2008). Measuring Financial Protection in Health. World Bank, Washington, DC; Development Research Group Policy Research Working Paper No 4134.

Wagstaff, A., and van Doorslaer, E. (2002). Catastrophe and impoverishment in paying for health care: With applications to Vietnam 1993-98. *Health economics*, 12 (11),921-934.

Wagstaff, A., Flores, G., Hsu, J., Smitz, M.F., Chepynoga, K., Buisman, L.R., van Wilgenburg, K., and Eozenou, P. (2018). Progress on Catastrophic Health Spending in 133 Countries: A Retrospective Observational study. *The Lancet Global Health*, 6(2), e169-e179.

Xu, K., Evans, D. B., Carrin, G., Aguilar-Rivera, A. M., Musgrove, P., and Evans, T. (2007). Protecting Households from Catastrophic Health Spending. *Health affairs (Project Hope)*, 26(4), 972–983.

Xu, K. (2005). Distribution of Health Payments and Catastrophic Expenditures: Methodology. Discussion paper, No. 2.

Yardim, M.S., Cilingiroglu, N., Yardim, N. (2010). Catastrophic Health Expenditure and Impoverishment in Turkey. *Health Policy*, 94, 26–33.

Yawson, A., Malm, K., Adu, A., Wontumi, G., and Biritwum, R. (2012). Patterns of Health Service Utilization at a Medical School Clinic in Ghana. *Ghana Medical Journal*, 46(3), 128.