

**ASSESSMENT OF THE IMPACT OF FOREIGN AID ON HEALTH
OUTCOMES IN NIGERIA**

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ABSTRACT

Nigeria has the lowest life expectancy at birth, and maternal mortality still remains very high. This study investigates the impact of foreign aid on health outcomes (life expectancy and maternal mortality) of Nigeria for the period 1980 - 2024. The study used time series secondary data, which were collected from the World development Indicators database. The data collected were analyzed using correlation analysis, unit root test as well as the Autoregressive Distributed lag (ARDL) model estimation technique. The results of the analysis revealed that foreign aid has a positive but insignificant impact on life expectancy in Nigeria. Similarly, foreign aid was found to exert an insignificant negative impact on maternal mortality rate of Nigeria. The study concludes that that Nigeria should not over rely on foreign aid to drive changes in health outcomes but to look inwards for alternative means of financing the health sector and achieving the desired changes in health outcomes. The study recommends that the government of Nigeria should implement overall health insurance coverage for its citizens and improve health service delivery to promote life expectancy for its citizens.

Keywords: Foreign aid, Health outcomes, Life expectancy, Maternal mortality, Population.

JEL Codes: F35, I10, J13.

Introduction

A healthy population is a critical factor among the numerous determinants of sustainable economic growth for all countries. This underscores the importance of improved health outcomes and a thriving health sector for developing economies. Global development goals like the Millenium Development Goals (MDGs) and the Sustainable Development Goals (SDGs) both targeted improvements in health outcomes, reduction in infant mortalities, improvement of maternal health, combating HIV/AIDS, Malaria and other diseases, promoting

good health and well-being among others (Leunig et al., 2024). These have led to increased campaigns for developed countries to transfer resources in the form of foreign aid to developing countries to help in the achievement of better health outcomes and fighting the diseases (Chima-Uzosike, 2024).

Although foreign aid plays an important role in improving health outcomes of poor countries, it depends on how effectively the receiving countries invest the resources effectively for social development. For instance, it has been claimed that there is no correlation between the amount of foreign aid received and the lowering of HIV/AIDS infection, and mortality rates despite billions of dollars spent on HIV programmes by international agencies (Adelman & Norris, 2001). On the contrary, Uwishema et al. (2025) opined that Africa's HIV/AIDS response depended on substantial foreign aid, expanding access to Antiretroviral therapy (ART) reducing mortality, and transmission rates. Though foreign aid has multi-purpose roles to recipient countries, aids on health has a direct impact on quality of human life (Akinola & Asaolu, 2022). Foreign aid also promotes the development of enhanced health infrastructure, transfer of medical technology, improved surveillance programmes, and capacity building of the health workforce - all of these put together improve health outcomes of Nigeria (Hasan et al., 2025).

Nigeria has the lowest life expectancy at birth, 54.78 years, while Tunisia, a north African country has the highest life expectancy of 76.97 years- two extremes in one continent (Eghosa, 2025). Dogbanya (2025) asserts that maternal mortality still remains very high in Nigeria. Nigeria is said to be the country with the highest estimated maternal death rate, accounting for one quarter (28.3%) of all estimated global maternal deaths with approximately 8200 maternal deaths and a maternal mortality ratio of 1047 per 100,000 livebirths (WHO, 2023 as reported by Dogbanya, 2025).

The assertion by William Easterly, a prominent economist from the US that foreign aid was being wasted in Nigeria has been the subject of heated debates by development scholars. His claim raised a red flag against foreign aid, suggesting that \$2.3 trillion in foreign aid went down the drain in 50 years (Sachs, 2008). This position has prompted many researches into the impact of foreign aid on health outcomes of developing countries. Economic growth and health outcomes

are the main targets of interest because foreign aid contributes to health and education of Nigeria through vaccines, antibodies, food supplements, improved seeds, etc which impact life expectancy, mortality rates and other health indices for Nigeria. According to Olonade et al. (2019), about \$11.6 billion was invested to improve maternal health care in developing countries. Although Nigeria have been the major recipients of foreign aid for decades, they still exhibit the worst health outcomes in comparison to some non-recipients. Although some scholars argue that foreign aid is a controversial tool for helping countries to achieve welfare and economic growth, it has been a tool in use for long (Leunig et al., 2024). With the current foreign aid funding freeze from major donors like the USA, it becomes necessary to re-evaluate the role of foreign aid for Nigeria, and if positive relationship is established, proactive measure can be developed to avoid a retrogression in health outcomes (Dogbanya, 2025). Therefore, the question is, does foreign aid have a positive, negative or no impact on health outcomes of Nigeria. This study is aimed at assessing the impact of foreign aid on health outcomes of Nigeria between 1980 and 2024, to take a stand on the debate as to whether foreign aid contributes to welfare in Nigeria, or is a waste. The remaining part of the paper is structured thus; literature review, methodology, results and discussion, conclusion and policy recommendations.

