

Dynamic Effects of Healthcare Financing on Poverty Reduction in Nigeria

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Abstract

This research examined how healthcare financing has influenced poverty alleviation in Nigeria between 1986 and 2023. The analysis draws on data obtained from the World Development Index (2024) and applies a range of econometric methods, including the Augmented Dickey–Fuller (ADF) unit root test, the Autoregressive Distributed Lag (ARDL) bounds testing approach, and an error correction model (ECM). In addition, descriptive statistical procedures such as unit root and bounds co-integration tests

are utilised to evaluate the behaviour and distributional patterns of the variables. The study investigates both short-term and long-term relationships between major healthcare financing mechanisms namely social health insurance (SHI), donor health financing (DHF), and public health financing (PHF) and poverty levels. Empirical results indicate that SHI and PHF do not produce immediate effects; however, their lagged short-run impacts are statistically significant, suggesting delayed yet substantial contributions to poverty reduction. In contrast, DHF demonstrates a significant short-run poverty-reducing effect, though this impact does not persist over time. Overall, the findings highlight that enduring poverty reduction depends on strengthening public healthcare systems alongside expanding the reach of social health insurance. The study therefore recommends policies aimed at widening SHI coverage, improving the efficiency of public health expenditure, diversifying healthcare funding sources, and fostering sustained economic growth.

Keywords: Healthcare Financing, Poverty, Public Health Expenditure, Social Health Insurance

JEL Classification Codes: I13, I18, H51, I32, F35

1. Introduction

The health spending in Nigeria has been characterized as substandard over the last 20 years, where average health spending has been under 3% of GDP in the 2000-2019 period and per-capita government spending on health amounted to US 11.2. (Bosede et al., 2023). A large share of the healthcare expenses is paid at the individual level, creating high out-of-pocket expenses that often put the families below the poverty threshold (National Health Accounts, 2019). In Nigeria, almost 90 % of healthcare spending was done out-of-pocket (Idowu et al 2018). By contrast, social health insurance systems have been found to play a significant role in health financing in most countries offering financial security when it comes to covering the cost of illness and decreasing dependence on out-of-pocket flow.

In Nigeria, 4.2 % of the population had social health insurance coverage in 2016, which is mainly federal government civil servants and federal government dependents. This is mostly left out of the informal sector, where most of the Nigerians; the poorest and the most sick are, thus making them to do without care or incur out-of-pocket expenses to treat the illness, which negates the whole idea of risk pooling and financial protection. Donor funding will provide a much-needed cushion, and it complements the healthcare budget in Nigeria particularly in dealing with certain health issues, enhancement of infrastructure, fight against disease, and contributing to the public health projects; it covers 9.2 % of total health funding (Matthew et al., 2018). The amount of national budget allocated to healthcare has been continuously considered as hideously inadequate to serve the increasing population in the country. The state financing of health care in Nigeria is still very low relative to World Health Organisation (WHO) recommendations, as Gross Domestic Product (GDP) share in the field of public health is 7.23 % in 2014 and 4.38 % in 2020 (Yusuf et al., 2020), while the required share is 15 %. Nigerians have to endure financial strain as a result of huge medical bills especially to the poor and vulnerable sections (Henry, 2022).

The challenges that are presently faced by the healthcare financing in Nigeria are a very critical problem, which has far reached consequences to alleviate poverty. Poor investment, mixed access and out-of-pocket expenditure remain a challenge to the country in its struggle to reduce poverty by way of better health results. The decreased access to health generates a significant gap in treatment and forces individuals to pay out of pocket, which only leads to

impoverishment (Jibril et al., 2019). Ill-health and low life expectancy explain why half of economic growth differentials between developed and developing economies have taken place and hence explains why the high share of GDP used by the advanced economies in health (Matthew et al., 2018).

Poverty is a universal phenomenon which is varied in nature in different continents, countries and people. Osinowo et al. (2019) argue that in a time of plenty, the challenge that the world faces is poverty, and the major developmental goal is the achievement of equal distribution of income and poverty alleviation. Hunger, disease, desperation, and degradation are dehumanising and unsanitary conditions experienced by millions of people all over the world (United Nations Development Programme [UNDP], 2023). Poverty is measured by identifying a minimum threshold of resources called the poverty line and counting the proportion of the population whose income or consumption falls below that line. Poverty is measured through absolute, relative, and multidimensional approaches. The key methods include, the world bank's absolute poverty line (basic needs/calories), relative income thresholds (percentage of median income), and multidimensional indices (deprivation in education, health, and living standards) (Lumen Learning, n.d.).

According to the report by World Bank (2020), 689 million people, about 8.9 per cent of the global population, live under the poverty line of under US 1.90 in purchasing-power-parity (PPP) daily. There are over 60 percent of the world population living below the international poverty line (IPL) in Sub-Saharan Africa, and the poverty rate in the region is highest at 40 percent. There is no country in the world that is totally poverty-free; the only difference is on the level and degree of poverty.

In Nigeria, almost half of the population lives below the International Poverty Line (IPL) of US 0.90 per day, and unemployment rates are at 23.1 per cent (World Bank, 2020). According to the report of Busayo et al. (2021), even with the nominal growth in GDP per capita in US \$ terms, about 71 per cent of the Nigerians make less than US 1.90 a day and about 92 per cent make less than US 2 a day. The World Bank and the (UNDP, 2020) hypothesized that, the average growth rate of Nigeria between 1990 and 2007 was 0.91% and the average growth registered is 1.31 % between 2000 and 2007 in the country, compared with 1.37 % in 2000

to 2007 in the case of the peer developing economies, namely Benin, Burkina Faso and Ethiopia.

In addition, Nigeria is the 15th largest producer on earth, and 1st in Africa, extracting about 1.9 million barrels per day, consuming 480,000 barrels per day, and positioning at the 37th place globally in terms of oil consumption. There are also 37,070,000,000 barrels of total oil reserves, and the exports are 1,654,739 barrels per day (Independent Statistics and Analysis, 2016). Emily et al. (2019) prove that ill health increases the risk of living in poverty with reduced working abilities, and high costs of medical treatment. People who have chronic disease tend to retire out of labour force leading to a decrease in income.

