

ECONOMIC CONSEQUENCES OF CORRUPTION IN THE NIGERIAN HEALTHCARE SECTOR

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Abstract

This study economically evaluates the impact of corruption on healthcare delivery in Nigeria using secondary data sourced from the World Development Indicators from 2000-2023. The data were analyzed using ARDL bound Test for Cointegration. The findings of the first objective revealed that corruption have no significant relationship with life expectancy in Nigeria. While the findings of the second objective revealed that corruption has a positive and statistically significant relationship with infant mortality in Nigeria. This indicates that increase in corruption will reduce infant mortality in Nigeria. The findings of the third objective revealed that corruption have a negative and statistically significant effect on government health expenditure in Nigeria suggesting that an increase in corruption will reduce government health expenditure in Nigeria. This may be perhaps due to persistent corruption that dominated the health sector. The study recommends among others that given the negative impact of corruption on government health expenditure; targeted reforms are necessary to reduce corruption within healthcare. Strengthening transparency and accountability measures in healthcare budgeting, procurement, and service delivery can help mitigate the diversion of funds and improve healthcare investments.

Keywords ARDL, Corruption, Healthcare delivery:

INTRODUCTION

Background of the Research

Corruption is everywhere. Its gripping forces bring challenges in both rich and poor countries alike. It is however more visible in the majority of countries that are below the expectations such as Nigeria, which since has implications on the delivery of essential needs such as health services. Nigeria is a country that is endowed with many resources and has the largest economy after South Africa in Africa yet there are lots of challenges in the provision of healthcare services due to corruption (Social Protection Organization, 2024). Healthcare delivery is among the most essential services in any given country because it determines the health and output of its population. It is worthy of note that, the World Health Organization (WHO) explains that without implementing

social equity in the health systems healthcare, advancement cannot be achieved (World Health Organization, 2020). Sad to note though, Nigeria has been encapsulated with dysfunctions in its health system operating structure which is mostly explained by corruption. In terms of Corruption Index in 2020, Nigeria was 149 out of 180 countries, this is based on Transparency International's Corruption Perception. In primary sectors whether in the public or private sectors, Nigeria has a high level of corruption (Transparency International, 2020). Corruption in Nigeria is an accepted evil that has an all-encompassing repercussion on several aspects of society including the health sector. It involves theft of public money, bribery, favoritism, and fraud, and other forms of corruption (Onwujekwe et al., 2019). Such activities not only acts as a bottleneck in healthcare provision but misappropriates resources that would otherwise have been used in strengthening health systems, provisioning of basic drugs and training of health personnel. Pertaining to the health sector, a predominant way through which corruption affects healthcare services in Nigeria is the loss of funding aimed at promoting the welfare of the nation's people. Evidence has shown that healthcare budgets are exaggerated to provide room for corruption and when such misconstructions are built, funds are usually embezzled by the public offices (Lawal, 2021). In addition, it causes starvation of the hospitals, poor supplies of medical equipment, and demoralized the health workers, every aspect of which will lead to poor health care for patients. Corruption also impacts the purchases made in regard to the health care system. In most cases in Nigeria, procurement strategies are enacted by government officials in conjunction with contractors where contracts are awarded through political patronage as opposed to need or other objective criteria. Because of this, vital medicines and supplies are either provided at exorbitant rates or are formulating suboptimal quality (Makinde et al., 2020). Corruption as an Economic Factor in the Healthcare Sector of Nigeria. The economic costs of corruption in the healthcare system in Nigeria are much high. Wastage of available resources to be put to improving health indicators results from corruption to health care expenditure. Misallocation of funds for instance leads to inadequate facilities in a Healthcare sector where resources are required to provide good health services and in turn poor health outcomes which reduce the quality of manpower available in the country hence reducing productivity (Ogazama, et al., 2019). Moreover, the country has had to rely on the payment for services with enormous amount of money as many citizens have no choice but to patronize private hospitals owing to the collapse of public health facilities. This development has forced a large number of individuals into poverty and therefore the vicious cycle of inequality has been maintained (World Bank 2021). In addition, it also discourages any international investors who are willing to invest in the healthcare industry in Nigeria because of the problem of corruption. Most Investors are always reluctant in investing in totally corrupted cases because of the high chances of incurring unnecessary costs and wasteful expenditures. As a result, the Nigerian Health system suffers underdevelopment and it remains hard for the country to contain the easy preventable conditions and high health indices remain poor (Akinyemi et al, 2020). The toll corruption takes on Nigeria's healthcare system is heartbreaking. It's not just numbers or statistics it's real and people are suffering. According to the World Health Organization (2021), Nigeria carries a heavy burden of preventable diseases like

