Financial Sector Development and Health Outcomes in Nigeria: A Causality Approach

Ibrahim Samaila[1] Esho Olusegun[2], and Olorunfemi Yasiru Alimi[3]

[1]Central Bank of Nigeria, Ibadan, Nigeria
[2] Federal school of Statistics, National Bureau of Statistics, Ibadan, Oyo, Nigeria
[3]Lead City University, 200255, Ibadan, Oyo State, Nigeria

E-mail: *adms4real@gmail.com; alimi.olorunfemi@lcu.edu.ng*

Abstract

This study investigates the causal relationship between financial sector development and health outcomes in Nigeria from 1985 to 2022, employing a Granger causality approach. The analysis focuses on key variables, including life expectancy (LEXP), under-five mortality (UN5M), liquidity ratio (LR), domestic credit to the private sector (DCPS), monetary policy rate (MPR), and loan-to-deposit ratio (LDR). The results reveal a unidirectional causal relationship, where under-five mortality Granger causes life expectancy, but not vice versa. This underscores the critical role of targeted child survival interventions in achieving long-term improvements in population health. Furthermore, short-term fluctuations in key financial indicators, liquidity ratio, domestic credit, and monetary policy rate, do not exhibit a significant causal effect on under-five mortality, suggesting that transient financial measures are insufficient to address health outcomes. A pivotal finding is the significant Granger causality from under-five mortality to government development expenditure, indicating that rising child mortality rates precipitate increased public spending. This reactive pattern highlights the necessity for proactive, rather than responsive fiscal policy actions. As a result, the study recommends sustained investment in child healthcare, flexible and adaptive health crisis responses, long-term strategic planning, and robust cross-sectoral collaboration to effectively address the interconnected challenges within Nigeria's health and economic sectors.

Keywords: Financial sector development, health outcomes, life expectancy, under-five mortality, Granger causality, Nigeria

1. Introduction

In recent decades, the interplay between financial sector development and health outcomes has become a subject of increasing importance in the global discourse on public policy. As nations strive to achieve sustainable development goals, understanding the intricate relationships between different sectors of the economy and their impact on public health becomes imperative. Nigeria, as one of the largest economies in Africa, provides a compelling context for exploring these connections.

Several studies have investigated the impact of public health expenditure on health outcomes, particularly infant mortality, maternal mortality, life expectancy, and disease-specific mortality rates such as those related to Malaria and HIV/AIDS. For instance, Novignon and Lawanson (2017) found that public healthcare expenditure is positively and significantly related to infant mortality, under-five mortality, and neonatal mortality in Nigeria. Conversely, Yaqub, Ojapinwa, & Yussuff (2012) found that public health expenditure in Nigeria had a negative effect on health outcomes when governance indicators, such as corruption, were included in the analysis.

Moreover, Ogunjimi (2019) examined the relationship among health expenditure, health outcomes, and economic growth in Nigeria for the period between 1981 and 2017, using the Toda-Yamamoto causality framework, and found a unidirectional causality running from health expenditure to infant mortality, and a unidirectional causal relationship running from real GDP to health expenditure. These findings suggest that increasing government health expenditure in Nigeria may contribute to improved health outcomes and the general welfare of the people.

Understanding the causal pathways between financial sector development and health outcomes is crucial for formulating evidence-based policies that address the complex challenges facing Nigeria's healthcare system. This study employs a causality approach to discern the direction and nature of the relationship between financial sector development and health outcomes, shedding light on potential policy interventions that could foster positive synergies between these two critical domains.

This paper contributes to the existing literature by investigating the causal relationship between financial sector development and health outcomes in Nigeria. Financial sector development encompasses various dimensions, including the depth and efficiency of financial markets, the extent of financial inclusion, and the effectiveness of financial intermediation. Health outcomes, on the other hand, encompass a wide array of indicators, ranging from basic measures such as life expectancy and infant mortality to more nuanced aspects such as healthcare accessibility and disease prevalence.

The remainder of this paper is organized as follows: Section 2 provides a conceptual review and review of existing theories on the relationship between financial sector development and health outcomes; Section 3 outlines the data and methodology used in this study; Section 4 presents the findings; and Section 5 concludes with policy implications and avenues for future research.

2. Literature Review

Financial sector development refers to the enhancement and advancement of the financial system within an economy. One potential approach involves augmenting the supply of financial assets within the economy and establishing a competent and efficient intermediation mechanism. This strategy aims to boost the overall well-being of individuals in society and foster economic growth. The government frequently enhances its financial system by intervention, achieved by the promulgation of laws, rules, and policies. The primary focus of financial policies centers on the advancement of a nation's financial sector[1]. Therefore, a well-developed financial system is considered to be a driving force behind economic advancements and development.

