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ASSESSMENT OF THE IMPACT OF HEALTH CARE INVESTMENT ON ECONOMIC GROWTH IN NIGERIA

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Abstract

This paper examined the impact of public health investment on economic growth in Nigeria spinning from 1981 – 2020. Gross Domestic Product (GDP) was proxied to economic growth as the dependent variable while recurrent health investment (RHI), capital health investment (CHI), domestic health spending (DHS) and external health investment (EHI) were used to represent the health investment parameters as the independent variables. This paper applied Augmented Dickey Fuller (ADF) and Philips-Perron (PP) tests for unit root which indicated that all the variables were stationary at first difference except gross fixed capital formation at level. While, Autoregressive Distributive Lagged (ARDL) model was employed for examining the impacts of the independent variables on the dependent variable. From the results of the analysis so far, this paper concludes that, Recurrent health investment, Capital health investment, Domestic health spending and External health investment have positive impacts on economic growth in Nigeria during the period understudy. It is therefore recommends that: Monetary authority should maintain and sustain a deliberate fiscal and monetary policy measures that could encourage external health financing by external donors agencies to the health sector for promoting and sustaining economic growth in Nigeria; Government should increase its health investment that would provide more health infrastructure in health facilities and diseases control through increase in domestic health financing in the health sector as the effects shall be transferred to the economic growth. In addition, Government should continue to provide policy that would ensure macroeconomic stability especially foreign exchange rate and interest rate stability that would encourage increase investment in human capital by individuals and the private sector in Nigeria.

Keywords: Assessment, Impact, Health Care Investment, Economic Growth, Nigeria.

INTRODUCTION

Nigeria as a developing country needs adequate investment in human capital development especially in the health sector which is threatened with a lots of challenges that lead to lower ranking of the country in term of health indicators in the world (WHO, 2019). The justification towards investing in health sector is obvious in the face of poor health status of human

resources in the country. The need for adequate and sustainable investment in health of any economy should be high as such developing economies which are aspiring foe economic growth should allocate more funds on health sector to reveal its potentials for economic transformation. Advanced economies like United States of America (USA), Germany, Russia, Japan, China and Norway budget huge amount of their national income on health sector hence the economies experienced high standard of living and improved health status among the world economies (UNDP, 2017).

Economic growth encompasses the process of improving the quality of all human lives and capabilities by raising people's levels of living, self-esteem, and freedom. This means the efficient allocation of existing scarce productive resources and with their sustained growth over time, it must also deal with the economic, social, political, and institutional mechanisms, both public and private, necessary to bring about rapid and large-scale improvements in levels of living for the peoples in the country (Toddaro& Smith, 2021).

Economic growth is concerned with the economic, cultural, and political requirements for effecting rapid structural and institutional transformations of entire societies in a manner that will most efficiently bring the fruits of economic progress to the broadest segments of the populations. It must focus on the mechanisms that keep families, regions, and even entire nations in poverty traps, in which past poverty causes future poverty, and on the most effective strategies for breaking out of these traps. Government plays a crucial role and some degree of coordinated economic decision making directed toward transforming the economy are usually viewed as essential components of economic growth.

Health investment in this context refers to public and private expenditure to improve health outcomes of a nation. Investment in health and its outcomes in Nigeria would enhance and spur economic growth and development as noticed by World bank (2018) declaring **that Nigeria spends less than one per cent of its Gross Domestic Product on health, imploring the government to spend more on its people, invest more in HCD than covet vacuous economic growth statistics reporting for the economy.**

Economic indicators showed that as at 2013, total health expenditure as a proportion of GDP was 3.7%, and out-of-pocket payments represented over two thirds of health expenditure. The World Health Organization (WHO, 2017) reported that a physician per 1000 population of 0.4 and nurse per 1000 population of 1.6, with gross inequity in rural–urban distribution in terms of both number and skills range. In addition, the major problem to the plan implementation was inadequate absorption capacity due to shortage of skilled manpower, serious neglect of government in funding of education and health sectors, political instability which cause frequent changes in education and health policies, low measure of budgetary allocation to human capital development and its relative indices and low quality of education and health services which is needed for human capital development have been resulted to high rate of unemployment of 23 % , poverty index of 87% and 91 % in 2018 and 2019 respectively with high level of insecurity in Nigerian economy (World Bank, 2019).