malaria, tuberculosis, and maternal mortality, illnesses that claim lives needlessly. With proper funding and governance, so many of these tragedies could be avoided. For instance, Nigeria has one of the highest maternal mortality rates in the world, with over 512 mothers losing their lives out of every 100,000 live births (World Bank, 2021). Behind these statistics are women who should have been saved, but corruption in the form of absent healthcare workers, demands for under-the-table payments, and the theft of medical supplies makes survival less likely (Onwujekwe et al., 2019). This problem doesn't stop at Nigeria's borders. When the country struggles to control diseases like polio, Ebola, or, more recently, COVID-19, it puts the whole world at risk. International efforts to help Nigeria face these health threats often fall short because corruption on the ground prevents effective solutions. This weakens the country's ability to respond to health crises and leaves its population, and potentially others, more vulnerable to outbreaks (World Health Organization, 2020).

Statement of the Problem

Widespread corruption in Nigeria's healthcare sector is a critical barrier to health service delivery and equitable health outcomes, (heavily) impacting its possibility. In Nigeria, where health infrastructures and healthcare services are heavily underfunded and thus very fragile despite the numerous resources available. (Nigeria is a country with one of biggest economies in Africa), have systemic dysfunctions owing to corruption. Money allocated to improve health facilities in the public sector ends up looted, rendering hospitals under-resourced with no medical supplies and demotivated staff. Some other preventable diseases such as malaria, tuberculosis and maternal mortality continue to take the lives of thousands. Corruption also skews the procurement processes, ending up with medical equipment bought at above-market prices and of poor quality which leads yet again to lower patient care. In Nigeria, the economic implication of corruption in its health care system is enormous and as a consequence funds which ought to be deployed for provision of basic essential services notwithstanding that they are misallocated ends up making these hospitals understaffed and poorly resourced leading directly to poor patient outcomes other than direct cost losses estimated at \$200 billion per annum (World Bank 2020). As a result, most Nigerians are left with expensive health care services thereby sinking the resources of many indigenes into absolute poverty and worsening inequality. The extra costs of corruption also act as a disincentive for foreign investment to be made in the health sector, which is critical for growth and innovation. The corruptive impact on the global health community writ large is considerable, since corruption in Nigeria weakens its responses to outbreaks of polio and COVID-19; when it comes to epidemics, we are all at risk while borders do not protect against disease. That kind of history underscores the urgency to tackle a systemic problem that not only affects Nigeria, but global efforts toward eradicating preventable diseases within health systems today.

Objective of the study

The major objective of the study is to evaluate the impact of corruption on health care delivery in Nigeria. Specifically, to examine the long run relationship between corruption and health outcome (such as life expectancy and infant mortality) in Nigeria; to evaluate the relationship between health expenditure and corruption in Nigeria.

This study organized in five sections. Section one which already presented the background of the study, statement of the problem and the objective of the study. Section two center on literature review consist of conceptual literatures, theoretical literatures, empirical literatures and theoretical framework. The third section consists of the methodology of the study, while section four takes care of data presentation and analysis. The last section consists of conclusion and recommendations.

LITERATURE REVIEW AND THEORETICAL FRAME WORK

Conceptual literature

Corruption: (adapted from a definition by Transparency International, 2020): The abuse of entrusted power for private gain that undermines trust in public institutions and distorts decisionmaking processes. Corruption can be seen in various forms including embezzlement, bribery and fraud practices particularly in procurement processes as well as fraudulent billing (Onwujekwe et al., 2019) among the sectors such as healthcare. It hampers the access to health services, sometimes leading public money going into pockets. Corruption in healthcare leads to inefficiencies by moving resources from the system (resource diversion, substandard service delivery) and patients pay more out of pocket because regimes are costly resulting ineffective health systems (Makinde et al, 2020).

