Constrained Public Health Care Spending and Steady State in Health Outcomes in Nigeria

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Abstract
Health expenditure is described as expenses on health, which any government incurs for the maintenance and provision of healthcare services, for the good of the health system, society and the economy. The total government expenditure on health for Nigeria as for 1990, 2000, 2017, 2018 2020, and 2021 are N658.1million, N202.8million, N304billion, N340billion, N547billion and N427billion respectively. The belief is that this would improve the health of the citizenry, which can be translated into better human capital base with its multiplier effects on the health outcomes and status of the economy and as well as the economic growth and development. In modeling the effect of health expenditure on health outcome in Nigeria, the study used multiple regression analysis approach to captures the dynamics of annual health expenditure, cash expenditure on health, health insurance and health tax on health outcome (proxy by life expectancy and infant mortality) within the nation, using data set from World Development Indicator (WDI) from 1985 to 2020. The study found that private health expenditure as the major determinants to steady state growth in health outcome in Nigeria. The study revealed that public health expenditure shows a negative relationship with infant mortality and life expectancy in Nigeria due to constrained healthcare financing. This equally

points to the fact that private sector (cash expenditure on health) is more efficient than the constrained public health budget allocations (public health expenditure). The implication of this finding is that private sector (cash expenditure on health) has greater influence on health outcomes especially in infant mortality and life expectancy. The economic implication of this finding is that health services will be obtained at a high cost in Nigeria due to constrained public health spending. That is to say that the principle of excludability is at work in Nigeria health sector thereby making achievement of social optimality in Nigerian health care services impossible. Following the finding of the study, therefore, government should endeavor that all the citizens benefit from health insurance irrespective status.

Keywords: IMR, Life Expectancy, Public Health Expenditure & Cash Expenditure on Health

Introduction
An increase in public expenditure not only leads towards a quality, healthy, longer life, foster sustainable economic growth, and reinforced by long life, but also increases a larger workforce, which can also drive holistic sustainable growth. Studies revealed that a healthy individual not only works efficiently, but also able to provide more time for economic activities that increase productivity, (Anyanwu and Erhijakpor, 2018). Health itself is often defined as a fundamental 'good'. That is, one, which enables the creation of other tangible goods in an effort to meet human's wants. In principle, health is most often categorized as an economic good since the resources for it, such as human capital and fund, are limited. However, society's needs and wants for health are unlimited like every other economic goods. This implies that the consumption and production of health can only be increased by diverting resources from other sectors of the economy, like transport and aviation towards the healthcare sector. Such decisions are based on the 'opportunity cost' concept, which would represent the benefits foregone if the resources were utilized for the next best alternative. Nigeria, since joining the rest of the world in spending on healthcare for the improvement of the health outcomes of Nigerians, the available data indicated that on the average of about 2.1% to 5.8% of total government expenditure was spent on health within 2000 and 2007. The total government expenditure on health as for 1990, 2000, 2017, 2018, 2020, and 2021 were N658.1million, N202.8million, N304billion, N340billion, N547billion and N427billion respectively. The capital expenditure showed a continuous increase in trends in health expenditure. The belief is that this would improve the health of the citizenry, which can be translated into the beneficial human capital base with its multiplier effects on the health outcomes and status of the economy and as well as the economic growth and development, (Nwanosike et al., 2015).

Health is determined by a number of indicators such as life expectancy, infant mortality rate, child mortality rate, and the fertility rate. Based on these indicators, most of the developing and developed countries have experienced progress in health. For example, increased life expectancy have been followed by declines in mortality and child rates, and fertility rates over the years in countries like United State of America, France and other developed countries. On the African scene especially in Nigeria, the government is still finding it difficult to reduce infant mortality, and other indicators. The World Health Organization (WHO, 2018) states that the linkages of health to increase in life expectancy, reduction in infant mortality rate, child mortality rate and poverty leads to long-term economic growth and are powerful, much stronger than is generally recognized. Nigeria accounted for 27% of malaria cases in Africa and an estimated 24% of global malaria death (WHO, 2018).

