NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

DETERMINANTS OF PUBLIC HEALTHCARE EXPENDITURE IN NIGERIA

OBOMEILE Cyril[1] & MUSA Abdulai Aliakhue (PhD)[2]

1. Department of Accounting and Finance, College of Management Sciences, Glorious Vision University, Ogwa Edo State (Formerly Samuel Adegboyega University)
2. Department of Banking and Finance, School of Financial Studies, Auchi Polytechnic, Auchi Edo State

Corresponding author: **Obomeile Cyril**
Email/ Phone No.: cymek2003@yahoo.com (+2348069211489)[1]
afilechi@gmail.com (+2348165783354)[2]

Abstract

The study examines the factors that determine public health care expenditure in Nigeria from 1980-2021. To facilitate this study, data were sourced from World Bank database and analysed using the ordinary least square (OLS) regression method. The result revealed that per capita income and government developmental policy on health are significant determinants of public health expenditure. It was therefore recommended among others that government should put in place policies that will bring about human and infrastructural development in the health sectors in order to improve the health of the people and reduce the burden on the government by encouraging more private sector participation.

Keywords: Public health care expenditure, out-of-pocket expenditure, Health financing

1. INTRODUCTION

Increase in public health expenditure, it is general belief, improves the health status which in turn transform into healthy human capital formation with its attendant multiplier effect on growth and development (Edeme & Olisakwe, 2019). Any nation which must experience meaningful growth and development must invest in its health sector because good health is one of the sources of happiness and well-being of people irrespective of their rank in society (World Bank, 2014, 2016). Investment in the health sector creates opportunity for individuals to improve their health position and also improve the economy at large. Like other investment projects, investing in health requires pooling together both financial and non-financial resources. Therefore, any public expenditure on health can be seen as a form of investment in the overall

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

well-being of a nation and as we know the prevention and treatment of illnesses consume scarce enormous resources including productive time (Alaba & Alaba, 2002; Omotor, 2009; Dang, Likhar & Alok, 2016).

Nigeria operates three-tier health care system i.e. the primary, secondary and tertiary systems. The primary health care level is usually the first point of contact between the patient and the health delivery system. The institutional component at this level includes public health clinics and centres, dispensaries, private clinics and maternity centres. The secondary system comprises of hospitals of all kinds such as general, cottage and mission hospitals. The tertiary system includes the teaching hospitals as well as specialist hospitals. Despite the above arrangements of health care delivery system, Nigeria still falls among the developing nation with low health service delivery. Some of the factors that may be adduce to this may include; greater disparity in the distribution of health institutions and personnel between town and country, poverty, low level of literacy, poor nutritional standards, etc. (Oloruntuyi, 2003; Folahan & Awe, 2014). For a nation to have a meaningful growth the health status of its human capital must be taken seriously. This justifies the significance of health expenditure in the budget of any country. According to the World Health Organization (WHO) "the meagre budget allocation to the health sector in many developing countries is the major problem confronting their health sector" (WHO, 2000). Public health expenditure as a percentage of government expenditure has been fluctuating over the years. According to statistics, it was 9.19% in 2007, 7.63% in 2008, 7.37% in 2009, 5.72% in 2010, 7.42% in 2011, 7.43% in 2012, 6.48% in 2013 and in 2014 it was at 8.17%. As a percentage of GDP, from 2010 to 2014 it recorded 0.91%, 1.15%, 1.03%, 0.88%, 0.92% respectively; the highest value being recorded in 2011. (AFDB, 2011; UNECA, 2012; World Bank, 2013b)

Its observed that many studies have attempted to examine factors that determines health expenditure both in Nigeria and outside Nigeria such as Rahman, 2008; Das & Martin, 2010; Choabouni & Abednnaher, 2010; Tang, 2010, Abbas & Heimenz, 2011; ilori &Ajiboye, 2015; Omotor, 2009; Agbatojun & Taiwo, 2010; Okafo & Eiya,

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

2011, Oaikhena & Umoru, 2012; Imoughele &Ismaila 2013; Fasoranti, 2015; etc. It has become imperative for a more recent study to look at factors that determines public heath expenditure in the face of current challenges facing the health sector.

