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PUBLIC HEALTH EXPENDITURE AND ECONOMIC DEVELOPMENT NEXUS: EVIDENCE FROM NIGERIA

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Abstract

This study explores the nexus between public health expenditure and economic development in Nigeria from 2000 to 2023. Nigeria faces significant healthcare funding challenges, with expenditures below the World Health Organization's recommended threshold of 5% of GDP, thus affecting overall economic growth. The Autoregressive Distributed Lag (ARDL) model was adopted to assess the broad objectives of the short- and long-term effects of public health expenditures on the economic development nexus and address potential endogeneity. Based on the endogenous growth theoretical approach, the findings reveal a long-run cointegrating nexus between public health expenditure and economic development. Poverty significantly hampers economic growth through structural issues such as high-income inequality, which limits the effectiveness of health investments. This study underscores the need for targeted healthcare financing and strategic investment in public health to address endemic diseases, enhance human capital, and boost productivity.

Keywords: Public Health Expenditure, Economic Development, ARDL Model, Nigeria, Human Capital

INTRODUCTION

A sustainable and clean environment enhances individuals' mental, physical, and emotional stability through good health, ultimately boosting economic productivity (Lee 2019; Umar 2017). Government investment in social health projects, as highlighted by UNAIDS (2016), improves health expenditure through life expectancy and reduces under-5 mortality

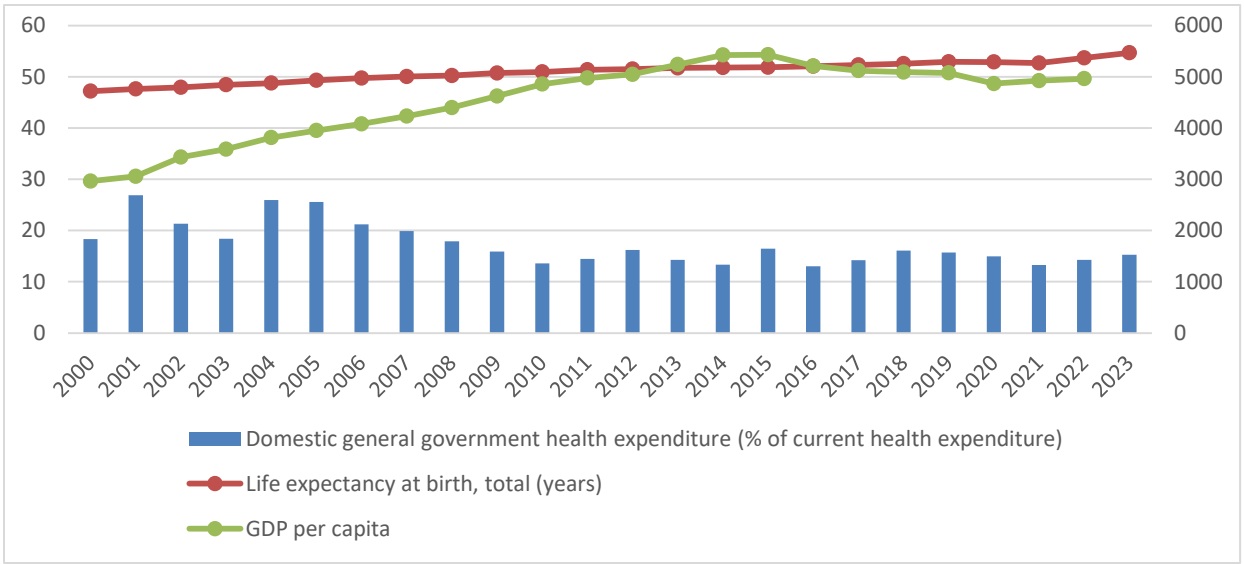
rates, morbidity, and other killer diseases such as malaria and tuberculosis. This is especially crucial for emerging economies such as Nigeria, which face significant challenges from endemic diseases (Danforth et al., 2017).

Good health is a vital indicator of a standard of living, and is essential for the success of national development plans. In the context of Nigeria's estimated 200 million citizens, Ercelik (2018) underscores the importance of health in assessing living standards. Cole and Neumayer (2006) argue that health is a cornerstone of human capital development, influencing various aspects of personal and societal progress. The World Health Organization (WHO, 2019) highlights a developmental nexus in which labor productivity depends on the health conditions of the population and their education level.