Health care delivery: Although the exact type of care can differ greatly in these settings, many have medium variation units and include tertiary-level healthcare services. Healthcare delivery is how well-suited available health resources are used to come across specific needs for population while timely access to medical care, human resources for health, essential drugs and supplies or hospital management are all part of effective healthcare delivery (World Health Organization [WHO], 2020). In corrupt systems, healthcare delivery is affected by resource diversion, lack of accountability and unethical practices. This creates inequalities of access to health services, especially among the most disadvantaged populations and has a negative impact on supplying essential health inputs in countries with weak medical infrastructure like Nigeria (Lawal, 2021). **Health expenditure:** Health expenditure involves the allocation of financial resources for health services, including infrastructure, personnel, medicines, and public health interventions (World Bank, 2021). Corruption diverts these critical funds away from their intended purposes, leading to inefficiencies in health spending (Ogazama et al., 2019). The misallocation of resources reduces the effectiveness of health expenditure, contributing to inadequate facilities, shortages of medical supplies, and underpayment of healthcare workers, which in turn reduces the overall quality of care provided to the population (Lawal, 2021).

Economic Growth: Economic growth is the upward movement in the capacity of an economy to produce goods and services, compared from one period of time to another. Population health and productivity are both tools to ensure economic growth, a reason why it is so important for the healthcare system of a country to work efficiently (World Bank 2021). Yet, corruption in health care delivery through reducing access to good quality health care on increases burden disease with worsen outcome that constitutes a drag on economic growth (Akinyemi et al.,

2020). Corruption also reduces foreign investments in the health industry which results into low economic advancement (Ogazama et al., 2019).

Theoretical literature

Systems Theory: The system theory offers a way to view healthcare delivery as a system that includes the sum of its parts (healthcare providers, patients, infrastructure & architecture [buildings and equipment, policy and technology. In this theory the healthcare system is a whole, where everything affects each other. If corruption finds its way into any part of the system, say channeling funds and wrong procurement procedures it will be like a parasite in that subsystem or organ until something is done. When inefficiency affects overall operation of the economic system (Meadows, 2008). Systems Theory provides a framework that illustrative the removal of funds or resources from one part of the healthcare system as well assists with theft, bribery and fraud poses to all parts in the effective delivery of health care. This results in service gaps, delays and inefficiencies that erode the level of care delivery for patients.

Public Choice Theory: (Buchanan and Tullock 1962) provides a framework for understanding the influence of self-interested behavior by government personnel on decisions as to how much public money including health expenditure funds is allocated. This derived theory suggests that both public officials and politicians often behave in an opportunistic way rather than to the benefit of those they serve, particularly as it applies to resource allocation. In a corrupt health system, embezzlement or bribery by public officials can mean that money is diverted from its intended use (for example on hospitals medicines and salaries for health workers). Corruption is way in which economic theory and the political economy reflected most directly by Public Choice Theory can help us to understand why health budgets may be corruptly inflated or misspent, resulting in inefficiencies at all levels of a country's national health system.

Endogenous Growth Theory: Is a theory that concerns itself with the long-run determinants of economic growth emphasizing on how investment in human capital, innovation and knowledge not only affects aggregate output per worker but also ranks as an industrial policy. Human capital development depends of health as a basic factor considered in the literature to increase productivity under higher economic output (Romer, 1994). Corruption steals resources from health care, then undermines the tribes growing human capital and slowing economic growth. The theory implies that due to potential misallocation of health expenditure, better health outcome might not get improved efficiently; the productivity will decrease and people's life expectancy becomes shorter. This in turn helps slow down the rate of economic growth as over time there are less and less people to contribute meaningfully towards productivity.

Empirical Review

These empirical studies reveal a multidimensional understanding of how corruption severely impacts Nigeria's healthcare system, leading to poor health outcomes, inefficiencies, and inequities in access. Onwujekwe et al. (2019) highlight various forms of corruption, such as embezzlement, procurement fraud, and bribery, which

weaken the health system and disproportionately harm low-income populations. Their study underlines the direct connection between systemic corruption and deteriorating health outcomes, urging the need for governance reforms. Similarly, Lawal (2021) demonstrates how public sector corruption leads to misallocation of healthcare funds, which depletes resources for essential services, exacerbating maternal and child mortality.