2. Review of related literatures

Health and Public Health Expenditure

Health is a very important aspect of an individual's well-being, and since individuals make a nation, therefore, healthcare could be regarded as one of the necessary conditions to achieving a sustainable long-term economic development. Health can be referred to as general physical condition i.e. condition of the body or mind especially in terms of the presence or absence of illness, injuries or impairments. The issue of health is a very sensitive one because it deals with not just humans but with human body. Without a good health condition, it is almost impossible to carry out any economic activity and if at all there is any, it will certainly not be efficient (Obomeile & Braimah, 2021; Edeme & Olisakwe, 2021). It has been established in literatures that improvement in health care is an important prerequisite for enhancing Human Capital Development (HCD) in any and every economy. Health status of a nation creates outward shift in labour supply curve/increase productivity of labour with a resultant increase in productivity of investment in other forms of human capital. Thus, the level of government expenditure on health determines the ultimate level of human capital development which eventually leads to better, more skilful, efficient and productive investment in other sector of the economy. (Imoughele & Ismaila, 2013). Bakare and Olubokun (2011) emphasized that health care expenditures possess growth implication for any nation as it improves health status, life expectancy, efficiency and productivity of labour. Given the important role health care expenditure play in the lives of individuals and the nation at large, it is therefore of paramount importance to the government to finance public health if such factors that propel health expenditure are identified. To further buttress this, Boachie, (2017) opined that good health is an essential factor for the achievement of economic growth and development of countries.

The financial commitments of government to the health sector are both the recurrent

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

and capital expenditure on health. The capital expenditure of government decrease from N7.3million in 1970 to N4.88 million in 1972 before it rose again to N126.75 in 1994. It dropped sharply to N79.2 million in 1982. From 1982 to 1987, capital expenditure on health declined from N72.9m in 1982 to an all-time low of N17.2m in 1987. This development is occasioned by the fact government was more preoccupied in the business of paying workers' salaries with less attention being paid to capital expenditure. In 1988 there was a significant rise to N297.96m. By 1991, statistic dropped to N137.3m but plummeted to N33.72m in 1992. The figure rose steadily from N586.2 million in 1993 to N17,717.42m, N33,396.97m and N34,647.9m in 2003, 2005 and 2007 respectively the capital expenditure on health stood at N64,922.9m in 2008 and N79,321.09m in 2011. The recurrent expenditure on health also follows a similar trend. It rose gradually from N12.48m in 1970 to N59.47m in 1977 but fell to N40.48m in the successive year. The pattern of health expenditure at this period reflects both the product of the disposition of government policy towards health issue and the determination of the Federal Government to improve the health care system with the wind fall of oil revenue. Recurrent expenditure nosedived into N15.32m in 1979 before it rose to N52.79m, N84.46m N82.79 million in 1979, 1987 and 1983 respectively. From 1984 to 1986, recurrent expenditure rose from N101.55m to N134.12m when the recurrent expenditure as a percentage of total expenditure stood at 77.4 percent. The value of recurrent health expenditure reduced significantly in 1987 to N41.31m before it rose steadily from N422.80 in 1988 to N24,522.27m in 2001. This figure rose again from N40, 621.42 in 2002 to N44, 551.63, N58,686.56 and N72,290.07 in 2005, 2006 and 2007 respectively. Recurrent expenditure on health stood at N18, 200.00 million in 2008 and N21, 542.9m in 2011 and there have been fluctuations till date. (Edeme & Olisakwe, 2019; World Bank, 2013, 2014) .

Public Health expenditure and Budgetary allocation to Health

In every nation of the world, budgetary allocation is an indication of government priorities i.e. it shows the sectors of the economy that the government feel need serious attention (Bakare & Olubokun,

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

2011). A meagre allocation to health sector is an indication of how the government prioritises the health of its citizens. In Nigeria the federal government is required to allocate 15% of its budget to the health sector on annual basis. Unfortunately, in the year 2010 only 3.7% of the budget was allocated to health, in 2011 5.7%, in 2012 5.8%, in 2013 5.7%, in 2014 5.6%, in 2015 5.5% and in 2016 4.1%. It is disheartening to know that since 2010 when the government budgeted 3.7% to health the sector, we've not really progressed in the last seven (7) years. Here we are referring to allocations and not amount of funds released. Often times funds released are less than what has been appropriated. Furthermore, 80% of the appropriated budget is usually on recurrent expenditure meaning we are only left with 20% for capital expenditure. Considering the level of inflation, the purchasing power of our budget is further reduced, thus affecting the actual allocation to the health sector. The drop in purchasing power is an indication that the health sector requires more funding to meet up with health care services requirement that have become more expensive because of our current economic situation. (world Bank, 2017)

