

An Econometric Analysis of the Determinants of Government Health Expenditures in Nigeria

M. M. Fasoranti¹

Abstract

A healthy population is an indispensable factor in the growth and sustainable development of a nation. Therefore, to achieve sustainable development, every national government cannot but devote sizeable funds to finance health services. To provide a platform for evaluating and controlling government expenditures, it is necessary to know those factors that affect government spending on health. This study therefore examined the determinants of government health expenditures in Nigeria between 1970 and 2012. Focus was on the analysis of government expenditures within the period of study, the determinants of and the direction of causality between government health expenditures and the specified independent variables. Data was sourced from various issues of Central Bank of Nigeria's publications, National Bureau of Statistics and world bank publications. Data collected was analyzed with the aid of descriptive statistics and the Ordinary Least Square multiple regression. Other tests employed were the Augmented Dickey-Fuller (ADF) unit root test, Johansen co-integration test and the pairwise Granger Causality test. The study found that all variables were stationary at level and that long run relationship existed between government health expenditures and the determinants. Furthermore, all the variables were positively related to government health expenditures except total population of age 14 years and younger. 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. The income elasticity was found to be inelastic showing that health is a necessity. This study recommended higher budgetary allocation to health services and that higher premium be placed on the health needs of the population aged 14 years and younger. Moreover, such funds must be properly managed so as to reach the target population.

Keywords: Health expenditures, Causality, Determinants.

1. Introduction

A healthy population is an indispensable factor in the growth of an economy. Studies such as Siddiqui and Hug (1995) and Muhammad and Khan (2007) have shown that the level of government expenditures on health will go a long way to determine the quality of the nation's human capital. With qualitative human capital, there will be increase in labour's efficiency and productivity, skills and productive investment. Given that there is a positive relationship between health and growth, then to ensure economic growth, the government must spend sufficiently on health. Increase in health expenditure is often justified on the ground that it is a pre-requisite for human resource development of which health status is an important component. Health status is expected to impact directly on individual's life time income, efficiency, productivity, effective application of knowledge and skills, poverty reduction and the general economic development of the country (Schultz, 1999). In a later study, Bakare and Olubokun (2011) emphasized that health care expenditures possessed growth implication for any nation. It improves health status, life expectancy,

¹Phd. Department of Economics Adekunle Ajasin University Akungba-Akoko, Ondo State, Nigeria

efficiency and productivity of labour. Given the vital role of health expenditure for the individuals and the nation at large it is of paramount importance to the government who finances public health if such factors that propel health expenditure, are identified.

There have been different studies on the factors or determinants of health expenditures in the developed and less developed countries. Given the impression that health is a public good to which the government must allocate sufficient funds, there is the need to investigate those determinants and how each impacts on the economy. Studies have shown that health and sustainable development are closely linked. Health expenditure is an important indicator of sustainable development and the latter cannot be realized where there is the prevalence of life threatening diseases and sicknesses.

Boyacioglu (2012) showed that expenditures on health have positive influence on health indicators such as life expectancy and infant mortality in Turkey. His study found that as total health expenditures increased, life expectancy rose while infant mortality rate reduced significantly. He concluded by saying that for sustainability of development health expenditures are of vital importance. In stressing the importance of health in sustainable development, report from the United Nations (2012) identified three ways through which health and development are related viz

- Health as a contributor to the achievement of sustainable development.
- Health as a potential beneficiary of sustainable development.
- Health as an index of sustainable development policies.

Hence to achieve sustainable development, every rational government cannot but devote sizeable funds to finance health services. According to Bloom and Canning (2003), health indicators have positive influence on aggregate output as healthy individuals will work effectively, efficiently and productively. It is also known that good health enhances effective use of knowledge acquired through education (Schultz, 1991). From the foregoing therefore, for any economy to attain sustainable economic growth, the government must devote sufficient share of its expenditure on health. Consequently, it is needful to examine the determinants of government health expenditures and their implications.

This study therefore aimed at examining those factors that affect government spending on health and how such impact on economic growth. This may provide a platform for evaluating and controlling government expenditures. Also, there have been extensive literatures on health expenditures and their growth in developed countries especially OECD countries. However, literatures on developing countries are few. As at present, only few considered the case of Nigeria. The most recent of such studies_ Imoughese and Ismaila (2013) analysed the determinants of health expenditures between 1986 and 2010. This study has taken a broader view of the determinants of government health expenditures in Nigeria between 1970 and 2012. The study also examined the trend of government health expenditures in Nigeria between 1970 and 2012. and also considered the causality between government health expenditures and the determinants. The study differed from previous studies on Nigeria in that it covered more years, more variables and also used more modern econometric tools of analysis.

