Government Health Expenditure and Health Outcomes in Nigeria: The Challenge to Underdeveloped Economy

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Abstract:-The analysis aimed at examining the impact of government health expenditure on health outcomes in Nigeria. The research employed government health expenditure per capita to proxy government expenditure and neonatal mortality, child mortality and infant mortality rate to proxy health outcomes in Nigeria. Other control variables used in the model include private health expenditure per capita, per capita income, numbers of physician and life expectancy. The unit root result shows that the variables were stationary at first difference. Also, the Engel granger cointegration test carried out shows a long-run relationship among the variables of interest. The result shows that government health expenditure per capita have positive relationship with neonatal mortality rate, child mortality rate and infant mortality rate in Nigeria. Private health expenditure, numbers of physicians and life expectancy shows a negative relationship with neonatal mortality, child and infant mortality rate in Nigeria. The implication of this finding is that private sector has greater influence on health outcomes than the public sector which means that health services will be obtained at a high cost in Nigeria. Also, with the principle of excludability inherent in private sector means that Nigeria cannot achieve social optimal in her health care services. We therefore recommend that there should be proper monitoring of government funds, subsidy to the private sector, improvement in the working conditions of health workers and the provisions of basic necessities to improve health outcomes in Nigeria.

Key words: Government health expenditure, Health outcomes, Neonatal mortality, child mortality and infant mortality.

Jel classification: H51, I14

I. INTRODUCTION

Better health care is a primary human need (Starfield, Shi, and Macinko, 2005). Since 1970's, the non-income dimension of economic performance and development has been promoted through various basic needs and the composite physical quality of life index (Bérenger and Verdier-Chouchane, 2007; Hall, Giovannini, Morrone and Ranuzzi, 2010). In 1990, United Nation Development Planning (UNDP) strongly advocates a similar position in its Human Development Reports (HDRs) which involves a multi-dimensional view of development in Human Development Index (HDI) (Leigh and Wolfers, 2006; Safari and Ebrahimi, 2014). The Millennium Development Goals (MDGs) which was preceded by the international development targets, explicitly adopted a range of social goals including reducing two-third infant and under-five mortality, reduce child mortality, and improve maternal health, eradicate HIV/AIDS, combat malaria and other diseases by 2015 as poverty reduction target(Sachs et al. 2004).

Health is a major problem confronting the less developed countries (LDCs) overtime. The deteriorating health status in LDCs have resulted to over 11 million children's death, and 90 percent of this population are children less than five years (Bokhari, Gai and Gottret, 2007). Child mortality rate in LDCs was estimated to fall between 4 to 300 deaths per 1000 live births. Health challenges in LDCs has reached a challenging state as five diseases – diarrhea, malaria, measles, pneumonia, and HIV/ AIDS – was estimated to account for over 50 percent of child deaths. United Nation (UN, 2004) also estimated that 20 percent of infant mortality occurs within the first week of birth. This was attributed to poor antenatal care and malnutrition in the mother and fetus. The United Nation in the effort to eradicate poverty and proffer solution to disease, malnutrition and extreme hunger made the UN to form a development agenda which is known as the Millennium Development Goals (MDGs) in September 2000. 189 countries subscribed into this development plan, and the plan was targeted to be met in 2015. Some health-related issues contained in the development plan include a target to reduce children by 50%, maternal mortality by 65%, under-five mortality by 75%, and prevalence of underweight etc (UN, 2004).

As noted by Victora et al. (2000), Busse, Aboneh and Tefera (2014), approximately fifty percent in growth differences between the developed and developing countries could be attributed to difference in health outcomes. This therefore implies that health challenges such as low life expectancy and other ill-health problems are responsible for poor output performance, and also responsible for poor economic development in the less developed countries (LDCs) (Stuckler, 2008; Renton, Wall and Lintott, 2012).Busse et al. (2014) further posit that developed countries allots grater part of their income to human capital development, especially health care services, as they believed that human capital development serves as the major factor that influences economic growth and development.

To this end, Nigeria governments in order to enhance human capital development, for the realization of global World Health Organization (WHO)target, had made frantic efforts in increasing health expenditure overtime(Bakare and Sanmi, 2011).In 1970, health carecurrent expenditure was ₦12.48 million. This figure rose geometrically to ₦52.79 million and ₦500.70 million in 1980 and 1990 respectively. This trend continues as the expenditure rose steadily from ₦15.2 billion in 2000 to ₦102.6 billion in 2010 and further increased to ₦236.1 billion 2017 respectively. This clearly shows that Nigerian government had made tremendous effort in improving health care over the years. More also, government capital expenditure on social and community service – which comprises of capital expenditure on education and health – has also been increasing over the years. In 1980, social capital expenditure was ₦1.8 billion. The value increased to ₦2.1 billion in 1990 and further increased to ₦28.0 billion and ₦151.8 billion in 2000 and 2010. In 2017, social capital expenditure was ₦148.0 billion. These also show that effort has been made by the Nigerian government to boost human capital development through health care services.