Governmental health financing is critical to human capital accumulation and endogenous growth. However, Nigeria's healthcare funding of 2-3% of GDP is inadequate, well below the global standard of at least 5% of the GDP necessary for essential health services (Gizem, 2018). In response, Nigeria established the National Health Insurance (NHI) scheme and the Basic Health Care Provision Fund (BHCPF) to increase health financing and improve access to quality health services for all citizens, irrespective of employment status (Parliamentary Monitoring Group, 2017). Achieving these objectives requires effective budget allocation and monitoring to avoid the chaotic disbursement of funds, often favoring urban areas over rural ones.

Empirical literature establishes that government healthcare expenditure (HEX) is crucial for development. Rajeshkumar and Nalraj (2014) revealed that a higher income per capita in developed nations leads to improved standards of living and life expectancy (Figure 1). Despite Nigeria's increase in GDP per capita, healthcare expenditure remains below the recommended 5-6% of GDP.

Figure 1: Income per capita, Life expectancy rate and Government expenditure on health



Previous studies on the relationship between health and economic development have revealed diverse influences. Sharma (2018) and Bloom et al. (2018) reported a linear and nonpositive nexus, whereas Sede and Ohemeng (2015) and Serag et al. (2019) reported a nonlinear nexus. Kunze (2014) points out the complexity of determining a dominant outcome due to mixed results, arguing that other macroeconomic factors might influence the health-economic growth nexus directly because the health finance and economic growth nexus is indirect (Sharma, 2018; Pakdaman et al., 2019). Figure 1 reveals significant fluctuations in governmental health expenditure, peaking at 26.89% in 2001, dipping to 13.60% in 2010, and slightly increasing to 15.27% in 2023 due to investment in the heartcare system due to the COVID-19 pandemic. Similarly, life expectancy (LIEX) increased from 47.19 years in 2000 to 54.68 years in 2023, indicating overall health improvements. However, these fluctuations in health expenditure (HEX) do not directly correlate with life expectancy trends, indicating that other factors, such as spending efficiency, healthcare infrastructure, and access to care play significant roles.

Poverty also influences the relationship between health improvement and economic growth. Omoniyi (2018) argues that poverty impacts the health-economic growth link. The saying "health is wealth underscores that ill health is a dimension of poverty (Bloom, 2003). Improving healthcare reduces poverty (Bloom, 2003) and boosts economic growth (Lange and Vollmer, 2017). Health improvements accelerate the realization of the United Nations Sustainable Development Goals (SDGs), particularly Goal 1 (no poverty) and Goal 3 (ensuring healthy lives), through healthcare investment by 2030 (United Nations, 2017).

Economic growth in emerging economies is closely linked to poverty levels, and healthcare improvements significantly reduce the poverty indices. Studies in Nigeria often yield mixed results when focusing on the direct nexus between economic development and health, neglecting the crucial role of poverty reduction. Most studies use HEX as a proxy for human capital in the context of economic growth. However, increased expenditure does not necessarily translate into improved health outcomes. This underscores the need for more accurate health indicators such as LIEX, which directly reflect health improvements and their implications for economic development. Murthy and Okunade (2009) argue that healthcare improvements increase life expectancy and reduce morbidity and infant mortality. Additionally, poverty, lack of access to medical care, lack of health insurance coverage, and increased costs have contributed to Nigeria's health care and economic development crisis.

This study uniquely contributes to the literature on public healthcare expenditure and economic development by focusing on Nigeria from 2000 to 2023 (23 years period). The time series of 2000-2023 is significant in this study given the country's substantial population growth,

urbanization, and demographic changes impacting healthcare demands and economic activities. This 23-year period allows for a longitudinal analysis of public health expenditure trends and economic development over a substantial period, capturing both short-term fluctuations and long-term trends. This study provides insights into the evolution of public health expenditure policies over time in response to economic change, crises, and governmental priorities. The study covers periods of significant health crises (Ebola outbreak between 2014-2016 and the COVID-19 pandemic, among others). The turn of the millennium in 2000 marked significant economic reforms in Nigeria, including the National Economic Empowerment and Development Strategy (NEEDS) in 2003, designed for poverty reduction, wealth creation, and sustainable and inclusive economic development. The 2000-2023 time series in this study provides a comprehensive view of the dynamic relationship between public health expenditure and economic development in Nigeria, offering valuable insights for policy formulation and decision making.

