HEALTH CARE EXPENDITURE AND ECONOMIC DEVELOPMENT NEXUS: THE CASE OF NIGERIA

Taye, Alekeu
Postgraduate Student,
Department of Economics & Development Studies,
Federal University Kashere,
Gombe State.
08025089777
alekeutaye@gmail.com

Abdullahi Jauro Mohammed
Department of Economics,
Faculty of Social Science,
Adamawa State University, Mubi
amjauro99@yahoo.com

***Corresponding author:**
Taye, Alekeu
Postgraduate Student,
Department of Economics & Development Studies,
Federal University Kashere,
Gombe State.
08025089777
alekeutaye@gmail.com

ABSTRACT

Human capital consists of two components; one is education and the other is health. It is surprising that health, which is another component of human capital has been largely underestimated in the development studies. Moreover, among few studies that has been carried out on health expenditure as it's relates to economic development has shown an absence of consensus in regards to the effect of health care expenditure on economic development as well as their relationship in Nigeria. This Study examines the Health care Expenditure and Economic development Nexus in Nigeria, using annual time series data from 1995 to 2021. Real gross domestic product was used as proxy for economic development, while the independent variables are per capita health expenditure, improved sanitation facilities and improved water were sourced from World Bank's Development Indicators 2023. The Cointegration, Error Correction Mechanism and Granger Causality techniques were employed in analyzing annual time series data. The study indicates an evidence of long run equilibrium relationship between economic development and health care expenditure. The Granger Causality test also shows that health expenditure granger causes economic development. Implying that increase in health expenditure will bring about increase in the economic development. The major policy implication of the study is that, more economic development can be achieved by improving the health care expenditure. Therefore, the study recommend that more funds should allocated to health sector as it pays back in increase in economic development.

Keywords: Health Care Expenditure, Economic Development, Cointegration, Granger Causality, Nigeria

1.0 Introduction

One of the vital public services provided by governments across the globe is health care, developed countries spend a high proportion of their Gross Domestic Product (GDP) on health care because they believe that their resident health can serve as a major driver for economic activities and development. Therefore, there is a strong economic case for governments to increase public health expenditures. This is anchored on the fact that the main objective of government in expending its resources on the economy is to achieve certain macroeconomic objectives that will stimulate economic growth, and development.

@A Publication of the Department of Economics, ADSU, Mubi. ISSN- Print: 2550- 7869; ISSN-Online: 3043-5323. Journal homepage: https://ajaefm.adsu.edu.ng

To achieve this broad goal, governments certainly need productive and active workforce so that any investment centered at enhancing human capital will in turn enhance economic development. The above scenario is justified by the views of (Bloom and Canning (2005) on how human capital development plays a major role for sustainable economic growth and that health is an integral part of human capital development which enhances the productivity of workers by increasing their physical strengths and capacities.

The World Health Organization Report in 2019 indicated that Nigeria's public health expenditure as a percentage of gross domestic product (GDP) is low compared to global standards. Understanding the extent of the connection between the size of public health expenditure on the GDP and changes in the standard of living is necessary to enhance proper accounting of any notable growth in the health sector. This is validated by the recommendation of the World Health Organization (WHO) that a country's public health expenditure should be at least 5 percent of GDP. Public health expenditures as a percentage of GDP in Nigeria for 2015, 2016, 2017, 2018 and 2019 were, 4%, 3.4%, 3.6%, 3.7% and 3.8% respectively (WHO National Health Accounts). The budgetary allocations to the Federal Ministry of Health (N1.38.2B, N154.5B, N161.8B, N235.8B, and N284.9B for 2008, 2009, 2010, 2011 and 2012 respectively) shows an erratic growth of health expenditure, the magnitude of allocations with regards to the GDP was still not enough to propel the needed economic growth and development to meet global standards.

Available data indicates that public health expenditure in Nigeria has been on the increase in the past 10 years, but in spite of the increase, much impact has not been made in the reduction of infant, under age five and maternal mortalities since 1970. For instance, Nigeria's rate of infant mortality (91 per 1000 live births) is among the highest in the world, immunization coverage has dropped below thirty percent while the mortality rate for children under age five is 192 deaths per one thousand. By year 2007, it was reported that more than one hundred and thirty-four thousand (134,000) women died from pregnancy complications. In addition, the life expectancy ratio on the average has been on the decline over the study period. Despite the increase in government expenditure in health care in Nigeria, the contribution of this to health is still marginally low whereas the extent and magnitude of its impact on economic growth and development is undetermined. There is no doubt that a possible relationship between health and economic development could exist. However, there are so many reasons why it is difficult to reach a definitive conclusion one of which is the prioritization that is involved in the determination of a nation's income and expenditure.