Chu and Jay (2019) determine that illness is the number one cause of poverty in China, among other causes of poverty, thus, a major part of the Chinese 2016 poverty alleviation strategy was to reinforce financial risk insurance against illness among the economically disadvantaged populations. This programme cut down out-of-pocket (OOP) levels by an average of 15 per cent and decreased the likelihood of catastrophic health spending by 7.7 per cent and impoverishing health spending by 11.7 per cent. Globally, health is affecting the participation in labour, and the pursuit of universal health coverage (UHC) is an objective of many countries in the action of Sustainable Development Goal 3.8. According to Peter et al. (2021), UHC guarantees the accessibility of high-quality healthcare without any financial struggle. However, some 800 million individuals around the globe spend at least 10 percent of their domestic incomes on healthcare, and more than 100 million become languishing in abject poverty each year because of disastrous out-of-pocket expenses; out-of-pocket spending consumes over 71 per cent of the global health expenditures and subject's vulnerable households to significant financial risks (Wagstaff et al., 2018).

In order to avert these risks, advanced economies like Germany, France and Japan use social health insurance system. Vietnam provides a free health insurance, but the poor are required to pay co-payment of 5 percent of the healthcare expenses; China offers voluntary coverage with government subsidisation (more than 80 percent of the premium) and patients are required to pay 25-50 percent co-payment. On the other hand, Indonesia and Thailand provide public insurance to the poor with no co-payment (Chu & Jay, 2019).

Donor funds to development programmes in different parts of the world are administered by different international organisations such as the United Nations and the World Bank, International Monetary Fund, regional development banks and other specialised agencies. There is the Bill and Melinda Gates foundation, United States Agency for International Development (USAID) and Red Cross which are examples of notable donors. International organisations like the Global Fund to Fight AIDS, Tuberculosis and Malaria, Gavi, the vaccine Alliance, provide financial coverage of specific health projects in poor-income environments. Therefore, the spending on public health care is central in terms of access to basic services and high-income nations tend to spend more of the gross domestic product or national budgets on health as compared to low-income nations.

2. Literature Review

2.1 Theoretical Review

2.1.1 Vicious Circle of Poverty

Nurkse (1962) One of the most probable explanations as to why poor, underdeveloped countries have never attained a sustained economic growth is that it is because they are caught up in a vicious cycle of poverty. Nurkse came up with three different mechanisms of poverty. To begin with, it is at a macro level, which contributes to poverty because of unequal distribution of resources that lead to unequal income distribution, and even worse, the poor have resources in the wrong quantity and in low quality. Second, the difference in the quality of human capital, which is manifested in the lack of education and health, is converted into less productivity, and, accordingly, less wages. Third, variations in access to opportunities and equal treatment also exacerbate poverty.

The argument on a vicious cycle says that the situation in low-income developing countries makes economic development impossible due to the structural conditions existing there. Poverty is thus assumed to continue in the same way and its different parts tend to solidify one another in a cyclic manner. Nurkse argues that capital accumulation may provide a way out of the vicious circle of pernicious poverty; low productivity should provide low real incomes, which limit savings and, hence, capital formation, which in turn inhibits low investment and low productivity becomes even more stagnant.

In order to present a more detailed example of the vicious circle, it is possible to use the metaphor of a poor person. A poor

person, with very low revenues, has under nutrition and food insecurity. This kind of undernourishment makes the person weak and he becomes vulnerable to illness and disease. As a result, the earning power of the person is reduced and this limits his income even more. Therefore, there is development of a negative feedback loop: ill health is a result of poverty and vice versa. The import lies in that; in less developed economies the constraint of subsistence leads to no savings. Poor savings do not translate to high investment but to poor productivities hence continuing with poverty.

Other concomitant factors arise, which support the cycle; such as, poor income is usually accompanied by poor educational levels and poor health. Nurkse goes on to argue that the vicious cycle is a circulating constellation of forces, which interrelates in a way that perpetuates a country into being poor. Since the income is low, a poor country incurs little savings thus having low amount of capital to use in developmental projects. Low capital leads to the use of labour-intensive production that is less productive. In this way, the nation suffers in terms of low productivity. Therefore, it is seen that low income is the direct consequence of low productivity (Siti et al., 2013).

2.1.2 Grossman Health Capital Model

According to Hashim et al. (2016), health capital is basically worried with the distribution of individual resources and its use in the production of health. This theoretical explanation adheres to the unconstrained utility-maximisation approach whereby a person attempts to maximise utility under a given fixed set of resources. According to Grossman (1972), since the consumer is trying to maximise health, he does this by investing in himself to generate a level of health status which he desires. The theory, therefore, mainly explains the connexion between financing of health and other inputs, including health outcomes. It thus introduces the person as having a derived demand of health input, not necessarily of consumption at all but of production of a normal health outcome. In this regard, the individual achieves the goal by ensuring the provision of health inputs such as government or individual funding of healthcare, food, physical activity, climate, income, and time so that he can participate in a production process that creates a typical health output. The model by Grossman (1972) additionally brings a new theoretical construct in establishing the health status of a population.

Grossman grounds his strategy on the household-production-function model originated by Gary S. Backer, and on his human capital theory of investment. What consumers are seeking is health which can be measured in terms of the illness-free days of a year or life span and then create it through the efforts of the medical-care services and diet plus other market goods and services and time. Grossman also considers health and knowledge as joint constituents of the stock of human capital as permanent. On this basis, consumers have a motivation to make an investment in health in order to boost the future income. In this view, Grossman considers complementarities in health capital with other sources of human capital especially the knowledge capital that is gained by schooling and its effect on the efficiency of production.

He makes the conclusion that the rate of investment in health through education can be higher as compared to the rate of investment in health through higher medical care. The increase in income does not always result in the improvement of the health outcome because wealth can potentially lead to the consumption of goods and services that have negative health consequences. However, this theory assumes that people value the value of health but do not make it the most important issue in their existence otherwise complete overeating, smoking, accelerating cars, or other risky activities will not exist. Lastly, people have low incomes with which to finance health and other activities.