Nigeria as a nation, its health expenditure is relatively low compared to other African countries. The Total Health Expenditure (THE) as percentage of the Gross Domestic Product (GDP) from 1998 to 2021 was less than 5%, falling behind THE/GDP ratio in other developing

countries such as Kenya (5.3%), Zambia (6.2%), Tanzania (6.8%), Malawi (7.2%), and South Africa (7.5%).

Achieving a successful health care financing system continues to be a challenge in Nigeria. Limited institutional capacity, corruption, unstable economic, and political context have been identified as factors why some mechanisms of financing health care have not worked effectively.

The problems of poor budgetary allocations to health sector, inadequate manpower in the federal, state ministry of health and health departments in all 774 local government areas of the federation over the years (Federal Ministry of Health, Nigeria, 2019), high mortality rate, and low life expectancy rate. The worst of it all, the insufficient budgetary allocation to education sector which have affected the attitude of citizens to manage common illness (malaria, cholera, typhoid fever, measles, and sexual transmitted diseases) in order to enhance their health status for high productivity in Nigerian economy remain unachievable.

Research Questions

From the statement of problem above, this paper put forward the following questions that guided it for the achievement of its specific objectives as:

i. To what extent has recurrent health investment influenced economic development in Nigeria?
ii. To what extent has capital health investment influenced economic growth in Nigeria?
iii. What is the impact of domestic health spending on economic growth in Nigeria?
iv. What is the impact of external health investment on economic growth in Nigeria?

Objectives of the Study

The main objective of this study is to examine the impact of health investment on economic growth in Nigeria. The specific objectives sought to:

i. Examine the impact of recurrent health investment on economic growth in Nigeria;
ii. Evaluate the impact of capital health investment on economic growth in Nigeria;
iii. Assess the influence of domestic health spending on economic growth in Nigeria;
iv. Investigate the influence of external health investment on economic growth in Nigeria.

LITERATURE REVIEW

Health Investment

World Health Organization (WHO, 2018) defined health as a state of complete physical, mental, and social wellbeing, and not merely the absence of disease or infirmity. Health is a dynamic condition resulting from a body's constant adjustment and adaptation in response to stresses and changes in the environment for maintaining an inner equilibrium called homeostasis. Investment in this context refers to public and private expenditure to improve health outcomes of a nation; while public expenditure is the main concern of this work. It is known as government consumption, investment, and transfer payment in national income accounting (World Bank Development Indicator, 2019). Furthermore, the acquisition by governments of goods and services for current use that directly satisfy the individual or collective needs of the country are important for economic development (World Bank, 2018).

Public health expenditure according to WHO (2018) consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds. Total health expenditure is the sum of public and private health expenditure. It made up of federal, state and local government areas budgetary allocations for the health sector. It covers the provision of health services (preventive and curative), family planning activities, nutrition activities, and emergency aid designated for health but does not include provision of water and sanitation. Health expenditure, total (% of GDP) in Nigeria was 3.67% as of 2014. Its highest value over the past 19 years was 4.47% in 2007, while its lowest value was 2.43% in 2002 in the economy (Central Bank of Nigeria, 2017). There is growing concern about the economic impact of health care expenditure on households who face illness, particularly in areas where pre-payment mechanisms do not exist and households have to make out of pocket expenditures to use health services. In Nigeria, private expenditure accounts for almost 70% of total expenditure on health of which 90% is out-of-pocket. This high level of out-of-pocket expenditure implies that health care can place a significant financial burden on households in Nigeria (Ayuba, 2018). It is expected that Nigeria government in all tiers should priority to health financing in order to provide quality health services to all her citizens for economic prosperity in this nation.

