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CAUSALITY AND EXOGENEITY ISSUES IN SOCIO-ECONOMIC DETERMINANTS OF GOOD HEALTH IN NIGERIA

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Abstract

The premise of this study is to empirically appraise and identify the factors that can promote good health in Nigeria. The study use a VEC and Granger causality/block exogeneity tests methods to explain the linear relationship between the endogenous and exogenous variables and to test whether the endogenous variable life expectancy at birth (LEP) (proxied as good health) can be treated as exogenous. The results show that health expenditures, income per capita, education expenditure, physical environment and unemployment rate are significant in explaining LEP in the long run, while population growth rate did not. In the short run, the result shows that the past value of good health, health expenditure, income per capital and physical environment were positively associated with current LEP, while population growth and unemployment rate were negatively associated LEP. The granger causality/block erogeneity Wald test results show that LEP granger-cause health expenditure, education expenditure and population growth rate. The study therefore, recommended that there is need for government and corporate private organisation to pay attention to these variables that are directly related to good health and adequate macroeconomic policy need to be postulated by the government to reduce cost of health.

Keywords: Causality, Exogeneity, Good Health, Nigeria
JEL Classification: C50, I12

1. Introduction

Good Health a benchmark for measuring progress towards the reduction of poverty, the promotion of social cohesion and the elimination of discrimination and it is a precondition for well-being and the quality of life (WHO, 2013). The overall wealth of countries is a strong indicator of population health. But within countries, socio-economic position is a powerful predictor of good health as it is an indicator of material advantage or disadvantage over the lifespan. Material conditions of life determine health by influencing the quality of individual development, family life and interaction, and community environments. Material conditions of life lead to differing likelihood of physical (infections, malnutrition, chronic disease, and injuries), developmental (delayed or impaired cognitive, personality, and social

development), educational (learning disabilities, poor learning, early school leaving), and social (socialization, preparation for work, and family life) problems.

For a nation to have a sound economic growth, the health status of the human capital must be taken seriously. The field of socioeconomic determinants of health is perhaps most complex and challenging of all. At every stage of life, health is determined by complex interactions between social and economic factors, the physical environment and individual behaviour. These factors are referred to as 'determinants of health'. They do not exist in isolation from each other. It is the combined influence of the determinants of health that determines health status (Aguayo-Rico, 2005).

Over the last 20 years in Nigeria, the need for better evidence has become manifest in the health sector. It is worthwhile to mention that Nigerian government at all levels is making concerted efforts to solve the problem of acute health services delivery. More medical and nursing schools are built and existing ones expanded to train more doctors and nurses. Infrastructures are put in place, particularly in rural areas. The federal government recognizes that spending more on health research is only part of the solution. The government equally address health issues by broadening our approach to interventions on health.

With the foregoing arrangements of health care delivery system in Nigeria, comprising of Primary Health Care (PHC), Secondary Health Care and Tertiary Health Institutions, Nigeria still falls among the developing nation with low health service. (Agbatogun & Taiwo, 2010). While Bakare and Olubokun, (2011) shows that Nigeria rate of infant mortality (91 per 1000 live births) is among the highest in the world, and immunization coverage has dropped below thirty per cent (30%) and the mortality rate of children under five is 192 death per one thousand.

With all these problem statements, one cannot but wonders what actually determines good health in Nigeria and what can be done to improve the Nigerian health sector. All of these problem statements require the best information possible to help us address these very difficult health issues. Understanding the determinants of good health is about looking at how and where people live, work and play and how this affects their health and behaviours.Thebroad objective of this study is to identify, analyses, evaluate and summarize research findings on the effectiveness of some variables stated in our research problem in determining good health.

In the light of the strategic nature of this study, the intention is to shed light on the following research questions in order to address what actual determinant an individual good health in Nigeria. These questions include: What is the impact of income per capital on health outcome in Nigeria? What is the implication of total population on the health system in Nigeria? How does physical environment affect good health in Nigeria? How does education expenditure, health expenditure, unemployment, and GDP determine good health? Is there any long run

relationship between the dependent and independent variables under consideration?

