Health Outcome, Labour Participation and Economic Growth in Nigeria

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Abstract- ***This study examined the effect of health outcome and labour participation on economic growth in Nigeria from 1982–2023. The data used in this study were obtained from the Central Bank of Nigeria Statistical Bulletin (2023) and World Development Indicators (2023). These comprise annual data of the following variables: Gross Domestic Product Growth Rate, which serves as the dependent variable, while Life Expectancy at Birth, Government Expenditure on Health, Labour Participation Rate and Gross Fixed Capital Formation serve as the independent variables. The test statistic used in the analysis was the Auto-Regressive Distributed Lag (ARDL) model. The results showed that Life Expectancy at Birth has a positive but insignificant relationship with economic growth in Nigeria, while Government Expenditure on Health, Labour Participation Rate and Gross Fixed Capital Formation have negative relationships with economic growth, with only Government Expenditure on Health being statistically significant. The study concluded that although health outcome and labour participation remain critical drivers of economic performance, the findings reflect structural weaknesses and persistent inefficiencies in N igeria's health system, labour market and capital investment processes. It was recommended that government should intensify efforts toward improving public health infrastructure in order to enhance labour productivity; ensure transparency and efficiency in health spending so as to achieve growth-enhancing outcomes; promote skill development and job creation to improve labour participation; and strengthen the investment climate to enhance productive capital formation and stimulate long-term economic growth.***

Keywords: Health Outcome, Government Expenditure on Health, Labour Participation Rate, Life Expectancy at Birth, Gross Fixed Capital Formation, Economic Growth.

I. INTRODUCTION

1.1 Background to the Study

Nigeria is widely described as the "giant of Africa," not only because of its large population but also due to its abundant natural resources, sizeable labour force, and economic potential (UNDP, 2019). These attributes should ideally place the country on a stronger productivity path compared to nations with fewer resources. Yet, the ability of any country to transform natural resources into sustainable economic growth depends fundamentally on the quality, health, and efficiency of its labour force (Odili, Onyele & Onyemaechi, 2022). This underscores why human capital—particularly health outcomes and labour participation—has become central in explaining variations in economic performance across developing economies. Health outcomes are an essential component of human capital formation. They determine the physical, mental, and social readiness of individuals to contribute productively to economic activities. As Kelani, Odunayo, Ozegbe and Nwani (2019) assert, the quality of health significantly shapes an economy's growth trajectory through its influence on productivity and labour efficiency. The mechanism is well established: improved health enhances workers' ability to perform tasks effectively, reduces absenteeism, increases energy levels, and strengthens cognitive functioning (Singh & Das, 2015). This supports earlier reasoning by Husain (2009), who argues that understanding the link between health and wealth is indispensable for policymakers seeking to promote inclusive growth, poverty reduction, and reduced inequality. The concept of health extends beyond the absence of disease to include adequate nutrition, mental well-being, and social stability. Todaro and Smith (2006) observed that many citizens of developing countries suffer from malnutrition, which undermines health and reduces labour efficiency. Using comparative life expectancy data, they found that average life expectancy in less developed countries stood at 50 years in 2002, far below the averages in developing and developed nations. Over time, empirical evidence has shown that

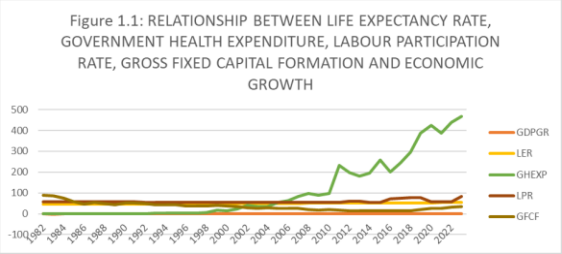
improved health outcomes enhance labour participation and contribute to economic growth through channels such as longer working years, higher productivity, and greater educational attainment (Bloom et al., 2004; Dabus, Grandes & Monterubbianesi, 2017; Sengupta, 2017). Recent studies strengthen this argument. Adebayo and Olanrewaju (2023) found that health indicators such as life expectancy and disease burden significantly influence labour supply decisions in sub-Saharan Africa. Similarly, Okoye and Eze (2022) report that improvements in Nigeria's health indices positively affect labour productivity and real output, highlighting health as a key driver of growth.

The relationship between health, labour participation, and economic growth is also reflected in national income accounting. GDP growth—the primary measure of economic performance—is influenced by both the quantity and quality of labour inputs (NBS, 2016). Since health improvements enhance education, boost savings, and encourage investment, their effect on aggregate output is multifaceted (Kelani et al., 2019). Wealthier countries tend to have healthier populations, and healthier workers are more able to learn, innovate, and accumulate capital—factors that reinforce long-term growth (NBS, 2016; NBS, 2017). This reflects the long-standing saying that "health is wealth." Peykarjou et al. (2011) note that health affects production through several channels. Improved health boosts motivation for education, enhances learning capacity, and raises productivity. It also increases life expectancy, which encourages long-term planning and higher savings. Following Weil (2001), increased savings lead to higher physical capital accumulation, which directly impacts labour participation and economic growth. More recent studies confirm this pathway: Zhou and Ahmed (2023) find that improvements in health outcomes increase savings behaviour and labour market participation in developing economies.

Labour participation serves as the crucial intermediary between health outcomes and economic growth. Healthier individuals can work more consistently, adopt modern production techniques, and remain in the labour force for longer periods. Recent evidence from Akinlo and Adedeji (2021) shows that health shocks significantly reduce labour participation in Nigeria, with negative repercussions for output. Likewise, Olanrewaju (2024) finds that improvements in population health are associated with higher formal-sector participation and greater productivity growth. Taken together, the literature demonstrates a mutually reinforcing relationship: improved health outcomes enhance labour participation, labour participation strengthens economic productivity, and economic growth provides resources for improving health. For Nigeria—where health challenges and labour market inefficiencies continue to impede development—understanding this dynamic is critical for designing effective policies capable of unlocking long-term growth.