2. Review of Literatures

Most existing literatures are on the relationship between health expenditures and economic growth indexed by the Gross Domestic Product (GDP) for the developed countries, Kleiman (1974) showed a significant positive relationship between health expenditures and GDP and that a greater percentage of the variations in health expenditures are explained by the GDP. Others such as Hansen and King (1996), Newhouse (1987), Milne and Molana (1991), Hitiris and Posnett (1992) explained per capita health expenditures as a function of per capital GDP/income. The consensus of these studies is that income is the major determinant of health expenditures. On the international scene, Kleiman (1974) studied the health expenditures of different countries and found income to be the most critical factor accounting for the differences in the health expenditures of such countries. However, studies by Culyer (1990), Hansen and

King (1996) found no long run relationship between health care expenditures and GDP. A study on 20 OECD countries between 1960 and 1997 by Gerdtham and Lothgen (2000) showed that health expenditures and GDP are non-stationary and that there is a presence of co integration between them. Their study showed that GDP/income alone cannot account for the variations in health expenditures over the years in all the countries.

A recent study of 30 developed countries by Miniar and Hammami (2013) indicated the predominance of bidirectional granger causality between per capita health expenditure and per capita GDP. The study made use of data between 1975 and 2011 and applied the Toda and Yamamoto (1995) test for the long run causality. Studies by Matteo (2003) and Sen (2005) showed income and age as the major determinants of health care expenditure in the United States of America. Analyzing the determinants of health expenditures in developing countries, Xu et al (2011) used panel data from 143 countries over fourteen years (1995-2008). Their findings showed great variation in health expenditure as a share of GDP across the countries. The study showed that income, demographic and health system characteristics are significant factors causing variations in health expenditures. Furthermore, the study showed income elasticity of less than one implying that health is a necessity in the countries under consideration. The study suggested that health expenditure did not grow faster than GDP in such countries. Considering the direction of causality between health expenditure and GDP, Erdil and Yetkiner (2009) applied a granger causality approach to panel data of 75 low and high income countries. Their findings revealed a significant bidirectional granger causality of 46 countries. Their analysis suggested uni-directional causality for low and middle income countries while the reverse holds for high income countries. On the other hand, Hartwig (2008) found no evidence that health expenditure causes per capita GDP but that GDP causes growth in health expenditure.

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 65 years 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. For Malaysia, Tang (2010) showed that health expenditures and its determinants were co integrated. Also that income, health care prices and proportion of population aged 65 years and above were significant determinants of health expenditure during the period between 1967 and 2007. In a similar vein, Abbas and Heimenz (2011) with the aid of co integration and error correction modeling showed that unemployment and urbanization were negatively related to health care expenditures in Pakistan between 1972 and 2006.

Apart from income/GDP, literatures have shown population indexed as share of young people (14 years and below) and old people (above 65 years) over active population as determinants of health expenditure. However these variables were normally found to be statistically insignificant (Di Matteo and R.D, Matteo, 1998, Hitiris and Posnett, 1992, Agbatogun and Taiwo, 2010, Raza et al., 2012). Among other things, technological progress has been considered an important factor in health care expenditure (Baker and Wheeler, 1998, Weil, 1995). Dreger and Reimers (2005) showed life expectancy and infant mortality as important determinants of the growth of public expenditure on health. Mode of financing health has also been found to be an important determinant of health expenditures. Wagstaff and Bank (2009) and Wagstaff and Moreno-Serra (2009) showed that per capita expenditure was higher in countries where social health insurance scheme existed than countries where health is majority tax-financed. Also, external fund was considered as having influence on health expenditures depending on how it is channeled. (U et al (2010) showed that external fund channeled through non-governmental sectors has positive relationship with government health expenditure while it was negatively correlated when channeled through the government sector. One other variable found in literatures is provider payment mechanism. According to Gerdtham and Jonsson (2000), fee-for-service payment system tended to lead to higher health expenditure than financing health through the budget systems. A study of ECA countries by Rodrigo and Wagstaff (2010) confirmed this finding also.

Furthermore, total number of admission in the hospital was found to be positively related to total expenditures on health (Gerdtham and Jonsson, 2000). Lastly, total supply of doctors was considered to have

positive effects on health expenditures (Gerdtham et al,1998). However, a study of African countries by Murthy and Okunade (2009) showed no relationship between the supply of doctors and government health expenditures.

Using simple regression analysis on macro-economic data, Agbatogun and Taiwo (2010) showed GDP as the most important determinant of health expenditure in Nigeria. Other factors such as literacy rate and population growth rate were found to be statistically insignificant though positively related to health expenditures.

Reman, Basse and Edu (2011) considered the health expenditure in Nigeria between 1980 and 2003. With the aid of cob-Douglas production function and ordinary least square techniques, the study showed that health expenditure was negatively related with life expectancy and literacy rate in the short and long runs. Also income elasticity of health expenditure was below unity implying that health is a necessary good in Nigeria.

Imoughese 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 capita, unemployment rate, population per physician, consumer price index and political instability were statistically insignificant.

From the literatures cited above, one can deduce that most available studies considered the determinants of health expenditure in developed countries while there were only few studies on the developing countries. As at present, only few considered the case of Nigeria. The most recent of such studies, Imoughese and Ismaila (2013), analysed the determinants of health expenditures between 1986 and 2010. This study provides a bridge for this gap by analyzing the determinants of government expenditures on health between 1970 and 2012.