Akinyemi et al. (2020) take a socio-economic perspective, showing how corruption increases inequality in healthcare access, forcing many Nigerians into poverty due to reliance on expensive private healthcare. This reinforces the vicious cycle of poverty and poor health outcomes. Makinde and Onwujekwe (2020) focus on procurement corruption, providing evidence of how inflated contracts and substandard equipment result in reduced care quality, contributing to high infant mortality rates and other poor health indicators. Ogazama (2019) examines the inefficiency of health spending caused by corruption, revealing that even with increased budget allocations, Nigeria's health outcomes remain poor because corruption neutralizes the benefits of such spending. Akinlo (2021), using econometric analysis, finds that corruption reduces healthcare efficiency and is directly linked to higher disease prevalence and poor health outcomes, further emphasizing the need for governance reforms. Oboh and Ogundeji (2020) specifically address maternal health, showing how corruption leads to high maternal mortality by weakening maternal health programs. The study underscores the importance of accountability to improve these health outcomes. Adesina (2022) connects corruption with delays in healthcare infrastructure projects and the use of substandard materials, which worsens patient care and overall health outcomes. Lastly, Ajayi and Sanusi (2021) examine the economic burden of corruption during the COVID-19 pandemic, revealing how it exacerbated the healthcare system's response, leading to high infection rates and fatalities. Their study highlights the compounded effects of corruption in times of crisis, showing how it undermines emergency health responses and exacerbates already poor health outcomes in Nigeria.

Theoretical framework

Institutional Theory

This theory emphasizes the role of institutions (rules, norms, and behaviors) in shaping the actions of individuals and organizations. Corruption is often entrenched in institutional structures, especially in developing countries where weak institutions allow for mismanagement and fraud. In Nigeria, weak institutions fail to regulate healthcare delivery effectively, allowing corrupt practices to persist, which negatively impacts the allocation of healthcare resources and patient outcomes. This theory is deemed to be relevant in the Nigerian context.

METHODOLOGY

Research Design

The research strategy for this study was planned and arranged to evaluate the impact of corruption on health outcome in Nigeria. Through the use of time-series secondary data, the study's ex post facto research technique enables the researcher to assess the link or impact between the dependent variable and the explanatory variables.

The impact of corruption on health outcome in Nigeria was empirically investigated using the Augmented Dickey-Fuller Unit Root Test, correlation and ARDL Bound Test for Cointegration.

S/N	Data Type	Abbreviation	Sources/Time
1	Economic growth (proxy by real GDP)	RGDP	World Development Indicators (2024)
2	Corruption Perception Index	COP	World Development Indicators (2024)
3	General Government Health expenditure	GGHE	World Development Indicators (2024)
4	Infant Mortality	IMF	World Development Indicators (2024)
5	Life Expectancy	LIE	World Development Indicators (2024)

Source: Author's Compilation 2024

Model Specification

The ARDL equation for model one (1) using (**life expectancy**) as dependent variable for health outcome:

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$$\Delta LIE_t = \alpha_0 + \sum_{i=1} \alpha_{1i} \Delta LIE_{t-i} + \sum_{i=0} \alpha_{2i} \Delta COP_{t-i} + \sum_{i=0} \alpha_{3i} \Delta GGHE_{t-i} + \sum_{i=0} \alpha_{4i} \Delta INF_{t-i} + \sum_{i=0} \alpha_{5i} \Delta RGDP_{t-i} + \beta_1 LIE_{t-1} + \beta_2 COP_{t-1} + \beta_3 GGHE_{t-1} + \beta_4 INF_{t-1} + \beta_5 RGDP_{t-1} + \mu_t \dots \dots \dots 3.0$$

Thus, the error correction version of ARDL model pertaining to the variables in equation (3.0) is as follows:

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$$\Delta LIE_t = \alpha_0 + \sum_{i=1} \alpha_{1i} \Delta LIE_{t-i} + \sum_{i=0} \alpha_{2i} \Delta COP_{t-i} + \sum_{i=0} \alpha_{3i} \Delta GGHE_{t-i} + \sum_{i=0} \alpha_{4i} \Delta INF_{t-i} + \sum_{i=0} \alpha_{5i} \Delta RGDP_{t-i} + \lambda EC_{t-1} + \mu_t \dots \dots \dots 3.1$$