Various researches have been conducted around issue relating to health expenditure in Nigeria and in other countries. It could been seen that none of these researchers examined the exogeneity issues in good health determination. They are more concerned about the relationship between health expenditure and economic growth (see Anyanwu &Erhijakpor, 2007; Bloom, 2004; Bakare & Olubokun, 2011; Ogundipe & Lawal, 2011 & others). On this note, this research work hopes to empirically appraise good health in Nigeria with a view to identifying its major determinants as well as critically assessing the relationship between each determinant and good health in Nigeria. This will pave way for a more comprehensive appraisal of good health in Nigeria and consequently lead to emergence of a more vibrant health policy made possible through improved funding and proffer possible solutions towards the promotion of quality health.

2. Relevant Literature Review

Literature has it that positive relationship exists between health and income and improvement in the health of the nation population have a substantial effect on the Nation viability. Ajani & Ugwu (2008) study shows that, health enhances work effectiveness and productivity of an individual through increase in physical and mental capital which are necessary for economic growth.

Ricci & Zachariah (2006) study the role of education in aggregate production function of health services. According to them, education has two different roles in the aggregate production function of health services. Firstly,the average level of education in the economy improves its absorption capacity for health-related technology and ideas. Secondly, the level of education of household's head enhances the longevity of its members. This means that, education influences crucial factors such as the understanding of treatments or feeding children healthy. In similar view, Lantz and Pritchard (2010) concluded in their study that tertiary education has a great impact on health outcomes compared to primary education and the socioeconomic composition of a community, which is the "levels of education, employment, income, and income security in a community" have significant effects in "creating and shaping risks and benefits for health, many of which accumulate over the life course.

Wilkinson & Pickett (2006) had also suggested that the size and distribution of income within a country is a strong determinant of health status. Kaplan et al (1996) also found a direct relationship between income inequality and mortality rate. Smith (1998) further observed that being at the bottom of unequal income distribution can trigger social ranking disorder as well provoke negative health outcomes. Indisputable relation has also been set between the expected life span and national gross income (Marmot& Bell, 2012)

Reverse causation (income loss due to poor health) occurs but does not fully account for the observed associations of income/wealth and health. Many longitudinal studies show that economic resources predict health or its proximate determinants, even after adjustment for education (Daly, et al. 2002) although education is a stronger predictor for other outcomes and both are likely to matter. Health effects of increasing income have been observed in randomized and natural experiments (Kawachi et al, 2010; Wolff, 2010). Kamiya (2010) used the generalised method of moment to examines the determinant of health in 14 developing countries, with under-five mortality rate with a cross country of 141 developing countries. The empirical results show that health factor which are measured by government health spending, immunization coverage and physician density do not significantly impacted on child morality reduction, while GDP per capital and access to improve sanitation have statistically significant in reducing child.

Imoughele, et al, (2014) looked at the quantitative analysis of determinants of health outcomes in Nigeria, according to them, better health care is a prerequisite for human needs. The study concluded that health enhances worker effectiveness and the productivity of an individual through increase in physical and mental capacities which are necessary for economic growth and development.

3. Theoretical Framework and Model Specification

3.1. Theoretical framework

The First Element of the CSDH Framework is the Socio-Economic and Political Context. The social determinants framework developed by the CSDH differs from some others in the importance attributed to the socioeconomic- political context. This is a deliberately broad term that refers to the spectrum of factors in society that cannot be directly measured at the individual level. "Context", therefore, encompasses a broad set of structural, cultural and functional aspects of a social system whose impact on individuals tends to elude quantification but which exert a powerful formative influence on patterns of social stratification and, thus, on people's health opportunities. In this stated context, one will find those social and political mechanisms that generate, configure and maintain social hierarchies (e.g. the labour market, the educational system and political institutions including the welfare state) (Graham, 2009; WHO, 2010).

The Second Element is the Structural Determinants and Socioeconomic Position.
The main categories of structural determinants and socioeconomic position determinants of health are: income, education, occupation, social class and gender. Income or years of education provide familiar examples. Income is the indicator of socioeconomic position that most directly measures the material resources component. As with other indicators, such as education, income has a "dose-response" association with health; it can influence a wide range of material circumstances with direct implications for health**.** Income also has a

cumulative effect over the life course, and it is the socioeconomic position indicator that can change most on a short term basis. Education is a frequently used indicator in epidemiology.

