An Analysis of the Determinants of Public Healthcare Expenditure in Nigeria

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Abstract: Nigeria has one of the highest infant mortality rates and low life expectancy when compared with other developing countries. In addition, there is significant inequality in the distribution of financial and human resources in the health sector and Nigeria's expenditure in the health sector of 3.8% is grossly lower than 16% of GDP as recommended by the United Nations Development Programme. It therefore becomes very worrisome how Nigeria may react to the increasing demand for public healthcare expenditure following the outbreak of COVID-19 pandemic. The study thus assessed the determinants of public healthcare expenditure in Nigeria between 1970 and 2020 using an ARDL model and time series annual data obtained from the Central Bank of Nigeria. The result analyzed confirms the consumer price index, number of physicians and other medical personnel, per capita income, infant mortality rate and life expectancy at birth as the main determinants of public healthcare expenditure in Nigeria during the period of study. On that note, policy recommendations made were for the government to provide adequate healthcare services through outlining and devising suitable healthcare policies that will be beneficial to the citizenry, the need for increased investment in health and nutrition and to arrest corruption and penalize those who divert and embezzle public health fund.

1.1 INTRODUCTION

There is a popular ancient adage which says *"health is wealth"*. Health services according to Edeme, Emecheta, & Omeje (2017) and Abdul & Zurina (2016) is the combination of all the total facilities concerned with the detection and treatment of disease, or the advertising, management and conservation of health. It thus comprises of both private and public health services and the services are the greatest noticeable purposes of any health system, mutually to public and overall consumers (World Health Organization (WHO), 2015). Healthcare service delivery connotes the strategy which involves such things as physical cash, infrastructure,

workforce, apparatus and medications, pooled to permit the conveyance of health intermediations (Udeorah, Obayori, & Onuchuku, 2018). It covers the provision of health services whether preventive and curative, family planning activities, nutrition activities and emergency aid designated for health but does not include provision of water and sanitation.

There is increasing theoretical and empirical evidence that an improved and efficient health services partly ginger the tempo of economic growth and development as one of the major causative agents. That is to say that the literature on economic growth clearly showed the role of health in influencing economic performance at both micro and macro level (Edeme, Emecheta, & Omeje, 2017 and Ilori, 2015). Economists as well as health experts are in a unanimous agreement that, healthy workers are more likely to work for longer period of time, be generally more active and productive than those less healthy counterparts, and are thus able to secure higher earnings than diseases ridden workers (Abdul & Zurina, 2016 and WHO, 2015). In the words of Babatunde (2012), poor health infrastructure, illness and diseases shortened the working lives of people thereby reducing their life time earnings and capacity to contribute to economic growth activities.

Furthermore, an efficient health sector brings greater impetus to the learning ability of children which by the multiplier effect results into better and qualitative educational attainment such as school completion rate, enrolment rate, lower years of school completion and higher capital formation for both the individuals, households and government (Udeorah, Obayori, & Onuchuku, 2018 and Schultz, 2010). That is to say that health is one of the major components required for effective, qualitative and quantitative human capital formation (Lawanson, 2009). Todaro & Smith (2009) and Miller (2000) in their separate remarks reveal human resources formation as the ultimate aim of the wealth of most nations. They contended that while capital and natural resources are passive production factors, human beings are the active factors of production that organize capital, exploit other natural resources, and build all the social, economic and political organizations required for national development. Most advanced countries strive to mobilize good health because of its acknowledged advantages as a basic component of economic growth and development.

Generally, improvement in health status in developing countries including Nigeria possesses a great challenge and there exits large scale health problems which include high infant mortality rate and low life expectancy are all as a result of scarce or rudimentary health resources and infrastructure (Edeme, Emecheta, & Omeje, 2017). Available statistics reveal that apart from healthcare budget that is far below the developed countries, the few health infrastructures available are grossly inadequate

and completely unbalanced between urban and rural areas. It is only availability of and access to improved healthcare services that reduces mortality rate and increase life expectancy among the population while at the same time addressing the twin problems of hunger and poverty (Aregbeshola & Khan, 2017). In this regard, adequate and efficient public healthcare expenditure remains crucial and a *sine quo non* in improving health status.