3. Methodology

Data for the study was obtained from secondary sources majorly from the central Bank of Nigeria (CBN) statistical bulletin, National Bureau of Statistics, relevant text books and learned journals, and publications of World Health Organization and World Bank research centre. Data was collected on the following macro economic variables.

- Federal government expenditures on health
- Population indexed by the percentage of population aged 14 years and below and Percentage of population aged 65 years and above.
- Infant mortality rate
- Literacy rate
- Income indexed by GDP per capita
- Life expectancy rate
- Share of health expenditure in total government total expenditure.
- Consumer price index (proxy for health care prices).

Method of Analysis

The study used descriptive and quantitative techniques to analyse the data obtained. Descriptive method such as percentages, tables and graph were used to examine the trend of government expenditures on health. The quantitative techniques used was Ordinary Least Square (OLS) multiple linear regression analysis to explain the relationship between government expenditures and the determinants. For data treatment, the study employed the Augmented Dickey-Fuller (ADF) unit root test to test the stationarity of the variables. The Johansen Co-integration test was also used to test for co-integration among the variables.

Model Specification

Thus study adopted Ismaila and Imoughele’s (2013) model with modification with the addition and subtraction of certain variables. The following model was specified for this study.

$$TGHE = f(PCGDP, TPY, TPA, LER, LR, THE/TGE, CPI) \dots \dots \dots (1)$$

In a multiple linear regression form, model (1) becomes:

$$TGHE = b_0 + b_1 PCGDP + b_2 TPY + b_3 TPA + b_4 LER + b_5 LR + b_6 THE/TGE + b_7 CPI + u_i \dots \dots \dots (2)$$

To ensure linearity of the results, the logarithm of the model is specified as follows

$$\text{Log}TGHE = b_0 + b_1 \log PCGDP + b_2 \log TPY + b_3 \log TPA + b_4 \log LER + b_5 \log LR + b_6 \log THE/TGE + b_7 \log CPI + u_i \dots \dots \dots (3)$$

Where:

LogTGHE = logged value of Total Government health expenditure.

LogTPY = logged value of per capital Gross domestic product.

LogTPY = logged value of total population of 14 years and below

LogTPA = logged value of total population of 65 years and above.

LogLER = logged value of life expectancy rate.

LogLR = logged value of literacy rate.

LogTGHE/TGE = logged value of total government health expenditure as percentage of total government expenditure.

LogCPI = logged value of consumer price index.

μ_i = error term.

b_0, \dots, b_7 = parameters to be estimated.

All the independent variables are expected to be positively related to the dependent variables.

4. Data Analysis

Table 1: Trend in Government Health Expenditures (1970-2012)

Year	Total Government Health Expenditure (#'M)	GDP Per Capita	Share of 14 Years & Younger in Total Population (%)	Share of 65 Years & Above in Total Population (%)	Life Expectancy rate (years)	Literacy Rate (%)	Health Expenditure Share in Total Government Expenditure (%)	Consumer Price Index
1970	34.8	73.5	41.1	2.9	41	37.2	3.8	0.16
1971	38.9	80.1	41.1	2.9	41	38	3.9	0.19
1972	56.7	81.3	41.1	2.9	41	38	3.9	0.19
1973	57.6	86.1	41.0	3.0	42	38.2	3.8	0.20
1974	88.7	251.1	41.0	3.0	42	39	3.2	0.23
1975	155.4	417.4	42.0	3.0	42	39	2.6	0.31
1976	192.5	434.4	42.0	3.0	43	40.1	2.4	0.38
1977	223.6	456.2	42.0	3.0	43	41	2.5	0.44
1978	122.5	410.3	43.0	3.0	43	41	1.5	0.54
1979	183.7	408.0	43.0	3.1	45	42	2.5	0.60

1980	302.5	417.8	44.0	3.0	45	43	2.0	0.66
1981	248.2	3235.2	44.0	3.0	46	43	2.2	0.80
1982	286.0	3099.6	44.0	3.0	46	43	2.4	0.86
1983	279.6	2823.3	45.0	3.0	46	44	2.9	1.06
1984	190.2	2715.1	45.0	3.0	46	43	1.9	1.25
1985	223.9	2948.9	45.0	3.0	46	44	1.7	1.34
1986	360.4	2926.0	45.0	3.0	46	45	2.2	1.42
1987	236.4	2831.8	45.0	3.0	46	47	1.1	1.58
1988	443.2	2971.0	45.0	3.0	46	48	1.6	2.43
1989	452.6	3103.0	45.0	3.0	46	50	1.1	3.66
1990	658.1	4842.7	45.0	3.0	46	52	1.1	3.93
1991	757.0	3286.5	44.9	3.2	46	51	1.1	4.44
1992	1025.4	3293.8	44.9	3.2	46	54	1.1	6.43
1993	2684.5	3265.4	44.9	3.2	46	55	1.4	10.10
1994	3027.8	3211.4	44.9	3.2	46	56	1.9	15.86
1995	5060.9	3205.9	44.9	3.2	46	57	2.0	27.41
1996	4851.5	3261.3	44.9	3.2	46	57	1.4	35.43
1997	5803.0	3276.9	44.9	3.2	46	57	1.4	38.45
1998	11984.3	3292.1	44.9	3.2	46	57	2.5	42.29
1999	16180.0	3254.2	44.9	3.2	46	57	1.7	45.09
2000	18181.8	3333.3	44.9	3.2	47	57	2.6	48.22
2001	44651.5	3407.9	44.9	3.2	47	57	4.4	57.32
2002	63171.2	3480.6	44.9	3.2	47	57	6.2	64.70
2003	39685.5	3719.1	44.9	3.2	48	57	3.2	73.78
2004	59787.4	3867.9	44.9	3.2	48	62	4.2	84.84
2005	71685.4	4020.3	44.9	3.2	49	63.1	3.9	100.00
2006	105590.0	4157.9	41.3	4.1	49	57.2	5.4	108.24
2007	116628.8	4314.6	43.5	4.0	50	66.9	4.8	114.07
2008	136902.5	4460.5	44.0	3.0	50	66.9	4.2	127.27
2009	132876.2	4653.6	44.0	3.0	51	66.9	3.8	141.96
2010	149269.8	4901.1	44.0	3.0	51	61.3	3.6	161.43
2011	271303.9	5133.3	44.0	3.0	52	56.9	5.8	178.93
2012	242906.3	5225.1	44.0	3.0	52	61.3	5.3	200.79