Reasons for health investment in Nigeria

Nigerian economy required huge investment in human capital development especially health sector which is confronted with a lots of challenges that lead to lower ranking of the country in term of health indicators (WHO, 2019). The rationale to invest in health sector are glaring in the face of poor health status of human resources in the country. In fact, in the word of Lucas (1988)cited by the World Health Organization (WHO, 2019), human capital development is engine of economic development through improvement in education and health status of labour. It means increase in marginal product of labour in terms of economic production and distribution in the society.

Furthermore, the rationale for health investment would be to enhance economic growth and development as outline in Nigerian National Strategic policy (National Human Resources for Health Strategic Plan, 2017) which include:

i. Ensuring equitable distribution of human resources for health care delivery between urban and rural areas including difficult terrains such as mountainous, riverine, and hard-to-reach areas in the country and provide universal health services for all;
ii. Promoting collaboration among human resource managers at the tertiary, secondary, and primary levels, and with private health institutions including compliance with approved guidelines on health human resources;
iii. Ensuring the right quantity and quality of staff at all levels in line with health sector development plans, and creating conducive atmosphere that encourages health workers to serve anywhere in Nigeria, and to contain brain drain;
iv. Pursuing the training of specialized manpower in areas of national priority, and bonding of government-sponsored beneficiaries in line with the appropriate policies;

v. Ensuring that professionally-trained health human resources managers are responsible for human resources for health development units, and all staff continuously trained in health human resources management;
vi. HRH recruiting agencies from other countries shall register with the FMOH and operate within the provision of memoranda of understanding with the Federal Ministry of Health and regulatory bodies; and
vii. Deliberate efforts on the part of the Ministries of Health to offer additional incentives to encourage skilled Nigerians working abroad to return and provide health services for the citizens.

Health Investment in Nigeria

The total GDP of Nigeria was estimated at $448 billion in 2019. Five sectors are the major contributors to the per capita total health expenditure was $72·7 and the proportion of total health expenditure relative to GDP was 3·6% in 2018.

Moreover, most of this expenditure was private with public spending as a percentage of total health expenditure constituting only 16·3%, whereas private spending as a percentage of total health expenditure was 76·6% and out-of-pocket spending as a percentage of total health expenditure was 74·9%. External resources as a percentage of total health expenditure were 7·7%. Total health expenditure as a percentage of GDP has remained between 3·4% and 4·1% since 2006.

Rapidly increasing health expenditure, even by as little as $30 per capita per year (around $6 billion per year) could substantially improve coverage of essential health-care packages resulting in less sickness and death for millions. This increase in health expenditure in turn would improve wellbeing and economic output via increased individual, family, and community activity, and contribute to a rapid improvement in the nation's wealth.

Delivering such an improvement in health and wealth would bring political dividends to national and state governments. The promise of this win-win-win situation therefore necessitates overcoming the barriers stopping it from happening.

Increasing health expenditure constitutes approximately 2·5 times the current $11·85 (16·3%) public spending of total health expenditure per capita of $72·7 in 2019. The true costs required, however, are likely to be much higher than these costs extrapolated from the National Health Strategic Development Plan (2020).

Public health care in Nigeria is organized around approximately 13,703 Primary Health Centres (PHC) supported by a network of hospitals that includes 845 secondary and 59 tertiary health care centres which included University Teaching Hospitals, and Specialized Hospitals (WHO, 2019). There is a variety of types of basic care facilities especially in the rural areas group by various names like dispensaries, health centres and health posts. In addition to the public health care, the informal private-traditional healers-remain an important source of care that should not be forgotten especially in the rural areas of the country. Going by the statistics, about 47.8 percent and 70.9 percent have health access in rural and urban areas respectively while 9.1 percent and 4.6 percent consulted traditional healers in both the rural and urban areas respectively (WHO, 2019). An analysis of health spending in Nigeria reveals

that insufficient funds are allocated to health sectors of the economy. Hence, there is large room for improvement in terms of both efficiency and equity. The above is an indication that the government over the years have underestimated the importance of investing in health. This among other factors is the reason for the lukewarm attitudes of the services providers at both the public and private health centres. The proportion of resources devoted to health out of the available total resources continued to dwindled to as low as 1.07 per cent between 1987 and 1992. Other years range between 2 and 3 per cents while the figures for 2002 and 2007 fell between 4.11 and 6.21 per cents. The total expenditure as a percentage of GDP for all years falls under 10 per cent as recommended by UN but 2006 and 2009 which are respectively 9.87 and 9.25 per cents are higher than 8 per cent (WHO, 2019).