It is surprising that health, which is essential component of human capital, has been largely ignored in the development studies, moreover, among few studies that has been carried out on health expenditure as it's relates economic development has shown an absence of consensus on the effect of health expenditure on economic development as well as their relationship in Nigeria. Hence, the lack of consistent findings in the literature lends justification to the analysis that we pursue in this study.

Also, from the literature survey made by the researcher shown that lack of access to improved sanitation facilities which holds the health of so many people at ransomed especially in the various cities of a country, other factors like access to improved water source hindered good health delivery in Nigeria. Yet the timely attention given by the government to this health relating variable have being neglected by researchers, hence this work intends to cover this gap by including these variables to see how they relates on Nigerian economic development.

@A Publication of the Department of Economics, ADSU, Mubi. ISSN- Print: 2550- 7869; ISSN-Online: 3043-5323. Journal homepage: https://ajaefm.adsu.edu.ng

This study examines the relationship between health care expenditure and economic development as proxied by real gross domestic product from 1995-2022, the study is guided by the following questions: -

What is the relationship between health care expenditure and economic development in Nigeria? And what is causal relationship between health care expenditure and economic development in Nigeria? Whereas the main objective of the study is to determine the long-term relationship between health care expenditure and economic development in Nigeria while the specific objective is to explore causal relationship between health care expenditure and economic development.

Following the introduction of this study thus followed by Literature review, Data and methodology, result and discussion and finally conclusion and recommendation**.**

2.0 Literature Review

2.1 Concept of Health

According World Health Organization (1948), health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity. Stocks, Noren and Shindell (1982), defines health as state characterized by antomic, pschycologic, and physiological integrity; ability to perform personally valued family work and community roles; ability to deal with physical, biological, physiological and social stress. Just as there is a shift in viewing diseases as a state to think of it as a process, there was also a shift in the definitions of health and WHO again played a leading role when it fostered the development of "health promotion" movement in the 1980's. This brought in a new conception of health, not as a state, but in dynamic terms of resilience, in other words, as a "resource for living". (WHO, 1986). WHO (1984), defines health as the extent to which an individual or group is able to realized aspirations satisfy needs and to change or cope with the environment, health is a resource for everyday life, not the objective of living: it is a positive concept, emphasizing social and personal resources, as well as physical capacities.

2.1.1 Relationship between Health Expenditure and Economic Development

The study of the relationship between health care expenditure and economic Development is rather a new phenomenon in economic literature and it has received a lot of attention in recent times.

Capital health expenditure is one of the public expenditures classified under government social and community services expenditure in Nigeria that served as one of the critical determinants of human and economic development. Primary purpose of government health expenditure is to improve the health status by making it accessible for all, health status is governed and measured by the level of investment in the health care (Aranda, 2010). The means by which government can improve healthcare system delivery is by raising government healthcare infrastructures (Berger & Messer, 2002). This is capital intensive and therefore involves huge capital health expenditure allocation in nature. Therefore, health care expenditures and improvement of health care status are means to an end. The means here are expenditures on health while the end is the quality of the health care delivery (output improvement), human development and in turn national growth and development. Health expenditure is a necessity toward achieving sustainable economic development (Edeme & Nkalu, 2016).

@A Publication of the Department of Economics, ADSU, Mubi. ISSN- Print: 2550- 7869; ISSN-Online: 3043-5323. Journal homepage: https://ajaefm.adsu.edu.ng

Healthier 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:
(i) they might be more productive at work and so earn higher incomes;

(ii) They may spend more time in the labour force, as less healthy people take sickness absence or retire early;

(iii) They may invest more in their own education, which will increase their productivity and;
(iv) 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 and development. Also, according to WHO (1996) ‘’health is a state or ability of individual to live a socially and economically productive life’’. Health is a somewhat nebulous condition, difficult to define and never in a state of perfection since one can be really sick, but never perfectly healthy.

2.2 Empirical Literatures

Narayan et al (2020) to investigated the short term and the long-term effect of health care expenditure, institutional quality, domestic and foreign investment on economic growth of South Asia Countries during the period 1996-2018.The study used OLS estimation with random effect model and cointegration to test the short term and long-term relationship. The study found out that there runs a bidirectional causality from health expenditure to economic growth in the short run. The study recommends that South Asia nations require to strengthen the accessibility towards affordability, accountability of the health care services being provided by the population.

