The Interconnections between Life Expectancy, Mortality Rates, Public Health Expenditure on the Economic Growth of Nigeria (1985-2020)

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ABSTRACT

A good healthcare system has been considered as a function of government investment towards restoring the health system in Nigeria. Citizens' well-being is dependent on their health. This study empirically explores the interconnections between life expectancy, mortality rate, and public health expenditure on economic growth. The study is shown using annual time series data between the period 1985 and 2020. Augmented Dickey- Fuller (ADF), Phillips- Perron (PP) was adopted to test for the stationarity of the series.

However, the error correction model (ECM) result showed that the model is satisfactory and fit. The ECT is predicted to be negative and significant at 1%, implying that the value of RGDP will converge to its long-run value by 18.58% by using public health spending, mortality rate, and life expectancy as response variables.

Findings showed that demonstrates that life expectancy at birth has a significant positive impact on economic growth. Interestingly, this support the Granger causality testing which found that there is a bi-directional connection between the two variables. It was however suggested that government has to step up its efforts by raising the amount of its budgetary allocation to the health sector in order to meet WHO's recommended proportion for the country's yearly budget. The Nigerian government should enact policy requiring the allocation of healthcare resources to initiatives programs that would improve life expectancy.

Keywords: Life Expectancy, Public Health Expenditure, Economic Growth, Bounds Test.

ÖZ

İyi bir sağlık sistemi, Nijerya'daki sağlık sistemini restore etmeye yönelik hükümet yatırımının bir işlevi olarak kabul edilmiştir. Hükümet politikasının temel bileşenlerinden/hedeflerinden biri, toplam ekonomik büyümeye ulaşmak için kaliteli bir sağlık sisteminin sürdürülmesindeki ilerlemedir. Bu çalışma, ekonomik büyüme üzerindeki yaşam beklentisi, ölüm oranı ve kamu sağlık harcamaları arasındaki bağlantıları ampirik olarak araştırmaktadır.

Çalışma, 1985-2020 yılları arasındaki yıllık zaman serisi verileri kullanılarak gösterilmiştir. Çalışma betimsel test kullanır. Çalışmanın sonuçları, Johansen eşbütünleşme testine dayalı olarak Reel Gayri Safi Yurtiçi Hasıla (LRGDP), yaşam beklentisi, kamu sağlık harcaması, ölüm hızı gecikmesinin uzun dönemli bir denge ilişkisine sahip olduğunu göstermektedir, ADF tüm değişkenlerin olduğunu göstermektedir. durağan ve I (1) ve I (0) sırasına göre bütünleşik, sınır testi, tüm değişkenlerin F istatistiğinin karar kuralı kullanılarak eşbütünleşik olduğunu gösterir. Bununla birlikte, değişkenin uzun dönem denge yoluna doğru ayarlanma hızının düşük olduğunu, tahminen %18,58 olduğunu ortaya koymaktadır. Bu nedenle hükümet, korona virüsü (COVID-19), grip, tüberküloz, zatürree gibi önde gelen ölüm oranlarına neden olan ve sonunda ülkenin yaşam beklentisini azaltan hastalıklara karşı mücadele etmeye yönelik bu tür yatırımlarla ülkenin sağlık sektöründeki yeterli harcamalarını yeterince artırmalıdır.

Anahtar Kelimeler: Yaşam beklentisi, Kamu sağlık harcamaları, Ölüm oranı, Ekonomik büyüme,

DEDICATION

In loving memory of my beloved mother,

Mrs. Omolasho Eweade

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INTRODUCTION

1.1 Background of the Study

The Healthcare sector is primarily considered an essential sector to every developing economy (Burlea-Schiopoiu & Ferhati, 2021). It is a global commodity that serves as a substantive good to economic growth. The good health system has also been considered as the powerful engine and panacea to health issues in developed and developing countries which invariably results in effective economic performance. According to Ralph Waldo Emerson, in his words of "Health is wealth" which means that health creates prosperity, and also contributes to economic growth. Many works of literature posited that the ill health of the citizenry causes unproductive outcomes to the labor force, increasing the poverty level and depriving developing countries of attaining economic growth.