1.2 Statement of Problem

Nigeria, with its abundant human resources, should theoretically be a model of economic growth driven by high labour productivity. However, the country continues to face issues of underemployment, poor healthcare infrastructure, and low productivity, which hinder its economic potential. Despite decades of policy pronouncements emphasizing the importance of a healthy and productive labour force for economic transformation, budgetary allocations to the health sector have persistently fallen below regional and global benchmarks (Ayaga, Normor, Obute & Ngutsav, 2024). As a result, Nigeria's health system continues to exhibit chronic weaknesses, including insufficient infrastructure, uneven distribution of health facilities, shortages of personnel, weak primary healthcare structures, and limited access to quality services (Okoye & Eze, 2022). According to Ayaga, Normor, Obute and Ngutsav (2024), reports by the World Bank (2020) rank Nigeria among countries with low human capital performance, revealing significant gaps in both healthcare provision and labor productivity. Given that labour participation is expected to serve as the critical transmission channel between health improvements and economic growth, its stagnant trend signals deeper structural inefficiencies in the labour market. Poor health outcomes limit the quality and efficiency of labour by increasing absenteeism, weakening cognitive performance, reducing energy for productive activities, and shortening working years (Kelani et al., 2019; Bloom et al., 2004).



Source: Central Bank of Nigeria Statistical Bulletin of various issues (2023) and WDI (2023)

According to CBN (2023) and WDI (2023), the diagram presented above illustrates long-run trends in Nigeria's economic growth relative to major health outcome indicators over selected years from 1982, 1986, 2001, 2006, 2011, 2016, 2021 and 2023. The plotted values show that while health expenditure has increased nominally over the years, the trajectory remains inconsistent and largely insufficient when compared to population growth and the scale of Nigeria's health challenges. For instance, although modest increases in health expenditure occurred across the selected periods, these increments were not matched by corresponding improvements in labour participation or health outcomes such as life expectancy. Similarly, GDP growth exhibited pronounced fluctuations, declining sharply to –0.07302 in 1981, recovering slightly in 1986 (0.000603), rising in 2001 (0.055857) and 2006 (0.057177), but again falling into recession in 2016 (-0.01609) before a moderate recovery to 0.032806 in 2021 but declining sharply again to 0.026674 in 2023. These erratic patterns underscore the unstable relationship between health outcomes, labour productivity, and economic growth in Nigeria. Although government spending on health has increased in recent years, as shown by Central Bank of Nigeria (CBN) data, the outcomes in terms of labor participation and productivity and economic growth remain limited. It also suggests that health investments may not be reaching the segments of the population most relevant for productivity gains. This disconnect suggests that the effects of health expenditure on labour participation/productivity and growth are either underexplored or inadequately addressed by existing policies. The persistent fluctuations in GDP growth over the reference period raise important concerns about whether Nigeria's investments in health are effective, efficient, and adequate enough to generate strong and inclusive economic performance. The paradox of rising nominal spending but weak and unstable growth trajectories suggest a mismatch between spending patterns and developmental outcomes. This raises critical empirical questions regarding the channels through which health conditions influence labour dynamics and, ultimately, national output.

Furthermore, much of the literature on Nigeria focuses primarily on education as the key driver of human capital, while the crucial role of health in shaping labor participation productivity remains understudied.

1.3 Objective of the study

The broad objective of this study is to examine the impact of health outcome, labour participation on economic growth in Nigeria. However, the specific objectives are:

1. To determine the relationship between life expectancy rate at birth and economic growth in Nigeria
2. To investigate the impact of government expenditure on health and economic growth in Nigeria
3. To examine the relationship between labour participation rate and economic growth in Nigeria
4. To analyze the effect of gross fixed capita formation on economic growth in Nigeria

1.4 Research Questions

The research questions are stated below;

1. What is the relationship between life expectancy rate at birth and economic growth in Nigeria?
2. Does government expenditure on health have any significant impact on economic growth in Nigeria?
3. What is the relationship between labour participation rate and economic growth in Nigeria?
4. Does gross fixed capita formation have any significant effect on economic growth in Nigeria?

1.5 Research Hypotheses

The research hypotheses are stated below;

$H0_1$: Life Expectancy rate at birth has no statistically significant relationship with economic growth in Nigeria.

$H0_2$: Government expenditure on health has no statistically significant impact on economic growth in Nigeria.

$H0_3$: Labour participation has no statistically significant relationship with economic growth in Nigeria in Nigeria.

$H0_4$: Gross Fixed Capita Formation has no statistically significant effect on economic growth in Nigeria in Nigeria.

1.6 Significance of the study

By focusing on Nigeria's health outcome, labor participation, and economic growth, this study contributes to the existing body of knowledge and provides policy insights aimed at improving human capital development and achieving sustainable economic growth in the country. This study will also provide valuable insights for policymakers to better align health expenditures with productivity gains and growth outcomes in Nigeria.

1.7 Scope of the study

This study examined the effect of health outcome and labour participation on economic growth in Nigeria from 1982-2023. The data used in this study were obtained from Central Bank of Nigeria Statistical Bulletin of various issues (2023) and WDI (2023). These comprises of annual data of the following variables Gross Domestic Product Growth Rate which serves as the dependent variables in the model while Life Expectancy rate at birth, Government Expenditure on Health, Labour Participation Rate and Gross Fixed Capital Formation serves as the independent variables.

II. LITERATURE REVIEW

2.1 Conceptual Literature

2.1.1. Health Outcome

According to Wu and Street (2022), Health outcomes refer to patients' clinical (e.g., blood pressure, blood sugar, disease status, mental state), behavioral (e.g., physical functioning, gait), and subjective measures (e.g., pain, vitality, anxiety) of health status in relation to actions, interventions, or events that may or are intended to impact health and well-being.

Health Outcome and Labour Force Participation

Health is a specific feature of a human being, defining to a considerable extent the possibility of using one's own physical and mental efforts, abilities and experience in the labour market (Kelani et al, 2019). Similarly, professional development depends on an employee's health condition. Health belongs to rare goods that are difficult to evaluate (Go-linowska, 2015). Apart from education and professional experience, health is one of the three most important factors determining the quality of human capital.