According to Ogunjimi and Adebayo (2019), health expenditure is the government's responsibility to provide the necessary healthcare services for the benefit of the people and the economy and society. It is also referred to as the expenditure of government on the healthcare system. However, the study of Adewumi et al (2018) revealed that adequate healthcare expenditure can significantly improve health outcomes through improving life expectancy at birth, reducing child and infant mortality rates. Both public and private healthcare spending showed a strong positive association with health outcomes even though public health care spending had a relatively higher impact. This is because public health expenditure involves spending on both preventive and intervention services and is distributed through service delivery systems; health literacy, sanitary condition, and the employment of trained and qualified doctors and nurses.

In this regard, adequate and effective public health spending is still critical for improving health outcomes and status. For example, health spending as a proportion of GDP averaged 0.32 percent between 1986 and 1990, and little changed between 1995 and 1999, when it averaged 0.33 percent. When comparing Nigeria's performance to that of other African countries, Anyanwu and Erhijakpor (2018) found that health spending as a percentage of GDP was 2.7 percent in 1990, compared to 3.5 percent in Ghana, 4.3 percent in Kenya, and 4% in Seychelles between 1995 and 1997. The inverted form of the health expenditure pyramid exacerbates poor health spending in most developing countries.

The World Health Organization (WHO) recognized the importance of healthcare spending and proposed at the 2010 World Health Assembly that the healthcare system be adequately funded by 11 percent of their annual budget, as this would ensure quality and affordable healthcare services (Asbu et al., 2017). WHO (2018) recommended that the Nigerian government commit at least N6, 908 per Nigerian per year, which when multiplied by 180 million Nigerians amounts to N1.2 trillion. In addition, in 2001, Nigeria hosted the Heads of State of African Union (AU) member countries, who signed the "Abuja Declaration," in which the leaders agreed to pay at least 15% of their national income to the AU. However, this has highlighted the importance of health and the necessity for health spending, as it is predicted to improve health outcomes in the country, such as a decrease in infant mortality, neonatal mortality, and child mortality ratios.

Despite this increase in health spending in Nigeria's healthcare sector, the country still lags behind other African countries. According to statistics, the country's health spending as a proportion of GDP is 4.1 percent, compared to 4.6 percent in Africa and above 6.3 percent in wealthy countries. Nigeria's general health status or sector performance outcomes have not been encouraging despite these efforts. Nigeria has not met the pledged spending standard since the Abuja declaration, as the federal government has never allocated more than 6% of its yearly budget to the health sector. The highest percentage since the proclamation was 5.95 percent in 2012, when health received 5.95 percent of the budget allocations. Though growth in income per capita is significantly over the past few years, has had less impact on health spending and hence on the significantly low health status.

According to the World Health Organization (WHO), child mortality in Nigeria has increased in recent years. In 1990, the infant mortality rate was 87 per 1000, whereas it was 100 in 2003. This can be explained in part by the continued low number of newborns in health facilities and the low number of births attended by skilled healthcare personnel. In Nigeria, the maternal death rate was 800 per 100 000 live births in 2000.

Public health spending, on the other hand, is a significant policy tool that is projected to reduce infant mortality, under-five mortality, and raise life expectancy (Nwanosike et al., 2015). However, recent research linking health spending to a drop in child mortality has been unconvincing. According to Anyanwu and Erhijakpor (2018), boosting health spending in Nigeria will significantly lower child death rates. Some research, on the other hand, found no link between health spending and child mortality (Gupta, 2012; Yaqub, 2012).