Theoretical Underpinnings of Public Health Expenditure in Nigeria

Wagner's law of increasing public expenditure

This theory was first associated to Adolphus Wagner (1835-1917) a German economist who based his law of increasing state activities on historical facts. The law states that there are inherent tendencies for the activities of different layers of governments to increase both intensively and extensively. It assumes the existence of an economy and the growth of the government activities in which the government sector grows faster than the economy (Ilori & Ajiboye ,2015)

Wiseman and Peacock Hypothesis

This theory deals with the growth of public expenditure. It was put forth by Wiseman and Peacock in their study of public expenditure in UK for the period 1890-1955. It emphasizes the recurrence of abnormal structures which cause sizeable dumps in public expenditure and revenue. Public expenditure should not be expected to increase in a smooth and

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

continuous manner, but in jerks or a stop-like fashion to accommodate special needs, such as natural disaster, war epidemics etc.

Musgrave and Rostow theory of public expenditure

Musgrave and Rostow put forward a development model under the causes for growth in public expenditure. They argued that public expenditure is a prerequisite of economic growth. The public sector initially provides economic infrastructure such as roads, railways, water supply and sanitation. As economic growth takes place the balance of public investment shift towards human capital development through increased spending on education, health and welfare services (Taiwo, 2011).

Empirical review of current research in area Public Health Expenditure in Nigeria

Literature on the determinants of public health expenditure has begun to attracting attention of recent in Nigeria and abroad. Rahman (2008) carried out a study on the determinants of health expenditure in some Indian states using a panel data model. The study revealed that state per capital income and literacy rate are significant factors that influence health expenditure, while other structural demand variables such as proportion of state population over the age 60, population per primary health care centre and population per doctor were insignificant. Das and Martin (2010) carried out a quantitative examination on the determinants of total health care expenditure using a co-integration procedure. The results indicate that per capita income contributes significantly to the explanation of health care expenditure, while age of the population does not have significant impact on aggregate health care expenditure in the U.S.

Chaabouni and Abednnaher (2010) considered the determinants of health expenditure in Tunisia between 1961 and 2008. With the aid of auto regressive and distributed lags (ARDL) approach, their study showed a stable long run relationship between per capita health expenditure, GDP, population of 65years and above, medical density and environmental quality. The study established a unidirectional causality flowing from health expenditure to income during the short and long run periods.

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

Tang (2010) investigated the determinant of health expenditure in Malaysia. Using time series framework from 1967 to 2007 and employing econometric methodology. The study reveals that the major factor that influence health expenditure are income, health care prices and proportion of population aged more than 65 years of age and the causality indicates that health expenditure and income is bi-directional in nature. Similarly, Abbas and Heimenz (2011) empirically examine the determinants of public health expenditure in Pakistan from 1972 and 2006. Using co-integration and error correction methodology, the study reveals that urbanization and unemployment have negative effect on health care expenditure.

In the case of Nigeria, Omotor, (2009) examined the determinants of health expenditure for the period 1970-2003. His principal finding is that health expenditure in Nigeria is income inelastic (0.472) and positive. The study also revealed civilian/participatory democratic governments spent more money on health care than military regimes in Nigeria. Agbatogun and Taiwo (2010) empirically examined the determinants of health expenditure in Nigeria. They found that gross domestic product is the most important determinants of health allocation and literacy rate and population's growth rate are insignificant determinant of health expenditure in Nigeria. Okafor and Eiya (2011) studied the determinants of growth of government expenditure in Nigeria using ordinary least squares (OLS) and found that population, public debt, total government revenue, and inflation were all statistically significant at 5% level, while inflation was not. Oaikhenan and Umoru (2012) reviewed a number of studies on the determinants of public health expenditure. The result shows that infrastructural development positively affects expenditure on health. Other determinants highlighted include government recurrent expenditure and price of healthcare as significantly positive to healthcare expenditure. Imoughele and Ismaila (2013) examined the determinant of health expenditure in Nigeria within the period between 1986 and 2010. The study showed that total population aged 14 years and below and the share of health expenditure in total government expenditure (proxy for government development policy in health) as significant determinant of health expenditure. On the other hand, GDP per