2.0 Literature Review

2.1 Conceptual Review

2.1.1 Foreign aid

The term foreign aid typically refers to the transfer of resources from wealthy nations to poorer, less developed countries (Chibuzor & Orji, 2023). Foreign aid refers to the cross-border transfer of funds, goods, or services provided by governments or international organizations to support the recipient country or its population (Jebbin & Ikogi, 2022). Foreign aid may involve providing professional expertise and training, as well as the transfer of goods or financial resources. These financial resources may come in the form of concessional loans or grants, including export credits. The most common type of foreign aid is Official Development Assistance (ODA), which is aimed at promoting development and reducing poverty (Umeh, 2019).

2.1.2 Health Outcomes

Health outcomes refer to the positive or negative effects that arise from health-related interventions. They encompass factors such as survival and mortality rates, hospital readmissions, adverse events, functional ability, pain levels, and the capacity to perform everyday activities (The Value of Health, 2016). Health outcomes can also be said to be any change in the health status of an individual, group, or population that results, either fully or partly, from a specific intervention or set of interventions (Sanson, 2016). Health outcomes represent the clinical (e.g., blood pressure, blood sugar levels, disease condition, mental health), behavioral (e.g., physical ability, movement), and subjective indicators (e.g., pain, energy, anxiety) of a person's health that are linked to actions, interventions, or events aimed at influencing health and overall well-being (Wu & Street Jr., 2022). The most common health outcomes that are mostly affected by foreign aid or interventions in developing countries include child mortality rate, maternal mortality rate, infant mortality rate, life expectancy, and prevalence of HIV and other related diseases.

2.2 Empirical Literature Review

Several studies have been conducted on the impact of foreign aid on health outcomes; a number of these studies are reviewed in this section. For instance, Williamson (2008) studied the impact of foreign aid to the health sector and its effectiveness to overall human development using some health outcomes as indices of measurement. Using a panel dataset of 208 countries, applying fixed effects techniques and controlling for reverse causality. The study concluded that foreign aid is not effective in improving overall health and has failed as a tool of promoting human development. Perhaps the findings of this study was one of the earliest scholarly article that sparked the controversial calls to end foreign aid by Easterly and other prominent economists. In another study with a controversial result for foreign aid, Leunig (2021) evaluated the relationship between health aid and health outcomes of 84 developing countries between 2008 and 2018. The study concluded that foreign aid does not guarantee an improvement in health outcomes, but domestic healthcare expenditure does. Kondo et al. (2025) in a study of foreign aid and life expectancy in Zimbabwe also made a similar finding. Using causality analysis, the study concluded that foreign aid does not improve life expectancy in Zimbabwe, but domestic spending does.

In another investigation, Akinola et al. (2022) applied the use of Autoregressive Distributed Lag (ARDL) model for Nigeria's datasets covering 1981-2019. The study found that foreign aid exhibited positive but not statistically significant impact on life expectancy rate in Nigeria, while government expenditure on health showed positive and significant relationship. They also found that direction of causality from foreign aid to life expectancy. Contrary to the findings of Kondo et al. (2025), Akinola et al. (2022) and Leunig (2021), Jebbin and Ikogi (2022) also investigated foreign aid, governance and life expectancy in Nigeria. They study found that foreign aid to the health sector promotes life expectancy in Nigeria.

Chima-Uzosike (2024) used Lagos State Teaching Hospital as a case study to assess the impact of foreign aid on health outcomes. The study applied the use of survey method, and found that foreign aid has a positive impact on Nigeria health outcomes especially maternal health, but it was found to be ineffective in other areas. In another study, Sakiru and Isiaq (2022), in another investigation on the effect of health aid on life expectancy in SSA used a panel of 46 African countries from 2000 -2019, evaluated using GMM techniques. They found that health aid does not have any significant effect on life expectancy of SSA countries. Negeri (2023) also studied a sample of 34 low-income countries between 2000-2017 and applied fixed effects regression. In sharp contrast to the findings of other studies, the study found that health aid is beneficial in the long-run to the health of low-income countries. In the same vein, Jeong (2016) also studied a sample of 131 countries for the period 2000-2013 for the impact of health official development assistance (ODA) on infant mortality, under 5 mortality and life expectancy. The study found that health ODA has a significant positive impact on health outcomes.