The share of government spending has been as low as 0·2% (1992) with the highest share of spending in 2011 at about 7% (appendix p 33). Compared with the rest of Africa, Nigeria's Government spending on health care is only 0·5% of GDP, lower than the African regional average of 2% and the world average of 3·5% as of 2017. Nigeria continues to spend very little on health and health care compared with its peers in the region and around the world. As of 2018, the share of government spending assigned to health care was only 5·2%, slightly above the average of 3·4% between 1981 and 2018.

Economic Growth

The term economic growth is described as the positive and sustained increase in aggregate goods and services produced in an economy within a given time period (Jhingan, 2012). When measured with the population of a given country, then economic growth can be stated in terms of per capita income according to which the aggregate production of goods and services in a given year is divided by the population of the country in the given period. Economic growth can also be stated in nominal or in real terms (CBN, 2017). Hence, when the increase in the aggregate level of goods and services is deflated by the rate of inflation, we have the real economic growth, otherwise when measured without deflating; it is called nominal economic growth.

However, the concept of economic growth has not been quite easy to grasp and measure in real terms. This is so because often on the literature of economics, some authors have variously differentiated economic growth from the economic development.

Lewis (1978) defined economic growth as, mere increase in the aggregate level of production of goods and services in an economy but did not tell us anything about the "quality of life" of a citizenry, given the threats of global pollution, abysmal lop-sided distribution of aggregate output and income, environmental degradation, prevalence of chronic and deadly disease, abject poverty and the absence of freedom and justice. For such authors, attention should be focused not merely on the increase in aggregate output and income but also on the total quality of standard of living and that there is yet no satisfactory measure of "quality of life" that can be applied to quantitative measure of aggregate output and income which would be acceptable to all and sundry that will stand the test of the time.

Thus, economic growth refers to a positive increase in the aggregate level of output within a given time period in a country while economic development is seen as sustainable increase in the aggregate level of output and incomes, with due consideration given to the quality of life

which hopefully takes account of such issues as equal distribution of income, healthcare, education, environmental degradation, reduction in global pollution, freedom and justice.

Theoretical Review

Grossman's Model of Demand for Health

Health economics is the application of economic concepts and techniques in the field of health and healthcare to obtain maximum benefits from the unlimited health and health care wants by allocating and utilizing the limited health and healthcare resources efficiently. As defined by WHO, "Health is a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity." For an individual, health has a double function. On the one hand, perfect health represents a value of the person. On the other hand, there are other aims in life as well like good health gives good income in labour market.

Thus, health is a function of biological factors, income, social status, working conditions, education, culture, social and physical environments, gender, early child development, health systems, globalization and social support networks, profiles of the population, lifestyle, geography etc.

The demand for health is somewhat more complicated than the demand for a typical product. Here, the individual demands health and not health care. The demand for health care is, therefore, a derived demand. This was first discussed by Michael Grossman in 1972. The amount of health care demanded is sometimes measured by the quantity of services used, such as inpatient days, outpatient visits, or prescriptions. More often, it is measured by the total cost of all these services.

The central idea behind Grossman's model of demand for health is how age, education, health status, income etc. affect the production of health through the demand for health capital. Michael Grossman defined health both as a consumption good as well as a production good. He provided two reasons behind this; one health is consumed directly i.e. people are happier when they are healthier. Second, health is an investment i.e. good health permits people to do other things. Thus, the individual is both the consumer and the producer of health.

