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Impact of Health Expenditure on Economic Outcome in Nigeria

Anuforo, Cajetan Chima[1], Ugwueke, Livinus Ifesinachi[2], Okeke Izuchukwu Chetachukwu[2]

[1]*Department of Economics, University on the Niger, Umunya, Anambra State, Nigeria*

[2]*Department of Economics, Chukwuemeka Ojukwu University, Igbariam, Anambra State, Nigeria.*

Corresponding Author:** ***Okeke Izuchukwu Chetachukwu, *Department of Economics, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Anambra State, Nigeria.*

Abstract: *It is a well-known fact that health is a capital productive asset and an engine of economic productivity. Developed countries invest a substantial proportion of their budgetary allocations on provision of health care because they are convinced that their residents' health can serve as a major driver of economic growth. As health is wealth, no amount spent on health by a nation is considered too much. The major objective of this research is to determine the impact of health expenditure on economic outcomes in Nigeria from 1993 to 2022. The study adopted Ordinary Least Square (OLS) method for data analysis. The result of the study reveals that gross domestic product (GDP), per capita income (PCI) and infant mortality rate (IMTR) have positive relationship with health expenditure for the period under review. It was also discovered that gross domestic product (GDP) is statistically insignificant at 5 percent level which implies underfunding of the health sector. Unit root test was conducted to ascertain the stationarity of the data and it was discovered that all the variables were stationary at level. This research recommends that in order to enhance the contribution of gross domestic product (GDP) to health expenditure in Nigeria, the present government should increase the budgetary allocation of health sector and also improve on the quality and efficacy of vaccines so as to reduce the high rate of infant mortality (IMTR) in the country.*

Keywords: *Health Expenditure, Gross Domestic Product, Per Capita Income, Infant Mortality Rate.*

1. BACKGROUND TO THE STUDY

A healthy nation is a wealthy nation (Koutsoyiannis & Forster, 1999). By implication, it means that the healthier the people in a country, the wealthier the country in question shall become. The amount of money spent in developing the health sector of a country has a direct effect on state of health of the people. Better health care is a primary human need. According to the WHO (2005), fifty percent of economic growth differentials between developed and developing nation is attributable to ill-health and low life expectancy. The effect of health on workers' productivity suggests a relationship between health and aggregate output (Oni, 2012). Healthy workers lose less time from work due to ill health and are more productive when working. Health gains have the economic consequences of widespread economic growth and an escape from ill-health traps in poverty (WHO, 1999). There has been a growing interest to extend the relationship between health and economic growth, catalyzed in considerable extent by a 1993 World Bank report on health (World Bank (1993). Barro (1996) stated that health is a capital productive asset and an engine of economic productivity. Developed countries invest a substantial proportion of their budgetary allocations on provision of health care because they are convinced that their residents' health can serve as a major driver of economic growth. As health is wealth, no amount spent on health by a nation is considered too much. The United Nation (UN) recommended for a country, an average of 8 to 10 percent of the GDP as benchmark expenditure on health. Governments in Nigeria, over the years have made deliberate efforts at ensuring that there is increase in the level of public expenditure on health. Health and economic growth are extricable linked in any economy. The problems of non-correspondence between health expenditure and economic outcomes have raised a serious issue bordering on adequacy of health expenditure for enhancing economic growth in Nigeria.

There exists a two-way relationship between improved health and economic outcome. Health and other forms of human and physical capital increases the per capita GDP by increasing productivity of existing resources coupled with resource accumulation and technical change. Furthermore, some part of this increased income is spent on investment in human capital, which results in further per capita growth.

This is because of the importance of health to nation building and as a facilitator of economic progress. It should however be noted that despite the increase in government expenditure on health provisions in Nigeria, the contribution of this to human health is still marginally low. Moreover, the extent and magnitude of its impact on economic growth is yet to be adequately investigated probably because of the general unidirectional impression that economic growth facilitates better health. It is the need to address these emerging issues which has lent credence to the present study. Unless there is a clear insight into the growth effect of public health expenditures in Nigeria and the magnitude and direction of the growth effect precisely determined, it would be almost impossible to formulate public health policies which would ensure maximum Medicare delivery to maximum number.