Contrary to the findings of Williamson, Burfeind (2014) assessed the effects of foreign aid for health, on health outcomes in developing countries. The study found evidence to suggests that a remarkable increase in external resources (foreign aid) will lead to a small increase in child mortality rate. In a similar study, Odokonyero et al. (2015) investigated the effectiveness of foreign aid on health outcomes in Uganda. The study found that foreign aid has achieved overall significant impact in reducing both disease severity and burden despite

not being targeted at localities with the worst health condition in Uganda. Furthermore, Mongbet and Tourere (2021) assessed the effects of development assistance for health in developing countries. The study applied panel data techniques like pooled OLS, fixed effects and Generalized Method of Moments (GMM) for a panel of 126 countries between 1990 and 2017. They found that health aid contributes significantly to improved health outcomes in developing countries.

Sikiru et al. (2021) studied foreign aid and infant mortality in sub-Saharan Africa for the period 2000-2019 for a cross-section of 46 African countries. They found that health aid and domestic health expenditure reduced infant mortality rate of sub-Saharan African countries. Similarly, Mallaye and Yogo (2012) used a sample of 33 countries and found that health aid helps in improving health outcomes (HIV prevalence, child mortality and infant mortality rate) among sub-Saharan African countries. Furthermore, Banchiani and Swiss (2019) also investigated the impact of foreign aid on maternal mortality on a panel of 130 low- or middle-income (LMIC) countries from 1996 to 2015. The study found that the effect of foreign aid allocated to reproductive health sector is associated with a significant reduction in maternal mortality. Adebajji et al. (2020) also investigated foreign aid and child mortality rate in Nigeria for the period 1981- 2018. The study employed the use of Autoregressive Distributed lag (ARDL) model estimator and found that foreign aid impacts child mortality rate negatively in Nigeria, a finding which contradicts the findings of Sikiru et al. (2021), Banchiani and Swiss (2019) among others.

2.3 Theoretical Framework

2.3.1 Human Capital Theory

Investment in health and educations are generally considered to be human capital development regardless of the source (internal or external) of investment into these sectors. According to Gary Becker (1964), human capital represents a form of physical means of production. Institutions, governments and organizations tend to invest heavily in human capital through initiatives such as education, training, and healthcare. According to McConnell (2009), a better trained person is capable of supplying a larger amount of useful production effort than one with less

educations and training. In the original analysis of human capital, education and training were more emphasized than health. However, it is becoming increasingly clear that health is as important, or even more important than training and education because when one is highly educated but unhealthy, he cannot be very useful in the production process (Wuttaphan, 2017).

3.0 Methodology

This study adopted the ex-post factor research design, which relies on the use of secondary data and empirical analysis to make conclusions about past events and forecast future events. The study investigated the impact of foreign aid on health outcomes in Nigeria between 1980 and 2024. The Autoregressive Distributed lag (ARDL) technique was used for analysis if times series data which were collected from the World Development Indicators database 2025.

3.1 Model Specification

This study assessed the impact of foreign aid on health outcomes in Nigeria, with specific interest on two health outcomes - life expectancy and maternal mortality. Therefore, two models were designed, each of which will estimate the impact of foreign aid on life expectancy and on maternal mortality over the period of study.

The model of Akinola et al. (2022) was adapted in this study with some modifications. The original model is expressed as;

$$LER = f(FAID, GEH, ECG, EXC) \quad 3.1$$

Where: LER = Life Expectancy; FAID = Foreign aid; GEH = Government Expenditure on Health; ECG = Economic Growth; and EXC = Exchange rate.

The modified model is expressed as;

$$LEX = f(FOA, POP, ING) \quad 3.2$$

$$MMR = f(FOA, POP, INF) \quad 3.3$$

Where: LEX = Life Expectancy at birth; POP = Population growth; INF = Inflation Rate; MMR = Maternal Mortality Rate.

The linear- log transformation of the model yields;

$$LEX_t = \beta_0 + \beta_1 \log FOA_t + \beta_2 \log POP_t + \beta_3 \log INF_t + u_t$$

3.4

$$MMR_t = \beta_0 + \beta_1 \log FOA_t + \beta_2 \log POP_t + \beta_3 \log INF_t + u_t$$

3.5

The linear-log transformation was meant to transform the dataset into a more normalized form to avoid the problem of heteroscedasticity. The study utilized the Augmented Dickey-Fuller (ADF) test to check the time-series properties of the data before the estimation of the regression equation. Diagnostic and stability tests were employed to check the goodness of fit and model adequacy of our specification. The estimation of the impact of foreign aid on health outcomes was done through the Autoregressive Distributed Lag (ARDL) Bounds test to cointegration suggested first by Pesaran and Shin (1999) and supported by Pesaran, Shin, and Smith (2001).