2.2.3 Human Capital Theory

The human capital theory is a paradigm of the approach to comprehending earnings, and it is considered as a key determinant of poverty. human capital refers to investment that one makes in themselves and that it has a positive impact on economic productivity. The notion also includes knowledge and skills gained and also goes to the physical strength and vitality of an individual, which is dependent on the health and nutritional condition. As such, the theoretical construct matching the educational goals and the developmental efforts is labelled human capital theory (Gary, 1964). What makes the theory interesting is the fact that the returns on investment in the human capital are in the form of individual economic success and success.

2.2 Empirical Review

Onuche et al. (2025) investigated the impact and sustainability of donor-funded projects on livelihoods, social services, and economic empowerment in Kogi State in Nigeria, between 2014 and 2024. A mixed-method approach, primary data were collected through structured questionnaires administered to 372 respondents, while secondary data were sourced from project reports and government publications. Data analysis was conducted using descriptive statistics and Chi-square tests to determine the significance of relationships between donor interventions and key development outcomes. The results revealed that donor-funded projects have made a statistically significant contribution to poverty reduction ($\chi^2 = 124.586$, $p = 0.000$), improved healthcare delivery ($\chi^2 = 35.258$, $p = 0.000$), and demonstrated a degree of sustainability even after donor withdrawal ($\chi^2 = 46.898$, $p = 0.000$). Respondents largely agreed that donor interventions enhanced income generation, job creation, and access to essential services, particularly benefiting vulnerable groups such as women and youth. However, sustainability challenges were identified, including inadequate local funding, weak maintenance culture, and limited post-project monitoring, which threaten long-term project continuity. Critically, as a departure from this previous study, the current study intends to fill this gap geographically by considering the case of Nigeria.

Eze and Ifeoma (2024) investigate whether expanding health insurance in rural Nigeria result in improved health outcomes and poverty reduction. The recent surge in enrolment in Nigeria's National Health Insurance Scheme (NHIS) of 11% in Q4 of 2023 discovered that despite the theoretical advantages of health insurance in enhancing access to care and alleviating financial burdens, its impact in rural areas is severely constrained by a lack of healthcare professionals and facilities. These systemic deficits limit access to quality care, undermining the potential benefits of expanded insurance coverage. they argue that while expanding health insurance is essential, it is insufficient to generate substantial improvements in health outcomes or meaningful poverty reduction without concurrent investments in healthcare infrastructure and workforce development. Furthermore, they augured that proposing a phased strategy that prioritizes strengthening healthcare facilities and increasing the availability of healthcare professionals in rural areas, followed by broader insurance coverage expansion. This approach ensures that the

gains from health insurance translate into real improvements in healthcare access, outcomes, and long-term poverty reduction, thereby enhancing services for underserved populations. Critically, as a departure from this previous study, the current study intends to fill this gap using the 1986 to 2023.

Aleksandra and Ewa (2023) report on a causal impact of catastrophic health spending on poverty in Poland that includes data on 2010-2013 and 2016-2018 and estimate a recursive bivariate probit model based on the Polish Household Budget Survey data. The model considers an extensive range of covariates and considers endogeneity between poverty and catastrophic health expenditure with statistically significant and positive causal relationship found in a variety of methodological strategies. There is no empirical data that indicates that catastrophic health expenditure once leads to a poverty trap. Further, when a poverty measure that assumes out-of-pocket medical payment and luxury consumption to be perfect substitutes, poverty among the elderly can be underestimated. To sum up, out-of-pocket medical payments must have higher priority in the eyes of policymakers than those suggested by the official statistics. One of the modern issues is the possibility to define and adequately assist the people who have been the most vulnerable victims of disastrous spending on health. It is justified that the modernization of the Polish public health system should be conducted in a comprehensive manner in the future. Most importantly, unlike the previous study, the study under consideration explores the catastrophic impact of health spending on poverty in Poland, but it does so on a geographically contingent basis, that is, using the case of Nigeria.

Ataayo et al. (2022) investigated Healthcare Financing as a strategy for poverty reduction in Nigeria from 1981-2021. Analytical survey design method was used to examine the impact of health care financing on poverty. The study highlights some health care indices and their poor consumption pattern by Nigerians which leads to low life expectancy, low infant survival rate, high maternal mortality and the prevalence of HIV/AIDS. The ratio of doctors/nurses per unit of a population is still very high, per capita health expenditure by government is low as compared to developed nations like USA and France. There is high “out of pocket” medical expenses and some Nigerians cannot afford the hospitals and health center bills. Increased healthcare financing by government is the feasible strategy for poverty reduction in that, poverty and ill health reinforce one another.

However, the study is not rich in variables as other key variable of concerned such as social health insurance and donor healthcare financing are not considered.

Ayal et al. (2022) evaluate the role and issues of health financing in Ethiopia towards universal health cover. The literature was found by searching PubMed, Scopus, and Web of Science using more general three terminologies: health-care financing, universal health coverage (UHC), and Ethiopia. Results were summarised under a framework that involved revenue creation, risk pooling, and strategic buying. Other accomplishments were in creating supplementary income to health facilities, facilitating cost -sharing and risk-sharing of unexpected illness, creating special assistance schemes to the indigent, and acquiring health-care services. Financing of health-care projects in Ethiopia had positive effects on infrastructure, supplies, diagnostics, pharmaceuticals, financial-risk insurance, and service delivery. However, the lack of fair quality care was linked with low funding and high out-of-pocket expenses. The research suggests that the benefits package should be standardized, be fair, and have an accreditation system to reduce discrepancies in services. The suggestion that the best way to promote equitable-access is to have a unified health-insurance system with the same benefits within the country replicates the findings in other countries. This research was carried out on Ethiopia; the current research proposal aims at filling the geographical gap by studying Nigeria.

