

Analysis Of Public Healthcare Financing, Access, And Outcomes: Evidence From Nigeria

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ABSTRACT

This study seeks to investigate the analysis of public healthcare financing, access, and outcomes drawing evidence from Nigeria. The Nigerian health sector has been identified as one of the most poorly performed sectors in the world going by global standards and ranking. The general health status and outcomes all over the world and Nigeria, in particular, are measured by life expectancy, maternal mortality rate, under-five mortality rate, infant mortality rate, stillbirth rate, crude death rate, and morbidity rate. However, low public health spending and limited health insurance coverage have militated against improved health outcomes in Nigeria. The Grossman Model of Health Demand was used and it states that the idea of investing in human capital (health and education), is to improve health outcomes in both the market and non-market sectors of the economy. This suggests that spending or investment in health and education in any economy leads to positive health outcomes, contributing to higher gross domestic product (GDP) and is represented thus. The study adopted the Two-stage least squares (2SLS) approach and employs the Root Mean Square (RMSE), and formal tests, including the Campbell and Thompson test statistic for data analysis. The findings among others revealed that the coefficient (-0.00453) of LNPSH in the model implies that low public spending on health (recurrent expenditure) reduces the health outcome of the populace at a statistical significance p-value level of less than 1%, and the coefficient (-0.006940) of LNCAPEXP in the model also implies that poor capital spending on health reduces health outcomes significantly. The recommends among others that, the provision of health care infrastructures and technology as well as the recruitment of more health personnel, training and retraining of health personnel, and increased salary for health personnel reflected in the recurrent expenditure will put a stop to the brain drain in the health sector and on the long run reverse the negative impact on health outcome.

Keywords: Public Healthcare Financing, Access, and Outcomes

INTRODUCTION

It is by no coincidence that the productivity of a nation's workforce hinges on the performance of the social services sector, namely health and education. Specifically, the health sector plays a pivotal role in supporting the effectiveness and efficiency of the workforce in all other sectors of an economy. A healthier workforce is considered productive; hence, the quality of health in the economy determines the economic activities that will be inherent in the economy. The general health status and outcomes all over the world and Nigeria, in particular, are measured by life expectancy, maternal mortality rate, under-five mortality rate, infant mortality rate, still birth rate, crude death rate, and morbidity rate. However, low public health spending and limited health insurance coverage have militated against improved health outcomes in Nigeria.

Expectedly, Nigeria's health system has performed poorly by global standards, ranking 178th out of 192 countries, according to the World Health Organisation (WHO). The poor health system cannot be dissociated from the low priority of primary healthcare, with its administration vested in the lowest and third tier of government –the local government (Osain, 2011). Also, the skewness of healthcare financing towards households (that is, out-of-pocket spending) suggests the government's funding gap in the health sector. Public health spending in Nigeria is less than US\$8 per capita compared with the global benchmark of US\$34 (Lambo, 2015). One of the key reasons for the ineffectiveness of contributory health insurance in Nigeria is the high level of informality, creating vulnerable jobs. The informal sector accounts for 65 percent of the Gross Domestic Product (GDP) and over 80 percent of total employment. The challenges facing Nigeria's health sector are multi-facet, ranging from catastrophic out-of-pocket expenditures on healthcare to inadequate coverage of social insurance and poor coordination of donor activities. The persistence of these challenges results in the inability to access quality healthcare services when needed (Arikpo et al., 2021).

Moreover, although universal health coverage (UHC) seems to increase the use of health services, shortages in human resources and medical supplies, socio-cultural barriers, physical inaccessibility, lack of education and information, decision-making power, and gender-based autonomy, prenatal visits, previous experiences, and fear of cesarean delivery were still found to deter access to, and use of, health services (Sanogo et al., 2019). Health systems attempting to expand health insurance coverage face various opportunities and challenges affecting performance. The success of any health financing reforms is contingent on embracing sound policies, regulations, and accountability measures (Akhoki, 2016).

The National Health Insurance Scheme (NHIS), introduced in 2005, is entirely streamlined to only federal workers and is voluntary to the general population. Consequently, the NHIS has only been able to cover about 5 percent of the Nigerian population (Obikeze, 2022). Meanwhile, adopting the NHIS at the sub-national level remains a crucial challenge for realising universal health coverage in Nigeria (Eboh et al., 2016). Although the proposed universal health coverage reform may take some years to achieve, it is more feasible to collect taxes, improve tax administration and expand the tax base than to enforce payment of contributions from non-salaried workers and those who cannot afford to pay for health insurance or healthcare services out-of-pocket (Aregbeshola, 2018).

