



POLAC MANAGEMENT REVIEW (PMR)
DEPARTMENT OF MANAGEMENT SCIENCE
NIGERIA POLICE ACADEMY, WUDIL-KANO



IMPACT OF OIL WEALTH ON HEALTH OUTCOMES IN NIGERIA

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Abstract

The study investigates the impact of oil wealth on health outcomes in Nigeria, focusing on life expectancy as the dependent variable and examining GDP per capita, oil rent, and health expenditure as independent variables from 1990 to 2023. The result revealed that while GDP per capita and oil rent are positively correlated with life expectancy, their effects are not statistically significant. In contrast, health expenditure has a significant positive impact on life expectancy. These findings underscore the crucial role of healthcare investment in improving health outcomes, aligning with the Social Determinants of Health Theory. The study recommends prioritizing healthcare investments and diversifying the economy beyond oil dependency. Future research should explore additional factors such as government policies and socio-cultural dynamics, and address residual non-normality with further diagnostic tests.

Keywords: GDP Per Capita, Health Expenditure, Nigeria, Life Expectancy Rate, Oil wealth

JEL Classification Code: I15

1. Introduction

Nigeria, often dubbed the giant of Africa due to its substantial population and vast natural resources, has its economy predominantly shaped by oil production (Ahmad & Daoud, 2019). As the largest oil producer in Africa and 13th globally, oil constitutes over 90% of Nigeria's exports and 70% of total revenue, though it represents only 8% of the Gross Domestic Product (GDP) (CBN, 2018). This heavy reliance on oil has significantly influenced Nigeria's political economy, with oil wealth affecting everything from economic strategies to political dynamics (Akinyetun, 2016). Despite these abundant resources, Nigeria's economic growth has stagnated for decades, largely due to political instability, corruption, and poor macroeconomic management (Matthew, Adegboye & Fasina, 2015).

The paradox of Nigeria's situation is the cohabitation of immense oil wealth with widespread poverty, often referred to as the "curse of oil" (Habiba, 2018). While the nation has achieved trade and current account

surpluses during periods of high oil prices, it has struggled with poverty levels where over 57% of the population lives in extreme poverty (Agu, Obodoechi, & Nebo, 2023).

The volatility in oil prices directly impacts government finances, leading to unpredictable economic outputs and reduced allocations for social spending, which has hampered long-term human development (Oduyemi & Owofe, 2020). Despite increases in health expenditure, Nigeria's human capital development remains low, with healthcare indicators such as life expectancy and maternal and infant mortality rates significantly lagging behind global averages (Baghebo, 2018; WHO, 2016).

Healthcare spending has fluctuated over the years, with capital and recurrent expenditures demonstrating inconsistent patterns due to shifting government priorities and economic pressures (Matthew et al., 2015). This inconsistent investment has not translated into improved health outcomes, reflecting in Nigeria's

poor global health status and high rates of preventable diseases and mortality (Orji, Ogbuabor, Peter & Orji, 2021). The underfunding and mismanagement of the health sector highlight the broader issue of inadequate investment in essential services despite substantial oil revenues (Stenberg et al., 2017).

The central problem lies not merely in the presence of oil but in the mismanagement of its revenues. Nigeria's Sovereign Wealth Fund, for example, was critically low at \$1.5 billion in 2012, indicating poor savings and fiscal planning relative to other oil-producing nations (Adelowokan & Osoba, 2015). The revenue from oil, which significantly contributed to the nation's GDP and foreign exchange earnings in the past, has often been poorly managed, leading to excessive government spending, corruption, and a lack of proper monitoring and accountability (Anochie & Duru, 2015). This mismanagement has impeded substantial progress in job creation and poverty reduction, perpetuating a cycle of underdevelopment and economic instability.

Thus, while Nigeria's oil wealth holds the potential to drive economic growth and development, the failure to manage this wealth effectively has led to economic stagnation and poor social outcomes (Solomon, 2018). The paradox of vast natural resource wealth coupled with socio-economic challenges underscores the need for a robust policy framework to ensure that oil revenues are managed sustainably and invested effectively in key sectors such as healthcare (Adelowokan et al., 2015). The challenge remains to leverage oil wealth to foster meaningful development and improve living standards across the nation.

