Healthcare Determinants and their Impacts on Health Sector Development in Nigeria

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Abstract

There is general view that healthcare determinants and their significant impact on health sector development encompasses a broad range of factors that influence health outcomes, healthcare delivery systems in developing country like Nigeria. Therefore, this paper was attempt to empirically examine the impact of healthcare determinants on health sector development in Nigeria and specially to examine the impact of life expectancy, the out-of-pocket expenditure, the per capita income, the government health recurrent expenditure and the government health capital expenditure on health sector development in Nigeria. Also, Auto-regressive Distributed Lag (ARDL) approach was applied to estimate the impact of healthcare determinants on health sector development in Nigeria. The findings revealed that the out-of-pocket expenditure in Nigeria and the government health capital expenditure in Nigeria were found to have a negative and significant impact on the health sector development in Nigeria. On the other hand, life expectancy in Nigeria, the per capita income in Nigeria and the government health recurrent expenditure in Nigeria have a positive impact on the health sector development in Nigeria however, the it was only government health recurrent expenditure had significant impact on health sector development in Nigeria at a 5 percent significant level and this suggests that government health recurrent expenditure has a great potential in increasing the health sector development in Nigeria. Therefore, the paper recommended that Federal Ministry of Finance and stakeholders should ensure that health expenditures are complemented by policies aimed at increasing the significant impact of government health recurrent expenditure in Nigeria on the health sector development in Nigeria. also, Federal Ministry of Health should prioritize the expansion of health insurance coverage to reduce the financial burden on individuals through the National Health Insurance Scheme.

Keywords: *Healthcare Determinants, Development, Health Sector, Life Expectancy, Out-of-Pocket*

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Background to the Study

The global view of healthcare determinants and their significant impact on health sector development encompasses a broad range of factors that influence health outcomes, healthcare delivery systems, and overall population health. Also, health sector development requires coordinated efforts at global, regional, national, and local levels, with a focus on sustainability, equity, and resilience to effectively address current and future health challenges and effective management of healthcare determinants, especially the social and economic determinants (Landrigan *et al.*, 2018). Health is of great importance at the workplace, society and at every step of life because a healthy environment would lead to fruitful results in every aspect of life and if a person is healthy he/she will attain a better education and do better on the job which in return gives better earnings. A healthy individual would lead a welfare society (Gulliford *et al.,* 2017).

A robust healthcare sector contributes to economic development by enhancing workforce productivity, reducing healthcare costs through preventive care, and attracting investments in healthcare infrastructure and poor healthcare determinants can strain the economy through increased healthcare spending, lost productivity due to illness, and decreased foreign investments (Siddiqi *et al.*, 2017). Healthcare determinants such as access to healthcare services, quality of healthcare facilities, availability of healthcare professionals, and health education significantly impact health outcomes in Nigeria. Improved determinants lead to better health indicators such as reduced mortality rates, improved life expectancy, and lower incidence of communicable and non-communicable diseases (Blanchet *et al.*, 2017). However, healthcare expenditures are necessary for increasing societal welfare ensuring its sustainability and ensuring equal and fair access to health services for all segments of society through health expenditures, thereby reducing health inequalities, which is important for improving the overall health level of societies (Marmot *et al.*, 2017). Additionally, a need to protect the productive population of a society to support productivity and economic development sustainably through health expenditures.

Therefore, the government over the years have consistently strived to increase the health and education expenditures to increase the socioeconomic status of citizens for instance, by launching of the National Health Policy and Strategy to Achieve Health for all Nigerians in 1988, the Nigerian government designed and implemented programs, such as the National Poverty Eradication Program (NAPEP), the Subsidy Reinvestment and Empowerment Program (SURE-P), and the National Social Investment Program (NSIP), National Health Insurance Scheme (NHIS) National Economic and Empowerment Development Strategy (NEEDS) and public-private partnership programmes to improve workers' productivity by reducing out-of-pocket hospital bills settlement.

On the other hand, the government has also launched several education reforms for improving the expenditure in the sector for example formulation of education policy in Nigeria, the Universal Basic Education Scheme was launched in 1999, Education Tax Fund (ETF) was created by the Education Tax Act No. 7 of 1993, the Tertiary Education Trust Fund (TETFund) Act, 2011 was established and the adoption of the UNESCO recommendation of

increased annual expenditure for education. Human capital is measured by education, health, and training among other factors that can promote productivity (Braveman *et al.*, 2017). The workings of human capital development such as health and education are closely connected modules that work together to make the individual producer.

The Nigerian government recognized that health sector development and effective healthcare are critical prerequisites for the country's economic growth, development, and social progress and has made several efforts to improve its life expectancy and standard of living by exploring four 5-year development plans, one structural adjustment programme, two 3-year rolling plans, four visions and strategies including the Economic Recovery and Growth Plan (ERGP) and presently the five years National Development plan, embedded in those plans are strategies of human development and all of which were designed to provide financial assistance, vocational training, more access to health care and other forms of support to improving standard of living (David *et al.,* 2023).

