

Public Health Expenditure and Human Capital Development: Implication on Economic Growth in Nigeria

OGUNJOBI Joseph Olufemi (Ph.D)

*Department of Economics
Landmark University, Omu – Aran, Kwara State*

OLALERE Sunday Shina (Ph.D)

*Department of Economics,
Ekiti State University, Ado-Ekiti*

Abstract: The objective of the study is to examine the effects of public health expenditure and human capital development on economic growth in Nigeria between 1981 and 2021. The study employs non-linear equation (VAR). The study incorporates the following variables: Economic growth (proxied by GDP growth rate), growth rate of capital formation, Human capital (proxied by secondary school enrolment), labor force, public health expenditure, life expectancy rate and infant mortality rate. The result of the findings shows that public health spending and secondary school enrolment exhibit both positive and negative impact on economic growth in the short- run, but their impact are said to be insignificant. This might be attributed to inappropriate funding of both health and education sector, misplacement of priority, corruption, money policy formation and some other human factors. The study therefore recommended that governments at all levels should ensure proper funding of both health and education sectors in Nigeria as well as formulating appropriate policies to improve high standard of education and health care services and facilities in Nigeria.

Keywords: Human capital, economic growth, health expenditure, capital formation.

1.1: Introduction

The development economists have stressed much on the importance of human capital to the economic growth (Schultz, 1960), Kuznets (1966) and Figel (1994). These studies revealed that human capital is the most important and a catalyst of growth in productivity and economic growth respectively. Accordingly, technology, ICT and other innovations are the products of human minds, which are the human skills, education and experience. Ejere (2011) confirmed that human factor in the production process and human capital combined knowledge skills or competencies and abilities of the workforce. The two most components of human capital are education and health care services. Every country seeks to increase their productivity through the development of human capital, in order to achieve this, efforts are being made to have efficient and effective health care delivery for workers by the governments. The level of education shows the quality of services and intelligent of workers. At the same vein, the welfare and healthiness of workers also aid their strength and capability to work. A healthy skilled or unskilled labour will put more strength and time to increase their input to the production of goods (MDGs) specifically justify the importance of good health status in its three goals which are related to health care development. Goal number three (3) of the MDGs specifically entrenched good health living and to promote the well-being of the people in each country. The World Health Organization recommended 12% of annual budget of each member country should be allocated to health care delivery. Health is essential for complete mental, physical, emotional and social-wellbeing of individuals. Good health gives pleasure to individual as well as stimulating to work. Investment in health care delivery by governments is a social investment which is not for profit making motive and its expenditure comes from different sources, this include the federal, states, and local governments, private organizations and private sector, individuals, donors or acids and from non-governmental organization (NGOs).

Different authors defined human capital in different perspectives, Harbison (1962), Ejere (2011); OECD (2001), Aderemi (2014) and Odonkor (2017) see human capital as skills, knowledge, competences acquired through education training. These skilled and knowledge are essential for the coordination of natural resources and other factors of production of goods and services. A high level of human capital stimulates innovation and technology as well as helping to solve macroeconomic problems of a nation. The importance of public expenditure on health care delivery was the concerns of Castro-leaf, Dayton and Hehra (2000) Novigon, Olakojo and Novigon (2012) and Grenado, Guspta and Haydenberg (2010). According to their various studies high public expenditure aids the well –being and health care delivery. It also encourages more productivities, reduces mortality and death rates and acts and acts as stimulus to thinking and knowledge .therefore development does healthcare spending affect education of a child? According to Abdulwahab, Kefeli and

Hashin (2018); and Emmanuelle, Maria and Lois (2003), an unhealthy child or scholar would find it inconvenient to comprehend in the classroom or at home. Learning involves mental reasoning, seeing, hearing and feeling, a shortfall in any of these series would affect the welfare or learning of a child or scholar. A strong mind with a high level of healthiness will do well in learning, both in the classrooms or training. Also, it aids thinking, efficiency and effectiveness. In literature, there seems a very strong link between health care delivery and economic growth. For instance, the works of Mehrara and Musai (2011), Oni (2014), Serap (2016), Piabuo and Tieguhong (2017), Tengiz (2019) and Raphupathi and Raphupathi (2020) reveal that there exist a positive relationship between health care expenditure and economic growth. Also through their findings, life expectancy and mortality rates affect the quality of labour force and working age (premature retirement) as well as working period and years.

Furthermore, Olaniyan, Onisanwa and Oyinlola (2013), Eneji, Dickson and Bisong (2013) showed that there is a long-run positive relationship between health care expenditure and the gross domestic product (GDP). In addition, some scholars worked on the relationship among education, health and economic growth. Eggoh, Horreninro and Sosson (2015), Adelorokan (2012) and Lawanson (2015) concluded that there exists a positive relationship among them. According to them, a healthy human being would contribute positively to economic growth.