Furthermore, the inadequate health infrastructure and limited availability of medical specialists have resulted in the members of the elite checking out of the country in search of high-quality health delivery. Nigeria loses about US\$1 billion to outbound medical tourism annually. Their estimates also showed that 60 percent of outbound medical tourism is in relation to medical specialties, including oncology, orthopaedics, nephrology, and cardiology². This partly explains inequality in the access to primary and quality healthcare services in Nigeria, suggesting that the poor and the vulnerable have been left behind, which is detrimental to achieving UHC.

In addition, investing in primary health care and expanding coverage of reproductive, maternal, and child health and malaria interventions would have a significant economic impact on poor Nigerians driven by a healthier, more educated, and more productive young workforce. Seventy-two percent of the burden of disease remains from communicable, maternal, neonatal and nutritional diseases (Odunyemi, 2021). To this end, the proposed study will assess the impact of public health financing and health access on various health outcome indicators in Nigeria.

1.2 Objectives of the study

Broadly, the proposed study seeks to investigate the impact of healthcare financing and health insurance coverage on health outcomes in Nigeria. The specific objectives are to:

- Determine the effect of health-related recurrent expenditure on health outcomes.
- Determine the effect of health-related capital expenditure on health outcomes.
- Determine the effect of total public health spending on health outcomes.
- Determine the role of NHIS in the performance of health outcomes.

- Determine the possible influence of other socio-economic factors on health outcomes.

1.3 Research questions

This study is premised on providing answers to the following research questions:

- What is the effect of health-related recurrent expenditure on health outcomes?
- What is the effect of health-related capital expenditure on health outcomes?
- What is the effect of total public health spending on health outcomes?
- What is the role of NHIS in the performance of health outcomes?
- Are there other socio-economic factors that could influence health outcomes?

2. BACKGROUND OF THE STUDY AND LITERATURE REVIEW

2.1 Stylised Facts

Nigeria has consistently ranked low on health-related indicators, including health financing, personnel adequacy and health outcomes, underperforming other African peers (see **Table 1**). Nigeria's average life expectancy, currently at 54 years, underperforms other African countries, including Ghana (63 years) and South Africa (64 years). Similarly, the country has recorded unimpressive performance in some other health outcomes relative to other countries of the world (see **Figures 1, 2 and 3**). This could be attributed to higher out-of-pocket health spending in Nigeria relative to other countries, including Ghana and South Africa.

Table 1: Health Financing, Personnel Adequacy and Health Outcomes as of 2017

Indicator	Nigeria	South Africa	Ghana	Global average
Out-of-pocket spending (% of total healthcare expenditure)	77.2	7.8	40.3	18.6
Public spending (% of total healthcare expenditure)	14.2	53.7	33.5	59.8
External spending (% of total healthcare expenditure)	7.9	1.9	14.5	0.23
Physicians (per 10,000 people)	4	9	1	15*
Nurses and midwives (per 10,000 people)	12	24	13	20*
Under-five mortality rate (per 1,000 live births)	120	35.3	50	41.1
Maternal mortality (per 100,000 live births)	917	119	308	211
Life expectancy at birth (years)	54	64	63	72

Table 1: Health Financing & Personal Adequacy in Nigeria as of 2017

Data Source: World Development Indicators (WDI) & Fede

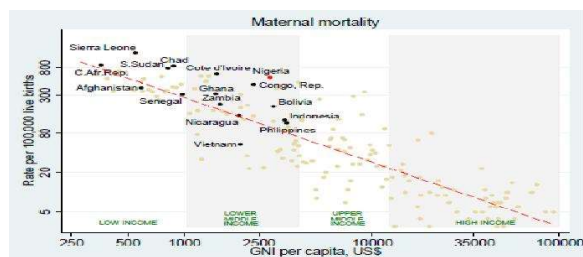


Figure 1: Infant mortality by income status (2015)