Report from Ilori (2015) show Nigeria as currently operating a three-tier health care system. First is the primary health care which is usually the first point of contact between the patient and the health delivery system. The primary health care comprises of public health clinics and centres, dispensaries, private clinics and maternity centres. Next to this is the secondary system which comprises essentially of hospitals of all kinds; general, cottage and mission hospitals. Last is the tertiary system includes the teaching hospitals as well as specialist hospitals. Despite this elegant arrangement of health care delivery system in place, Nigeria still falls among the developing nations with low health care service delivery system. The factors responsible for the poor performance according to Aregbeshola & Khan (2017) and Ilori (2015) include; the poor budgetary allocations and expenditure, greater disparity in the distribution of health institutions and personnel between urban and rural areas, massive poverty, low level of literacy and poor nutritional standards.

A critical examination of the portion of government expenditure on health in the Nigerian budget shows abysmally low figures both in absolute and comparative terms (Udeorah, Obayori, & Onuchuku, 2018). In 2020 and 2015 for instance, health expenditure as a share of gross domestic product (GDP) in Nigeria was as low as 3.8% and 3.7% respectively. This shows the health expenditure as a share of GDP to have declined gradually from 8.5% in 1990, 7.05% in 1995, 4.22% in 2000, 6.41% in 2005 and 4.4% in 2010 to the current 3.8% in 2020 (International Monetary Fund (IMF), 2020). The availability of healthcare services and the physical, biological, epidemiological and socio-economic environment in which a person lives, broadly determines the disease pattern, health status and generally the quality of life which reflects on the welfare of an individual.

It thus implies that any country that wants to be successful in her economic fortunes, a fari and increasing amount of money has to be spent on healthcare (Udeorah, Obayori, & Onuchuku, 2018 and Imoughele & Ismaila, 2013). This also explains why government intervention in undertaking the necessary role of financial allocation, distribution, stabilization and regulation has been encouraged, especially where the market mechanism proves inefficient. In the case of Nigeria, social and

demographic indicators have as well presented a very dismal picture. Nigeria still has one of the highest infant mortality rates and low life expectancy when compared with other developing countries (Edeme, Emecheta, & Omeje, 2017). In addition, there is significant inequality in the distribution of financial and human resources in the health sector. Still, Nigeria's expenditure in the health sector of 3.8% is grossly lower than 16% of GDP as recommended by the United Nations Development Programme (UNDP) in 2013 (UNDP, 2013).

What then would Nigeria do in this event of increasing demand for public healthcare expenditure following the outbreak of COVID-19? Global estimate indicates that illness and death caused by tuberculosis alone for instance were estimated to cost $1.4 to $2.8 billion in economic output per year worldwide (WHO, 2015) while the on-going COVID-19 is already predicted to cost a total loss ranging from $456 billion to $775 billion globally (Sussane, 2020). It thus remains a mirage when the Nigerian Ministry of Finance announced before the Nigerian National Assembly, a budget cut for the health and educational sectors in the 2020 federal government budget. Economics and health experts believes this would certainly have a negative impact on public health expenditure and hence the already comparatively low health status of Nigerians. Given this background, it becomes imperative to assess the determinants of public healthcare expenditure in Nigeria. The study covers the determinants of health care expenditure in Nigeria between 1970 and 2020 to add the emerging pressures of COVID-19 on government expenditure in Nigeria.