Kelvin et al. (2022) assess the impact of Health Expenditure on economic growth in Kenya as one of the health indicators hindering growth rate. The study adopted the endogenous growth theory and incorporated key health expenditure into the model as a function of human capital. The research design employed was explanatory and relied on secondary data from World Bank from 1987 to 2018. Applying the regression model, the results revealed that the coefficient of healthcare expenditure was 0.3032, which was positive and insignificant at a 5 per cent level. This implied that for every one per cent increase in the coefficient of health care expenditure, the GDP growth rate could increase by 0.3032 %. The Kenya government could put in place health policies promoting citizens' health under social pillar and also increase allocation to health care to promote economic growth.

In a yet another study, Olubokun, and Bakare. (2020) examined the relationship between healthcare expenditure and the health outcomes in Nigeria using annual time series data for the period of 30 years beginning from 1985–2015. They adopted the Ordinary Least Squares technique. The results revealed that healthcare expenditure is directly related with the health outcome. The study recommends increase in the public healthcare expenditure to enhance the health performance outcome.

The findings in Paul and Akindele (2019) when investigating the effect of health expenditure on economic growth in Nigeria using Cointegration, VECM and Granger Causality test on time series data showed that there is negative long-run relationship among public health care related -variables and economic growth

@A Publication of the Department of Economics, ADSU, Mubi. ISSN- Print: 2550- 7869; ISSN-Online: 3043-5323. Journal homepage: https://ajaefm.adsu.edu.ng

More so, Aluko and Oluseyi (2018) seeks to investigate the effect of health expenditure on economic growth in Nigeria from the period 1980 to 2013.The study used Johansen-Juselius cointegration test, VECM and granger causality test. The result of Johansen cointegration test revealed the existence of five cointegrating equation. The VECM result showed that all the explanatory variables were in line with the a priori expectation and the model satisfied the stability condition while the granger causality result depicts a uni-directional relationship between health indicators and economic growth in Nigeria. Therefore, it was suggested that government should increase the allocation of fund to the health sector and create awareness for more availability for health services.

Ilori and Ajiboye (2019) examines the impact of health expenditure on economic growth in Nigeria, using time series data spanning from 1981 to 2013. Ordinary least square regression analysis, Auto-regressive Distributed Lag (ARDL) Model approach and Error Correction Mechanism (ECM) were employed as the estimating techniques to test the existence of long-run relationship among the variables and the result shows positive impact that gross capital formation, and total health expenditure determine in part the level of economic growth in Nigeria while life expectancy rate indicates statistical negative impact on the growth contrary to theoretical economic expectation for the period covered by the study. As a result, the following policy measures are suggested among others that government should encourage savings and investments in the economy, increase expenditures on health provisions, induce the level of labour productivity and place priority on the issues of security to lives and properties so as to pave way for growth and development of the Nigerian economy.

Badri (2016) examines effect of health spending on economic growth in 24 selected countries of OECD in the period 2006-2013 using GMM methods. The results show that health spending has a significant and positive effect on economic growth, so that an increase of 1 percent of its value, economic growth 0/04 percent increased. Also, physical capital and the working population have a significant positive effect on economic growth. However, inflation has a negative effect on economic growth, as inflation increased the rate of economic growth decreased

3.0 Data and Methodology

This section discusses the type and sources of the data that are used in this research, model specification and techniques of data analysis.

3.1 Sources/ Method of data collection

This research work relies on secondary sources of data. The annual time series data from 1995 to 2016 used in this study were obtained from World Bank's development indicators 2017. The variables: Real gross domestic product (RGDP) and per capita health expenditure used in this study were transformed into logarithms in order to reduce the possibility of heteroskedasticity and also to make the interpretation of results in percentage.

3.2 Model specification

In order to study the relationship between health Care expenditure and economic development in Nigeria, this study adopt Grossman Theory (1972), the theory was concerned with how individuals allocate their resources to produce health. The model goes beyond traditional demand analysis and has been extremely influential in health economics. It utilizes the idea of the individual as a producer of