Despite various policy efforts by the government, the country continues to face significant challenges limiting productive human development in terms of life expectancy and standard of living. Some of these challenges include low budgetary allocation to sectors that enhance human development, poor infrastructure, brain drain which has to do with the migration of health personnel from Nigeria to other countries in search of better working conditions, high population growth rate, low standard of living, low per capita income which translates into low out of pocket expenditure on health, underemployment, shortage of health and nutrition facilities, corruption, and lack of quality human resources compared to other countries. Therefore, the main objective of this paper is to examine the impact of healthcare determinants on health sector development in Nigeria. While the specific objectives are to:

  i.   Examine the impact of life expectancy on health sector development in Nigeria.
  ii.   Assess the impact of out-of-pocket expenditure on health sector development in Nigeria.
  iii. Investigate the impact of per capita income on health sector development in Nigeria.
  iv.   Determine the impact of government health recurrent expenditure on health sector development in Nigeria.
  v.   Identify the impact of government health capital expenditure on health sector development in Nigeria.

Materials and Methods
Conceptual Review
Health Sector Development
Health sector development refers to the systematic and sustained efforts to improve the quality, accessibility, and efficiency of healthcare services. It encompasses a broad range of activities and policies aimed at enhancing the overall health system infrastructure, workforce, service delivery, financing, and governance (Barasa *et al.*, 2018). The ultimate goal of health sector development is to ensure that all individuals have access to high-quality healthcare services, thereby improving health outcomes and achieving health equity (Bates *et al.,* 2018).

Health Care Determinants

Healthcare determinants are the various factors that influence the health outcomes of individuals and populations and these determinants include a wide range of biological, social, economic, and environmental factors, understanding healthcare determinants is essential for developing effective public health policies and interventions aimed at improving health outcomes and reducing health disparities (Witter *et al.,* 2019). On the other hand, life expectancy refers to the average number of years that an individual is projected to live. Life expectancy is the calculated projection of the average number of additional years a person of a specific age is likely to live (Eke *et al.,* 2023). World Development Indicators (2018) indicate that life expectancy is influenced by local factors. Life expectancy at birth is much lower in less-developed countries in comparison to more-developed countries.

Also, Out-of-pocket expenditure (OOPE) refers to direct payments made by individuals to healthcare providers at the time-of-service use. These expenses are not reimbursed by insurance and include payments for medical services, medications, and other health-related products and services. The World Health Organization (WHO) defines out-of-pocket expenditure as "any direct outlay by households, including gratuities and in-kind payments, to health practitioners and suppliers of pharmaceuticals, therapeutic appliances, and other goods and services whose primary intent is to contribute to the restoration or enhancement of the health status of individuals or population groups" (WHO, 2017). Furthermore, per capita income, also known as average income, quantifies the average amount of revenue earned by each individual in a specific geographical area, such as a city, region, or country, during a particular year. The calculation involves dividing the aggregate income of a specific area by the total number of people residing in that area (Braveman *et al.,* 2017).

Government health recurrent expenditure refers to the ongoing spending necessary for the maintenance and operation of health services and this type of expenditure covers a wide range of costs, including salaries of healthcare personnel, costs of medical supplies, utilities, and other operational costs required to keep healthcare facilities functioning (Kutzin *et al.,* 2017). Government health recurrent expenditure is defined as the portion of government health expenditure that is consumed within the fiscal year and is necessary for the day-to-day operation of health services (World Health Organization [WHO], 2019). On the other hand, government health capital expenditure refers to the investments made by the government in long-term assets and infrastructure to support the health sector and this type of expenditure is crucial for building and maintaining the physical and technological foundation necessary for delivering health services (Barroy *et al.,* 2018). Capital expenditure includes the construction and renovation of healthcare facilities, the purchase of major medical equipment, and investments in information technology systems. Government health capital expenditure is defined as spending on physical assets that have a useful life extending beyond a single fiscal year (World Health Organization [WHO], 2020).

Empirical Review

Ataboh & Aigbedion (2024) assessed the impact of government expenditure on the health sector in Nigeria (1990-2022). Autoregressive Distributed Lagged (ARDL) and Error

Correction Model (ECM) method and the study reveals that health capital expenditure and health recurrent expenditures were found to have a positive and significant impact on the health sector in Nigeria. On the other hand, per capita income has a positive and significant impact in the short run, it has a negative and significant impact in the long run on the health sector in Nigeria and the study recommended that the government should prioritize allocating funds for infrastructure development, medical equipment procurement, and healthcare facility expansion. Also, Akoji & Julius (2024) investigated a review of the determinants of health-seeking behaviour in Nigeria. A secondary method of data collection was adopted. The study concluded by stating that the multifaceted nature of health-seeking determinants must be taken into consideration in any attempt to understand health-seeking behaviour in Nigeria, and also recommended that; future interventions aimed at improving healthcare-seeking behaviour may be enhanced by targeting not only the patient's effort but also on the institutional capacity to make accessibility to health care facilities possible; and also, improvement in healthcare seeking behaviour cannot be fully achieved without achievable policy at the national level.

In another study, David *et al.,* (2023) examined the impact of government health expenditure and health sector performance using autoregressive distributed lag model technique. The analysis found that government health domestic spending and income per capital enhanced LE and reduced newborn mortality. Foreign health grants increase LE but decreases IM. Corruption also shortens LE and increases infant mortality and health insurance again lowered LE. Thus, the study recommends that Nigeria dedicate 15% of its budget to health to implement the 2001 WHO Abuja Declaration. The Nigerian government should also promote UHC ventures with healthcare regulators and Nigeria should institutionalize PPP healthcare. While, Grace & Mukhtar (2022) examined the determinants of healthcare choice in Kontagora town. The study utilized the multiple regression equation. The study revealed that gender, marital status, education, and religion are significant factors that influence the choice of healthcare and the study also revealed that most respondents (about 45.7%) used the public health service. The selection of healthcare service was attributed to cost and quality service, effective treatment, nearness of the facility, and waiting time. The study recommended that government and stakeholders play a significant role in increasing community-based health education, creating awareness, and improving access to information through public discussions and local media.