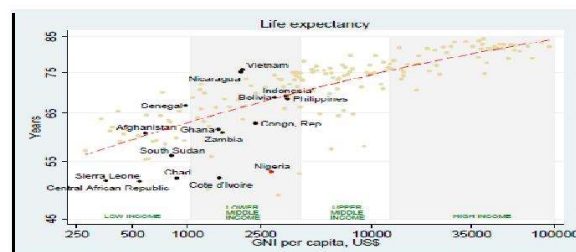


Figure 2: Infant mortality by income status (2015)

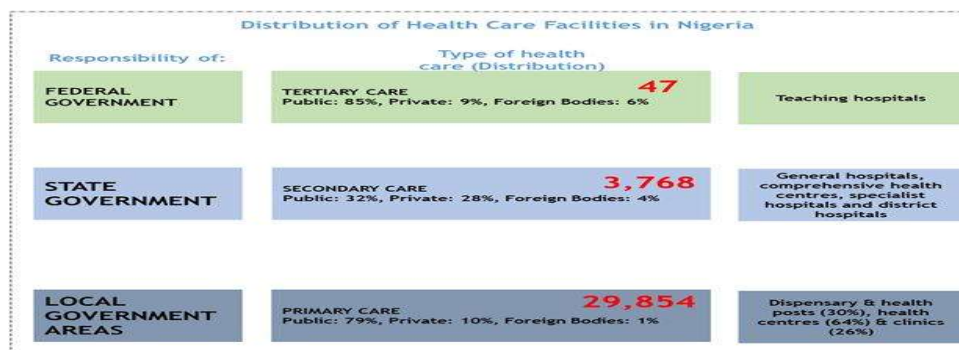


Figure 3: Infant mortality by country income status (2015)

Source: Adapted from Odunyemi (2021)

Moreover, public spending on healthcare in Nigeria remains the constitutional responsibility of the three tiers of government, which is to mobilize and deploy resources to provide healthcare in their respective jurisdictions (see **Figure 4**). As observed in the literature and practice, the most reliable way to achieve universal health coverage is government spending through the imposition of taxes, including sin tax (levy on alcoholic drinks) which could discourage the intake and consumption of hard drugs and harmful substances. An instance of a successful case is Thailand. From all indications, this avenue has not been largely explored in Nigeria, which has one of the lowest tax rates globally.

Figure 4: Nigeria Health Sector Statistics



Source: Nigeria's Federal Ministry of Health

A household is classified as incurring catastrophic spending expenditure "if it spends 40 percent or more of its discretionary (non-food), or percent or more of its total expenditure (Odunyemi, 2021). In Nigeria, household spending on healthcare accounts for 6.1 percent and 14.1 percent of total consumption expenditure and non-food consumption spending in 2019 (NBS, 2020). Although Nigerians have not reached the catastrophic expenditure level, catastrophic health expenditure results not only from direct costs on healthcare services but also from indirect costs resulting from a depreciating health status, which has a negative impact on workforce productivity

(Odunyemi, 2021). Moreover, out-of-pocket spending on health which is more than 70 percent, has the capacity to impoverish Nigerians, leading up to the cycle of perpetual extreme poverty (see **Figure 5**).

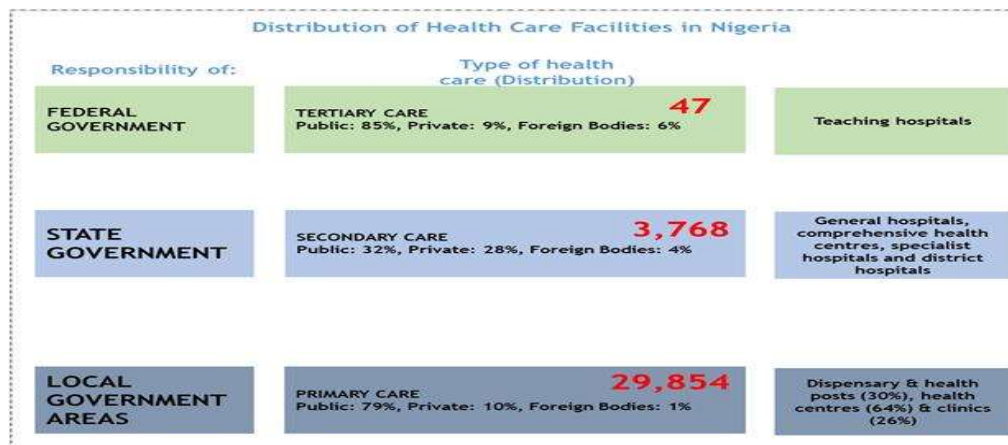


Figure 5: Cycle of impoverishment due to excessive out-of-pocket spending on healthcare