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

capita, unemployment rate, population per physician, consumer price index and political instability were statistically insignificant. Folahan and Awe, (2014) examined the determinants of health expenditure in Nigeria from 1976 and 2010. Cointergartion and error correction model was used to estimate a model that expressed health expenditure as a function of number of physicians, number of nurses, number of hospitals, reported cases of Malaria, HIV AIDS, tuberculosis, population and the GDP. The result showed that number of physicians, number of nurses, and number of hospitals have a long run positive relationship with health expenditure in Nigeria. However, cases of various diseases such as Malaria, HIV AIDS, and tuberculosis did not have a significant long run relationship with health expenditure. Fasoranti, (2015) examined the determinants of government health expenditures in Nigeria from 1970 and 2012. Data collected was analyzed with the aid of descriptive statistics and the Ordinary Least Square multiple regression. The study found that literacy rate, share of health expenditures in total government expenditures and consumer price index were significant factors in government health expenditures within the study period. On the other hand, per capita GDP, total population of age 65 and above, total population of age 14 and younger and life expectancy rate were found to be insignificant. The causality test showed the existence of uni-directional and bi-directional causality for some variables while for some others, there was no causality. Ilori and Ajiboye (2015), empirically analyze the determinants of public health expenditure in Nigeria using the error correction techniques and time series data spanning from 1981 to 2014. The result shows that total population, Unemployment rate and the Tuberculosis are the major determinants of health expenditure in Nigeria while gross domestic product per capita, Sickle-Cell Anemia and the Human Immuno-Deficiency Virus are insignificant.

3. Method

The research design adopted for this study is the analytical/causal research design. This establishes relationship between the dependent variable and independent variables. To ascertain this relationship, the Ordinary Least Squares (OLS) regression analysis was carried out on the time series data which were sources from the world bank database from 1980-2021.

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

The statistical analysis package used for this study is the E-Views 8.0.

Model specification

The model of past studies by Imoughele and ismaila, (2013) and Fasoranti (2015) that carried out an econometric analysis of the determinants of government expenditure were adapted and modified. The functional relationship between the dependent variable and its associated independent variables can be expressed in the following form;

PHE = f(PCI, POP, OPE, DPH, HCP)

Putting the foregoing functional relationship in a linear econometrics form, we have;

$PHE_t = \alpha_0 + \alpha_1 PCI_t + \alpha_2 POP_t + \alpha_3 OPE_t + \alpha_4 DPH_t + \alpha_5 HCP_t + \varepsilon_t$ ----------(1)

Where;

PHE_t= Public Health Expenditure

PCI_t= Per Capita Income

POP_t= Total Population (14years and younger)

OPE_t = Out-of-Pocket Expenditure

DPH_t= Government Developmental Policy on Health

HCP_t = Health Care Price

ε_t = Error Term

- **Apriori Expectation**

Public health expenditure (PHE) is expected to have a direct relationship with Population (POP), Government developmental policy on health (DPH) and Health care price (HCP), i.e. $\alpha_2, \alpha_4, \alpha_5 > 0$ and inverse relationship with Per capita income (PCI) and Out of pocket expenditure (OPE) i.e. $\alpha_1, \alpha_3 < 0$.

4. Presentation and Interpretation of Results

Table 1: Descriptive Statistics Result

	PHE	POP	PCI	OPE	HCP	DPH
Mean	17.17153	55107490	1280.829	61.93077	54.58928	0.342503
Skewness	0.047448	0.405155	0.648465	-1.457775	1.279248	0.102985
Jarq-Bera	2.511082	2.664485	4.226770	15.65725	11.48539	2.192405
Prob	0.284922	0.263885	0.120828	0.000398	0.003206	0.334138
Obs	39	39	39	39	39	39

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

Researchers' computation, 2023

The table above shows the descriptive statistics result of the variables used in the analysis. The result shows that from 1980-2018 the average public health expenditure, population size, per capita income, out-of-pocket expenditure, health care price and government developmental policy on health rate variables were 17.17153, 55107490,1280.829, 61.93077, 54.58928 and 0.342503 respectively. These indicate that the variables exhibit significant variation in terms of magnitude, suggesting that estimation at levels may introduce some bias in the result. It is observed that all the variables except out-of-pocket expenditure are positively skewed, meaning they have been rising overtime. The descriptive analysis also revealed that out-of-pocket expenditure and health care prices were normally distributed, while public health care expenditure, population size, per capita income and government developmental policy on health were not as observed from the Jarque-Bera probability.

Table 2: Unit Root Test

	Value @ levels		Value @ 1st Diff		
Variables	ADF Test Statistic	Critical Value @ 5%	ADF Test Statistic	Critical Value @ 5%	Remark
PHE	-2.194935	-3.533083	-6.638323	-3.540328	/(1)
PCI	-3.797125	-3.536601	-7.054081	-3.536601	/(0)
POP	-1.402345	-3.557759	-5.506290	-3.557759	/(1)
OPE	-2.083612	-3.533083	-6.505763	-3.536601	/(1)
DPH	-1.162940	-3.533083	-6.270526	-3.540328	/(1)
HCP	3.736214	-3.540328	-2.581099	-3.540328	/(0)

Researchers' computation, 2023

The Augmented Dickey Fuller (ADF) test was employed to test for the presence of unit root in the variables in our model. The result presented in table 2 above shows that only per capita income (PCI) and health care price (HCP) were stationary at levels i.e. integrated at order zero [/(0)], while the variables of public health care expenditure (PHE), population size (POP), out-of-pocket expenditure (OPE) and

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

government development policy on health (DPH) were found to be stationary after first difference i.e. integrated at order one [/(1)].

