EFFECT OF INSTITUTIONAL QUALITY ON MATERNAL AND CHILD HEALTH OUTCOMES IN NIGERIA

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Abstract

This study examines the influence of institutional quality on maternal and child health outcomes in Nigeria between 1978 and 2023. The generalised method of moments (GMM) is used in this study. The study employs two institutional quality measures (democracy and corruption) and four

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maternal and child health measures (infant mortality

Introduction

Maternal and child health is the health status of pregnant women who currently deliver a newborn, as well as the health status of the newborn (WHO, UNICEF, UNFPD, World Bank Group and UNDESA/Population Division 2023; O'Neil et al, 2017, pg 1). Maternal and child health remains a major health problem in Nigeria, despite notable increases in policies and programs to reduce the alarming rates of maternal and child deaths in Nigeria. The country is reported to account for a substantial proportion of maternal deaths across the world (EQUAL Research Consortium 2023, pg 23). The statistics show that five out of 1,000 Nigerian women die while delivering their babies, which is frightening. Also, the current maternal health statistics from (United Nations Inter-Agency Group for Child Mortality Estimation 2018, pg 8; Dauda 2023, pg 8; Nasir *et al.,* 2022;

rate, maternal mortality rate, contraceptive prevalence, and the number of neonatal deaths) to determine the specific role of institutional quality in producing maternal and child health outcomes in the country. A correlation matrix was used to examine the association between the research variables. Regression analysis was used to determine the functional relationship between institutional quality and maternal and child health outcomes. The results showed that institutional quality significantly influenced maternal and child health outcomes in Nigeria. The study concluded that the quality of institutions influences healthcare delivery in the country and recommended an improvement in the awareness of the institutional quality-healthcare delivery nexus in the country. The Nigerian government should establish effective mechanisms to support public health campaigns, thereby enhancing awareness of the connections between corruption and the poor maternal and child health outcomes in Nigeria. This study is the first to emphatically examine the influence of institutional quality on the maternal and child health outcomes nexus in Nigeria, using different measures of institutional quality and health outcomes.

Kouassi *et al.,* 2021, pg 1) revealed that Nigeria accounts for over 34 per cent of the global maternal deaths, while the lifetime risk of dying during pregnancy and childbirth for Nigerian women is one in 22 compared to one in 4900 in developed countries. (Nasir *et al.*, 2022, pg 1) added that Nigeria accounted for the highest neonatal death rate in Africa. According to the (UN, 2017) cited in the work of (WHO 2023, pg 17), 15000 children died before reaching their fifth birthday, making maternal and child health a problem in developing countries.

Despite the alarming increase in health challenges in developing countries, the quality of the health institutions has remained less effective in recent years, with continued adverse effects on the population's health status (Sharma *et al.,* 2022). Poor institutional quality is a key problem in the health sector because it elevates the risk of maternal and child deaths in society. According to Sania et al. (2019), institutional quality is closely linked to the perfect standard of living for women and children, as it leads to a long and fulfilled life, allowing women and children to attain meaningful development. (Bertone & Meessen, 2012) maintained that institutional quality has a sustainable influence on the population's health. The institutional contexts of health service delivery, particularly healthcare delivery institutions' operations, play a crucial role in how health institutions achieve national health objectives. Healthcare delivery institutions play a crucial role in coordinating the demand for healthcare services.

Based on the foregoing, the study examines the role institutional quality plays in achieving maternal and child health outcomes in Nigeria between 1978 and 2023. To achieve this objective, institutional quality is proxied using democracy and corruption. In contrast, maternal and child health outcomes are proxied by infant mortality rate,

maternal mortality rate, contraceptive prevalence, and the number of neonatal deaths. Data from these variables are analysed using the generalised method of moments due to its advantages over other estimation techniques in correcting errors of omission of variables, endogeneity, collinearity, etc.

Apart from this introduction, the remaining part of the paper is organised as follows: Section 2 discusses the theoretical and empirical literature. Section 3 is the methodology. Section 4 presents the results and discussion. Section 5 contains the conclusions and policy recommendations.

Literature Review

This section is subdivided into the theoretical issues and the empirical issues. The theoretical framework explains the features and arguments about the theoretical framework adopted in this study. At the same time, the empirical issues elucidate the strengths and shortcomings of studies in the extant literature. This exercise emphasises the contribution of this study to the extant literature.

Theoretical Issues

The principal-agent model theory propounded in the 1970s by Michael Jensen and William Meckling underpins the study. It is an old-age problem that has persisted since the evolution of joint-stock companies. Agency theory explains the association between an organisation's agent and the principal (Chang & Chen, 2013). According to Oliueria & Filho (2017), the organisation owners are the principals, while the managers are the agents. The uneven information between the principal and the agent creates conditions for the latter to report incomplete or biased information voluntarily or not. In this study, the institution owner is the government, while the service deliverers are the agents.