In particular, spending on primary health care in Nigeria has significantly increased. For instance, expenditure on the National Programme of Immunization (NPI) was ₦9 million in 1998. But as of 2014, the value was given as ₦7.5 billion. Budget allocation for programs meant to control diseases such as guinea worm, malaria, and so on has increased to₦195 million in 2013 budget and further increased to ₦213 billion in 2017 (World Bank 2017). Revenue of Local Government Authorities (LGAs) that are primarily responsible for public spending on primary health care, has increased from an average of 5 percent of GDP between 1990 and 1998, to over 10 percent of GDP in 2011 (Pukuma, 2014).

However, in spite of all these increase in government health expenditure, much impact has not been felt in health outcomes as infant mortality, under five and maternal mortalities are still on the increase in Nigeria. In Nigeria infant mortality rate was estimated at approximately 1 in every10 live births, which put Nigeria among the highest infant mortality rate in the world, compared to 1 in every 4000 live births in North America(Dedini, Odimegwu, Imasiku, Ononokpono, and Ibisomi, 2014; Boulet, Alexande, Salihu and Pass, 2003).Also, child mortality rate – defined as children between the ages of 1 to five years –was also estimated at 192 per 1000 children in this group (Walker, Yenokyan, Friberg and Bryce, 2013). Immunization coverage has dropped below thirty percent while the mortality rate for children under age five is 192 deaths per one thousand (Omotara and Okujagu, 2012). By the year 2007, it was reported that more than one hundred and thirty-four thousand women died from pregnancy complications per annum. The record shows that 109 women died daily from pregnancy and childbirth due to preventable causes. And for each death, there are an estimated 30 to 50 women who will experience life-long conditions and disabilities such as obstetric fistula. In total, that's more than 500 women die each day or face serious and lasting health consequences (WHO, 2017). Although record shows that maternal mortality has decreased overtime, the pace of this reduction has been slower in Nigeria with respect to other nations of the world.

The trend of health deterioration has been of great concern in Nigeria. In 1995, over nine million children under five in developing countries died avoidable deaths. This staggering figure is more than the entire population of Sweden or of Zambia (Filmer and Pritchett, 2001). Accordingly, it has been noted by Jamison and Sandbu (2015) that the World Health Organization ranked Nigerian's overall health system performance as 182th among the 189 members state who subscribed into the development goal of the UN. Nigeria has one of the worst human development indicators especially for women and children in sub-Saharan Africa and indeed the rest of the world(Abrahams, Mchiza and Steyn,2011). The country account for 10% of the world maternal deaths from pregnancy and child birth related causes but only represent 2% of the world population (Cutler, Deaton and Lleras-Muney, 2006).

One of the most fundamental, yet unresolved, issues in the health policy is whether public spending on health yields health benefits, especially in the form of improved health outcomes. Economics considerations, such as the public goods, externalities, catastrophic cost, the failure of the insurance market, and existence of highly cost-effective public health measures, provide a rational for the public provision of health service (Anomaly, 2015). If these considerations were important we would expect to see a strong connection between health spending and productivity. It is this connection that this study seeks to test. The study would note, however, that the public demand for health care, and ethical arguments, in which health can be considered a fundamental good that is required for human capabilities, have also been important driving force for public spending on health (Musgrove 1999) and health care spending may depend on these factors as well as economic efficacy (Anomaly, 2015).

In conclusion, Hogan et al, (2010) attributed the downward spiral movement of the health indicators in Nigeria to the poor medical provision in the delivery of healthcare services and indicate number of qualified health professionals, accompanied by the attendant user charges for all treatments at the Primary Health Care (PHC) institutions. Analyses of the historical decline in childhood mortality rates in today's industrialized countries suggest that important drivers of this decline were employed nutrition, public health, and medical technological progress (Fogel 2008), Cutler, Miller, Deaton and Cutler (2009). Therefore, despite the continuous increased government expenditure over the years, its impacts on productivity had not been felt in Nigeria.

II. EMPIRICAL LITERATURE

Theoretical Literature

Wagner's Theory of Government expenditure

The Wagner's theory of government expenditure was named after the German economist who developed it in his article named the "law of increasing state activities" which focused on the analysis of the activities of Western Europe in the end of the 19th century. The theory posits that government expenditure is a function of increase in industrialization and development. Wagner argued that advancement in industrialization process increases income, which invariably increases the per capita income of the people. The increase in per capital income invariably increases the share of government expenditure as total expenditure increases. The reason being that; as the society advance in development, social vices will also accompany the progress and this put an upward pressure government expenditure. The law cited that "The advent of modern industrial society will result in increasing political pressure for social progress and increased."

In explaining this view, Wagner posits that during industrialization, most private sector activities will be replaced by public sector activities. This will increase the state administrative and defence function. Also, industrialization entails that government provide some basic necessities (which are cultural and welfare services) like education, old age pension or retirement public health, food subsidy, environmental protection, natural disaster aid and other welfare services. Furthermore, industrialization brings about merging of large firms to form monopoly or cartel. Therefore, there is need for the government to increase her expenditure on in providing social and merit goods to offset the monopolistic tendency in such areas.

In his Finanzwissenschaft (1883) and Grundlegung der Politischen (1893), Adolf Wagner takes government expenditure as being determined exogenously, and it is determined by the growth in national income. Hence, the model posits a uni-directional relationship between government expenditure and economic growth.