The COVID-19 pandemic has highlighted the strengths and weaknesses of Nigeria's health care system, revealing gaps in funding, infrastructure, and preparedness. The impact of the pandemic on public health expenditures is crucial for understanding both immediate and long-term economic consequences. The Ebola outbreak between 2014-2016, though successfully contained, stressed the healthcare system and underscored the importance of investment in public health infrastructure. Endemic diseases such as malaria, HIV/AIDS, and tuberculosis continue to burden Nigeria's healthcare system. Understanding how expenditure on these health challenges influences economic development is crucial.

Empirically, this study adopts the dynamic ARDL model, which considers both small and finite samples and incorporates both I(0) and I(1) series in the same estimation. Previous studies have extensively used static models, which cannot account for both short- and long-term effects. The ARDL approach enhances the precision and reliability of the results, addressing the gaps ignored by previous studies that have focused on short-term impacts.

LITERATURE REVIEW

Theoretically and empirically, the link between health financing and economic development is a complex and debated topic with both direct positive and indirect adverse effects. The endogenous growth model captures the direct positive nexus, while neoclassical and Keynesian economic theories emphasize indirect adverse effects. The endogenous growth model reveals that health is a crucial component of human capital. Improved healthcare services boost productivity, encourage investment in human capital, and drive inclusive growth. Key theorists such as Romer (1986) emphasize the central role of human capital in this process.

In contrast, neoclassical and Keynesian theories reveal that public expenditure on health has adverse effects. Tax increments to fund health investments reduce economic activity and well-being. According to Keynesian theory, life expectancy increases decrease aggregate demand, whereas the neoclassical paradigm, as exemplified by Solow (1956), links economic growth to savings and population, underscoring the role of human capital. Empirical studies on the impact of HEX and LIEX have yielded mixed results. Some studies show a positive nexus, others an inverse nexus, and others find ambiguous linkages. Table 1 summarizes the diverse methodologies and key findings of these studies.

Table 1: Empirical Studies

Authors	Scope	Methodology	Key Findings
Kunze (2014)	General scope	Econometric Analysis	Life expectancy impact economic growth.
Ngangue and Manfred (2015)	141 developing countries (2000-2013)	Generalized Method of Moments (GMM)	Life expectancy impact economic growth, though results varied by income level, being insignificant in middle-income countries.
Orisanwa (2015)	Nigeria (1995-2009)	Cointegration, Granger Causality Tests	Health expenditure positively impacts economic growth via life expectancy.
Ogunleye et al. (2017)	Nigeria (1981-2015)	Ordinary Least Square (OLS)	Inverse nexus between life expectancy and economic growth.
Bloom et al (2004)	31 countries	Empirical Analysis	Life expectancy reduces income inequality and improves economic growth.
WHO (2002)	General scope	Empirical Analysis	Increased health spending improves life expectancy and under-5 mortality, contributing to saving, investment, well-being, poverty reduction, and economic growth.

This table highlights the inconclusive nature of the relationship between health (life expectancy) and economic growth, indicating a need for further investigation.

THEORETICAL FRAMEWORK

Traditional growth theories emphasize inputs, such as labor, capital, and savings. However, the neoclassical model limits the effect of diminishing returns on health. Endogenous growth theory rejects this limitation by recognizing life expectancy as crucial for long-term economic growth. Lucas (1998) and subsequent empirical studies (Maddsen, 2012)

acknowledge health as a core driver of economic growth, treating human capital as fundamental to production. Health investments boost economic activities and reduce poverty, which Sen (1999) defines as capability deprivation. Improved health reduces deprivation and fosters economic development by enhancing human capital.

METHODOLOGY

Research Design

An *ex-post facto* research design was employed to assess the nexus between the HEX and economic development using the ARDL model. Unlike other linear models that do not solve the problem of endogeneity, this method addresses potential endogeneity issues common in time-series data.