However in Nigeria, the relationship between health care delivery and human capital have not been totally solved, children are being under-fed, high mortality rate is still high compared with other developed countries, scarcity and poor equipped health institution both medical or staffing in the rural areas, frequent strikes of medical staff for unpaid salaries and allowances and above all, poor budgeting and expenditure on health care sector in the country. These are however affecting the human capital development and cumulatively have negative effects on economic growth and development in developing nations. With the current state of healthcare delivery and the current "Covid 19" insurgent worldwide, especially in Nigeria, this study examines the effect of government spending on public health and human capital development on the economic growth in particular in Nigeria.

1.2.1: Literature Review

Various researchers have worked on the importance of human capital development to economic growth both in developing and developed economies. Ibe and Olulu-Biggs (2015) examined the relationship between health expenditure and economic growth between 1981 and 2013. Secondary data were sourced for and ordinary least square (OLS), multiple regression and Johansen multivariate integration were used to analyze the data. The result of the findings showed that there exists a significant positive relationship between public health expenditures and economic growth in Nigeria.

Contributing to the importance of health expenditure in economic growth in Iran between 1970 and 2007, Moshen and Maysan (2011) used secondary data and Auto-Regressive Distributed Lag (ARDL) approach to analyze the data. The result of the findings showed a significant relationship in all the variables except in economic growth, such variables include the real GDP, education, health expenditure, oil revenue and capital stocks. According to their findings, health expenditure did not make any significant marginal contribution to the growth of Iran's economy. Also, Obamsa, Abubakar and Akanegbu (2013) examined the contributions of health expenditure to economic growth in Nigeria for 25 years (1985-2009). Secondary data were obtained from the central Bank of Nigeria, Office of the Bureau of statistics and other statistical bulletins. The study employed Vector Autoregressive (VAR) and Granger causality to process the data. The result of the findings showed a significant relationship between health care expenditures and some major variables used such as maternal mortality life, expectancy rate and infant mortality rates. Eneji, Dickson and Onabe (2013) focused their attention on the relationship between health expenditure and the level of productivity in Nigeria between 1999 and 2012 using both secondary and primary data. OLS was used to analyze the data. The results of the findings showed a strong link between unemployment, poverty, health status, nutrition and the aggregate productivities in Nigeria. The results showed poor health finding and gross inequality in health care delivery. The study also found out that expenditure on education infrastructure, technology and capital stock affect the level of productivity in Nigeria.

In addition, Oni (2014) used his study to analyze the growth impact of public health expenditure in Nigeria. Secondary data was collected from statistical bulletins on health e.g. Nigeria bureau of statistics. Multiple regression analysis was employed to process the data and the result of their findings showed that health expenditure, gross capital formation and labour productivity are essential economic growth determinant. It also shown that life expectancy had a negative impact on economic growth. Fuhmei (2015) wrote on increased health expenditure and its effects on better economic performances using OECD countries as case study between 1990 and 2009. The study employed system generalized method of moments (GMM) to process the collected data. The result of the findings showed that increased health expenditure leads to an increase economic performance.

The findings also revealed that health expenditure in OECD countries was 5.48% of the GDP while the economic growth was 1.87%.

Piabuo and Tieguhong (2017), in the contribution of their study to the existing body of literature on the impact of public health expenditure on economic growth in Central African States (CEMAC), select some African countries. Secondary data from World Development Indicators were used while panel OLS fully modified OLS (FMOLS) and Dynamic OLS (DOLS) were employed to process the data and the analysis. The results of the finding indicate that health expenditure has a positive and significant impact on economic growth in the CEMAC Bloc. It also revealed that a long-run relationship exist between health expenditure and economic growth. Udeorah, Obayori and Onuchuckwu (2018) examined the contributions of health expenditure to economic growth for thirty-six years (1980-2016). Data was sourced from the Central Bank of Nigeria statistical bullet. The study used both descriptive and generalized method of moment (GMM) test as the technique to estimation. The result of findings showed that health care expenditure had no significant impact on economic growth while education expenditure had positive and significant impact on economic growth at the same period of study.

Tengiz (2019) examined the role of health care expenditure in economic growth of Georgia between 1990 and 2015. The secondary data were obtained from the statistical institutions in Georgia. Tables and percentages were used to analyze the data. The study was descriptive in nature, the study revealed that maternal and children's mortality rate had reduced while healthcare expenses have increased without much increase in government expenditure on the sector. According to the study, patients were less motivated to attend public primary healthcare for treatment hence they treated themselves when they critically ill. His findings showed that primary health care services have not been developed in Georgia due to poor funding. Fashina, Asalaeye, Ogunjobi and Lawal (2018) worked on the role of Foreign Aid and human capital on economic growth in Nigeria. Secondary data was employed which OLS and Vector Error Correction Model (VECM) were adopted with Augmented Dickey Fuller and Phillip Peron Unit root tests. The study revealed that growth in education expenditure, economic growth and health expenditure were unidirectional.