Sources: Central Bank of Nigeria (CBN) Statistical Bulletin (2005, 2009, 2011 and 2012).

National Bureau of Statistics (NBS) publications (Various Issues) (2006, 2007 and 2012). World Bank, World Development Indicators (WDI). www.indexmundi.com, www.kushnirs.org, www.unesco.org

In Nigeria, health is regarded as a public good. Unfortunately, the percentage of total Federal Government expenditures devoted to health has been ridiculously low. On the average, between 1970 and 1974, health expenditures accounted for 3.7 percent of total expenditure. Between 1975 and 1999, averagely the total share was less than 2.5 percent of total government expenditure. The reduction could be related to the IMF loan conditionality which mandated the Federal government to cut down on the expenditures on social amenities. However the share of health expenditures rose to 6.2 percent in 2002, decreased to 3.2 percent in 2003 but later rose to 5.8 percent in 2011. As at 2012, the share was 5.3 percent (CBN,2012).

However, the highest share of health expenditure in total expenditures (6.2 percents in 2002) is far behind the World Bank prescribed minimum of 15 percent of government budgetary allocation. Nonetheless, data from different issues of CBN statistical bulletin revealed that government expenditures on health have been on the increase. Total health expenditures rose from N38.8 million in 1970 to ₦302.5 million in 1990 and by 2012, it rose to ₦2,429,006.3. Among other things, a greater percentage of total health expenditures have been devoted to capital expenditures over the years.

From fig. 1, there was no noticeable growth in budgetary allocation to recurrent health expenditure between 1970 and 1974 when it oscillated between ₦ 12.5 million and ₦ 16.3 million. By 1975, it moved up to ₦ 109.5 million in 1977 but crashed down to ₦ 72.9 million in 1978. Recurrent health expenditure showed zigzag movement 1979 and 1984. However, it rose to ₦ 167.7 million in 1985 and has since been increasing up to date though not on a smooth basis. Nevertheless, it fell to ₦ 197, 900.6 by 2012.

Similar pattern was observed for capital health expenditures (fig 2). In the early 70s, a higher percentage of government health expenditure was devoted to capital health expenditure. On the average, about 70 percentage of total health expenditure was allocated to capital project between 1970 and 1976. However, the situation changed thereafter when recurrent expenditure took the largest share as from 1980 till date.

The share of health expenditure in total expenditures has been uneven. The share ranged between 2.0 percent and 3.9 percent between 1970 and 1983. The share oscillated between 1.1 percent and 2.6 percent between 1984 and 2000. However, the share increased and ranged between 3.2 percent and 6.2 percent between 2001 and 2012.

Fig 1: Growth of Recurrent Expenditure

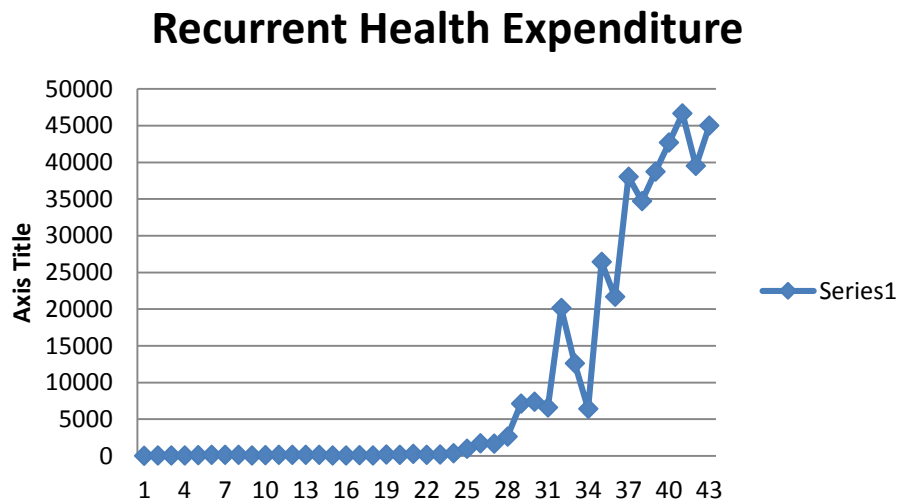


Fig 2:

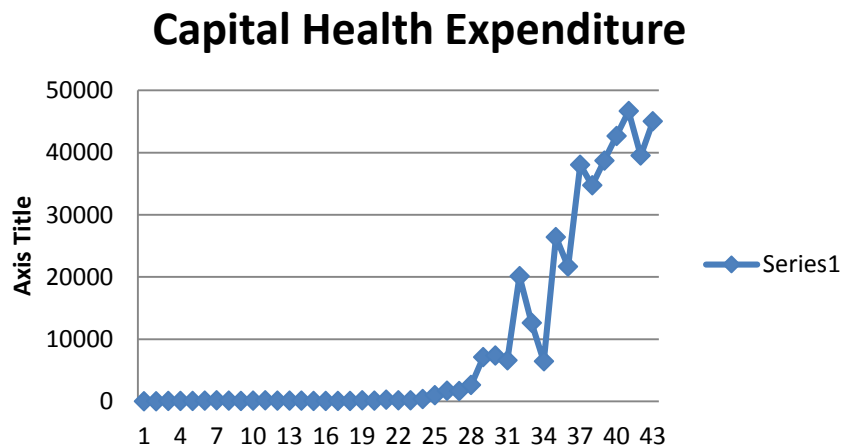


Fig 3:

Capital & Recurrent Health Expenditure

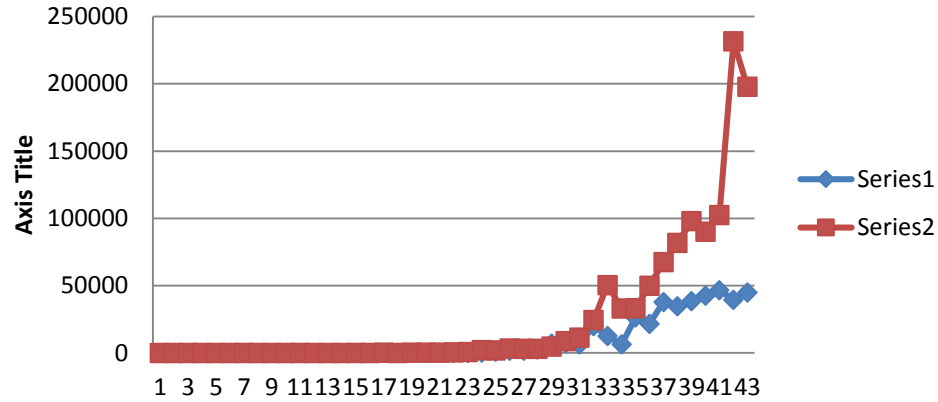
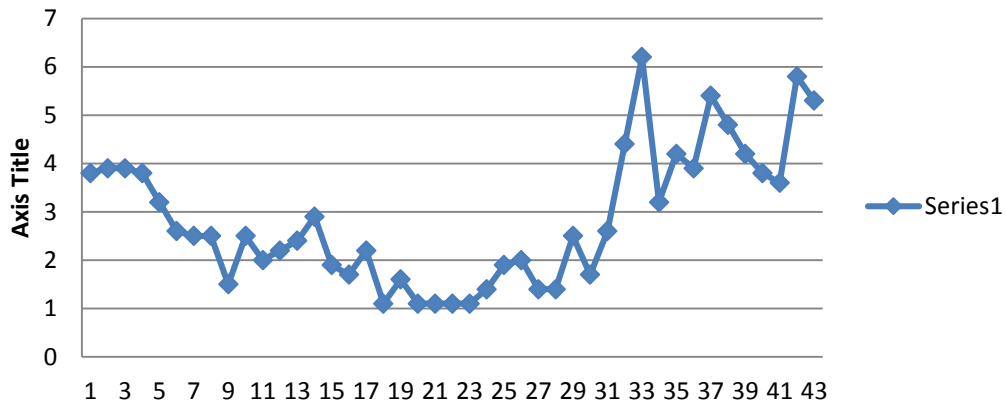


Fig 4:

Health Expenditure Share in Total Government Expenditure



Unit Root Test

The Augmented Dickey-Fullers unit root test is shown in table II below.

Table 1: Augmented Dickey-Fuller (ADF) Unit Root Test at Level

Variable	Test Statistic	5% Critical level	Level	Remarks
THE	/-0.422770/	/-2.93391	I(o)	Non-stationary
PCGDP	/-2.7353521/	-2.9339/	I(o)	Non-stationary
TPY	/-2.304258/	-2.9339	I(o)	Non-stationary
TPA	/-3.524086/	-2.9339	I(o)	Stationary
LR	/-1.129800/	-2.9339	I(o)	Non-Stationary
TGHE/TKE	/-143630/	-2.9339	I(o)	Non-Stationary
CPI	/-0.553837/	-2.9339	I(o)	Non-Stationary

The ADF test shows that only TPA was stationery at level showing that it was not characterized by unit root problem. All the other variables were non-stationery at level. Hence they were subjected to further test.