The Data

The datasets were of a secondary nature, sourced from the World Bank Development Indicators (2023) and the National Bureau of Statistics (NBS) (2023) from 2000 to 2023. This study uniquely contributes to the literature on public healthcare expenditure and economic development by focusing on Nigeria from 2000 to 2023 (23 years period). This 23-year period allows for a longitudinal analysis of public health expenditure trends and economic development over a substantial period, capturing both short-term fluctuations and long-term trends. It also provides insights into the evolution of public health expenditure policies over time in response to economic change, crises, and governmental priorities. The study covers periods of significant health crises (Ebola outbreak between 2014-2016 and the COVID-19 pandemic), among others. The turn of the millennium in 2000 marked significant economic reforms in Nigeria, including the National Economic Empowerment and Development Strategy (NEEDS) in 2003, designed for poverty reduction, wealth creation, and sustainable and inclusive economic development.

Modeling

Conventionally, output growth in an economy is determined using the growth accounting equation, which aligns with Lucas's (1998) endogenous growth model and is supported by empirical findings (Acemoglu and Johnson, 2007; Maddsen, 2012). This equation incorporates labor, capital, and human capital, emphasizing the role of health and education as key drivers of productivity and long-term economic growth, and is expressed as

$GDPC = \beta + a_1A + a_2V + a_3Z + e$…… (Eq 1)

Where, A is the vector of variables explaining growth indicators (initial per capita income, gross capital formation, and labor force), V is the vector of variables affecting economic growth, Z is

the vector of control variables such as health expenditure, education expenditure, and e is the error term (see Omran and Bolbol 2003). To determine the magnitude and size of the health impact on economic growth from to 2000-2023 (Eq2) is expressed linearly in line (Eq.1)

$GDPC = \beta + a_1LIEX + a_2HEX + a_3EDU + a_4LOF + e$…… (Eq 2)

The ARDL is expressed as:

$GDPC_t = \beta_0 + \beta_iGDPC_{t-i} + \delta_iLIEX_{t-i} + \lambda_iHEX_{t-i} + \Upsilon_iEDU_{t-i} + \phi_iLOF_{t-i} + \varepsilon_t$ ……(Eq3)

$\Delta lnGDPC_t = \beta_0 + \beta_i\Delta lnGDPC_{t-i} + \delta_i\Delta lnLIEX_{-i} + \lambda_i\Delta lnHEX_{t-i} + \Upsilon_i\Delta lnEDU_{t-i} + \phi_i\Delta lnLOF_{t-i}$

$+ \lambda_1 lnGDPC_{t-1} + \lambda_2 lnLIEX_{t-1} + \lambda_3 lnHEX_{t-1} + \lambda_4 lnEDU_{t-1} + \lambda_5 lnLOF_{t-1} + \varepsilon_t$ …….. (Eq4)

Error Correction Model (ECM) Equations

$\Delta lnGDPC_t = \beta_0 + \beta_i\Delta lnGDPC_{t-i} + \delta_i\Delta lnLIEX_{t-i} + \lambda_i\Delta lnHEX_{t-i} + \Upsilon_i\Delta lnEDU_{t-i} + \phi_i\Delta lnLOF_{-i} +$

$\infty ECT_{t-1} + \varepsilon_t$ …… (5)

The ARDL bound test is expressed in (Eq3). The F-statistic value of the bound test was estimated to assess the presence of a long-run nexus among the variables, as prescribed by Pesaran et al. (2001). The values of the estimated F-statistics were compared to the upper and lower critical values.

The ECM captures the long-run nexus between variables; the coefficient indicates the speed of convergence to the long-run equilibrium from the short-run divergence due to shocks in the system. We expect the coefficient to be negative and significant following an external shock. The diagnostic test results include autoregressive conditional heteroscedasticity (ARCH), Breusch–Godfrey (BG) test for serial correlation, and Jargue–Bera (JB) test for normality.

Table 2: Variable Description and Role in the Study

Variable	Description	Role in the Study
GDPC	Per capita GDP (constant US$)	Measures economic performance
LIEX	Life expectancy at birth	Impacts economic growth positively and negatively correlate with poverty incidence.
HEX	Health expenditure as a % of GDP	Control variable
EDU	Education expenditure as a % of GDP	Control variable
CAP	Gross capital formation (proxy for capital)	Naturally impacts economic growth positively
LOF	Labour force (age 15+ years)	Naturally impacts economic growth positively
POV	% of the population below the poverty line.	Naturally impacts economic growth negatively
B	Constant	-
E	Error term	-
a_1-a_5	Coefficients (elasticities)	Measures changes in GDPC due to changes in explanatory variables

Source of data: World Bank Development Indicators (2023) and National Bureau of Statistics (NBS) (2023). Data from World Development Indicators were due to unavailability of some data used for this study at the country level; however, it is the most dependable source of data.