The Third Element of the Framework is the Intermediary Determinants. The structural determinants operate through a series of what we will term intermediary social factors or social determinants of health. The social determinants of health inequities are causally antecedent to these intermediary determinants, which are linked, on the other side, to a set of individual-level influences, including health- related behaviours and physiological factors. The intermediary factors flow from the configuration of underlying social stratification and, in turn, determine differences in exposure and vulnerability to health-compromising conditions

3.2 Model Specification

With inferences to the theoretical framework above, the main variable of interest and other control variables argued in theories would dilate the relationship between the good health and its socioeconomic determinants be specified. The specification includes other explanatory variables as defined below in this study after a modification of the variables in the theoretical framework.
The quantitative variables taken into consideration and empirical model adopted in this study is thus specified as

$$LEP_t = \delta_0 + \delta_1 HEP_t + \delta_2 LOGIPC_t + \delta_3 EEP_t + \delta_4 PEM_t + \delta_5 POPR_t + \delta_6 UEM_t + \mu_t \quad (1)$$

LEP = Life expectancy at birth is also a measure of overall quality of life in a country and summarizes the mortality at all ages and this implies that longevity of life depends on good health. LEP a proxy for good health. It can also be thought of as indicating the potential return on investment in human capital and is necessary for the calculation of various actuarial measures. This entry contains the average number of years to be lived by a group of people born in the same year, if mortality at each age remains constant in the future. The entry includes total population as well as the male and female components. Good health is proxy as Life expectancy (LEP), HEP = Health expenditures: This entry provides the total expenditure on health as GDP percentage. IPC = Income per capita, EEP = Education expenditure: This entry provides the total expenditure on education as a percentage of GDP. PEM = Physical environment: This entry provides the total expenditure on other social and community services, which include housing, proxy by physical environment as a percentage of GDP. POPR = Population Growth rate and UEM = Unemployment rate

A-Priori Assumptions in the Model: The a-priori assumptions for the above model based on (equation 1) are: $\delta_1 > 0$, $\delta_2 > 0$, $\delta_3 > 0$, $\delta_4 > 0$, $\delta_5 < 0$, $\delta_6 < 0$. $\delta, s > 0$ implies a positive relationship between the dependent variable. This implies that an increase in these independent variables will lead to an increase in the good health. $\delta, s < 0$ means that there is a negative relationship between the dependent variable and the independent variables.

3.3 Data Sources

The data for this study consists of annual time series, they are generated in line with the period covered by the study which is 1980-2017. This choice is predicated by the research method adopted for this work and following the purposes and objectives of the study. The data used for this study such as fertility rate, life expectancy, and other variables are obtained from the publications of World Bank website, CBN Statistical Bulletin (CBN, 2017) and National Bureau of Statistical (NBS, 2017) to establish our empirical investigation of our formulated model.

3. Estimation Techniques

This study analysis thecausality and exogeneity issues in socio-economic determinants of good health in Nigeria. The goal of this study is achieved in these following steps: first, the unit root, cointegration, the Vector Error Correction Model (VECM), Granger-causality and block exogeneity Waldtests. Using the vector error correction framework, this study carries out VEC Granger causalityand block exogeneityWald tests whether an endogenous variable can be treated as exogenous. Exogeneity is the property of being determined outside the model under analyses, so concerns the analysis of models conditional on putative exogenous variables without loss of relevant information. In other words, if LEP have strong exogeneity or if LEP does/does not Granger-cause its determinants.

Strong exogeneity combines weak and granger causality. Suppose, in addition, that $f(x_t \mid y_1,...,y_{t-1}, x_1,...,x_{t-1}, \Psi) = f(x_t \mid x_1,...,x_{t-1}, \Psi)$ that is, conditional on $x_1,...,x_{t-1}$, that the distribution of x_t does not depend on past values of $y, y_1,...,y_{t-1}$. Then, we say that $\{y_1,...,y_{t-1}\}$ does not Granger-cause x_t. This condition, together with weak exogeneity, suffices for strong exogeneity. This is helpful for prediction purposes.