Table 2: Augmented Dickey Fuller (ADF) unit Root Test at First Difference

Variable	Test Statistic	5% Critical Level	Order of Integration	Remarks
TGHE	-5.325701	-2.9358	1(1)	Stationary
PCGDP	-4.685579	-2.9358	1(1)	Stationary
TPY	-5.602476	-2.9358	1(1)	Stationary
LER	-3.730489	-2.9358	1(1)	Stationary
LR	-4.8430016	-2.9358	1(1)	Stationary
TGHE/TGE	-5.373773	-2.9358	1(1)	Stationary
CPI	-3.935460	-2.9358	1(1)	Stationary

Table 2 showed that all the variables were stationary at first difference. By implication, they were not characterized by unit problem.

Given that all the variables were stationary at first difference, the test for co integration among the variables was conducted using the Johansen co-integration test. This test was used to determine the long run relationship among the variables. Here the null hypothesis of no co integration was tested against the alternative hypothesis of full co integration. The null hypothesis is rejected if values of the likelihood Eigen value test are greater than the critical values at a chosen level of significance. The co-integration test is a presented below.

Table 3: Johansen co-integration Result

Eigen Values	Likelihood Ratio	5% Critical Values	Hypothesized no. of CE
0.781240	221.0966	156.00	None
0.676389	158.7857	124.24	At most 1
0.651559	112.5289	94.15	At most 2
0.474620	69.30309	68.52	At most 3
0.357220	42.91408	47.21	At most 4
0.261570	24.79404	29.68	At most 5
0.190065	12.36167	15.41	At most 6
0.086711	3.718808	6.65	At most 7

The cointegration test presented in Table 3 showed that there are four co-integrating equations at 5% significance level. The implication is that there is long run relationship between total government health expenditures and the independent variables in the model. Next step is to examine the marginal impacts of GDP per capita, population, life expectancy rate, literacy rate, consumer price index on total government health expenditure using ordinary least square.

Regression Results

The results of the ordinary Least Square (OLS) multiple linear regression is as presented below:

The OLS results showed that all the variables were positively signed according to economic a prior expectation except total population of 14 years and below (TPY). With this, an increase in total population aged 14 below will lead to a decrease in total government expenditures. This contradicts economic a prior expectation as increase in population of children should naturally increase government expenditure on the provision of drugs and immunization for children. The reason for this could be that little attention is paid to budgetary allocation to this section of the population during the period under review. However, this variable is insignificant as confirmed by earlier studies (Di Mabteo and R.D. Mattw,1998 and Agbatosun and Taiwo,

2010). The result also contradicted findings by Imoughese and Ismaila (2013) whose study showed the variable as a significant determinant of health expenditure between 1986 and 2010.

Table 4: OLS Regression Results.

Variable	Coefficient	Std Error	t-Statistic	Prob.
Constant	1.901268	11.35910	0.167393	0.8680
PC GDP	0.150297	0.191753	0.783803	0.4384
TPY	-4.949714	5.196361	-0.952535	0.3474
TPA	0.220234	1.365871	0.161242	0.8728
LER	0.352191	3.144276	0.112010	0.9115
LR	4.346784	1.997438	2.176180	0.0364
THE/TGE	1.030167	0.241342	4.268495	0.0001
CPI	0.691307	0.168420	4.104653	0.0002
R ² :			0.979556	
Adjusted R ² :			0.975468	
S.E. of regression:			0.188922	
Sum squared resid:			1.249200	
Log Likelihood:			15.06763	
DW:			1.609557	
Mean dependent variable:			3.319302	
S.D dependent variable:			1.206183	
Akaike into criterion:			- 0.328727	
Schwarz criterion:			- 0.001062	
F-statistic:			239.5761	
Prob(F-statistic):			0.000000	

The per capita Gross domestic product (proxy for income), though positively signed, was statistically insignificant as observed by earlier studies Miniar and Hammami, 2013; Xu ke et ai,2011, and Tang (2010). Furthermore, the study revealed an income elasticity less than one implying that health is income inelastic and by implication that health was a necessity in Nigeria during the period covered by the study.

Life expectancy rate and total population of age 65 years and above were positively related to total government health expenditures but insignificant in determining the size of public expenditures on health. The absolute values of these variables were significantly less than one showing that government spending has little or no bearing with life expectancy and the aged population. Presently, there are little or no special health packages for the aged in Nigeria except in few states.

The regression results, however, showed literacy rate, proportion of health expenditure in total government expenditure and consumer price index as significant determinants of government health expenditure within the study period in Nigeria. These variables also confirmed with a prior expectation as they were positively signed. Public expenditure on health was shown to be a significant component of total government expenditures. This is a confirmation of Wagner’s theory of ever increasing public expenditures that specified that as development proceeds, expenditure on social service will increase.

The coefficient of determination (R²) showed that 97 percent variation in total government health expenditures during the period under study was explained by the independent variables identified in the model.