Source: Adapted from Odunyemi (2021)

2.2 Review of the Empirical Literature

A large body of the literature has delved into the determinants of health outcomes within the context of Nigeria and comparator country studies. Riman and Akpan (2012) evaluated the relationship between health outcomes, health care financing and health financing utilisation in Nigeria, particularly concerning three local government areas in Cross River State, Nigeria. The authors revealed that high infant mortality and morbidity rates were associated with the high incidence of out-of-pocket payments. The study also observed a disparity in the spatial distribution of health facilities, which are concentrated mainly at the urban-based LGA compared to the two rural-based LGAs, and this caused poor health service demand in the latter.

Based on Grossman's model function of health data spanning production 35 years, Onisanwa *et al.* (2018) established that public health spending has an inverse and significant impact on the infant mortality rate in Nigeria. Oladosu *et al.* (2022) investigated the effect of public health expenditure on health outcomes in Nigeria and Ghana whilst measuring health outcomes using infant, maternal, Malaria, and HIV/AIDS mortality. The authors observed low public health expenditure in both countries, despite that an inverse relationship was established in the Ghanaian case and a positive relationship was found in the case of Nigeria. On their part, Orji *et*

al. (2022) demonstrated that health expenditure by the government reduces the under-five

mortality rate and improves life expectancy. Similarly, immunization of measles was found to reduce the under-five mortality rate, while the prevalence of HIV reduces life expectancy.

Using instrumental variables techniques, Bokhari found that in developing countries, economic growth is undoubtedly a significant contributor to health outcomes, while government spending

on health is just as important a factor (Bokhari, 2007). With the aid of the OLS estimator, Adekunle *et al.* (2021; 2022) revealed that socioeconomic conditions drove the prevalence of COVID-19 across four continents: Africa, Asia, America and Europe, covering three sub-sample periods of the first wave, second wave and vaccine roll-out. While the only significant and positive driver of the pandemic across continents is life expectancy, higher healthcare spending is prevalence-reducing. The authors also established the prevalence impacts of out-of-pocket

spending, net migration, distance and international arrivals or Africa, America, Asia and, Europe, respectively.

Moreover, a number of studies have utilised a different combination of health outcomes; for instance, infant mortality (Farag et al., 2012); disease prevalence (Adekunle et al., 2021; 2022), and infant, maternal, Malaria and HIV/AIDS mortality (Oladosu et al., 2022). Aside from public healthcare spending, the extant literature has identified the drivers of health outcomes, including the level of income, education and nutritional status, access to healthcare systems, material standard of living, disease incidence and institutional quality (see Hobcroft et al., 1984; United Nations, 1988; Hill, 1987; Dixon et al., 2001; Farag, 2012; Murray and Chen, 1992; Murray and Lopez, 1997; Bloom and Canning, 2004; Arrow et al., 2014). To this end, the proposed study will offer the following innovations. *First*, the study will employ all indicators of health outcomes (depending on data availability). This will help identify the impact of public health spending, health access and other control variables on positive and negative health outcomes (life expectancy, maternal mortality rate, infant mortality rate, under-five mortality rate, and fertility rate.), whose combination is rare in the previous studies on Nigeria, except in the case of Orji *et al.* (2022).

Second, the study will estimate the Grossman model of health demand in line with past studies but will take a step further to assess the forecast accuracy of the health outcome models in predicting health outcomes in Nigeria, as found in the case of Adekunle et al. (2022). Unlike previous studies, the *third* contribution of the proposed research will be to assess the impact of the NHIS on health outcomes in Nigeria since its introduction in 2005. *Fourth*, the study will adopt the aggregate and disaggregated public health spending in Nigeria, which was not the case with previous studies on Nigeria, including the recent study by Orji et al. (2022). *Lastly*, this study will carry out simulations to assess the response of health outcomes to different policy scenarios, such as a 25 percent, 75 percent, and 100 percent increase in public health spending.