Thus, the issue of whether public health spending has an influence on infant mortality, under-five mortality, and life expectancy is still not settled. However, taken into account this background, this study seeks to examine public health expenditure and health outcomes in Nigeria. This study is guided by the following research questions: What is the impact of public health expenditure on infant mortality rate in Nigeria? What is the relationship between public health expenditure on life expectancy in Nigeria? Furthermore, it becomes imperative to determine how public health expenditure has contributed to the improvements in health outcomes in Nigeria, using life expectancy at birth and infant mortality rates as outcomes, with these specific objectives; To examine the impact of public health expenditure on infant mortality rate in Nigeria. To ascertain the relationship between public health expenditure and life expectancy in Nigeria. The study will be limited to Nigeria. The study would basically look at the under-five mortality and life expectancy as the health outcomes after spending on the health systems of the country.

Review of Related Literature
Grossman (1972) proposed a model for the commodity demand for good health. He explained that the demand for good health is driven by the quantity of productivity and labor force available in the economy, and that good health is assessed in mortality and morbidity rates. Second, he demonstrated how the outcomes, rather than the medical services provided, impact the demand for health care (good health). Because standard demand theories presume that commodities and services purchased in markets enter consumers' utility functions, Grossman observed that economists were focusing on demand for healthcare at the expense of desire for health. He refuted this logic by establishing a clear separation between commodities and market goods, which are the most basic objects of choice. Thus, consumers produce commodities with inputs of market goods and their own time.

As a result, good health is viewed as a long-term asset in the new paradigm for analyzing consumer behavior, and it is referred to as health capital. Individuals inherit a starting stock of health, which depreciates at an increasing rate over time until they reach a point in their lifespan when it can be increased by investments. This means that at the start of time, there is an initial stock of health capital, which depreciates with age and appreciates with health investment. In the model, health is not exogenous, but rather depends, at least in part, on the number of resources given to its creation (Case & Deaton, 2005). The investment effect views health as a demand for its capacity to boost an individual's ability to work in a healthy manner.

In terms of funding this health, Wagner (1835-1917) emphasizes the necessity for the government to expand its responsibility from traditional security to welfare (health and education). According to Wagner's Law, which was referenced by Likita (2009), government growth is a function of increasing industrialization and economic progress. The theory looked at trends in public expenditure growth and the size of the public sector in a variety of nations around the world. As a result, the state develops as an organism, reflecting changes in society and the economy and making decisions on behalf (and in the best interests) of its residents (Brown, 1996 cited in Uzohuo, 2018). As a result, a person's health and health indicators such as mortality, morbidity, overall health, and health outcomes improve.

Anyanwu and Erhijakpor (2018) used data from 47 African countries to conduct an empirical study on health expenditures and health outcomes in Africa. They provided econometric evidence linking African countries' per capita total as well as public health expenditures and per capita income to two health outcomes: infant mortality and under-five mortality. The study used Johansen co-integration to analyze data collected from fieldwork between 1970 and 2017. It was discovered that health spending had a considerable impact on baby and under-five mortality. The findings suggest that total health expenditures (including the public component) are a significant impact to health outcomes in African countries.

Ssewanyana and Younger (2017) looked at the impact of healthcare spending on Uganda's newborn mortality rate, from 1990 to 2015. To evaluate the data gathered for the study, the researchers used the OLS and Newey-White estimation techniques, as well as Johansen cointegration. According to the study, an increase in health-care spending, notably on immunization, is likely to have a favorable impact on Uganda's infant mortality rate .They claim that raising the immunization rate to 100% would have the biggest and most cost-effective benefit, lowering infant mortality by 16 deaths per thousand births.

In trying to ascertain the how health expenditure influences health outcome and economic growth; how health outcomes influence economic growth, Ogunjimi and Adebayo (2019) examined the relationship among health expenditure, health outcomes and economic growth in Nigeria for the period between 1981 and 2017 using Toda-Yamamoto causality framework. The results of the Toda-Yamamoto causality tests showed a unidirectional causality running from health expenditure to infant mortality while there is no causality between real GDP and infant mortality. The study recommended that the government should make concerted efforts geared towards increasing the health expenditure at least to meet up with the WHO"s recommendation that all countries should allocate at least 13 per cent of their annual budget to the health sector for effective funding as this would bring desired health outcomes in Nigeria.