Johanson Co-Integration Test

Since the order of integration of the variables is not uniform (integrated of different order), the method of co-integration test employed is the Johanson co-integration investigating method which is a system equation. According to the rule, all that is required to ensure co-integration is at least on con-integrating equation. The result is as presented below in table 3.

Table 3: Johanson co-integration Test Result

	TRACE STATISTIC		**MAX-EIGEN STATISTIC**	
Hypothesized No. of CE(s)	Trace Statistic	Critical Value @ 5%	Max-Eigen Statistic	Critical Value @ 5%
r = 0*	114.191	95.754	43.119	40.078
r = 1*	71.072	69.819	26.421	33.877
r = 2	44.651	47.856	22.170	27.584
r = 3	22.481	29.797	14.696	21.132
r = 4	7.785	15.495	7.449	14.265
R=5	0.336	3.841	0.336	3.841

Researchers' computation, 2023

The co-integration result is in two partitions; the Trace Statistic and the Max-Eigen Statistic. From the trace statistic it can be seen that there are at least two co-integrating equations, whereas in the Max-Eigen Statistic there is at least one co-integrating equation. This confirms therefore that there is co-integration between the dependent and the independent variables of each of the model.

Vector Error Correction Model (VECM) Test

Since the order of integration is not the same, it means that we are not permitted to adopt a linear equation modelling such as ECM because literature says for ECM to be adopted series must be integrated of the same order. Now that they are integrated of different order it means that the only way forward is to adopt a system equation method. The study therefore decides to

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

adopt VECM since it's theoretically justified unlike VAR that is a-theoretical. The result is as presented below in table 4 and the model of interest is model 1 which is the model that carries the dependent variable D(PHE).

Table 4: Vector Error Correction Model (VECM) Result

Explanatory Variables	D(PHE)	D(PCI)	D(POP)	D(OPE)	D(DPH)	D(HCP)
ECM	-0.160866 [-3.06586]	-432.4927 [-0.14328]	25.80274 [4.43127]	-0.042264 [-0.22732]	-0.019983 [-0.23620]	-0.003203 [-1.17102]
D(PHE(-1))	-0.626364 [-2.57206]	-2508.459 [-0.17905]	-6.092566 [-0.22544]	0.244915 [0.28383]	-0.137923 [-0.35125]	-0.031881 [-2.51130]
D(PHE(-2))	0.126729 [0.48708]	-6343.434 [-0.42381]	44.09041 [1.52700]	-0.708181 [-0.76817]	-0.551845 [-1.31542]	-0.002518 [-0.18563]
D(PCI(-1))	0.002740 [1.99944]	139.0359 [1.76330]	0.297808 [1.95790]	-0.009112 [-1.87613]	-0.005773 [-2.61239]	0.000104 [1.45314]
D(PCI(-2))	-0.001105 [-0.99059]	9.610142 [0.14973]	0.036999 [0.29882]	0.002212 [0.55943]	-0.000997 [-0.55405]	-2.78E-05 [-0.47725]
D(POP(-1))	-1.64E-06 [-0.45651]	0.954190 [4.61851]	0.000676 [1.69546]	-8.84E-06 [-0.69494]	1.53E-06 [0.26463]	-2.19E-07 [-1.16860]
D(POP(-2))	-9.01E-06 [-2.01616]	0.003207 [0.01247]	0.000619 [1.24876]	9.39E-06 [0.59253]	5.77E-06 [0.79995]	-6.59E-08 [-0.28258]
D(OPE(-1))	-0.084751 [-1.04136]	1733.490 [0.37025]	22.35378 [2.47503]	-0.236808 [-0.82118]	-0.039446 [-0.30060]	-0.002602 [-0.61321]
D(OPE(-2))	-0.030180 [-0.41979]	-3842.121 [-0.92897]	23.72804 [2.97404]	0.044053 [0.17293]	-0.085762 [-0.73983]	-0.001533 [-0.40904]
D(DPH(1))	13.17222 [2.71441]	1200.817 [0.00430]	998.3304 [1.85381]	-28.19138 [-1.63954]	8.098885 [1.03506]	0.390403 [1.54325]
D(DPH(2))	-10.30296 [-1.80092]	92399.00 [0.28075]	124.2270 [0.19567]	19.47897 [0.96092]	9.210882 [0.99853]	-0.174813 [-0.58616]
D(HCP(-1))	-0.358401 [-2.05988]	6522.488 [0.65164]	19.65838 [1.01811]	-0.576648 [-0.93534]	0.878341 [3.13083]	-0.015522 [-1.71128]
D(HCP(-2))	-0.009333 [-0.04518]	-10643.35 [-0.89549]	83.34781 [3.63523]	-0.025486 [-0.03481]	-0.458895 [-1.37753]	0.010580 [0.98234]
C	17.07568 [3.37912]	101519.9 [0.34922]	-2434.981 [-4.34204]	5.090859 [0.28432]	-6.322993 [-0.77602]	0.452342 [1.71711]
R^2	0.683270	0.971715	0.695415	0.385594	0.929054	0.566668
Adjusted R^2	0.496111	0.955001	0.515433	0.022535	0.887131	0.310608
F-Stat	3.650753	58.13788	3.863801	1.062071	22.16104	2.213031