RESULTS AND DISCUSSION

The descriptive statistics results in Table 3 for the study variables provide crucial insights into the nexus between the HEX and economic development in Nigeria from 2000 to 2023. The mean LIEX in Nigeria is 50.65 years, with minor fluctuations. Negative skewness reveals improvements in public health expenditures, impacting economic development. The GDP per capita mean of $1904.237 showed substantial variability, with a standard deviation of 757.2528. Negative skewness reflects an increase in per capita GDP, boosting life expectancy and overall economic productivity. The mean value of 3.60% for health expenditure indicates the government's commitment to healthcare in recent years for better health outcomes, which, in turn, can stimulate economic development by creating a healthier workforce. The high mean value (92.69000%) for the percentage of the population below the poverty line underscores severe poverty issues in Nigeria, limiting access to healthcare and education and hindering human capital development and economic growth. The average education expenditure was significantly high, at 280.9020%, with considerable variability. Gross capital formation (mean 22.67499%) reflects the level of investment in physical assets. The labor force participation rate was fairly stable, with a mean of 58.97796% and low standard deviation. Negative skewness indicates relatively stable and consistent labor force participation over time. The series are largely platykurtic in nature (<3), except for health expenditures, which are mesocratic (3).

Table 3 Descriptive Statistics

	LIEX	GDPC	HEX	POV	EDU	CAP	LOF
Mean	50.65718	1904.237	3.602610	92.69000	280.9020	22.67499	58.97796
Median	51.15100	2074.614	3.420693	90.65000	325.1900	21.64707	60.22500
Maximum	52.91000	3200.953	5.053610	98.17000	646.7475	34.10954	60.41000
Minimum	47.19300	565.3060	2.490640	89.50000	39.88260	14.90391	55.27000
Std. Dev.	1.797836	757.2528	0.594286	3.590846	192.4120	6.512596	1.630485
Skewness	-0.513971	-0.413258	0.763746	0.635310	0.491283	0.255760	-0.857900
Kurtosis	2.017976	2.272049	3.424873	1.680437	2.088857	1.712309	2.526432
Jarque-Bera	1.852617	1.162499	2.199532	1.398218	1.571166	1.759818	3.036225
Probability	0.396013	0.559199	0.332949	0.497028	0.455854	0.414821	0.219125

Time-series data tend to be non-stationary, meaning that their statistical properties change over time and may lead to unreliable forecasts. To address this issue, we performed a unit root test to determine whether the series follows a stochastic trend and to avoid potential misspecifications before conducting the ARDL estimate, and all data were transformed into their logarithmic form.

Unit root test

The Augmented Dickey Fuller (ADF) unit root results in Table 4 show that the series are stationary at first difference I (1) and level I (0). The mixed stationarity properties of the series provide our ARDL model with the creditability to test for cointegration. Thus, to meet the Gauss-Markov conditions for an unbiased estimation,

Table 4: ADF Unit Root Test

Variables	ADF Test Statistics	0.05% Critical Value	Order of Integration	Remark
LIEX	-6.398	-3.673	I (1)	Stationary
GDPC	-4.032	-3.644	I (0)	
HEX	-5.758	-3.673	I (1)	
POV	- 5.810	-3.673	I (1)	
EDU	-5.424	-3.673	I (1)	
CAP	- 8.970298	-3.673	I (1)	
LOF	-7.241	-3.644	I (0)	

Cointegration Analysis

The long- and short-run cointegrating nexus effects between HEX and economic development were assessed, and the results are presented in Table 5, along with the ARDL bound test. If the calculated ARDL F-statistic bound test exceeds the upper critical bound, cointegration is established; if it is below the lower critical bound (LCB), cointegration is not established.