Health outcomes refer to the measurable effects on individuals or populations resulting from healthcare interventions, policies, or other factors that influence health. These outcomes can encompass a wide range of dimensions, including physical health, mental well-being, mortality rates, disease prevalence, quality of life, and healthcare utilization. For this study emphasis will be placed on life expectancy and infant mortality rate as they are used to proxy health outcomes.

Life expectancy is a critical indicator of a population's overall health and well-being. It measures the average number of years a person can expect to live from birth, assuming current mortality rates remain constant. This metric is an essential tool for assessing the overall health of a nation and understanding the effectiveness of its healthcare system. In the year 2023, the life expectancy in Nigeria was approximately 61.79 years. To be more precise, the statistic indicated a life expectancy of 60 years for males and 64 years for females. The life expectancy at birth in Nigeria is comparatively low, both within the African continent and globally. Several factors influence life expectancy, including access to healthcare, socio-economic conditions, lifestyle choices, and genetics. In developed countries with robust healthcare systems, access to quality medical care, disease prevention measures, and advancements in medical technology contribute to longer life expectancies. On the other hand, in developing countries with limited access to healthcare and higher rates of infectious diseases, life expectancy tends to be lower.

Efforts to improve life expectancy often involve addressing social determinants of health, such as poverty, education, and nutrition. Public health interventions, vaccination programs, and initiatives to reduce smoking and alcohol consumption have also played significant roles in increasing life expectancy worldwide. Additionally, advancements in medical research and healthcare delivery have led to longer, healthier lives for many individuals. While life expectancy has generally been increasing globally, disparities still exist within and between countries. Addressing these disparities requires a multifaceted approach that considers not only healthcare but also broader social and economic factors that impact health outcomes.

Infant mortality rate (IMR) is another crucial indicator of a nation's health outcomes, specifically focusing on the well-being of its youngest citizens. IMR measures the number of infants who die before their first birthday per 1,000 live births in a given year. A low IMR is a sign of a healthy population, as it indicates that infants are surviving their critical early months of life. As of 2023, the infant mortality rate in Nigeria was measured at 55.17 per 1,000 live births. This indicates that the infant mortality rate was approximately 55 fatalities per 1,000 live births for infants under the age of one year. In Africa, there is a relatively high rate of child mortality. IMR is strongly linked to the quality and

accessibility of maternal and child healthcare services, as well as broader socio-economic factors. Adequate prenatal care, skilled birth attendants, access to clean water and sanitation, and vaccinations all contribute to reducing infant mortality. Additionally, efforts to improve maternal health and nutrition play a significant role, as healthier mothers are more likely to have healthier babies. Reductions in IMR are often seen as a marker of a country's progress in healthcare and social development. Public health initiatives, like immunization campaigns and education on safe infant care practices, have been successful in driving down IMR in many parts of the world. International organizations and governments have also worked together to improve access to healthcare in underserved areas and address preventable causes of infant mortality, such as infectious diseases and malnutrition.

Despite global progress, significant disparities persist in infant mortality rates, both between and within countries. Addressing these disparities requires a comprehensive approach that includes improving access to healthcare, reducing poverty and inequality, and promoting education and awareness about maternal and child health. Efforts to reduce IMR are essential for ensuring that every child can grow and thrive (Leigh-Hun et al., 2017; Nutbeam, McGill, & Premkumar, 2018; Michou, Panagiotakos, & Costarelli, 2018).

The Bismarck health care finance model is characterized by its adoption of a social insurance framework. In the present paradigm, the provision of healthcare services is financed by means of contributions made to a health fund. According to Gitobu., Gichangi, & Mwanda (2018) the primary source of contributions commonly stems from the payroll, wherein both the employer and employee allocate a proportionate amount of their respective salaries. Social insurance plans have significant potential for delivering efficient risk protection, particularly within nations with high income levels. The primary drawbacks associated with social health insurance models arise from their limited coverage, particularly in low-income nations where these models predominantly cater to formal sector employees and simply aggregate the health risks of scheme members. The implementation of social health insurance necessitates the presence of sufficient fiscal capacity within the government, as well as widespread acceptability among the population. Similar to taxes, social health insurance encounters some

challenges that diminish its efficacy in terms of tax collection. Additionally, contributions to social health insurance by employers increase the cost of labour and may lead to increases in unemployment levels (Kabia et al., 2019). According to Fenny, Yates, & Thompson (2018), Tanzania (17%) and Kenya (11%) are among the countries with the largest coverage of social health insurance schemes.