Peacock and Wiseman Theory of Public Expenditure

This theory was developed in 1967 based on England experience. Peacock and Wiseman posit that increase in government expenditure does not follow the established order of Wagner. The authors decided to use the political proposition rather than the organic state in Wagner and explained that increase in government expenditure emanates from the voting of the citizens for more social services, whereas the people do not want to increase tax increase.

The theory also allows for divergence in voting for public spending and limits of taxation, but these can be narrowed by large-scale disturbances, such as major wars. During these disturbances, the government will plan to rehabilitate the economy back to its previous state. This will necessitate an increase in tax in order to finance the rehabilitation process. At the initial stage, the citizens try to vote against such tax increase as such reduces their disposable income. But later on, the citizens will be accustomed to the new tax system and

government expenditure will increase. After such rehabilitation process, there will be no need for tax cut, and this will make government expenditure to remain high.

Peacock and Wiseman considers the period of displacement as the period that hampered the sovereignty of a state and bestow the expenditure of the state on the central government. The concentration nature of the government will invariably increase the expenditure role of the central government. Hence, this theory is also referred to as the concentration theory of public expenditure.

Classical Theory of Government expenditure

The classical theory was in support of free market system, and believed that government expenditure is harmful to the economy as they believed that the market forces should be allowed to determine the equilibrium level of price and quantity. Adam Smith (1776) advocated laissez-faire, an economy system where profit making drives the forces of economic development. To this school, the economy is always at full employment, and any increase in expenditure will leads to an increase in nominal variables in the economy. An increase in government expenditure increase the money in circulation and since the real variable in the economy is fixed, the increase in government expenditure will leads to an increase in price.

The increase in money as a result of increase in government expenditure with no correspondent increase in output is known as neutrality of money. The assumption here is that the economy is perfect and fee form externalities. The economy is self-adjusting, the budget is always balance as savings equals investment. Hence, with the believed pf full employment equilibrium, there is no need for government expenditure as such will cause a more disequilibrium state.

The Keynesian Model

The Keynesian model of public expenditure, emanated in the early 1930's after the great depression experienced in 1929-30. Keynes opposed the view of the classical school and advocates for government expenditure to increase in order to increase the purchasing power of the hand of the people. The classical was of the view that market failure could be prevented though the abolition of trade union which often opposes price flexibility. Keynes on the other hand favour government to prevent market failure. To Keynes, we cannot rely of the classical long-run relationship, because in the long run, we are all dead. Hence, there is need for short-run model that will bring the economy to its equilibrium state, and there is need for government expenditure to cure for short-run dynamics. To him, saving is a withdrawal from the circular flow, but spending encourages production. He therefore advocates for increase in government expenditure to create more purchasing power in the hand of the people, hence, increases employment. The extent to which government expenditure influences economic growth depends on government expenditure multiplier, and the multiplier depend

on the marginal propensity to consume. Keynes takes government expenditure as exogenous variable that can influence economic growth, and he viewed government expenditure as a crucial factor that determines growth.

Empirical Literature

Some proponents of government expenditure like Levine and Renelt (1992), Barro (1990, 1991) among others have examined the relationship of government expenditure on economic growth. Other researchers have actually examine the linkages between government expenditure and health outcomes. Some of these researchers' empirical works will be discussed below.

Anyanwu and Erhijakpor (2007) examine the impact of government expenditure on health outcomes in Sub Saharan Africa with evidence of the relationship between government expenditure, per capita income and health outcomes in African countries. Using data from 47 Sub Saharan African countries, the researchers found that health expenditure has a significant impact on infant mortality and child mortality in Africa. Hence, the result laid emphasis to the fact that government expenditure is an important factor that influences mortality rate in the region. The model also shows that infant and child mortality has positive relatively related to health outcomes in the region. This finding is a-theoretical.

Novignon, Olakojo, and Nonvignon (2012) examine the impact of private healthcare expenditure on health status using data from 1995 to 2010, and from 44 sub-Saharan African countries. The researchers employed the fixed and random effect model based on the Hausman pre-test result. The result shows that healthcare expenditure has a positive relationship with health outcomes in the region. It shows that public health expenditure has a greater impact on health outcomes than private healthcare expenditure. The researchers conclude that healthcare expenditure improves life expectancy in sub-Saharan African countries.

Boachie and Ramu (2015) in their examination of the relationship between public hearth expenditure and health outcomes in Ghana employed data from 1990 to 2002. Using the Ordinary Least Square (OLS) methodological technique through the Newey-West heteroscedasticity approach, the researcher found that public healthcare expenditure has a negative relationship with infant mortality. Hence, the researchers conclude that health expenditure is an efficient tool in curbing mortality rate in Ghana.

Siddiqi et al. (2014) examine the macroeconomic variables and policy variables that determine health expenditure in Pakistan. The researcher in the quest to examine the impact of health-related variables such as per capita calorie availability and health status on economic development found that in the short-run, government health expenditure is negatively related to health outcome, while in the long-run, elasticity of government expenditure in less than unity. The result also shows that health expenditure is positively related with female life expectancy and negatively related to infant mortality rate.