Relevant to the concept of health are Life Expectancy, Adult Survival Ratio, and Maternal Mortality (Kelani, et al, 2019). This study adopts Life Expectancy at Birth as the indicator for Nigerians Health Outcome.

Life Expectancy at birth (LE): Life expectancy at birth is defined as number of years a newborn infant could expect to live if prevailing patterns of age-specific mortality rates at the time of birth remains constant throughout the infant's life (UNDP, 2014).

2.1.2 Labour Force Participation

Labour force participation is defined as the proportion of a country's working age population that are actively employed or actively seeking for employment (World Bank, 2023). The World Bank defined working age population as those in the category of 15 and 64 years. From another perspective, OECD (2023) defined labour force participation rate as the ratio of total labour force to total working age population. Thus, it follows that people in the age category of 15 years and above who desire to work and are actively engaged in a paid employment (either full time or part-time) are counted as the labour force.

The labor force participation rate for males in Nigeria is over 70%, but it has been steadily declining from 77% in 1980 to 73% in 2009, according to estimates from the International Labour Organization (ILO, 2019).

According to World Bank (2023), Nigeria's labor force participation rate dropped to 55.1% in December 2017, compared with 55.2% in the previous year, with an average rate of 55.1% from 2018 through 2023. The data reached an all-time high of 56.4% in December 1990 and a record low of 54.7% in December 2004. About two million individuals, or 14% of Nigeria's total workforce, are employed in the transportation sector, according to the National Bureau of Statistics (NBS, 2022). The Nigerian industries are categorized under the "Economic Activities" subgroup for easier study when analyzing the country's labor market. Below is the sectoral analysis of Nigeria's labour force participation rate based on the Barry Jones (1996) System of Industrial Classification:

1. Nigeria's primary industries are divided into three categories: mining and quarrying, agriculture, and fishing. Within this sector, the mining and quarrying business employs 1% of the workforce, while the agricultural, fishing, and forestry industries employ 99%.

2. The manufacturing and construction sectors comprise Nigeria's secondary industries. In Nigeria, 13% of all industrial jobs are in the secondary sector. In this sector, 18% of workers were employed in the construction industry and 82% in the manufacturing sector.

3. The third sector of the economy: Water, sewage, waste management, remediation, transportation and storage, electric, gas, steam, and air conditioning supply, and wholesale/retail trade are all included. Thirty percent of all industrial jobs in Nigeria are in the tertiary sector. Within this sector, 84% of the workforce is employed in wholesale/retail commerce, 84% in motorcycle and motor vehicle maintenance, 14% in transportation and storage, 1% in electricity, 1% in gas and air supply, and 1% in water, sewage, waste management, and cleanup.

4. Nigerian ICT enterprises, financial and insurance firms, real estate firms, and professional, scientific, and technical research companies make up the quantitative industry. In Nigeria, 3% of all industrial jobs are in the quantitative sector. Within this industry, 33% of workers are employed in information and communication, 12% in finance and insurance, 5% in real estate, and 50% in professional, scientific, and technological research.

5. Quinary Industry: Nigerian housing and food service activities; administrative and support services; public administration; defense and security; education; human health and social work; arts, entertainments, and recreations; other service activities; household services; and extraterrestrial activities. The Quinary Industry accounted for 23% of all industrial employment in Nigeria. Of this sector, 24% were employed in housing and food services; 9% were employed in administrative support services; 7% were employed in public administration, defense, and security; 14% were employed in education; 7% were employed in human health and social work; 7% were employed in entertainment, recreation, and the arts; 3% were employed in other services; 31% were employed in households; 5% were employed in households; and 1% were employed in extraterrestrial activities.

2.1.3 Economic Growth

Tadaro (2007) defined the term economic growth as a process by which the productive capacity of the economy is increased over time to bring about raising level of national output and income. Kuznets (1966) on the other hand views economic growth as a long-term process wherein the substantial and sustained rise in real national income, total population and real per capita income takes place. Kindlerberge (1965) see economic growth to mean more output derived from greater efficiency. Friedman (1972) however views economic growth as an expansion of the system in one or more dimensions out a change in its structure. Thus economic growth is related to a quantitative sustained increase in the countries per capita output or income accompanied by expansion in its labour force, consumption, capital and volume of trade Jhingan (2013). From the above definitions its essential to understand that economic growth basically entails a long run process involving a period of time, increase in real per capital income level and volume of production linked with large increase in the productive ability of the economy, urbanization, equitable distribution of income and wealth among the population which result in reduction poverty and unemployment in a country.

2.2 Theoretical Literature Review

2.2.1 Theories on Health Outcome and Labor Participation.

Grossman's Theory of Healthcare Production (1972)

The study by Grossman (1972) depicts the pioneering effort to discuss to the evolution of Health Economics as an independent discipline. In his analysis, Grossman (1972) posits that an individual's Health Outcome is determined by two major factors: the initial health endowment at birth, and the level of healthcare demands. In furtherance to this analysis, Grossman (1972b) considered educational attainment as a key factor that determines individuals' health status. The position of Grossman was validated by Lleras-Muney (2002) who recognized education as a key input in the production of health outcomes. In review of this theory, health status does not in reality depends only on education, initial health endowment and healthcare demand but also on the quality the environment, nutrition and maternal life style. Had this theory incorporated these factors as determinants of health status, it could have been more encompassing.

Neoclassical Growth Theory:

Neoclassical growth theory, particularly Solow's model (1956), attributes economic growth to the accumulation of physical capital, labor force expansion, and technological progress. Solow's model uses a Cobb–Douglas production function to show how these factors contribute to aggregate output. When both labor and capital grow at the same rate, the economy grows through the interaction of labor, capital, and technical change. The model posits that growth depends heavily on technological progress (exogenous in Solow's framework). However, education and health improvements, as forms of human capital investment, can significantly augment the labor force's effectiveness, thereby fostering economic growth. The incorporation of human capital into Solow's model has led to a broader understanding of how education and health spending—important elements of public expenditure—affect labor productivity and growth. The augmented Solow model, developed by Mankiw (1992) and others, introduces human capital into the growth equation, highlighting how investments in human capital (education and health) can increase productivity. This model underscores that human capital is critical for long-term economic development, enhancing labor productivity and fostering technological innovation.