2.1 HEALTH STATUS AND PUBLIC HEALTHCARE EXPENDITURE

There exist a theoretical and empirical causation between macroeconomic performance and health status (Olori, 2015). This is so because a very important component of economic development of a country is its people's state of health. In fact, there is the argument as to whether it is health that granger causes development or economic development granger causes health improvements. The measurement of health according to Udeorah, Obayori, & Onuchuku (2018) is regarded as health status. Since health is a diverse issue, health status is also multi-dimensional, and thus has a variety of measures (Mwabu, 2008). The measure that is mostly adopted is referred to as the general health indicators which include mortality and morbidity rates, life expectancy at birth, and various indicators of diseases burden such as disability adjusted life span and quality adjusted life span (WHO, 2015). Health status also determines to some extent the job productivity, the capacity to learn at school and the ability to grow intellectually, physically and emotionally (Edeme, Emecheta, & Omeje, 2017 and WHO, 2015).

The goal of any health reform is therefore to improve the health status of people in order to attain a globally acceptable level of poverty reduction. Aranda (2010) noted that the major reason for health expenditure is the expectation of improved health status, and that health status is improved by massive investment in health care expenditure. The demand for health care is derived from the demand for health itself. Both health care expenditure and improved health status are means to an end; the end is increased productivity and national development. Berger & Messer (2002) explained that one of the basic ways by which governments can positively change her healthcare delivery systems is to improve public funding of healthcare infrastructure. Denton & Walters (1999) contributed by underlining the structures of social inequality as the most important determinants of health. World Bank (2014) gave an outline to the effect that social determinants of health include income, social support networks, illiteracy, employment, social environment, physical environment and personal health practices.

On his part, Ilori (2015) sees health care expenditure as the result of consumer and producer choices underlying the demand and supply for health services. In its simplest form, health expenditures are defined on the basis of their primary or predominant purpose of improving health, regardless of the primary function or activity of the entity providing or paying for the associated health services. To World Bank (2014) however, health expenditure 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. In a different notion, WHO (2015) defines health expenditure as a measure of final consumption of health goods and services plus capital investment in healthcare infrastructure. In this context, health is a critical component in gauging the living standards of a nation or region. When linked with improvements with other variables like water, sanitation and nutrition, health is visualized as an input into and outcome of growth process, integrated socio-economic upliftment based on health status improvements which depicts a reflection and cause of ongoing development efforts towards human welfare.

The Organization for Economic Cooperation and Development (OECD), (2001) sees public healthcare expenditure as the expenditure on health care incurred by public finds. Public funds are the state, regional and local and international bodies and social security schemes. Public capital formation on health includes publicly-financed investment in health facilities plus capital transfers to the private sector for hospital construction and equipment. The general government expenditure on health encompasses

the direct outlays of funds earmarked for the management of health status of the population or the distribution of medical care goods and services among population by the following financing agents: federal, state, and local authorities, extra budgetary agencies, social security schemes and parastatal Udeorah, Obayori, & Onuchuku (2018). According to Ilori (2015), the rise in health care expenditure comes because of consumer and producer choices underlying demand and supply. His argument relies on the fact that a person's demand for health care would depend on his or her health status, income, the price of health care and sometimes health insurance.

2.2 PUBLIC HEALTHCARE EXPENDITURE IN NIGERIA

The general expectation of Nigerians is for the government to increase expenditure on health care pursuant to combating the effect, spread and contagion of COVID-19. This is not just in line with the global reaction, but also in recognition of the previous dreaded consequences of diseases on the explosive Nigerian population. It is imperative to note that the top five diseases causing the death of Nigerians according to WHO (2011) include malaria, HIV/AIDS, influenza and pneumonia, diarrhoea and tuberculosis. Thus, the outbreak of COVID-19 has also added great impetus to the combustion with over 14,000 cases and 1,000 deaths already reported in Nigeria at the time of the research. Worrisome is the fact that the minimum level of public healthcare expenditure to cover essential interventions estimated by WHO is 16% of GDP. However, Nigeria is far short of this standard benchmark as she currently spends less than 4% of her GDP, knowing very well that about 51% of the rural population still have no access to other important safety measures such as safe water and reproductive health education (Udeorah, Obayori, & Onuchuku, 2018).