Additionally, the ARDL is based on the assumption that the series are $I(0)$, $I(1)$ or a combination of $I(0)$ and $I(1)$. Therefore, one of the precursors of the ARDL model is the determination of the order of integration of all the series through a unit root test.

This method shows the short-run dynamics besides the estimated long-run coefficients. The Autoregressive Distributed Lag (ARDL) bounds testing procedure can be mathematically specified in equations 3.5 and 3.6 as follows;

$$\begin{aligned} \Delta LEX_t = & \alpha_0 + \beta_1 \Delta LEX_{t-1} + \beta_2 \Delta \ln FOA_{t-1} + \beta_3 \Delta \ln POP_{t-1} + \beta_4 \Delta \ln INF_{t-1} \\ & + \sum_{i=1}^p \alpha_1 \Delta LEX_{t-i} + \sum_{i=1}^p \alpha_2 \ln FOA_{t-i} + \sum_{i=1}^p \alpha_3 \Delta \ln POP_{t-i} \\ & + \sum_{i=1}^p \alpha_4 \Delta \ln INF_{t-i} + \mu_t \dots \dots \dots (3.5) \end{aligned}$$

Where p denotes the lag length, Δ represents the difference operator, α_0 is the drift, μ_t is the error term, β_1 to β_4 are coefficients of the long-run dynamics while α_1 to α_4 are coefficients of the short-run relationship. Hence, equation 3.5 is the base equation for estimating the short-run and long-run relationship among the variables.

$$\begin{aligned}\Delta MMR_t = & \alpha_0 + \beta_1 \Delta LEX_{t-1} + \beta_2 \Delta \ln FOA_{t-1} + \beta_3 \Delta \ln POP_{t-1} + \beta_4 \Delta \ln INF_{t-1} \\ & + \sum_{i=1}^p \alpha_1 \Delta MMR_{t-1} + \sum_{i=1}^p \alpha_2 \ln FOA_{t-1} + \sum_{i=1}^p \alpha_3 \Delta \ln POP_{t-1} \\ & + \sum_{i=1}^p \alpha_4 \Delta \ln INF_{t-1} + \mu_t \dots \dots \dots (3.6)\end{aligned}$$

Where ρ denotes the lag length, Δ represents the difference operator, α_0 is the drift, μ_t is the error term, β_1 to β_4 are coefficients of the long-run dynamics while α_1 to α_4 are coefficients of the short-run relationship. Hence, equation 3.6 is the base equation for estimating the short-run and long-run relationship among the variables.

The error correction model associated with the long-run and short-run estimates is described as:

$$\begin{aligned}\Delta LEX_t = & \alpha_0 + \sum_{i=1}^p \alpha_1 \Delta LEX_{t-1} + \sum_{i=1}^p \alpha_2 \Delta \log FOA_{t-1} + \sum_{i=1}^p \alpha_3 \Delta \log POP_{t-1} \\ & + \sum_{i=1}^p \alpha_4 \Delta \log INF_{t-1} + \lambda ECM_{t-1} + \varepsilon_t \dots \dots \dots (3.7)\end{aligned}$$

Where α_1 to α_6 are the parameters of the short-run dynamics, λ is the speed of adjustment to long-run equilibrium following a shock to the system and ECM_{t-1} is the error correction term. The parameter λ is expected to be negative and significant to confirm the long-run relationship among the variables.

$$\begin{aligned}\Delta MMR_t = & \alpha_0 + \sum_{i=1}^p \alpha_1 \Delta MMR_{t-1} + \sum_{i=1}^p \alpha_2 \Delta \log FOA_{t-1} + \sum_{i=1}^p \alpha_3 \Delta \log POP_{t-1} \\ & + \sum_{i=1}^p \alpha_4 \Delta \log INF_{t-1} + \lambda ECM_{t-1} + \varepsilon_t \dots \dots \dots (3.8)\end{aligned}$$

Where α_1 to α_6 are the parameters of the short-run dynamics, λ is the speed of adjustment to long-run equilibrium following a shock to the system and ECM_{t-1} is the error correction term. The parameter λ is expected to be negative and significant to confirm the long-run relationship among the variables.