Wagner's Law of Increasing State Activities:

Wagner's Law, propounded by Adolph Wagner in 1883, posits that as economies develop, the role of government, particularly expenditures, increases. Wagner argued that economic development increases the complexity of legal and social relationships, which in turn requires expanded government involvement in providing public services, including education and health. Wagner suggested that as societies become wealthier, public demand for services such as education, health, and welfare increases, leading to greater government spending. This theory aligns with the idea that health expenditure increases with economic development, as governments seek to provide services that enhance the population's productivity, including improving healthcare. Wagner's Law implies a direct relationship between national income growth and public sector expansion, which is crucial for this study on health expenditure and its impact on labor productivity.

This research is grounded in both Neoclassical Growth Theory and Wagner's Law. Neoclassical theory highlights the role of human capital (particularly education and health) in enhancing productivity and fostering economic growth. In this framework, health investments are essential for labor productivity, which drives long-term growth. Wagner's Law complements this by explaining why governments increasingly invest in sectors such as health as economies grow, thereby promoting greater human capital development and, in turn, productivity and growth.

2.2.2. Theoretical underpinnings on economic growth

Harrod-Domar Growth Model-

Every economy must save a certain proportion of its national income, if only to replace worn-out or impaired capital goods (buildings, equipment, and materials). However, in order to grow, new investments representing net additions to the capital stock are necessary. If we assume that there is some direct economic relationship between the size of the total capital stock, K, and total GDP, Y—for example,

if $3 of capital is always necessary to produce an annual$1 stream of GDP—it follows that any net additions to the capital stock in the form of new investment will bring about corresponding increases in the flow of national output, GDP.

Suppose that this relationship, known in economics as the capital-output ratio, is roughly 3 to 1. If we define the capital-output ratio as *k* and assume further that the national net savings ratio, *s,* is a fixed proportion of national output (e.g., 6%) and that total new investment is determined by the level of total savings, we can construct the following simple model of economic growth:

1. Net saving (*S*) is some proportion, *s,* of national income (*Y*) such that we have the simple equation; S = sY.

2. Net investment (*I)* is defined as the change in the capital stock, *K,* and can be represented by Δ*K* such that$I = \Delta K$.

But because the total capital stock, *K,* bears a direct relationship to total national income or output, *Y,* as expressed by the capital-output ratio, *c,*it follows that

$$\frac{K}{Y} = C.$$

Or $\frac{\Delta K}{Y} = C$ and finally, $\Delta K = c\Delta Y$.

3. Finally, because net national savings, *S*, must equal net investment, *I,* we can write this equality as S=I.

We know that S=sY and so; $I = \Delta K = c\Delta Y$. It therefore follows that $S = sY = c\Delta Y = \Delta K = I$.

Or simply $sY = c\Delta Y$.

Dividing both sides by Y and then by c:

$\frac{\Delta Y}{Y} = \frac{s}{c}$; note that $\frac{\Delta Y}{Y}$ represents the rate of growth of GDP.

The final equation is a simplified version of the famous equation in the Harrod-Domar theory of economic growth, states simply that the rate of growth of GDP (Δ*Y*/*Y*) is determined jointly by the net national savings ratio, *s,* and the national capital-output ratio, *c.* More specifically, it says that in the absence of government, the growth rate of national income will be directly or positively related to the savings ratio (i.e., the more an economy is able to save and invest out of a given GDP, the greater the growth of that GDP will be) and inversely or negatively related to the economy's capital-output ratio.

2.3 Empirical Review

Ayaga, Normor, Obute & Ngutsav, (2024) investigated the relationships among health expenditure, labor productivity and economic growth in Nigeria. Secondary data from 1986-2022 were used to analyze these relationships with the help of the structural vector autoregressive (SVAR) model, which revealed long-term relationships between health expenditure, labor productivity and economic growth in Nigeria. The study also revealed that in the short run, health expenditure has a positive but insignificant relationship with labor productivity, and labor productivity in the short run has a positive but statistically insignificant relationship with economic growth in Nigeria. Additionally, the variance decomposition analysis shows that health expenditure is a more significant predictor of economic growth than labor productivity in the short run, with labor productivity being more responsive to health investments than to economic output during the same period. It was concluded that health expenditures in Nigeria have positive potential for increasing labor productivity; however, the impact is negligible because of inadequate health care expenditures. Emergent from the above findings and conclusions, it was recommended that, as a matter of urgency, the government should increase investment in the health sector, and in addition to increasing investment, there is a pressing need to improve the efficiency of resource allocation in the health sector. This should involve a concerted effort by the Ministry of Health, the Bureau of Public Procurement, and anticorruption agencies to minimize wastage, corruption, and mismanagement of funds.

Ugwu et al. (2020), demonstrated that government spending on education and health positively impacts labor productivity in the long run, although capital expenditures on education were found to have little effect. A recurrent theme is the distinction between the

long-term and short-term effects of human capital investments on labour productivity.

Ezeanyagu, Ugwuanyi and Anumudu (2025) examined labour force participation and economic growth in Nigeria. The independent variables were labour force participation rate, technology penetration rate and capital formation, while the dependent variable was real gross domestic product. The Neoclassical growth model was the theoretical foundation of the study and the theory helped to explain the relationship between input quantities—capital, labor, technology input and the resulting output. The data were collected for the period 1990 to 2023 and analyzed using unit root test, Johansen cointegration test and the error correction model. The results showed that while capital formation and technology input both have positive effects on Nigeria's economic growth, only capital formation increases economic growth significantly. Labour force participation which is the pivotal variable exerted negative effect on economic growth in Nigeria. The study recommended a conscious increase in the percentage of active working population through a well-targeted scheme that will enhance manpower development especially for the age category of 15 and 50 years.