The Nigerian health care expenditure pattern shows that only few amount of money is actually spent on the health sector and this is far less than the WHO standard earlier stated. CBN (2020, 2016) further reveals that less than 1% of GDP was allocated to health care provision, and only about 2% of government oil revenue was allocated to health sector in Nigeria between 1980 and 2019. The fact that this low financial commitment will result in inequality in access to healthcare resources and since majority of Nigerian are poor and pay for their healthcare out of their pocket money may be left of healthcare provision. The figure is an indication of poor commitment of the nation to improved health provisions and deliveries (CBN, 2016).

On policy perspective, it can be noted that the Nigerian government has over the years set out very audacious health target in line with the Millennium Development Goals (MDGs) towards the attainment of 70 years

life expectancy by 2020, the government also stepped up her policy focused on the health sector through varying reforms and several health intervention programmes including the Primary Healthcare (PHC) intended to impact positively on life expectancy, the Commercialization Policy which was aimed at injecting some measure of efficiency into the public hospitals, the National Health Insurance Scheme (NHIS) initiated to mitigate the cost of access and the efficient health service delivery monitory policy (Ministry of Health, 2004). However, Edeme, Emecheta, & Omeje, (2017) and Sede & Ohemeng (2012) noted large scale inefficient utilization of available financial resources in most public hospitals in Nigeria. This culminates into technical and large scale inefficiencies, notwithstanding the upwards trends in percentage GDP growth rate and oil revenues accruals to the country.

The aggregative effect of the huge inefficient use of available financial resources in most public hospitals in Nigeria accompanied by the poor budgetary allocation as recently proposed by the Ministry of Finance for the 2020 budget, has relegated the health status of most Nigerians to an abysmally low level when compared to other developing countries in the same category. Life expectancy in Nigeria has remained as low as 52 years since 1999 (World Bank, 2016) and other important health estimates show that 124 out of 1000 new births do not survive beyond the age 5. Only 29.56% of male and 32.25% of female survive up to the age of 65 years. Additionally, there are close to 5 million adults within the age bracket of 15 to 49 years living with HIV while COVID-19 has already affected over 14,000 Nigerians at the time of report (Udeorah, Obayori, & Onuchuku, 2018). At the international arena, the World Bank has severally ranked Nigerian relatively poor based on the performance of some selected health indicators while the general health system performance was also ranked poor by the WHO. Nigeria is also one of the countries lagging behind in all the millennium development goals (MDG'S) to which 191 countries including Nigerian signed at the turned of the millennium in 2001.

The inadequacy of the public health expenditure has paved the way for the increasing prominence to private health sector as well as to traditional and spiritual healers in Nigeria (Ilori, 2015). Therefore, the Nigerian economy despite its wide range of resources has not experienced the necessary managerial, structural and institutional impetus required to guarantee rapid and sustainable growth conducive to as acceptable minimum standard of living among the people. The productive and technology bases, which form the prime movers of the real economy are weak, obsolete, disperse, and the sectoral linkages are scarce. Poor and uneven macroeconomic policies, weak diversification of the economic base,

macroeconomic mismanagement, weak inter-sectoral linkages, persistence of structural bottlenecks on the economy, high import dependence and heavy reliance on crude oil exports are high on the list of causes (Udeorah, Obayori, & Onuchuku, 2018). Others include long absence of democracy and the usurpation of political power by the military elite, lack of transparency and high level of corruption, declining productivity and low morale in the public service as well as implementation. Increased government expenditure on health and education will raise the productivity of labour and increase the growth of national output. Similarly, increased government expenditure on infrastructure such as roads, communications, power, rail, sea and air transport reduces production costs, increases private sector investment and profitability of firms, thus, fostering economic growth.