This study aims to examine the impact of oil wealth on health outcomes in Nigeria, focusing on life expectancy as the primary dependent variable and analyzing how socioeconomic variables like GDP per capita and oil rent, as well as healthcare investment (health expenditure), influence it. The research will test the hypotheses that these variables significantly affect life expectancy and will provide insights into how oil wealth can be better leveraged to improve public health. By analyzing data from 1990 to 2023 sourced from the World Bank, National Bureau of Statistics, and other economic databases, this study seeks to inform policy on resource allocation and

healthcare investment, contributing valuable empirical evidence to the literature on sustainable development and public health in Nigeria.

2. Literature Review

2.1 Conceptual Issues

Concept of Oil Wealth Oil wealth, derived from the extraction and sale of crude oil, can significantly influence a country's health outcomes. While oil revenue provides resources that can potentially improve health services, the relationship between oil wealth and health outcomes is complex and multifaceted.

Oil wealth has the potential to enhance health infrastructure and services by increasing government revenue, which can be allocated to healthcare. For example, in countries like Saudi Arabia and Kuwait, oil revenues have been used to build modern healthcare facilities and improve medical services (Al-Hamoudi et al., 2021). However, the benefits of increased health spending are not always evenly distributed, and disparities in healthcare access and quality may persist.

The concept of the "resource curse" suggests that oil wealth can lead to health disparities. In some oil-rich nations, the influx of wealth has been linked to increased income inequality, which negatively affects health outcomes (Mottaghi et al., 2020). Wealth concentration among elites can lead to underfunding of public health services, exacerbating health inequalities and limiting access for disadvantaged populations.

Oil extraction and production have direct environmental health impacts. Oil spills, air pollution, and contaminated water sources from drilling activities can lead to a range of health problems, including respiratory issues, cancers, and other chronic conditions (López et al., 2021). The health risks associated with environmental degradation are particularly severe in regions heavily reliant on oil extraction.

Concept of Health Outcomes

The concept of health outcomes is crucial for understanding the impact of healthcare interventions. Health is defined by the World Health Organization (WHO) as a state of overall well-being, encompassing physical, mental, and social dimensions rather than merely the absence of disease (Leonardi, 2018). Health

outcomes, such as life expectancy and child mortality rates, reflect the effectiveness of healthcare interventions and the overall quality of health services (Olowookere, 2015; Oduyemi, 2020). Despite increased health expenditure in Nigeria, health outcomes remain poor compared to other nations with similar or even lower expenditures, indicating a need for improved health system performance and resource allocation (Angell et al., 2022). Several factors contribute to the underperformance of Nigeria's health system. These include a historical lack of trust between the government and the population, resulting in entrenched corruption and mismanagement, and complexities arising from Nigeria's federal system which hinder effective primary healthcare delivery (Adeyi, 2016). Additionally, the absence of a robust evidence-based planning and research function, dysfunctional development assistance mechanisms, and an overemphasis on input-driven health financing rather than outcomes further exacerbate the challenges facing Nigeria's healthcare system (Adeyi, 2016). Addressing these issues is critical for improving health outcomes and ensuring that oil wealth contributes effectively to better healthcare in Nigeria.

Nigeria's membership in the Organisation of Petroleum Exporting Countries (OPEC) has played a crucial role in its oil industry. Since joining OPEC in 1971, Nigeria has aimed to stabilize oil prices by regulating oil supplies. However, the global oil market's dynamics, including the 2014 price decline and subsequent challenges like the U.S. shale oil boom, have tested OPEC's effectiveness (Ogunnoiki, 2019). Despite efforts to stabilize prices, the benefits to Nigeria's economy and health system have been inconsistent. The volatility in oil prices has often led to financial instability, affecting the allocation of resources to crucial sectors such as healthcare (Amodu, 2018).

Numerous studies have examined the relationship between oil-related activities and various socio-economic and health outcomes in Nigeria. The findings highlight the diverse impacts of oil wealth and environmental factors on health, economic growth, and institutional quality.

2.2 Empirical Review

Okoye et al. (2022) found a positive long-term relationship between oil rent, gas flaring, and

economic growth, but noted that gas flaring could negatively affect economic performance. Modibbo and Inuwa (2020) demonstrated that improved health outcomes, such as increased life expectancy, positively impact economic growth, suggesting that healthcare investments foster development. Hassan et al. (2019) studied institutional quality and oil wealth, showing that better institutions can mitigate negative effects of oil wealth on economic growth in the long term and enhance its positive effects in the short term.