The health status of West African countries like Nigeria greatly undermines their prospects for economic growth. Cutler (2006) opines that in poor countries, 30% of all deaths are of children, compared with less than 1% in rich countries. At least 10 million children under the age of five die each year mainly from preventable (or curable) diseases that seldom kill children in rich countries (Jones, 2003). These deaths have led to increase in government spending on health sector and much impact had not been seen in the area of reduction of mortalities since 1970. Life expectancy in Nigeria is the worst in the world. With a retirement age of about 65 years in most countries, the life expectancy shows that, on the average, the labour force does not live to complete their expected/legitimate contribution to the country of choice, for death takes them on a journey before 60. In 2008 alone, Nigeria comfortably posted infant and under-5 mortality rates of 86 and 144 respectively. The adults posted heart-wrenching mortality rates of 381 and 420 for females and males respectively. The effect of rising health expenditure is yet to be noticed in Nigeria, this has created a need for present study which now seeks to gain an insight into the impact of health expenditure and economic outcomes in Nigeria. There is need to understand the interplay of health expenditure and economic outcomes in Nigeria. Presently, Nigeria is the world's second nation with the highest maternal and child deaths after India (WHO, 2022). All these issues are what informed the choice of this topic with the intention to providing a lasting solution.

1.1. Research Questions

The research questions are:

1. What is the relationship between health expenditure and economic growth in Nigeria?
2. To what extent does human development index impact economic growth in Nigeria ?
3. What is the relationship between infant mortality rate and economic growth in Nigeria?

1.2. Research Objectives

The broad objective of this study is to determine the impact of health expenditure on economic outcome in Nigeria. The specific objectives are to:

1. determine the relationship between health expenditure and economic growth in Nigeria.
2. assess the extent to which human development index impact economic growth in Nigeria.
3. investigate the relationship between infant mortality rate and economic growth in Nigeria

2. LITERATURE REVIEW

2.1. Conceptual Review

2.1.1. Gross domestic product (GDP)

This is the total monetary or market value of all the finished goods and services produced within a country's borders in a specific time period. As a broad measure of overall domestic production, it functions as a comprehensive scorecard of a given country's economic health. Gross domestic product provides an economic snapshot of a country that is used to estimate the size of an economy and its growth rate.

2.1.2. Health Expenditure

Health expenditure includes all expenditures for the provision of health services, family planning activities, nutrition activities and emergency aid designated for health, but it excludes the provision of drinking water and sanitation. Health financing is a critical component of health systems. Health expenditure measures the total cost of health care (public and private expenditures) as a percent of GDP.

2.2. Theoretical Literature Review

The study of the relationship between health care spending and economic outcomes has received a lot of attention in recent times. Health as human capital affects growth directly through, for example, its impact on labour productivity and the economic burden of illness. Bloom and Canning (2000, 2003) describe how healthy populations tend to have higher productivity due to their greater physical energy and mental clearness. According to them, healthier individuals might affect the economy in four ways: (a) They might be more productive at work and so earn higher incomes; (b) They may spend more time in the labour force, as less healthy people take sickness absence or retire early; (c) They may invest more in their own education, which will increase their productivity; and (d) They may save more in expectation of a longer life for example, for retirement; increasing the funds available for investment in the economy. Health is so important as both a source of human welfare and a determinant of overall economic growth.