The article by Kamal et al. (2021) examines how COVID-19 and its subsequent wave of poverty have affected Nigeria by a qualitative and descriptive review of the available sources and key-informant interviews with 116 participants, who were conveniently sampled. The paper measured the level of poverty among vulnerable Nigerians pre- and during the COVID 19 outbreak and identified social factors like poor leadership, corruption and illiteracy as contributory. The results revealed that recent and past governmental social-intervention programmes, targeting at alleviating poverty, performed mostly poorly due to inconsistency of the policies, ineffective implementation, ambiguous guidelines, absence of transparency as well as corruptness. The COVID-19 crisis further worsened the financial situation and further increased already existing poverty, implying that governments must focus on the pro-poor health-financing programmes supported by transparency, accountability and the real desire to alleviate poverty. The previous

research has only focused on the COVID 19 and poverty relationship; this research will focus on the effect and consequent implications on poverty in Nigeria.

The study Patricia et al. (2021) measured the out-of-pocket payments made by insured clients to healthcare under the Ghanaian National Health Insurance Scheme, and utilised a descriptive survey performed in April-June 2018. Out of two thousand and sixty-six respondents at health-facility in Ashanti, Northern and Central regions, 49.7% said they paid out-of-pocket expenses when receiving outpatient care; 46.9% among the insured clients did so also, and 42% of the poor quintile also paid out-of-pocket. Insured customers paid consultations (75%), medications (63.2%), and 34.9 percent bought medications outside the facility that they have visited. These payments were caused by the unavailability of drugs (67.9) and the drugs that are not included in the NHIS (20.8) as well. The research finds that insured Ghanaian clients pay out-of-pocket when consulting and getting drugs in accredited facilities, which is an indicator that UHC and Sustainable Development Goals would be hindered. Critically, as a departure from this previous study, the current study intends to fill this gap geographically by considering the case of Nigeria.

Gwom et al. (2021) investigated how out-of-pocket health spending affects the household standard of living of the Plateau State through a descriptive study design. A sample size of 407,900 gave 400 respondents who were chosen using simple random and stratified sample. Results determined the availability of healthcare centres, household income, place of residence, access to health-insurance, health status, and family sizes as determinants. Out-of-pocket spending reduced the disposable income, increased susceptibility to poverty, decreased real income, and limited consumption. Leaving this previous study, the proposed one seeks to verify whether the same is true in Nigeria.

Aryeetey et al. (2016) reviewed whether out-of-pocket and catastrophic spending and poverty reduction are insured by health insurance; and analysed the data of Ghana National Health Insurance Scheme (2009-2011) using probit models with instrumental variables. The results revealed that 718 percent of insured households spent catastrophically because of out-of-pocket payments, as compared to 2936 percent of uninsured. Moreover, out-of-pocket payments reduced both the insured and uninsured households to poverty by 35%. Regressions indicated that enrolment decreased out-of-pocket

payments by 86 percent and prevented households against catastrophic spending and poverty by 3.0 percent and 7.5 percent, respectively. These findings confirm the pro-poverty agendas of Ghana and the general applicability of insurances in low- and middle-income nations. This Ghanaian analysis will be stretched to Nigeria.

3. Methodology

3.1 Nature and Sources of Data

This empirical research used the secondary data that approximated the given econometric models. The data set which included the years 1986 to 2023 that is, a total of thirty-seven (37) years was used to determine the influence of healthcare financing on the poverty rate in Nigeria. Regarding the above-stated premise, the dependent variable of the given question is the poverty rate (PR), which in turn is provided by the World Bank (2022) Development Indicators.

The first independent variable is healthcare financing (HF). Just like the available literature and theoretical insights, the principal independent variable (HF) is considered weak and inefficient to capture the determinants of poverty in a reasonable manner. Based on this, additional variables to be estimated included real gross domestic product per capita (RGDP_{PC}) as a proxy of income and literacy rate (LR) as a proxy of education as control variables and public health financing (PHF) which data is provided by the Central Bank of Nigeria Statistical Bulletin (2024), donor health financing (DHF) whose data was sourced by some donations from World bank, World Health Organization (WHO), UNICEF and UNDP (2025) and social health insurance (SHI) as target variables obtained with the help of the World Development Indicators (2024). The econometric calculations were estimated with the help of the econometric software package EViews 10, and the outcome of the estimation equation which should confirm the impact of healthcare financing on the rate of poverty

3.2 Model Specification

The current study made use of an Autoregressive Distributed Lag (ARDL) model. This method is a least-squares regression approach that uses lags of both exogenous and endogenous variables. The ARDL equation is traditionally represented as $(x_1, y_1, y_2, y_3, \text{etc.}, y_k)$, with x_1 indicating the number of lags of the endogenous variable, y_1 indicating the number of lags of the first exogenous variable, and

y k indicating the number of lags of the k th exogenous variable. The ARDL specification that is used in this study was informed by the practical use of Grossman (1972) definition of health-production model that has been applied in the theoretical framework. According to this model, the health status of an individual depends on the number of inputs a person puts in health that is represented in the equation:

$$Y = f(W) \text{-----(1)}$$

Where Y is the health outcome and W is a set of health inputs. In the current study, the functional form has been extended to include more variables to support the determinants of the poverty rates to achieve the ultimate goals of the study.

$$PR = f(RGDP_{pc}, LR, SHI, DHF, PHF) \text{-----(2)}$$

$$POV_t = \alpha_0 + \sum_{i=1}^p \theta_i \Delta RGDP_{pc\ t-i} + \beta_1 LR_t + \beta_2 SHI_{2t} + \beta_3 DHF_t + \beta_4 PHF_t + \mu_t \text{---(3)}$$

Where;

$\beta_0 - \beta_6$ are the coefficients while μ_t is the error term

Where: Poverty rate (PR), being the dependent variable while income proxied by real gross domestic product per capital (RGDP_{PC}), education proxied by literacy rate (LR), social health insurance (SHI), donor health financing (DHF) and public health financing (PHF) were the independent variables.