Olanrewaju, Idowu and Abimbola (2013) examined the long-run relationship between health care expenditure and gross domestic product (GDP) in thirty two sub-Sahara African countries between 1995 and 2009. Panel data collected from these countries were used while regression analysis was also applied to process the data. The result of the findings showed that there exist a long-run relationship between income and the GDP in the countries under examination. Furthermore, Eggoh, Honeninro and Sosson (2015) studied the relationship between education, health and economic, growth in forty nine African countries between 1996 and 2010, using panel data to find out the long and short run effects of human capital indicators on economic growth. Traditional cross section and dynamic techniques were used to process the data. The result of the findings revealed that public expenditure on health and education have negative impact on the economic growth in the short-run, while human capital stock indicators have positive effect. In addition to the literature, a study on the relevant of education and health care components of human capital development was carried out by Lawanson (2015). The study focused on sixteen West African countries between 1980 and 2013 using secondary data. Panel data with regression analysis were employed to process the data. The result of the findings showed that both education and health components of human capital significantly influences economic growth in West African region.

The work of Akinola and Bokana (2017) examined the relationship among human capital, enrolment in higher educational institutions and economic growth in sub-Sahara Africa. Panel data from twenty countries in the four blocs comprises the SSA were used. Also five variables – human capital formation, employment rate, education enrolment, capital stock and total factor productivity were used. Panel model and panel analysis were employed to process the data. The result revealed that human capital and higher education enrolment contributed significantly to the gross domestic product in Southern Africa bloc. Generally, the study revealed that enrolment in higher educational institutions have a weak relationship with economic growth in SSA. In their own submission, Ogunleye, Owolabi, Sanyaolu and Lawal (2017) made use of the annual time series data to investigate the effect of human capital development on economic growth of Nigeria. The study employed ordinary least square regression to process the data. The result of their findings showed that school enrolment (secondary and tertiary institutions), government expenditure on health and education have a significant positive effect on economic growth in Nigeria while life expectancy and primary school enrolment exhibited a negative and insignificant value on economic growth.

In their contribution to literature, Fadila and Olure-Bank (2019) examined the contributions of human capital development on economic growth of ECOWAS member states between 1980 and 2016. Time series data for 37years were used while Pedroni residual co-integration approach was employed to test for the long-run relationship among the variables used. The result of their findings showed a positive relationship exist between the gross domestic product and government spending on education, health and school enrolment in the regional

bloc. This also shows that human capital development has a significant positive impact on the economic growth of Ecowas. Uzodigwe, Umeghalu and Ozoh (2019) investigated the contributions of human capital to the economic growth of Nigeria between 1980 and 2015. The study used time series data and OLS technique to process the collected data. The result revealed a positive significant relationship between government spending on education, government expenditure on health, labour and economic growth. It also explained a negative relationship between student enrolment in all higher educational institutions and economic growth in Nigeria.

Based on the empirical review of the literature above and lots outside this review, it is observed that studies have been carried out on the relationship between public health expenditure and economic growth, government spending and economic growth and human capital development and economic growth, none had been carried out as we are having in this study with the three variables altogether – public healthcare, human capital development and economic growth in Nigeria. Therefore, the objective of this study is to examine the implication of public healthcare and human capital development on economic growth of Nigeria.

1.2.2: Theoretical Framework

The main objective of the study is to examine the effects of public health expenditure and human capital development on economic growth in Nigeria. Various models have been developed to incorporate the importance of human capital to economic growth and development; these include the works of Solow (1956); Romer (1986) and Barro (1991). Also, the augmented Solow model emphasized the importance of human capital to growth. The theory of how public health investment affects both the economic growth and development is entrenched in the endogenous growth models. The endogenous model based their argument on the ability of human capital to influence growth either in the long or short-run (Piabu and Tieguhong 2017). The theoretical framework for this work therefore based on augmented Solow model. This is because it relates to the functional relationship between economic growth and health care development, which is one of the major components of human capital.

The objective of this study therefore is to examine the effects of public health expenditure and human capital development on economic growth in Nigeria

1.3: Methodology

Based on the above theoretical frameworks and empirical review of literatures and lots outside this review, it is observed that many studies have been carried out on the impact of public health expenditure and economic growth, and human capital development and economic growth. None of these studies has combined the three vital variables together i.e public health expenditure, human capital development and economic growth in Nigeria.

This study employs non-linear equation (VAR) to examine the effect of public Health Expenditure and Human Capital Development on Economic Growth in Nigeria. The study incorporates the following variables: Economic Growth (proxied by GDP growth rate), Growth Rate of Capital Formation (GRFC), Human Capital (proxied by SSE), Labour force (LAB), Public Health Expenditure (PHE), Life Expectancy Rate (LER) and Infant Mortality Rate (IMR).