@A Publication of the Department of Economics, ADSU, Mubi. ISSN- Print: 2550- 7869; ISSN-Online: 3043-5323. Journal homepage: https://ajaefm.adsu.edu.ng

health (not simply a consumer) by removing the artificial separation of consumption and production. It also introduces the idea of investing in human capital (health and education) to improve outcomes in both the market (work) and non-market (household) sectors. Demand for health care is derived from a demand for health (few people want health care for its own sake). Demand for health is derived from the demand for utility (e.g. healthy days in which to participate in leisure and work) Individuals are not passive consumers of health but active producers who spend time and money on the production of health can be seen as lasting over time periods. It depreciates (perhaps at a non-constant rate) and can therefore be analyzed as a capital good. Individuals value health but do not value it above all else (if they did, they would not over-eat, smoke, drink too much, or drive too fast) We have limited incomes with which to finance health and other activities, and neither is costless We exert a relatively high degree of control over our health by virtue of the fact that we can influence our health-affecting consumption patterns, our health care utilization and our environment. Health demand consists of two elements:

(1) Consumption effects: health yields direct utility i.e. you feel better when you are healthier

(2) Investment effects: health increases the number of days available to participate in market and non-market activities –the novel bit of the model

According to Grossman, the present stock of health is the function of the past stock of health minus the depreciation plus investment in health which can be expressed as:

$H_t = H_{t-1} - \delta + I$

Where:

H_t = Present Stock of Health

H_{t-1} = Past Value of Stock of Health

δ = Depreciation

I = Investment in Health

A person is born with initial endowment of health (H), which they add to by investment. The rate of health (H) production will depend on the efficiency of investment in health (H). There will be δ (depreciation) in the value of the stock of health (H) through age, accident, carelessness, sudden disease. The individual is a producer of H (amongst other things): they buy market inputs (medical care, food, clothing), and combine them with their own time to produce services that increase their utility. The analysis is based on human capital theory which shows how individuals invest in themselves e.g. through training or investment in health, to increase their productivity. The optimal amount of investment in human capital is determined by the relative Cs and Bs: usually the Cs occur in the short-term whilst the Bs accrue in the future in the form of enhanced job opportunities.

The VAR granger causality model specification of this study therefore was adapted from the work of Sede and Ohemeng (2015) and modified. The VAR granger model for this study can be specify as:

$$LRGDP_t = \boldsymbol{\varphi_{1t}} + \sum_{i=1k}^{k} \pi_{1i} LRGDP_{t-1} + \sum_{i=1k}^{k} \theta_{1i} PHE_{t-1} + \sum_{i=1k}^{k} \delta_{1i} ISF_{t-1} + \sum_{i=1k}^{k} \vartheta_{1i} IWS_{t-1} + \boldsymbol{\varepsilon_{1t}} \quad (3.1)$$

@A Publication of the Department of Economics, ADSU, Mubi. ISSN- Print: 2550- 7869; ISSN-Online: 3043-5323. Journal homepage: https://ajaefm.adsu.edu.ng

$$PHE_t = \boldsymbol{\varphi_{2i}} + \sum_{i=1k}^{k} \pi_{2i} LRGDP_{t-1} + \sum_{i=1k}^{k} \theta_{2i} PHE_{t-1} + \sum_{i=1k}^{k} \delta_{2i} ISF_{t-1} + \sum_{i=1k}^{k} \vartheta_{2i} IWS_{t-1} + \boldsymbol{\varepsilon_{2t}} \quad (3.2)$$

$$ISF_t = \boldsymbol{\varphi_{3i}} + \sum_{i=1k}^{k} \pi_{3i} LRGDP_{t-1} + \sum_{i=1k}^{k} \theta_{3i} PHE_{t-1} + \sum_{i=1k}^{k} \delta_{3i} ISF_{t-1} + \sum_{i=1k}^{k} \vartheta_{3i} IWS_{t-1} + \boldsymbol{\varepsilon_{3t}} \quad (3.3)$$

$$IWS_t = \boldsymbol{\varphi_{4i}} + \sum_{i=1k}^{k} \pi_{4i} LRGDP_{t-1} + \sum_{i=1k}^{k} \theta_{4i} PHE_{t-1} + \sum_{i=1k}^{k} \delta_{4i} ISF_{t-1} + \sum_{i=1k}^{k} \vartheta_{4i} IWS_{t-1} + \boldsymbol{\varepsilon_{4t}} \quad (3.4)$$

Where:

$LRGDP_t$ = Log of Real Gross Domestic Product

PHE_t = Per capita health expenditure.

ISF_t = Improved sanitation facilities.

IWS_t = Improved water source.

i = 1, 2, 3 and 4

k = Total number of lags.

α = Autonomous term.

π_{ji} = Coefficients of the log of Real Gross Domestic Product.

θ_{ji} = Coefficient of Per capita health expenditure

δ_{ji} = Coefficients of Improved sanitation facilities.

ϑ_{ji} =Coefficient of Improved water source.