The ARDL model is used to examine the effect of healthcare financing on poverty rate in Nigeria. The ARDL model based on the functional form presented above in equation "2" is represented as shown in equation (4).

$$\begin{aligned} \Delta PR_t = & \alpha_0 + \sum_{i=1}^x \gamma_i \Delta RGDP_{PC\ t-1} + \sum_{k=0}^x \delta_k \Delta LR_{t-k} \\ & + \sum_{l=0}^x \omega_l \Delta SHI_{t-l} + \sum_{m=0}^x \theta_m \Delta DHF_{t-m} \\ & + \sum_{n=0}^x \vartheta_n \Delta PHF_{t-n} + \beta_1 PR_{t-1} + \beta_2 RGDP_{PC\ t-1} \\ & + \beta_3 LR_{t-1} + \beta_4 SHI_{t-1} + \beta_5 DHF_{t-1} + \beta_6 PHF_{t-1} \\ & + \mu_t \text{-----(4)} \end{aligned}$$

Where α_0 and μ_t are the autonomous component and white noise respectively. The expression with the signs of summation in the equation is error correction. The parameter coefficient denotes the short run effects while Beta (β) is the corresponding relationship in the long run. The study estimate the ARDL Long Run model assuming

co-integration is established, the second stage involves the estimation of the following conditional ARDL (a, b, c, d, e, f, g, h) long-run model by estimating the following Bound test.

The cointegration ARDL bound test will help in establishing the long-run relationship between healthcare financing and poverty in Nigeria, and as such this will address the objectives of the research. Furthermore, the error-correction mechanism (ECM), which is formulated in the ARDL model, is the error, A.K.A. the residual of the cointegrating equation, where its coefficient is η . The error-correction coefficient shows how fast the variables will reach equilibrium, and it is expected to be statistically significant and negative. Integration of the ECM therefore allows correcting the imbalance between the dependent and independent variables with regard to the research questions and objectives. A combination chart and descriptive statistics is used to determine the trend and pattern of the sources of healthcare financing and its relationship with the poverty rate in Nigeria during the period 1986-2023.

4. Results and Discussion

Table 1: Descriptive Statistic Result

	POV	DHF	LR	PHF	RGDP _{pc}	SHI
Mean	44.57895	11.20198	55.83861	8.632949	1981.728	0.897137
Median	47.80000	5.843987	55.44675	7.678514	1916.153	0.042197
Maximum	58.40000	38.71017	70.19835	16.08437	2738.598	6.314692
Minimum	30.90000	0.804061	51.07766	3.247945	1414.698	0.003044
Std. Dev.	10.17708	10.37340	4.659297	3.991474	490.7101	1.744992
Skewness	-0.146302	0.715698	1.566814	0.380949	0.186778	1.935623
Kurtosis	1.573752	2.442760	5.655328	1.667167	1.358227	5.323100
Jarque-Bera	3.356352	3.735738	26.71145	3.731811	4.488688	32.27363
Probability	0.186714	0.154452	0.000002	0.154756	0.105997	0.000000
Sum	1694.000	425.6753	2121.867	328.0520	75305.68	34.09121
Sum Sq.						
Dev.	3832.203	3981.475	803.2347	589.4789	8909466.	112.6649
Obs.	38	38	38	38	38	38

Source: Authors Computation 2025.

The Table 1 presents descriptive statistics for the variables poverty rate (POV), donor health financing (DHF), literacy rate (LR), public health financing (PHF), real GDP per capita (RGDPpc), and

social health insurance (SHI) based on the 38 observations. The poverty rate averages 44.6% with moderate variation and is approximately normally distributed. DHF and PHF show moderate to high variability, with DHF exhibiting greater dispersion and right skewness, while both variables are roughly normally distributed. RGDPPC displays wide income variation but is fairly symmetric and normally distributed. Literacy rate shows relatively low variability but is highly right-skewed and not normally distributed, indicating the presence of extreme higher values. SHI has the lowest mean but the widest relative dispersion, with strong right skewness and significant deviation from normality, reflecting that most observations recorded very low values with a few extreme increases. Overall, the statistics indicate substantial variation across the variables, with some departing from normality, which has implications for further econometric analysis.

Table 2: Unit Root Test Result

Variables	Augmented Fuller (ADF) at Level	Dickey Critical value.	Augmented Fuller (ADF) at 1 st Diff	Dickey Critical value.	Order of integration (d).
	T-Stats		T-Stats		
POV	0.410289	-2.943427	-5.971185	-2.945842	I(1)
DHF	-0.973043	-2.951125	-6.961168	-2.951125	I(1)
LR	-3.316710	-2.943427	-	-	I(0)
PHF	-1.498795	-2.943427	-5.599757	-2.945842	I(1)
RGDPPC	-0.323986	-2.945842	-4.168590	-2.945842	I(1)
SHI	3.323297	-2.971853	-9.935984	-2.971853	I(1)

Source: Authors Computation 2025.

Table 2 shows the results of the unit-root test on the variables that will be used in this study. The literacy rate (LR) was found to be at stationary level (I(0)) and Poverty rate (POV) Income (RGDPPC) Social Health Insurance (SHI) Donor Health Financing (DHF) and Public Health Financing (PHF) were found to be at stationary level (I(1)) at the 5 per cent level of significance. The mixed integration orders (I(0) and I(1)) justify the use of the autoregressive distributed lag (ARDL) framework as the most methodologically suitable one.

The research therefore uses the ARDL bound cointegration test to determine the existence of long run equilibrium relationship between the variables.

Table 3: Bounds Co-integration Test Result

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	4.847403	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15

Source: Authors Computation 2025.

The result of ARDL bounds co-integration test are shown in Table 3. The calculated F-mean of 4.847403 versus the critical values at 5 percent significance level, which was 6.3467, shows that the null hypothesis of co-integration cannot be rejected. Therefore, there is a long-run equilibrium relationship existing between the variables and a subsequent analysis to estimate the ARDL model.

