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An Assessment of the Impact of Government Expenditure on Infrastructures: Evidence from Nigerian Health Sector Performance

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Abstract
It is evident that Nigeria over the years spent huge amount of money with a view to improving health system. In view of the aforementioned, this study was conducted to assess the impact of government expenditure on social service in Nigeria with emphasis on health sector performance. Secondary data were sourced from CBN bulletins, World Bank publications as well as the Nigerian Budget Office Portal. Life expectancy and infant mortality rates were measured against government expenditure from 2000-2013. The study employs Pearson's moment correlation and found that government expenditure is inversely and significantly related to infant mortality implying that an increase in government budget to the health sector can cause a decrease in the rate of infant mortality. On the other hand, weak positive and statistically insignificant relationship exists between government expenditure and life expectancy. It is therefore recommended that government should allocate more funds to health sector and encourage private sector financing of health sector as part of their corporate social responsibility.
Keywords: Government Expenditure, Infant Mortality, Life Expectancy, Social Infrastructure, Health Sector Performance.

1.0 Introduction

Government in any given society is saddled with two basic roles; maintaining law and order as well as providing public goods such as good roads, education, health, defense, and power among other infrastructures (Samuel & Kabir 2011). The availability of such infrastructures (functional ones) has significant effect on the quality of life of people in a given environment. It is on this background that, Global Competitiveness Report (2010-2011) emphasizes that Extensive and efficient infrastructure is critical for ensuring the effective functioning of the economy, as it is an important factor determining the location of economic activity and the kinds of activities or sectors that can develop in a particular economy.

Provision of health care facilities among other infrastructures is of immense importance because socio-economic status of people largely depends on the quality of infrastructural facilities provided with good maintenance culture (Idachaba, 1995 and Adefila & Bulus 2014).

Public health infrastructure is the underlying foundation that supports the planning, delivery, and evaluation of public health activities and practices. Public health concentrates on the health of the population rather than care of the individual patient. Public health works to protect and improve the health of communities through education, policy development, promotion of healthy lifestyles, and research to improve clinical care and injury prevention (Michelle 2012).

On the contrary, according to Willoughby (2004), insufficient infrastructure also represents a major cause of loss of quality of life, illness and death. Jeffery (2004) further submits that Poor infrastructure impedes a nation's economic growth and international competitiveness. In furtherance to this, Willoughby (2004) opines that insufficient infrastructure also represents a major cause of loss of quality of life, illness and death. In order to stimulate growth and reduce poverty, it is essential to improve the supply, quality and affordability of infrastructure services.

All investments in infrastructure according to Mary,(2012) are characterized by initial huge amount of capital and indivisibility. As a result of this and the attendant externalities, the government is responsible for their provision most often times at subsidized rates. Hence, the various governments made budgetary provisions for infrastructure from year to year which translated into huge public expenditures. Right from the time of classical economists, the provision of infrastructure has been the sole responsibility of the government.

Public Expenditure on the other hand is the expenses that Government incurs for its own maintenance, society and the overall economy. This continuous increase in public expenditure is as a result of some fiscal operations which are recognized as major tools for the management of the economy and stimulation of economic growth and development (Agenor and Moreno, 2006; Edame, 2012). Government expenditure in Nigeria has been on the increase resulting from flow of revenue from production and sales of crude oil. This is to meet the huge demand for public goods such as roads, electricity, education, and health among others (Samuel & Kabir 2011). According to Adekininju (2005), Government expenditure varies and ranges from education, defense,

general administration, health, to water supply, electricity generation and supply, roads, telecommunications among others and public expenditure on infrastructure has been an issue for policy discourse among researchers and scholars all over.

1.1 Problem Statement

However, in Nigeria despite the increase in public expenditure, the level of public infrastructure is very low. A recent study by Edame (2013), analyzed that the trend on public expenditure on infrastructures (Road, Water, Electricity, Transport & Housing) in the period 1970-2010. However the result shows that expenditure in the aforementioned infrastructure has not yielded positive results over the time period 1970-2010. Consequently, this study intends to focus on Health infrastructure and analyze the effect of Government expenditure on health performance proxies by infant mortality and life expectancy for the period 2000-2013.