Also, Taofik & Ditep (2022) investigated the relationship between public health expenditure and health indicators in Nigeria. The study utilized the Error Correction Mechanism (ECM) framework and the results also indicate that GDP per capita and literacy level positively affect health indicators while urban population and carbon dioxide emissions impacted negatively on health indicators. Furthermore, the results revealed that the various speeds of adjustment are significant and low. The study concluded that expenditure on healthcare is vital for improving the quality of life in Nigeria and recommends that the government should increase health expenditure, control over-crowding in urban centres, reduce inequality, and promote the use of green energy. While, Rene *et al.,* (2022) analysed asserting public health interest in acting on commercial determinants of health in sub-Saharan Africa and regional agencies and

the three areas of discourse stood out, demonstrating also tensions between commercial and public health objectives. we found and present options for using these same three forms of narrative, agential and structural power to proactively advance public health objectives and leadership on CDOH in SSA.

In another study, Ebhotemhen & Hezekiah (2021) carried out an analysis on impact of public health expenditure on the Nigerian health sector performance from 1981 to 2020 by employing Autoregressive Distributed Lag model technique. The results of the Error Correction Mechanism (ECM) accentuated the connection between public healthcare expenditure and health sector performance in Nigeria through establishment of stable long-term equilibrium relationship among the variables employed in the model. Therefore, the study recommends not only increase in the budgetary allocation to the health sector but also establish a platform that will ensure probity and accountability in the health sector. This in turn leads to achieve improvement in the health sector performance necessary for building human capital in Nigeria. While, Aderibigbe (2021) examined the influence of strategic processes on organizational development and growth of the public health institution in Nigeria. The strategic plan outlines a plan or strategy to improve the organizational performance, effectiveness as well as overall efficiency of an institution whether public or private. Numerous research studies show that many institutions are often involved in strategic planning in order to attain and maintain the organizational goals of profit maximization and greater market share. Also these studies in literature show that the development and implementation of it has a direct influence on the efficiency and effectiveness of health institutions with increases in the performance of departments and longevity of the institution.

Also, Owumi & Alfred (2021) assessed the contributions of the healthcare expenditure to life expectancy at birth in Nigeria for a period of 18 years (2000 to 2017). Robust least squares regression was adopted to estimate the model. Results showed that domestic general government health expenditure, out-of-pocket payment and external health expenditure had respective significant positive effects on life expectancy in Nigeria for the period under review. Specifically, when other variables are held constant, a $1% increase in the domestic general government health expenditure would lead to 6% increase in life expectancy at birth in Nigeria. Similarly, a $1% increase in out-of-pocket health expenditure would lead to 63% enhancement in life expectancy. Moreover, 11% improved life expectancy at birth will depend on a 1% increase in external health expenditure. However, out-of-pocket payment had the most significant positive effect on life expectancy in the country for the period under review. While, Hezekiah *et al.,* (2020) examined determinants and perceptions of health insurance participation among healthcare providers in Nigeria using a mixed-methods cross-sectional design. Results showed that a higher proportion of provider facilities participating in insurance relative to non-participating facilities were larger with mid to (very) high patient volume, workforce, and longer years of operation. The study concluded that for the Lagos state and other government insurance schemes in developing countries to be successful, effective contracting and quality assurance of healthcare providers are essential.

Furthermore, Lulin *et al.,* (2020) examined the determinants of health care expenditure among twenty-two (22) emerging countries for a period of 18 years (2000 to 2018). Findings from the study unveiled that the quantile regression test revealed that economic growth and aging population could induce healthcare costs in emerging countries. However, the impact of industrialization, agricultural activities, and technological advancement on health expenses are found to be noticeably heterogeneous at the various quantile levels. The authors suggested that effective and integrated strategies should be considered by industries and agricultural sectors to help reduce preventable diseases that will ultimately reduce healthcare costs among the emerging countries. While, Ijeoma *et al.,* (2019) empirically analyzed a review of the incidence and determinants of catastrophic health expenditure in Nigeria: Implications for universal health coverage using a descriptive analysis. Results from the study showed that at 10% of total household and nonfood expenditures, the incidence of CHE was 8.2% to 50%, while 3.2% to 100% of households incurred CHE at 40% of non-food expenditures. There is a high incidence of CHE across various common health conditions in Nigeria. The authors recommended the expansion of the National Health Insurance Scheme via informal social and financing networks platforms. Increased budgetary allocation to health and inter sectorial collaboration will also play a significant role in CHE reduction.

In another study, Obi *et al.,* (2019) examined the effect of identified critical determinants on supply of services and also show how much these critical determinants can collectively predict this supply of services using a quantitative approach. Multistage sampling technique was adopted. Results showed that the critical determinants of reimbursement structure, tariff structure, facility number of enrollees and cost of hospital consumables studied had positive impact on the supply of service but the impact of cost of hospital consumable was insignificant. The authors submitted that most of the identified critical determinants studied had a significant effect and also collectively could account significantly for changes in the supply of services and so, therefore, there is a need to properly address these factors so as to achieve the set-out objectives in the programme. While, Idowu *et al.,* (2018) investigated the impact of healthcare financing and health status analysis in Nigeria using the Grossman's model of health production function. from the study it was discovered that public health spending has an inverse and significant impact on the rate of infant mortality in Nigeria. Also, there is a high prevalence of preventable ailments such as malaria, cholera, and Lassa fever in some states of the country. Similarly, incidences of Tuberculosis and HIV/AIDS as well as death-related cases are still on high. The authors submitted that the Government of Nigeria should improve on budgetary allocation to healthcare.