Table 4: ARDL Long and Short run Results

Dependent Variable: POV				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Long-Run Estimates				
LNDHF	-8.519354	8.766071	-0.971856	0.3520
LNPHF	5.534181	14.80416	0.373826	0.7156
LNRGDP _{PC}	24.68573	94.79642	0.260408	0.7994
LNSHI	-7.247115	7.688972	-0.942534	0.3662
LR	1.240915	1.423319	0.871846	0.4019
C	-226.1216	779.4177	-0.290116	0.7771
Short run estimates				
D(LNDHF)	-1.761634	0.702080	-2.509164	0.0290
D(LNDHF(-1))	-2.254637	0.699746	-3.222080	0.0081
D(LNPHF)	2.778854	1.603816	1.732652	0.1111
D(LNPHF(-1))	3.875449	1.613132	2.402437	0.0351
D(LNRGDP _{PC})	14.92671	7.889936	1.891866	0.0851
D(LNRGDP _{PC} (-1))	-26.85465	9.605679	-2.795705	0.0174
D(LNRGDP _{PC} (-2))	-45.08715	11.41649	-3.949301	0.0023
D(LNRGDP _{PC} (-3))	-49.94818	11.59713	-4.306943	0.0012
D(LNSHI)	0.669624	0.434180	1.542273	0.1513

D(LNSHI(-1))	3.863365	0.527811	7.319593	0.0000
D(LNSHI(-2))	2.860221	0.482090	5.932957	0.0001
D(LNSHI(-3))	1.515301	0.499931	3.031022	0.0114
D(LR)	0.146945	0.075758	1.939675	0.0785
D(LR(-1))	-0.374024	0.070703	-5.290059	0.0003
CointEq(-1)*	-0.327308	0.045199	-7.241553	0.0000
R-squared	0.893986	Mean dependent var		-0.497059
Adjusted R-squared	0.794208	S.D. dependent var		3.178668
S.E. of regression	1.441980	Akaike info criterion		3.876764
Sum squared resid	35.34819	Schwarz criterion		4.639944
Log likelihood	-48.90498	Hannan-Quinn criterion		4.137030
Durbin-Watson Stat	2.738181			

Source: Authors Computation 2025.

The Table 4 shows both the long and short-run correlation between the dependent variable and the independent variables. The autoregressive distributed lag (ARDL) model is used to determine the effect of donor health financing (DHF), public health financing (PHF), real GDP per capita (RGDPPC), social health insurance (SHI), and literacy rate (LR) on poverty (POV). The long-run coefficient of DHF is -8.52 which implies that poverty is likely to decrease as a result of increased donor health financing in the long run. However, the p-value (0.3520) shows that such effect is not statistically significant, and so there is not enough evidence to support the impact in the long-term. Conversely, the short run coefficient $D(LNDHF) = -1.76$ ($p = 0.0290$) is statistically significant at the 5 0 percent level, thus indicating that donor health financing minimises poverty in the short-run. Furthermore, $D(LNDHF(-1)) = -2.25$ ($p = 0.0081$) even more robust and highly significant, and it indicates that the positive impact of the donor health financing on the reduction of poverty is still maintained.

The long-run coefficient of a public health financing is 5.53, which shows that the rise in the levels of poverty is associated with the rise in funding of the public health in the long-run. This non-intuitive finding, however, does not reach statistical significance ($p = 0.7156$) and can be, thus, explained by a random variance, as opposed to the effect itself. The coefficient on $D(LNPHF)$ is 2.78 ($p = 0.1111$), and not statistically significant, although the one-period lag $D(LNPHF(-1))$ is statistically significant at the 5 -percent level (3.88 ($p = 0.0351$)). The trend indicates that public health financing has no direct influence of poverty but has a delayed positive influence, hence, making a contribution to poverty reduction in the long-run.

The long-run coefficient of real GDP per capita (RGDPPC) is 24.69 which means the higher the income levels the higher the poverty which is quite contrary to what conventional expectations demand of an economy growth. However, the p-value (0.7994) is very large, and such a value does not have a statistical significance and cannot be considered as credible. The modern effect ($D(LNRGDPPC)$) = 14.93 ($p = 0.0851$) is not significant but positive in the short run. However, lagged coefficients become negative and significant: $D(LNRGDPPC(-1)) = -26.85$ ($p = 0.0174$), $D(LNRGDPPC(-2)) = -45.08$ ($p = 0.0023$), and $D(LNRGDPPC(-3)) = -49.95$ ($p = 0.0012$). The findings above reveal that, even though economic growth might seem to increase poverty initially, the long-term impacts of economic growth can lead to high levels of poverty reduction and it might be due to the fact that initially, inequality effects might be experienced and thereafter the effects of economic gains may be spread out.

The long-run coefficient of social health insurance (SHI) is equal to -7.25, which implies that the increase of SHI can help reduce poverty in the long run. The p-value (0.3662) once again shows that this effect is not statistically significant. The short-run coefficient of $D(LNSHI)$ is not significant, 0.67 ($p = 0.1513$); however, lagged effects are large with $D(LNSHI(-1)) = 3.86$ ($p = 0.0000$), $D(LNSHI(-2)) = 2.86$ ($p = 0.0001$) and $D(LNSHI(-3)) = 1.51$ ($p = 0.0114$). As a result, the social health insurance seems to take time to make an impact on the poverty but has a strong positive impact in the long-term.

Literacy rate (LR) has a long-run coefficient of 1.24 which means that higher literacy is correlated with poverty that is slightly higher. The p-value (0.4019) shows that this effect is not statistically significant. The short-run coefficient $D(LR)$ of the day has a value of 0.1469 ($p = 0.0785$), which is just significant. Conversely, one period lag $D(LR(-1)) = -0.374$ ($p = 0.0003$) is negative and significantly significant, which indicates that literacy is likely to raise poverty in the short run but not in the long run since this effect will reduce poverty. The education policies should be aligned to the requirements of the labour market in order to maximise these benefits.

The coefficient of the error-correction term (CointEq (-1) 0) is significant as expected and has the expected sign (-0.3273). The negative coefficient shows that the short-run disequilibrium is shifted back to the long-run equilibrium. Specifically, the scale of the value of -0.3273 means that about 32.73 percent of the deviation is adjusted

annually. The coefficient of multiple determination (R^2) is 0.8939 and the adjusted R^2 is 0.8808, which means that the explanatory variables can account the variation in the dependent variable together by a factor of 89.39 and, on adjusting the time to the number of explanatory (predictor) variables, account the variation in the dependent variable by a factor of 88.08.