2.3 Theoretical Framework

According to Micheal Grossman's model of health demand (1972), each individual is considered a producer and a consumer of health. Health in his model is treated as a stock that depreciates over time in the absence of investment in health; hence, health is seen as a sort of "capital". The model acknowledges that health is both a consumption good that yields direct satisfaction and utility (through the reduction of sick days) and an investment good that yields satisfaction to consumers indirectly through increased productivity, fewer sick days, and higher wages.

In Grossman's model, the optimal level of investment in health occurs where the marginal cost of health capital is equal to the marginal benefit, that is, $MC = MB$. Over time, health depreciates at some rate δ . The interest rate faced by the consumer is represented by r . Thus, the marginal cost of healthcare is the addition of the two variables: $MC = r + \delta$. The marginal benefit of health capital (MB) is the rate of return on investment in health capital. In this model, the optimal health stock can be influenced by factors like age, wages, nutrients, and education. For instance, the depreciation rate of health capital (δ) increases as age increases and thus reduces the health stock. Conversely, health stock rises with the increase in education, nutrient intake, and wages.

Thus, Grossman introduced the idea of investing in human capital (health and education) to improve health outcomes in both the market and non-market sectors of the economy. This suggests that spending or investment in health and education in any economy leads to positive health outcomes, contributing to higher gross domestic product (GDP). Health as a capital good can be represented with the equation below:

$$H_t = H_{t-1} - \delta + I \quad (1)$$

where H is the total stock of health, H_{t-1} is the initial endowment of health, δ is as defined earlier, and I is the rate of investment on health. The equation above shows that a person is born with an initial endowment of health stock which depreciates with time and increases with investment in health. The rate of health production will therefore depend on the efficiency of investment in health.

3. METHODOLOGY AND DATA

3.1 Model Specification

To estimate the Grossman-type health model, the study follows the works of Orji et al. (2022), which showed a relationship between health outcomes and their determinants in Nigeria. This study specifies the functional relationship between health outcome indicators (*HEO*) as a function of the main explanatory variables of interest, including public spending on health (*PSH*), and a dummy variable to assess the impact of NHIS since its introduction in 2005 ($NHIS = 1$ periods from 2005 and 0 for periods before 2005) while employing real GDP per capita (*RPCI*), literacy rate (*LIT*) and nutritional status (*NUTS*) as control variables.

$$HEO = f(PSH, NHIS, RPCI, LITR, NUTS) \quad (2)$$

This function is re-specified in the equation below

$$HEO_t = \beta_1 + \beta_2 PSH_t + \beta_3 NHIS_t + \beta_4 RPCI_t + \beta_5 LITR_t + \beta_6 NUTS_t + \varepsilon_t \quad (3)$$

To generate elasticity coefficients of health outcomes ($\beta_2 * , \beta_4 * - \beta_6 *)$ to changes in its quantitative determinants, eq. (3) is logged on both sides except for the dummy variable (*NHIS*) and re-specified as:

$$\ln(HEO_t) = \beta_1 * + \beta_2 * \ln(PSH_t) + \beta_3 * NHIS_t + \beta_4 * \ln(RPCI_t) + \beta_5 * \ln(LITR_t) + \beta_6 * \ln(NUTS_t) + \varepsilon_t \quad (4)$$

Where ε_t = the random error term

3.2 Data Description and Sources

The study seeks to collect annual data on all variables employed in this study over the period of 1981 to 2021 from two main sources, namely, the World Bank's World Development Indicators (WDI) and the Central Bank of Nigeria's (CBN) Statistical Bulletin.

3.3 Estimation Technique and Expected Results

In order to resolve the issue of endogeneity amongst the explanatory variables on the one hand and reverse causality between health outcomes and their possible determinants, the study adopted the Two-stage least squares (2SLS) approach. One of the assumptions of the classical linear regression model (CLRM) states that the error term of an equation should be uncorrelated with each of the explanatory variables in the equation. If such a correlation exists, then the ordinary least squares (OLS) regression is biased. To avoid "simultaneity bias", alternative estimation techniques would be explored depending on whether or not an equation in the system of equations is exactly identified or is over-identified. In general, in cases of exact identification, the appropriate technique is the method of "indirect least squares (ILS)", while in cases of over-identified equations, the "two-stage least squares" method is the most commonly used (Asteriou and Hall, 2007; Garba et al., 2020). Following Gujarati and Porter (2009), the 2SLS method is usually preferred over the ILS approach for the following reasons:

- The 2SLS can be applied to an individual equation in the system without directly considering any other equation(s) in the system. Hence, for solving econometric models involving a large number of equations, 2SLS offers an economical method.
- Unlike ILS, which provides multiple estimates of parameters in the over-identified equations, 2SLS provides only one estimate per parameter.
- Although designed to handle over-identified equations, the 2SLS method can also be applied to identified equations; in this case, ILS and 2SLS will give identical estimates.