Asbu et al (2017) explored the link between health funding and health system. The study finds that the growth of total health expenditure does not correspond with the growth rate of Gross Domestic Product. It was further reported that out-of-pocket spending (OOPS) was catastrophic with a high risk of households becoming poorer due to payment of medical care. Therefore, the study recommended government intensification of health financing. This was also supported by Idowu et al (2018) finding of inverse relationship between Public Health Spending the rate of Infant mortality in Nigeria.

In a similar but independent study, Adewumi et al (2018) found that government health expenditure per capita have positive relationship with health outcome in Nigeria proxied by neonatal mortality rate, child mortality rate and infant mortality rate. They differed by revealing 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. The study also found that with the principle of excludability inherent in private health sector, that Nigeria may not achieve social optimal in her health care services. Ibukun & Komolafe (2018) analyzed the prevalence of household catastrophic health spending in Nigeria. From their findings, they revealed the need to improve health financing and provide social intervention mechanisms to mitigate the adverse effect of catastrophic health spending. Bein et al (2017) studied the relation that exists between health financing and measures of health state among East African countries. The findings revealed that health expenditure and the number of years an individual is expected to live on average moves in the same direction. Meanwhile, the influence of health financing on the prevalence of infant mortality, under-5 deaths and neonatal death was negative.

Omotosho and Icoku (2017) used data from the Harmonized Nigerian Living Standard Survey HNLSS 2009/2010 to study health financing and universal health coverage in Nigeria. The study calculated the catastrophic and impoverishing impacts of out-of-pocket health payment in Nigeria and discovered that 19.5% of Nigerians suffered financial catastrophe, while 3.5% are pushed below the poverty line. The study observed excessive reliance on out-of-pocket expenditure as a limit towards achieving the goal of financial protection and UC. In a similar study, Anyanwu and Erhijakpor (2018) examined the relationship between health expenditures and health outcomes in Africa using data from 47 African countries between 1999 and 2004. The study revealed that health expenditures have a statistically significant negative effect on infant and under-five mortality rates, noting that government health expenditures are paramount in determining health outcomes.

Research Methodologyand Model Specification

An econometric model is adopted in this research which is a representation of the basic features of an economic phenomenon. In modeling the effect of health expenditure on health outcome in Nigeria, the model captures the dynamics of annual health expenditure, cash expenditure on health, health insurance and health tax on health outcome (proxy by life expectancy and infant mortality) within the nation. Two models were postulated in this research work; each for the two objectives of the study.

Model I

Model one of this study expresses health outcome proxy by infant mortality as a function of public health expenditure, cash expenditure on health, health insurance, health tax. This can be expressed as;

$$IMR = f(HEXP, CEH, HI, HT) ----------1$$

The model can be specified econometrically as

$$IMR_t = \alpha_0 + \alpha_1 HEXP_t + \alpha_2 CEH_t + \alpha_3 HI_t + \alpha_4 HT_t + \mu_t ------2$$

Where

LEXPECT = Life Expectancy.   HEXP = Public Health expenditure.
CEH = Cash Expenditure on Health   HI = Health Insurance
HT = Health Tax u_t =   an error term.

Model II

Model two of this study expresses health outcome proxy by life expectancy as a function of public health expenditure, cash expenditure on health, health insurance, health tax. This can be expressed as;

$$LFEXP = f(HEXP, CEH, HI, HT) ----------3$$

The model can be specified econometrically as

$$LFEXP_t = \beta_0 + \beta_1 HEXP_t + \beta_2 CEH_t + \beta_3 HI_t + \beta_4 HT_t + \mu_t -----4$$

Where

LEXPECT = Life Expectancy.   HEXP = Public Health expenditure.
CEH = Cash Expenditure on Health   HI = Health Insurance
HT = Health Tax u_t =   an error term.