Where λ is the speed of adjustment parameter and EC is the residuals that are obtained from the estimated cointegration model of equation (3.1)

The ARDL equation for model two (2) using (**Infant Mortality**) as dependent variable for health outcome:

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$$\Delta IMF_t = \alpha_0 + \sum_{i=1} \alpha_{1i} \Delta IMF_{t-i} + \sum_{i=0} \alpha_{2i} \Delta COP_{t-i} + \sum_{i=0} \alpha_{3i} \Delta GGHE_{t-i} + \sum_{i=0} \alpha_{4i} \Delta INF_{t-i} + \sum_{i=0} \alpha_{5i} \Delta RGDP_{t-i} + \mu_t$$

$$\alpha_5 \Delta RGDP_{t-i} + \beta_1 IFM_{t-1} + \beta_2 COP_{t-1} + \beta_3 GGHE_{t-1} + \beta_4 INF_{t-1} + \beta_5 RGDP_{t-1} + \mu_t \dots \dots \dots 3.2$$

.....3.2

Thus, error	COP	GGHE	IFM	INF	RGDP	the
COP	1.000000					
GGHE	0.661419	1.000000				
IFM	-0.738290	-0.903344	1.000000			
INF	0.021523	0.140118	0.006904	1.000000		
RGDP	-0.400308	-0.709128	0.640553	-0.106768	1.000000	

correction version of ARDL model pertaining to the variables in equation (3.2) is as follows:

$$\Delta IFM_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta IFM_{t-i} + \sum_{i=0}^n \alpha_{2i} \Delta COP_{t-i} + \sum_{i=0}^n \alpha_{3i} \Delta GGHE_{t-i} + \sum_{i=0}^n \alpha_{4i} \Delta INF_{t-i} + \sum_{i=0}^n \alpha_{5i} \Delta RGDP_{t-i} + \lambda EC_{t-1} + \mu_t \dots \dots \dots 3.3$$

$$\Delta IFM_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta IFM_{t-i} + \sum_{i=0}^n \alpha_{2i} \Delta COP_{t-i} + \sum_{i=0}^n \alpha_{3i} \Delta GGHE_{t-i} + \sum_{i=0}^n \alpha_{4i} \Delta INF_{t-i} + \sum_{i=0}^n \alpha_{5i} \Delta RGDP_{t-i} + \lambda EC_{t-1} + \mu_t$$

..... 3.3

Where λ is the speed of adjustment parameter and EC is the residuals that are obtained from the estimated cointegration model of equation (3.3)

The ARDL equation for model three using (**General Government Health Expenditure**) as dependent variable:

$$\Delta GGHE_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta GGHE_{t-i} + \sum_{i=0}^n \alpha_{2i} \Delta COP_{t-i} + \sum_{i=0}^n \alpha_{3i} \Delta IFM_{t-i} + \sum_{i=0}^n \alpha_{4i} \Delta INF_{t-i} + \sum_{i=0}^n \alpha_{5i} \Delta RGDP_{t-i} + \beta_1 GGHE_{t-1} + \beta_2 COP_{t-1} + \beta_3 IFM_{t-1} + \beta_4 INF_{t-1} + \beta_5 RGDP_{t-1} + \mu_t \dots \dots \dots 3.4$$

$$\Delta GGHE_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta GGHE_{t-i} + \sum_{i=0}^n \alpha_{2i} \Delta COP_{t-i} + \sum_{i=0}^n \alpha_{3i} \Delta IFM_{t-i} + \sum_{i=0}^n \alpha_{4i} \Delta INF_{t-i} + \sum_{i=0}^n \alpha_{5i} \Delta RGDP_{t-i} + \beta_1 GGHE_{t-1} + \beta_2 COP_{t-1} + \beta_3 IFM_{t-1} + \beta_4 INF_{t-1} + \beta_5 RGDP_{t-1} + \mu_t$$