μ_{ji} = Stochastic Error Term

3.2 Expected Outcomes

In line with economic theory, the a prior expectation of this study is that per capita health expenditure, improved sanitation facilities and improved water source will play a vital role in influencing positively the level of economic development in Nigeria. Increase in Per capita health expenditure is expected to have positive sign since an increase in total health expenditure is expected to improve the health of the labour force and consequently increase their productivity. An increase labour productivity will inevitably reflect in national economic development. Improved sanitation facilities are expected to have positive sign mainly because it represents an increase in the standard of living of the work force hence it is expected to motivate labour to put in more strength, this push national output upward hence economic development. Cholera, typhoid and other environmental diseases in Nigeria has been attributed to poor

@A Publication of the Department of Economics, ADSU, Mubi. ISSN- Print: 2550- 7869; ISSN-Online: 3043-5323. Journal homepage: https://ajaefm.adsu.edu.ng

water source, then an improved water source will definitely not only improve the health status of Nigerian work force but also make clean water available for other industrial activities consequently increasing productivity and economic development.

3.3 Variables Measurement

Real Gross Domestic Product (constant LUC): Refers to the sum of gross value added by all resident produced in the economy plus any product taxes and minus any subsidy included in the value of the products. It is measured in local currency that is Nigerian Naira (World Bank, 2023).

Per capita health expenditure (PHE): It consist of private and public health expenditure (central and local) budgets, external borrowing and grants and social health insurance funds. It's measured as percentage of gross domestic product (% of GDP)

Improved sanitation facilities (ISF) is measured by Percentage (%) of people with access to improved sanitation facilities.

And improved water source (IWS) is measured by Percentage (%) of people with access to improved

Result and Discussions

4.0 Correlation

Correlation test was conducted in order to ascertain the degree of association among the variables and the result is presented in table 1

Table 1: Correlation test result among RGDP, PHE, ISF and IWS (1995-2022)

	RGDP	PHE	ISF	IWS
RGDP	1.000000			
PHE	0.736521	1.000000		
ISF	-0.940159	0.840784	1.000000	
IWS	0.955567	-0.799715	-0.991603	1.000000

Source: Author's computation using E-views 10. 2024

The correlation result from table 1, reveals that there is strong positive correlation between real gross domestic product (RGDP) proxy for economic development and per capita health expenditure (PHE) as shown by 0.73(73%) correlation coefficient. The correlation between RGDP and improved sanitation facilities (ISF) is highly negative correlation but a highly positive correlation between real gross product and improved water source as clearly shown by the correlation coefficients of 0.95(95%). Also, a positive correlation exists between per capita health expenditure and improved sanitation facilities but shown negative correlation with improved water source (IWS) as shown by -0.799 (-79%). There is a highly negative correlation between improved sanitation facilities and improved water source shown by -0.99.

4.1 Unit Root Test

@A Publication of the Department of Economics, ADSU, Mubi. ISSN- Print: 2550- 7869; ISSN-Online: 3043-5323. Journal homepage: https://ajaefm.adsu.edu.ng

Unit root test was conducted on the variables to know or determined the stationarity conditions of the variables and the result is presented in table 2

Table 2: Phillips-Perron Unit Root Test of LRGDP, LEX, ALR and PSE (1995-2022)

	Phillips-Perron Test Statistics			5% Critical Value			Order of integration
	At Level	At First Difference	At Second Difference	At Level	At First Difference	At Second Difference	
LRGDP	-1.636830	-3.349098	-16.24447	-3.029970	-3.040391	-3.052169	I(1)
PHE	-1.513505	-5.28462	-20.42059	-3.012363	-3.020686	-3.029970	I(1)
IWS	-1.171616	-3.119785	-2.020446	-3.012363	-3.020686	-3.029970	I(1)
ISF	-1.916513	-3.451422	-0.947298	-3.012363	-3.020686	-3.029970	I(1)

Source: Author's computation using E-views 10. 2024

Based on the unit root test results presented in table 2, using 5% level of significance, economic growth (LRGDP), per capita health expenditure (PHE), improved sanitation facilities (ISF) and improved water source (IWS) are not stationary at level but appears to be stationary at first difference when only intercept is included in the test, however real gross domestic product (LRGDP) and per capita health expenditure (PHE) are stationary at second difference. This have satisfied the condition for conducting cointegration test using Johansen cointegration method.

