

Does National Health Insurance Programme in Nigeria Protect Against Catastrophic Health Expenditure? Evidence from Enrollees Versus Non-Enrollees.

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Abstract

One of the aims of establishing the national health insurance programme in Nigeria is to reduce health care expenditure induced poverty, a financial situation that is caused by high catastrophic health expenditure by households. Meanwhile, studies that examine the protection of enrollees on the national health insurance programme in Nigeria against catastrophic health expenditure are scarce. This study, for that purpose, examined if enrolment on the national health insurance programme provided protection against catastrophic health expenditure. Crosssectional research design was adopted in the study as primary data was collected through the instrumentality of a structured questionnaire from enrollees and non-enrollees working in the federal and state government establishments in Akwa Ibom State, Nigeria. Fisher's exact proportion test was used in analysing the data. The result indicated a significant reduction in incurring catastrophic health expenditure for enrollees on the national health insurance programme against the non-enrollees. It was concluded that enrolment on the national health insurance protects against catastrophic health expenditure. The establishment of social health insurance agencies by state governments in Nigeria to facilitate expansion of coverage to the economically vulnerable households was the key recommendation.

Keywords: Catastrophic health expenditure; Social health insurance; Financial protection; Universal health coverage; Poverty reduction.

Introduction

Medical care is a necessary emergency expenditure as illness is typically fortuitous in nature. According to biopsychosocial theory, first conceptualised by George Engel in 1977, health is as an asset and as such staying healthy is a priority for all individuals leading to individuals always working out ways to settle medical care bills (Physiopedia, 2025). However, for Some individuals, paying medical bills when the need arises can lead to unpleasant consequences, chief among them being the depletion of their finances. This depletion of personal finances exposes individuals to poverty. This concern is even more in a developing country like Nigeria where the level of poverty is high and actionable approaches are needed to eradicate poverty. Sadly, government total expenditure on health care in Nigeria is abysmally low resulting in about 80.4% of total health care expenditure funded through out-of-pocket payment(ReportLinker, 2024).

Increase in out-of-pocket expenditure on medical care is linked to increase in the rate of poverty (Sirag & Mohamed, 2021). Furthermore, the high out-of-pocket expenditure on medical care is counterproductive to poverty reduction strategies in Nigeria where 133 million people living in the country are multidimensionally poor (National Bureau of Statistics, 2022). To put it in perspective, there is imminent threat of increase in number of Nigerians that are multidimensionally poor if payment of medical care bills out-of-pocket persist. However, out-of-pocket expenditure on medical care can only lead to poverty if the spending results in what is called catastrophic health expenditure, CHE.

Catastrophic health expenditure, CHE, occurs when payment for medical care exceeds the financial capacity of an individual or a household with the potential of exposure to hardship or poverty (Eze, Lawani, Agu & Acharya, 2022).. CHE can be incurred from payment for any form of health care needs from in and out patients care to medications, consultation, laboratory test and ambulatory service. Such, medical care payment by households must exceed 40% of the total household non-food expenditure for it to be considered catastrophic (Zhao*et.al.,* 2020). Catastrophic health expenditure induced poverty is common place in developing economies as a significant proportion of those that are not poor but are living just on the poverty line or a little above the poverty line rendering them economically vulnerable.What this mean then is that catastrophic health expenditure from medical care use exposes households to slipping into poverty. In addition, CHE limits the ability of individuals or households that are poor to access and utilize basic healthcare which is detrimental to economic recovery (Yadav, Menon & John, 2021).

Regrettably, a significantly high number of households in Nigeria consistently incur CHE from medical care use (Edeh, 2022). In a bid to reduce CHE for households, the federal government of Nigeria increased budgetary allocation to health care sector by 25% in 2024 from 2023 allocation (Nigeria Health Watch, 2025). The increase in the 2024 financial allocation for health care sector is meant to fund targeted activities aimed at boosting enrolment on the National health insurance programmes operated by the National health insurance Authority, NHIA. Against this background, it is important to understand if the national health insurance

programme provides financial protection to enrollees by reducing their Exposure to CHE. Therefore, the objective of this study is to examine if enrolment on the national health insurance programme managed by National Health insurance authority, NHIA, in Nigeria guarantees financial protection by reducing CHE against non-enrolment. The findings of this study will support healthcare funding decisions through the mechanism of insurance to reduce poverty in Nigeria and other developing economies.