Bruederle and Hodler (2019) investigated the effects of oil spills on infant mortality in Nigeria, revealing that spills occurring before conception significantly increase neonatal mortality by approximately 100%. This effect was consistent across various demographics and attributed to risks posed by hydrocarbon exposure.

Furthermore, Manasseh et al. (2019) analyzed oil price fluctuations and their impact on well-being using time series data. They found no significant effect on well-being but identified a negative relationship when error correction mechanisms were included.

The relationship between Nigeria's oil wealth and its healthcare system is a topic of considerable debate. On one hand, oil revenue has the potential to substantially fund healthcare infrastructure, medical services, and health interventions. However, this potential is often undermined by mismanagement, corruption, and lack of transparency, which hinder the efficient allocation of resources to the health sector (Uzonwanne, 2015; Broni-Bediako, Onyije, & Unwene, 2018). Nigeria's heavy reliance on oil exposes it to significant risks due to the volatile nature of oil prices, impacting its macroeconomic indicators and health outcomes. During high oil price periods, Nigeria experiences improved trade balance and increased foreign reserves, but these benefits are not consistently translated into better health outcomes due to systemic issues (NNPC, 2014; Dele, 2017).

Matthew et al. (2018) focused on greenhouse gas emissions and health outcomes, noting that increased emissions significantly reduce life expectancy. They suggested enhancing healthcare expenditure to mitigate these effects. Similarly, Urhie et al. (2020) explored economic growth and health outcomes, identifying a positive link between GDP growth and health performance, moderated by air pollution and government health expenditure. Pona et al. (2021)

reviewed environmental health challenges, revealing that air pollution is a leading cause of death and advocating for sustainable policies to improve public health.

Elum, Mopipi, and Henri-Ukoha (2016) examined the socioeconomic effects of oil exploitation in the Niger Delta, noting severe environmental degradation and pollution. They emphasized the extensive negative impacts on wildlife, agriculture, and local ecosystems, despite the economic benefits of oil.

ThankGod and Maxwell (2013) studied the impact of oil price shocks on monetary policy from 1970 to 2010, uncovering a long-run relationship involving oil prices and inflation. Similarly, Ijirshar (2015) found that oil revenue positively impacts industrial growth in the long run but not in the short term due to revenue mismanagement. Furthermore, Aregbeyen and Kolawole (2015) and Ademola et al. (2015) explored the interactions between oil revenue, government spending, and economic growth. Both studies confirmed that oil revenue drives government spending and economic growth, though the latter highlighted corruption as a hindrance.

These studies collectively underscore the need for further research into the complex relationships between oil wealth, environmental factors, and health outcomes in Nigeria. They suggest that addressing environmental degradation and improving institutional quality could mitigate adverse health impacts and support sustainable development.

2.3 Theoretical Review

Social Determinants of Health Theory

This theory focuses on how social, economic, and environmental factors influence health outcomes. The social determinants of health theory (SDH) encompass non-medical factors that significantly impact health outcomes. They include the circumstances under which individuals are born, grow, work, live, and age, as well as broader societal forces and systems that shape daily living conditions. These forces and systems encompass economic policies, development agendas, social norms, social policies, and political systems.

SDH play a crucial role in influencing health inequities, which refer to the unfair and avoidable

differences in health status observed within and between countries. Regardless of income levels, health and illness exhibit a social gradient, where individuals in lower socioeconomic positions experience poorer health outcomes (WHO, 2019). The social determinants of health encompass various factors that can either positively or negatively influence health equity. These include income and social protection, education, employment status, working conditions, food security, housing quality, early childhood development, social inclusion, and access to affordable healthcare services.

Research indicates that these social determinants can have a greater impact on health outcomes than healthcare access or individual lifestyle choices, with studies suggesting they account for a significant portion, ranging from 30% to 55%, of health outcomes. Furthermore, estimates indicate that sectors beyond healthcare significantly contribute to population health outcomes, surpassing the influence of the health sector alone. Addressing these determinants effectively is crucial for improving overall health and reducing longstanding disparities, necessitating collaborative action from various sectors and civil society organizations (WHO, 2019).

3 Methodology

The primary objective of this research is to investigate the impact of oil wealth on health outcomes in Nigeria spanning from 1990 to 2023. The analysis will be conducted through multiple regression analysis, necessitating the development of a model to elucidate the correlation between the variables pertinent to the study.