While, Loel & Michael (2018) examined the impact of health care steps up to social determinants of health in the United States. The authors stated that mounting evidence of the impact of social determinants on people's health has stimulated a surge of activity among policymakers, health systems, and a growing number of social entrepreneurs to integrate health and social services and to find novel ways to finance those efforts. Also, Alhassan & Abdu (2017) empirically investigate the determinants of health status in Nigeria using cross-sectional data. The Grossman's health production model has been applied as the theoretical model. Both logistic and probit regression models have been estimated. The estimated work

suggests that age, sources of drinking water, residence-type, marriage-type, and household size are statistically significant. Sources of drinking water and residence have positive impacts on households' health status, while age, household size and marriage type have negative effect on their health status. Finally, Idowu (2014) examined the impact of health on economic growth in Nigeria for the period of 14 years (1995 to 2009). The co integration, and Granger Causality techniques were used in analyzing Quarterly time series data of Nigeria. The study finds that GDP is positively influenced by health indicators in the long run and health indicators cause the per capita GDP. It reveals that health indicators have a long run impact on economic growth. Thus, the impact of health is a long run phenomenon. The major policy implication of the study was that, a high level of economic growth can be achieved by improving the health status of the populace, especially if the current status is at low ebb.

Theoretical Framework

The paper adopted the theory of social determinants of health and the theory was developed by Michael Marmot and Richard Wilkinson in 1999 as the theoretical framework. The theory states that health is a multidimensional issue various factors influence its supply, development, or destruction and it also stresses that people, systems, and organizations in society play a role in making and receiving health outcomes (Bayati *et al.,* 2012). Among the factors that affect health, the share of healthcare, biological factors, physical, environmental, and behavioral factors, and socioeconomic determinants are 25%, 15%, 10%, and 50%, respectively (Marandi, 2013). The theory opined that the most fundamental causes of health inequalities are related to different socioeconomic conditions (Marandi, 2013), also the most serious factors of illness are related to socioeconomic conditions in which people work and live (Huynen *et al.,* 2005). This condition in the literature is known as "the causes of the causes" (Marmot, 2007).

Understanding health sector development requires recognizing the main causes, and direct and indirect effects mechanism of, the conceptual models of socioeconomic status (SES) or social determinants are used. Different models were presented to describe public health (Khang *et al.,* 2005). these models are also used and shape different conceptual models of SDH. WHO, at the international level, has emphasized the importance of SDH in assessing the health inequalities in middle- and low-income countries (Tarrant *et al.,* 2013) and about different pathways, mechanisms and indicators suggested by different and conflict conceptual models of SDH, motivated us to present these models in historical perspective and provide a main component of SDH models as SES indicators which include health expenditures and out-of-pocket expenditures, life expectancy and per capita income. Therefore, the theory establishes a functional relationship between healthcare determinants and health sector development in Nigeria which can be expressed in equation (1).

$$Y_t = X_1 + X_2 + \ldots\ldots\ldots + X_n \qquad\qquad (1)$$

Where Y_t is the dependent variable and this study is the health sector development while $X_1 + X_2 + \ldots\ldots\ldots + X_n$ are the independent variables which are life expectancy in Nigeria (LEX), the

out-of-pocket expenditure in Nigeria (OPE), the per capita income in Nigeria (PCY), the government health recurrent expenditure in Nigeria (HRE), and the government health capital expenditure in Nigeria (HCE).

Methodology

Research Design and Sources of Data

The secondary method of data collection was adopted in this paper and the *ex-post facto* research design was adopted. Also, the data were sourced from the Central Bank of Nigeria (CBN) and the World Development Index of the World Bank data bank. The life expectancy in Nigeria (LEX), the out-of-pocket expenditure in Nigeria (OPE), and the per capita income in Nigeria (PCY) were sourced from World Development Index (WDI) while, the health sector development in Nigeria (HSD), the government health recurrent expenditure in Nigeria (HRE) and the government health capital expenditure in Nigeria (HCE) were sourced from Central Bank of Nigeria (CBN).

Model Specification

The study adapted the model of the work of Ataboh and Aigbedion (2024) who assessed the impact of government expenditure on the health sector in Nigeria (1990-2022) with a functional model as stated below.

$$LE = f(HCE, HRE, PCI) \tag{2}$$

Where; LE is Annual Life Expectancy in Nigeria, HCE is the Health Capital Expenditure, HRE is Health Recurrent Expenditure and PCI is Per Capita Rate in Nigeria. The model was modified to establish the functional relationship between health care determinants and health sector development in Nigeria in equation (3)

$$hsd = f(lex, ope, pcy, hre, hce) \tag{3}$$

The implicit model is in equation (4)

$$hsd_t = \alpha_0 + \beta_1 lex_t + \beta_2 ope_t + \beta_3 pcy_t + \beta_4 hre_t + \beta_5 hce_t + \mu_t \tag{4}$$