Multivariate linear regression analysis was adopted as the econometric tool to test the hypotheses. This was preferred to because of its ability to predict the nature of relationships between health expenditure and health outcomes well. The data used in this study were sourced from World Development Indicators 2020, as well as statistical bulletin of the Central Bank of Nigeria 2020. The elements of the vector include public health expenditure, life expectancy, infant mortality, and other variables. Eview 8.0 was used to estimate the models.

Presentation and Analysis of Results

The test is carried out to know whether the mean value and variances of the variables are time invariant, that is, constant over time. The unit root test for stationarity is applied using the Augmented Dickey Fuller (ADF) test at 5% critical value and the result is presented below as table 4.1 with the null hypothesis being that the series has a unit root if the t statistics is less than the critical value (5%), otherwise the study rejects. Reject H_0 if the absolute values for the calculated ADF for any of the variables are greater than the absolute value of the 5% critical values. The summary of the result is presented below as table 4.1.

Table 4.1
Unit Root Test Result summary

VARIABLES	ADF stat	Crit. value at 5%	Order of Integration
LFEXP	-3.606893	-3.562882*	I(1)
IMR	-3.910707	-2.963972*	I(1)
PHEXP	3.158623	-2.954021*	I(1)
CEH	-2.996076	-2.954021*	I(1)
HT	-5.500587	-2.957110*	I(1)
HI	3.644944	-3.587527*	I(1)

Source: Researcher's computation 2022

From table 4.1, it is observed that all the variables are stationary after taking their first difference. From the Augmented Dickey Fuller (ADF) test results (see appendix), infant mortality rate, health tax, life expectancy, health insurance and cash expenditures on health

were all stationary after the first difference, I(1). This means that these variables were integrated of order 1. The variables were tested basically at 5% critical value.

Evaluation Based On Economic Criteria
In the first model, the dependent variables are health outcomes proxy by infant mortality rate while the independent variables are: public health expenditure, health tax, health insurance, and cash health expenditure.

Table 4.4
Summary of Model I Regression Result

Variables	COEFFICIENTS	T-STATISTICS	PROB. VALUE	STATUS at 5%
C	1.996401	12.80091	0.0000	Statistically Significant
PHEXP	-0.152485	-4.652822	0.0001	Statistically Significant
CEH	0.569562	2.150842	0.0400	Statistically Significant
HT	0.384249	1.928751	0.063	Statistically Insignificant
HI	0.134289	2.474146	0.0195	Statistically Significant
R^2	**0.635287**	**F-statistic**	**12.62864**	

Dependent variable = LFEXP (Life Expectancy)
Source: Researcher's computation 2022