The study utilized relevant secondary data sourced from existing time series covering the period from 1990 to 2023, encompassing a span of 33 years. The data was gathered from various sources including the World Bank and the CBN Statistical Bulletin.

3.1 Data and Sources

Table 1: Data Sources and Measurement

Variables	Definition	Measurement	Source
LER	Life Expectancy Rate	Average number of years a newborn is expected to live measured in years	WDI (2023)
GDP	Gross Domestic Product per capita	Average economic output per person measured in Naira (NGN)	CBN (2023)
OR	Oil Rent	Income derived from the production and export of oil measured in US dollars	WDI (2023)
HE	Health Expenditure	Total amount of money spent on healthcare services and infrastructure measured in Naira (NGN)	CBN (2023)

Source: Researcher's Compilation (2024)

3.2 Model Specification

To fulfill the objectives, this study revises the model proposed by Ewubare and Obayori, (2019), which examined the impact of oil rent on healthcare in Nigeria and Cameroon from 1995 to 2015. The model is presented below as Equation 1 and it reflects these variables and their relationships.

$$HLT_t = \beta_0 + \beta_1 ORET_t + \beta_2 MRET_t + \mu_t \quad (1)$$

Where; HLT = Health (proxy by child mortality under five years of age), ORET = Oil Rent, MRET = Mineral Rent, μ_t = Error term. In our modified model from Equation 1, we redefine the analysis by introducing additional significant variables and eliminating less relevant ones. Equation 2 reflects these adjustments, where the dependent variable Health Outcome is measured as a function of Life Expectancy Rate in Nigeria while the independent variable Oil Wealth is measured as a function of GDP Per Capita, Oil Rents and Health Expenditure. So, additional variables were added to the model;

$$LER_t = \beta_0 + \beta_1 GDP_t + \beta_2 OR_t + \beta_3 HE_t + \mu_t \quad (2)$$

Where;

LER = Life Expectancy Rate

GDP = GDP Per Capita

OR = Oil Rent

HE = Health Expenditure in Nigeria

β_0 = Intercept

β_1, β_3 = Coefficient of Regressors

μ_t = Error Term.

3.3 Method of Analysis

This research utilizes multiple regression analysis, starting with summary statistics to describe the dataset's key features, followed by correlation analysis to assess linear relationships between variables. The Augmented Dickey-Fuller (ADF) Unit Root Test checks for stationarity in the time series data to address potential spurious regression issues. The ARDL Bounds Cointegration Test examines long-term relationships among variables. Ordinary Least Squares (OLS) regression assesses how GDP per capita, Oil Rent, and Health Expenditure impact Life Expectancy in Nigeria. Post-estimation tests for heteroscedasticity, serial correlation, normality, and stability ensure the robustness of the results. The Coefficient of Determination (R^2) and Adjusted R^2 measure model fit, with higher values indicating better explanatory power. The F-statistic evaluates the overall model significance, with values exceeding the critical threshold confirming the collective significance of explanatory variables.

4. Results and Discussions

This subsection provides a detailed analysis of the variables of study i.e. Life Expectancy Rate (LER) as the dependent variable and GDP Per Capita (GDP), Oil Rent (OR), and Health Expenditure (HE) as independent variables. Unit Root Test, Co-integration Test, Ordinary Least Squares and Post Estimation test are all computed in this section.

Table 2: Unit Root Test

	At Level I(0)		At First Difference I(1)		Order of Integration
Variables	t-statistic	p-value	t-statistics	p-value	
LER	-4.547779	0.0050	-	-	I(0)
GDP	-3.102067	0.1259	-4.064974	0.0163	I(1)
OR	-3.800171	0.0337	-	-	I(0)
HE	0.025666	0.9944	-3.963280	0.0234	I(1)

Source: Researcher's Computation using Eviews9, 2024

The table displays the Augmented Dickey Fuller (ADF) Unit Root Test results, showing that Life Expectancy Rate and Oil Rent are stationary at Level (I(0)), while GDP Per Capita and Health Expenditure are stationary at First Difference (I(1)). Since variables

with mixed integration orders (I(0) and I(1)) could lead to spurious regression with Ordinary Least Squares (OLS), the ARDL bounds test for cointegration is necessary to identify any long-term relationships among these variables.