Review of Related Literature

Aregbeshola and Khan, (2018) utilized secondary data from the Harmonized Nigeria Living Standard Survey (HNLSS) of 2009/2010 to assess the catastrophic and impoverishing effects of payment for healthcare on households in Nigeria with simple descriptive study design of percentage as the method of data analysis. The result of the study indicated 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. The study recommended proper funding of healthcare by the government and the provision of a viable social health insurance as the way out of the negative effects that was reported.

Rickard et al., (2018) study aimed at determining in-hospital charges for patients with peritonitis and if patients are at risk of catastrophic health expenditure. As part of a larger study examining the epidemiology and outcomes of patients with peritonitis at a referral hospital in Rwanda, patients undergoing operation for peritonitis were enrolled and hospital charges were examined. The primary outcome was gathering data on the percentage of patients at risk for catastrophic health expenditure. Logistic regression was used to determine the association of various factors with risk for catastrophic health expenditure. The results indicated that over a 6-month period, 280 patients underwent operation for peritonitis and in-hospital charges were available for 245 patients while a total of 240 (98%) patients had health insurance. The Median total hospital charge was 308.1 USD, and the median amount paid by patients was 26.9 USD. Thirty-three (14%) patients were at risk of catastrophic health expenditure based on direct medical expenses. Estimating out-of-pocket non-medical expenses, 68 (28%) patients were at risk of catastrophic health expenditure. Unplanned reoperation was associated with increased risk of catastrophic health expenditure (p < 0.001), whereas patients with community-based health insurance had decreased risk of catastrophic health expenditure (p < 0.001). The study concluded that the median hospital charges paid out-of-pocket by patients with health insurance were small in relation to total charges and that a significant number of patients with peritonitis were at risk of catastrophic health expenditure.

Azzani, Roslani and Su, (2019) conducted a systematic review to identify the determinants of household catastrophic health expenditure (CHE) in low-to high-income countries around the world using both electronic and manual searches were conducted with the determinants of CHE due to healthcare payments as main outcome of interest and thirty-eight studies met the inclusion criteria and was reviewed. The review outcome revealed that household economic status, incidence of hospitalisation, presence of an elderly or disabled household member in the family, and presence of a family member with a chronic illness were the common significant factors associated with household CHE. The authors concluded that socio-economic inequality

plays an important role in the incidence of CHE all over the world, where low-income households are at high risk of financial hardship from healthcare payments. It was thus, recommended that healthcare financing policies should be revised in order to narrow the gap in socio-economic inequality and where social safety nets should be implemented and strengthened for people who have a high need for health care.

Li, Shi, Yang & Wang, (2019) analyzed the extent of Catastrophic health expenditure (CHE) among Chinese households and explore the effect of critical illness insurance (CII) and other associated factors on CHE. Data that was derived from the Sixth National Health Service Survey (NHSS, 2018) with a sample of 3660 households in urban and rural areas in Jiangsu Province, China was used for the study and Logistic regression and multiple linear regression models were used to estimate the effect of CII and related factors on CHE. The results indicated that the proportion of households with no one insured by CII was 50.08% (1833). At each given threshold, from 20% to 60%, the incidence and intensity were higher in rural households than in urban ones. CII implementation reduced the incidence of CHE but increased the intensity of CHE. Meanwhile, the number of household members insured by CII did not affect CHE incidence but significantly decreased CHE intensity. Socioeconomic factors, such as marital status, education, employment, registered type of household head, household income and size, chronic disease status, and health service utilization, significantly affected household CHE. It was concluded that policy effort should further focus on appropriate adjustments, such as dynamization of CII lists, medical cost control, increasing the CII coverage rate, and improving the reimbursement level to achieve the ultimate aim of using CII to protect Chinese households against financial risk caused by illness.