In this model I, the dependent variable is health outcomes proxy by life expectancy (LFEXP) while the independent variables are: public health expenditure (PHEXP), cash expenditure on health (CEH), health tax (HT) and health insurance (HI). The coefficient of constant is positive and it is statistically significant. The constant term represents initial health outcomes proxied by life expectancy before the health expenditure and it conformed to 'a priori' expectation. The coefficient implies that life expectancy is 1.996401 at the beginning of the study period, when other variables are not operational or held constant. However, the coefficient public health expenditure is negative. This does not conform to the standard economic theory which postulates that government expenditure enhances health outcome (proxy by life expectancy). The coefficient of 0.152485 implies that over the study period, on average, a unit increase in the government expenditure on health leads to approximately 15.2485 unit increase in life expectancy. This goes to reveal that there are some fundamental problems with the way in which public health expenditure are implemented in the Nigerian health sector. This is further justified by figure 1, which shows the steady state of life expectancy with health expenditure. The result of this analysis is invariant with Barenberg, Basu, and Soylu (2015) that revealed that public expenditure on healthcare dampens infant mortality rate and accelerate life expectancy.
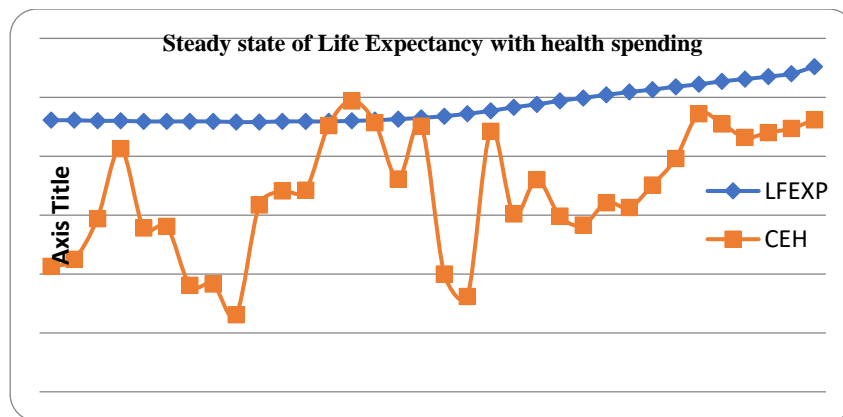
Fig I: Steady state of life expectancy in Nigeria

Source: Researcher's computation 2022

Therefore, figure 1 above tends to suggest that the effect of cash expenditure on health on life expectancy became insignificant when personal health spending (out-of-pocket) is the major source of health financing in Nigeria while public health spending was treated as unimportant by the government due to insufficient funding and poor management of public health expenditure. As such, Nigerian health insurance scheme is yet to cover a large percentage of the population. This argument is supported by the positive coefficient of cash expenditure on health which is 0.569562. This means that holding other variables constant, a unit increase in of cash expenditure on health will lead to an increase in the life expectancy by about 56 units. This result can be compared with Reem (2018) that found that cash payments were conditional on the quantity and quality of key child health services. The economic implication of this is that it reduces household consumption and impact more on the poor people of the society. Similarly, the coefficient of health tax is 0.384249, meaning that holding other variables constant, a unit increase in health tax leads to an increase in the level of life expectancy by about 38 units. The economic implication is that Individuals especially the indigent, children and disabled will have better health if health tax is utilize on preventive and curative health care when needed and in a timely manner.

The coefficient of health insurance is 0.134289 which implies that over the study period, on average, a unit increase in the health insurance leads to approximately 13unit increase in life expectancy. In theory, the economic implication is that health insurance will contribute to the achievement of better health outcomes because it increases access and utilization by lowering the price of health care and reduction in out of pocket health care expenditure. This conforms to the standard economic theory which postulates that health insurance enhances health outcome (proxy by life expectancy). The R^2 measures the proportion of total variation in the regressand explained by the regressors in regression model. From the regression result of model I, the R^2 is 0.635287**.** This means that the model explains about 64% of the total variation in health outcome (life expectancy LFEXP). From the results displayed in the table 5 above, we conclude that all the parameter estimates, are statistically significant at 5% level of significance except for health tax (HT) in both model I which is statistically significant at 10% critical level.

Model II
Table 4.4
Summary of model II regression result

Variables	COEFFICIENTS	T-STATISTICS	PROBABILITY	Status at 5%
C	46.31922	36.11592	0.0000	Statistically Significant
PHEXP	-0.026809	-5.979110	0.0000	Statistically Significant
CEH	0.073507	2.028905	0.0517	Statistically Significant
HT	-0.050105	-1.838259	0.0763	Statistically Insignificant
HI	0.020862	2.809336	0.0088	Statistically Significant
R^2	0.721390	F-statistic	18.77202	

Dependent variable = IMR (Infant Mortality Rate)
Source: Researcher's computation 2022 using E-Views