Where: HSD is the health sector development in Nigeria, LEX is the life expectancy in Nigeria, OPE is the out-of-pocket expenditure in Nigeria, PCY is the per capita income in Nigeria, HRE is the government health recurrent expenditure in Nigeria and HCE is the government health capital expenditure in Nigeria. Therefore, equation (5) is the specification of the Autoregressive Distributed Lagged (ARDL) model that was used to examine the impact of health care determinants on the health sector development in Nigeria and as specified as follows:

$$\Delta hsd_t = \beta_0 + \sum_{i=1}^{q} \beta_1 hsd_{t-1} + \sum_{i=1}^{q} \beta_2 lex_{t-1} + \sum_{i=1}^{q} \beta_3 ope_{t-1} + \sum_{i=1}^{q} \beta_4 pcy_{t-1} + \sum_{i=1}^{q} \beta_5 hre_{t-1}$$
$$+ \sum_{i=1}^{q} \beta_6 hce_{t-1} + \beta_7 \Delta hsd_{t-i} + \beta_8 \Delta lex_{t-i} + \beta_9 \Delta ope_{t-i} + \beta_{10} \Delta pcy_{t-i} + \beta_{11} \Delta hre_{t-i} + \beta_{12} \Delta hce_{t-i} + \mu_t \tag{5}$$

Where: Δ is First difference operator, β_0 is Constant parameter, $\beta_1, \beta_2, \beta_3,$ to β_{12} are Parameter Co-efficient in the long-run dynamics and μ_t is the Error term.

Method of Data Analysis

Autoregressive Distributed Lagged (ARDL) was used for the analysis and the estimation of economic variables which was developed by Pesaran & Shin (1999) and further expanded by Pesaran *et al.,* (2001) the procedure allows the researcher to use variables that are not integrated in the same order. Also, this method was used to establish the short-run and long-run relationship between the impact of healthcare determinants and health sector development in Nigeria.

Table 1: Description of the Variables Used for the Model

Variable	Description/Measure	Type	Source	Apriori Expectation
HSD	Health Sector Development in Nigeria	Dependent	CBN, 2023	
LEX	Life Expectancy in Nigeria	Independent	WDI, 2023	$\beta_1 >< 0$
OPE	Out-of-Pocket Expenditure in Nigeria	Independent	WDI, 2023	$\beta_2 >< 0$
PCY	Per Capita Income in Nigeria	Independent	WDI, 2023	$\beta_3 >< 0$
HRE	Health Recurrent Expenditure in Nigeria	Independent	CBN, 2023	$\beta_4 >< 0$
HCE	Health Capita Expenditure in Nigeria	Independent	CBN, 2023	$\beta_5 >< 0$

Source: Author Compilation, 2024

The a priori expectation is that $\beta_1 \beta_2 \beta_3 \beta_4$ and $\beta_5 >< 0$ indicates a positive or negative relationship between the healthcare determinants in Nigeria and health sector development in Nigeria, this means, an increase/decrease in the healthcare determinants in Nigeria will lead to a decrease/increase in health sector development in Nigeria.

Presentation and Discussion of Results
Descriptive Statistics
This paper presented a descriptive statistics summary of all the variables used.

Table 2: Descriptive Summary

	HSD	LEX	OPE	PCY	HRE	HCE
Mean	376.4006	49.56853	70.06588	1650.358	134.5459	22.73029
Maximum	1322.250	57.21000	77.27000	3200.950	459.3300	53.87000
Minimum	3.950000	45.49000	58.34000	494.1290	0.150000	0.380000
Skewness	0.918107	0.293671	-0.758537	-0.068609	0.916374	0.364885
Kurtosis	2.641923	2.308436	2.606515	1.841878	2.515577	1.706301
Jarque-Bera	4.958192	1.166245	3.479818	1.926772	5.090974	3.125482
Probability	0.083819	0.558153	0.175536	0.381599	0.078435	0.209561
Observations	34	34	34	34	34	34

Source: Researcher's Computation Using EViews-12 (2024)

Table 2 shows the descriptive summary of the variables used in the paper and the summary revealed that all the variables were not mesokurtic as their kurtosis values are less than three (3) and therefore, the variables were platykurtic. Similarly, the probability of the Jarque-Bera shows that all the variables were normally distributed at the 1%, 5%, and 10% normality test. The mean value of the health sector development in Nigeria is 376.4 billion Naira, the maximum value is 1322.25 billion Naira and the minimum value is 3.95 billion Naira. Also, the mean value of life expectancy in Nigeria is 49.56 percent, the maximum value is 57.21 percent and the minimum value is 45.49 percent. More so, the mean value of the out-of-pocket expenditure in Nigeria is 70.07 billion Naira, the maximum value is 77.27 billion Naira and the minimum value is 58.34 billion Naira. Furthermore, the mean value of the per capita income in Nigeria is 1650.358 dollars, the maximum value is 3200.95 dollars and the minimum value is 494.13 dollars. Also, the mean value of the government health recurrent expenditure in Nigeria is 134.54 billion Naira, the maximum value is 459.33 billion Naira and the minimum value is 0.15 billion Naira. Financially, the mean value of the government health capital expenditure in Nigeria is 22.73 billion Naira, the maximum value is 53.87 billion Naira and the minimum value is 0.38 billion Naira.

Stationary Tests (Unit Root Tests)
This section shows the unit root of the variables using the Augmented Dickey-Fuller (ADF) Test to check the stationary at a 5 percent level of significance.