3.2 Variables and Measurements

Table 3.1: Variables, Measurements and a priori expectations

Variables	Measurement	A priori expectation
Life Expectancy at Birth (LEX)	Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life (World Bank, 2025)	Dependent variable
Foreign Aid (FOA)	Net official development assistance (FOA) consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of FOA recipients. Net official aid refers to aid flows (net of repayments) from official donors to countries and territories in part II of the DAC list of recipients: more advanced countries of Central and Eastern Europe, the countries of the former Soviet Union, and certain advanced developing countries and territories. Official aid is provided under terms and conditions similar to those for FOA. Data are in current U.S. dollars (World Bank, 2025).	Negative Impact
Maternal Mortality Rate (MMR)	Maternal mortality ratio is the number of women who die from pregnancy-related causes while pregnant or within 42 days of pregnancy termination per 100,000 live births. The data are estimated with the proportion of maternal deaths among non-AIDS deaths in women ages 15-49, fertility, birth attendants, and GDP measured using purchasing power parities (PPPs) (World Bank, 2025).	Dependent variable
Population growth rate (POP)	Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. The values shown are midyear estimates (WDI, 2025).	Positive impact
Inflation rate	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency (WDI, 2025).	Positive impact

Source: Metadata Indicators, WDI, 2025.

4.0 Results and Discussion

The results of the analysis are presented in this section and interpreted. The results include correlation analysis, unit root test, as well as ARDL results as well as the necessary post estimation results. The findings of this study are corroborated with the findings of previous studies to find consistencies and discrepancies in findings.

Correlation Analysis

Table 4.1: *Correlation Matrix*

	INF	LEX	MMR	ODA	POP
INF	1.0000				
LEX	-0.469	1.0000			
MMR	0.1841	-0.753	1.0000		
ODA	-0.1494	0.5769	-0.5390	1.0000	
POP	0.1064	-0.5519	0.3694	-0.2784	1.0000

Source: Authors' Computation using E-Views 9.0, 2025.

Based on the results of the correlation analysis presented in Table 4.1, life expectancy at birth (LEX) has a weak negative correlation (-0.46) with inflation rate (INF). Maternal Mortality rate (MMR) and inflation rate (INF) have weak positive correlation (0.18). Foreign aid (FOA) and inflation rate (INF) share a very weak negative correlation (-0.14), and population growth (POP) also shares a weak positive correlation (0.10) with inflation rate (INF). Maternal mortality rate (MMR) and life expectancy (LEX) share a strong negative correlation (-0.75). There is a moderate positive correlation (0.57) between foreign aid (FOA) and life expectancy at birth (LEX). The correlation between life expectancy (LEX) and population growth is a moderate negative one given by the coefficient (-0.55). There is also a moderate negative relationship (-0.53) between maternal mortality (MMR) and foreign aid (FOA). There is a weak positive correlation (0.36) between maternal mortality rate (MMR) and Population growth (POP), and a very weak negative correlation (-0.27) between foreign aid (FOA) and population growth (POP). Because the explanatory variables in the model are not highly correlated, there is little fear that the result of the estimation will yield results that have problem of multicollinearity.

Unit Root Analysis

The unit root analysis is a pre-estimation test usually conducted to test the stationarity or otherwise of time series data. The analysis is presented in Table 4.2.

Table 4.2
Unit Root Result

		AT LEVEL				
		POP	FOA	MMR	LEX	INF
With	t-	-2.2128	-3.1399	-2.0461	0.8734	-6.1426
Constant	statistic	0.2053	0.0310	0.2668	0.9942	0.0000
	prob.	No	**	no	No	***
With	t-	-2.7638	-4.6691	-2.5982	-3.5590	-7.0041
constant	statistic	0.2189	0.0028	0.2833	0.0466	0.0000
and Trend	prob.	No	***	no	**	***
Without	t-	-1.5395	-2.3088	-2.1158	1.5759	-4.7012
constant	statistic	0.1148	0.0218	0.0346	0.9699	0.0000
and Trend	prob.	No	**	**	No	***
		AT FIRST DIFFERENCE				
		d(POP)	d(FOA)	d(MMR)	d(LEX)	d(INF)
With	t-	-2.5611	-6.9871	-3.2188	-2.2875	-17.8676
Constant	statistic	0.1098	0.0000	0.0268	0.1806	0.0000
	prob.	No	***	**	No	***
With	t-	-2.7113	-6.8939	-3.2409	-3.1351	-18.5156
constant	statistic	0.2380	0.0000	0.0923	0.1117	0.0000
and Trend	prob.	No	***	*	No	***
Without	t-	-2.3123	-7.0497	-2.5257	-1.6883	-17.7566
constant	statistic	0.0219	0.0000	0.0130	0.0861	0.0000
and Trend	prob.	**	***	**	*	***

Note: ***, ** and * indicates significant at 1%, 5% and 10% respectively.