In this model II, the dependent variable is health outcomes proxy by infant mortality rate (IMR) while the independent variables are: public health expenditure (PHEXP), cash expenditure on health (CEH), health tax (HT) and health insurance (HI). From the regression result in table 4.4, the coefficient of constant is positive and it is statistically significant. The coefficient implies that infant mortality rate is **46.31922** at the beginning of the study period, when other variables are not operational or held constant. The economic implication of this result is that; that holding other factors that influences infant mortality constant, average infant mortality rate is 46 per 1000 live births.
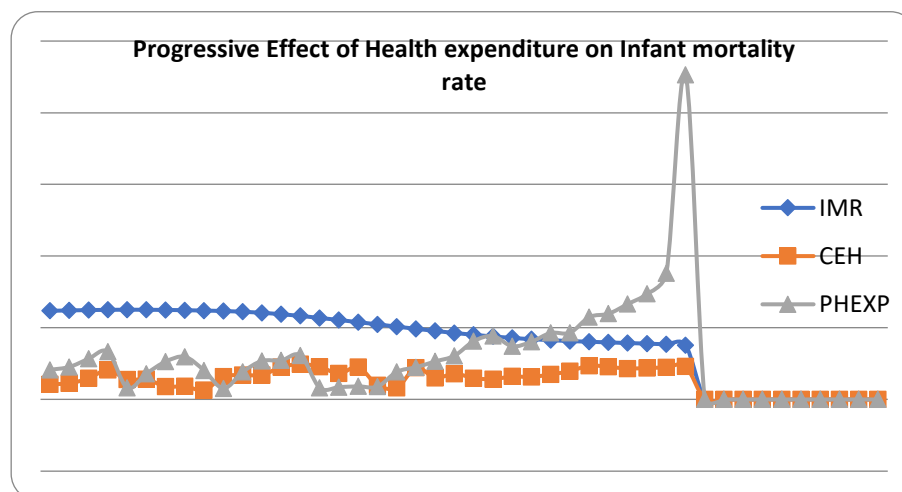

Fig 2: Progressive Effect of Health Spending on Health outcome (IMR)
Source: Researcher's computation 2022 using E-Views

This figure is a reflection of the reduction in infant mortality due to health expenditure. This indicates a triumph of health expenditure over infant mortality rate, leading to its reduction, starting from 2014. This improvement can be attributed to massive MDG And SDG health campaign and expenditure. This is more realistic when compared with Adewumi, Acca, & Afolayan, (2018) that found average child mortality rate to be 717 per 1000 live births. Similar

to the above, Anyanwu and Erhijakpor (2018) had revealed that health expenditures better health outcomes in Africa. Worth to note, the private cash expenditure on health is not statistical significant the reduction of infant mortality rate.

For Public health expenditure, the sign of its coefficient is negative and does not conform to the standard economic theory which postulates that government expenditure decreases infant mortality rate. The coefficient of 0.026809 implies that over the study period, on average, a unit increase in the government expenditure on health leads to approximately 2.6809 unit decrease in infant mortality rate. This result confirmed the work Anyanwu and Erhijakpor (2018) where Health expenditures were found to have a significant effect on infant mortality and under-five mortality. This is similar with cash expenditure on health and health insurance. For instance, the coefficient of cash expenditure on health is 0.073507, which is positive and that of health insurance is 0.134289 which is equally positive. This means that holding other variables constant, a unit increase in of cash expenditure on health and health tax will lead to a decrease in the infant mortality rate by about 5 units and 13 units respectively. This result can be compared with Reem (2018) that found that cash payments were conditional on the quantity and quality of key child health services.