Oyintonyo and Udeh (2024) employed a comprehensive multi-variable analysis to explore the drivers of labour force participation in Nigeria. Access to electricity, oil revenue, total secondary school enrollment, total unemployment and the total labor force participation rate were the variables used. The regression results revealed that access to electricity did not exhibit a statistically significant relationship with labour force participation. Oil revenue demonstrated a statistically significant connection with labour force participation while total secondary school enrollment also showed a statistically significant relationship. Total unemployment did not display a significant relationship with labour force participation.

Yakubu, Akanegbu and Jelilov (2020) examined the effect of labour force participation on economic growth in Nigeria. Finding from the Vector Error Correction model (VECM) showed that labour force participation, capital formation and real GDP have long-run relationship and also long-run causality was found running from labour force participation and capital formation to RGDP. The study recommended that it is necessary for policy makers to address the problems of unemployment and gender inequality in employment.

2.4 Literature Gap

It can be clearly observed in the empirical literature above that different studies have been carried out in economics to investigate the relationship between health outcome, labour participation and economic growth within and outside Nigeria. Some studies focused on only health outcome and economic growth while many others have focused on labour participation and economic growth. This is because health outcome and labour participation has significant roles in determining economic growth especially in developing countries like Nigeria. However, only few studies have managed to combine and assess how both health outcomes and labour force participation have impacted on economic growth in the same study. In the light of the above, this paper attempts to examine the impact of health outcome and labour participation on economic growth in Nigeria in order to add knowledge to the existing literature. The study focused on the long-run and short-run effects of helath outcome and labour participation on economic growth using ARDL model for the period 1982-2023. Most of the works reviewed scope was inconsistent in terms of years of analysis but this present study extended its scope to 2023; hence the gap of the study.

III. RESEACH METHODOLOGY

3.1 Research Design/Theoretical Framework

This study adopted an ex post facto research design. The data used for this study are time series data obtained from secondary sources about the study variables. The variables include real gross domestic product growth rate (GDPGR), Life Expectancy Rate at Birth (LER), Government Expenditure on Health (GEXPH), Labour Participation Rate (LPR) and Gross Fixed Capital Formation (GFCF).

In order to appropriately capture the effect of health outcome and labour participation on economic growth on economic growth in Nigeria, this study will employ

the Solow's neoclassic growth model adapted from Ayaga et al, (2024).

The production functions may be expressed as follows:

$Y = f(A, K, L)$ ……1

where Y = output, A = level of technology, K = capital stock, and L =

labor quantity.

Equation (1) can be rewritten as

$Y_t = A_t F(K_t\ L_t)$ ……2

where Y_t = aggregate real output,

K = capital stock,

L = labor,

A = efficiency factor, and

t = time dimension.

3.2 Model Specification

$GDPGR = \alpha_0 + \alpha_1 LER + \alpha_2 GEXPH + LPR + \alpha_4 GFCF + \varepsilon$ ……(3.4)

Where:

GDPGR = Gross Domestic Product Growth Rate

GEXPH = Government Expenditure on Health

LPR = Labor Participation Rate

GFCF = Gross Fixed Capital Formation

Further, the work set out to present an Autoregressive Distributed Lag (ARDL) model of the relationship between selected components of health outcome and labour participation in Nigeria. The ARDL (p, q) model is stated as:

$$GDPGR_t = \sum_{i=1}^{p} \alpha_i \Delta GDPGR_{t\text{-}i} + \sum_{i=0}^{q} \alpha_i \Delta LER_{t-i} + \sum_{i=0}^{q} \alpha_i \Delta GEXPH_{t-i} + \sum_{i=0}^{q} \alpha_i \Delta LPR_{t-i} + \sum_{i=0}^{q} \alpha_i \Delta GFCF_{t-i} + \sum_{i=1}^{p} \beta_i GDPGR_{t\text{-}i} + \sum_{i=0}^{q} \beta_i LER_{t-i} + \sum_{i=0}^{q} \beta_i GEXPH_{t-i} + \sum_{i=0}^{q} \beta_i LPR_{t-i} + \sum_{i=0}^{q} \beta_i GFCF_{t-i} + \varphi ECT + \varepsilon_t \quad (3.5)$$

Where

$$ECT_t = Y_t - \alpha_0 - \sum_{i=1}^{p} \gamma_1 \Delta Y_{t-i} - \sum_{i=0}^{p} \beta_i \Delta X_{t-i} \text{ and}$$

$$\phi = 1 - \sum_{i=1}^{p} \gamma_1 \Delta Y_{t-i} \quad (3.6)$$

The Bound test procedure used equations 3.3 and 3.4 into 3.5 as:

$$\Delta Y_t = -\sum_{i=1}^{p-1} \gamma_1 Y * \Delta Y_{t-i} + \sum_{i=0}^{p} \beta_i \Delta X_{t-i} - \rho Y_{t-1} - \alpha - \sum_{i=0}^{p} \delta X_{t-i} + \mu_{it} \quad (3.7)$$

Then we test the existence of level relationship as ρ = 0 and $\delta_1 = \delta_2 = \ldots = \delta_k = 0$

where Δ = difference operator, α = the short term coefficient, β = the long run coefficients μ = white noise error term.

3.2.1 Pre-estimation

3.2.1.1 Unit Root Test

To fully explore the data generating process, we first examined the time series properties of model variables using the Augmented Dickey- Fuller test.

The ADF test regression equations with constant are:

$$\Delta Y_T = \alpha_0 + \alpha_1 Y_{T-1} + \sum_{j=1}^{k} a_j\ \Delta Y_{T-1} + \varepsilon_T \ldots \quad (3.8)$$

where Δ is the first difference operator ε_T is random error term that is iid k = no of lagged differences Y = the variable. The unit root test is then carried out under the null hypothesis α = 0 against the alternative hypothesis of α < 0. Once a value for the test statistics

$$ADF_\tau = \frac{\hat{\alpha}}{SE(\alpha)} \quad (3.9)$$ is computed we shall compare it with the relevant critical value for the Dickey-Fuller Test. If the test statistic is greater (in absolute value) than the critical value at 5% or 1%

level of significance, then the null hypothesis of $\alpha = 0$ is rejected and no unit root is present. If the variables are non-stationary at level form and integrated of the same order, this implies evidence of co-integration in the model.