This model introduces the idea of investing in human capital (health and education) to improve outcomes in both the market (work) and non-market (household) sectors. The goal is to improve the earnings. Health is characterized as a capital good because it can be seen as lasting over time periods and depreciating at a non-constant rate.

Health is endogenous and that individuals choose the optimal amount of it that they need so as to produce 'healthy days'. That is, health status is governed by health investment and consumption activities of individuals. The model specified investment in health as a function of medical care and time spent investing in health. Berger and Messer (2002) explained in their work that Grossman pointed out that other goods aside medical care could also be in the production function.

Empirical Review

Aguayo and Iris (2010) examines the impact of health on national output for 13 European countries, 12 African countries, 16 American countries, and 11 Asian countries over the period

1970-80 and 1980-90 using ordinary least square (OLS), the authors find that health capital has a significant effect on national output, especially with a variable that captures all the determinants of health. Some other studies on health and national output conducted earlier found a positive relationship between the two.

Ogundipe and Lawal (2011) examined the impact of health expenditure on national output in Nigeria. Using the OLS technique, they found a negative effect of total health expenditure on growth.

Piabuo and Tieguhong (2017) examined health expenditure and economic growth: a review of the literature and an analysis between the economic communities for central African states (CEMAC). The study applied panel ordinary least square (OLS), fully modified ordinary least square (FMOLS) and dynamic ordinary least square (DOLS) on data obtained from the World Bank Development Indicators (2016). They submitted that health expenditure has a positive and significant effect on economic growth in both countries.

Similarly, Amadu et al. (2017) assessed the contribution of public health investments to the economic growth of Cameroon. They applied VECM procedure on the World Development Indicators (WDI, 2013) data of the World Bank which spanning from 1988 to 2013. The study showed that government health expenditures contribute to economic growth only in the long run and not in the short run.

Rahman, Bassey and Edu (2011) examined healthcare expenditure in Nigeria; as to whether the level of government spending for the period between 1980 and 2003 has any impact on economic development of the nation. Their finding is that life expectancy as well as literacy rate were negatively correlated with healthcare expenditure both in the short and long run, and that income elasticity of healthcare expenditure was below unit both in the short and long run. Their recommendation is that government needs to increase funding of health sector and reduce the inequality in the budgeting distribution of health expenditure in order to improve the health status of Nigerians.

Aluko and Oluseyi (2015) examined the effect of health on economic growth in Nigeria using time series data from the period 1980 to 2013. The study applied Johansen-Juselius cointegration, VECM and granger Causality test and the result revealed that there were five co-integrating equations, explanatory variables were positively related GDP-per capita and depicted uni-directional between health indicators and economic growth in Nigeria respectively.

Similarly, Jaiyeoba (2015) investigated the relationship between investment in education, health and economic growth in Nigeria; using secondary data from 1982 to 2011. The study applied trend analysis, Johansen cointegration and OLS techniques and revealed that there was a long-run relationship between government expenditure on education, health and economic growth. It also uses health and education expenditure, secondary and tertiary enrolment rate and gross fixed capital formation as variables for the analysis. The result concluded that there was positive signs and statistically significant exist among the variables except government expenditure on education and primary enrolment rate within the period.

Babatunde (2014) analysed the impact of health expenditure on economic growth in Nigeria from 1970 to 2010. The study applied multiple regression analysis and find out that gross capital formation, total health expenditures and the labour force productivity are important determinants of economic growth in Nigeria whereas life expectancy rate has negative impact on economic growth.

Akintunde and Satope (2013) investigated the effect of health investment on economic growth in Nigeria: 1977 - 2010. Applying the VECM as method of analysis and found that there was a long run relationship between health expenditure and economic growth. The results also revealed a positive relationship between health expenditure and economic growth in Nigeria. Bakare and Olubokun (2011) investigated the relationship between health care expenditures and economic growth in Nigeria. The study used ordinary least square (OLS) multiple regression analytical method on the relationship between health care expenditures and economic growth. The result showed a significant and positive relationship between health care expenditures and economic growth in Nigeria.