Source: Author's Computation Using E-views 9.0, 2025.

Based on the results of the unit root analysis presented in Table 4.2, the variables are a mix of variables stationary at level and first difference, as can be observed. Therefore, by the conditions of stationarity test, all the variables have met the condition for estimation using Autoregressive Distributed lag (ARDL) model.

ARDL Bound test for Co-integration

The ARDL bounds test, which is synonymous to the Co-integration test, is a test of long run equilibrium relationship among variables modelled. The result of the ARDL Bounds test is presented in Table 4.3

Table 4.3
Bounds Test Result

Test Statistic	Value	K
F-Statistic	4.75	3
Critical Values Bounds		
Significance	I(0)	I(1)
10%	2.37	3.20
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.66

Source: Author's Computation Using E-views 9.0, 2025.

Based on the result of the ARDL bounds test for integration presented in Table 4.3, there is evidence to suggest that a long run relationship exists among the variables. This is because the F-statistic being 4.75 is greater than the I(0) and I(1) critical values.

Table 4.4: *Short-Run and Long Run ARDL Result*

SHORT-RUN ESTIMATES				
Variable	/Coefficient	Std. Error	t-statistic	Prob*
D(LEX(-1))	0.559031	0.166280	3.361987	0.0023***
D(LEX(-2))	-0.078992	0.196411	-0.402171	0.6906
D(LEX(-3))	0.325094	0.157619	2.062524	0.0485**
DLOG(FOA(-1))	-0.002095	0.041163	-0.050883	0.9598
D(POP)	0.685862	0.413590	1.658315	0.1084
D(POP(-1))	0.215195	0.278906	0.771566	0.4468
D(POP(-2))	0.734646	0.323188	2.273123	0.0309**
D(INF)	0.002061	0.001722	1.197398	0.2412
ECT(-1)	-0.015361	0.004816	-3.189838	0.0035***
LONG-RUN ESTIMATES				
LOG(FOA)	2.129108	2.252200	0.945304	0.3526
POP	-2.7443688	37.879646	-0.724497	0.4748
INF	-0.070859	0.129634	-0.546607	0.5890
C	83.478728	91.556852	0.911769	0.3697

Note: ***, ** and * indicates significant at 1%, 5% and 10% respectively.

Source: Author's Computation Using E-views 9.0, 2025.

Based on the result of the ARDL short-run analysis, foreign aid was found to exert a negative impact on life expectancy at birth, which is inconsistent with a priori expectation. The coefficient of the variable being -0.002095 suggests that a 1 unit increase foreign aid will lead to 0.002095 units decrease in life expectancy at birth. This finding is inconsistent with the finding of Jebbin and Ikogi (2022) who found that foreign aid promotes life expectancy in Nigeria. It is however consistent with the finding of Sakiru and Isiaq (2022) who found that foreign aid does not have any significant impact on life expectancy in Nigeria.

On the other hand, population growth was found to have a positive but statistically insignificant impact on life expectancy at birth. In line with the coefficient, a 1 unit increase in population growth was associated with a 0.685862 units increase in life expectancy. In the same vein, inflation rate also has a positive impact on life expectancy at birth. The coefficient of inflation rate being 0.002061 suggests that a 1 unit increase in inflation will lead to a 0.002061 units increase in life expectancy, though it is not statistically significant.

The long run results suggests that foreign aid has a positive but statistically insignificant impact on life expectancy in the long run. Its coefficient being 2.129108 suggests that a unit increase in foreign aid is associated with increase in life expectancy by 2.129108 years. This finding is consistent with the finding of Akinola et al (2022) who found that health aid has positive but insignificant impact on life expectancy in Nigeria. Population growth was found to have a negative impact on life expectancy at birth in the long run. Its coefficient being -2.7443688 suggests that life expectancy decrease by 2.7443688 years each time population growth increase by 1 unit. Inflation rate is also associated with a negative impact on life expectancy such that, life expectancy decreases by -0.070859 when inflation increases by 1 unit.