3.3 Justification of the Model

The use of ARDL test approach is predicated on its several advantages over other cointegration tests such as Engle-Granger and Johansen's cointegration method. Firstly, the ARDL efficiently determines the cointegrating relation in small sample cases (Ghatak & Siddiki, 2001; Tang, 2003), whereas Johansen's method requires large sample for validity. Secondly, other methods requires that the variables must be integrated of the same order before the cointegration test is carried out, while the ARDL approach can be applied irrespective of whether the regressors are *I(1) and I(0) or mutually* cointegrated, in which the dependent variable must be *I(1).*

3.3.1 Test of Significance

The significance test were tested at 5% level of significance using the coefficients of the independent variables and following the Rule: Reject the Null hypothesis if the t-prob is less than 0.05, otherwise accept the Null hypothesis when t-prob is greater than 0.05 i.e. Reject if t-prob <0.05, Accept if t-prob > 0.05

3.3.2 Test of Hypothesis

The Hypotheses were tested using the probability of f-statistics: Reject the Null hypothesis if the probability of f-statistics is less than the critical value (0.05), otherwise accept the Null hypothesis when critical value (0.05) exceeds probability of f-statistics.

3.4 Source of Data

The data for this study was sourced from United Nations World Population Prospects (2023) and WDI (2023); for the period of 1982 to 2023.

IV. DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Data Presentation

The data used in this study are; Gross Domestic Product Growth Rate (GDPGR), Life Expectancy at Birth in Logaritm (LER), Government Expenditure on Health in Logarithm (GEXPH), Labor Participation Rate in Logarithm and Gross Fixed Capital Formation in Logarithm (GFCF).

4.1.1 Unit Root Test

Table 4.1: Summary of ADF test results at 5% critical value

VARIABLE	ADF TEST STATISTICS	CRITICAL VALUE 5%	ORDER OF INTEGRATION	DECISION RULE
GDPGR	-4.06184	-2.9350	I(0)	Reject Ho
LER	-3.21129	-2.9369	I(1)	Reject Ho
GEXPH	-10.5331	-2.9369	I(1)	Reject Ho
LPR	-3.50061	-2.9511	I(1)	Reject Ho
GFCF	-4.76054	-2.9369	I(1)	Reject Ho

Source: Authors computation 2025

From table 4.1 above, Gross Domestic Growth Product Rate (GDPGR), was integrated of order zero (I ~ (0)) as it was stationary at level form. While Life Expectancy Rate (LER), Government Expenditure on Health in Rate (GEXPH), Labor Participation Rate (LPR) and Gross Fixed Capital Formation (GFCF) weren't not stationary at level form, but became stationary after first difference which implies that the variables (LER, GEXPH, LPR and GFCF) were integrated of order one (I ~ (1)). The decision is based on the fact the ADF statistics that is greater than the ADF critical values at 5%, we reject H_0 and conclude that the variables are stationary. Since the variables are integrated of order one and zero and none of the variables is integrated of order two. We therefore, apply the ARDL bound co-integration test.

4.1.2 ARDL Bound Co-integration Test

A necessary condition for testing for ARDL bound co-integrating test is that each of the variables be integrated of either of order one or zero or both (Pesaran, Shin and Smith, 2001). Since all the variables are integrated of order one and zero, we proceeded to estimate the ARDL bound test. The null hypothesis of ARDL bound co-integration is that the

variables are not cointegrated as against the alternative that they are cointegrated. The decision rule is to reject the null hypothesis if the F-statistics is greater than the upper bound critical values at chosen level of significance.

Table 4.2: ARDL Bound Co-integration (5% critical value) Test Result for the models

Model	F-Statistics	K	Significance level	Critical Bound Value	
				10 (Low	11 (Upp
	6.408918	4	5%	2.56	3.49

Source: Author's Computation 2025

From table 4.2 the F-statistics for the model is 6.408918 and is greater than the upper (I1) bound of 3.49 at 5% level of significance. Thus, we reject the null hypothesis and conclude that there is a long run relationship between health outcome, labor participation and economic growth in Nigeria. Since there is a long run relationship, we therefore estimate the short run and long run ARDL analysis.

4.1.3 Test for Short Run Relationship

Having ascertained that there exist a co-integrating relationship between health outcome, labor participation and economic growth in Nigeria, the short run relationship needs to be ascertained.

Table 4.3: Summary of Parsimonious Short Run Relationship Result between health outcome, labor participation and economic growth in Nigeria

ARDL Error Correction Regression
Dependent Variable: D(GDPGR)
Selected Model: ARDL(1, 4, 0, 0, 0)
Case 2: Restricted Constant and No Trend
Date: 11/07/25 Time: 18:29
Sample: 1982 2023
Included observations: 38

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LER)	3.333308	3.341790	0.997462	0.3271
D(LER(-1))	5.220144	4.207196	1.240766	0.2250
D(LER(-2))	3.241999	4.165981	0.778208	0.4430
D(LER(-3))	6.787151	3.723031	1.823018	0.0790
CointEq(-1)*	-0.999277	0.148436	-6.732028	0.0000

Source: Author's Computation 2025

From table 4.3 above; the coefficient of the error correction term (cointEQ) is statistically significant and carries the expected negative sign at 5% level of significant; revealing that a short run relationship exists between health outcome, labor participation and economic growth in Nigeria. The speed of adjustment is -0.999277 that is 99% of the adjustment to equilibrium of the economic growth is expected to occur in short run.

4.1.4 Test for Long Run Relationship

It's imperative to ascertain the long run relationship that exists between health outcome, labor participation and economic growth in Nigeria.