@A Publication of the Department of Economics, ADSU, Mubi. ISSN- Print: 2550- 7869; ISSN-Online: 3043-5323. Journal homepage: https://ajaefm.adsu.edu.ng

4.2 Cointegration Test

Table 3: Cointegration test result of LRGDP, LPHE, ISF and IWS (1995-2022)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.953988	110.9090	47.85613	0.0000
At most 1 *	0.651395	40.09522	29.79707	0.0023
At most 2	0.471234	15.85747	15.49471	0.0441
At most 3	0.050905	1.201670	3.841466	0.2752

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

** denotes rejection of the hypothesis at the 0.05 level*

***MacKinnon-Haug-Michelis (1999) p-values*

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.953988	70.81374	27.58434	0.0000
At most 1	0.651395	24.23775	21.13162	0.0177
At most 2 *	0.471234	14.65580	14.26460	0.0434
At most 3	0.050905	1.201670	3.841466	0.2730

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

** denotes rejection of the hypothesis at the 0.05 level*

***MacKinnon-Haug-Michelis (1999) p-values*

Source: Authors computation using E-view 10. 2024

Based on the result of the Johansen Cointegration test in table 3, the trace test indicates 3 cointegrating equations while the Max-eigenvalue indicates also 3 cointegrating equation at 5% level of significant. This finding therefore indicates an evidence of cointegrating relationship between economic development proxied by the log of real gross domestic product (LRGDP), per capita health expenditure (PHE), improved sanitation facilities (ISF) and improved water source (IWS) in Nigeria. The existence of the cointegration relationship is a good indication that the variables of interest actually move together in the long-run. This outcome is in agreement with the study carry out by Ilori and Ajiboye (2019) and Aluko and Oluseyi (2018). Given the fact that the variables are cointegrated in this study, evidence of error correction might also exist. Based on that, we proceed to build an error correction model, the result is given in table 4.

@A Publication of the Department of Economics, ADSU, Mubi. ISSN- Print: 2550- 7869; ISSN-Online: 3043-5323. Journal homepage: https://ajaefm.adsu.edu.ng

4.3 Vector error correction test result of LRGDP, LPHE, ISF and IWS

Table 4: Error correction result

Error Correction:	D(LRGDP)	D(LPHE)	D(ISF)	D(IWS)
CointEq1	-0.092932	-3.146546	0.460256	0.040076
	(0.28468)	(1.06910)	(0.14801)	(0.21613)
	[-0.32645]	[-2.94317]	[3.10973]	[0.18542]
D(LRGDP(-1))	0.612872	1.312194	-0.119480	0.046674
D(LPHE(-1))	0.008465	-1.068140	0.124893	-0.074471
D(ISF(-1))	-1.086223	-1.896891	-0.318085	-0.033361
D(IWS(-1))	-0.087092	2.711292	0.355377	-0.365275
R-squared	0.769330	0.801476	0.918575	0.461371
Adj. R-squared	0.436141	0.514718	0.800960	-0.316649
Sum sq. resids	0.017388	0.245233	0.004700	0.010022
S.E. equation	0.043955	0.165070	0.022852	0.033371
F-statistic	2.308987	2.794959	7.810037	0.593007

Source: Authors computation using E-view 10. 2024

The existence of cointegrating equations indicates that there is possibility of an error correction mechanism. The error correction test result is given in the table 4, where the coefficient of real gross product RGDP is -0.0929 which is statistically significant in correcting short run disequilibrium at 5%. It also indicates that economic development (RGDP) is converging towards long-run equilibrium. In the same vein, the coefficient of Per capita health expenditure is -31465 which is as well statistically significance at 5% indicating that there is evidence of convergence from Per capita health expenditure to economic development, ISF and IWS, towards equilibrium with the speed of adjustment being about 43% and equally indicating that 43% of the error is being corrected each year, and that they do succeed in correcting short-run disequilibrium. The coefficient of the error correction term on improved sanitation facilities (ISF), and improved water source (IWS) are not rightly signed not statistically insignificant at 5%, the coefficient of ISF and IWS are 0.460 and 0.040 respectively with t-statistics being 3.11 and 0.185 as well. This indicates that there is absence convergence from ISF and IWS to RGDP and PHE towards long run equilibrium and insignificant for correcting the short-run disequilibrium. Therefore, indicates a divergence from equilibrium. This might be as a result of negligence of government towards provision of improved sanitation facilities and improved water source or under estimation of government effort towards these health-related variables.