A study by Lee and Yoon, (2019) examined the determinants of catastrophic health expenditure in households with cancer patients by conducting a panel analysis of three-year data from surveys administered by Korea Health Panel for 20122014 on 1380 households with cancer patients. A correspondence and conditional transition probability analyses to examine households that incurred catastrophic health expenditure, followed by a panel logit analysis were adopted for data analysis. The analyses revealed three notable results. First, the occurrence of catastrophic health expenditure differed by age group, that is, the probability was higher in households with National Health Insurance than those receiving medical care benefits. Thirdly, households without private health insurance reported a higher occurrence rate. The findings suggested that elderly people with cancer had greater medical coverage and healthcare needs and that private health insurance contributes toward protecting households from catastrophic health expenditure. Future study on catastrophic health expenditure with focus on varying age groups, healthcare coverage type, and private health insurance was recommended.

Liu, Coyte, Fu & Zhang, (2019) investigated the catastrophic health expenditure and equity in the incidence of catastrophic health expenditure by addressing its potential determinants in both integrated and non-integrated areas in China in 2013 using primary data drawn from the fifth China National Health Services Survey in 2013 with the final sample comprising 19,788 households (38.4%) from integrated areas and 31,797 households (61.6%) from non-integrated areas. A probit model was employed to decompose inequality in the incidence of catastrophic health expenditure in line with the methodology used for decomposing the concentration index. The results indicated that the incidence of catastrophic health expenditure in integrated areas was higher than in non-integrated areas (13.87% vs. 13.68%, respectively). The concentration index in integrated areas and non-integrated areas was -?0.071 and?-?0.073, respectively. Average household out-of-pocket health expenditure and average capacity to pay in integrated areas were higher than those in non-integrated areas. However, households in integrated areas had lower share of out-of-pocket expenditures in the capacity to pay than households in non-integrated areas. The majority of the observed inequalities in catastrophic health expenditure were explained by differences in the health insurance and householders' educational attainment both in integrated areas and non-integrated areas. The study concluded that the medical insurance integration system in China is still at the exploratory stage; hence, its effects are of limited significance, even though the positive impact of this system on low-income residents is confirmed. Moreover, catastrophic health expenditure was associated with pro-poor inequality. Medical insurance, urban-rural disparities, the elderly population, and use of health services significantly affect the equity of catastrophic health expenditure incidence and should be key areas in the implementation of future insurance integration policies.

Methods

The study adopted a cross-sectional study design as data was gathered from a cross-section of the population of study. The population of the study was state and federal government workers in Akwa-Ibom State, Nigeria. The federal government workers are compulsorily enrolled on the formal sector social health insurance programme, FSSHIP and constitute the sample of enrollees in the study. State government workers who are not enrolled on any form of health insurance were sampled to make up the non-enrollees in the study. A total of 1000 workers were sampled for the study constituting 500 enrollees and 500 non-enrollees on the FISSHIP for the study. The choice of the state and federal workers was to ensure similarity of social, demographic and economic characteristics of the participants to support the method of data analysis adopted in the study. Purposive sampling technique was used to select participants in the study as the relevant government establishments turned down the request to furnish the researchers with the total number of state and federal workers in the Akwa Ibom state. Data was collected through the instrumentality of a structured questionnaire administered on the participants on a face to face basis at their place of work.

The Respondents were profiled using simple descriptive statistics to provide an understanding of the characteristics of participants. Furthermore, proportion test was used in data analysis. Proportion test was used because the two independents variables which are enrolment status and catastrophic health expenditure status are binary in nature and typically will not be normally distributed. The binary variables produced four contingent outcomes as follows;

- EIC = Enrolled but incurred CHE
- NEIC = Not enrolled but incurred CHE
- ENIC = Enrolled but did not incur CHE
- NENIC= Not enrolled but did not incurred CHE

The odd of enrolment amongst those that incurred CHE with regards to enrolment status will be:

EIC		(1)	
NEIC			
While th	ne odd among	g those that did not ir	ncur CHE will be:
ENIC		(2)	
NENIC	-		
Theodd	l ratio of the p	roportion test is estin	mated as,
EIC	X ENIC		
NEIC	NENIC	(3)	

The estimate obtained from (3) must be less than 1 to assert that enrolment reduced CHE. To confirm if the effect was statistically significant, 5% level of significance was applied in the analysis. In this study, a household was considered to have incurred CHE if the total expenditure on health care exceeded 40% of the household non-food expenditure. Stata statistical software was used in the analysis.