The Income and Expenditure Theory, which focuses on the relationships between aggregate income and total expenditures in an economy, can be applied to the intersection of financial sector development and health outcomes. In the context of healthcare, financial sector development plays a crucial role in shaping the income and expenditure dynamics related to health services. As the financial sector evolves and becomes more sophisticated, it facilitates income growth through mechanisms such as increased access to credit, investments in health infrastructure, and the expansion of health-related industries. This income growth can positively impact individual and household spending on healthcare, leading to improved access to medical services, preventive measures, and overall better health outcomes. Moreover, the Income and Expenditure Theory's multiplier effect is relevant in the context of financial sector development and health outcomes. A well-developed financial sector can contribute to increased income not only through direct investments in health but also through the creation of employment opportunities and the expansion of economic activities related to healthcare. This, in turn, can trigger a multiplier effect, where the initial financial investments in health lead to subsequent rounds of spending, job creation, and income growth. The resulting positive feedback loop can contribute to sustainable improvements in health outcomes as communities benefit from increased resources for healthcare services and infrastructure. In summary, financial sector development, guided by the principles of the Income and Expenditure Theory, can foster economic growth, increase income, and positively influence health outcomes by enhancing the capacity of individuals and communities to invest in their well-being.

The Grossman model of health investment posits that individuals make rational decisions about their health by investing in medical care and health-related activities. This economic theory, developed by Michael Grossman, views health as a form of capital that can be improved

through investments in health-enhancing activities and medical care. In the context of financial sector development and health outcomes, the Grossman model suggests that a well-functioning financial sector plays a crucial role in facilitating individuals' ability to make optimal health investments. Access to credit, insurance mechanisms, and financial instruments can empower individuals to allocate resources efficiently, enabling them to make investments in preventive measures, medical care, and a healthier lifestyle.

Financial sector development enhances the Grossman model's applicability by providing individuals with the means to make informed health investments. For example, improved financial literacy, coupled with accessible financial services, allows individuals to plan for and afford health-enhancing activities. Additionally, the availability of health insurance and other risk-mitigation tools within a well-developed financial sector can protect individuals from the financial burden of unexpected health expenses. As a result, the Grossman model suggests that a symbiotic relationship exists between financial sector development and health outcomes, where a robust financial sector empowers individuals to make effective health investments, leading to improved overall health and well-being.

Grossman developed a model for good health in 1972, and health has been treated as a durable capital stock. According to Grossman, healthy days are said to have been born out of health stock, where utility is said to have been gained both directly because it allows for the enjoyment of good health (via consumption commodity) and indirectly because it allows for time to be expended on other market as well as non-market activities (via individual commodity). As Grossman enforces two constraints, it is assumed that individuals maximize the utility they derive from consumption. First, such time constraints that establish time in a specified period has to be allotted to investment, consumption, or wage generation. An increase in sick days reduces the amount of time available for actions. Second, income constraints should represent the real cost of time spent on consumption or some levels of investment rather than wage generation, which is a maximization issue.

In the field of research that explores the relationship between financial sector development and health outcomes, several noteworthy gaps

persist in the current body of knowledge. The presence of these gaps highlights the importance of the proposed study and demonstrates the unique contributions it aims to provide. One notable deficiency in the existing body of literature is the lack of a comprehensive health outcome indicator that encompasses several dimensions of a country's health status. While previous research frequently examines individual health indicators separately, the current study aims to address this limitation by developing a comprehensive health outcome score that incorporates many variables. This index aims to integrate key health indicators, namely life expectancy and child survival rate. This comprehensive metric will provide a more intricate and comprehensive viewpoint on the overall health condition of Nigeria, illuminating the varied aspects of health outcomes.

Furthermore, it is worth noting that although there exist a considerable amount of scholarly literature investigating the overarching connection between economic development and health outcomes, there is a dearth of research that delves into the specific impact of the financial sector on influencing health outcomes, particularly in emerging nations such as Nigeria. Moreover, prior scholarly investigations have frequently demonstrated correlations between economic development and health outcomes. However, these studies have not extensively explored the underlying mechanisms and routes by which the expansion of the financial sector affects health. The objective of this study is to investigate the complex connections between financial sector development and health, specifically focusing on the precise causal interconnections and mechanisms that influence the impact. Gaining a more profound comprehension will facilitate the development of a comprehensive viewpoint about the interplay between these two areas.