4. Analysis of Empirical Results

Unit Root Test

Table 1 shows the ADF test statistics, comparing the variables *p* values levels with the first difference ADF unit root test statistic and various probabilities. From the ADF test statistics, the results show that LOGLEP, HEP, LOGIPC, EEP, PEM, POPR and UEM were integrated at order one, that is I(1) or they were stationary at first difference. Comparing the variables levels with their first difference (the ADF unit root test statistic) and various probabilities, the test statistics show that the variables are integrated at order of one. All the variables were statistically significant at 1% and 5% level of significance in differences. From the results in the above tables' summary, there is an existence of unit root. This implies that all the series are non-stationary at levels.

Table 1. Summary of Results of Unit Root Tests

Series: LEP, HEP, LOGIPC, EEP, PEM, POPR, UEM					
Method			Statistic		Prob.**
Sample: 1980 2013			101.613		0.0000
ADF - Choi Z-stat			-8.53462		0.0000
Intermediate ADF test results					
Series	t-Stat	Prob.	Order of Integration	Max Lag	Obs
D(LOGLEP)	-8.0716	0.0000	I(1)	1	35
D(HEP)	-8.0921	0.0000	I(1)	1	36
D(LOGIPC)	-4.2519	0.0046	I(1)	1	35
D(EEP)	-5.8384	0.0000	I(1)	1	35
D(PEM)	-7.8023	0.0000	I(1)	1	36
D(POPR)	-4.9843	0.0032	I(1)	1	36
D(UEM)	-7.7279	0.0000	I(1)	1	36
Test critical values:		1% level	-4.284580		
		5% level	-3.562882		
		10% level	-3.215267		

*Source: Author's Computation. Notes: ***indicates significance at the 5% and 10% level. The optimum lags length for the ADF determined by Schwarz Information Criterion (SIC).*

Cointegration Test

The result of using Johansencointegration test for the variables is shown in Table 2. There are three (3) and three (3) cointegration equations between the variables at 5% significance level for the Trace and Maximum Eigenvalue respectively, and the null hypothesis of no cointegration is rejected. This result indicates that there is a long run relationship between the dependent and all the independent variables used in both models.

Table 2. Summary of Results of Johansen Cointegration Test

Series: LOGCPI LOGDOD LOGEXD LOGEXR				
Unrestricted Cointegration Rank Test (Trace)				
H_0	Eigenvalue	Trace Statistic	Critical Value 5%	Prob.**
r = 0*	0.926258	222.7952	125.6154	0.0000
r ≤ 1	0.774836	131.5439	95.75366	0.0000
r ≤ 2	0.661620	79.36144	69.81889	0.0071
r ≤ 3	0.375691	41.43594	47.85613	0.1752
r ≤ 4	0.344772	24.94709	29.79707	0.1633
r ≤ 5	0.242707	10.15005	15.49471	0.2694
r ≤ 6	0.011925	0.419870	3.841466	0.5170
Trace test indicates 3 cointegratingeqn(s) at the 0.05 level				

*Authors' Computation.r indicates the number of cointegrating vectors. * Indicates rejection the hypothesis at the 5% significance level and ** indicates MacKinnon-Haug-Michelis (1999) p-values. Also, the test statistics are based on a model with two (2) lags and a trend (rtrend). The trend (rtrend) model excludes linear trends in the differenced data but could allow for linear trends in the cointegrating equations.*

With this evidence, it can be interpreted that LEP and its determinants will move together in the long-run. The economic reason behind co-integration analysis is that economic variables do not normally drift far away from each other, and this seems to be the case with the variables concerned in this study as shown in the results above.

Long Run Dynamic Analysis

This long-run analysis procedure begins with theanalysis of the VECM model. Table 3 presents the long-run coefficients with their standard errors and *t*-values extracted from the estimated ECM. Having established the cointegration relationship in Table 2, the steady-state long-run relationship between LOGLEP, HEP, LOGIPC, EEP, PEM, POPR and UEMare solved from or implicit in the estimated error correction equation.