4.1 Discussion of Findings

The current study has examined the association between healthcare financing and poverty levels in Nigeria, with an aim of explaining the effects of disparity in sources of health financing and poverty alleviation in Nigeria. The results of the model showed that there is a statistically significant negative correlation, which implies that SHI can highly reduce poverty, but at a slower rate. These results are in agreement with Aryeetey et al. (2016), who have reported that out-of-pocket spending increases the catastrophic expenditure on health and worsens poverty in Ghana, but the enrolment to the National Health Insurance Scheme reduced these spending, which offered financial protection and reduced poverty.

In Nigeria, 5% of population are enrolled in NHIS, while 70% still finance their healthcare independently. Okechukwu et al (2024), Policy prescriptions that are aimed at maximising the impact of SHI should focus on increasing enrolment and protecting programme maintenance. In this same vein, findings showed that DHF has a contemporaneous, positive impact on poverty reduction, which highlights the usefulness of this intervention as a short-term one. However, the lack of a sustainable effect suggests that donor aid cannot be a reliable measure in long-term poverty reduction.

The results indicated that PHF did not have any direct or conclusive long-term effect on poverty, instead, its effects became apparent over time, which means that investments in healthcare are required to give time before it affects the socio-economic parameters positively. This is consistent with Kamal et al. (2021), who also established that recent and historical government social intervention programmes that aim to reduce high poverty and economic hardship among vulnerable populations in Nigeria were ineffective largely because of lack of consistency in policy, sub-optimal implementation, opaque guidelines, lack of transparency and corruption among government officials that oversee such programmes.

Altogether, the results indicate that a hybrid policy framework, based on a short-term and a long-term policy is paramount to use healthcare financing as a potent tool to reduce poverty in Nigeria as supported by Atauyo et al. (2022). Immediate relief may be offered by donor funding as concord by Onuche et al. (2025) though a long-term reduction in poverty requires more investment in PHF and growth in SHI. Besides, specific policy efforts should be made towards guaranteeing that the healthcare resources are channelled among the most vulnerable populations to be effective as much as possible in the reduction of poverty. This study provides an in-depth review of the role that healthcare financing plays in poverty in Nigeria with the emphasis that both short-term and long-term financing modalities are important. The facts substantiate the fact that donor funds also result in short-term gains, but Nigeria needs to increase its social health financing and extend SHI programmes to ensure long-term poverty alleviation. Investment in health infrastructure is an effective strategy that can not only improve the health performance but also promote the economic development in the long term and reduce poverty.

5. Conclusion and Recommendation

The evidence used in the study suggests that the healthcare financing plays a central role in alleviating poverty in Nigeria, but its effectiveness will depend on the financing mode used and the time frame utilised. Health financing with the support of donors produces a rapid decrease in the level of poverty, but its effects fade away in the long run. On the other hand, social health insurance plans and governmental health financing systems take a long time to produce observable results, the value of which increases with the duration of time. These findings highlight the importance of short-term measures, including the example of donor-financed health financing, but indicate that short-term initiatives cannot replace the long-term plans, including the enlargement of public health funding and the strengthening of health insurance systems.

In turn, the long-term reduction of poverty should be supported by a complex mechanism of combining short-term financial aid with long-term structural changes in healthcare funding. On the one hand, the study supports the necessity of the long-term and strategically planned investment in the sphere of healthcare financing

because such measures are critical to improving health outcomes and promoting socio-economic mobility among the Nigerian populations. The study recommends the following based on the findings and conclusions:

- i. The government must increase access to social health insurance programmes to guarantee wider coverage especially to the low-income households. In this regard, policy changes should aim at addressing the expenses involved in joining the social health insurance programme and improvement in service delivery to increase the levels of its efficacy in alleviating poverty.
- ii. Public financing of healthcare has a lagging effect on poverty, thus the government should ensure that the funds are disbursed fast and effectively to resources. Primary healthcare facilities in rural communities should be given priority in the areas of investment since they are the areas with the highest level of poverty.
- iii. Donor funds on health provide a short-term relief, but do not form a long-term mechanism of reducing poverty. It, therefore, becomes necessary that the government comes up with other ways of financing like the public-private partnership (PPP) and taxation on health as a way of ensuring long term financing of healthcare.

References

- Aleksandra, K., & Ewa, W. (2023). The causal effect of catastrophic health expenditure on poverty in Poland. *The European Journal of Health Economics* 25(2), 193-206
<https://doi.org/10.1007/s10198-023-01579-6>
- Ayal, D., Resham, B. K., & Yibeltal, A. (2022). Contributions and challenges of healthcare financing towards universal health coverage in Ethiopia: a narrative evidence synthesis. *BMC Health Services Research*, 22(866)
<https://doi.org/10.1186/s12913-022-08151-7>
- Ataayo, I. E., & Godliness, O. U. (2022). Health care financing as strategy for poverty reduction in Nigeria. *European Journal of Humanities and Educational Advancements (EJHEA)* Available Online at: <https://www.scholarzest.com>. 3(08), 2660-5589
- Aryeetey, C., Judith, W., Ernst, S., Caroline, J., Irene, A. A., & Rob, B. (2016). Can health insurance protect against out-of-pocket and catastrophic expenditures and also support poverty reduction? Evidence from Ghana's National Health Insurance