2.3 SUMMARY OF EMPIRICAL REVIEWS

There are certain recent empirical works on this subject matter in Nigeria that deserves recognition. Udeorah, Obayori, & Onuchuku, (2018) examined the impact of health care expenditure on economic growth in Nigeria for the period of 1980 to 2016 and the result revealed positive impact of health care expenditure. Richardson, Chisom & Mary (2017) investigated the effect of public health expenditure on health outcomes in Nigeria and the result shows that public health expenditure and health outcomes have long-run equilibrium relationship. Ilori (2015) empirically analyzed the determinants of public health expenditure in Nigeria using the error correction techniques and time series data spanning from 1981 to 2014 and the result shows total population and unemployment as the main determinants of health expenditure in Nigeria.

Similarly, Folahan & Awe (2014) examined the determinants of health expenditure in Nigeria between 1976 and 2010 and the result showed that number of physicians, number of nurses, and number of hospitals has a long run positive relationship with health expenditure in Nigeria. Imoughele & Ismaila (2013) on their part examined the determinants of public health expenditure in Nigeria from 1986 to 2010 and the results show that demand for health in Nigeria is price inelastic. It also shows that that total population and gross domestic product are the major determinants of health expenditure in Nigeria. It can be seen from the empirical review that the current work on this subject matter in Nigeria remains the work of Udeorah, Obayori, & Onuchuku (2018). However, the advent of COVID-19 in the world and its attendant consequences on economic growth and development activities in Nigeria has become the game changer. The international call for increased health care spending and the current budget

adjustment across the globe becomes necessary for an investigation into the renewed impact of health expenditure in Nigeria. This study hopes to become one of the latest works on this subject matter since December 2019 when COVID-19 engulfed the universe.

3.1 METHODOLOGY

The study relied essentially on annual time series secondary data that was sourced from the publications of the CBN, National Bureau of Statistics and the Budget Office in Nigeria. It comprises of annual time series data on all the variables in the model form 1970 to 1st quarter CBN report of 2020. The data was used in its log form to eliminate extreme fluctuations.

3.2 SPECIFICATION OF THE MODEL

Following the works of Udeorah, Obayori, & Onuchuku, (2018), Richardson, Chisom & Mary (2017), Ilori (2015) and WHO (2015) indices for health measurement, the linear model is adopted and further adjusted and specified as follows;

$$PHS = f \ (CPI, PPH, PCY, IMR, LEB, UMP) \tag{3.1}$$

Equation 3.1 can be stated econometrically to include the stochastic random element as follows:

$$PHS = \beta_0 + \beta_1 CPI + \beta_2 PPH + \beta_3 PCY + \beta_4 IMR + \beta_5 LEB + \beta_6 UMP + \mu \tag{3.2}$$

Where; PHS = Total Public Healthcare Expenditure; CPI = Consumer Price Index as a proxy for health care prices including during the period of COVID-19; PPH = Total Number of Physicians and other Health Workers; PCY = Per Capita Income as a Measure of Economic Welfare; IMR = Infant Mortality Rate; LEB = Life Expectancy at Birth; UMP = Unemployment Rate and μ = Stochastic Error Term. The OLS model specified above is further transformed into an ARDL equation and specified as follows:

$$\Delta LPHS = a_0 \sum_{i=1}^{p} a_{1i} \Delta LPHS_{t-1} + \sum_{i=1}^{p} a_{2i} \Delta CPI_{t-1} + \sum_{i=1}^{p} a_{3i} \Delta PPH_{t-1} + \sum_{t-1}^{p} a_{4i} \Delta PCY_{t-1}$$

$$+ \sum_{t-1}^{p} a_{5i} \Delta IMR_{t-1} + \sum_{t-1}^{p} a_{6i} \Delta LEB_{t-1} + \sum_{t-1}^{p} a_{7i} \Delta UMP_{t-1} + \lambda ECM + \zeta \tag{3.3}$$

Where λ the speed of adjustment parameter and ECM is is the residuals obtained from model (3.3). The coefficient of the lagged error correction term (λ) is expected to be negative and statistically significant to further confirm the existence of a co-integrating relationship among the variables.