The data between 1981 and 2021 for the above stated variables are sourced from World Development Indicators (WDI) (2020) and from the African Development Bank (AfDB) statistical yearbooks (various issues) of the World Bank. The measurements of the variables are in value and percentages. Variables like GGDP, GRFC and PHE are in Nigerian currency (#), LAB and LER are in percentages while IMR is on rates, only SSE are in real numerical value.

Based on the above analysis, the general model can be written as:

GRGDP is function of Gross fixed capital (GRFC), health expenditure (PHE), Secondary school enrolment (SSE) Life expectancy rate (LER) and Infant Mortality Rate (IMR).

$$GGDP = f(GRFC, PHE, IMR, LER, SSE) \quad \dots 1$$

To achieve objectives of this study which to examine the effect of public health expenditure and human capital development on economic growth in Nigeria, the following equations are used.

$$\Delta GGDP = \sum_{k=1}^P \beta_k GGDP_{t-k} + \sum_{k=1}^P \alpha_k GRFC + \sum_{k=1}^P \delta_k GHE + \sum_{k=1}^P \phi_k IMR + \sum_{k=1}^P \lambda_k LER + \sum_{k=1}^P \sigma_k SSE + \varepsilon \quad \dots 2$$

$$\Delta GRFC = \sum_{k=1}^P \beta_k GRFC_{t-k} + \sum_{k=1}^P \alpha_k GGDP + \sum_{k=1}^P \delta_k PHE + \sum_{k=1}^P \phi_k IMR + \sum_{k=1}^P \lambda_k LER + \sum_{k=1}^P \sigma_k SSE + \varepsilon \quad \dots 3$$

$$\Delta PHE = \sum_{k=1}^P \beta_k PHE_{t-k} + \sum_{k=1}^P \alpha_k GRCF + \sum_{k=1}^P \delta_k GGDP + \sum_{k=1}^P \phi_k IMR + \sum_{k=1}^P \lambda_k LER + \sum_{k=1}^P \sigma_k SSE + \varepsilon \dots 4$$

$$\Delta IMR = \sum_{k=1}^P \beta_k IMR_{t-k} + \sum_{k=1}^P \alpha_k GRCF + \sum_{k=1}^P \delta_k PHE + \sum_{k=1}^P \phi_k GGDP + \sum_{k=1}^P \lambda_k LER + \sum_{k=1}^P \sigma_k SSE + \varepsilon \dots 5$$

$$\Delta LER = \sum_{k=1}^P \beta_k LER_{t-k} + \sum_{k=1}^P \alpha_k GRCF + \sum_{k=1}^P \delta_k PHE + \sum_{k=1}^P \phi_k IMR + \sum_{k=1}^P \lambda_k GGDP + \sum_{k=1}^P \sigma_k SSE + \varepsilon \dots 6$$

$$\Delta SSE = \sum_{k=1}^P \beta_k SSE_{t-k} + \sum_{k=1}^P \alpha_k GRCF + \sum_{k=1}^P \delta_k PHE + \sum_{k=1}^P \phi_k IMR + \sum_{k=1}^P \lambda_k LER + \sum_{k=1}^P \sigma_k GGDP + \varepsilon \dots 7$$

To achieve the objective two: To investigate the effect of human capital development and economic growth, the following equation is used.

$\beta_k, \alpha_k, \delta_k, \phi_k, \lambda_k$ and σ_k are the coefficients of the estimated variables.

1.4: Estimation Techniques

The estimation techniques employ is Vector Autoregressive Model (VAR). This technique is employed to determine the short-run effect of Public Health Expenditure and Human Capital development on economic growth in Nigeria. Unit root test is carried out to determine the time series characteristics of the variables in the model.

1.5: Results and Discussion of Findings

1.5.1: Descriptive Statistics

The table 1.1 below shows the descriptive characteristics of variables

Table 1.1: Descriptive Statistics of Variables

Variables	Observations	Mean	Std. Dev.	Minimum	Maximum
GGDP	39	0.5208	5.3249	-15.4504	12.4575
GRCF	39	35.9434	19.3905	14.1687	89.3861
PHE	39	72.0039	94.4626	0.0400	257.7200
IMR	39	104.3815	22.9739	60.6620	128.7340
LER	39	48.2771	3.0250	45.6370	54.6870
SSE	39	15.5446	0.5155	14.7212	16.4923

Source: Author's Computation, 2022

In the Table 1.1, the results of the estimated mean value which show the distribution of data, indicates that IMR recorded the highest mean value of 104.38, followed by 72.00 for PHE, while LER, GRCF, SSE and GGDP have the mean value of 48.28, 35.94, 15.55 and 0.52 respectively. Standard deviation which measures the variability is all positive. Variable like PHE (94.46) has highest standard deviation which indicates highest variability, while other variables like IMR (22.97), GRCF (19.39), GGDP (5.33), LER (3.03) and SSE (0.52) have low standard deviations with low variability when compare to PHE.