METHODOLOGY

Research Design

The *ex-post facto* research design is adopted to enable the researchers use secondary data for the conduct of the study. It is appropriate to analysed the impact of health investment on economic growth in Nigeria within the period of 1981 to 2020. The method of data collection in this study was secondary because of its nature. The data were sourced from the United Nations Development Programme annual reports and Central Bank of Nigeria (CBN) Statistical Bulletin and World Bank Development Indicators. Gross domestic product (GDP) was proxied as the depending variable while, recurrent health investment, capital health investment, domestic health spending and external health investment were the independent variables.

Model Specification

The functional model showing the technical relationship between the economic development proxied by human development index and health investment indicators in Nigeria as stated in the work (Shuaibuetal, 2016; Aluko&Oluseyi ,2015; Nwodo&Asogwa (2017) and Grossman(1972) will be modified and specified thus: According to Grossman (1972), health investment function is denoted as:

GDP = f (HEALTH EXPENDITURE);

This model can be transformed into equation as:

GDP = (RHI, CHI, DHS, EHI)……..……..(1)

Mathematical form of the model in (eqn 1) above is given as:

GDP = (RHI+CHI+DHS+EHI)……...……..(2)

The model is econometrically specified thus:

$GDP = (b_o + b_1RHI+b_2CHI+b_3DHS+b_4EHI)+ \mu_t$..……..……..(3)

Where:

GDP = Growth Domestic Product which proxied to economic growth

RHI = Recurrent Health Investment

CHI = Capital Health Investment

DHS = Domestic Health Spending

EHI = External Health Investment

μ_t = Error Term

Thus, b_o is the intercept of the equation, b_1– b_4 are the coefficients of the explanatory variables to be estimated, μtis the error term. The *apriori* expectations of the variables included in the model are expected to be positive sign. Hence, b_1, b_2, b_3 and b_4>0.

Method of Data Analysis

This paper used Augmented Dickey-fuller (ADF) and Philips-Perron (PP) tests for its unit root test to determine the behaviour of the variables and stationarity level.Autoregressive Distributive Lagged Model (ARDL) was adopted the examined the impacts of health investment variables on economic growth for the period understudy.

RESULTS

Table 1: Descriptive Statistic of Variables

	GDP	RHI	CHI	DHS	EHI
Mean	2.665287	2.728213	4.459743	3.863512	2.768974
Median	2.926830	2.801500	4.362869	2.365289	4.256489
Maximum	4.106341	4.890752	4.843918	4.752432	4.453782
Minimum	1.048830	0.367356	4.139226	0.983526	4.258694
Std. Dev.	0.927101	0.910671	0.243724	0.763542	0.852756
Skewness	-0.291256	-0.609465	0.344411	-0.754218	0.865487
Kurtosis	1.909326	3.605293	1.630051	3.854265	1.858673
Jarque-Bera	2.420743	2.932599	3.722790	2.897635	3.587869
Sum	105.0809	103.6721	169.4702	108.5392	157.5638
Sum Sq. Dev.	31.80207	30.68492	2.197843	32.53987	3.654867
Observations	40	40	40	40	40

Source: Authors' computation, using E-views 10.0

Table 2: Unit Root Test Results

	ADF			PP		
Variables	Level	First	Status	Level	First	Status
GDP	-3.322852 [0.0166]	-4.235043 [0.0020]**	I(1)	-3.556440 [0.0116]	-5.216519 [0.0021]**	I(1)
RHI	-4.001147 [0.0009]***		I(0)	-4.511147 [0.0009]***		I(0)
DHF	-3.698401 [0.0081]***		I(0)	-6.707629 [0.0079]***		I(0)
RHI	-4.001147		I(0)	-4.511147		I(0)

	[0.0009]***			[0.0009]**		
DHF	-3.698401		I(0)	-6.707629		I(0)
	[0.0081]**			[0.0079]**		
Test critical values						
1% level	-3.615588	-3.6210239		-3.615588	-3.6210239	
5% level	-2.941145	-2.943427		-2.94091145	-2.943427	
10% level	-2.609066	-2.610263		-2.609066	-2.610263	

Source: Authors' Computation using E-Views 10.0

Table 3: ARDL Bound Test Result

Test statistic	Values of F-Statistic	K	Signif. %	I(0)	I(1)
Sample size (n) = 40	11.96543	6	10%	2.353	3.599
			5%	2.797	4.211
			1%	3.8	5.643

Source: Extracted from Authors' Computation Using E-Views Version 10.0.