4.1 RESULTS AND DISCUSSION OF FINDINGS

4.1.1 Trends in Public Healthcare Expenditure in Nigeria

This is explained with the use of descriptive statistics as contained in figure I depicted below. The figure provides to the effect that public healthcare expenditure as a percentage of the GDP in Nigeria since 1970 to date has been abysmally low and negative in selected years before one can consider any external effect. The figure shows that throughout the period of study, public healthcare expenditure was high and significant only between 1994 and 1995. More worrisome is the fact that it has continued to decline into negative figures in 2020 when efforts should have been made to increase healthcare expenditure. The summary remains that, public heath care expenditure has remained low and below the 16% recommended by the WHO.
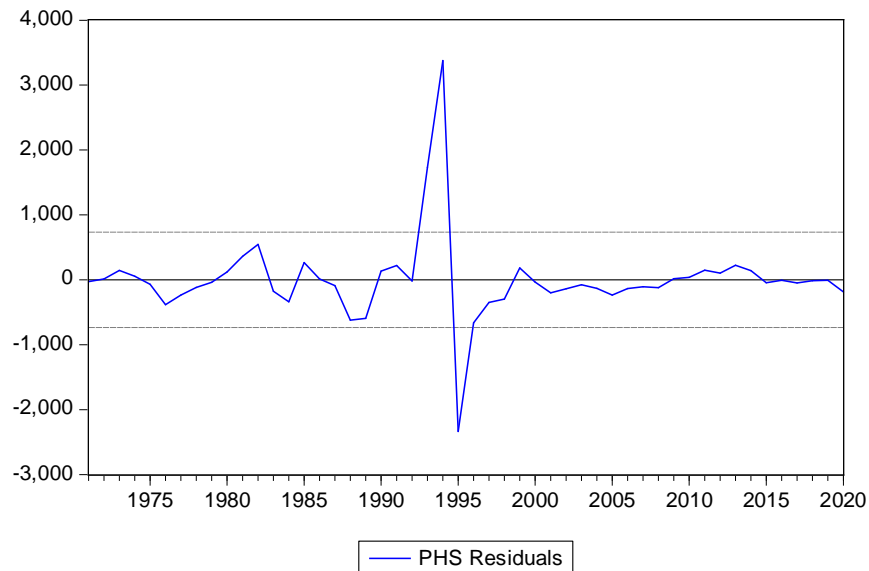

Figure I: Trends in Public Healthcare Expenditure in Nigeria

4.1.2 Unit Root Test

The result of the unit root test using Augmented Dickey-Fuller (ADF) approach was presented in Tables 4.1 below. The result shows that the following variables – PPH, PCY, IMR, LEB and UMP were not stationary at levels while PHS and CPI were stationary at levels. The series after first difference became stationary at 5% level of significance but with a mix order of integration. Thus, with all the variables not integrated of the same

order but have revealed a mix combination of I (0) and I (1) as shown in the result of ADF unit root test, the use of Johasen co-integration test has collapsed. The most appropriate choice left now is the ARDL bound co-integration to examine the existence of long run relationship amongst the variables in the model.

Table 4.1: ADF Unit Root Test

Variables	ADF Test Statistic	0.05 Critical value for ADF Statistic	Order of Integration
PHS	-4.066865	-2.921175	I (0)
D(PHS)	-7.018228	-2.923780	-
CPI	-3.813765	-2.921175	I (0)
D(CPI)	-7.158201	-2.923780	-
PPH	-0.759381	-2.921175	-
D(PPH)	-7.076789	-2.922449	1 (1)
PCY	-0.019609	-2.921175	-
D(PCY)	-6.177783	-2.922449	I (1)
IMRD	-2.211723	-2.921175	-
(IMR)	-6.557338	-2.922449	I (1)
LEB	-0.899735	-2.929734	-
D(LEB)	-3.247676	-2.929734	I (1)
UMP	-0.709558	-2.921175	-
D(UMP)	-8.778235	-2.922449	I(1)