1.5.2: Unit Root Test

The methods of unit root test adopted for this study is Phillips-Perron. This test has been proved to be suitable in verifying stationarity of variables (Maddala & Wu, (1999). The results are presented in Table 1.2.

Table 1.2: Unit Root Test

Variables	LEVEL		FIRST DIFFERENCE		SECOND DIFFERENCE		
	Phillips-Perron t-stat.	Prob	Phillips-Perron t-stat.	Prob	Phillips-Perron t-stat.	Prob	
GGDP	-4.2024	0.0021	-----	-----	-----	-----	I (0)
GRCF	-3.5398	0.0121	-4.4156	0.0012	-----	-----	I (1)
PHE	0.4080	0.9807	-9.1070	0.000	-----	-----	I (1)
SSE	-0.2126	0.9282	-5.1970	0.0001	-----	-----	I (1)
IMR	2.2414	0.9999	-1.2244	0.6535	-5.4473	0.0001	I (2)
LER	2.3928	0.9999	-0.9722	0.7530	-4.8062	0.0012	I (2)

Source: Author's Computation, 2022

The results of unit root test on table 1.2 examine the statistical prosperities of all the variables using Phillips-Perron unit root model. The results of Phillips-Perron unit root test indicate that, the variables are not found to be stationary at the same order. For instance, GRCF, PHE and SSE are said to be stationary at first difference while IMR and LER are stationary at second difference. However, only GGDP is said to be stationary at level.

1.5.3: Analysis of Impulse Response Results

From the results of unit test, there is an indication that long-run analysis will not work for this study. Therefore, the study employs Vector Autoregressive (VAR) Model which is short-run analysis to investigate the impact of public health expenditure and human capital development on economic growth in Nigeria. Therefore, below are the analyses of impulse response results.

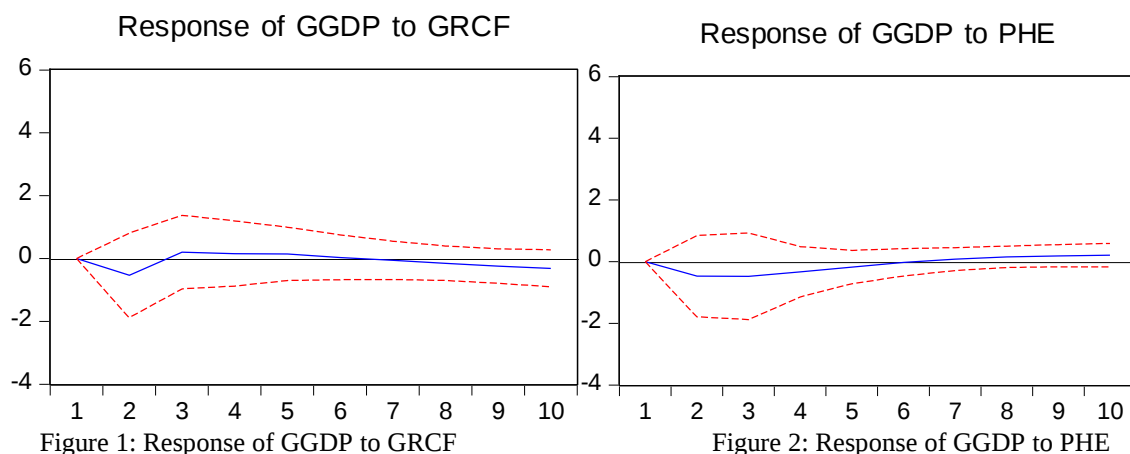


Figure 1 above displays the impulse response of GGDP to a standard deviation shock from GRCF. From the result, it is revealed that a standard deviation shock from GRCF exerts negative but non-significant impact on the GGDP. This negative impact is from the 1st to the 3rd period under review. However, this Impact became positive from 3rd period to the 7th period when the impact becomes negative again, where it was gradually sinking more into negative. Throughout this period, this impact remained insignificant on the part of GGDP in the short-run. Also the Figure 2 above shows the impulse response of GGDP to a standard deviation shock from PHE. The Figure indicates that, a standard deviation shock from GRCF impacts negatively on the GGDP. However, this impact is said to be insignificant in the short-run. The effect of this negative impact begins from the 1st period and it continues up till 6th period after which the impact starts declining towards the equilibrium line and it becomes positive but insignificant throughout the remaining periods.