Ojo Olusoji et al (2020) affirm that providing a good health system is a fundamental goal to be achieved by the three tiers of government in Nigeria (for instance, the Federal, state, and local governments), also a major component of a policy to stimulate general economic growth and development. Viruses relating to health such as Coronavirus (Covid-19), HIV/AIDS, Ebola, Laser fever, and many more are identified to slow the growth of developed and developing countries. Hence, prior to the aforementioned health viruses, every country allocates substantive resources in monetary terms to improve the healthcare system. The problem of the healthcare

system is extremely sensitive since it involves not just humans but also the human condition. In the absence of a healthy condition of a country, it is practically difficult to exhibit any economic activity, and if there is any, it would almost definitely be inefficient, therefore we must treat this issue seriously by investing a substantial amount to the system (Sunday & Adeleye, 2017). In assertion to (Yaqub et al., 2020; Osakede 2020; World Bank 1998), all agree that a good health system in Nigeria promotes economic growth through productive labor.

Technologically, developed nations such as Germany, United Kingdom, Australia, United States, Belgium to mention a few, invest a significant percentage of their budgetary allocations on the good healthcare system. The higher percentage allocated to health increases the quality of life, provision of well-constructed medical laboratory, employment of qualified medical practitioners, and importation of modern equipment. All of these would contribute to citizenry health which serves as a key driver to growth. Since investing in health is significant, no amount of resources spent on quality health by country is considered too much since health is wealth. It is an investment to enhance growth (Wang, 2020; Lukyanets, Okhrimenko, & Egorova, 2020).

United Nations (UN) suggested an average health expenditure of 8-10 % from a country's GDP to improve the health system that serves as a yardstick to a quality life. Particularly, Nigerian governments over decades have put some policies in place to ensure a rise in the level of government spending on the healthcare sector. For instance, government capital spending increases from N7.3 million in the year 1970 to N126.75 million in the year 1987. The implication of the massive increase was due to the creation of hospitals, dams, schools, and bridges. Significant increase in the year 1988 of about N297.96million. Progressively, capital expenditure skyrockets to a

value of N586.2 million in 1993 to N17, 717.42, N33, 396.97, and N34, 647.9millions in the years 2003, 2005, and 2007 up to N4, 12,085 billion in the year 2020. Nigeria's current expenditure rose to an average annual rate of 8.21%. Nigeria's health expenditure was 6,405 million US dollars in 2018 which increased from 6,040 million US dollars in the year 2004 to 16, 405 million US dollars in the year 2018.

The monetary values of capital and recurrent expenditure on health in Nigeria vary significantly over decades, 2008 - 2010, health expenditure has increased to N64, 922.9 and N98, 211.52 respectively. Nigeria governments spent N1, 190.71 billion, N1, 329.78, and N1, 477.77billion on the healthcare system in the year 2019, 2020, and 2021 respectively. These figures showed the flow of governments' investment in health expenditure over the years. Capital Investment in the health sector varies yearly, indicating the prominence of health to economic growth. Many studies showed the effect of public expenditures on health in Nigeria, health provision is soundless and slightly low because of corruption in governance, mismanagement of national resources, etc.

The Sustainable Development Goals (SDGs) placed health as a key to global development and held more descriptive on how objective number three of the United Nations the Envision 2030, that deals with universal health can be accomplished. The contemporary international priorities were on the Millennium Development Goals (MDGs) from 2000 to 2015. MDG's have been used as a trend on how to achieve them. Apart from these two, there are some global initiatives and policies, and declarations that have been made in the past in the pursuit of improved healthcare provision around the globe as indicated by (WHO, 2011).

Twenty- six African Union nations met and promised to set an objective of 15% of their yearly financial plan to reinforce and strengthen the health and admonished contributors from nations to raise subsidizing. Twenty-six nations expanded the fraction of government spending devoted to health and eleven countries decreased it. The remaining nine nations' contributions were not carried out effectively. Poor and unfavorable economic growth is considered when the population's quality of adequate living conditions is severely deplorable, therefore degrading the economy and development of many nations. (WHO, 2020).