Ahmed and Hasan (2016) examine the relationship between public health expenditure and governance on health outcomes in Malaysia and employing Autoregressive Distributed Lag (ARDL) cointegration estimation technique and with data from 1984-2009. The result established a long-run relationship between health expenditure and health outcome in Malaysia. Furthermore, the result shows that government health expenditure and corruption adversely affect health outcome in the country. Hence, the researchers emphasized the need for health orientation and reduction in corrupt practices.

Ricci and Zachariad (2006) carried out a panel analysis on the impact of government heath expenditure and health outcomes with evidence from 77 countries from 1961 to 1995. The major aim of this research is to examine the determinants of public health outcomes in a macroeconomic perspective taking into cognizance of health related expenditure, saving and households' choices concerning education. The result shows that education has a positive impact on health outcomes.

Dauda (2004) examines health expenditure and economic growth in Nigeria using the OLS estimation technique. The researcher found that government health expenditure exerts positive relationship with economic growth in Nigeria.

Some researchers also found a negative relationship between government health expenditure and health outcomes. Issa and Ouattara (2005) examine the impact of health expenditure by disaggregating government expenditure into private and public expenditure and also divided the country into two groups according to the level of income (or the level of development). Using a panel of 160 countries, their result shows a negative relationship between government expenditure and health outcomes.

Paxson and Scady (2005) found a negative relationship between government expenditure and infant mortality in Peruvian after the crisis. The researcher found that during the crisis, gross GDP fell by 30% between 1987 and 1990. They equally found that public health expenditure fell by 58% and this led to a rise in infant mortality in this period. Therefore, the researchers conclude that government health expenditure has an impact on health outcome.

Nixon and Ulmann (2006) also provide a panel analysis of the impact of government expenditure on health outcomes using 16 countries form the EU. The researchers found that government health expenditure and the number of physicians have a positive impact in reducing infant mortality rate.

Harttgen and Misselhorn (2006) in their study examine the impact of government expenditure on health outcome. The researchers found that health infrastructure – medical infrastructure – has a positive impact in reducing infant

mortality. The researchers also found that socioeconomic factors are the determinant of health outcomes.

Gottret and Schieber (2006) in their analysis of the impact of government health expenditure on health outcomes examine it using 81 countries from low and middle-income countries. The researchers found that government expenditure has a greater impact in reducing infant mortality and under-five mortality than a ten percent increase in education expenditure, but a smaller impact on maternal mortality.

III. METHODOLOGY

This model will be an extension of Keynesian impact of government expenditure. The Keynesian argument of the of government health expenditure postulated that government expenditure is necessary to prevent market failure. This market failure is mostly viewed in the area of education, health and other public goods. In this research, government per capital health expenditure will be used to access the impact of government health expenditure on infant, child and neonatal mortality rate in Nigeria. The model will adopt ordinary least square (OLS) methodological approach and with variables such as government health expenditure per capital, private health expenditure per capita, per capita income, numbers of physician per 1000 population and life expectancy. The analytical models for this work are stated as:

$$NMR_t = \beta_1 + \beta_2 GHEPC_t + \beta_3 PHEPC_t + \beta_2 PCI_t + \beta_2 NPH_t + \beta_2 LEX_t + \mu_t \qquad --(1)$$

$$CMR_t = \beta_1 + \beta_2 GHEPC_t + \beta_3 PHEPC_t + \beta_2 PCI_t + \beta_2 NPH_t + \beta_2 LEX_t + \mu_t \qquad --(2)$$

$$IMR_t = \beta_1 + \beta_2 GHEPC_t + \beta_3 PHEPC_t + \beta_2 PCI_t + \beta_2 NPH_t + \beta_2 LEX_t + \mu_t \qquad --(3)$$

Where:

NEO, CMR and IMR (the dependent variables) represent neonatal mortality rate, child mortality rate and infant mortality rate. $GHEPC$ is the variable for government health expenditure per capita and the a priori expectation for this variable should be negative, as increase in government expenditure should bring a reduction in Neonatal, child and infant mortality rate. $PHEPC$ represent private health expenditure per capita. An increase in this variable should also lead to a decrease in Neonatal, child and infant mortality rate. PCI is per capita income, and an increase in this variable should also lead to a decrease in Neonatal, child and infant mortality rate. NPH is the numbers of physician, and this should lead to a reduction in Neonatal, child and infant mortality rate. Lastly, LEX is life expectancy and an increase in life expectancy should lead to a decrease in Neonatal, child and infant mortality rate.

IV. RESULT

Unit Root Test

It is important for us to identify the nature of the variables of interest. We have to identify the order of integration of these variables. In order to ascertain the order of integration of these variables, we employed the double check of augmented Dickey-Fuller and the Phillips-Perronunit root test. This result is presented below.