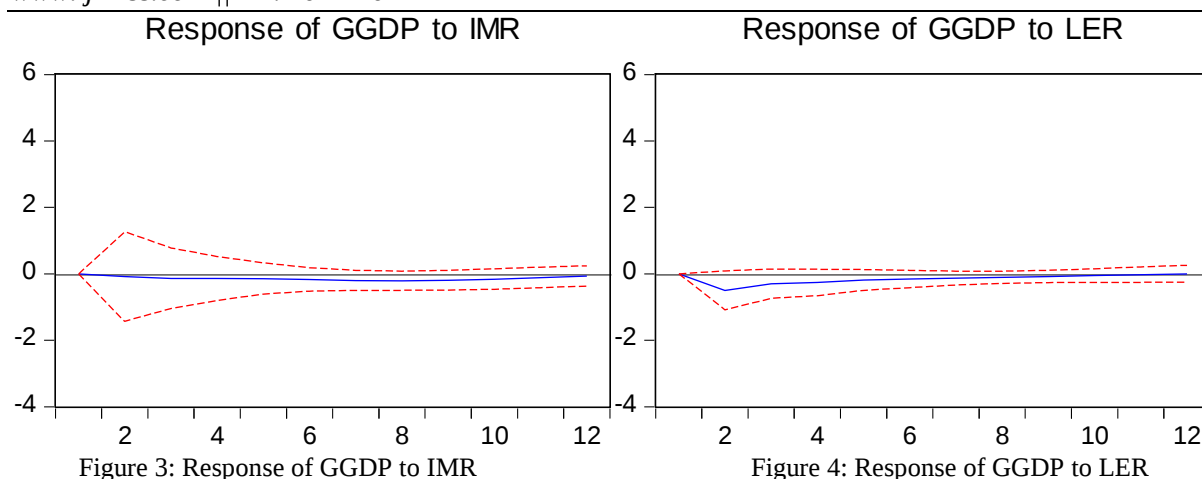
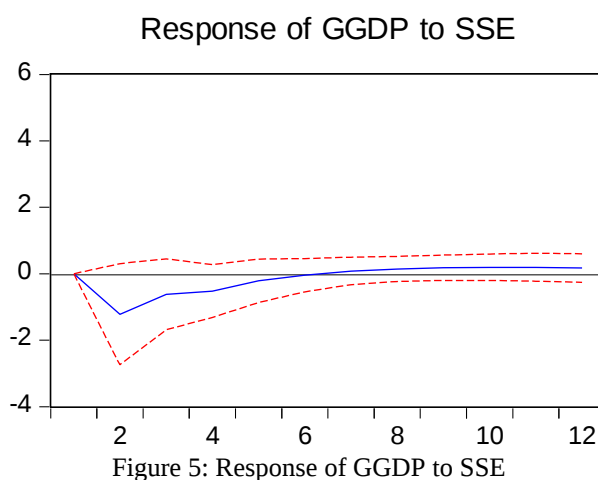


Figure 3 and 4 above demonstrate the impulse response of GGDP to a standard deviation shock from IMR and LER respectively. The Figures explain that, a standard deviation shock from IMR and LER to GGDP indicate that, these variables have negative but insignificant impact on the GGDP in the short-run throughout the period. While the impact of shock from LER to GGDP is reducing as the effect line moves towards the equilibrium line, the response of GGDP to shock from IMR is relatively stable as it maintains a straight line with slight deviation all through the period.



From Figure 5 above the result of impulse response of GGDP to a standard deviation shock from SSE shows that a standard deviation shock from GGDP exerts negative and significant impact on the SSE. The negative and significant impact is robustly pronounced from the 1st period up till the 3rd period from where it starts to decrease towards equilibrium as time increases. But this impact becomes positive right from the 6th period and this trend continue throughout the period. However, this positive impact is said to be insignificant in the short-run.

1.5.4: Variance Decomposition of Variables

The results of variance decomposition are explained below.

Table 1.3: Variance Decomposition of GGDP with respect to GRCF, PHE, IMR LER and SSE

Variance Decomposition of GGDP: Period	S.E.	GGDP	GRCF	PHE	IMR	LER	SSE
1	3.516611	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	3.824437	85.02240	1.970230	1.114630	0.046727	1.698844	10.14717
3	3.918253	81.09383	2.150079	2.213062	0.165146	2.204771	12.17311
4	3.981782	78.82238	2.235484	2.586673	0.283122	2.567599	13.50475
5	4.003295	78.20525	2.344259	2.637920	0.412995	2.757097	13.64248
6	4.020827	78.01863	2.330550	2.640018	0.589255	2.884498	13.53705
7	4.046922	77.67360	2.322538	2.818971	0.832849	2.950882	13.40116
8	4.084539	77.07397	2.424574	3.171286	1.086593	2.966112	13.27747
9	4.129013	76.27418	2.719033	3.599498	1.286734	2.940794	13.17976
10	4.174591	75.36075	3.225773	4.007636	1.404528	2.892308	13.10900
11	4.216007	74.43349	3.885103	4.334481	1.449974	2.838980	13.05797
12	4.249381	73.59963	4.586576	4.552042	1.451081	2.794562	13.01611

Source: Author's Computation, 2022

Table 1.3 above shows the variance decomposition of GGDP with respect to some selected variables. Findings from the results confirm that the shock from GRCF, PHE, IMR, LER and SSE explains about 2.15%, 2.21%, 0.17% and 2.21% variation in GGDP during the 3rd quarter respectively. But their proportionate explanation powers increase it to about 4.59%, 4.55%, 1.45%, 2.80% and 12.17% respectively in the 12th quarter.