Researchers' computation, 2023

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

It is observed from the result that the ECM is correctly signed i.e. it's negative and statistically significant hence conforms to economic theory of negativity and statistical significance of the ECM. The coefficient of ECM of -0.160866 shows that approximately 16.09% of the discrepancies between the long run and the short run dynamics is corrected annually. This reveals that the ECM has an effective correcting property as the short run and the long run equilibrium will converge in the long run. From the result one period past public health care expenditure (PHE) with the coefficient of --0.626364 and a t-value of -2.57206 reveals that a unit increase in one period past PHE will cause current PHE to decrease by 0.626364 and it's statistically significant. Also, two periods past PHE with the coefficient of 0.126729 and a t-value of 0.48708 shows that a unit increase in two periods past PHE will bring about 0.126364 unit increase in PHE but it's not statistically significant.

The result shows that one period past per capita income (PCI) with the coefficient of 0.002740 and a t-value of 1.99944 signifies that a unit increase in one period past PCI will bring about 0.002740 units increase in PHE but it is not statistically significant. Also, two periods past PCI with the coefficient of -0.001105 and a t-value of -0.99059 reveals that a unit increase in two periods past PCI will lead to 0.001105 unit decrease in PHE and it's found to be statistically insignificant. The result shows that one period past population (POP) with the coefficient of -1.64 and a t-value of -0.45651 signifies that a unit increase in one period past POP will bring about 1.64 units decrease in PHE and is statistically insignificant. Also, two periods past POP with the coefficient of -9,01 and a t-value of -2.01616 reveals that a unit increase in two periods past POP will lead to 9.01 unit decrease in PHE and it's found to be statistically significant. The result also reveals that one period past government developmental policy on health (DPH) with the coefficient of 13.17222 and a t-value of 2.71441 reveals that a unit increase in one period past DPH will cause PHE to increase by 13.17222 units and it's statistically significant. Also, two periods past DPH with the coefficient of -10.30296 and a t-value of -1.80092 shows that a unit increase in two periods past DPH will bring about 10.30296 units decrease in PHE but not statistically significant. From the result, one period past health care price (HCP) with the

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

coefficient of -3.58401 and a t-value of -2.05988 signifies that a unit increase in one period past HCP will bring about 3.58401 units increase in PHE and it is statistically significant. Also, two periods past HCP with the coefficient of -0.009333 and a t-value of -0.04518 reveals that a unit increase in two periods past HCP will lead to 0.009333 units decrease in PHE and it's found to be statistically insignificant.

The coefficient of determination (R^2) of 0.683270 shows that 68% of the systematic variation in public health expenditure is due to the variations in the included regressors, while the remaining 32% is attributed to the error term. When the coefficient of determination was adjusted by its degree of freedom, the explained variation became 50%. Thus judging by R^2 and its adjusted counterpart, the estimated model has both high explanatory power and good predictive ability. The F-statistics of 3.650753 exceeds the critical value at 5% level. This shows that the explanatory variables are at least simultaneously related to public health expenditure (the dependent variable).

Table 5: Long Run Regression Result.