- Scheme Genevieve. *International Journal for Equity in Health*. 15(116) DOI 10.1186/s12939-016-0401-1
- Chu, C. & Jay, P. (2019) The effect of the health poverty alleviation project on financial risk protection for rural residents: evidence from Chishui City, China: *Chen and Pan International Journal for Equity in Health*, 18(1), 79 <https://doi.org/10.1186/s12939-019-0982-6>
- Busayo, A., Dominic, A., Olaronke, O., Ogundipe, O., Bowale, E., & Akunna, A. (2021). Poverty drivers and Nigeria's development: Implications for policy intervention, *Cogent Arts & Humanities*, 8(1), 192-7495, DOI: 10.1080/23311983.2021.1927495
- Emily, J. C., Haylee, F., & Daniel, L.C. (2019). Out-of-pocket healthcare expenditure in Australia: trends, inequalities and the impact on household living standards in a high-income country with a universal health care system. *Health Economics Review*, 9(1),10 <https://doi.org/10.1186/s13561-019-0227-9>
- Eze, O. I., & Chukwuma, I, F. (2024). Does expanding health insurance in rural Nigeria result in improved health outcomes and poverty reduction? *Journal of Global Health Economics and Policy*, 4(2) e024007. doi:10.52872/001c.12549
- Ezenduka, C. & Onwujekwe, O, (2025). The financial burden of malaria and the benefit incident of malaria and the benefit incidence of donor-supported service in Enugu State. *PLOS global publish health. Nigeria*, 5(3), e0004286 doi: 10.1371/journal.pgph.0004286
- Gary, S. B. (1964). *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education* (1st ed.). New York: National bureau of economic research (NBER).
- Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of political Economy*, 80, 223-255. <http://dx.doi.org/10.1086/259880>
- Gwom, A. U., Dalyop, K. M., & Yitnoe, M. A. (2021) Effect of Out-of-pocket Health Expenditure on Households' Standard of Living in Jos South Local Government Area, Plateau State. *Rainbow: A Multidisciplinary Journal*, 4(1), 16-30.
- Henry, C. E. (2022). Exploring dynamics in catastrophic health care expenditure in Nigeria: Edeh *Health Economics Review*,

- publish online*. 12(1), 22 <https://doi.org/10.1186/s13561-022-00366-y>.
- Idowu, D. O., Benjamin, S. S., & Mercy, O. A. (2018). Healthcare Financing and Health Status Independent Statistics and Analysis (2016). Country analysis brief: Nigeria. US Energy Information Administration. Retrieved from [https://: www.Nigeria.pdf](https://www.Nigeria.pdf).
- Jibril, A., Saheed, O., Sumaiyah, D., Crick, L., Dan, C., & Oye, G. (2019). Sustainable financing mechanisms for strengthening mental health systems in Nigeria, *International Journal of Mental Health Systems*, 13(1), 38 <https://doi.org/10.1186/s13033-019-0293-8>
- Kamal, A.O., Kamorudeen, A., Shola, J. O., & Abimbola, A. A. (2021). *COVID-19 and New Wave of Poverty in Nigeria*. Department of Economics, University of the Western Cape, Bellville 7535, Republic of South Africa.
- Lumen Learning (n.d.). *Drawing the poverty line*. In Microeconomic courses.lumenlearning.com.
- Matthew, I. O., Olufemi, O. O., Iyanuoluwa, O. A., & Oluwakemi, C. O. (2018). Health Care Expenditure in Nigeria and National Productivity. *South Asia Journal of Social Study and Economics*. 1(1), 1-7. DOI: 10.9734/SAJSSE/2018/39369
- National Health Accounts. (2019). Health Financing Profile, Nigeria.
- Nurkse, R. (1962). *Problems of capital formation in underdeveloped countries*. Basil Blackwell. Retrieved from <https://www.abebooks.com/book-search/title/problems-of-capital-formation-in-underdeveloped-countries/>
- Okechukwu, I. E., Alexander, I., & Davies, A. (2024). The National Health Insurance (NHIS) in Nigeria: Current Insures and Implementation Challenge. *Journal of Global Health, Economics and Policy*, 4(1). CEST.
- Osinowo, O., Sanusi, R., & Tolorunju, E. (2019). Poverty in Nigeria: the role of economic growth, governance and agriculture, a paper presented at the 6th African conference of agricultural economists, 23-26 september 2019. Abuja Nigeria.
- Onuche, M. L., Sumaila, A. F., & Adaji, A. (2025). Impact and sustainability of donor-funded projects on livelihoods, social services, and economic empowerment in kogi state. *International Journal of Management Science and Business Analysis Research Published by Cambridge Research and*

- Publication.* 9(7) 1-10. DOI:
<https://doi.org/10.70382/caijmsbar.v9i7.037>.
- Peter, B., August, K., Mariam, A., Moritz, P. & Gemini, M. (2021). Assessment of equity in healthcare financing and benefits distribution in Tanzania: a cross-sectional study protocol. *BMJ Open*, 1(1), e045807. Doi: 10.1136/bmjopen-2020-045807
- Patricia, A., Moses, A., Kaspar, W., Paola, S. & Fabrizio, T. A. (2021) Insured clients out of pocket payments for healthcare under the national health insurance scheme in Ghana. *BMC Health Services Research*, 21(1), 440 <https://doi.org/10.1186/s12913-021-06401-8>
- United Nations Development Programme. (2020). *Human development report 2020: The next frontier—Human development and the Anthropocene*. United Nations Development Programme. <https://hdr.undp.org/content/human-development-report-2020>
- United Nations Development Programme. (2023). Briefing note for countries on the 2023 Multidimensional Poverty Index
- Wagstaff, A., Flores, G., Hsu, J., Smitz, M.F., Chepynoga, K. & Buisman, L.R., (2018). Progress on catastrophic health spending in 133 countries: a retrospective observational study. *Lancet Glob Heal*, 6(2), e169.
- World Bank. (2020). *Global Economic Prospects June 2020*. Washington DC
- World Bank. (2022). *World Development Indicators* [Online database]. The World Bank. Retrieved from <https://databank.worldbank.org/source/world-development-indicators>.
- Yusuf, A. A., Joshua, O. U., Omotayo, C. O., Aishat, J. A., Ayomide, B. S. & Don, E. L. (2020). Assessment of Health Budgetary Allocation and Expenditure Toward Achieving Universal Health Coverage in Nigeria. *Int. J. Health Life Sci.*, 6(2) e102552. doi: 10.5812/ijhls.102552.