Table 4: ARDL Estimated Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RHI	0.001895	0.000239	8.164167	0.0000
CHI	6.05E+05	6.835E+05	0.656472	0.0963
DHS	0.000762	5.96E+05	-5.913728	0.0000
EHI	0.005836	0.001162	-5.689354	0.0000

Source: Extracted from Authors' Computation Using E-View Version 10.0

DISCUSSION

The mean and median constitute the first two descriptive statistics of measures of central tendency for the variables employed in this study. The GDP has the maximum standard deviation (deviation from the mean) as against recurrent health investment (RHI), external health investment (EHI) domestic health spending (DHS) and capital health investment has the least standard deviation (deviation from the mean).

The Jarque-Bera test examines the normality of the distribution where the null hypothesis is that the distribution of the sample is a normal one and vice versa. However, if the probability value of the Jarque-Bera test is significant, then the null hypothesis is rejected, and the alternative is accepted. This suggests that the sample is not normally distributed. If each variable is statistically significant (indicated by a zero probability), then the series is not normally distributed. Furthermore, the farther the probability statistic of a variable is to zero, the lower the value of its Jarque-Bera statistic and the more normally distributed it is and vice versa. From the results above, the Jarque-Bera tests presented in Table1 shows that the null

hypothesis is strongly accepted for all the distribution. Hence, the variables can be described to be normally distributed in the following order (from the maximum to the minimum).

Unit root test result in table 2 revealed that gross domestic product (GDP) was stationary at first difference 1(1) while the independent variable RHI, CHI, DHS and EHI in the model were all stationary at levels 1(0).

In the Table 3, the result of F-bound test indicated that there were cointegration among the variables. That is, the variables included in the model have long-run relationship among themselves. This can be noticed from the value of F-statistic of 11.96543 which was greater than both lower and upper bounds (values I ($_0$) and I ($_1$)) of 2.797 and 4.211 at 5% level of significance in the result when sample size was 40 observations.

However, since, we have small sample size, we make use of the critical values provided by Narayan (2020). The critical value for the upper bound in Narayan's Table is 4.013 and for the lower bound 2.804. The F-statistics for this bound test which was 11.96543 greater than both 4.013 and 2.804. Therefore, the null hypotheses of no long run relationship were strongly rejected at the 5% level of significance according to the decision rule.

This proved that, there were long-run relationship among variables, i.e health investment variables and economic growth were cointegrated. In other word, there was equilibrium among the investigating data included in the model. This result agreed with Ogunniyi (2017) and Okafor *et al* (2017) that a long run dynamic relationship exists between human capital formation and economic growth in Nigeria. Even, Shobande, *et al* (2018) supported that there were long-run between health investments on economic growth of Nigeria.

Table 4 shows the estimated results for the various variables (RHI, CHI, DHS, and EHI) and their coefficients with their probabilities values. The Standard Error and t-statistic were also presented in the Table 4.

More to that, the main objective of this study was to examine the impact of health investment on economic growth in Nigeria. From the result in Table 4, the analysis proved that, health investment has impacted positively on economic growth in Nigeria. That is, by the coefficients of variables included in the model and the probability values, it can be noticed that health investment influenced economic growth within the study period.

The outcomes of this finding in Table 4 agreed with the apriori expectation which states that the slope of the coefficient of health investment would be positively impact on economic growth proxied by gross domestic product (GDP).