Regressors	C	POP	PCI	OPE	HCP	DPH	
Coefficients	8.680	2.770	-0.002	-0.040	-0.070	5.646	
T. Stat	1.251	1.107	-2.056	-0.629	-1.817	2.227	
Probability	0.220	0.276	0.048	0.534	0.078	0.033	
R^2=0.675 Adjusted R^2=0.626 F-Stat=13.700 (0.000) DW Stat=1.000							

Researchers' computation, 2023

The long run regression result above shows that all the variables except health care price were rightly signed. From the result above, the coefficients of population size and government developmental policy on health of 2.770 and 5.646 shows that a unit increase in population size and government developmental policy on health will bring about 2.770 and 5.646 units increase in public health expenditure respectively. Also, the coefficients of per capita income, out-of-pocket expenditure and health care prices of -0.002, -0.040 and -0.070 shows that a unit increase in per capita income, out-of-pocket expenditure and health care prices will

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

bring about 00.002, 0.040 and 0.070 units decrease in public health expenditure. On the basis of the individual statistical significance of the model as shown by the t-values, the result shows that in the long run, per capita income and government developmental policy on health have a significant negative and positive impact on GDP since their t-values of -2.056 and 2.227 are greater than their critical t-values at 5% level of significance. From the result the coefficient of determination of 0.675 shows that 68% systematic variations in public health expenditure is due to the variations in the explanatory variables in the model, while the remaining 32% is attributed to the error term. When adjusted to its degree of freedom, the explained variation became 63%. Thus, judging from the coefficient of determination and their adjusted counterparts, the estimated models have both high explanatory power and good predictive ability. The F-statistics of 13.700 is statistically significant at 5% level. This shows that there is a significant simultaneous relationship between the dependent variable and the independent variables in the model and it confirm that the model is of good fit. Lastly, the Durbin-Watson statistics of 1.00 confirm the presence of autocorrelation in the model.

5. Discussion

It was found from the result that population size has a positive and significant relationship with public health expenditure in Nigeria during the period under investigation. This implies that as population increases the prevalent rate of diseases also increases and this causes the expenditure on health to rise. This is in agreement with the findings of Imoughele and Ismaila, (2013), Ilori, (2015) and Okafor and Eiya, (2011) who found a significant relationship between population and public health expenditure. Per capita income was found to have a negative and insignificant impact on public health expenditure. This is in consonance with the findings of Imoughele and Ismaila, (2013) and Fasoranti, (2015). This implies that as the standard of living improves people tend to be healthier and the rate of sickness reduce thereby leading to reduction in amount of money budgeted to the health sector. Out-of-pocket expenditure is found to have a negative and insignificant impact on public health expenditure suggesting that the citizens have limited access to quality public healthcare services and government organs such as National Health Insurance Scheme (NHIS) has not provided financial risk protection to the population, hence resort seeking better health care through personal financing. Health care price has inverse and insignificant impact on public health care expenditure in Nigeria. This is also in conformity

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

with the findings of Imoughele and Ismaila, (2013); Havemann and Vander Berg (2002) in South Africa that the amounts charge in hospital is not statistically significant in demand for health care services. The negative nature indicates that high cost of health care discourage Nigerians for the demand of health resources.

Government developmental policy on health has positive and significant impact on public health care expenditure in Nigeria and this is in conformity with the findings of Imoughele and Ismaila, (2013) and Abbas and Hiemenz, (2011). This finding indicates that health policies formulated and implemented in the Nigerian health sector have not been consistent with the world health organisation policy over the years, hence the rise in public health care expenditure.

6. Conclusion and Recommendations

The study examined the determinants of public health expenditure in Nigeria from 1980-2020. Using time series data on public health expenditure, population size (age 14 years and younger), per capita income, out-of-pocket expenditure, health care price (consumer price index) and development policy on health, it was found that population size and government development policy on health are significant determinants of public health expenditure in Nigeria. Base on the findings, the following recommendations are made;

1. Government should put in place policies that will bring about human and infrastructural development in the health sectors in order to improve the health of the people and reduce the burden on the government by encouraging more private sector participation.
2. Adequate Machinery should be put in place by all sectors of government to check corruption and penalize those who divert and embezzled public health fund.
3. Government should take into consideration the population of Nigerian between 14 Years of Age and Younger in health care expenditure and allocation policies since this impact on the level of health expenditure in Nigeria.
4. There is need for collaboration between public and private sector in providing quality and quantitative health facility to meet the demand of Nigerians.
5. There is need for proper implementation and monitoring of our national health policy such as national health insurance scheme (NHIS). This will improve the health status

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

and reduced health burden on household and the government.

References

Abbas, F. & Hiemenz, U. (2011). Determinants of Public Health expenditures in Pakistan. ZEF- Discussion Papers on Development Policy No. 158, Center for Development Research, Bonn, November 2011.