In contrast, Tibrewal and Cahudhri (2022) argued that agency theory contains mathematical modelling that is based on economic concepts and theory. (Baker, 2018) defined theory in five different ways: the function of an agent, the relationship between the principal and that person's agent, the capacity condition and the state of exerting power. (Kallmuenzer, 2015) Maintaining the theory helps to understand cooperation problems, such as asymmetric information and uncertain decision-making outcomes (Panda & Leepsa, 2017). Agency theory refers to the contractual agreement between a principal and an agent, where the agent is delegated responsibility for carrying out a function or set of tasks on the principal's behalf (Yallew *et al*., 2018). One of the theory's limitations is the assumption of agreement between the principal and agent for a limited or unlimited future uncertainty problem. It simplifies the idea as the analytical framework for analysing the contractual relationship between two parties: individuals, groups, or institutions (Pires & Guimaraes, 2015; Widmal, 2016).

The theory elucidates government policies' decision-making and implementation processes in modern democracies (Dellreux & Adriaensen, 2017; Renmans *et al.,* 2016) and states that most agents sometimes pursue their interests instead of the principal's claim, leading to the agency problem. The principal-agent model is a mechanism that helps to identify the critical actors for understanding and explaining the politics of delegation and discretion (Lupia, 2001). The agency problem has different academic fields, such as accounting, finance, economics, political science, and sociology (Pires *et al.,* 2015). In this study, the government was the principal who delegated tasks to improve health service delivery.

In contrast, health providers are the agents. According to Lupia (2001), the principal plays a vital role in policy development separately, while the health providers' agents deliver health services and report on the outputs. The principal-agent model theory is the relationship between those who provide agency services and those who allocate resources to service providers, the same as those who make claims on governmental resources (agent) and those who distribute and ration the resources (principal) (Leruth and Paul, 2007).

 The theory-related study is the ideology behind the agent and the principle: the government and the health providers. However, the contract is between the government (principal) and the health providers (agent), hoping the agency will do the job desired by the principal (Lupia, 2001). The governments in Nigeria are the principals, while health institutions are the agents. By applying this theory, governments at the three tiers of governance in the country delegate responsibility for healthcare delivery and management to health institutions. However, poor institutional quality, such as corruption and industrial disharmony, hinders health institutions from achieving the principal's objective for health delivery.

Therefore, there is a growing need to separately analyse the contributions of each variable to ascertain which area needs more attention for better performance. Previous studies have not examined the influence of institutional quality on maternal and child health outcomes in Nigeria; most studies on health have focused on public spending, governance quality, corruption in health organisations and democracy (Chang & Chen, 2013; Oliueria & Filho, 2017; Tibrewal & Cahudhri, 2022; Kallmuenzer, 2015; Panda & Leepsa, 2017). Therefore, this study addresses the missing literature by empirically investigating the influence of institutional quality on Nigeria's maternal and child health outcomes.

Empirical Literature

Numerous studies have examined the connections between institutional quality and health outcomes (Sharma *et al.*, 2022; Sania *et al.*, 2019; Ouedraogo *et al.*, 2020; Lee et al., 2022; Dhrifi, 2018; Njemenza & Okoro, 2015). However, there are variations in studies' results due to differences in periods, methodologies and the variables captured in

the studied models. (Vaidean *et al*., 2021), An examination of the impact of corruption on health outcomes reveals that a high level of corruption more deeply affects the physical health of the population in low-income countries than in high-income countries. This assertion shows that infant mortality is essential to a nation's health. In addition, Dhrifi (2018) revealed that institutional quality, as measured by Control of Corruption, harmed infant mortality rates. Meaning spending on health is unlikely to lead to lower infant and child mortality if the government has high levels of grand corruption in the public sector regarding the quality of the institutions.

However, (Luca *et al.,* 2019) also observed that institutional quality plays a crucial and significant role in maternal and child healthcare outcomes. (Lee *et al.,* 2022) This illustrates how institutional quality in healthcare is challenging when corruption permeates the healthcare institution, and resources for patient care are misallocated. It is maintained that a higher institutional quality reduces maternal and child health risks. In a related study, Hadipour et al. (2023) highlighted the significant impact of corruption on the quality of service delivery for infant and child mortality within institutions. (Bousmah *et al.,* 2016; Sibanda *et al*., 2024). Stated institutional quality is a crucial factor in achieving better health outcomes. Furthermore, the democratic accountability system of government lacks continuity, as each elected government has its own distinct plan for governing the country. (Bertone *et al.,* 2012) confirmed that Institutional quality plays a critical role in determining the health status of a society. (Ouedraogo *et al.,* 2020) support the view by adding that the quality of the health system is an essential element of achieving the promise of increased access to maternal health services. (Amporfu *et al.,* 2013) observed that institutional relevant dimensions that improved health outcomes include control of corruption, government effectiveness, rule of law, political stability, voice, and accountability. Sania et al. (2019) found a positive relationship between institutional quality and health outcomes in their study. (Factor and Kang, 2015) established that corruption in any country negatively impacts the health outcomes of its citizens.