The literature lacks sufficient analysis of policy alignment and cooperation between the financial and healthcare sectors. The present study aims to fill this research vacuum by evaluating the degree of synergy, or the absence thereof, in current policies. The objective of this study is to comprehend the influence of these policies on the relationship between economic growth and health outcomes, thereby enhancing our comprehension of the policy environment in Nigeria.

3. Data and Methodology

This study investigates the causal links between financial sector development and health outcomes in Nigeria between 1985 and 2022. This scope was selected because it falls under the period of financial sector reforms in Nigeria when the government of Nigeria has been emphasizing that banks increase their provision for credit to the private sector. Moreover, the study intends to cognizance of the post-structural period were health sector reforms takes a full shape in Nigeria. Data was sourced from the Central Bank of Nigeria (CBN) statistical bulletin and Word development Indicators (WDI, 2022). The description and measurement of the variables are presented in Table 1.

Table 1: Variable description and measurement

Variable	Signs	Description	Measurement
Health Outcomes			
Under-Five Mortality Rate	un5m	Probability of a child dying before reaching the age of five	Per 1,000 live births
Life Expectancy at Birth	lexp	Average number of years a newborn is expected to live	Years
Financial Development indicators			
Liquidity Ratio	lr	Ratio of banks' liquid assets to their total deposits	Percentage (%)
Domestic Credit to Private Sector	dcps	Financial resources provided to the private sector by financial corporations	% of GDP
Loan-to-Deposit Ratio	ldr	Measures a bank's liquidity by dividing its total loans by its total deposits	Percentage (%)
Monetary Policy Rate	mpr	Central Bank's benchmark interest rate	Percentage (%)

3.2 Model Specification

To examine the dynamic interactions between the variables, a Vector Autoregression (VAR) model is adopted. The general form of the VAR model with two variables, X_t and Y_t, is specified as:

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$$X_t = \alpha_1 + \sum_{i=1}^{p} \beta_{1i} X_{t-i} + \sum_{i=1}^{p} \gamma_{1i} Y_{t-i} + \epsilon_{1t}$$

$$Y_t = \alpha_2 + \sum_{i=1}^{p} \beta_{2i} X_{t-i} + \sum_{i=1}^{p} \gamma_{2i} Y_{t-i} + \epsilon_{2t}$$

Where: α is the constant term; p is the optimal lag length; β and γ are the coefficients to be estimated; ϵ_t is the white noise error term.

Within this VAR framework, the Granger causality test is conducted. The core principle is that if the past values of a variable Y help predict the current value of another variable X, then Y is said to Granger cause X.

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4. Result and Discussion of Findings

4.1 Summary statistics

Table 2 summarizes key statistics from the preliminary study, providing details on the mean, standard deviation, skewness, and kurtosis of the variables used to investigate the relationship between the financial sector and health outcomes in Nigeria. According to the table, the average life expectancy in Nigeria is 48.84 years, and the under-5 mortality rate is 164.65 per 1,000 live births. The maximum values for life expectancy and under-5 mortality rate are 52.91 years and 209.6 live births, while the minimum values are 45.49 years and 110.8 per 1,000 live births, indicating relatively low health outcomes in the country. Examining monetary policy rate, the result shows that the average rate for the monetary policy rate is 13.62%. The highest value for this rate is 26% while the lowest value is 6%, respectively. Regarding the average liquidity ratio, loan-to-deposit ratio, and domestic credit to the private sector as a percentage of GDP are 49.16%, 65.89%, and 12.14%, respectively. Their maximum values are 104.2%, 96.82%, and 22.76%, while their minimum values are 26.39%, 37.56%, and 5.81%, respectively.

Table 2: Descriptive statistics

Signs	Mean	Std Dev.	Max.	Min.	Kurtosis	Skewness	Jarque-Bera	Prob.
un5m	164.65	36.641	209.6	110.8	1.3911	-0.0276	4.103	0.129
lexp	48.839	2.7743	52.91	45.487	1.379	0.1427	4.290	0.117
lr	49.155	14.856	104.20	26.393	6.506	1.4883	33.493	0.000
dcps	12.143	5.663	22.755	5.806	1.439	0.4564	5.176	0.075
mpr	13.618	3.737	26.000	6.000	4.994	0.7850	10.195	0.006
ldr	65.886	13.172	96.817	37.560	2.832	-0.0287	0.0502	0.975

Note: Std. Dev. - standard deviation; Max. - maximum; Min. - minimum; Prob. - probability; Observation is 38.
Source: Authors' computation (2024).