The results in Table 3, shows that the coefficients are not fully in line with our apriori expectation in the long run. In the estimated regression line above, the value of the constant term is 3.105 which means that holding the value of HEP, LOGIPC, EEP, PEM, POPR and UEM constant, the value of LOGLEP will increase by 3.105 % in the long run.

Table 3. The Long-Run Coefficients

Normalized cointegrating coefficients *Standard errors in ( ) & t-statistics in [ ]*							
LOGLEP	HEP	LOGIPC	EEP	PEM	POPR	UEM	C
1.000000	-0.061918	-0.075224	- 0.069398	-0.056803	-0.058483	0.003939	-3.104756
	(0.02032)	(0.00667)	(0.00735)	(0.01131)	(0.01021)	(0.00032)	
	[-3.04731]	[-11.2846]	[-9.43800]	[-5.02291]	[-5.72649]	[12.2121]	
Johansen Long Run Cointegrating Equation: LOGLEP = 3.105 + 0.062HEP + 0.075LOGIPC + 0.069EEP + 0.057PEM + 0.058POPR - 0.004UEM							

Source: Author's Computation.

The results show that estimated long run coefficient of health expenditures (0.062), income per capita (0.075),education expenditure (0.069), physical environment (0.057) and unemployment rate (-0.004)have expected signs in the long run. The variables did conform to a prior expectation. Population growth rate (0.058) did not conform to a prior expectation, on the average ceteris paribus, the result shows that 1% increase in health expenditures income per capita, education expenditure, physical environment and population growth rate will increase good health by 6.2% , 7.5%, 6.9%, 5.7%, and 5.8% respectively in the long run, while 1% increase in unemployment rate, will decrease good health by 0.4%in the long run.

These empirical results discussed in this study find support for stated hypotheses in this work, this implies that they are conformed to some previous researches carried out. The positive coefficient on the variable means that the changes in the explanatory variables affect future level of the endogenous variable.

Error Correction Term and Short Run Analysis

The result in Table 4, shows that the coefficients are fully in line with our apriori expectation in the short run. The result shows that the past values (lagged values) of good health (LEP) health expenditure (HEP), income per capital (IPC), education expenditure (EEP) and physical environment (PEM) are positively associated with current good health proxy (LEP) in the short run.

The result also show that, the regression coefficients of the lagged values of population growth rate (POPR) and unemployment rate (UEM)are negatively associated with the good health (LEP) in the short run. The negative signs indicates that a once-and-for-all increase in the annually value of POPR and UEM will cause a short-run decrease in good health.

The error correction term (ECT) or the ECM is included among the explanatory variables and is denoted as Cointegrating Equation (CoinEq) and it derived from level results. The ECT is the lagged value of the dependent variable. The coefficient associated with this

explanatory variables is typically the speed of adjustment to equilibrium in every period. The coefficient of the lagged error term or equilibrium error correction model (ECM) (-0.273), is negative and highly significant. In an empirical sense, it implies -0.27% of the disturbance in the short run is corrected each year given the annual data or the system adjust any disequilibrium towards long run equilibrium state at-0.273% speed of adjustment.

Table 4. VEC Error Correction Term

Error Correction:	D(LOGLEP
Ect_{t-1}	-0.272641
	(0.14171)
	[-1.92398]
Short-Run Dynamics Equation	
D(LOGLEP) = ECT(-) + 0.026D(LOGLEP(-1)) + 0.613D(LOGLEP(-2)) + 0.036D(HEP(-1)) + 0.0023D(HEP(-2)) + 0.083D(LOGIPC(-1)) - 0.012D(LOGIPC(-2)) + 0.004D(EEP(-1)) + 0.011D(EEP(-2)) + 0.0013D(PEM(-1)) + 0.021D(PEM(-2)) - 0.048D(POPR(-1)) - 0.002D(POPR(-2)) - 0.0007D(UEM(-1)) - 0.00011D(UEM(-2)) + 0.00047	
R-squared	0.647592

Source: Author's Computation. Standard errors in ( )& t-statistics in [ ]

Table 4 indicates goodness of fit given that R^2 is 0.65 and Adjusted R^2. This indicates over 65% variation in our dependent variable is explained by the explanatory variables. The result indicates that the overall model is well fitted as the independent variables explained over 65% movement in the dependent variable.