1.2 Research Questions

i. Does government expenditure in health sector have relationship with the life expectancy in Nigeria?
ii. Does government expenditure in the health sector reduce the rate of infant mortality in Nigeria?

1.3 Objectives of the Study

The main objective of the study is to assess the impact of government expenditure on social service, evidence from Nigerian health sector performance, with the following specific objectives.

i. To assess the impact of government expenditure on the infant mortality in Nigeria.
ii. To examine the relationship between government expenditure and the life expectancy in Nigeria

1.4 Research Hypotheses

i. there is no relationship between Government budget and infant mortality in Nigeria
ii. there is no relationship between Government budget and life expectancy in Nigeria.

2. Literature Review

Samli, (2011) viewed Infrastructural development as a necessary condition for economic growth as it leads to expansion of macro markets and creates a better quality of life. The importance of infrastructure in economic growth cannot be over-emphasized. It has been described as the foundation upon which all economic activities such as satisfying consumers' needs, setting up a factory, moving goods and services from the point of production among others are laid (Mary, 2012). According to Waters (1999), Muiu (2008) and Friedman (2006), infrastructural development generates growth, facilitates trade and creates global trade power respectively. Nurkse (1953) asserted that economies cannot develop without proper infrastructural base. Lack of proper infrastructural basis is one of the major reasons why the less developed countries are not making much progress. In the words of Samli (2011), the less developed countries will likely not have a chance to become newly industrialized countries.

Considering the contribution of infrastructure to economic growth, empirical literatures have shown divergent views. Some studies testified to the growth-enhancing effects of infrastructure while some others showed evidence of reverse causal relationship between infrastructural spending and growth. For example, Agenor and Moreno-Dodson (2006) and Fourie (2006) showed that infrastructure impacts on economic growth in several ways such as lowering of the costs of production thereby increasing productivity, improvement in the productivity of worker, long-term creation of job opportunities and improvement in the quality of the labour force through expenditures on health and education. They further argued that infrastructure generates economies of scale in that better transport services lower the cost of transportation. Many other studies such as Calderon (2004), Seethepali et al., (2008) and Macdonald (2008) aligned with the fact that infrastructure is an important and significant determinant of growth.

Public expenditure on infrastructural facilities has a great role to play in the form of stimulating the economy. The mechanism in which government spending on public infrastructure is expected to affect the pace of economic growth depend largely upon the precise form and size of total public expenditure allocated to economic and social development projects in the economy. When public expenditure is incurred, by itself it may be directed to particular investments or may be able to bring about re-allocation of the investible resources in the private sector of the economy. This effect, therefore, is basically in the nature of re-allocation of resources from less to more desirable lines of investment. An important way in which public expenditure can accelerate the pace of economic growth is by narrowing down the difference between social and private marginal productivity of certain investments. Here, public expenditure on social and economic infrastructure like education, health, transport, communication, water disposal, electricity, water and sanitation etc., has the potential of contributing to the performance of the economy based on Promotion of infant industries in the economy; Reduction in the unemployment rate; Stabilization of the general prices in the economy; Reduction in the poverty rate and

increase the standard of living of the people; Promotes economic growth by attracting foreign investment; and Promotes higher productivity (Taiwo and Abayomi, 2011).

The Keynesian macro-economic theory postulate that public spending can contribute positively to economic growth and development. An increase in government expenditure leads to the same proportionate increase in employment, profitability and investment through multiplier effect on aggregate demand. Base on this background government spending augument the aggregate demand, which provokes increases in output depending on expenditure multiplier (Saad and kalakech, 2009).

Barro and Sala-I-Martin (1992) in their opinion classify public expenditure as productive and unproductive and hypothesized that productive expenditure such as expenditure on agriculture, education, health, road, etc. have a direct influence on the rate of economic growth while unproductive expenditure such expenditure on salary, rent, etc. have indirect or no effect.