Furthermore, Hadipour *et al. (*2023) revealed a significant impact of institutional quality on the health system. This study focused only on the health system without considering the health outcome of the populace, which is an important determinant. In addition, Bertone et al. (2012) and Abba-ji et al. (2021) also stressed that a higher institutional quality brings better health investment than a low-quality outcome. While (Ubi & Udah, 2014) argued that corruption practices in the health sector are perceived to consistently appear prominently, leading to negative institutional quality and further increasing the sector's dysfunctional service delivery system. It may mean that the high corruption rate varies from country to country; this may be because each country is at a different stage of development. However, the study result is in tune with the findings of (Vaidean *et al.,* 2021).

Studies such as (Kouassi *et al.,* 2022; Adindu, 2010) show evidence that the quality of institutions decreased because of corruption, which negatively affected Nigeria's health sector service performance. The study was in line with the report of the Equal Research Consortium (2023), which emphasised that corrupt practices deteriorate and increase inequality. Empirically, no consensus has emerged regarding the effect of institutional quality on maternal and child health.

Regarding health, institutional aid, and health outcome, Ponku (2018) investigated private and public health expenditures and how institutional quality mediates between these health expenditures and health outcomes in Sub-Saharan Africa from 2000 through 2015. The study shows that institutional quality significantly enhances the effect of private and public health expenditures in achieving better health outcomes. However, this study contradicts the previous work of Keefer and Khemani (2005) regarding the method of analysis because the current study gives evidence of empirical research, which the previous researcher did not provide.

Bousmah, Ventelou and Abu-Zainch (2016) estimate the macro-level determinants of health outcomes with a panel dataset of 18 countries from the Middle East and North Africa region from 1995-2012. They found that increasing health expenditure leads to improvements in health outcomes only to the extent that the quality of institutions within a country is sufficiently high. However, these findings do not conform to the last result because the current study focused on medicine and democracy, neglecting health expenditure.

Cimpoeru and Cimpoeru's (2015) findings reveal that institutional variables, such as corruption and GDP per capita, explain 60% of budget transparency. Moreover, high budget transparency leads to reductions in crime, improved government policies, and provides vital information to the public. The study used segregated panel data for 2006, 2008, 2010, and 2012. It focused on corruption as it affects budget transparency. Still, other essential aspects of institutions can affect budget transparency. However, the study fails to include health outcomes in its variables, which is a significant limitation.

In contrast, Clemence (2006), using data on 42 developing countries from 1975 to 2001, asserts that politicians shift the pre-election spending towards current expenditure away from capital expenditure. This assertion implied that the government preferred to allocate more money to recurrent expenditures to gain advantages over increasing capital expenditure, which is more likely to improve public spending to reduce corruption. The study did not focus on health outcomes concerning health expenditure but on Democracy, which is one of the many institutional quality variables.

Ferrara & Nistico (2019) also believed and provided empirical evidence that IQ affects regional well-being inequality regarding institutional quality. Moreover, the effect varies heterogeneously according to the level of public expenditures. However, the result shows that institutional quality affects the well-being of the people regardless of the level of

health expenditure. Furthermore, the study uses time-series data to run the analysis. It is contrary to the findings of previous researchers who focused on economic growth without linking it to the health outcomes of the populace. However, the results align with those of Kiross, Chojenta, Barkar, and Loxton (2020), who examined the relationship between public health expenditure, child mortality, and IQ's role in reducing the high infant mortality rate. Findings, however, revealed a positive effect of health expenditure on infant mortality in high-income countries with no significant impact on infant mortality in lower, lower-middle and upper-middle-income countries. This assertion shows that infant mortality is essential to a nation's health. However, the study selected developed countries and used one variable of health indicators out of the many variables. Dhrif (2018) used a simultaneous-equation model for 93 developed and developing countries with data from 1995–2012 using the 3SL method to investigate the effects of healthcare expenditures on child mortality rates and economic growth. The findings indicate that in less developed countries, public spending on health has a more significant impact on mortality rates than private health expenditure. In contrast, personal spending positively impacts child health at high development levels. The study found that public health expenditure in developed countries has a more significant impact on reducing the mortality rate. The study result conformed to the work of Kiross, Chojenta, Barkar, and Loxton (2020), as both studies focused on the relationship between health expenditure, institutional quality and maternal mortality. One of the criticisms is that the previous data is time series based on upper-middle-income and high-income countries, as well as low-income and lower-middle-income countries. The latter used panel data based on developed countries.