Table 4.5: Diagnostic Tests

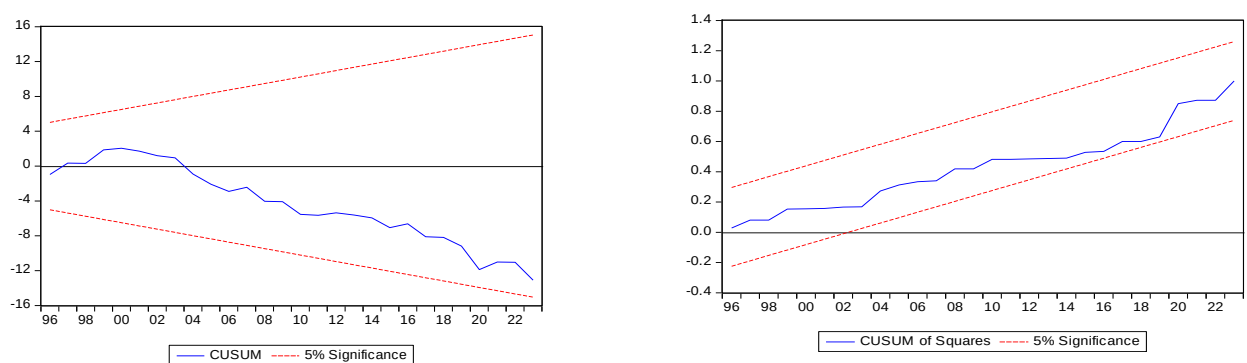
Test	Coefficient/Jargu-Bera	P-Value
Serial Correlation LM Test	0.923245	0.4099
Residual Heteroskedasticity Test	0.762871	0.6099
Jargu-Bera Residual Normality Test	0.228965	0.891828

Source: Author's Computation Using E-views 9.0, 2025.

Based on the results of the Serial correlation test and the heteroskedasticity test presented in Table 4.5, it can be observed that there is no problem of serial correlation or heteroskedasticity problem among the residual. This is because the probability values are all greater than the threshold of 0.05. Based on the result of the normality of residuals test presented in Figure 4.1, it can be observed that the residual plotted on the histogram appear to follow the normal distribution curve. However, it is not absolutely in line with the normal distribution curve as the probability of the Jarque-Bera statistics suggests.

Figure 4.1

CUSUM and CUSUM of Squares



Source: Author's Computation Using E-views 9.0, 2025.

Based on the results of the CUSUM and CUSUMSQ test presented in Figure 4.2, the results suggests that there is a slight problem of parameter instability. This is because the CUSUM and CUSSUMSQ are slightly out of the 5% critical bounds line.

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Table 4.6: Bounds Test Result

Test Statistic	Value	K
F-Statistic	4.15	3
Critical Values Bounds		
Significance	I(0)	I(1)
10%	2.37	3.20
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.66

Source: Author's Computation Using E-views 9.0, 2025.

Based on the result of the ARDL bounds of co-integration test presented in Table 4.6, the results suggest that there is a long-run relationship among the variables. This is because the F-statistic being 4.15 is greater than the I(1) critical bounds value at 5% level of significance.

Table 4.7: Short-Run and Long-Run ARDL Result

SHORT-RUN ESTIMATES				
Variable	Coefficient	Std. Error	t-statistic	Prob*
D(MMR(-1))	0.454414	0.170543	2.664515	0.0142***
D(MMR(-2))	0.110203	0.153016	0.720202	0.4790
DLOG(FOA)	-2.465231	3.454561	-0.713615	0.4830
D(POP)	-1.7858647	71.518782	-2.497057	0.0205***
D(POP(-1))	2.11854292	99.218935	2.135220	0.0441**
D(POP(-2))	-8.6894547	82.819585	-1.049203	0.3055
D(INF)	0.046864	0.157527	0.297496	0.7689
ECT(-1)	-0.072489	0.027596	-2.626812	0.0154***
LONG-RUN ESTIMATES				
LOG(FOA)	-1.202701	36.625683	-0.032838	0.9741
POP	3.9130195	2.217494	1.839259	0.0794*
INF	3.068637	3.281095	0.935248	0.3598
C	33.971009	1149.191442	0.029561	0.9767

Note: ***, ** and * indicates significant at 1%, 5% and 10% respectively.

Source: Author's Computation Using E-views 9.0, 2025.

Based on the results of the ARDL short-run and long-run estimation presented in Table 4.7, foreign aid was found to have a negative impact on maternal mortality rate both in the short-run and long-run. The coefficient of foreign aid in the short run being -2.465231 suggests that a 1 unit increase in foreign aid is associated with 2.465231 units decrease in maternal mortality rate, which is according to a priori expectation. This finding is consistent with the finding of Bachiani and Swiss (2019) who found that health aid allocated to reproductive health reduces maternal mortality. Population growth was found to exert a positive impact on maternal mortality rate. The coefficient of population growth suggests that a 1 unit increase in population growth is associated with 1.7858647 units decrease in maternal mortality rate in the short run. Inflation rate was found to have a positive impact such that maternal mortality rate

increase by 0.046864 units for every 1 unit increase in inflation rate in the short-run.