However, government spending on health plays a crucial role in economic growth. Therefore, the healthier nature of population determined their ability to contribute to economic performance. Better health enables better earning ability for both workers and enterprises which in turn enhance the tax based of the government leading to better fiscal posture (Babatude, 2012). These interactions, all things being equals, will lead to better economic performance. Thus the manner in which growth is shared also influence the rate of poverty reduction.

Health is one of the significant factors that determine the quality of human capital which is a necessary factor for economic growth. Based on this paradigm developing countries have attempted to enhance the human capital through public health expenditure as well as government spending on education and other social services **(**Imoughele and Ismaila, 2013). Al-Yousufy (2000) and Lawson (2009) observed that education, health care, training and investment in social services enhances and improves the human capacity which has a spillover effect on economic growth.

Public health expenditure consist of recurrent and capital spending from government (federal, states and local government) budgets, external borrowings, and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds. While, total health expenditure is the sum of public and private health expenditure. It covers the provision of health service (preventive and curative) family planning activities, nutrition activities and emergency aid designated for health but does not include the provision of water and sanitation (WHO, 2010).

Most developing countries suffer from poor expenditure on health care and the majority of public health care expenditure on hospital and expensive medical care that benefit a small minority of the population living in the cities. A high proportion of the poor is far from this service especially those living in rural areas. They usually rely on home remedies and traditional medicine (Graffian and Mckinley, 1992 in Imoughele and Ismail, 2013).

There is a growing literature on the determinants of public health expenditure in cross countries and country specific. For examples Das and Martin (2010) quantitatively examine the determinants of aggregate health care expenditure using a co-integration procedure. The evidence in the study supports co-integration. The results also indicate that per capita income contributes significantly to the explanation of the health care expenditure. Age of the population, the number of practicing doctors and the ratio of public health expenditure to total health care expenditure does not seem to have any big impact on aggregate health care expenditure in the U.S. The conclusions drawn from the results is that the health expenditure policy should be coupled not necessarily with the increase in the supply of physicians or policies that promote competition but, with long-run policies that promote human capital. They also find that the mixture of public-private funding does not contribute significantly to the explanation of the health care expenditure in the U.S. Khorassani and Paskawych (2009) also reported in Imoughele and Ismail, (2013) that the major determinants of per capita healthcare expenditures in U.S.A are age and income related. The proportion of the population 15 years old or younger seems to have the largest effect on per capita healthcare expenditures in the United States. They concluded that children are the ones highest in demand for healthcare. It also appears that the supply of healthcare in the United States is not a significant determining factor of healthcare expenditures.

Chaabouni and Abednnadher (2010) examine the determinants of health expenditures in Tunisia during the period 1961-2008, using the Autoregressive Distributed Lag (ARDL) approach by Pesaran et al. (2001). The results of the bounds test show that there is a stable long-run relationship between per capita health expenditure, GDP, population ageing, medical density and environmental quality. In fact, on the one hand there are the short-run and long-run results which reveal that health care is a necessity, not a luxury good. On the other hand, results of the causality test show that there is a bi-directional causal flow from health expenditures to income, both in the short and in the long run. They recommended that policies aiming at encouraging health expenses are required to build up a healthier and productive society to support the Tunisian's economic growth and development. In addition, the Ministry of Health should minimize the gap of inequality distribution of health care among people considering the spread of emerging chronic diseases and assuring the quality and

performance of public health supply.

Moreover, the external cooperation of the World Health Organization is also required to make an exchange of expertise and health care information.

David and Jameelah (2013) observed that in Nigeria, health expenditure is less than US$8 per capita compared to the international recommendation. While health care needs are increasing, government expenditure on health in developing countries like Nigeria in particular, is declining. The Federal Ministry of Health (FMH) (2005) had earlier observed some erratic growth of health expenditure in Nigeria. Detailed analysis of the FMH data as studied by David and Jameelah (2013) reveals that total expenditure is on the low side. In 1985, health expenditure as a fraction of total expenditure was 1.87%. This nevertheless rose to 3.25% in 1986 and peaked at 3.30% in 1995. The trend was never devoid of fluctuating decreases that dropped to 2.74% in year 2000. The total expenditure on health as part of gross domestic product in 2005 was 4.3%. This however rose to 5.3% in 2006 and thereafter embarked on a declining course afterwards as it fell to 5.0% in 2007, 4.7% in 2008, and 4.6% in 2009 and again stabilizes at 4.3% in 2010.