$$\Delta GGHE_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta GGHE_{t-i} + \sum_{i=0}^n \alpha_{2i} \Delta COP_{t-i} + \sum_{i=0}^n \alpha_{3i} \Delta IFM_{t-i} + \sum_{i=0}^n \alpha_{4i} \Delta INF_{t-i} + \sum_{i=0}^n \alpha_{5i} \Delta RGDP_{t-i} + \beta_1 GGHE_{t-1} + \beta_2 COP_{t-1} + \beta_3 IFM_{t-1} + \beta_4 INF_{t-1} + \beta_5 RGDP_{t-1} + \mu_t$$

$$\Delta GGHE_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta GGHE_{t-i} + \sum_{i=0}^n \alpha_{2i} \Delta COP_{t-i} + \sum_{i=0}^n \alpha_{3i} \Delta IFM_{t-i} + \sum_{i=0}^n \alpha_{4i} \Delta INF_{t-i} + \sum_{i=0}^n \alpha_{5i} \Delta RGDP_{t-i} + \beta_1 GGHE_{t-1} + \beta_2 COP_{t-1} + \beta_3 IFM_{t-1} + \beta_4 INF_{t-1} + \beta_5 RGDP_{t-1} + \mu_t$$

$$\Delta GGHE_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta GGHE_{t-i} + \sum_{i=0}^n \alpha_{2i} \Delta COP_{t-i} + \sum_{i=0}^n \alpha_{3i} \Delta IFM_{t-i} + \sum_{i=0}^n \alpha_{4i} \Delta INF_{t-i} + \sum_{i=0}^n \alpha_{5i} \Delta RGDP_{t-i} + \beta_1 GGHE_{t-1} + \beta_2 COP_{t-1} + \beta_3 IFM_{t-1} + \beta_4 INF_{t-1} + \beta_5 RGDP_{t-1} + \mu_t$$

Thus, the error correction version of ARDL model pertaining to the variables in equation (3.4) is as follows:

$$\Delta GGHE_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta GGHE_{t-i} + \sum_{i=0}^n \alpha_{2i} \Delta COP_{t-i} + \sum_{i=0}^n \alpha_{3i} \Delta IFM_{t-i} + \sum_{i=0}^n \alpha_{4i} \Delta INF_{t-i} + \sum_{i=0}^n \alpha_{5i} \Delta RGDP_{t-i} + \beta_1 GGHE_{t-1} + \beta_2 COP_{t-1} + \beta_3 IFM_{t-1} + \beta_4 INF_{t-1} + \beta_5 RGDP_{t-1} + \mu_t$$

$$\Delta GGHE_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta GGHE_{t-i} + \sum_{i=0}^n \alpha_{2i} \Delta COP_{t-i} + \sum_{i=0}^n \alpha_{3i} \Delta IFM_{t-i} + \sum_{i=0}^n \alpha_{4i} \Delta INF_{t-i} + \sum_{i=0}^n \alpha_{5i} \Delta RGDP_{t-i} + \beta_1 GGHE_{t-1} + \beta_2 COP_{t-1} + \beta_3 IFM_{t-1} + \beta_4 INF_{t-1} + \beta_5 RGDP_{t-1} + \mu_t$$

$$\Delta GGHE_t = \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta GGHE_{t-i} + \sum_{i=0}^n \alpha_{2i} \Delta COP_{t-i} + \sum_{i=0}^n \alpha_{3i} \Delta IFM_{t-i} + \sum_{i=0}^n \alpha_{4i} \Delta INF_{t-i} + \sum_{i=0}^n \alpha_{5i} \Delta RGDP_{t-i} + \beta_1 GGHE_{t-1} + \beta_2 COP_{t-1} + \beta_3 IFM_{t-1} + \beta_4 INF_{t-1} + \beta_5 RGDP_{t-1} + \mu_t$$

$$\alpha_5 \Delta INF_{t-i} + \alpha_6 \Delta RGDP_{t-i} + \lambda EC_{t-1} + \mu_t$$

3.5

Where λ is the speed of adjustment parameter and EC is the residuals that are obtained from the estimated cointegration model of equation (3.5)