Table 4.4: Summary of Long Run Relationship between health outcome, labor participation and economic growth in Nigeria Result

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LER	0.601630	0.575555	1.045303	0.3048
GEXPH	-0.036265	0.016546	-2.191759	0.0369
LPR	-0.116153	0.151464	-0.766870	0.4496
GFCF	-0.061481	0.053360	-1.152180	0.2590
C	-0.665844	0.857668	-0.776343	0.4441

Source: Author's Computation 2025

4.1.5 Interpretation of Long Run ARDL Result

GDPGR = -0.665844 +0.601630LER - 0.036265GEXPH – 0.116153LPR
– 0.061481GFCF

The long run coefficient from table 4.4 above shows that the joint impact of all exogenous variables (LER, GEXPH, LPR, and GFCF) on the endogenous variable will amount to -0.66 percent; this is on the basis that they are all held at constant. In other word if all the exogenous variables are held at constant it will amount to -0.665% negative contribution to economic growth in Nigeria.

Life Expectancy Rate (LER) possessed a positive relationship with economic growth in Nigeria with coefficient value of 0.6016 percent; this entailing that on the long run, as Life Expectancy Rate (LER) increases by one percent, it causes a 0.6016 percent increase in economic growth in Nigeria.

Government Expenditure on Health (GEXPH) possessed a negative relationship with economic growth in Nigeria with coefficient value of -0.036265 percent; this entailing that on the long run, as Government Expenditure on Health (GEXPH) increases by one percent, it causes a -0.036 percent decrease in economic growth in Nigeria.

Labour Participation Rate (LPR) possessed a negative relationship with economic growth in Nigeria with coefficient value of – 0.116153 percent; this entailing that on the long run, as Labour Participation Rate (LPR) increases by one percent, it causes a – 0.1161 percent decrease in economic growth in Nigeria.

Gross Fixed Capital Formation (GFCF) possessed a negative relationship with economic growth in Nigeria with coefficient value of – 0.0614 percent; this entailing that on the long run, as Gross Fixed Capital Formation (GFCF) increases by one percent, it causes a – 0.0614 percent decrease in economic growth in Nigeria.

4.2 Test of Hypotheses

The individual test was carried out to test for joint significance of the independent variables on the dependent variable at 5% level using t-probability and t-statistic shown in table 4.5 and 4.6. The rule applied was: If t-probability is greater than the prescribed level of 5% or 0.05, accept the null hypothesis, otherwise reject the null hypothesis when f-probability is less than 0.05.

Ho_1: Life Expectancy rate at birth has no statistically significant relationship with economic growth in Nigeria.

Conclusion: From table 4.4 above, the probability of t-stat of LER was 0.3048, and greater than 0.05 critical values. Thus, we accept the null hypothesis and conclude that Life Expectancy rate at birth has no statistically significant relationship with economic growth in Nigeria.

Ho_2: *Government expenditure on health has no statistically significant impact on economic growth in Nigeria.*

Conclusion: From table 4.4 above, the probability of t-stat of GEXPH was 0.0369, and less than 0.05 critical values. Thus, we reject the null hypothesis and conclude that Government Expenditure on Health has a statistically significant relationship with Economic Growth in Nigeria.

Ho_3: *Labour participation has no statistically significant relationship with economic growth in Nigeria in Nigeria.*

Conclusion: From table 4.4 above, the probability of t-stat of LPR was 0.4496, and greater than 0.05 critical values. Thus, we accept the null hypothesis and conclude that Labour participation has no statistically significant relationship with economic growth in Nigeria in Nigeria.

$H0_4$: *Gross Fixed Capita Formation has no statistically significant effect on economic growth in Nigeria in Nigeria.*

Conclusion: From table 4.4 above, the probability of t-stat of GFCF was 0.2590, and greater than 0.05 critical values. Thus, we accept the null hypothesis and conclude that Gross Fixed Capita Formation has no statistically significant effect on economic growth in Nigeria in Nigeria.

4.3 Discussion of Findings

This study examined the effect of health outcomes and labour participation on economic growth in Nigeria over the period 1982–2023, a span of forty-two years. The empirical results provide mixed and, in some cases, counterintuitive evidence on the relationship between life expectancy, government expenditure on health, labour participation rate, gross fixed capital formation and economic growth. From the ARDL long-run estimation, the study discovered that life expectancy exerted a positive but statistically insignificant effect on economic growth in Nigeria, while government expenditure on health, labour participation rate and gross fixed capital formation exerted negative relationships with economic growth. Among these, only government expenditure on health displayed statistical significance.

Specifically, the insignificant positive effect of life expectancy contradicts the theoretical propositions of

the Grossman (1972) health-capital model and deviates from several empirical studies such as Adebayo and Olanrewaju (2023), and Okoye and Eze (2022), which established that improvements in health outcomes significantly enhance labour productivity and economic performance in Nigeria and Sub-Saharan Africa. The inability of life expectancy to significantly influence growth in this study may reflect persistent weaknesses in Nigeria's health system which is characterised by poor infrastructure, uneven access to quality care and inadequate investment which limit the productivity gains expected from improved longevity.

More strikingly, the negative and significant relationship between government expenditure on health and economic growth deviates sharply from both theoretical expectations and the empirical findings of studies such as Ayaga, Normor, Obute and Ngutsav (2024), who found that health spending has positive long-term implications for labour productivity and output. The finding in this study implies that rising health expenditure has not translated into growth-enhancing outcomes in Nigeria. This reinforces persistent concerns about inefficiencies in public sector spending, leakages, corruption, and misallocation of health funds. This result, however, aligns with the findings of Ezeanyagu, Ugwuanyi and Anumudu (2025), who also reported a negative effect of labour participation on growth in Nigeria. This pattern indicates deep structural distortions in Nigeria's labour market such as skill mismatch, high prevalence of low-productivity informal employment, rising unemployment, and inadequate absorption capacity of the industrial sector. Increased participation in a labour market dominated by low-skilled, low-earning and informal jobs may therefore not translate into appreciable economic gains, resulting instead in disguised unemployment and low productivity.