Source: Author's computation using Eviews 10.0

4.1.3 Analysis of Cointegration Test

Table 4.2
Result of the Bound Test

F-statistic	Alpha Level	Critical Bound Lower Bound	Upper Bound	Decision
5.75	5%	2.85	3.61	Co-integrated

Source: Author's computation using Eviews 10.0

Table 4.2 indicates the calculated F-statistics of 5.75. Given the upper bound critical value of 3.61 which is less than the F-statistic, the null hypothesis of no co-integration is rejected, implying long-run co-integration relationships exist amongst the variables. This leads to the estimation of the long run relationship and the associated short-run dynamics.

Table 4.3 contains the long run ARDL coefficients. The result of the long-run estimates of the ARDL revealed CPI, PPH, PCY, IMR and LEB to be positively related with the PHS while UMP to be negatively related with PHS in the long-run. CPI, LEB, PPH and IMR are clearly the main

Table 4.3
Estimated Long Run Coefficients: ARDL (1, 0, 0, 0, 0, 0, 0) selected based on
Schwarz Bayesian Criterion

Dependent variable is PHS
50 observations used for estimation from 1970 to 2020

Regressors	Coefficient	Standard Error	T-Ratio	(Prob)
CPI	9.003041	9.800228	1.939041	0.0592
PPH	3.805273	4.422718	0.317240	0.7526
PCY	0.005874	0.515200	0.011401	0.9910
IMR	3.297731	9.511307	0.346717	0.7305
LEB	9.098026	6.358990	0.054362	0.0569
UMP	-9.968078	6.160632	-0.865848	0.3915
C	-2.852780	7.898362	-0.099717	0.9210

Source: Author's computation using Eviews 10.0

determinants of public healthcare expenditure in Nigeria during the period of study. This corroborates with the works of Udeorah, Obayori, & Onuchuku, (2018), Richardson, Chisom & Mary (2017) and Ilori (2015) CPI, PPH, PCY, IMR and LEB are major determinants of health care expenditure in most countries of the world.

Table 4.4
Error Correction Representation for the Selected ARDL Model
ARDL (1, 0, 0, 0, 0, 0, 0) selected based on Schwarz Bayesian Criterion

Dependent variable is PHS
50 observations used for estimation from 1970 to 2020

Regressors	Coefficient	Standard Error	T-Ratio	(Prob)
dCPI	15.322789	9.379722	1.63360	0.1098
dPPH	10.009581	33.886460	0.31528	0.7541
dPCY	0.004736	0.415484	0.01139	0.9910
dIMR	2.659071	7.678216	0.34631	0.7308
dLEB	7.336044	4.848603	0.05440	0.9569
UMP	-3.227602	3.868344	-0.85104	0.3996
ECM(-1)	-0.806334	0.177684	-4.53800	0.0000
R-Squared	0.628998	Akaike Criterion	16.17926	
S.E. of Regression	0.617164	F-Stat.	2.941851 (0.013375)	
DW-statistic	1.944294	Schwarz Bayesian Criterion	16.48519	

Source: Author's computation using Eviews 10.0

The results of the short-run dynamics associated with the ARDL (1,0,0,0,0,0,0) presented in Table 4.4 above revealed the coefficient of the

lagged error correction term (-0.806334) to be negative and statistically significant at any level. The negative coefficient is an indication of co-integrating relationship among the variables. The magnitude of the coefficient implies that about 80% of the disequilibrium caused by previous year's shocks converges back to the long-run equilibrium in the current year.