RESULTS AND DISCUSSIONS

Correlation analysis

Table: 1 Correlation Analysis

Author's computation using Eviews

Table 1 shows that government health expenditure (GGHE) and inflation (INF) has a positive correlation with corruption (COP), while infant mortality (IFM) and economic growth proxied by (RGDP) has a negative correlation with corruption (COP). Infant mortality (IFM) and economic growth (RGDP) has a negative correlation with government health expenditure (GGHE), while inflation (INF) has weak positive correlation with government health expenditure (GGHE). Furthermore, inflation (INF) and economic growth (RGDP) has a positive correlation with infant mortality (IFM). There is a negative correlation between economic growth (RGDP) and inflation (INF). Finally, corruption (COP), government health expenditure (GGHE) and inflation (INF) has a negative correlation with economic growth (RGDP), while infant mortality (IFM) has a positive correlation with economic growth (RGDP)

Unit root test

Table: 2 Unit root test results

VARIABLES	Augmented Dicky-Fuller test statistic		Critical Value at 5% at level		Order of integration
	At Level	At 1 st Difference	At level	At 1 st Difference	
RGDP	-4.623161		-3.644963		I(0)
COP	-4.340755		-3.710482		I(0)
INF	-3.031783	-4.538277	-3.658446	-3.733200	I(1)
IFM	-5.044890		-3.673616		I(0)
LIE	-4.029953		-3.012363		I(0)
GGHE	1.900276	-5.346835	-3.020686	-3.658446	I(1)

Author's computation using Eviews.

The unit root test results revealed that the variables economic growth (RGDP), corruption (COP), infant mortality (IFM) and life expectancy (LIE) are stationary at level. Because their ADFs are less than their critical value at 5%. Thus integrated of order zero $I(0)$. The variables inflation (INF) and government health expenditure (GGHE) are not stationary at level but become stationary after first differencing thus integrated of order one $I(1)$.

Lag Selection Criteria

Table: 3 Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ		
0	-363.7830		NA	4.62e+08		36.97830	37.27701	37.03661
1	-291.4773		93.99735*	14735831*		33.34773*	35.43877*	33.75592*

Author's computation using E-views

Based on the result presented in Table 3, among the maximum lag lengths of two lags, the optimal lag length of (1) was chosen based on four distinct factors, with the least values for one lag. The study estimated the ARDL limits (Wald) test after determining the number of lags to be employed in the models; the results are shown in Table 4

Table 4 Bound Test

Lag =1		F-statistics = 129.1432*					
Critical Value Bound of the F-statistics							
K	10%		5%		2.5%		1%
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0) I(1)
4	2.08	3	2.29	3.38	2.7	3.73	3.06 4.15

Note: * implies that computed f-statistics is above upper bound values

Source: Authors computation using Eviews

Based on the result presented in Table 4, the co-integration approach and bound test result shows that the first method compares the computed f-statistic result to the crucial values provided in the Pesaran, Shin, and Smith (2001) paper. Thus, at 10%, 5%, 2.5%, and 1%, the f-statistic of

129.1432, which is computed at $k=4$ (number of independent variable), surpasses the upper critical threshold. Without taking into account whether or not they are integrated of the same order, the null hypothesis that there is no co-integration was thus rejected. As a result, it was determined that the variables have a long-term relationship Table 5.

Estimated long run Coefficients based on ARDL for Life Expectancy Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.058388	2.113727	0.500721	0.6243
COP	0.002240	0.002380	0.941006	0.3627
GGHE	-8.55E-07	3.04E-07	-2.809433	0.0139
INF	0.018671	0.011488	1.625248	0.1264
RGDP	-0.025936	0.011993	-2.162495	0.0484

Source: Authors computation using E-views 10, 2024.

The long-term corruption coefficient (COP) in Table 5 is positive but not statistically significant at the 5% level. The long run coefficient of government health expenditure (GGHE) is negative and statistically significant at 5% level. This implies that an increase in government expenditure has the potential to reduce life expectancy in Nigeria. This may be attributed to the syphoned of monies allocated to private pockets. The long run coefficient of inflation (INF) is positive but not statistically significant at 5% level. But the long run coefficient of economic growth turns out to be negative and statistically significant at 5% level. This also confirm that economic growth may not necessarily lead to economic growth. There is a long-term link between the variables, which is confirmed by Table 5's Error Correction Term coefficient (ECTt-1). According to CointEq(-1)*0.017004% of the variables' annual deviations from their long-term equilibrium are fixed until they reach their long-term equilibrium.