@A Publication of the Department of Economics, ADSU, Mubi. ISSN- Print: 2550- 7869; ISSN-Online: 3043-5323. Journal homepage: https://ajaefm.adsu.edu.ng

The R-squared indicates that 76% of variation in real gross domestic product (RGDP) is explain by the variables captured in the model while the remaining 24% is explain by factors outside the model. The estimation also shows that, the coefficient of per capita health expenditure (PHE) is 0.008465, indicating that all things being equal, economic development (LRGDP) will increase by 0.008% for every one percentage (1%) increase in per capita health expenditure (PHE) holding improved sanitation facilities (ISF) and improved water source (IWS) constant. Meaning that per capita health expenditure (PHE) has a positive effect on economic development (LRGDP) during the period. The outcome of per capita health expenditure in this study is in line with a prior expectation, because it is expected that per capita health expenditure will have a positive influence on economic development. Meaning that, when there is increase in the level of per capita health expenditure, economic development will also increase since increase in per capita health expenditure increase standard of living and life span of the people in the country.

On the other hand one percent (1%) increase in the access to improved sanitation facilities will lead to about -1.08% decrease in economic development as proxy by real gross domestic product during the period of this study holding per capita health expenditure (PHE) and improved water source (IWS) constant, this might be because government effort in providing sanitation facilities has either been undermined or under estimated. This is however contrary to a prior expectation of this study because improved sanitation facilities are expected to increase the well-being of the workforce, ability to contribute their quota effectively and efficiently hence is expected to have a positive effect on economic development.

In same vain one percent increase (1%) in the access to improved water source (IWS) will bring about -0.087% decrease in economic development (RGDP) during the period of study holding other variables (PHE & ISF) constant. This is also not in agreement with a prior expectation of this study because access to improved water source will not only improved the health status of the work force by combating the menace environmental diseases such as typhoid and cholera. But also provide portable water for industrial used, this expected to have a positive effect on economic development.

@A Publication of the Department of Economics, ADSU, Mubi. ISSN- Print: 2550- 7869; ISSN-Online: 3043-5323. Journal homepage: https://ajaefm.adsu.edu.ng

4.4 VAR granger causality test result of LRGDP, LPHE, ISF and IWS (1995-2022)

Table 5: VAR granger causality

Dependent variable: LRGDP

Excluded	Chi-sq	Df	Prob.	Decision
LPHE	14.02960	3	0.0029	Reject Null
ISF	11.97552	3	0.0075	Reject Null
IWS	8.170019	3	0.0426	Reject Null
ALL	35.10347	9	0.0001	

Dependent variable: LPHE

Excluded	Chi-sq	Df	Prob.	Decision
LRGDP	0.923341	3	0.8198	Accept Null
ISF	2.176147	3	0.5367	Accept Null
IWS	3.584343	3	0.3100	Accept Null
ALL	6.144485	9	0.7254	

Dependent variables: ISF

Excluded	Chi-sq	Df	Prob.	Decision
LRGDP	4.110745	3	0.2498	Accept Null
LPHE	2.3663356	3	0.4999	Accept Null
IWS	2.501859	3	0.4750	Accept Null
ALL	14.33080	9	0.1110	

Dependent variables: IWS

Excluded	Chi-sq	Df	Prob.	Decision
LRGDP	0.189956	3	0.9792	Accept Null
LPHE	5.001908	3	0.1717	Accept Null
ISF	2.863577	3	0.4131	Accept Null
ALL	9.897613	3	0.3588	

Source: authors computation using E-views: 10. 2024

Base on the VAR granger causality test result from the table 5, it's revealed that there is unidirectional causality running from per capita health expenditure (LPHE) to economic development as proxy by real gross domestic product (RGDP) also there is unidirectional causality running from improved sanitation facilities (ISF) to economic development and also a unidirectional causality again running from improved water source (IWS) to economic development. This implies that per capita health expenditure (LPHE), improved sanitation facilities (ISF), and improved water source (IWS) granger cause economic development which is proxy as real gross domestic product (RGDP) at 5% level of significant, therefore we reject the null hypothesis that per capita health expenditure (LPHE), improved sanitation facilities (ISF) and improved water source (IWS) does not granger cause economic development. This is in line with a prior expectation of this study also in agreement with the findings of Aluko and Oluseyi (2018) and Narayan et al (2020) whose findings revealed that there is causality from health indicators to economic development.

On the other hand, economic development which is proxy as real gross domestic product (RGDP), does not granger cause per capita health expenditure (LPHE) at 5% level of significant during the period of

@A Publication of the Department of Economics, ADSU, Mubi. ISSN- Print: 2550- 7869; ISSN-Online: 3043-5323. Journal homepage: https://ajaefm.adsu.edu.ng

this study so we accept the null hypothesis that economic development does not granger cause per capita health expenditure (LPHE). This is however contrary to a prior expectation of this study.