The long-run ARDL results suggests that foreign aid has a negative impact on maternal mortality in the long-run. Its coefficient being -1.202701 suggests that a 1 unit increase in foreign aid is associated with a decrease in maternal mortality by 1.202701 units. This finding is consistent with the findings of Negeri (2023), Jeong (2016) as well Mallaye and Yogo (2012) who found that foreign aid improves health outcomes. However, population was found to have a positive impact on maternal mortality rate. Maternal mortality rate is likely to increase by 3.913095 units each time population growth increase by 1 unit. In the same vein, inflation is associated with a positive impact on maternal mortality. Its coefficient being 3.068637 suggests that maternal mortality rate increase by about 3.068637 units whenever inflation rate increases by 1 unit in the long-run.

Table 4.8 Diagnostic Tests

Test	Coefficient/Jargu-Bera	P-Value
Serial Correlation LM Test	0.071740	0.9310
Residual Heteroskedasticity Test	0.831578	0.6261
Jargu-Bera Residual Normality Test	2.360534	0.307197

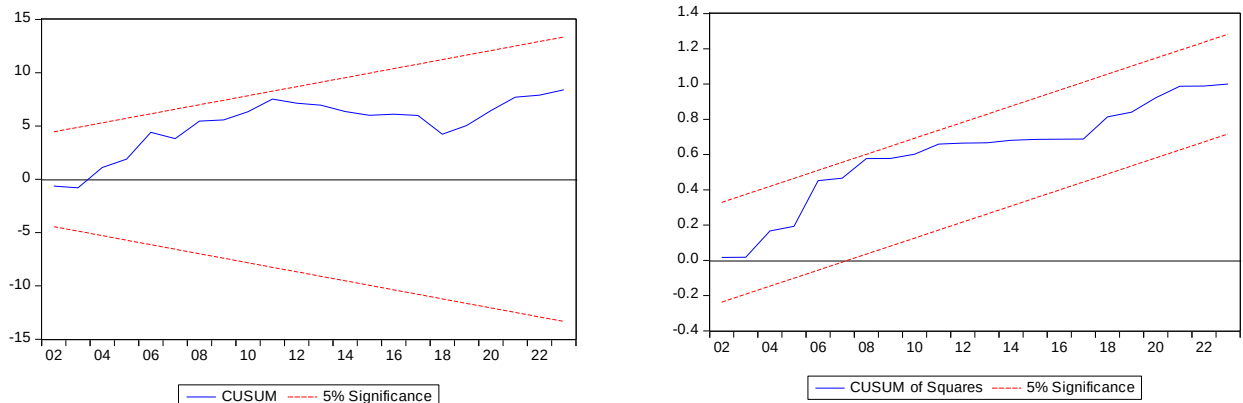
Source: Author's Computation Using E-views 9.0, 2025.

Based on the results of the Serial correlation test and the heteroskedasticity test presented in Table 4.5, it can be observed that there is no problem of serial correlation or heteroskedasticity problem among the residual. This is because the probability values are all greater than the threshold of 0.05.

Based on the result of the normality of residuals test presented in Figure 4.3, it can be observed that the residual plotted on the histogram appear to follow the normal distribution curve. However, it is not absolutely in line with the normal distribution curve as the probability of the Jarque-Bera statistics suggests.

Figure 4.2

CUSUM and CUSUM of Squares



Source: Author's Computation Using E-views 9.0, 2025.

Based on the results of the CUSUM and CUSUMSQ test presented in Figure 4.2, the results suggests that there is a slight problem of parameter instability. This is because the CUSUM and CUSSUMSQ are slightly out of the 5% critical bounds line.

5.0 Conclusion and Policy Recommendations

The study assessed the impact of foreign aid on health outcomes in Nigeria with specific interest in Life expectancy and maternal mortality rates for the period 1980 -2024. The Autoregressive Distributed Lag (ARDL) estimation technique was used for analysis. The study found that foreign aid does not have a nay significant positive impact on life expectancy in Nigeria over the period of study. On the other hand, the study found that foreign aid has a negative impact on maternal mortality rate both in the short and long-run. The study concludes that Nigeria should not over rely on foreign aid to drive changes in health outcomes but to look inwards for alternative means of financing the health sector and achieving the desired changes in health outcomes. Therefore, the following recommendations are made

- (i) It is recommended that the government of Nigeria should implement overall health insurance coverage for its citizens and improve health service delivery to promote life expectancy for its citizens.

- (ii) It is recommended that the government should further channel foreign aid to reproductive health sector by establishing maternity centres in remote areas so as to reduce maternal mortality to the barest minimum level in Nigeria.

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