Table 6.

Estimated long run Coefficients based on ARDL for Infant Mortality Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
COP	0.014861	0.005488	-2.707794	0.0170
GGHE	-6.88E-07	1.19E-06	-0.579221	0.5716
INF	-0.005151	0.022223	-0.231792	0.8201
RGDP	-0.028901	0.026638	-1.084975	0.2963
C	13.18990	1.886740	6.990844	0.0000

Source: Authors computation using E-views 10, 2024.

The long run corruption coefficient (COP) in Table 6 is positive and statistically significant at 5% level. This implies that increase in corruption will reduce infant mortality in Nigeria. The long run coefficient of government health expenditure (GGHE) is also negative but not statistically significant at 5% level. Similarly, the coefficient of inflation (INF) is also negative but not statistically significant at 5% level. Finally, the long run coefficient of economic growth (RGDP) is negative but not statistically significant at 5% level. There is a long-term link between the variables, which is confirmed by Table 6's Error Correction Term coefficient (ECTt-1). According to CointEq(-1) -0.131921% of the variables' annual deviations from their long-term equilibrium are fixed until they reach their long-term equilibrium.

Table 7. Estimated long run Coefficients based on ARDL for Government Health Expenditure Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.839758	15.88320	0.493588	0.6305
IFM	-0.021462	0.041977	-0.511283	0.6184
INF	0.009688	0.009869	0.981584	0.3457
RGDP	-0.029612	0.012406	-2.387013	0.0343
COP	-0.010165	0.003134	3.243558	0.0070
LIE	-0.270503	0.220277	-1.228013	0.2430

Source: Authors computation using E-views 10, 2024.

The long run infant mortality (IFM) coefficient in Table 7 is negative but not statistically significant at 5% level. The long run coefficient of inflation (INF) is positive but statistically significant at 5% level. But the coefficient of economic growth (RGDP) is negative and statistically significant at 5% level. This indicates that an increase in economic growth will lead to a reduction in government expenditure on health in Nigeria. The coefficient of corruption (COP) is negative and statistically significant at 5% level. This also implies that an increase in corruption will reduce government health expenditure in Nigeria. This may be perhaps due to persistent corruption that dominated the health sector. The long run coefficient of life expectant (LIE) is negative and statistically significant at 5% level. This indicates that an increase in life expectancy has reduce government health expenditure in Nigeria. This suggest that health outcomes have the potential of reducing health finance. There is a long-term link between the variables, which is confirmed by Table 6's Error Correction Term coefficient (ECTt-1). According to CointEq(-1)-0.472684% of the variables' annual deviations from their long-term equilibrium are fixed until they reach their longterm equilibrium.

CONCLUSION AND RECOMMENDATIONS

This study economically evaluates the impact of corruption on healthcare delivery in Nigeria using secondary data sourced from the World Development Indicators. The data were analyzed using ARDL bound Test for Cointegration. The findings of the first objective revealed that corruption have no significant relationship with life expectancy in Nigeria. While the findings of the second objective revealed that corruption has a positive and statistically significant relationship with infant mortality in Nigeria. This implies that increase in corruption will reduce infant mortality in Nigeria. The findings of the third objective revealed that corruption have a negative and statistically significant effect on government health expenditure in Nigeria. This also implies that an increase in corruption will reduce government health expenditure in Nigeria. This may be perhaps due to persistent corruption that dominated the health sector.

In line with the findings, the following recommendations were made

- i. Given the negative impact of corruption on government health expenditure, targeted reforms are necessary to reduce corruption within healthcare. Strengthening transparency and accountability measures in healthcare budgeting, procurement, and service delivery can help mitigate the diversion of funds and improve healthcare investments.
- ii. Despite the study indicating a reduction in infant mortality with increased corruption, this counterintuitive result may reflect issues in data or resource allocation. To ensure long-term improvements in child health, the government should increase direct investments in maternal and child health programs, ensuring proper monitoring to prevent corruption.
- iii. The negative impact of corruption on health expenditure suggests inefficiencies in resource allocation. The government should enact policy reforms that prioritize efficient allocation of health funds, including digitization of healthcare financial management systems to reduce leakages, and independent audits to ensure proper use of public resources.

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