Table 1: Augmented Dickey-Fuller and Phillips-Perron Unit Root Result

Variables	ADF Stat.	5% Critical V	Prob.	PP Stat.	5% Critical V	Prob.
Test at level						
NMR	-2.851	-2.966	0.6278	-1.284	-2.966	0.5765
IMR	-0.580	-2.969	0.8755	-1.032	-2.969	0.7415
UMR	-0.578	-2.969	0.8758	-1.040	-2.969	0.7383
GHEPC	-1.687	-2.966	0.4378	-1.723	-2.966	0.4192
PHEPC	-1.231	-2.966	0.6603	-1.222	-2.966	0.6642
PCI	-0.162	-2.966	0.9428	-0.329	-2.966	0.9214
NPH	-1.025	-2.966	0.7439	-1.015	-2.966	0.7479
LEX	-1.012	-2.969	0.7489	-1.195	-2.969	0.6759
Test at First Difference						
NMR	-3.858	-2.972*	0.0024	-3.962	-2.972*	0.0016
IMR	-2.984	-2.972*	0.0401	-2.994	-2.972*	0.0405
CMR	-2.993	-2.972*	0.0443	-2.997	-2.972*	0.0445
GHEPC	-5.401	-2.969*	0.0000	-5.369	-2.969*	0.0000
PHEPC	-6.928	-2.969*	0.0000	-6.887	-2.969*	0.0000
PCI	-4.632	-2.969*	0.0001	-4.678	-2.969*	0.0001
NPH	-3.845	-2.969*	0.0025	-3.761	-2.969*	0.0033
LEX	-3.171	-2.972*	0.0067	-3.171	-2.972*	0.0054

Where * indicates the level of significance

The unit root result presented above shows that none of the variables were stationary at the level form both in ADF and Phillips-Perron test; but were all stationary in their first difference. This is a necessary step to proceed in the analysis. Hence, we conclude that neonatal mortality rate, infant mortality rate, child mortality rate, government health expenditure per capita, private health expenditure per capita, per capita income, number of physician and life expectancy are all stationary at first difference.

Cointegration Result

The cointegration test will be used to examine whether there is a long-run relationship between the variables of interest in the model. The Engel – Granger cointegration test will be used in this analysis

Table 2: Cointegration result for the three models

Model	ADF Stat.	5% Critical Value	Prob.
Model 1	-5.136	-2.969*	0.0000
Model 2	-6.402	-2.969*	0.0000
Model 3	-6.257	-2.969*	0.0000

Where * indicate cointegrating model.

The result presented in table 2 above shows that all the variables of interest have long-run relationship. Hence, we proceed to analyze the model.

Impact of Government Health Expenditure on Neonatal Mortality Rate

This section is devoted to analyze the impact of government health expenditure on health outcomes in Nigeria. the result is presented in the table below.

Table 3: The result of the impact of government health expenditure on neonatal mortality rate

Variables	Coefficient	t – value	Prob.
C	122.0222	14.98*	0.000
GHEPC	0.0580447	2.35*	0.025
PHEPC	-0.0261653	-2.81*	0.008
PCI	-0.0003428	-0.60	0.550
NPH	-20.80533	-2.91*	0.006
LEX	-1.430384	-7.16*	0.000

Where * indicates the variables that are significant at 5%

Thus,

$$NMR = 122.02 + 0.058GHEPC - 0.026PHEPC - 0.00PCI - 20.81NPH - 1.43LEX$$

The result presented above shows that holding other variables constant, the average neonatal mortality rate in Nigeria is 122 per 1000 maternal birth. Government health expenditure shows a positive and significant relationship with neonatal mortality rate. This is a theoretical, as the result shows that an increase in government health expenditure per capita also leads to an increase in neonatal mortality rate. This is akin to the fact that government health expenditure is not well utilized to achieve its aim – probably due to corruption. Private health expenditure per capitashows a negative relationship with neonatal mortality rate. This variable conformed to its a priori expectation as the result shows that an increase in private per capita health expenditure is efficient in reducing infant mortality in Nigeria. The result also shows that for a ₦100 increase in private health expenditure per capital will leads to a decline in neonatal mortality by 2 persons per 1000.

Per capita income shows a negative but insignificant relationship with neonatal mortality rate. The numbers of physicians per 1000 patient shows a negative relationship with neonatal mortality. This variable conformed to its theoretical expectation, and it shows that for every unit increase in the numbers of physician will leads to a decline in neonatal mortality rate by 40 per 1000 neonatal mortality death. Furthermore, life expectancy also shows a negative relationship with neonatal mortality rate. The result shows that for a one-year increase in life expectancy, also means approximately, one per 1000 decline in neonatal mortality rate.

Impact of Government Health Expenditure on Child Mortality

This section will be used to access the impact of government health expenditure on child mortality. The result is presented in the table below.

Table 4: Impact of government health expenditure on child mortality in Nigeria

Variables	Coefficient	t – value	Prob.
C	717.4948	11.26*	0.000
GHEPC	0.3445115	2.46*	0.020
PHEPC	-0.1799289	-3.40*	0.002
PCI	0.008024	1.55	0.130
NPH	-196.5405	-3.73*	0.001
LEX	-10.6127	-6.72*	0.000

Where * indicates the variables that are significant at 5%

Thus,

$$CMR = 717.49 + 0.345GHEPC - 0.18PHEPC + 0.01PCI - 196.54NPH - 10.61LEX$$

The result presented above shows that holding other factors that influences child mortality constant, average child mortality rate is 717 per 1000 live births. This figure is higher than its values in the real sense. Also, government health expenditure per capita shows a significant positive relationship with child mortality rate this therefore shows that for a ₦10 increase in per capita government health expenditure will also lead to increase in child mortality by 3 per 1000. This also buttresses the fact that there is a wrong channeling of government expenditure. Unlike government health expenditure per capita, private health expenditure per capita shows a significant negative relationship with child mortality. The result shows that for a ₦10 increase in PHEPC, child mortality will decline approximately by 2 children per 1000. Per capita income also shows insignificant but negative relationship with child mortality rate.