Sommer (2020) uses two-way fixed effects models for a sample of 90 low- and middle-income nations from 1996 to 2012 and examines the interaction between corruption, health expenditure impact and infant and child mortality. It found that health expenditure alone cannot reduce the infant mortality rate in the country without lowering crime in the public sector. Meaning spending on health is unlikely to lead to lower infant and child mortality if the government has high levels of grand corruption in the public sector. These findings contribute to Kiross, Chojenta, Barkar, and Loxton's (2020) and Dhrif's (2018) research. The studies suggest that health expenditure decreases infant and child mortality more in high-income countries. However, the study result contradicts Ferrara and Nistico's (2019) work. Their findings show that institutional quality does not affect the health outcomes of people, regardless of the increase in health expenditure. However, the study does not underpin its findings with any theory.

However, according to the corruption index, corruption in Nigeria has been at a high rate among the regions. The study established that corruption harms any health institution's quality in service delivery; Dhrifi (2018) also observed that institutional quality plays a crucial and significant role in mediating the link between health budgetary allocation and

infant mortality in developed and developing countries. The study examined the impact of IQ and budgetary allocation to health-on-health institutions, focusing on the infant mortality ratio as a key factor and determinant of health outcomes, which was a limitation of the study. The study will incorporate the missing variables. Luca, Lisi, Marorana and Siciliani (2019) also add that a higher IQ increase reduces MCH risk.

Several studies, such as Dauda (2023), Naima et al. (2022), Kouassi et al. (2021), Hadipour et al. (2021), and Adindun (2010), have provided evidence of no impact, while some have reported weak results. The work of (Noble, 2013; Oyekale, 2023) made it clear that democracy has a direct effect on the health outcome of the populace.

However, despite the importance of the quality of institutions to healthcare delivery, particularly maternal and child health, none of the existing studies use all the maternal and child health proxies. This study contributes to the extant literature by incorporating all the maternal and child health proxies that were missed out in the earlier studies and examining the effect of institutional quality on them in Nigeria.

Methodology

Model Specification

The model developed from the framework to achieve the objective explains the association between dependent and independent variables; the dependent variable is maternal and child health outcomes. The study adopts the Generalised Method of Moments (GMM) to test the effect of institutional quality on maternal and child health outcomes. The GMM method is suitable for the analyses because it corrects the problem of collinearity, simultaneity, endogeneity and omitted variables in the data.

In equation 1.1, the dependent variable is the maternal and child health proxy (infant mortality rate, contraceptive prevalence rate, maternal mortality rate). Institutional quality (corruption and democracy) and explanatory variables are human capital, inflation and Gross Domestic Product. This is consistent with the work of (Vaidean *et al.*, 2021; Hadipour *et al.*, 2023; Adindun, 2010; Tibrewal *et al.*, 2022)

$$MCH_{it} = \alpha_1 MCH_{it-1} + \alpha_2 Corrp_t + \alpha_3 Dem_t + \alpha_4 Sch.Enr_t + \alpha_5 GDP_t + \alpha_6 Inf_t + \varepsilon_t$$
………………………………………………..(1.1)

Here MCH_{it} Represents health indicator variables, democracy (DEM) and corruption (CORRP) were used to proxy institutional quality (IQ). School enrolment, inflation (INF), and Gross Domestic Product at local currency (GDP) serve as proxies for human capital (HC) in the model, representing explanatory variables in the study.

Design

The study used quantitative econometric analysis to find the association between institutional quality and maternal and child health variables. Data were gathered quantitatively to ascertain their relationship empirically.

Data

The study sourced secondary data from 1978 to 2023 from international country risk guides and World Development Indicators. Such as infant mortality rate (IMR), maternal mortality rate (MMR), contraceptive prevalence rate (CPR), number of neonatal deaths (NND), inflation, human capital, and Gross domestic product) In addition, data relating to measures of institutional quality, such as corruption and democracy, are extracted from the International Country Risk Guide. Data were analysed using the Generalised Method of Moments (GMM).

Measurement of Variable

The study adopted the dominant proxy of institutional quality in the health sector in the literature to ensure that the analysis performed is comparable with findings in existing literature. All existing studies (Vaidean *et al.*, 2021; Hadipour *et al,* 2023; Adindun, 2010; Tibrewal *et al.*, 2022; Sibanda *et al.*, 2024; Oyekola, 2023; Noble, 2019) seek to find out the effect of institutional quality on only one variable, neglecting other variables of maternal and child health.