Meanwhile, the coefficient of recurrent health investment (RHI), capital health investment (CHI), domestic health spending (DHS) and external health investmenthave contributed positive to economic growth which were in line with economic theory of Grossman's model of investment in health capital (Grossman, 1972). By these coefficients of 0.001895, 6.05E+05, 0.000762 and 0.005836 for RHI, CHI, DHS and EHI respectively. It means 1 unit increase in RHI, CHI, DHS and EHI would bring about 0.001895, 6.05E+05, 0.000762 and 0.005836 units increase in economic growth in Nigeria.

Also, the t-statistic and its p-values of 7.186097 (0.0000) indicated that the RHI was significant at 5% level in the model. It showed that recurrent public expenditure on health in term of wages and salaries, overhead expenses, immunization exercises, seminars, workshops and every year health programmes were important factors in improving economic growth in Nigeria. The study, therefore reject the null hypothesis which stated that recurrent public health does not has significant impact on economic growth in Nigeria.

The finding of this study agrees with the studies of Obialor (2017) which examined the effect of government human capital investment on the economic growth of three Sub-Sahara African (SSA) countries of Nigeria, South Africa and Ghana from 1980 to 2013 and Ogunniyi (2017)who explored impact of health expenditure on economic growth in Nigeria from 1981 to 2014. However, it disagreed with the result of Adeloye et al. (2017) which investigated the Health workforce and governance: the crisis in Nigeria from 2010 to 2016.

Moreover, CHI has contributed positively to economic growth which was statistically significant at 5% level of significance. This can be seen by its t-statistic and p-values of 0.0963. It means public health capital expenditure on building standard hospitals, teaching hospitals, specialised hospitals, research institutes, clinics, primary health centres across the country were commeasurable with her total population of 209 million people in Nigeria (NPC Projection, 2019). Similarly, the study rejected the null hypothesis which specified that capital health investment does no has significant impact on economic growth in Nigeria.

Furthermore, domestic health spending (DHS) which formed part of investment in the economy. The result revealed that DHS impacted positively on economic growth in Nigeria. In fact, it's co-efficient of 0.000762 means a unit increase in DHS would result to 0.000762 unit increase in economic growth in Nigeria. DHS was statistically significant by it t-statistic and p-values of -5.913728(0.0000). It meant the study has rejected the null hypothesis which postulated that DHS has no significant impact on economic growth in Nigeria within the study period.

In Table 4, the result showed EHI coefficient of 0.005836, by this coefficient, it means 1 unit increase in EHI will improve economic growth by 0.005836 units. Its t-statistics and probability of -5.689354(0.0000) indicated that the external health investment (EHI) was statistically significant at 5 % level of significance.

CONCLUSION

This paper examined the impact of public health investment on economic growth in Nigeria spinning from 1981 – 2020. Gross Domestic Product (GDP) was proxied to economic growth as the dependent variable while recurrent health investment (RHI), capital health investment (CHI), domestic health spending (DHS) and external health investment (EHI) were used to represent the health investment parameters as the independent variables. From the results of the analysis so far, this paper concludes that, Recurrent health investment, Capital health investment, Domestic health spending and External health investment have positive impacts on economic growth in Nigeria during the period understudy.

RECOMMENDATIONS

Based on the findings from the analysis presented, the following recommendations were made:

i. Monetary authority should maintain and sustain a deliberate fiscal and monetary policy measures that could encourage external health financing by external donors agencies to the health sector for promoting and sustaining economic growth in Nigeria.
ii. Government should increase its health investment that would provide more health infrastructure in health facilities and diseases control through increase in domestic health financing in the health sector as the effects shall be transferred to the economic growth.
iii. Government should continue to provide policy that would ensure macroeconomic stability especially foreign exchange rate and interest rate stability that would encourage increase investment in human capital by individuals and the private sector in Nigeria.
iv. Government should enlarge institutional aptitude by strengthening the infrastructure of health and educational institutions to produce qualified manpower, teachers/lecturers, medical personnel, salaries and wages and improved working conditions in health institutions.

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