1.5.5: Discussion of Findings

Based on the objective of this study which to examine the impact of public health expenditure and human capital development on economic growth in Nigeria. The study first carryout descriptive statistics of the variables, where the study notice that IMR recorded the highest mean value of 104.38, followed by 72.00 for PHE, while LER, GRCF, SSE and GGDP have the mean value of 48.28, 35.94, 15.55 and 0.52 respectively. Standard deviation which measures the variability is all positive. Variable like PHE (94.46) has highest standard deviation which indicates highest variability, while other variables like IMR (22.97), GRCF (19.39), GGDP (5.33), LER (3.03) and SSE (0.52) have low standard deviations with low variability when compare to PHE. After this, the stationarity test is conducted in order to avoid spurious regression. Phillips-Perron unit root test is adopted and the results reveal that all the series are not integrated of the same order. While GRCF, PHE and SSE are said to be stationary at first difference, IMR and LER are found to be stationary at second difference. But only GGDP attains its own stationarity at level. The outcomes of unit root test results show that, the condition for long-run estimation technique (co-integration) *has not been met. Therefore, the study adopts short-run estimation technique (Vector Autoregressive Model (VAR))* to examine the effect of public health expenditure and human capital development on economic growth in Nigeria.

The Impulse response from both Public Health Expenditure (PHE) and Secondary School Enrolment (SSE) show that, economic growth responses both positively and negatively to the shock in PHE and SSE in the short-run. Bit this impact is insignificant on the part of economic growth in Nigeria in the short-run. This finding is supported by Olaniyan, Onisawa and Oyinlola (2013); Piabuo and Tiegubong (2017), Tengiz (2019) who submitted that public health expenditure has positive impact on economic growth in Nigeria, Central African and USA respectively while Eggoh, Honeninro and Sosson (2015) was of the opinion that, public health expenditure has negative impact on economic growth. The negative aspect of the impact might as a result of inappropriate funding of both health and education sectors, misplacement of priority, corruption, wrong policy formulation and some other human factors.

The results of variance decomposition which suggest the degree of response of GGDP to changes in the some selected variables. Findings show that, the results variance decomposition confirm that the shock from GRCF, PHE, IMR, LER and SSE explains about 2.15%, 2.21%, 0.17% and 2.21% variation in GGDP during the 3rd quarter respectively. But their proportionate explanation powers increase it to about 4.59%, 4.55%, 1.45%, 2.80% and 12.17% respectively in the 12th quarter.

1.6 Conclusion

Following the results and findings of this study, the following conclusions are made: PHE and SSE are said to exhibit both positive and negative impact on economic growth in Nigeria in the short-run. However, these impacts are said to be insignificant. This might be attributed to inappropriate funding of both health and education sectors, misplacement of priority, corruption, wrong policy formulation and some other human factors.

1.7 Policy Recommendations

In view of all the aforementioned findings in this research work, the following recommendations are therefore put forward:

- i. Government at all levels should ensure proper fund of both health and education sectors in Nigeria.
- ii. Policy maker should formulate appropriate policies to proper and high standard education and improve health care service and facilities in Nigeria.
- iii. Government must be honest and show some level of seriousness in its fight against corruption in Nigeria.