Empirical Results

Table 1 presents the descriptive statistics of the variables across the studied period. The statistical characteristics of each variable, such as the mean, median, maximum, minimum, standard deviation, and measures of skewness and kurtosis, were presented in addition to the Jarque-Bera statistics. For instance, the mean of IMR was 202 infant deaths per 1000 live births (IMR=2.0208), reflecting a high level of infant mortality during the studied period. Likewise, the average maternal mortality in the studied period was 304 maternal deaths per

Table 1: Descriptive Statistics

Statistic	Infant Mortality Rate	Maternal Mortality Rate	Number of Neonate Deaths	Contraceptive Prevalence Rate	Corruption	Democracy	Gross Domestic Product	Inflation	Scholl Enrolment
Mean	2.0208	3.0441	5.3607	11.5761	27.0871	48.7529	12.7160	1.1615	30.6353
Median	2.0610	3.0769	5.3922	13.4000	25.0000	51.6950	12.8821	1.0929	27.2097
Maximum	2.1163	3.0792	5.4311	20.4000	33.3300	63.1900	14.1106	1.8623	56.1799
Minimum	1.8704	2.9623	5.2574	6.0000	16.6700	8.3300	10.7016	0.7314	9.0292
Std. Dev.	0.0840	0.0458	0.0573	4.1945	5.6327	13.0091	1.03822	0.2924	10.5209
Skewness	-0.5218	-0.7622	-0.6451	-0.1130	-0.5090	-1.6783	-0.3457	0.8981	0.3609
Kurtosis	1.6286	1.7834	1.8577	1.6506	2.2818	5.0823	1.7255	3.0045	2.58271
Jarque-Bera	5.1971	6.6570	5.1964	3.2761	2.7165	27.3049	3.6796	5.6461	1.2167
Probability	0.0743	0.0358	0.0744	0.1944	0.2571	0.0001	0.1588	0.0594	0.5442
Sum	84.875	127.8531	225.1507	486.2000	1137.660	2047.620	534.0716	48.7823	1286.683
Sum Sq. Dev.	0.2898	0.0859	0.1343	721.3562	1300.828	6938.704	44.1943	3.5060	4538.293
Observation	46	46	46	46	46	46	46	46	46

Notes: IMR; infant mortality rate, MMR; maternal mortality rate, NND; the number of neonate deaths, CPR; contraceptive prevalence rate, CORRP; corruption, DEM; democracy, LGDP; gross domestic product, LINF; the log of inflation, SCH. ENR; school enrolment;
Source: Author's Computation, 2025

100,000 live births (MMR=3.04), indicating a relatively high level of maternal deaths over the studied period. Also, the average contraceptive prevalence rate was 11.57 per cent during the studied period (CPR=11.5761), indicating that the contraceptive behaviour of childbearing women remains poor. However, the deaths, contraceptive prevalence rate, corruption index, and democratic statistical distribution revealed that most variables were negatively skewed: infant mortality rate, maternal mortality rate, number of neonatal deaths, and gross domestic product. In contrast, inflation and school enrolment were positively skewed.

The probability that the Jaque-Bera statistic exceeds (in absolute terms) the observed value was low for variables such as corruption index, gross domestic product, and school enrolment. The mean value of the gross domestic product was 12.7160 billion Naira, the average inflation rate in the same period was 1.16 per cent, while the middle school enrolment was 30.6353 pupils. The standard deviations of each variable examined were low, indicating that the measures of central tendency were valid and reliable. Corruption correlates with neonatal deaths and contraceptive prevalence. Furthermore, the Jaque-Bera statistic computed to assess the absolute terms of the variables showed that the observed values are consistent.

Table 2: Correlation Matrix

Variable	Contraceptive Prevalence Rate	Corruption	Inflation	Democracy	Gross Domestic Period	Infant Mortality Rate	Maternal Mortality Rate	Number of Neonate Deaths	School Enrolment
CPR	1.0000								
CORRP	-0.6436	1.0000							
LINF	0.7182	-0.3980	1.0000						
DEM	0.1911	-0.3092	0.3534	1.0000					
LGDP	0.8606	-0.5559	0.8859	0.2374	1.0000				
IMR	0.8607	-0.5559	0.8857	0.2372	1.0000	1.0000			
MMR	-0.6536	0.3169	-0.9388	-0.4341	-0.8556	-0.8554	1.0000		
NND	-0.6534	0.3161	-0.9396	-0.4335	-0.8554	-0.8552	0.9999	1.0000	
SCH.ENR	0.6284	-0.3917	0.7549	0.2890	0.8607	0.8607	-0.7801	-0.7798	1.0000

Source: Author's Computation, 2025

The correlation results in Table 2 showed that the two measures of institutional quality correlated differently with maternal and child health. Corruption negatively correlated with infant mortality and contraceptive prevalence rates. In contrast, the maternal mortality rate and the number of neonatal deaths were positively correlated with corruption, indicating that the number of neonatal deaths in the country may continue to increase if the corruption index increases. On the other hand, increases in the corruption index may suggest that infant mortality and contraceptive prevalence rates may decline. The democratic accountability index result in Table 2 positively correlated with infant mortality rate and contraceptive prevalence.

These results indicated that increased democratic accountability might lead to increased contraceptive prevalence. However, the degree of correlation was not substantial. In contrast, democratic accountability was negatively correlated with neonatal death and maternal mortality, indicating that as democratic accountability increases, infant and maternal mortality may also decline.