In addition, the estimation procedure involves two stages as follows:

- **Stage 1:** Regress each endogenous variable on all of the endogenous and lagged endogenous variables in the system by using simple OLS and obtain the fitted values of the endogenous variables of these regressions.
- **Stage 2:** Use the fitted values from stage 1 as proxies or instruments for the endogenous regressors in the original (structural form) equations. The instruments are stochastic variables and independently distributed of the error term. One requirement is that the coefficients of determination (R-squared) of the estimated equations in stage 1 should be relatively high. This ensures that the fitted value of the endogenous variable and the actual value is highly correlated to qualify as a suitable instrument (Asteriou and Hall, 2007).

Moreover, the study also employs forecast evaluation tools, including the Root Mean Square (RMSE), and formal tests, including the Campbell and Thompson test statistic. In addition, the study conducted policy scenarios on the responsiveness of health outcomes to changes in government spending.

4. DISCUSSION OF FINDINGS

4.1. Empirical Analysis

To estimate the modified Grossman-type health models stipulated in equation four, the unit root test is conducted. The majority of macro time series data have been shown to be non-stationary, which frequently produces spurious regressions. In most cases, testing the data is necessary to detect if there is the presence of unit roots. In testing for unit roots under the ADF test, the researcher includes a time trend with a one-lag structure. The outcome of the unit root test shows that variables employed in this study are stationary at various levels of integration. This is shown in Table 1. Table 1 indicates that all the variables used were stationary of a different order, levels, first difference, and second difference.

Table 1 Unit Root Test Results in Levels and Difference (Augmented Dickey-Fuller test)

Variables	Level	Diff.	95% critical level	Order of co-integration
HEO	-4.737126		-3.529758	I(0)
LITR	-4.343008		-3.529758	I(0)
PSH	-1.109976	-6.856666	-3.533083	I(1)
CAPEXP	-2.310374	-7.826761	-3.529758	I(1)
RPCI	-2.171988	-3.689939	-3.540328	I(1)
NUTS	-2.745798	-5.440389	-3.533083	I(2)
TOTEXP	1.013849	-7.630892	-3.533083	I(2)
SSE	-1.974066	-7.030381	-3.540328	I(1)

Source: Computed by the researcher using Eviews Software from data obtained from CBN Statistical Bulletin (2022) and WDI (2022).

Regression Results for the Modified Grossman-type health models

Table 2 depicts the results of the modified Grossman-type health model. It illustrates the regression estimates of the log of public spending on health (LNPSH), log of real GDP per capita (LNRPCI), log of literacy rate (LNLIT)

and log of nutritional status (LNNUTS) on the log of health outcome, The results show a statistically significant level of less than 1% at 95% confidence level, between the dependent variable and its lag and with a significant positive sign for the lag coefficient.

The coefficient (-0.00453) of LNPSH in the model, implies that low public spending on health (recurrent expenditure) reduces the health outcome of the populace at a statistical significance p-value level of less than 1%. This is consistent with the findings of Onisanwa et al. (2018) who established that public health spending has an inverse and significant impact on the infant mortality rate in Nigeria. The coefficient (-0.006940) of LNCAPEXP in the model also implies that poor capital spending on health reduces health outcomes significantly.

Findings from the study differ slightly from that of Bokhari (2007), as the coefficient of real GDP per capita (LNRPCI) was shown to be negative and insignificant, which points to the fact that there can be significant growth without development. An increase in economic growth does not automatically translate to positive health outcomes.

A key finding in the study that previous studies have not taken into cognizance is the role of the lag in health outcomes. The coefficient of a year lag of health outcome is positive and significant, indicating that current health outcome is significantly affected by past period outcomes.

Also, the results show a positive and significant relationship between health outcomes and the impact of NHIS. This shows that there is a marked difference in health outcomes before and after the introduction of NHIS. The introduction of NHIS in 2005 has significantly helped in boosting positive health outcomes.