The F-statistic showed that the explanatory variables were important determinants of government health expenditure in Nigeria. The DW statistic showed absence of autocorrelation among the explanatory variable in the model.

Pairwise Granger Causality Test
Table 5: Pairwise Granger Causality Tests

Date: 04/09/14 Time: 12:33

Sample: 1970 2012

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
GDPPC does not Granger Cause THE	41	0.00387	0.99614
TGHE does not Granger Cause GDPPC		0.21707	0.80592
TPY does not Granger Cause THE	41	0.39852	0.67423
TGHE does not Granger Cause TPY		0.39122	0.67907
TPA does not Granger Cause THE	41	1.19341	0.31490
TGHE does not Granger Cause TPA		3.94077	0.02834*
LER does not Granger Cause THE	41	1.33736	0.27527
TGHE does not Granger Cause LER		3.35353	0.04618*
LR does not Granger Cause THE	41	2.25660	0.11932
TGHE does not Granger Cause LR		0.46074	0.63449
HESTGE does not Granger Cause THE	41	2.86352	0.07013
TGHE does not Granger Cause HESTGE		2.62163	0.08651
CPI does not Granger Cause THE	41	3.61857	0.03698*
TGHE does not Granger Cause CPI		0.25868	0.77349
TPY does not Granger Cause GDPPC	41	1.06973	0.35375
GDPPC does not Granger Cause TPY		0.50498	0.60773
TPA does not Granger Cause GDPPC	41	0.14519	0.86536
GDPPC does not Granger Cause TPA		1.24488	0.30007
LER does not Granger Cause GDPPC	41	1.88604	0.16635
GDPPC does not Granger Cause LER		5.21029	0.01030*
LR does not Granger Cause GDPPC	41	0.18955	0.82816
GDPPC does not Granger Cause LR		1.56120	0.22376
HESTGE does not Granger Cause GDPPC	41	0.52512	0.59595
GDPPC does not Granger Cause HESTGE		0.44975	0.64132
CPI does not Granger Cause GDPPC	41	0.15834	0.85415
GDPPC does not Granger Cause CPI		1.61413	0.21314
TPA does not Granger Cause TPY	41	0.62252	0.54227
TPY does not Granger Cause TPA		6.46500	0.00399**
LER does not Granger Cause TPY	41	0.66810	0.51892
TPY does not Granger Cause LER		3.78071	0.03233*
LR does not Granger Cause TPY	41	0.42597	0.65638
TPY does not Granger Cause LR		5.30240	0.00959**
HESTGE does not Granger Cause TPY	41	1.19721	0.31378
TPY does not Granger Cause HESTGE		0.50566	0.60733
CPI does not Granger Cause TPY	41	0.39961	0.67352
TPY does not Granger Cause CPI		1.03805	0.36450
LER does not Granger Cause TPA	41	0.77847	0.46668
TPA does not Granger Cause LER		0.23982	0.78801

LR does not Granger Cause TPA	41	3.63679	0.03643*
TPA does not Granger Cause LR		6.80860	0.00311**
Table 5 contd.			
HESTGE does not Granger Cause TPA	41	0.03403	0.96657
TPA does not Granger Cause HESTGE		0.32273	0.72624
CPI does not Granger Cause TPA	41	3.16217	0.05430
TPA does not Granger Cause CPI		0.09333	0.91111
LR does not Granger Cause LER	41	1.28571	0.28884
LER does not Granger Cause LR		0.16549	0.84812
HESTGE does not Granger Cause LER	41	4.60568	0.01656*
LER does not Granger Cause HESTGE		1.48362	0.24035
CPI does not Granger Cause LER	41	1.95227	0.15669
LER does not Granger Cause CPI		0.86501	0.42962
HESTGE does not Granger Cause LR	41	0.31705	0.73031
LR does not Granger Cause HESTGE		2.93940	0.06570
CPI does not Granger Cause LR	41	2.27502	0.11738
LR does not Granger Cause CPI		2.53342	0.09345
CPI does not Granger Cause HESTGE	41	2.93049	0.06620
HESTGE does not Granger Cause CPI		2.03936	0.14488

*(**) denotes rejection of the null hypothesis of no causality

The Pairwise Granger causality test was used to identify the direction of causality among the variables. The results as presented in Table 5 showed the existence of a uni-directional casualty that runs from total government health expenditure to: Total population of age 65 and above (TPA); life expectancy rate; from per capital GDP to life expectancy rate, total population aged 14 years and below to population age 65 years old above, from health expenditure share in total government expenditure to life expectancy rate. On the other hand, there existed a bi-directional causality between population age 65 years and above and literacy rate.

5. Summary, Conclusion and Recommendation

The study examined the determinants of government health expenditure in Nigeria between 1970 and 2012. Focus was on the analysis of government health expenditure during the specified period, the determinants of and the direction of causality between government health expenditure and the specified independent variables. Data was sourced from various issues of Central Bank of Nigeria publication, National Bureau of statistic and World Bank publication. The Data sourced was analyzed with the aid of descriptive statistics and the Ordinary Least square. Other tests included the Augmented Dickey-Fuller (ADF) unit root test, Johansen co-integration test and the Pair Wise Granger causality test.