In same vain economic development which is proxied by real gross domestic product (RGDP), does not granger cause improved sanitation facilities (ISF) at 5% level of significant during the course of this study so we accept the null hypothesis that economic development does not granger cause improved sanitation facilities (ISF) this is not line with the a prior expectation of this study, these might be because of government underestimation of the contribution these variables can make to economic development therefore her timely contribution to these variables are mostly insignificant.

Conclusion and Recommendations

The causality link running from health-related indicators (per capita health expenditure, improved sanitation facilities and improved water source) to economic development implies that concerted effort has to be made by both the public and a private sector to improve the quality of the health delivery system in Nigeria. Therefore, the study recommends that more funds should be allocated to health sector for it pays back in increase in economic development

The policy implications of the study are that countries that desire a high level of economic development, they can achieve it by improving their health sector for a wide distribution of health knowledge and services. This may include state political support and also the facilitation of public participation in demanding better health. Particularly, in the case of Nigeria, it may be a difficult task to utilize such resources in the face of some practical constraints, such as inappropriate planning, faltering monitoring and skilled manpower, widespread corruption and administrative bottlenecks. In such a situation, inclusion of some potential variables, such as good governance and democracy, may provide insights about the efficacy of such spending on economic development.

REFERENCE

Aluko, O. O., & Oluseyi A. S. (2018). Exploring the effect of health on economic growth in Nigeria: a vector error correction model approach. *International Journal of Economics, Commerce and Management United Kingdom. 3 (9)*

Aranda, P. (2010). The determinant of health and the differences in healthcare expenditures private income and among Countries. *Journal of Health Economics,* 8(5), 103-118.

Badri, A. K., & Badri, S.K. (2016). Health Spending and Economic Growth in Selected OECD Countries. *American Journal of Clinical Neurology and. Neurosurgery* 2 (1): 5-9

Berger, M.C. & Messer, J. (2002). Public financing of health expenditure, insurance and health outcomes. Journal of economics and finance, 3(4), 2105-2113

Bloom, D.E., & Canning, D. (2003). The health and poverty of nations: from theory to practice. *Journal of Human Development*, 4 (1): 47–71.

Bloom, D.E., & Canning D. (2009; 2012): Healthy populations tend to have higher productivity due to their greater physical energy and mental clearness.

@A Publication of the Department of Economics, ADSU, Mubi. ISSN- Print: 2550- 7869; ISSN-Online: 3043-5323. Journal homepage: https://ajaefm.adsu.edu.ng

Bloom, D. E., & Canning, D (2000).” Population aging and Economic Growth:” Retrieved on 20- 2-2017 from: http://www.hsph. harvard edu/pgda/working.htm

Edeme, R.K., &Nkalu, N. (2016). Crowding in and crowding out effects of recurrent and capital expenditure on human capital development in Nigeria. *Asian Policy Review, 4*(3), 65-73. Do:10.184.88/journal.107/2016.4.3/107.3.65.73.

Ilori, I. A., & Ajiboye, M. O. (2019). The impact of health expenditure on the growth of the Nigerian economy: the ARDL approach. *International journal of economics, commerce and management United Kingdom* 3 (12):233-454

Kelvin M. M., Richard S., & Kipruto K. (2022) Assessment of Government Health Expenditure and Economic Growth in Kenya. *Journal of Business, Management and Economic* 3 (2) *2745-7281*

Narayan, S. & Sethi, S. (2020). Health Expenditure and Economic Growth Nexus: Empirical Evidence from South Asian Countries. *Sage Journals*. 5(2) 3-10

Paul A. A., & Akindele J. O. (2019). The impact of human capital development on economic growth in Nigeria: ARDL Approach IOSR *Journal of Humanities and social sciences*.31 (3) 01-07

Stokes, J., Noren, J., & Shindell, S. (1982). Definitions of terms and concepts applicable to clinical preventive medicine. *J. Community Health 33-41*

Wagner, A. (1883). Grundlegung der Politischen Okonomie, 3rd Edition, Leipzig: C. F. Winter.

Olubokun, S., & Bakare, A. (2020). Health Expenditure and Economic growth and the Role of Good Governance. *International Journal of Healthcare, Finance and Economics,* 13(1); 33-52.

World Health Organization (2019). National Health Accounts.

World Health Organisation (1984), Health promotion; a decision document

World Health Organisation (1986), Ottawa charter for Health Promotion