Table 5: ARDL Bound Test Results

Panel A: F-Bounds test					
ARDL model		(2,0,1,1,0,0)			
Test statistic		Value	Signif.	I(0)	I (1)
F-Statistics		7.311031	10%	2.407	3.517
K		7	5%	2.910	4.193**
			1%	4.134	5.761
Panel B: ARDL Long Run Results					
Variables DP = GDPC	Model	Coefficient	Std.Error	T-statistics	Prob.
C	(2,0,1,1,0,0)	7.9104	1.03547	7.6395	0.000**
LIEX		0.6349	0.10849	5.8528	0.0003**
HEX		0.6811	0.1352	5.0373	0.0001**
POV		-0.1837	0.7170	-0.256	0.4352
EDU		0.1070	0.3410	0.3139	0.3802
CAP		0.6068	0.3166	1.9164	0.0876
LOF		0.0613	0.0194	3.1522	0.0117

Other Parament Estimate				
R^2	Adjusted R^2	F-stat	DW	Prob (F-statistics)
0.99	0.99	578.632	2.01	0.000
Panel C: Diagnostic Tests: The probability values of the F-statistics				
BG LM Test	BPG heteroskedasticity Test		Heteroskedasticity ARCH test (1)	
0.65	0.64		0.47	

Note: *** significance at the 5% level.

Table 6: Short Run Error Correction Estimation (ECM) Model

COINTEQ*	-0.727	0.1246	-5.8362	0.0000**
LIEX	-0.606	0.1641	-3.6963	0.0022
HEX	0.057	0.0247	2.3037	0.0360
CAP	0.011	0.0059	2.0284	0.0607

Note: *** significance at the 5% level.

The results reported in Table 5, panel A of the ARDL bound test indicate a significant long-run cointegrating nexus between HEX and economic development in Nigeria, with an F-statistic of 7.311. This reveals that changes in governmental health expenditures have a long-term impact on economic development. The long-run results in Panel B support this finding, showing significant coefficients that demonstrate a robust link between the HEX and economic development. Specifically, the HEX influences economic development by 0.68%, underscoring the importance of investing in healthcare infrastructure. This investment enhances human capital and workforce productivity, and fosters economic development and growth. The management of the HIV/AIDS epidemic and the Ebola outbreak in Nigeria demonstrates significant public health responses, and the COVID-19 pandemic further underscores the critical role of sustained health investments in mitigating economic disruptions. These findings are consistent with those of Kunze (2014), Onisanwa (2014), Atake (2018) and Piabou and Tieguhong (2017).

Life expectancy increases economic development by 0.63%, indicating that improvements in life expectancy reflect better healthcare services, which in turn enhance workforce productivity and significantly contribute to economic growth. This finding aligns with endogenous growth theory, which posits that health is a vital component of human capital.

The negative but non-significant impact of poverty on economic development (-0.183%) reveals deep-rooted structural issues such as high-income inequality and an inelastic economic response to poverty changes. This finding implies that the other factors are more influential in

driving economic growth. This effect is consistent with the positions of Omoniyi (2018) and the World Bank (2019).

The positive coefficient (0.107) of educational expenditure indicates that the quality and efficiency of educational expenditure are more critical than the amount spent. Improved educational quality leads to a better skilled workforce, contributing to economic development and growth.

The positive coefficient (0.06) for gross capital formation indicates that investments in physical assets such as economic and healthcare infrastructure significantly contribute to economic development. This finding aligns with both endogenous and neoclassical growth theories, which emphasize the importance of capital formation in driving economic growth. Similarly, the labor force coefficient (0.06) indicates that effective population growth management and increased labor force participation positively, albeit modestly, impact economic development.

The Keynesian theory captures the indirect and adverse effects of public expenditure on economic growth, suggesting that tax increases to fund health investments reduce aggregate demand and economic activity. However, the significant positive impact of health expenditure indicates that well-targeted public health investments can mitigate these adverse effects and stimulate long-term economic growth. The ECM results in Table 6 reveal the speed of convergence (-0.727) from short-run disequilibrium back to long-run equilibrium at the 72% level annually, with the ECM results being correctly signed, negative, and significant.