Numbers of physician shows a highly negative relationship with child mortality rate. The result shows that an increase in the numbers of physician by 1 physician per 1000 population reduces child mortality rate by approximately 197 per 1000 children. Lastly, life expectancy also shows a negative relationship with child mortality rate in Nigeria. The result shows that for a year increase in average life expectancy rate in Nigeria leads to the reduction in child mortality rate by 11 children per 1000 live birth.

Impact of Government Health Expenditure on Infant Mortality

This section will be used to examine the impact of government health expenditure per capita on infant mortality rate in Nigeria. The result for this objective is presented in table 5 below.

Table 5: Impact of government health expenditure per capita on infant mortality rate in Nigeria

Variables	Coefficient	t – value	Prob.
C	404.6657	11.68*	0.000
GHEPC	0.1827224	2.31*	0.027
PHEPC	-0.0939045	-3.22*	0.003
PCI	0.0044395	1.59	0.122
NPH	-106.1175	-3.71*	0.001
LEX	-5.872814	-6.84*	0.000

Where * indicates 5% level of significant

Thus,

$$IMR = 404.7 + 0.183GHEPC - 0.094PHEPC + 0.004PCI - 106.12NPH - 5.873LEX$$

The result presented above shows that the average child mortality rate is approximately 405 per 1000 live births. As portrait in neonatal mortality and child mortality rate, government health expenditure per capita also shows a positive relationship with infant mortality rate. Hence, government health expenditure per capital does not conformed to its a priori expectation, which might be attributed to corruption and wrong channeling of public fund. Private health expenditure per capita shows a significant negative relationship with infant mortality rate. The result further shows that for every ₦10 increase in per capita health expenditure in the private sectorleads to approximately 1 per 1000 decline in infant mortality. Per capita income does not show a significant relationship with infant mortality rate in Nigeria.

The numbers of physician per 1000 population also a significant negative relationship with infant mortality rate in Nigeria. The result shows that a unit increase in the numbers of physician per 1000 population will bring about 106 declines in infant mortality per 1000 live births. Finally, life expectancy also shows a negative relationship with infant mortality rate in Nigeria. The result shows that a year increase in life expectancy in Nigeria will reduce infant mortality by approximately 6 per 1000 live births.

V. POLICY IMPLICATIONS OF RESULT FINDINGS

The analysis aimed at examining the impact of government health expenditure on health outcomes in Nigeria. From the analysis presented above, we observed that government health expenditure per capita exert positive relationship with neonatal mortality rate, child mortality rate and infant mortality rate in Nigeria. The implication of this finding shows that there is misappropriation of funds to its rightful places. The a priori expectations of this variable should be negative, but the positive result akin to the fact that government health expenditure are not well managed to realized its stated goals. Hence, there should be a proper management of public fund in the health sector.

Furthermore, private health expenditure shows a negative relationship with neonatal mortality, child and infant mortality rate in Nigeria. This buttress the fact that private sector is more efficient that the public sector. The implication of this finding is that private sector has greater influence on health outcomes which means that health services will be obtained at a high cost in Nigeria. The principle of excludability at work in this sector means that Nigeria cannot achieve social optimal in her health care services.

More also, numbers of physician show a negative relationship with neonatal, child and infant mortality rate in Nigeria. The result affirmed to the fact that an increase in the numbers of physician will improve health outcomes in Nigeria. But the recent problem of health workers migration due to poor working conditions, salary and other benefits should be addressed in order to achieve meaningful health outcomes in Nigeria. Lastly, life expectancy also shows a negative relationship in all the models. This means that the improvement in overall health status of the citizens is a prerequisite in achieving good health outcomes in Nigeria.

VI. SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

In summary, this analysis examines the impact of government health expenditure on health outcomes in Nigeria. The research employed government health expenditure per capita to proxy government expenditure and neonatal mortality, child mortality and infant mortality rate to proxy health outcomes in Nigeria. Other control variables used in the model include private health expenditure per capita, per capita income, numbers of physician and life expectancy.

Unit root test was carried out to examine the order of integration of these variables using augmented Dickey-Fuller (ADF) test statistics and Phillips-Perron test statistics.The unit root test shows that all the variables were integrated of order one. Also, Engel-Granger cointegration test was conducted to examine the long-run relationship in the models. The result also affirmed a long-run relationship among the variables of interest.

The result of the analyses shows that government health expenditure has positive relationship with neonatal mortality, child mortality and infant mortality rate in Nigeria. Furthermore, private health expenditure per capita show a negative relationship with neonatal mortality, child mortality and infant mortality rate in Nigeria. Per capita income does not show any significant impact on health outcomes within the period of study. More also, numbers of physicians and life expectancy shows a negative relationship with health outcomes in Nigeria

Conclusion

In conclusion, we affirmed that government health expenditure does not improve health outcomes in Nigeria, as

its impact tends to lead to a more deteriorating state. Private health expenditure on the other hand has a greater impact on health outcomes in Nigeria. We also conclude that health workers have a greater impact on health outcomes in Nigeria; and increase in life expectancy is a panacea for health outcomes in Nigeria. Lastly, we conclude that per capita income has no impact on health outcomes in Nigeria, probably because an increase in per capita income does not actually means a spread in income, as the realized income can be with the few 'high class' of the society.