Table 2: Regression Analysis Two-Stage Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNHEO(-1)	1.030608	0.042654	24.16182	0.0000
LNPSH	-0.004530	0.001980	-2.287640	0.0289
NHIS	0.017488	0.007878	2.219998	0.0336
LNRPCI	0.044226	0.027004	1.637741	0.1113
LNNUTS	0.029138	0.007500	3.885255	0.0005
LNLITR	-0.006951	0.005048	-1.377016	0.1781
LNCAPEXP	-0.006940	0.002389	-2.904880	0.0066
C	-0.729914	0.541351	-1.348318	0.1870

dependent variable: LNHEO; Method: two-stage least squares; Sample (adjusted): 1982-2021; Included observations: 40 after adjustments; Instrument specification: LNSSE LNPSH NHIS LNRPCI LNNUTS LNLITR, LNCAPEXP, LNTOTEXP; Constant added to instrument list; R, 0.99; 2Mean dependent var, 5.10; Adjusted R, 0.99; F-statistic, 6043.762; Prob. (F-statistic) ,0.000000; Durbin-Watson stat, 1.550066, Second-stage SSR, 0.050514; J-statistic, 2.995308; Prob (J-statistic), 0.083506, Instrument rank 9.

Diagnostic testing

The R = 0.99 that is all the exogenous variables explain 99% of the total variation in health outcomes. The F-

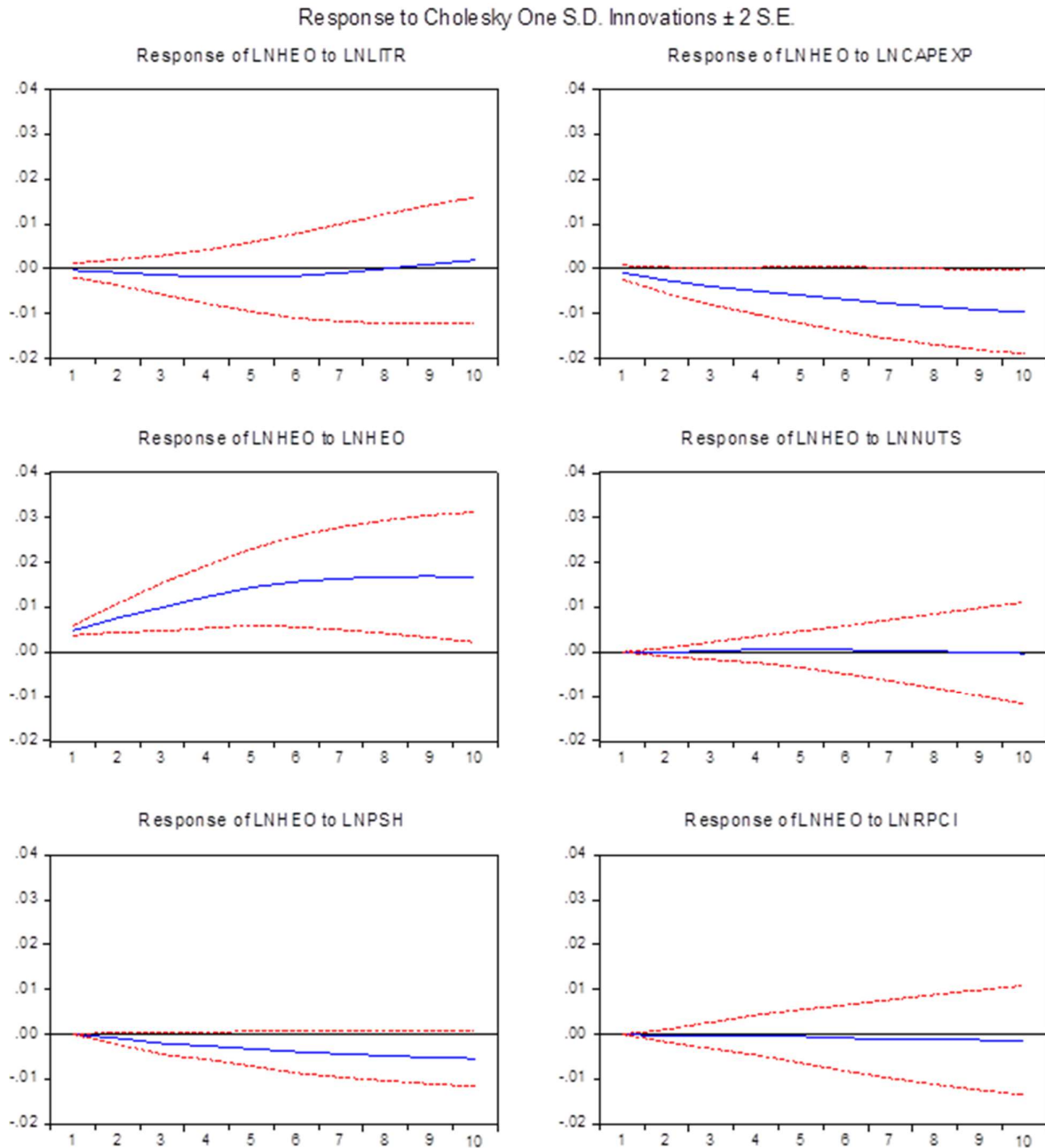
Statistic is significant considering the probability value. This means that the model has the goodness of fit. The Durbin-Watson value of 1.55 indicates that there exists no serial correlation, this is because further using the Breusch-Godfrey Serial Correlation LM Test confirms that the model is free from serial correlation. The Breusch-Pagan-Godfrey test for heteroscedasticity shows that the assumption of homoscedasticity was not violated, that is, equal variances are met (Gujarati and Porter, 2009).