Results

Profiling of the respondents

All 1000 questionnaires administered were returned but 970 were useful representing 100% return rate and 97% useable rate. Table 1 presents the characteristics of the respondents by enrolment status. Enrollees and non-enrollees households had almost 5 members per household with 43.94 years and 42.77 years as the average ages of the heads of household respectively indicating that enrolment was not household size and age of household head responsive. Male heads of household constituted 57.78% of the respondents that had enrolled on the social health insurance while 52.22% of the male respondents did not enroll. Furthermore, 42.22% of the respondents were female heads of enrolled households and 47.78% of the respondents were female heads of households that did not enroll on the social health insurance programme. The gender distribution indicated that male household being headed by male seems to increase enrolment rate. Among the enrollees 10.74% and 89.26% reside in the rural and urban areas while 54.44% and 45.56% of the non-enrollees reside in the rural and urban areas respectively indicating that urban residence supports enrolment. Workers in the health care sector constituted 51.11% of the enrollees and workers in the academic sector constituted 48.89% whereas 47.04% of health workers were not enrolled and 52.96% of academics were equally not enrolled indicating that households whose heads were healthcare workers enrolled more.

Characteristics	Enrolment	Enrolment Status (Mean or %)	
	Enrollee	Non-enrollee	
Household Size	4.91	4.76	
Age (years)	43.94	42.77	
Gender			
Male	57.78%	52.22%	
Female	42.22%	47.78%	
Location of residenc	e		
Rural	10.74%	54.44%	
Urban	89.26%	45.56%	
Employment sector			
Health	51.11%	47.04%	
Academics	48.89%	52.96%	

Table 1 - Characteristics of respondents by enrolment Status

₩=970

Source: Researcher's computation using data from field survey and Stata 13 software.

Result of analysis and discussion of findings

Table 2 is the contingency table for exposure to CHE against enrolment status. 4.07% of households that enrolled incurred CHE while 95.93% of the households that enrolled did not incur CHE indicating that a higher percentage of the households that enrolled on the social health insurance where less exposed to CHE. However, 81.11% of households that did not enroll on the social health insurance incurred CHE while 18.89% of the non-enrolled households did not incur CHE suggesting that non-enrolment exposed more households to CHE.

Table 2 - Contingency table for exposure to CHE against enrolment status

	Enrolled	Not Enrolled
Incur CHE	4.07%	81.11%
Not-incur CHE	95.93%	18.89

Source: Researcher's computation using data from field survey and Stata 13 software

From the contingency table, the odd ratio of financial protection from CHE for households in the study was estimated using Fisher's exact proportion test and the estimate is presented in table 3. The odd ratio obtained is 0.10 with a p-value of 0.00 indicating that the effect was statistically significant at 5% level of significance. Recall that the odd ratio must be less than 1 to

assert that enrolment reduced CHE. Thus, the odd ratio of 0.10 is less than 1 which suggest that enrolment on the social health insurance programme reduced CHE for the enrollees. Furthermore, the result indicates a significant reduction in the exposure to CHE for households that enrolled on the national social health insurance programme against those that did not enroll. The result implies that enrolment on the national health insurance programme provided protection against CHE. In line with the finding of this study, a similar financial protection effect of a reduction in the CHE intensity by enrolment on social health insurance was reported by Li, et al., (2019) in China. Also, a study by (Jung & Lee, 2021) corroborates the finding of this study by establishing that the national health insurance programme in Japan reduced the burden of CHE by lowering high cost on medical care. Another study by (ref) aligns with the finding of this study as it reported that the national health insurance coverage protected households in Korea from CHE.

Table 3 - Estimate of Fisher's exact proportion test

Odd ratio	P-value	Confidence interval
0.10	0.00	0.0622 0.1155

Source: Researcher's computation using data from field survey and Stata 13 software

Conclusion

The national health insurance programme, managed by the national health insurance authority in Nigeria, is a public health insurance designed to provide protection against CHE which is one of the key exposures to poverty. This study thus examined if enrollees on the national health insurance programme in Nigeria were protected against CHE. Fisher's exact proportion test was used to analyse primary data of enrollees and non-enrollees on the national health insurance programme. Result indicates that enrolment on the national health insurance programme reduced CHE significantly. It was therefore concluded that enrolment on the national health insurance programme provided protection against CHE. The following are the recommendations:

- i) The national health insurance authority in Nigeria should strategize to increase coverage to expand the financial protection benefits that the programme offers.
- ii) Stata governments in Nigeria should establish the state social health insurance agencies that will collaborate with the national health insurance authority to expand coverage to the economically vulnerable for the much-needed protection.