Furthermore, gross fixed capital formation exhibited a negative but insignificant relationship with economic growth. This contradicts both theoretical expectations and studies such as Yakubu, Akanegbu and Jelilov (2020), which established a long-run positive impact of capital formation on growth. The inconsistency observed in this study may be attributed to Nigeria's persistent infrastructural deficits, high cost of doing business, volatility of macroeconomic conditions, and the dominance of unproductive capital expenditures.

V. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The following summarizes the result of the research work;

i. Life Expectancy Rate at Birth has a positive but insignificant relationship with economic growth in Nigeria.

ii. Government Expenditure on Health has a negative but significant relationship with economic growth in Nigeria.

iii. Labor Participation Rate has a negative and insignificant relationship with economic growth in Nigeria

iv. Gross Fixed Capital Formation has a negative and insignificant relationship with economic growth in Nigeria.

5.2 Conclusion

This study examined the effect of health outcome and labour participation on economic growth in Nigeria from 1982–2023. The data used in this study were obtained from the Central Bank of Nigeria Statistical Bulletin (2023) and World Development Indicators (2023), comprising annual observations on Gross Domestic Product Growth Rate as the dependent variable, while Life Expectancy at Birth, Government Expenditure on Health, Labour Participation Rate, and Gross Fixed Capital Formation served as the independent variables. The Auto-Regressive Distributed Lag (ARDL) technique was employed as the main estimation method. The results showed that Life Expectancy at Birth has a positive but insignificant relationship with economic growth, while Government Expenditure on Health, Labour Participation Rate and Gross Fixed Capital Formation all exert negative relationships on economic growth, with only Government Expenditure on Health being statistically significant. The study concludes that although health outcome and labour participation remain critical drivers of economic performance, the

findings reflect structural weaknesses and persistent inefficiencies in Nigeria's health system, labour market and capital investment processes. The results further underscore the government's longstanding inadequacy and inconsistency in effectively investing in the health sector, thereby limiting the potential contribution of human capital to sustainable economic growth.

5.3 Recommendations

The following recommendations were made from the findings of this research;

1. Since Life Expectancy at Birth has a positive but insignificant relationship with economic growth in Nigeria, government should intensify efforts toward improving public health infrastructure and preventive healthcare systems, as better health outcomes will enhance labour productivity and stimulate long-term economic growth.
2. Since Government Expenditure on Health has a negative but significant relationship with economic growth in Nigeria, there is need for government to ensure transparency, accountability, and efficient allocation of health funds to ensure that health investments yield productive and growth-enhancing outcomes.
3. Since Labour Participation Rate has a negative and insignificant relationship with economic growth, government should adopt policies that promote skill development, vocational training, and job creation to improve labour productivity and increase the contribution of the workforce to national output.
4. Since Gross Fixed Capital Formation has a negative and insignificant relationship with economic growth, government should provide a more enabling business environment, ensure stable macroeconomic policies, and strengthen private sector participation to enhance productive investment and economic performance.

REFERENCES

[1] Adebayo, P. A., & Olanrewaju, F. A. (2023). Health indicators and labour supply dynamics in sub-Saharan Africa. Journal of African Economic Studies, 15(2), 112–129.

[2] Akinlo, A. E., & Adedeji, A. S. (2021). Health shocks and labour participation in Nigeria: Evidence from time-series analysis. Journal of Health Economics in Africa, 3(1), 19–34.

[3] Ayaga, Joyce & Nomor, Dennis & Obute, Christopher & Ngutsav, Ayila. (2024). Health Expenditure, Labor Productivity and Economic Growth In Nigeria: A Structural VAR Approach.

[4] Ezeanyagu, U.K, Ugwuanyi, C.U, Anumudu, C.N (2025). Labour Force Participation and Economic Growth in Nigeria. Global Journal of Applied, Management and Social Sciences (GOJAMSS); Vol.31, February 2025; P.288–298 (ISSN: 2276 – 9013)

[5] Grossman, M. (1972). On the Concept of Health Capital and Demand for Health. Journal of Political Economy. 80(2), 223-255

[6] Grossman, M.(1972b). "The demand for health: a theoretical and empirical investigation", NBER Working Paper, New York.

[7] Husain, J.M. (2009). Contribution of Health to Economic Development: A Survey and Overview. Retrieved fromhttp://www.economicsejournal.org/economics/discussionpaper/2009-40

[8] ILO (2017). World Employment and Social Outlook-Trends 2017-international Labour Office. https://. www.ilo.org/wcmsps/groups/public/.... /

[9] Lalonde, M. (1974). A new Perspective on the Health of Canadians. A Working Paper. Ottawa: Government of Canada, 1974

[10] Kelani, F.A., Odunayo, H.A., Ozegbe, A.E., & Nwani, S.E. (2019). Health Status, Labour Productivity and Economic Growth in Nigeria. Journal of Economics, Management and Trade.

[11] Odili,. O, Onyele,. K, Chukwuka,. E, Ihekwereme, J. (2022). Productivity of labour in an Emerging Market Economy: Determinants and Dynamic Responses in Nigeria.

[12] Okoye, L. U., & Eze, D. C. (2022). Health outcomes and productivity growth in Nigeria: A disaggregated approach. Nigerian Journal of Health and Economic Policy, 8(2), 77–95.

[13] Olanrewaju, O. T. (2024). Population health and formal sector participation in West Africa. African Journal of Labour and Human Capital, 12(1), 55–74.

[14] Peykarjou. K., Gollu, R. B., Gasfti, H. P., Sahrivar, R. B (2011): Studying the relationship between health and economic growth in OIC member states. journal of contemporary research in business. Vol 3, No 8, 1041-1054. http://www.journal-archieves13.webs.com/1041-1054.pdf

[15] Wu, Q.L, Street, R.L (2022). The International Encyclopedia of Health Communication (pp.1-6) DOI:10.1002/9781119678816.iehc0556

[16] Zhou, W., & Ahmed, F. (2023). Health, savings behaviour and labour market participation in developing economies. International Journal of Economic Development, 20(1), 88–110.