The health system, like the rest of Nigerian public systems is dominated by inadequate budgetary allocations, inefficiency and inequity in distributing available resources, rapid population growth, emergence of new diseases, and persistence of old diseases (Abdulraheem et al, 2012). The rural dwellers also account for the bulk of the informal sector group. This informal sector is largely poor and has a higher risk of suffering impoverishment as a result of catastrophic expenditures for health. The Nigerian public health system fails to adequately provide good health services and those who need it the most are usually unable to pay for what is available (Lawan et al, 2012).

The fall-out of a non-focused approach to health-care financing in Nigeria is the continual struggle of more than 60% of Nigerians to pay health care bills and the country's health indices continue to plummet. Existing health financing options for Nigerians are fragmented, comprising of pockets of private and community health insurance schemes and the NHIS's social health insurance programme for the formal sector. These schemes are plagued by poor penetration, low acceptance and narrow benefit packages (Lawan et al, 2012).

3.0 Methodology

An explanatory research design was adopted for this study. This is a correlational design in which the researcher is interested in the extent to which two variables (or more) co-vary, that is, where changes in one variable are reflected in changes in the other. Explanatory designs consist of a simple association between two variables. Investigators use the correlation statistical test to describe and measure the degree of association (or relationship) between two or more variables Creswell (2012). Secondary data were collected from statistical bulletins of the Central Bank of Nigeria, CIA world factbook, World Bank report for the period of 14 years, (2000 to 2013). Data collected were subjected to trend analysis and inferential analysis using Pearson Product Moment correlation coefficient analysis, which was used to determine the impact of the IV (Government expenditure proxies by Annual budgetary allocation to the health sector) on the DV (Health performance outcomes proxy by infant mortality rate and life expectancy) .

3.1 Result and Discussion

This section presents the analyses and interprets the results generated for the study. IBM (SPSS) 22 was used in computation of the correlation coefficients of the data generated from the study.

Table 1: Government Allocation To the Health Sector , Infant Mortality Rate and Life Expectancy in Nigeria (2000- 2013)

Year	Govt Budget (₦'m)	Infant mortality rate, (per 1,000 live births)	Life Expectancy at Birth
2000	181.8	187.7	51.56
2001	446.5	182.2	51.07
2002	631.7	176.5	50.59
2003	396.8	170.7	51.01
2004	617.9	164.8	50.49
2005	716.8	158.9	46.74
2006	1055.9	153.0	47.08
2007	1224.0	147.4	47.44
2008	943.88	141.8	46.53
2009	1088.4	136.2	46.94
2010	1618.4	131.1	47.24
2011	2667.3	126.2	47.56
2012	2827.2	121.6	52.05
2013	2792.3	117.4	52.46

Source: Budget figures were taken from CBN Annual Statistical Bulletins, while life expectancy and infant mortality rate were taken directly from World Bank website.

3.2 Trend Analysis of Table One

In the base year of the study i.e. year 2000 there was a total of ₦181.8 million budgetary allocations to the health sector, the infant mortality rate was 187.7 deaths per 1000 live births and the life expectancy of Nigerians was 51.56 years. Consequently by year the 2007, the budgetary allocations to the health sector rose to about 573.3 percent to the tune of ₦1224.0 billion, the infant mortality was reduced to 147.4 deaths per 1000 live birth indicating 21 percent decreased and life expectancy was also reduced to 47.44 years. However, year 2012 shows the highest budgetary allocation to the health sector in Nigeria for the study period of ₦2827.2 billion, the trends in the infant mortality indicate a decreased in the rate to 121.6 deaths per live births. Conversely, there was an increased of life expectancy to 52.05 years, Therefore the trends show a continuous stable inverse relationship between government expenditure with infant mortality rate that is to say as government increases its budgetary allocation to the health sector the rate of infant mortality reduces. However, yearly life expectancy figures was not stable with increases and decreases in the government budgetary allocations as can be seen on the table. For example in year 2005 budgetary allocations was increased from ₦617.9m in 2004 to ₦716.8m , but there was an inverse relationship with life expectancy which shows a decreased from 50.49 years in 2004 to 46.74 years despite the fact that there was an increase in budget allocation in that year. These fluctuations may not be unconnected with other determinants of life expectancy such as population growth, epidemic control, security and ethno religious stability.