The three control variables included in the model, namely, gross domestic product, inflation rate, and school enrolment, also revealed different natures correlated with maternal and child health. For example, the gross domestic product is negatively associated with maternal mortality and neonatal deaths; this shows that an increase in gross domestic product may also lead to a high death rate of maternal mortality rate and number of neonatal deaths. At the same time, there are positive correlations between infant mortality rate and contraceptive prevalence.

Similarly, inflation was negatively correlated with neonatal deaths and maternal mortality but showed positive correlations with infant mortality and contraceptive prevalence rates. Also, school enrolment was negatively correlated with the number of

neonatal deaths and maternal mortality, while showing positive correlations with infant mortality rate and contraceptive prevalence. There is a similar pattern in the relationships between gross domestic product and infant mortality. The correlations between gross domestic product and other maternal and child health measures were positive. School enrolment analysis showed that it negatively correlated with infant and maternal mortality but positively correlated with neonatal deaths and contraceptive prevalence.

Unit Root Test

Table 3 presents the results of the nature of stationarity in the estimation process. It was necessary because non-stationarity is one of the significant problems of time series data. Thus, it was essential to examine non-stationarity in the estimation process to avoid spurious regression analysis. Both the ADF (Augmented Dickey-Fuller) and the PP (Philip-Peron) tests identified the nature of stationarity. Four variables appeared stationary: maternal mortality rate, corruption index, democratic accountability, and school enrollment.

Table 3: Nature of Stationarity (Unit Root Test with trend and intercept)

Variable	Augmented Dickey-Fuller			Philip-Peron		
	Levels	1st difference	Remarks	Levels	1st difference	Remarks
IMR (-1)	-2.7401*	-	I(O)	-3.4093*	-	I(O)
MMR (-1)	-2.4938	-1.6369**	I(I)	-1.8447**	-	I(O)
NND (-1)	-2.6899**	-	I(O)	3.2029*-	-	I(O)
CPR (-1)	-3.6206*	-	I(O)	-3.6302*	-	I(O)
CORRP	-2.4001	-4.0174**	I(I)	-1.8560	-3.9442**	I(I)
DEM	-2.7851	-6.2062*	I(I)	-2.6226	-12.2406*	I(I)
LGDP	-5.2236*	-	I(O)	-4.6589*	-	I(O)
LINF	-4.2354*	-	I(O)	-3.4811**	-	I(O)
SCH.ENR	-2.1885	-6.6519*	I(I)	-2.4220	-6.6463*	I(I)

Source: Author's Computation, 2024

This result reflects that the variables are in their first difference. Hence, they are not equally stationary in their levels. Generally, results show that the variables are combinations of classes and different variables.

As shown in Table 4, Model 1 revealed that a unit change in democratic accountability would reduce infant mortality by 0.0001 units (ß = -0.001, p<0.01). Likewise, a unit change in the gross domestic product causes infant mortality to decline by 0.0060 units (ß = -0.0060, p<0.01). In contrast, unit changes in inflation and school enrolment lead to an increase in infant mortality by 0.0050 and 0.0007 units, respectively, for inflation (ß =

0.0050, p<0.01) and school enrolment (ß = 0.0007, p<0.01). The coefficient of determination confirms that the regression model explained a significant proportion of the variation in infant mortality (R^2 = 0.9989).

Table 4: Influence of Democracy Accountability on Maternal and Child Health

Variable	MODEL 1 Infant Mortality Rate	MODEL 2 Maternal Mortality Rate	MODEL 3 Number of Neonate Deaths	MODEL 4 Contraceptive Prevalence Rate
IMR (-1)	1.0227** (0.0000)	-	-	-
MM (-1)	-	1.0097** (0.0000)	-	-
NND (-1)	-	-	1.0066* (0.0000)	-
CPR (-1)	-	-	-	0.7661* (0.0000)
DEM	-0.0001 * (0.0000)	-0.0001* (0.0000)	-0.0001* (0.0000)	-0.0190 (0.2043)
LGDP	-0.0060 * (0.0000)	-0.0030* (0.0000)	-0.0032* (0.0000)	0.1963 (0.0632)
LINF	0.0050 * (0.0000)	0.0033* (0.0000)	0.0064* (0.0000)	-0.1433 (0.7725)
SCH. ENR	0.0007 * (0.0000)	0.0003* (0.0000)	0.0003* (0.0000)	0.0515 (0.0996)
R. Square	0.9989	0.9908	0.9976	0.7397
adjusted R^2	0.9988	0.9897	0.9973	0.7081
J-Statistics	7.9367	9.0079	8.1654	8.0392
Probability	0.9507	0.9130	0.9437	0.9476
Ins. Rank	21	21	21	21