Table 3: Unit Root Test Result

Variable	Augmented Dickey-Fuller (ADF) Test		
	ADF	@ 5%	Status
HSD	-3.745360	-3.574244	1(1)
LEX	-2.193238	-1.951687	1(0)
OPE	-5.465471	-3.557759	1(1)
PCY	-4.661799	-3.557759	1(1)
HRE	-4.740080	-3.603202	1(1)
HCE	-5.603461	-3.557789	1(1)

Source: Author's Computation Using EViews-12 (2024)

Table 3 shows the stationary test of the variables used in this paper and the ADF test results revealed that life expectancy in Nigeria was stationary at level, which means that it is integrated of order zero 1(0) at a 5% level of significance. On the other hand, the health sector development in Nigeria, life expectancy in Nigeria, the out-of-pocket expenditure in Nigeria, the per capita income in Nigeria, the government health recurrent expenditure in Nigeria, and the government health capital expenditure in Nigeria were not stationary at the level until they were differenced once and they were said to be integrated of order one 1(1). Given the mix result, as shown by ADF tests as well as the order of integration of the variables, the long-run relationship among the variables will be tested using the ARDL model which can capture the characteristics of a mixture of 1(0) and 1(1) of the variables as postulated by Pesaran *et al.,* (2001).

Co-integration of ARDL-Bounds Test
This section shows the ARDL co-integration bounds test of the variables used in this paper.

Table 4: ARDL-Bound Testing

Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	K
F-statistic	72.08878	3
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.08	3
5%	2.39	3.38
2.5%	2.7	3.73
1%	3.06	4.15

Source: Researcher's Computation Using EViews-12 (2023)

Table 4 shows the ARDL bounds test for co-integration that was carried out for all four models based on the research objectives. The result shows that the F-statistic derived from the ARDL bounds test is 72.08 and when compared with the critical values obtained from the Pesaran Table at a 5% level of significance, its value exceeded both 2.39 and 3.38 for 1(0) and 1(1) respectively. This implies that the dependent variable and the independent variables are co-integrated at a 5% significance level.

Presentation and Interpretation of Results
This section presented the long-run and short-run results of the ARDL regression analysis where the health sector development in Nigeria is the dependent variable while the life expectancy in Nigeria, the out-of-pocket expenditure in Nigeria, the per capita income in Nigeria, the government health recurrent expenditure in Nigeria and the government health capital expenditure in Nigeria are the independent variables.

Table 5: ARDL Regression Results
Dependent Variable: HSD

Co-integrating Estimates (ECM Estimates)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LEX)	21.83613	2.426692	8.998314	0.0000
D(OPE)	-1.763711	0.380372	-4.636806	0.0002
D(PCY)	0.023647	0.003522	6.713197	0.0000
D(PCY(-1))	-0.015773	0.003746	-4.210805	0.0005
D(HRE)	0.027880	0.037395	0.745562	0.4656
D(HRE(-1))	-0.191025	0.040573	-4.708151	0.0002
D(HCE)	-0.745630	0.175270	-4.254169	0.0005
CointEq(-1)*	-0.052955	0.002042	-25.93894	0.0000
R-squared	0.999758			
Adjusted R-squared	0.999583			
F-statistic	5710.447			
Prob. (F-statistic)	0.000000			
Durbin-Watson stat	2.800598			
Long Run				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LEX	29.36709	35.25533	0.832983	0.4158
OPE	-49.79900	41.06945	-1.212556	0.2410
PCY	0.437301	0.351043	1.245720	0.2288
HRE	5.548072	2.416650	2.295770	0.0339
HCE	-2.235763	4.425567	-0.505192	0.6196
C	1716.359	3127.903	0.548725	0.5899

Source: Researcher's Computation Using EViews-12 (2024)

From Table 5, the value of F-statistics of 5710.447 and the probability values of 0.0000, indicated that there is a long-run relationship between the healthcare determinants in Nigeria and health sector development in Nigeria. The R-square value of 0.99 revealed that healthcare determinants in Nigeria jointly accounted for about 99 percent of the variation in the health sector development in Nigeria during the period under review; while the remaining 1 percent accounted for by other factors outside the model. The short-run result and the ECT show the 1-period lag Error Correction Term and its value of -0.052955 indicates that it is negative and statistically significant with a probability value of 0.00 at a 5 percent significant level. This means that the average speed of adjustment from the short run to the long run should there be any disequilibrium is 5%.

From the long-run result the life expectancy in Nigeria shows a positive coefficient of 29.37, with a t-statistic of 0.833, which indicates a positive but insignificant impact on the health sector development in Nigeria at the 5% level (Prob. 0.4158). This suggests that an increase in life expectancy in Nigeria tends to have little or no impact on the health sector development in Nigeria and this result has also confirmed that life expectancy has the potential to improve the level of health sector development in Nigeria if well managed given its positive value. On the other hand, the out-of-pocket expenditure in Nigeria shows a negative coefficient of -49.79900, with a t-statistic of 1.212586, which indicates an insignificant negative impact on

the health sector development in Nigeria at the 5% level (Prob. 0.2410) and this implies that an increase in out-of-pocket expenditure in Nigeria tends to have negative impact on the health sector development in Nigeria and this negative impact was unexpected because the out-of-pocket expenditure should have positive impact on health sector development in Nigeria however, this negative impact shows that out-of-pocket expenditure model is not good model of healthcare financing in Nigeria.

Also, from the long-run result, the per capita income in Nigeria shows a positive coefficient of 0.437, with a t-statistic of 1.246, which indicates an insignificant but positive impact on the health sector development in Nigeria at the 5% level (Prob. 0.2288). This suggests that an increase in per capita income tends to have little or no impact on the health sector development in Nigeria and this result has also confirmed that per capita income has the capacity to improve the level of health sector development in Nigeria because increased in per capita income can lead to health sector development in Nigeria increase given the positive value of the coefficient of per capita income in Nigeria. On the other hand, the government health recurrent expenditure in Nigeria shows a positive coefficient of 5.548072, with a t-statistic of 2.296, which indicates a significant and positive impact on the health sector development in Nigeria at the 5% level (Prob. 0.0339). This suggests that an increase in government health recurrent expenditure tends to have strong and positive impact on the health sector development in Nigeria and this result has also confirmed that well managed government health recurrent expenditure can improve the level of health sector development in Nigeria.