Gupta and Mitra (2003) show that per capita public health expenditures positively influence health status; that poverty declines with better health, and that growth and health have a positive two-way relationship. Similarly, some empirical and historical studies have analysed the relationship between health and economic growth. They establish an endogenous relationship between them and, at the same time, argue that there are exogenous factors, which determine the health conditions of a person (Hamoudi and Sachs 1999). Aurangzeb (2001) investigates the relationship between health expenditure and economic growth within an augmented Solow Growth model for Pakistan during the period 1973-2003, Johansen cointegration technique and error correction model (ECM) are applied. The author finds a significant and positive relationship between GDP and health expenditure in both short- and long-run. Philips (2005) affirms that over the past 50 years, life expectancy has improved and infant mortality declined continuously in all parts of the world, except sub-Saharan African in the 1990s; Good health can reinforce economic growth by enabling people to be more productive especially in countries that have little corruption, poor health can constrain economic growth because it reduces the quality and quantity of labour. Also, in a study of India, the World Bank (2004) examines the impact of per capita GDP, per capita health expenditure and female literacy on infant mortality using state- level data over the period 1980-99. The study observes that both per capita public spending on health and per capita GDP are inversely related to infant mortality rate, but the results were observed not to be very robust to alternative specification of the model Bhargava, et al. (2001) finds positive relationship between adult survival rate and economic growth. Results remains similar when adult survival rate is replaced by life expectancy. Bloom, Canning and Sevilla (2001) in their study agreed with others on the positive and significant effect of health on economic growth. They therefore suggested that a one year improvement in a population life expectancy contribute to a recent increase in output. In the field of health economics, the endogenous causality between health and income has been the topic of several studies whose purpose is to establish the direction of the causality.

Luft (1978) gives an informal explanation of this causality: a lot of people who otherwise would not be poor are, simply because they are sick; however, few people who otherwise would be healthy are sick because they are poor. In order to explain the direction of the causality of the impact of health over income, Smith (1999) uses life cycles models, which link health condition with future income, consumption and welfare. According to this, Bloom and Canning (2000) explain this direction of the causality with education, indicating healthy people live more and have higher incentives to invest in their abilities since the present value of the human capital formation is higher. The higher education creates higher productivity and, consequently, higher income. Mehrare and Musai (2011) examines the relationship between health expenditure and economic growth for Iran over period 1979-2008 by employing Gregory-Hensen (1996) cointegration techniques which allows the presence of potential structural breaks in data. The authors find the presence of a long run relationship between health expenditure and the income elasticity for health care spending is greater than one during the period under study. The results also suggest one-way causality relationship running from GDP to health expenditure, thereby concluding that health expenditure does not granger caused economic growth. A more recent study by Mehrara and Musai (2011) examines the Granger causality tests between health expenditure and economic growth among 11 oil exporting countries during the period 1971-2007 by using panel unit root tests and panel cointegration techniques. The results suggest strong causality running from revenues and economic growth to health expenditure in the oil exporting states. Also, health expenditure does not have any significant effects on GDP in both short and long-run.

Baltagi, Adeniyi and Abiodun (2011) used ordinary least square (OLS) to examine the impact of health expenditure on economic growth over the period 1985-2009. The authors suggest that if funds are properly channelled and appropriate expended to both the recurrent and capital projects in health, the existence of a positive relationship between economic growth and health will be more widened. Similarly, Bakare and Sanmi (2011) also used ordinary least square (OLS) multiple regression for annual time series data for Nigeria covering 1974-2008, the results show a significant and positive relationship between health expenditure and economic growth. Therefore, the study recommends that policy makers should place more priority to the health expenditure by increasing its yearly budgetary allocation to the sector. Ogundipe and Lawal (2011) examined the impact of health expenditure on economic growth in Nigeria. Using the OLS technique, they found a negative effect of total health expenditure on growth. Bloom et al (2004) estimate a production function of aggregate economic growth as a function of capital stock, labour and human capital (education, experience and health).Their main result is that health has positive, statistically significant effects on economic growth. They however, do not consider how health is created. Olaniyi and Adams (2000) descriptively analysed the adequacy of the levels and composition of public expenditures and conclude that education and health expenditures have faced lesser cuts than external debt services and defence, but allocations to education and health sectors are inadequate when related to the benchmark and the performance of other countries.