Response of health outcome to Impulse from health expenditure and variables in the Model

The impulse response function is a means of tracing the dynamic responses of endogenous variables within any structural framework to external shocks. The responses of health outcomes to unexpected shocks from health expenditure both capital and recurrent provide a useful barometer for gauging and forecasting the responsiveness of health outcomes to these variables as well as for policy planning.

Figure 1, the impulse response functions, shows the estimated response of the health outcome variable (HEO) to a one standard deviation variation in literacy rate. The accumulated impulse responses (solid line in the Figures) are presented over a time horizon of ten periods.

The pass-through of a one standard deviation shock from public health expenditure and capital expenditure into health outcomes are both high. The shock puts downward pressure on health outcomes which declines sharply after the first period and second period in line with the increasing volatility. Implying that the degree of response of health outcomes to expenditure is relatively high, as such significant expenditure in health is likely to create a positive outcome and vice versa.



Source: Computed by the researcher using Eviews Software from data obtained from CBN Statistical Bulletin (2022) and WDI (2022).

5. Conclusion and Recommendations

The Nigerian health sector has been identified as one of the most poorly performed sectors in the world going by global standards and ranking. The paper investigates the impact of healthcare financing and health insurance coverage on health outcomes in Nigeria and found out that health outcome proxy with a Mortality rate, under 5 (per 1,000 live births) had a significant relationship with healthcare financing in Nigeria. Health financing (both recurrent and capital) showed a significant negative impact on health outcomes, the conclusion drawn is that in Nigeria the percentage of the budget for health as a percentage of the total expenditure falls grossly below the recommended threshold by WHO and proposed indigenous studies.

Further findings from the study, reveal that NHIS enhances the performance of health outcomes. The coefficient of NHIS was positive and significant in the model. The result also revealed that a year lag of health outcome is

significant and positively related to a current health outcome. The most disturbing finding in the study is the literacy rate is negatively related to health outcomes which go contrary to apriori expectation.

Based on the findings of this study, the following recommendations are made:

- i) Since the coefficients of health financing exerted a negative impact on health outcomes, the government should do well to increase health care expenditure. The provision of health care infrastructures and technology as well as the recruitment of more health personnel, training and retraining of health personnel, and increased salary for health personnel reflected in the recurrent expenditure will put a stop to the brain drain in the health sector and on the long run reverse the negative impact on health outcome.
- ii) The coefficient of literacy rate is negatively related to health outcomes, which might be also a result of poor remuneration, poor capital, and recurrent expenditure in the educational sector across all levels in Nigeria. Therefore, the government should ensure that significant funds be channelled to the educational sector as that is the sector that produces the manpower for every other sector inclusive of the health sector. The quality of staff and critical thinking in teaching should be enhanced through transparency in the recruitment process and appropriate compensation for innovations and research.
- iii) The result revealed a positive relationship between health outcomes and NHIS. There is a need for government to sustain the program and review it periodically in line with global best practices in order to ensure that workers and their families maximize the gains for better productivity.

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