Moreover, a skewness of 0 in a normal distribution signifies the symmetry of the series around its mean. Positive skewness indicates a

long right tail, while negative skewness suggests a long left tail. In Table 2, it was observed that all variables, except under-5 mortality rate, and loan-to-deposit ratio, exhibit positive skewness, implying the presence of long right tails in their distributions.

Kurtosis measures the distribution's peakness or flatness. A kurtosis greater than three indicates peaked or leptokurtic behaviour, while a kurtosis less than three suggests flat or platykurtic behaviour relative to a normal distribution. In the presented findings, only liquidity ratio has kurtosis value exceeding three, indicating they are peaked or leptokurtic. The other variables have kurtosis values below three, signifying flatness or platykurtic tendencies. The Jarque-Bera statistics further support that these variables are not normally distributed.

4.2 Correlation analysis

Table 3 illustrates the results of the correlation analysis conducted on the variables, shedding light on the interplay between financial sector development and health outcomes in Nigeria. The coefficients provide insights into the extent of the relationships between different factors. In line with the findings presented in Table 2, monetary policy rate, treasury bill rate, exhibit negative correlations with life expectancy and positive associations with under-5 mortality rate.

Table 3: Correlation analysis

	un5m	*lexp*	*lr*	*dcps*	*mpr*	*ldr*
un5m	1					
lexp	-0.9906	1				
lr	-0.3127	0.3245	1			
dcps	-0.8689	0.8887	0.0528	1		
mpr	0.3866	-0.3830	0.0631	-0.3940	1	
ldr	0.1131	-0.1280	-0.0720	-0.1308	-0.3230	1

Source: Authors' computation (2024).

Turning to liquidity ratio and domestic credit to the private sector as a percentage of GDP the results show positive correlations with life expectancy but are negatively associated with under-5 mortality rate. The loan-to-deposit ratio exhibits an indirect correlation with life expectancy while directly correlating with child mortality.

4.3 Granger causality test results

Following the Table 4, the Granger causality results provide valuable insights into the dynamic relationships between key economic indicators of the financial sector development and health outcomes in Nigeria. The analysis focused on variables such as life expectancy (LEXP), under-five mortality (UN5M), liquidity ratio (LR), domestic credit to private sector (DCPS), monetary policy rate (MPR), and loan-to-deposit ratio (LDR) over the period from 1985 to 2022.

Table 4: Granger casualty test

Dependent variables	Independent variables					
	un5m	lexp	lr	dcps	mpr	ldr
un5m		2.399*	0.8642	0.3153	0.7459	0.0795
lexp	8.246***		0.6182	0.0191	3.3957	0.8211
lr	0.6469	1.1903		1.8271	1.2659	1.1616
dcps	12.317***	8.5092***	1.7583		2.1212	0.1719
mpr	1.8106	1.7506	0.4676	4.3430**		0.5766
ldr	0.3899	0.1659	0.4557	1.1711	0.7749	

Source: Authors' computation (2024).

There is no significant Granger causality from life expectancy (LEXP) to under-five mortality (UN5M). The life expectancy at a given point does not significantly predict the under-five mortality rates in the subsequent period. This implies that policies aimed at improving life expectancy may not have an immediate impact on reducing under-five mortality. A broader set of health interventions and targeted measures may be needed to address child health specifically. The results revealed a significant Granger causality from under-five mortality (UN5M) to life expectancy (LEXP). Changes in under-five mortality rates influence life expectancy in the subsequent period. This implies that improvements in child health, as reflected in reduced under-five mortality, contribute positively to overall life expectancy. Investments

in healthcare, nutrition, and sanitation for children can lead to long-term gains in life expectancy.

The results show there is no significant Granger causality from liquidity ratio (LR) to under-five mortality (UN5M). Liquidity ratio does not significantly impact under-five mortality rates in the short term. This implies that short-term changes in borrowing costs or lending practices in the financial sector may not have an immediate effect on child mortality. Other factors, such as healthcare infrastructure and social determinants, may play a more significant role. Similarly, the results shows that there is no significant Granger causality from under-five mortality (UN5M) to liquidity ratio (LR). Under-five mortality rates do not significantly predict changes in lending rates in subsequent periods. This implies that child mortality trends may not be strong indicators for short-term changes in monetary policy.