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Works Cited

- Aregbeshola, B. S., & Khan, S. M. (2018). Out-of-pocket payments, catastrophic health expenditure and poverty among households in Nigeria. *International journal of health policy and management*, 7(9), 798.
- Azzani, M., Roslani, A. C., &Su, T. T. (2019). Determinants of household catastrophic health expenditure: a systematic review. *The Malaysian journal of medical sciences: MJMS*, 26(1), 15.
- Edeh, H. C. (2022). Exploring dynamics in catastrophic health care expenditure in Nigeria. *Health Economics Review*, *12*(1), *22*.
- Eze, P., Lawani, L. O., Agu, U. J., & Acharya, Y. (2022). Catastrophic health expenditure in sub-Saharan Africa: systematic review and meta-analysis. *Bulletin of the World Health Organization*, 100(5), 337.
- Jung, H. W., Kwon, Y. D., & Noh, J. W. (2022). How public and private health insurance coverage mitigates catastrophic health expenditures in Republic of Korea. BMC Health Services Research, 22(1), 1042.
- Jung, H., & Lee, J. (2021). Estimating the effectiveness of national health insurance in covering catastrophic health expenditure: Evidence from South Korea. *PloS one*, *16*(8), e0255677.
- Lee, M., & Yoon, K. (2019). Catastrophic health expenditures and its inequality in households with cancer patients: a panel study. *Processes*, 7(1), 39.
- Li, A., Shi, Y., Yang, X., & Wang, Z. (2019). Effect of critical illness insurance on household catastrophic health expenditure: the latest evidence from the National Health Service Survey in China. *International journal of environmental research and public health*, 16(24), 5086.
- Liu, S., Coyte, P. C., Fu, M., & Zhang, Q. (2021). Measurement and determinants of catastrophic health expenditure among elderly households in China using longitudinal data from the CHARLS. *International Journal for Equity in Health*, 20(1), 1-9.
- National Bureau of Statistics (2022) *About: National Bureau of Statistics, About* | *National Bureau of Statistics.* Available at: https://www.nigerianstat.gov.ng/news/78 (Accessed: 07 April 2025).
- Nigeria Health Watch (2025) *Nigeria's health sector in 2024: Policies, investments, partnerships, and milestones, Medium*. Available at: https://nigeriahealthwatch.medium.com/nigerias-health-sector-in-2024-policies-investments-partnerships-and-milestones- (Accessed: 07 April 2025).
- Physiopedia (2005) Biopsychosocial Model, Physiopedia. Available at: https://www.physiopedia.com/Biopsychosocial_Model (Accessed: 07 April 2025).
- ReportLinker (2024b) Forecast: Out-of-pocket health expenditure in Nigeria 2024 2028, ReportLinker. Available at: https://www.reportlinker.com/dataset/9af8270512141a0e1918d4dbc70a89b32e94032f#: ~:text=In%202023%2C%20out%2Dof%2D,year%20to%2081.92%25%20by%202027. (Accessed: 30 March 2025).
- Rickard, J. L., Ngarambe, C., Ndayizeye, L., Smart, B., Majyambere, J. P., & Riviello, R. (2018). Risk of catastrophic health expenditure in Rwandan surgical patients with peritonitis. *World journal of surgery*, 42, pp: 1603-1609.
- Sirag, A., & Mohamed Nor, N. (2021, May). Out-of-pocket health expenditure and poverty: evidence from a dynamic panel threshold analysis. In *Healthcare* (Vol. 9, No. 5, p. 536 560). MDPI.
- Yadav, J., Menon, G. R., & John, D. (2021). Disease-specific out-of-pocket payments, catastrophic health expenditure and impoverishment effects in India: an analysis of National Health Survey data. Applied Health Economics and Health Policy, 19, 769-782.
- Zhao, Y., Oldenburg, B., Mahal, A., Lin, Y., Tang, S., & Liu, X. (2020). Trends and socio-economic disparities in catastrophic health expenditure and health impoverishment in China: 2010 to 2016. Tropical *Medicine & International Health*, 25(2), pp: 236-247.