Furthermore, the coefficient of health tax is -0.050105, meaning that holding other variables constant, a unit increase in health tax does not directly lead to reduction in infant mortality rate within the period under study. Our finding is similar with Arthur and Oaikhenan (2016) that found that the mortality rate was related to public health expenditure, whereas life expectancy was linked with private health expenditure. The economic implication is that Individuals especially the indigent, children and disabled have not benefited directly from health tax in Nigeria. From the regression result of model II, the R^2 is 0.721390, which is equally high. This means that the model explain about 72% of the total variation in health outcome (Infant mortality rate, IMR) in Nigeria. We thereby conclude that the coefficients of determination (R^2) are statistically significant and a true goodness of fit for the models. From the results displayed in the table 6 above, we conclude that all the parameter estimates, are statistically significant at 5% level of significance except for health tax (HT) in model II which is statistically significant at 10% critical level.

Summary of Findings

This study has investigated and elaborated on the empirical issues pertaining to the effect public health expenditure and health outcomes in Nigeria from 1985 to 2020. Thus, the study modeled (1) infant mortality rate against public health expenditure with controlled variables like health insurance and health tax (2) Life expectancy against government expenditure on health with controlled variables like cash expenditure on health and health insurance to establish a long run relationship among the variables. The study used Johansen co-integration approach to determine the long run relationship between government health expenditure and health outcomes in Nigeria. The research findings revealed the following:

The study found that life expectancy and infant mortality are major significant determinants and proxies of health outcome in Nigeria. It further revealed that cash expenditure on health, public health expenditure and health insurance are major significant factor affecting health outcomes (proxy by life expectancy and infant mortality) in Nigeria within the period under

study (1985-2020). This implies that private health expenditure is the major determinants to steady state growth in health outcome in Nigeria.

Furthermore, this research found that in Nigeria, public health spending has a negative association with infant mortality and life expectancy. These points to the constrained and inadequate public health financing nature of the country, which is far below the stipulated World Health Organization benchmark, hence, limiting the sustainable acceleration rate of the health outcomes in Nigeria. This demonstrates that the private sector (cash health expenditures) is more efficient than the state sector (public health expenditure). This study implies that the private sector (financial spent on health) has a stronger impact on health outcomes, particularly in terms of infant mortality and life expectancy. This conclusion has the economic implication that health services in Nigeria will be expensive. That is to say, the principle of excludability is at work in the Nigerian health sector, making social optimality hard to accomplish in Nigerian health care services.

Low health insurance coverage was also identified as a significant factor for the poor health outcomes in Nigeria, particularly a higher rate of infant mortality, according to the study. This is because, in the absence of health insurance or with inadequate health insurance coverage, individuals and households find it difficult to pay for their sick children's medical care, resulting in an increase in infant mortality and a decrease in life expectancy, lowering Nigeria's health outcome.

The study's findings also reveal that there is a long-term association between public health spending and health outcomes in Nigeria, as measured by infant mortality and life expectancy. Cash expenditure on health is a direct factor that affects the steady state in health outcomes proxy by infant mortality in Nigeria, according to the findings. This direct effect is sustainable in the short run but may not be sustainable in the long run given that not all the individuals and households have access to health insurance coverage in Nigeria.

Policy Recommendations
From the research findings on the impacts public health expenditure and health outcomes in Nigeria, the following research policy recommendations are suggested; the federal government should increase the annual budget allocation to health sector to 15% based on the United Nation and World Health Organization benchmark. This is to reduce the effects of infant mortality on health outcomes and enhance the human life expectancy of the population as well as drawing closer towards sustainable economic development in Nigeria through effective labour force. This can be done by channeling more funds to health programmes which have the potential of promoting health outcomes in Nigeria. 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 and health insurance, rather than the increase in recurrent expenditure as currently experienced in the country. There is need for reduction in medical tourism in the outside the country among the political class, and the money redirected in primary health care in Nigeria for better efficiency, which will translate to improved health outcomes.

Again, following the finding that health insurance is one the major measures that influence health outcomes, therefore, government should endeavor that all the citizens benefit from health insurance irrespective status. This will help to ensure and improve health outcomes especially infant mortality and life expectancy. Furthermore, 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. This will help to consolidate and sustain the steady state improvement in health outcomes in Nigeria,

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