Table 5:The Granger Causality/ Block Exogeneity Wald Test Result

Block 1: Dependent Variable: D(HEP)			
Excluded	Chi-sq	df	Prob.
D(LOGLEP)	12.59031	2	0.0018
D(LOGIPC)	5.495696	2	0.0641
D(EEP)	15.95950	2	0.0003
D(PEM)	2.359778	2	0.3073
D(POPR)	19.27272	2	0.0001
D(UEM)	5.817701	2	0.0545
All	37.68541	12	0.0002
Block 2: Dependent Variable: D(LOGIPC)			
Excluded	Chi-sq	df	Prob.
D(LOGLEP)	0.489118	2	0.7830
D(HEP)	0.575595	2	0.7499
D(EEP)	1.391189	2	0.4988
D(PEM)	0.295721	2	0.8626
D(POPR)	2.800524	2	0.2465

D(UEM)	0.135807	2	0.9344
All	6.488373	12	0.8895
Block 3: Dependent Variable: D(EEP)			
Excluded	Chi-sq	df	Prob.
D(LOGLEP)	15.93331	2	0.0003
D(HEP)	1.717904	2	0.4236
D(LOGIPC)	3.720903	2	0.1556
D(PEM)	3.194536	2	0.2024
D(POPR)	31.96746	2	0.0000
D(UEM)	5.431026	2	0.0662
All	53.36808	12	0.0000
Block 4: Dependent Variable: D(PEM)			
Excluded	Chi-sq	df	Prob.
D(LOGLEP)	0.013637	2	0.9932
D(HEP)	1.565123	2	0.4572
D(LOGIPC)	0.331463	2	0.8473
D(EEP)	1.598613	2	0.4496
D(POPR)	4.299991	2	0.1165
D(UEM)	0.726384	2	0.6955
All	14.87332	12	0.2484
Block 5: Dependent Variable: D(POPR)			
Excluded	Chi-sq	df	Prob.
D(LOGLEP)	15.15171	2	0.0005
D(HEP)	4.154942	2	0.1252
D(LOGIPC)	13.21878	2	0.0013
D(EEP)	3.561775	2	0.1685
D(PEM)	3.034791	2	0.2193
D(UEM)	1.043430	2	0.5935
All	42.82788	12	0.0000
Block 6: Dependent Variable: D(UEM)			
Excluded	Chi-sq	df	Prob.
D(LOGLEP)	0.212846	2	0.8990
D(HEP)	1.238164	2	0.5384
D(LOGIPC)	0.408908	2	0.8151
D(EEP)	0.599081	2	0.7412
D(PEM)	0.172009	2	0.9176
D(POPR)	1.340476	2	0.5116
All	4.097105	12	0.9816

Source: Author's Computation

Granger causality/block exogeneity Wald test, use to examine the causal Relationship among the variables. Under this system, an endogenous variable can be treated as exogenous. Wald test for the joint significance of each of the other lagged endogenous variables in that equation.

If the Chi-Square test statistic value is greater than critical value table (P-value is smaller than significance level) then null hypothesis is rejected meaning that taken all lags together, the independent variable granger cause dependent variable/ can affect dependent variable in future/ can predict future values. Independent variable granger cause dependent variable. Independent variable can affect dependent variable in future or it can predict future values of dependent variable, otherwise not.