Recommendations

Based on the above findings, we recommend the following policies that could help in achieving a meaningful health outcome in Nigeria.

Firstly, the Nigeria government must undertake a measure for proper monitoring of funds allocated to the health sector. There should be a rechanneling of funds in providing health care facilities through the increase in capital expenditure to the heath sector rather than the increase in recurrent expenditure as currently experienced in the country.

Secondly, we recommend that there should be an increase in government social expenditure in form of subsidy to the private sector to enhance their services, as the sector proves to be efficient in improving health outcomes in Nigeria.

More also, we recommend that proper remunerations of health workers, provisions of more facilities, improvement in general working conditions as well as the employment of more capable hands in the health sector is necessary in achieving sound health outcomes in the country. Hence, the government must take drastic effort in improving the working conditions of health workers.

Lastly, we recommend the improvement in the provisions of clean environment, good water, access to primary health care facilities etc. that can improve the life expectancy of Nigerian citizens as this proved to improves the health outcomes in Nigeria.

REFERENCE

[1]. Abrahams, Z., Mchiza, Z., & Steyn, N. P. (2011). Diet and mortality rates in Sub-Saharan Africa: Stages in the nutrition transition. BMC Public Health, 11(1). doi:10.1186/1471-2458-11-801

[2]. Ahmad, R & J. Hasan (2016), Public Health Expenditure, Governance and Health Outcomes in Malaysia, JurnalEkonomi Malaysia 50(1): 29-40.http://dx.doi.org/10.17576/JEM-2016-5001-03

[3]. Anomaly, J. (2015). Public Goods and Government Action. Politics, Philosophy and Economics Review, 14(2). Pp(109-128)

[4]. Anyanwu, J. C & Erhijakpor, A. O (2007). "Health Expenditures and Health Outcomes in Africa". *African Development Bank (AFDB) Working Paper (91): 15-16.* http://www.afdb.org/

[5]. Bakare, A. S., &Sanmi, O. (2011). Health Care Expenditure and Economic Growth in Nigeria: An Empirical Study. *Journal of Emerging Trends in Economics and Management Sciences 2(2): pp(83-87)*

[6]. Bérenger, V., & Verdier-Chouchane, A. (2007). Multidimensional measures of well-being: Standard of living and quality of life across countries. *World Development*, 35(7), 1259-1276.

[7]. Boachie, M. K &Ramu, K. (2015), "Public Health Expenditure and Health status in Ghana". Munich Personal RePEc Archive (MPRA) Paper (66371). https://mpra.ub.uni-muenchen.de/66371/

[8]. Bokhari, F. A., Gai, Y., &Gottret, P. (2007). Government health expenditures and health outcomes. *Health Economics*, 16(3), 257-273.

[9]. Boulet, S. L., Alexander, G. R., Salihu, H. M., &Pass, M. (2003). Macrosomic births in the united states: Determinants, outcomes, and proposed grades of risk. American Journal of Obstetrics and Gynecology, 188(5), 1372–1378. doi:10.1067/mob.2003.302

[10]. Busse, H., Aboneh, E. A., & Tefera, G. (2014). Learning from developing countries in strengthening health systems: an evaluation of personal and professional impact among global health volunteers at Addis Ababa University's TikurAnbessa Specialized Hospital (Ethiopia). *Globalization and health*, 10(1), 64.

[11]. Cutler, D., Deaton, A., &Lleras-Muney, A. (2006). The Determinants of Mortality. Journal of Economic Perspectives, 20(3), 97–120. doi:10.1257/jep.2

[12]. Dauda, R. O. S. (2004). Health Care Spending and the Empirics of Economic Growth. *Journal of Society, Development and Public Health*, 1, 72 – 82.

[13]. Dedini, S. A., Odimegwu, C., Imasiku, E. N. S., Ononokpono, D. N., &Ibisomi, L. (2014). Regional Variations in Infant and Child Mortality in Nigeria: A Multilevel Analysis. *Journal of Biosocial Science, 47(02), 165–187.* doi:10.1017/s0021932013000734

[14]. Filmer, D., & Pritchett, L. (2001). Estimating Wealth Effects Without Expenditure Data--Or Tears: An Application to Educational Enrollments in States of India. Demography, 38(1), 115–132. doi:10.1353/dem.2001.0003

[15]. Gottret, P. and G. Schieber (2006). 'Health Financing Revisited: A Practioner's Guide', World Bank, Washington, DC.

[16]. Hall, J., Giovannini, E., Morrone, A., &Ranuzzi, G. (2010). A framework to measure the progress of societies.

[17]. Harttgen, K. & M. Misselhorn (2006). 'A Multilevel Approach to Explain Child Mortality and Undernutrition in South Asia and Sub-Saharan Africa', Ibero America Institute for Economic Research (IAI) Discussion Papers, September.