Hypothesis One:

$H0_1$: there is no significant relationship between Government budget and infant mortality in Nigeria

Table 2: Pearson Correlations Result on the relationship between Government budget and life expectancy

		Govt Budget	Infant Mortality
Govt Budget	Pearson Correlation	1	-.899**
	Sig. (2-tailed)		.000
	N	14	14
Infant Mortality	Pearson Correlation	-.899**	1
	Sig. (2-tailed)	.000	
	N	14	14

**. Correlation is significant at the 0.01 level (2-tailed).

r -0.899, N 14, p < 0.01

The result of the above table 2 shows the correlation coefficient for Government budget and infant mortality of -0.899. The values of correlation range between -1 to 1, therefore the result indicates a very strong negative relationship between the two variables. With the significance level or P – value at 0.000, it also indicates that the variables are statistically significance to each other. That is to show that an increase in government expenditure can cause a decrease in the rate of infant mortality in Nigeria. This is in line with the study of Willoughby C. (2004) who stated that insufficient infrastructure also represents a major cause of loss of quality of life, illness and death, thus null hypothesis two is hereby rejected. In furtherance of that the result is supported by the trend analysis which shows a continuous inverse relationship throughout the period of the study.

Hypothesis Two:

$H0_2$: there is no relationship between Government budget and life expectancy in Nigeria

Table 2: Pearson Correlations Result on the relationship between Government budget and life expectancy

		Govt Budget	Life Expectancy
Govt Budget	Pearson Correlation	1	.081
	Sig. (2-tailed)		.782
	N	14	14
Life Expectancy	Pearson Correlation	.081	1
	Sig. (2-tailed)	.782	
	N	14	14

***r* 0.081, *N* 14, *p*> 0.01**

The result in the above table 2 shows the correlation coefficient for Government budget and life expectancy of 0.081, this indicates a very weak positive relationship between the two variables. With the significance level or P – value at 0.782, it also indicates that the variables are not statistically significance to each other. That is to say that the impact of government expenditure on the life expectancy is very little and

therefore the null hypothesis is rejected. This is supported by the trend analysis of table one which indicates a variation in the relationship between the two variables.

4.0 Conclusion and recommendation

The major challenges facing policy makers is how to efficiently allocate and efficiently utilize the limited resources across the range of preferences that contribute to the improvement of the general well being of the citizenry including the budgetary allocation to the health sector. Provision of health infrastructure is key to the positive health performance outcomes. The present study assessed the extent to which government expenditure on the health infrastructure affect the health performance outcomes of Nigerians given the available resources allocated to the sector within the scope under review and the subsequent result obtained. The analysis was performed using data derived from the existing literature obtained from various sources. The SPSS version 22 was used to determine the correlation coefficient of the variables. The result suggests that there is clear direct relationship between the provision and availability of health infrastructures and decreased in the rate infant mortality. However, even though the study support previous studies that there is positive relationship between government expenditure and the life expectancy, (Eneji et al., 2013) yet the relationship is very weak. In addition, the study reveals that there has been poor allocation to the health infrastructure in Nigeria. This is obvious as it has been manifested in the average health status presented in the data.

Based on the findings of this study, the following recommendations are hereby proffered:

1. The government should as a matter of urgency increase the budgetary allocation to the health sector since this is considered as the explanatory variable for health sector performance.
2. Private sector should also be encouraged to involve in financing health sector as part of their business social responsibility function since government alone cannot provide all in view of its numerous responsibilities and paucity of its revenue.
3. Therefore, urgent steps need to be taken in order to have affordable and qualitative health infrastructure and delivery in Nigeria.
4. Furthers study should be carryout to determine the relationship between the impact of public spending on the health performance in Nigeria mediating effect National Health Insurance Programme

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