Source: Author's Computation, 2023

Table 4, model 2 showed that a unit change in democratic accountability would reduce maternal mortality by 0.0001 units (ß = -0.001, p<0.01). Similarly, a unit change in the gross domestic

product causes maternal mortality to decline by 0.0030 units (ß = -0.0030, p<0.01). In contrast, unit changes in inflation and school enrolment lead to an increase in maternal mortality by 0.0033 and 0.0003 units, respectively, for inflation (ß = 0.0033, p<0.01) and school enrolment (ß = 0.0003, p<0.01). The coefficient of determination confirms that the regression model explained a significant proportion of the variation in maternal mortality (R^2 = 0.9908). Model 3 reflected the same pattern of effects on neonatal deaths. The model

shows that a unit change in democratic accountability reduces neonatal deaths by 0.0001 units (ß = -0.0001, p<0.01). Similarly, a unit change in the gross domestic product causes neonatal deaths to decline by 0.0032 units (ß = -0.0032, p<0.01).

On the other hand, unit changes in inflation and school enrolment exert a positive effect on neonatal deaths by 0.0064 and 0.0003 units, respectively, for inflation (ß = 0.0064, p<0.01) and school enrolment (ß = 0.0003, p<0.01). In addition, results showed that the model was adequately estimated (R^2 = 0.9976). On the other hand, democratic accountability was negative on contraceptive prevalence. As revealed in Model 4, a unit change in democratic accountability caused a decline in contraceptive prevalence by -0.0190, but this was not statistically significant. Likewise, none of the control variables had a substantial effect on contraceptive prevalence. Therefore, the coefficient of determination confirmed the model adequacy (R^2 = 0.7397).

Table 5: Influence of Corruption on Maternal and Child Health

Variable	MODEL 1 Infant Mortality Rate	MODEL 2 Maternal Mortality Rate	MODEL 3 Number of Neonate Deaths	MODEL 4 Contraceptive Prevalence Rate
IMR (-1)	1.0090* (0.0000)	-	-	-
MMR (-1)	-	1.0023* (0.0000)	-	-
NND (-1)	-	-	0.9973* (0.0000)	-
CPR (-1)	-	-	-	0.5895* (0.0000)
CORRP	0.0004* (0.0000)	0.0002* (0.0000)	0.0005* (0.0000)	-0.1343* (0.0052)
LGDP	-0.0040* (0.0000)	-0.0014* (0.0000)	0.0003 (0.4162)	0.5305* (0.0115)
LINF	0.0014* (0.0000)	0.0011 (0.1281)	0.0027* (0.0001)	0.4098 (0.4689)
SCH. ENR	0.0004* (0.0000)	0.0279 (0.5090)	0.0352 (0.3230)	0.0433* (0.0333)
R. Squared	0.9995	0.9908	0.9984	0.7601
Adjusted R^2	0.9994	0.9897	0.9983	0.7311
J-Statistic	9.3324	9.0883	7.9830	8.1798
Probability	0.8990	0.9097	0.9493	0.9433
Instrumental Rank	21	21	21	21

Source: Author's Computation, 2023

Table 5 shows the corruption effect on maternal and child health. As shown in Model 1, a unit change in corruption increases infant mortality by 0.0004 units (β = 0.0004, p<0.01). Likewise, a unit change in the gross domestic product causes infant mortality to increase by 0.0004 units (β = 0.0040, p<0.01). Similarly, unit changes in inflation and school enrolment lead to an increase in infant mortality by 0.0014 and 0.0004 units, respectively, for inflation (β = 0.0014, p<0.01) and school enrolment (β = 0.0004, p<0.01). The coefficient of determination suggests that the corruption index was significant in predicting infant mortality (R^2 = 0.9995).

Understanding the current poor level of healthcare delivery in the country increased the significance of institutional quality in the general well-being of the Nigerian people. Without quality in the nation's health institutions and healthcare delivery systems, access to healthcare may not be universal. On the other hand, where access is guaranteed, services rendered may not be optimal or beneficial to patients. This study investigated the influence of institutional quality on maternal and child health outcomes. Institutional quality significantly influences maternal and child health in the country. It substantiates earlier findings across developing countries (Luca et al., 2019; Tibrewal, 2022; Amporfu *et al.*, 2013).

Furthermore, it indicates that improvement in health outcomes may not lead to better health for mothers and children without institutions to ensure best practices and good governance. Several existing studies (Ouedraogo, 2020; Luka *et al.,* 2019) have also confirmed that institutional quality is essential in improving general well-being and reducing health inequalities in human society. Two common reasons that undermine health delivery despite the increase in the quality of the institutions are corruption and a lack of democratic accountability. This study showed that corruption and democratic accountability significantly affected maternal and child health outcomes.