2.3. Basic Theories

2.3.1. Musgrave Theory of Public Expenditure

This theory was propounded by Musgrave as he found changes in the income elasticity of demand for public services in three ranges of per capita income. He posits that at low levels of per capita income, demand for public services tends to be very low. This is so because according to him such income is devoted to satisfying primary needs and that when per capita income starts to rise above these levels of low income, the demand for services supplied by the public sector such as health, education and transport starts to rise, thereby forcing government to increase expenditure on them. He observes that at the high levels of per capita income, typical of developed economies, the rate of public sector growth tends to fall as the more basic wants are being satisfied.

2.3.2. The Wagner's Law/ Theory of Increasing State Activities

Wagner's law is a principle named after the German economist Adolph Wagner (1835-1917). Wagner advanced his 'law of rising public expenditures' by analyzing trends in the growth of public expenditure and in the size of public sector. Wagner's law postulates that: (i) the extension of the functions of the states leads to an increase in public expenditure on administration and regulation of the economy; (ii) the development of modern industrial society would give rise to increasing political pressure for social progress and call for increased allowance for social consideration in the conduct of industry (iii) the rise in public expenditure will be more than proportional increase in the national income (income elastic wants) and will thus result in a relative expansion of the public sector. Musgrave and Musgrave (1988), in support of Wagner's law, opined that as progressive nations industrialize, the share of the public sector in the national economy grows continually.

2.3.3. The Keynesian Theory

Of all economists who discussed the relation between public expenditures and economic growth, Keynes was among the most noted with his apparently contrasting viewpoint on this relationship. Keynes regarded public expenditures as an exogenous factor which can be utilized as a policy instrument to promote economic growth. From the Keynesian thought, public expenditure can contribute positively to economic growth. Hence, an increase in the government consumption is likely to lead to an increase in employment, profitability and investment through multiplier effects on aggregate demand. As a result, government expenditure augments the aggregate demand, which provokes an increased output depending on expenditure multipliers.

2.4. Empirical Literature

A number of studies have focused on the relation between government expenditure and economic growth in developed and developing countries like Nigeria. The results varied from one study to another.

Abu and Abdullah (2022) investigated the relationship between government expenditure and economic growth in Nigeria for the period, 1970 - 2008. They used disaggregated analysis in an attempt to unravel

the impact of government expenditure on economic growth. Their results indicate that government total capital expenditure and total recurrent expenditure on education had negative effect on economic growth. On the contrary, government expenditure on transport, communication and health resulted in an increase in economic growth. They recommend that government should increase both capital expenditure and recurrent expenditure including expenditure on education as well as ensure that funds meant for development on these sectors are properly utilized. Anekwe and Amakom (2021) analysed the relationships amongst health expenditure, health outcomes and economic development in Sub-Saharan Africa. They employed pooled regression for the analysis of data. They found that health expenditure was a salient determinant of infant mortality and HIV prevalence rate in Africa. Also life expectancy was found to be truly necessary for the region's economic development; other causative factors being: the region's female literacy rate, labour force, and its gross national income.