[18]. Hogan, M. C., Foreman, K. J., Naghavi, M., Ahn, S. Y., Wang, M., Makela, S. M., … Murray, C. J. (2010). Maternal mortality for 181 countries, 1980–2008: a systematic analysis of progress towards Millennium Development Goal 5. The Lancet, 375(9726), 1609–1623. doi:10.1016/s0140-6736(10)60518-1

[19]. Issa, H. and B. Ouattara (2005). 'The Effect of Private and Public Health on Infant Mortality Rates: Does the Level of Development Matter?', University of Wales Swansea Economics Department, Discussion Paper Series 05-02, May.

[20]. Leigh, A., & Wolfers, J. (2006). Happiness and the Human Development Index: Australia Is Not a Paradox. *The Australian Economic Review*, 39(2), 176–184. doi:10.1111/j.1467-8462.2006.00408.x

[21]. Musgrove, P (1999). Public Spending on Health Care: How are different criteria relate. *US National Library of Medical, National Institute of Health.*

[22]. Nixon, J. & P. Ulmann (2006), 'The Relationship between Health Care Expenditure and Health Outcomes', European Journal of Health Economics, Vol. 7, pp. 7–18.

[23]. Novignon, J., Olakojo, S. A &Nonvignon, J (2012), "The Effects of Public and Private Health Care Expenditure on Health Status in Sub-Saharan Africa: New Evidence from Panel Data Analysis". *Health Economics Review, 2(1): 22.* https://doi.org/10.1186/2191-1991-2-22.

[24]. Omotara, A. B., &Okujagu F. T. (2012). Assessment of Knowledge, Attitude and Practice of Stakeholders Towards Immunization in Borno State, Nigeria: A Qualitative Approach. *Journal of Community Medicine & Health Education, 02(09).* doi:10.4172/2161-0711.1000181

[25]. Paxson, C. and N. Schady (2005). 'Child Health and Economic Crisis in Peru', World Bank Economic Review, Vol. 19, No. 2, pp. 203–23.

[26]. Pukuma, S. A. (2014). Analytical Problems And Approaches Towards Improving The Utilization Of Primary Health Care

Services By The Rural Communities In Nigeria. *International Journal of Research in Nursing, 5(1), 5–16.* doi:10.3844/ijrnsp.2014.5.16

[27]. Renton, A., Wall, M., &Lintott, J. (2012). Economic growth and decline in mortality in developing countries: An analysis of the World Bank development datasets. Public Health, 126(7), 551–560. doi:10.1016/j.puhe.2012.03.011

[28]. Renton, A., Wall, M., &Lintott, J. (2012). Economic growth and decline in mortality in developing countries: An analysis of the World Bank development datasets. *Public Health, 126(7)*, 551–560. doi:10.1016/j.puhe.2012.03.011

[29]. Ricci, F. &Zachariadis, M. (2006). Determinants of Public Health Outcomes: A Macroeconomic Perspective, Computing in Economics and Finance. *Society for Computational Economics.*

[30]. Sachs, J., McArthur, J. W., Schmidt-Traub, G., Kruk, M., Bahadur, C., Faye, M., & McCord, G. (2004). Ending Africa's Poverty Trap. Brookings Papers on Economic Activity, 2004(1), 117–240. doi:10.1353/eca.2004.0018

[31]. Safari, H., & Ebrahimi, E. (2014). Using Modified Similarity Multiple criteria Decision Making technique to rank countries in terms of Human Development Index. *Journal of Industrial Engineering and Management, 10(1).* doi:10.3926/jiem.837

[32]. Siddiqi, S., Haq, I. ., Ghaffar, A., Akhtar, T., &Mahaini, R. (2004). Pakistan's maternal and child health policy: analysis, lessons and the way forward. Health Policy, 69(1), 117–130. doi:10.1016/j.healthpol.2003.12.007

[33]. Starfield, B., Shi, L., &Macinko, J. (2005). Contribution of primary care to health systems and health. *The milbank quarterly*, *83*(3), 457–502.

[34]. Stuckler, D. (2008). Population Causes and Consequences of Leading Chronic Diseases: A Comparative Analysis of Prevailing Explanations. The Milbank Quarterly, 86(2), 273–326. doi:10.1111/j.1468-0009.2008.00522.x

[35]. UN. (2004). Progress towards the Millennium Development Goals, 1990–2004. Discussion Paper. Statistics Division, Department of Economic and Social Affairs of the United Nations Secretariat, available from http:// unstats.un.org/unsd/mi/mi coverfinal.htm

[36]. Victora, C. G., Vaughan, J. P., Barros, F. C., Silva, A. C., &Tomasi, E. (2000). Explaining trends in inequities: evidence from Brazilian child health studies. *The Lancet, 356(9235), 1093–1098*. doi:10.1016/s0140-6736(00)02741-0

[37]. Walker, N., Yenokyan, G., Friberg, I. K., & Bryce, J. (2013). Patterns in coverage of maternal, newborn, and child health interventions: projections of neonatal and under-5 mortality to 2035. *The Lancet, 382(9897), 1029–1038.* doi:10.1016/s0140-6736(13)61748-1

[38]. World Bank Group. (2017): Global Health Report. Washington DC.

[39]. World Health Organization (2015). Global Health Observatory data: Life expectancy. Geneva, Switzerland: World Health Organization (WHO).