Findings from the study showed that:-

- All the variables were stationary at first difference implying that they were not characterized by unit root problem;
- Long run relationship existed between total government expenditures on health and the independent variables in the model;
- All the independent variables were positively related to total government health expenditures except total population of age 14 and younger;

- Per capita GDP, TPY, TPA and LER are not significant determinants of the size of the public expenditures on health;
- Literacy rate, share of health expenditure in total government expenditures and consumer price index were significant factors in public health expenditure and
- There was existence of uni-directional and bi-directional causality for some variables while for others variable, there was no causality.

From the above findings., the study hereby concludes that health is a necessity in Nigeria and that government health expenditure is majorly determined by literacy rate (proxy for education), share of health expenditure in total government expenditure and consumer price index in Nigeria within the study period. It is therefore recommended that the share of health expenditures in total government expenditure should be increased at least to conform to the W.H.O. specified 15 percentage of annual budgetary allocation. Moreover, there is need to place higher premium on the health needs of total population aged 14 years and below and that such funds be properly managed to reach the target population.

References

- Abbas, F and Hiemenzi (2011). Determinant of Public Health expenditures in Pakistan. 2EF –Discussion papers on Development Policy No158, center for Development Research, Bonn.
- Bakare, As and Olubokun S(2011). Health care Expenditure and Economic growth in Nigeria: An Empirical study. *Journal of Emerging Trends in Economics and Management Science (JETEMs)* 2(2): 3 – 87.
- Bloom David and David Canning (2003). Health and poverty of Nations: From Theory to practice. *Journal of Human Development.* 2(1): 47-71.
- Bloom D.E, Canning D, Sevilla, J(2001) The effect of Health on Economic Growth: Theory and Evidence. Working paper 8587, National Bureau of Economic Research, Cambridge.
- Boyacioglu, E.(2012) The importance of health expenditure on sustainable Development. *International Journal of Social Science and Humanity studies* 4(2): 147- 158.
- Culyer, T.J, (1990). The Internal Market: An Acceptable means to a Desirable End. Working papers 067 chedP, University of York, Centre for Health Economics.
- Gerdtham, U & Lothgren, M (2000). On stationarity and co-integration of International health expenditures and GDP. *Journal of Health Economics,* 19,461-475.
- Hansen, P and King Alan (1996). The determinants of health care expenditure: A cointegration approach. *Journal of Health Economics* 15:127-137.
- Hitiris T and J. Posnett (1992) The Determinants and Effects of Health Expenditures in Developed countries. *Journal of Health Economics.* 11, 173 – 181.
- Imoughele, L.B. and Ismaila, M. (2013). Determinant of Public Health care Expenditure in Nigeria: An Error correction Mechanism Approach. *International Journal of Business and Social Science.* 4(13): 220 – 233.
- Kehinde Kabir Agbatogun and Abayomi Samuel Taiwo (2010) Determinant of Health Expenditure in Nigeria. *Journal of Research in National Development.* 8(2), 1-9.
- Kleiman, E(1974). The determinants of National outlay on health in Miniar B & S Hammanu (2013) *IOSR Journal of Pharmacy* 3(4),41-45.
- Matteo Livio D1. The Macro determinants of Health expenditure in the United States and Canada: assessing the impact of income, age distribution and time. *Health policy,* 71:23-42.
- Miniar Ben Ammar Sghari and Sami Hammami (2013). Relationship between Health Expenditure and GDP in Developed countries. *IOSR Journal of Pharmacy* 3(4), 41-45.

- Muhammed A, and Khan, F.J.(2007) Health care service and government spending in Pakistan, PIDE working paper 32.
- Newhouse, J.P (1977). Medical – care expenditure: a cross National survey. The journal of Human Resources ,12(1), 115 – 125.
- Raza, S. A., Ali, Y., & Mehboob, F. (2012). Role of Agriculture in Economic Growth of Pakistan. International Research Journal of Finance and Economics, (83), 180-186.
- Remman, H.B, Basse, J.U and Edu, B.E (2011). Health care Expenditure in Nigeria: Does the level of Government spending really matter? SSRN:<http://ssrn.Com.abstract=15540279>.
- Sen. Anindya (2005) is Health care a luxury? New evidence from OECD Data. International Journal of Health care Finance and Economic. 5(2).147-164).
- Schultz, T.P (1999). Health and schooling Investment in Africa. Journal of Economic perspective. 13: 335 – 337.
- Sidiqu, R,U Afrid, and R,Hag(1995). Determinant of Expenditure on Health in Pakistan.The Pakistan Development Review 34(4), 959-970.
- Tang, C.F. (2010). The determinant of health Expenditure in Malaysia: A time series Analysis. Munich personal REPEc Archive, Paper no 24356.
- United Nations Organization (2012) Report of the United Nations conference on sustainable Development.
- XU Ke, Priyanka Saksena and Alberto Holly(2011). The Determinant of Health Expenditure: A Country - Level panel Data Analysis. World Health Organization working paper, December 2011.