Olorunfemi (2008) examined the direction and strength of the relationship between public investment, economic growth and infant mortality rate in Nigeria, using time series data from 1975 to 2004 and observed that public expenditure impacted positively on economic growth and infant mortality rate and that there was no link between gross fixed capital formation and Gross Domestic Product. He averred that from disaggregated analysis, the result reveal that only 37.1% of government expenditure was devoted to capital expenditure while 62.9% share was to current expenditure. Robert B (1997) assessed the relationship between public expenditure and per capita income using panel co-integration and causality analyses for OECD countries, Panel Ordinary Least Square/ Pedroni Dynamic Ordinary Least Square and Fully Modified Ordinary Least Square estimators were employed in the study. Study revealed 10% of the increase in per capita income was linked to a four-tenth percent increase in economic growth. Zakir and Wunnava (1997) employed cross-sectional data covering 117 countries for the year 1993 which was used in determining the factors affecting infant mortality rates. The study employed Generalised least square regression result. They found that government expenditure on health care as a percentage of GNP does not play a major role in determining infant mortality rates. Deon (1997) investigated the impact of public spending on health and infant mortality. The study employed Ordinary least square estimates, two stages least square (2SLS). He found that the Public spending on health is not the dominant driver of child mortality outcomes. Government health expenditures accounted for less than one-seventh of 1% variation in under-5 mortality across countries, although the result was not statistically significant. Alexander (1990) applied OLS method for sample of 13 Organization for Economic Cooperation and Development (OECD) countries panel during the period ranging from 1959 to 1984. The results show, among others, that growth of government spending has significant negative impact on economic growth.

3. MODEL AND ECONOMETRIC METHODOLOGY

3.1 Model Specification

In order to determine the impact of health expenditures on economic outcomes in Nigeria, the study employed neo-classical Solow production function model. According to Solow's growth model, output is a function of capital accumulation, labour and technology. The functional relationship is therefore expressed as;

$Y_t = f(K_t, L_t, T_t)$ …… (1)
Where
Y_t = Aggregate real output
K = Capital stock
T = Technology
t = Time trend
However, the Solow's model has been adapted and presented in functional form as:
GDP = f(THEX, PCI, IMTR)
In an explicit form, the model is expressed as;
$GDP_t = \beta_0 + \beta_1 THEX_t + \beta_2 HDI_t + \beta_3 IMTR_t + \mu$……. (2)
Where
GDP_t = Gross Domestic Product
$THEX_t$ = Total Health Expenditure
$IMTR_t$ = Infant Mortality rate
HDI_t = Human Development Index

β_1, β_2, β_3= the parameters to be estimated
β_0 = constant term
μ = stochastic term
In order to have all the variables in the same base, gross domestic product (GDP) and total health expenditure (THEX) were expressed in a logarithmic form. Thus, it becomes;
LGDPt = β0 + Lβ1THEXt + β2PCIt + β3IMTRt + μ …… (3)

3.2. Estimation Techniques and Procedure

The ordinary least squares method (OLS) will be used in order to determine the extent to which the predictor variable contributed to RGDP. Unit root test will be conducted in order to determine the stationary status of the time series data. The evaluation of estimates involves economic, statistical and econometric criteria.

3.3. Method of Data Analysis

The study will adopt a multiple regression analysis with an OLS estimation technique to estimate the relationship between health expenditure (THEX), gross domestic product (GDP), and Infant Mortality Rate (IMTR), Human Development Index (HDI) in Nigeria from 1993 to 2022. The multivariate linear regression model of OLS is very essential when considering the relationship between a dependent variable and a set of independent variables. OLS estimates have some strong statistical properties.

3.4. Evaluation of Estimates

The evaluation technique or method of analysis determines the evaluation estimates. Since the study will adopt a multiple regression, estimates' evaluation would be premised on the statistical criteria (or first order test) and econometric criteria (second order test).

Statistical Criteria: *First Order Test*

This aims at the evaluation of the statistical reliability of the estimated parameters of the model, In this case, F-statistic, t-statistic, coefficient of determination (R^2), Adjusted R^2 are used.

Econometric Criteria: Second Order Test

.This aims at investigating whether the assumption of econometric method employed are satisfied or not in any particular case. They determine the reliability of statistic criteria and also establish 'whether the estimates have desirable properties of unbiasedness, and consistency. It also test validity of non-auto correlation disturbances, here the Durbin-Watson (D-W) statistic is used for the test.