Finally, the government health capital expenditure in Nigeria shows a negative coefficient of -2.235763, with a t-statistic of -0.505, which indicates a negative and insignificant impact on the health sector development in Nigeria at the 5% level (Prob. 0.2410) and this implies that an increase in government health capital expenditure in Nigeria tends to have negative impact on the health sector development in Nigeria and this negative impact was not expected because the government health capital expenditure should have positive impact on health sector development in Nigeria however, this negative impact shows that government health capital expenditure has not been properly used for health sector development in Nigeria. Furthermore, the hypothesis that stated H_{01}: life expectancy in Nigeria has no significant impact on the health sector development in Nigeria is accepted given that the probability value of 0.4158 is greater than 5 percent level of significance which implies that the life expectancy has a positive and insignificant impact on health sector development in Nigeria.

Also, the hypothesis that stated H_{02}: the out-of-pocket expenditure in Nigeria has no significant impact on the health sector development in Nigeria is accepted given that the probability value of 0.2410 is greater than 5 percent level of significance which implies that the out-of-pocket expenditure in Nigeria has a negative and insignificant impact on health sector development in Nigeria. On the other hand, the hypothesis that stated H_{03}: the per capita income in Nigeria has no significant impact on the health sector development in Nigeria is accepted given that the probability value of 0.2288 is greater than 5 percent level of significance which implies that the per capita income in Nigeria has a positive and insignificant impact on health sector development in Nigeria. Furthermore, the hypothesis that stated H_{04}: the government health

recurrent expenditure in Nigeria has no significant impact on the health sector development in Nigeria is rejected given that the probability value of 0.0339 is less than 5 percent level of significance which implies that the government health recurrent expenditure in Nigeria has a positive and significant impact on health sector development in Nigeria. Finally, the hypothesis that stated H_{05}: the government health capital expenditure in Nigeria has no significant impact on the health sector development in Nigeria is rejected given that the probability value of 0.6196 is greater than 5 percent level of significance which implies that the government health capital expenditure in Nigeria has a negative and insignificant impact on health sector development in Nigeria.

Post-Diagnostic Checks

Table 6: Results of Post-Diagnostic Checks

Tests		Outcomes	
		Coefficient	Probability
Breusch-Godfrey-Serial-Correlation Test	F-stat.	2.571356	0.1076
Heteroscedasticity-Breusch-Pagan-Godfrey Test	F-stat.	0.472460	0.9135
Normality Test	Jarque-Bera	1.614573	0.2147
Linearity Test	F-stat	1.324300	0.51574

Source: Researcher's Computation Using EViews-12 (2024)

Table 6 revealed that the variables are free from the problem of Serial Correlation since the F-statistics is 2.57 and the P-value of 0.1076 is greater than the 5% significance level. This outcome suggests the absence of Serial Correlation in the model of the impact of healthcare determinants on the health sector development in Nigeria. Similarly, the Heteroskedasticity results show that variables are free from the problem of Heteroskedasticity since the F-statistics of 0.47 and P-value of 0.91 are greater than the 5% significance level and this outcome suggests the absence of heteroskedasticity in the model of the impact of healthcare determinants on the health sector development in Nigeria.

Also, the Jarque-Bera test of normality shows that the error term in our specified equation is normally distributed. This is evidenced by the respective insignificant Jarque-Bera statistics of 1.61 and the probability value of 0.21. Finally, the results of the linearity show that there is a linear relationship between the dependent and independent variables used in the model given the F-stat value of 1.32 and probability value of 0.52.

Discussion of Findings

The model which assessed the impact of healthcare determinants on the health sector development in Nigeria revealed that the Autoregressive Distributed Lagged result revealed that life expectancy in Nigeria was found to have a positive and insignificant impact on health sector development in Nigeria and this implies that increase in life expectancy in Nigeria will lead to little or no increase in health sector development in Nigeria and this finding agreed with the work of Idowu (2014) who concluded that there is a positive impact of life expectancy on health sector development in Nigeria. On the other hand, the out-of-pocket expenditure in

Nigeria was found to have a negative and insignificant impact on health sector development in Nigeria and this implies that increase in the out-of-pocket expenditure will lead to decrease in health sector development in Nigeria and this finding disagreed with the work of Owumi & Alfred (2021) who concluded that there is a positive impact of the out-of-pocket expenditure on health sector development in Nigeria.

Also, the per capita income in Nigeria was found to have a positive and insignificant impact on health sector development in Nigeria and this implies that an increase in the per capita income in Nigeria will lead to little or no increase in health sector development in Nigeria and this finding agreed with the work of Ataboh & Aigbedion (2024) who concluded that there is a positive impact of the per capita income in Nigeria on health sector development in Nigeria. Similarly, the government health recurrent expenditure in Nigeria was found to have a positive and significant impact on health sector development in Nigeria and this implies that an increase in the government health recurrent expenditure in Nigeria will lead to a substantial increase in the health sector development in Nigeria and this finding agreed with the work of Ebhotemhen & Hezekiah (2021) who concluded that there is a positive impact of the government health recurrent expenditure on health sector development in Nigeria. Finally, the government health capital expenditure in Nigeria was found to have a positive and insignificant impact on health sector development in Nigeria and this implies that an increase in the government health capital expenditure in Nigeria will lead to little or no increase in health sector development in Nigeria and this finding agreed with the work of David *et al.*, (2023) who concluded that there is a positive impact of the government health capital expenditure in Nigeria on health sector development in Nigeria.