In Blocks 1, 3 and 5, the null hypothesis of good health proxied by Life Expectancy at Birth (LEP) does not Granger-cause ($\not\rightarrow^{G}$) HEP, EEP and POPR, in the models of HEP, EEP and POPR should be rejected at the regular 5% level as the associated P-values are as low as 0.0018, 0.0003 and 0.0005 respectively (way below 0.05). The Chi-Square test statistic of the LOGLEP (12.590), (15.933) and (15.152) for HEP, EEP and POPR modelsrespectively, are greater than the upper critical value table (5.991), we reject the null hypothesis, because the Chi-Square test statistic is greater than the tabled value with 2 degrees of freedom for two test at significance level $\alpha = 0.05$, which is the probability of exceeding the critical value. The direction of the causality between LEP and HEP, EEP, POPR are bidirectional, i.e., the alternative hypothesis are accepted. LEP granger-cause HEP, EEP and POPR. Meaning that taken all lags together, the independent variable (LEP) granger cause the dependent variables (HEP, EEP and POPR). LEP can affect HEP, EEP and POPR in future or it can predict future values of HEP, EEP and POPR. In sum, there are enough evidences for causality either way and there is enough evidences for bidirectional causality and strong evidence of granger causality exists (see the blocks 1, 3 and 5 in Table 5)

In Block 2, 4 and 6 , the null hypothesis of good health (LEP) does not granger-cause ($\not\rightarrow^{G}$) IPC, PEM and UEM, in the IPC, PEM and UEM models should not be rejected at the regular 5% level as the associated p-values are as high as 0.7830 (way above 0.05). The Chi-Square test statistic of the LOGLEP (0.48912), (0.01364) (0.212846) for LOGIPC, PEM and UEM models respectively, are lesser than the upper critical value table (5.991), we accept the null hypothesis, because the chi-square test statistic is lesser than the tabled value with 2 degrees of freedom for two test at significance level $\alpha = 0.05$. The direction of the causality between good health and LOGIPC, PEM and UEM areunidirectional, i.e., good health does not granger-cause LOGIPC, PEM and UEM. Meaning that taken all lags together, independent variable (LOGLEP) does not granger cause the dependent variables (LOGIPC, PEM and UEM) in blocks 2, 4 & 6 in Table 5. Good health cannot affect LOGIPC, PEM and UEM in future and no evidence of granger causality.

5. Conclusion and Policy Recommendations

The study was conducted with view to identify those factors that can promote good health in Nigeria. Life expectancy proxy for good health was regressed on health expenditure, income per capital, education expenditure, physical environment, population growth rate and unemployment rate. The study uses a Vector Error Correction Model and Granger causality/block erogeneity Wald tests methods to explain the linear relationship.

From the findings, the study shows that the long run coefficient of health expenditures, income per capita, education expenditure, physical environment, and unemployment rate, did conform expected signs in the long run, while population growth rate did not. The implication of the above findings is that the higher the economic position of health expenditures, income per capita, education expenditure, physical environment, the higher the health outcome attainment. In the short run, the result shows that the lagged values of good health, health expenditure, income per capital and physical environment were positively associated with current good health. While the lagged values of population growth rate and unemployment rate were negatively associated with the good health in the short run.This implies that increase in population has not improved good health outcome in Nigeria, while good health demand is employment sensitive in Nigeria.

The granger causality/block exogeneity Wald test findings show that good health granger-cause health expenditure, education expenditure and population growth rate. Meaning that taken all lags together, good health granger causes the health expenditure, education expenditure and population growth rate. Good health can affect or predict health expenditure, education expenditure and population growth rate. Also, the direction of the causality between good health and income per capita, physical environment and unemployment rate are unidirectional, i.e., good health does not granger-cause income per capita, physical environment and unemployment rate. Meaning that taken all lags together, good health does not granger cause the income per capita, physical environment and unemployment rate. Good health cannot explain these variables in the future.

From these findings, the following recommendations have been outlined which may be useful in assisting the Nigeria government in performing their oversight role and improving good health.

i. All citizens should be protected by minimum income guarantees and minimum wages legislation in order to have a higher per capita income to have access to services.
ii. Government management of the economy to reduce the highs and lows of the business cycle can make an important contribution to job security and the reduction of unemployment.

iii. Public health policies should remove barriers to health care, social services and affordable housing. It is also necessary that the government health policies that support health facilities are induced in the country.

iv. There is also the need for investment in education. Adequate investment in this sector will improve good health outcome in Nigeria. Also, to equip people for the work available, high standards of education and good retraining schemes are important.

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