3.5. Unit Root Tests

The use of time series data in econometric analysis poses several challenges to researchers. Stationarity of time series data is one of these problems, since a time series that is non-Stationary is bound to yield spurious regression. A series is said to be stationary if its mean and variance are constant over time and the value of covariance between two time periods depends only on the distance or lag between the two time periods and not on the actual time at which one covariance is computed Gujarati (1995).

4. EMPIRICAL RESULT

4a Table 1. *Summary of results of unit root test using Augmented Dickey Fuller (ADF)*

Series	PP at 5%	Critical Value at 5%	Order of Integration	Decision	Conclusion
LGDP	-3.974015	-2.9705	1(0)	No Unit root	It is stationary
FPI	-4.015435	-2.9705	1(0)	No Unit root	It is stationary
IMTR	-3.817242	-2.9705	1(0)	No Unit root	It is stationary
LTHEX	-4.23161	-2.9705	1(0)	No Unit root	It is stationary

Source: Researchers' computation (2025)

In the table above, the result of the unit root test at 5% critical value using Augment Dickey Fuller (ADF) was carried out. The result shows that there is no unit root among the variables and the variables were stationary at level and therefore the model is not spurious.

The empirical results obtained from the data are presented below.

Dependent Variable: LOG (GDP)				
Method: Least Squares				
Variable	Coefficient	Standard Error	t-statistic	Prob.
C	8.573011	4.932699	1.737996	0.0940
LOG(THEX)	0.329617	0.222094	1.484130	0.1498
IMTR	-0.046098	0.012722	-3.623574	0.0012
HDI	1.576499	2.171438	0.726016	0.4743

4.2. Interpretation

From the empirical result above, the average level of Gross Domestic Product (GDP) when Total Health Expenditure (THEX), Human Development Index (HDI) and Infant Mortality Rate (IMTR) are zero is about ₦8.573011million naira for the period under study. The empirical result also shows that a unit change in total health expenditure (THEX) on the average will increase the Gross Domestic Product by 0.329617 percent while a unit increase in Human Development Index (HDI), on the average will increase Gross Domestic Product (GDP) by 1.576499 percent. Finally, a unit decrease in infant mortality rate (IMTR) on the average will make the Gross Domestic Product (GDP) to rise by 0.046098 percent.

In the above model also, the coefficient of determination (R^2) was found to be 0.895300. This implies that 89 per cent variation in Gross Domestic Product is caused by the changes in THEX, HDI and IMTR while only about 11 per cent variations in GDP is caused by other variables outside the model. This shows a strong goodness of fit. The adjusted R^2 shows that about 88 per cent of total variation in GDP is explained by the explanatory variables. The probability of F-statistic of the model is 0.000000 at 5% level of significance. This shows that the joint influence of the predictors on the dependent variable is statistically significant. The empirical result also shows that the model is not infected with the problem of autocorrelation since the value of computed Durbin Watson statistic is approximately equal to 2.

5. Summary and Conclusion

The major objective of this research is to examine the impact of health expenditure on economic outcomes in Nigeria for the period 1993 to 2022. Based on the research findings of this study, it was observed that the gross domestic product (GDP) and total health expenditure (THEX) are positively related and statistically insignificant at 5 per cent level of significance. This implies an under funding of the health sector. While per capita income (HDI) had a positive relationship with Gross Domestic Product (GDP), it remained statistically insignificant at 5 per cent level. The infant mortality rate (IMTR) was found to be statistically significant at 5 per cent level and negatively signed with Gross Domestic Product (GDP) which implies that government is actually working on reducing the infant mortality rate, however, more effort is desired in order to strengthen the health sector.

5.1. Recommendations

To enhance the contribution of gross domestic product (GDP) to health expenditure in Nigeria, the present government is therefore advised to increase the budgetary allocation of health sector. The government of the day is also encouraged to improve on the quality and efficacy of vaccines so as to reduce the high rate of infant mortality (IMTR) in Nigeria.

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