Conclusion and Recommendations
The Autoregressive Distributed Lagged revealed that the out-of-pocket expenditure in Nigeria and the government health capital expenditure in Nigeria were found to have a negative and significant impact on the health sector development in Nigeria at a 5 percent significant level and this implies that out-of-pocket expenditure is negative and insignificant value. it shows that it is not a good model for the health sector development in Nigeria and the result shows that government health capital expenditure has not properly managed to significantly impact on health sector development in Nigeria despite the huge government health capital expenditure in Nigeria. On the other hand, life expectancy in Nigeria, the per capita income in Nigeria and the government health recurrent expenditure in Nigeria have a positive impact on the health sector development in Nigeria however, the it was only government health recurrent expenditure had significant impact on health sector development in Nigeria at a 5 percent significant level and this suggests that government health recurrent expenditure has a great potential in increasing the health sector development in Nigeria. Therefore, the paper recommended the following:
i. The Federal Ministry of Health should increase the primary healthcare activities by increasing the manpower and facilities to improve the efficiency of the primary healthcare provision which has the capacity to increase more access to healthcare and increase the significant impact of life expectancy on the health sector development in Nigeria.

ii.   The negative impact of out-of-pocket health expenditure on health sector development in Nigeria was unexpected because the apriori expectation is that it should have a significant impact on health sector development in Nigeria. Therefore, the Federal Ministry of Health should prioritize the expansion of health insurance coverage to reduce the financial burden on individuals through the National Health Insurance Scheme and establish a policy to strengthen the level of healthcare subsidy for low-income populations and expand the range of services covered by insurance plans.

iii.   The Federal Ministry of Finance should increase the incentive to Micro, Small, and Medium Enterprises (MSMEs) to increase productivity activities and increase the gross domestic product which is a major determinant of per capita income in Nigeria with an increase in the gross domestic product there would be improvement in the significant impact of per capita income in Nigeria on health sector development in Nigeria.

iv.   Based on the positive impact of government health recurrent expenditure in Nigeria on the health sector development in Nigeria, it is recommended that the Federal Ministry of Finance and stakeholders should ensure that health recurrent expenditures are complemented by policies aimed at increasing the significant impact of government health recurrent expenditure in Nigeria on the health sector development in Nigeria.

v.   Finally, considering the negative impact of government health capital expenditure in Nigeria on the health sector development in Nigeria, it is recommended that the health ministry and stakeholders ensure that health capital investments are complemented by policies aimed at mitigating the negative impact of government health capital expenditure in Nigeria on the health sector development in Nigeria. This could include designing policies to reduce the misappropriation of government health capital expenditure funds for health sector development in Nigeria.

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Table 7: Regression Data

YEAR	HSD	LEX	OPE	PCY	HRE	HCE
1990	3.95	46.04	58.34	567.518	0.5	0.53
1991	4.71	45.69	60.91	609.373	0.62	0.38
1992	12.14	45.67	63.51	519.636	0.15	0.54
1993	17.67	45.79	66.01	551.893	3.87	0.91
1994	20.47	45.51	68.83	762.399	2.09	1.27
1995	23.65	45.49	70.71	1302.55	3.32	2.34
1996	24.36	45.57	75.41	1673.91	3.02	2.2
1997	30.36	45.79	71.61	1765.08	3.89	1.75
1998	43.25	46.04	70.21	1871.76	4.74	5.93
1999	49.62	46.61	67.21	494.129	16.64	4.38
2000	98.12	47.19	60.16	563.047	15.22	7.1
2001	123.95	47.62	60.74	583.086	24.52	13.55
2002	130.09	47.93	65.05	733.538	40.62	8.25
2003	142.86	48.44	72.81	786.802	33.27	14.16
2004	159.67	48.77	64.55	992.745	34.2	7.63
2005	181.61	49.3	65.97	1250.41	55.7	18.13
2006	206.59	49.73	70.46	1652.15	62.25	19.99
2007	231.72	50.03	70.94	1876.41	81.91	38.33
2008	264.21	50.23	72.76	2227.79	98.22	38.65
2009	294.09	50.71	74.47	1883.89	90.2	36.81
2010	330.96	50.95	76.88	2280.11	99.1	38.55
2011	387.19	51.36	74.73	2504.88	231.8	23.58
2012	442.94	51.5	72.84	2728.02	197.9	24.74
2013	518.74	51.71	70.93	2976.76	180	39.3
2014	615.03	51.79	71.85	3200.95	195.98	28.27
2015	682.70	51.84	71.89	2679.55	257.7	21.08
2016	745.58	52.04	75.19	2144.78	200.82	20.23
2017	784.80	52.31	77.27	1941.88	245.19	37.57
2018	821.69	52.55	75.95	2125.83	296.44	51.67
2019	896.19	52.91	70.52	2334.02	388.23	52.38
2020	951.34	52.89	74.58	2074.61	423.36	53.87
2021	1,042.92	52.68	73.68	2065.77	386.24	52.64
2022	1,192.20	55.44	71.89	2162.63	437.52	52.96
2023	1,322.25	57.21	73.38	2224.26	459.33	53.16

Sources: CBN, 2023; WDI (2023)