Model 3 results in Table 5 showed that a unit increase in corruption would increase maternal mortality by 0.0002 units (β = 0.00021, p<0.01). However, a similar unit increase in the gross domestic product led to a reduction in maternal mortality by 0.0014 units (β = -0.0014, p<0.01). The effects of increases in the inflation rate and school enrolment on maternal mortality did not reveal any significance. However, the coefficient of determination of 0.9908 buttressed the adequacy of the model. This pattern differs slightly from the result of Model 4. As shown in the model, as the corruption index increases by a unit, neonatal death increases by 0.0005 (β = 0.0005, p<0.01). Likewise, if the inflation rate increases by a unit change, the effect is a 0.0027 increase in neonatal deaths (β = 0.0027, p=0.01). Results for the impact of changes in gross domestic product and school enrolment were not significant despite a high value of the coefficient of determination (R^2 = 0.9984). The effect of corruption on contraceptive prevalence was negative. As revealed in Model 4, a unit change in the corruption index caused a decline in contraceptive prevalence by -0.1343, but this was only significant at a higher level.

The gross domestic product and inflation rate did not have a considerable influence on contraceptive prevalence. However, increased school enrollment was associated with a positive effect on contraceptive prevalence. The value of the coefficient of determination ($R^2 = 0.7601$) provided evidence that the model was well-fitted. The study established that institutional quality is a major factor in quality service delivery concerning maternal and child health outcomes.

Several existing studies (Ouedraogo *et al.,* 2020; Hadipour *et al.,* 2023; Lee *et al.,* 2022; Amporfu *et al., 2013*) have also confirmed that institutional quality is essential in improving general well-being and reducing health inequalities in human society. The prevalence of corrupt practices in the health sector undermines the industry's growth and adversely affects infant and child health and other health outcomes. It is evidenced in some existing studies (Nadpara *et al.,* 2015; Factor *et al.,* 2015) and seen in the current study (Ubi & Udah, 2014).

According to Transparency International (2020), corruption in the health sector includes diverting life-saving resources, fraudulent procurement of essential supplies, manipulation of clinical data for new medicines, and bribery. (Li *et al*., 2017) also observed that corruption usually leads to poor-quality public health infrastructure and inefficient health resources. However, I disagree with the findings of Abba-ji et al. (2021). These vices affect maternal and child health by hindering access to vital healthcare services and causing an interruption in patients' treatment regimes. The result is consistent with the findings of (Ubi *&* Udah*,* 2014).

Failure to curb corrupt practices in the health sector will continue to yield adverse effects on maternal and child health outcomes until concrete steps address corruption's impact on people's health. (Adindu, 2010; Ferrara & Nistico, 2019) They observed that one of the critical steps in improving awareness about the links between corruption and poor maternal and child health outcomes could come through collaborative efforts of hospital management, staff unions, health professionals, and hospital clients to spread an understanding of the nature and magnitude of corrupt practices in the health sector. An important platform for such action could be for hospital management to commence regular public lectures, symposiums, and workshops that will centre on the scale of corruption, its dangers to healthcare and society, and why all hospital stakeholders should report its occurrence.

Another possible action to reduce corruption in the health sector is sponsoring research on crime by stakeholders in health delivery and management in the country. However, researchers should disseminate through credible health journals, not multidisciplinary journals. This action is beneficial in two ways. One, health professionals and management will have the opportunity to improve their awareness of the impact of corruption in the health sector. Second, corruption will become more prevalent in the health literature database compared to its current rarity, as observed in a study (Adindu, 2010).

This study investigates the association between institutional quality and maternal and child health in Nigeria. The goal is to provide more information on how the quality of institutions can improve maternal and child health indicators. Specifically, the study examines the influence of institutional quality on maternal and child health outcomes from 1978 to 2019. This study used secondary data from World Development Indicators and Country Risk Guards to investigate the ideas. In addition, our study specified suitable econometric models to examine the effect of the independent variables on the dependent variables. The study used econometric models using the General Method of Moments. At the same time, the result uses both descriptive and inferential statistical methods. The study findings showed that institutional quality influenced Nigerians' maternal and child health outcomes. The results of this study have thus contributed to promoting public-sector accounting in Nigeria.

Conclusion and Policy Implications

Regarding the numerous existing studies on institutional quality and health outcomes, little attention has been devoted to examining how institutional quality affects maternal and child health outcomes in Nigeria. Hence, the focus of this study is to examine the influence of institutional quality on maternal and child health outcomes in Nigeria. The result shows that institutional quality is an essential element of health status. Findings show that institutional variables such as democracy and corruption have a significant positive effect on maternal and child health. Understanding the current poor level of healthcare delivery in the country increased the significance of institutional quality in the general well-being of the Nigerian people.

The findings suggest there is a need for a public health campaign to improve awareness about the links between corruption and poor maternal and child health in the country. Policymakers could achieve such through collaborative efforts of hospital management, staff unions, health professionals, and hospital clients. In addition, it may improve understanding of the nature and magnitude of corrupt practices in the health sector. Further research can explore correctional data of institutional quality to scrutinise the relationship between institutional quality and maternal and child health.

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