The result shows there is no significant Granger causality from domestic credit to private sector (DCPS) to under-five mortality (UN5M). Government spending on development does not significantly influence under-five mortality rates in the short term. This implies that immediate increases in government development spending may not lead to immediate improvements in child health outcomes. The result shows there is significant Granger causality from under-five mortality (UN5M) to domestic credit to private sector (DCPS). High under-five mortality rates predict increased government development spending in subsequent periods. This implies that child health crises may trigger government responses in the form of increased spending on development projects, potentially focusing on healthcare infrastructure and services.

From Table 4, there is no significant Granger causality from monetary policy rate (MPR) to under-five mortality (UN5M). Short-term changes in the monetary policy rate do not significantly impact under-five mortality rates. This implies that monetary policy adjustments, such as interest rate changes, may not have immediate effects on child mortality. The relationship between financial policies and health outcomes may be more complex and longer-term. The result shows there is no significant Granger causality from under-five mortality (UN5M) to monetary policy rate (MPR). Changes in under-five mortality rates does

not predict subsequent changes in the monetary policy rate. This implies that child mortality trends may not be considered immediate factors in shaping monetary policy decisions. Policymakers may prioritize broader economic indicators.

There is no significant Granger causality from loan-to-deposit ratio (LDR) to under-five mortality (UN5M). Short-term changes in the loan-to-deposit ratio do not significantly affect under-five mortality rates. This implies that banking sector dynamics, as indicated by the LDR, may not have an immediate impact on child mortality. Other factors, such as healthcare access and quality, could be more critical. There is no significant Granger causality from under-five mortality (UN5M) to loan-to-deposit ratio (LDR). Changes in under-five mortality rates do not predict subsequent changes in the loan-to-deposit ratio. This implies that child health outcomes may not be strong indicators for short-term changes in banking sector practices. In cases where Granger causality was not established, it suggests that there is no clear temporal precedence between the variables, and one variable does not reliably predict changes in the other, making it challenging to draw direct policy recommendations based on these relationships.

5. Conclusion

This study investigates the causal links between financial sector development and health outcomes in Nigeria using a Granger causality approach. The analysis spanning the years 1985 to 2022 revealed nuanced relationships among key variables, including life expectancy, under-five mortality, liquidity ratio, domestic credit to private sector, monetary policy rate, and loan-to-deposit ratio. While the study found no significant Granger causality from life expectancy to under-five mortality, it highlighted a meaningful reverse causality, emphasizing the critical role of targeted interventions in child health for achieving long-term improvements in overall life expectancy. The absence of immediate impacts from short-term changes in lending rates, government development expenditure, and monetary policy rates on under-five mortality underscores the need for sustained investments and comprehensive health policies.

A notable discovery is the significant Granger causality from under-five mortality to government development expenditure, suggesting that

periods of high child mortality rates prompt subsequent increases in government spending on development projects. This underscores the importance of a flexible and responsive approach to address health crises affecting children. The outcomes emphasize the complexity of the relationships between financial indicators and health outcomes, urging policymakers to adopt an integrated and multifaceted policy framework. Recommendations include sustained investments in child health, flexible responses to health crises, long-term planning for sustainable development, and cross-sector collaboration. These recommendations are crafted to guide policymakers toward fostering holistic and impactful development strategies in Nigeria.

As the global community continues to grapple with challenges at the intersection of health and economics, this study contributes valuable insights to the ongoing discourse. The findings underscore the need for adaptive and integrated policy approaches that consider the diverse factors shaping the health and economic landscape. Future research endeavours should delve deeper into these complex relationships, considering additional variables and exploring potential causal pathways to further enrich our understanding of the intertwined nature of financial sector development and health outcomes.

The policy recommendations based on the findings are: (a) Government should prioritize sustained investments in child health, including healthcare infrastructure, nutrition programs, and vaccination initiatives. Given the observed Granger causality from under-five mortality to government development expenditure, targeted efforts to reduce child mortality can trigger increased government spending on development projects. (b) Government should develop flexible and responsive strategies to address health crises, particularly those impacting children. The significant Granger causality from under-five mortality to government development expenditure suggests that periods of high child mortality rates may necessitate rapid increases in government spending on healthcare and related sectors. (c) Government should adopt a long-term planning perspective for sustainable development. While immediate changes in economic indicators may not have a direct impact on child health outcomes, sustained investments and policy measures aimed at improving overall societal well-being can lead to positive outcomes over time. (d) Government

should encourage collaboration across sectors, including finance, health, and education. Cross-sectoral partnerships can enhance the effectiveness of policies and programs, addressing the complex web of factors influencing health and economic outcomes.

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