AFDB,(2011). Africa Economic Outlook 2011. African Development Bank Annual Report.

Agbatogun, K.K & Taiwo, A.S (2010). Determinants of Health Expenditure in Nigeria. *Journal of Research in National Development*, 8(2): 1-9.

Alaba, O.A. & Alaba, O. B. (2002), Malaria in Children: Implications for Female Caregivers and Productivity in Nigeria, 395-413

Aluko, O.O. & Aigbedion, I. M. (2017). Public health expenditure and economic growth in Nigeria: An error correction model. *Journal of Economics, Management and Trade*, 21(6): 1-11.

Bakare, A. S. & Olubokun, S. (2011). Health care Expenditure and Economic growth in Nigeria: An Emperical study. *Journal of Emerging Trends in Economics and Management Science* (JETEMs) 2(2): 83 – 87.

Boachie, M. K. (2017). Health and Economic Growth in Ghana: An Empirical Investigation. *Fudan Journal of the Humanities and Social Sciences* 10(1): 253–265

Chaabouni, S., & Abednnadher, C. (2010). The determinants of health expenditures in Tunisia: An ARDL bounds testing approach. Available on the internet at http://www.unicaen.fr/recherche/mrsh

Dang, A., Likhar, N. & Alok, U. (2016). Importance of economic evaluation in health care: An Indian perspective. *Value in Health Regional Issues*, 9(1): 78-83.

Das, A. & Martin, F. (2010). An Econometric Analysis of the US Health Care Expenditure. *Global Journal of Health*. 2 (1): 150-160.

Fasoranti, M. M. (2015). An Econometric Analysis of the Determinants of Government Health Expenditures in Nigeria. *Journal of Empirical Economics*, 4(4), 193-206

Folahan, D. A. & Awe, A.A.(2014). An Assessment of Health Expenditure Determinants in Nigeria. *IOSR Journal of Economics and Finance (IOSR-JEF*. 3(2), 23-30

Havemann, R. & Vander-Berg, S. (2002). The Demand for Health in South Africa. Stellenboseh. *Economic working paper 6, Bureau of Economic Research*, Pretoria.

Ilori, I. A. (2015). Determinants of Public Health Care Expenditure in Nigeria: An Error Correction Mechanism Approach. *Journal of Economics and Sustainable Development*, 6(24), 7-19.

Imoughele, L. E. & Ismaila, M. (2013). Determinants of Public Health Care Expenditure in Nigeria: An Error Correction Mechanism Approach. *International Journal of Business and Social Science.* 4(13), 220-233.

Oaikhenan, H. E. & Umoru, D. (2012). Determinants of Public Health Investment Expenditures in Nigeria. In: Economics of Health System Governance and financing in Nigeria, pp 149-162. Ibadan, Ibadan University Press.

Obomeile, C. & Braimah, M. (2021). Private Health Care Finance and Infant Mortality Rate in Nigeria. *Nigeria Studies in Economics and Management Sciences.* 4(2): 10-18

Okhuese, A. V. (2020). Estimation of the probability of reinfection with COVID-19 by the susceptible-exposed-infectious-removed-

NJSS
Nnadiebube Journal of Social Sciences
Vol. 4 No. 4 September 2023
ISSN: 2636-6398 (Print); 2636-638X (Online)
Journal URL: https://nnadiebubejss.org

undetectable-susceptible model. JMIR Public Health and Surveillance, 6(2), 19097.

Okafor, C., & Eiya, O. (2011). Determinants of growth in government expenditure: An empirical analysis of Nigeria. *Research Journal of Business Management*, 5, 44-50

Rahman, T. (2008). Determinants of Public Health Expenditure: Some Evidence from Indian States. *Applied Economics Letters,* 15, 853-857.

Sharma, R., (2018). Health and economic growth: Evidence from dynamic panel data of 143 years. PloS one, 13(10): e0204940. Available at: 10,137/journal.pone.0204940

UNECA, (2012). Economic Transformation for Africa's Development. United Nations Economic Commission for Africa, macroeconomic policy division, C-10 Meeting April, Washington DC

WHO (2000). The World Health Reaport. Health System: Improving Performance. Genevea, Switzerland. World Health organization.

World Bank, (2013). World development indicators databank. Washington: World Bank.

World Bank. (2014). World Development Indicators. Washington: World Bank.

World Bank. (2016). World Development Indicators. Washington: World Bank

World Bank, (2017). World development indicators. Washington: World Bank.