THEORETICAL LINKAGES AND STRUCTURAL ISSUES

The long-run results and theoretical linkages emphasize the complex interplay between HEX, human capital, and economic development. The significant positive impacts of HEX and LIEX on economic growth underscore the critical role of health care investment in fostering sustainable development. These findings align with endogenous growth theory, highlighting the importance of human capital while acknowledging the indirect effects captured by neoclassical and Keynesian economic theories. Addressing structural issues such as poverty and income inequality, improving education quality, and maintaining robust investments in physical and human capital are essential for sustained economic growth in Nigeria.

CONTRIBUTION TO LITERATURE

Existing studies on the link between health financing and economic development in Nigeria have yielded mixed results. Sharma (2018) and Bloom et al. (2018) reported no significant nexus, whereas Sede and Ohemeng (2015) and Serag et al. (2019) found a non-

linear nexus. This inconsistency indicates a gap in the understanding of the exact dynamics between health expenditure and economic development. Previous studies have primarily focused on the direct nexus between health expenditure and economic growth without considering broader contexts, such as the impact of poverty reduction and the role of life expectancy as a more accurate health indicator. These studies predominantly used static models such as Ordinary Least Squares (OLS), which are inadequate for capturing both short- and long-term effects. Failure to account for endogeneity and the dynamic nature of the data limits the reliability of these findings. Most existing studies do not simultaneously consider the long- and short-term impacts of health expenditures on economic growth, leading to an incomplete understanding of the nexus.

This study employed the ARDL approach to assess both short- and long-term effects, addressing the limitations of static models. This approach improves the precision and reliability of the results by considering the dynamic nature of the data and endogeneity problem. By focusing on the period from 2000 to 2023, this study captures significant economic reforms, demographic changes, and major health crises, providing a comprehensive analysis of the health-economic growth relationship in Nigeria. Unlike previous studies that primarily used health expenditure as a proxy for human capital, this study emphasizes life expectancy as a more direct and accurate indicator of health outcomes and their implications for economic growth. The integration of the role of poverty reduction in the health-economic growth dynamic reveals that improvements in healthcare significantly reduce poverty levels and enhance economic development. This study provides empirical evidence on how major health crises, such as the Ebola outbreak and the COVID-19 pandemic, impact public health expenditure and economic development, stressing the importance of sustained health investments. This study fills critical gaps in the literature by providing a robust and comprehensive analysis of the relationship between public health expenditure and economic development in Nigeria.

CONCLUSION AND POLICY RECOMMENDATIONS

This study explores the nexus between HEX and economic development in Nigeria, proposing that life expectancy positively influences economic growth and is contingent on macroeconomic conditions, particularly poverty levels. Given the significant and positive influence of HEX on economic development in Nigeria, this study recommends an increase in healthcare system infrastructure and service investment by funding hospitals, clinics, medical equipment, and training for healthcare professionals. The positive and significant impact of LIEX on economic development underscores the importance of improving health care services. This study recommends focusing on preventive healthcare, vaccination programs, and addressing

critical health issues, such as maternal and child health, to boost life expectancy. The non-significant impact of poverty on economic development reveals structural issues such as income inequality. This study recommends the implementation of targeted poverty alleviation programs that include healthcare access for the poor to mitigate the indirect effects of poverty on economic growth. The positive impact of educational expenditure reveals the need to enhance the quality and efficiency of education through investments in teacher training, curriculum development, and educational infrastructure to produce a skilled and productive workforce.

The positive gross capital formation nexus reveals the need for investments in physical assets, including healthcare infrastructure, to significantly drive economic development. The government should incentivize private and public investments in this sector through tax breaks, subsidies, and public-private partnerships. This study recommends policies that promote effective population growth management and increase labor force participation, such as family planning programs and labor market reforms, which can have modest but positive impacts on economic development. This study highlights the critical role of health investments during major health crises such as the Ebola outbreak and the COVID-19 pandemic. The government should develop contingency funds and strategic plans to ensure sustained healthcare funding during emergencies and to mitigate economic disruptions. By implementing these policy recommendations, Nigeria can enhance its economic development trajectory through strategic investments in healthcare and human capital, while addressing underlying structural issues and preparing for future health challenges. For further research, this study recommends a comparative study of Nigeria's healthcare and economic performance with other countries facing similar challenges. Exploring regional disparities in healthcare access and economic development in Nigeria using longitudinal analysis. By addressing these areas, future studies can deepen the understanding of the healthcare-economic development nexus in Nigeria and inform targeted policy interventions for sustainable development.

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