References

- [1]. Abdul Wahab A.O, Kefeli Zurina and Hashim Nurhazirah (2018) Investigating the dynamic effect of health care expenditure and education expenditure on economic growth in Organization of Islamic Countries (OIC) MPRA Paper No 90338.
- [2]. Adelowokan O.A (2012). Growth effect of education and health expenditure in Nigeria. *Africa Journal of Scientific Research* Vol. 10, No1
- [3]. Aderemi T.A (2014). Does human capital investment matter in economic development? Evidence from a Nigeria Micro-Data. *International Journal of Economics Practice and Theories*. Vol.4 No 1, pp 58-66
- [4]. Akinola G. W and Bokama R. G (2017) Human capital, higher education enrolment and economic growth in the Sub-Sahara Africa countries. *Journal of Economics and Behavioural Studies*. Vol.9, No. 6 pp 215-226
- [5]. Castro-Leaf D.J, Demery I. and Mehra K. (2010). Public spending on healthcare in Africa: Do the poor benefit? *Bulletin of the World Health Organization*. No 78 pp 66-74.
- [6]. Diabulo Madiefe Tieguhing Julius Chipezi (2017) Health expenditure and economic growth a review of the literature and an analysis between the economic community for Central African State (CEMAC) and selected African countries. *Health Economics Review*. Vol 7 (23)
- [7]. Eggoh J, Houeninvo H; and Sossou G.A (2015) Education, health and economic growth in African countries. *Journal of Economics Development*. Vol 40, No 1
- [8]. Emmanuelle B, Maria T.G and Luiz D.M (2003). More on effectiveness of public spending on healthcare and education: A Covariance Structure Model. *Journal of International Development*. Vol. 15 pp 709-725
- [9]. Eggoh Jude, Houeninro Hilaire and Sossou Gilles-Armand (2015) Relationship between Human Capital and economic growth. *Journal of Economic Development* Vol. 40, pp 40-111
- [10]. Ejere E.S.I (2011) Human capital formation as catalyst for national development: Nigeria in Perspective. *Canada International Business and Management* Vol. 2, No 2
- [11]. Eneji M.A, Dickson V.J and Bisong J.O (2013) Healthcare expenditure, health status and national productivity in Nigeria. *Journal of Economics and Finance*. Vol. 5(7) pp 258-272
- [12]. Fadila K. Usman and Olure-Bank Adeyinka (2019) Effect of human capital development on economic growth in Ecwas member state. *Advances I Sciences and Humanities*. Vol. 5 No 1 pp 27-42
- [13]. Fashina O.A, Asaleye J.A, Ogunjobi J.O and Lawal L. I. (2018) Foreign aid, human capital and economic growth nexus: Evidence from Nigeria: *Journal of International Studies*. Vol. 10(1) pp 1-8
- [14]. Forgel R.W (1994) Economic growth, population theory and physiology: The bearing of long-term process on the making of economic policy. *The American Economic Review*. Vol. 84, No 3, pp 369-395
- [15]. Fuhmei Wang (2015) More health expenditure, better economic performance? Empirical evidence from OELD countries. *The Journal of Healthcare Organization Provision and Finance*. Vol. 1, pp 1-5.
- [15]. Grenade J, Guspta and Hajdenberg (2010). Is social spending procyclical? IMF working paper WP/10/234. Pp 1-23 New York
- [16]. Harbinson F.H (1962). Human resources development planning in modernizing economics: *International Labour Review*. Pp 453-458.
- [17]. Ibe Reginald and Olulu-Briggs, Omiete Victor (2015). Any nexus between public health expenditure and economic in Nigeria? *Hard International Journal of Banking and Finance Research*. Vol 1. pp 1-12
- [18]. Kuznets S. (1966) *Modern economic growth: Rate, structure and spread*. Yale University Press. New Haven. Chapter 2 and 4

- [19]. Lawanson A.O (2015). Economic growth experience of West Africa region: Does human capital matter? *International Journal of Business and Social Sciences*. Vol.6 no 12.
- [20]. Moheesen Mehrara and Maysam Musai. (2012) Health expenditure and economic growth: An ARDL approach. *Journal of Economics and Behavioral Studies* Vol 3, No 4. pp 249-256
- [21]. Novigon J, Olakojo and Novigon Justice (2012) The effect of public and private healthcare expenditure on health status in Sub-Saharan Africa: New evidence from panel data analysis. *Health Economic Review*. Vol 2 (22).
- [22]. Obansa, S.A.J, Abubakar Idris and Akaregbu Benedict H. (2013) Impact of health expenditure growth in Nigeria. *European Journal of Management Sciences*. Vol. 1 No 2. pp 7-15
- [23]. OECD (2001) Organization for Economic Cooperation and Development. The role of human capital and social capital. Center for Educational Research and Innovative. France
- [24]. Odonkor A.A (2017). The impact of human capital on economic growth in Ghana. Published Master's Degree Thesis- KNUST School of Business.
- [25]. Oni, Lawrence Babatunde (2014). Analysis of the growth impact of health expenditure In Nigeria. *Journal of Economics and Finance*, Vol 3, Issue 1, pp 77-84
- [26]. Raghupathi V. and Raghupathi (2020). Health care expenditure and economic performance: Insight from the United States. *Data from Public Health*. Vol 8 (156)
- [27]. Schultz (1961). Investment in human capital. *The American Economic Review*. Vol 51. pp 1-17
- [28]. Serap Bedir (2016). Health care expenditure and economic growth in developing countries. *Advances in Economics and Business* Vol 4(2) pp 76-86
- [29]. Tengiz Verulara (2019) health capital, primary healthcare and economic growth. *Eastern Journal of Medicine* Vol. 24(1) pp 57-62
- [30]. Udeorah, S.A.F, Obayori J. Onuchukwu Obey (2018) Health care expenditure and economic growth in Nigeria. *International Journal of Research and Innovation in Social Sciences*. Vol 11, Issue 111, pp 33-36
- [31]. Uzodigwa A. Ajana; Umeghalu C. Chidubem; and OzohJ.Nwamaka (2019). Human capital development and economic growth in Nigeria. *International Journal of Economics, Commerce and Management*. Vol. viii, Issue 1 pp 359-377