Table 3: ARDL Bounds Test

Test Statistic	Value	k
F-statistic	9.409905	3
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

Source: Researcher's Computation using Eviews9, 2024

The test's null hypothesis states that there is no long run cointegration (or relationship). This can be verified by comparing the F-statistic value with the critical bounds. If the value is greater than the I(1) bound the null hypothesis is rejected and the conclusion is therefore that there is long run relationship. If the F-statistic value is less than the I(0) critical bound then the null hypothesis is not rejected and the conclusion is that there is no long run relationship.

Looking at the f-statistics result of 9.409905, which is greater than the I(0) and I(1) critical value bound of 3.23 and 4.35 at 5% significance level, the test's null hypothesis is rejected which concludes that there is long-run relationships among the stationary and non-stationary series in the model. Conclusively, since there is a long run cointegration, using the Ordinary Least Squares (OLS) method of regression to estimate the parameters will not lead to a spurious regression result.

Table 4: Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
	t			
GDP_PER_CAPITA	0.000914	0.000672	1.360546	0.1838
OIL_RENTS	-0.065300	0.080409	-0.812093	0.4231
HEALTH_EXPENDITURE	0.019614	0.003659	5.360477	0.0000
C	45.80571	1.706907	26.83551	0.0000
R-squared	0.775488	Mean dependent var		49.15568
Adjusted R-squared	0.753036	S.D. dependent var		4.375532
S.E. of regression	2.174440	Akaike info criterion		4.501550
Sum squared resid	141.8457	Schwarz criterion		4.681122
Log likelihood	-72.52635	Hannan-Quinn criter.		4.562789
F-statistic	34.54097	Durbin-Watson stat		2.155270
Prob(F-statistic)	0.000000			

Source: Researcher's Computation using Eviews 9, 2024

This result examines the impact of GDP per capita, oil rent, and health expenditure on Nigeria's life expectancy using Ordinary Least Squares regression. The results show that GDP per capita and health expenditure have positive correlations with life expectancy, while oil rent has a negative correlation; this means that for every one-unit increase in GDP per capita and Health expenditure, Life expectancy Rate in Nigeria is expected to increase by (0.000914) and (0.019614) respectively while for every one-unit increase in Oil rent, Life expectancy rate in Nigeria is expected to decrease by 0.065300. However, only

health expenditure is statistically significant with a p-value of 0.0000, indicating a significant impact on life expectancy. GDP per capita and oil rent both have p-values above the 5% significance level, suggesting their effects are not statistically significant. The model explains about 78% of the variation in life expectancy, with an R-squared of 0.775 and an Adjusted R-square of 0.753. The F-statistic of 34.54 with a p-value of 0.000000 confirms that the overall model is significant, highlighting the notable impact of health expenditure on life expectancy.

Table 5: Post-Estimation Test

Test	P-Value
Breusch-Godfrey Serial Correlation LM Test	0.7042
Breusch-Godfrey Heteroskedasticity Test	0.8848
Jarque-Bera Normality Test	0.0000

Source: Researcher's Computation using Eviews 9, 2024

The post-estimation tests reveal that the Breusch-Godfrey Serial Correlation LM Test (p-value of 0.7042) and the Breusch-Godfrey Heteroskedasticity Test (p-value of 0.8848) indicate no significant issues with serial correlation or heteroskedasticity in the regression model. However, the Jarque-Bera Normality Test shows a p-value of 0.0000, suggesting that the residuals are not normally distributed. Despite this non-normality, the model's reliability concerning serial correlation and heteroskedasticity remains intact.

5. Conclusion and Recommendations

This study examines the relationship between socioeconomic variables and Nigeria's life expectancy rate, guided by the Social Determinants of Health Theory (SDH). The analysis shows that while GDP per capita and oil rent are correlated with life expectancy,

their impacts are statistically insignificant, highlighting their limited role in influencing health outcomes in Nigeria. In contrast, health expenditure significantly affects life expectancy, underscoring its crucial role in improving health outcomes. To enhance life expectancy, policymakers should prioritize investments in healthcare infrastructure and diversify the economy beyond oil dependence, focusing on sectors like agriculture, tourism, and manufacturing. For future research, it is recommended to explore additional factors such as government regulations, healthcare systems, and socio-cultural dynamics to better understand the nuances of oil wealth's impact on health. Additional diagnostic tests could also help address issues like residual non-normality by examining outliers or alternative variable transformations.

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