The Durbin-Watson statistic of 1.94 shows positive serial correlation but within the normal bound of 2. The coefficient of multiple determinations (R^2) is 0.628998 and the adjusted value is 0.617164 indicating that about 62.8% of total variation or a change in the present value of PHS is explained by changes in the explanatory variables in the model while the remaining percentage is explained by other factors not explicitly captured in the model.

The CPI, PPH, PCY, IMR, and LEB remain positively related to the PHS in the short run even though; none of the variable was statistically significant at 5% level of significance in corroboration with the works of Udeorah, Obayori, & Onuchuku, (2018), Richardson, Chisom & Mary (2017) and Ilori (2015) on this subject. This entails that these variables remains the greatest motivators of government expenditure pattern in Nigeria and may remain so during the outbreak of COVID-19.

4.1.4 Causation Analysis

Table 4.5
Pairwise Granger Causality Test for Nigeria

Null Hypothesis:	Obs	F-Statistic	Prob.
CPI does not Granger Cause PHS	49	3.11998	0.0541
PHS does not Granger Cause CPI		14.0278	2.E-05
PPH does not Granger Cause PHS	49	0.08908	0.5592
PHS does not Granger Cause PPH		0.41772	0.6611
PCY does not Granger Cause PHS	49	0.00951	0.3727
PHS does not Granger Cause PCY		0.75332	0.4768
IMR does not Granger Cause PHS	49	0.06421	0.5510
PHS does not Granger Cause IMR		0.09033	0.9138
LEB does not Granger Cause PHS	49	0.01964	0.3051
PHS does not Granger Cause LEB		1.24003	0.2993
UMP does not Granger Cause PHS	49	1.51648	0.2307
PHS does not Granger Cause UMP		0.85896	0.4306

Source: Author's computation using Eviews 10.0

The result of causality contained in Table 4.5 above shows a uni-directional causation running from CPI, PPH, PCY, IMR and LEB to PHS

at 1%, 5% and 10% level of significance respectively. There is however, no causality between UMP and PHS in Nigeria during the time frame of analysis. There is thus, causality running from all the main determinants of public healthcare expenditure in Nigeria. This result further confirm the result of ARDL earlier discussed that CPI, PPH, PCY, IMR and LEB are the main determinants of government expenditure and has to be well targeted by the government through appropriate policy reform.

5.1 CONCLUSION AND POLICY RECOMMENDATIONS

It can be concluded on the basis of our data analysis that CPI, LEB, PPH and IMR are the main determinants of public healthcare expenditure in Nigeria during the period of study. On that note, the following policy recommendations were made to guide the Nigerian government in putting appropriate policy measures to contain both the spread and effect of the pandemic on the population. They include:

(i) Strong government involvement in the provision of adequate healthcare services through outlining and devising suitable health care policies that will be beneficial to the citizenry is recommended. This will make government healthcare expenditure to have a robust effect on Nigerian health status and near the WHO recommended budgetary allocation to the health sector.

(ii) With increased demand for healthcare services, it has been discovered that public healthcare expenditure alone cannot cater for expansions of healthcare needs. In this regard, the government may need to enter into partnership with other stakeholders such as WHO to mobilize the required resources, encourage efficiency and flexibility in healthcare provisions.

(iii) There is also the need for investment in health and nutrition. Adequate investment in the sector will improve educational outcome and induce the nation economic growth. It is also necessary that Government health policies that support provision of facilities are induced in the country.

(iv) Employment policy should be vigorously pursued. Enabling environment in terms of stable macroeconomic as well as watertight security conducive for business to triumph should be the ultimate preoccupation of the managers of the economy. If unemployment is likely to adversely affect life expectancy, a higher proportion of unemployed people would tend to increase the dependency ratio, widen income distribution and adversely affect the affordability of the unemployed to properly access medical care.

(v) Finally, adequate Machinery should be put in place by all sectors of government to arrest corruption and penalize those who divert and embezzle public health fund. This will enhance the mobilization of resources to furnish primary, secondary and tertiary health institutions and this will induced the Nation economic growth.

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