For a consistent economy, the United Nations also outline a dream for 2030 regathered as the 17 SDGs which incorporate good medical services that decline mortality rate at all levels and result in positive economic stability, growth, security, and cooperation to attain the target. A nation has a higher-performing health system than another nation if with the same amount of funding, it delivers better health outcomes or services or if it delivers the same outcomes but has less funding (Jaba et al., 2014). Health frameworks are financed whether through tax collection, on account of state-claimed medical clinic offices (public well-being offices), or through pay-related social ventures (federal retirement aide programs) (Hwende, 2019; Paris et al., 2010).

The key question that remains in the minds of researchers is, does the increase in life expectancy have a significant effect on growth? The rise in life expectancy could have a direct or indirect effect. Mostly, it could increase the production of available resources, but on the other hand, this could increase the long life span of a population. From an economics point of view, human capital incorporates health, education, technical or job training, and other economic values in the form of investments that influence human or labor productivity (Cervellati & Sunde, 2017).

The main purpose of this study is to consider the interconnections of life expectancy, public government expenditure, and death rates on growth in Nigeria. This is a crucial problem as the government seeks to raise the quality of living around the country, and this would increase the growth in the country. This study would also recognize those factors that would contribute to health services. As emphasized above, the research aims to examine the degree to which health spending would promote sustained growth.

1.2 Problem Statement

For a country to attain complete economic growth, the health sector must be taken seriously by the government in providing adequate modern equipment for public hospitals and subsiding the cost of imported equipment to the private hospitals. Mismanagement of funds allocated by federal, state, and local governments towards maintaining and restructuring the healthcare sector has become the major bottleneck to various health care sectors globally (WHO, 2019).

In Nigeria, there are numerous issues currently facing the health system that could be examined using different healthcare services (the three tiers of health care) ranging from a shortage of medical staff, lack of infrastructure, human and material resources, poor motivation of health workers, underfunding of the health sector, insecurity challenge, and political and bureaucratic corruption. Several of these factors give rise to various major health issues, such as increasing child mortality, poor life expectancy, and the proliferation of certain devastating infectious diseases, tuberculosis, and others.

A country's health sector is more efficient as it uses the same level of resources to achieve the same level of health or improved health (Drastichová, & Filzmoser 2020). Hence, a rise in health spending still hasn't been adequately measured without the

contribution of health spending to health outcomes especially in countries that are still developing. The link between life expectancy, mortality rate & health expenditure needs to be assessed, particularly in the case of Africa and developing countries.

1.3 Objective of the Study

The major purpose of this research is to determine the relationships between life expectancy, mortality rate, and government health expenditure on growth. The study goal is to address the research questions listed below:

I. Does investment in healthcare have a positive effect on growth in Nigeria?
II. What are various problems facing the health sector in Nigeria?
III. Is there any nexus between life expectancy, the mortality rate on growth in Nigeria?
IV. Is there a relationship between life expectancy and healthcare expenditure?

1.4 Research Methodology

This research uses a time series analysis to measure the nexus between life expectancy, Mortality rate, and government health expenditure on growth for the years between (1985- 2020) Secondary data has been collected from the World Bank development index such as real gross domestic product, life expectancy, death rate, and birth rate to validate the research hypotheses and to achieve objectives.

1.5 Limitation of the Study

In this study, there are numerous limitations in which the findings need to be interpreted. One of the limitations of the study is the nature of the Nigeria's data. Nigeria's data is naturally fragile simply because of manipulation of a false growth rates. Substantial data would generates a better or robust findings in the study. Failure to adopt empirical review to the study which would be used carried out in the subsequent research. Time is also a huge limitation towards the completion of study.

The result may not completely generalizable simple because the sample was restricted to Nigeria system.

1.6 Research Hypotheses

The hypotheses for this study are as follows:

- **Hypothesis I**

H_0: Life expectancy and mortality rates have no significant impact on growth in Nigeria.

H_1: Mortality rates and life expectancy have a significant effect on growth in Nigeria.

- **Hypothesis II**

H_0: There is no significant interconnection between public healthcare spending and growth.

H_1: There is a significant relationship connection public healthcare spending and growth.

1.7 Significance of the Study

The research aims to shed light on the link between government health expenditure, life expectancy, death rates on growth in Nigeria. This will help the governments of developing countries such as Nigeria, Niger, Togo, Sudan, Mali, Liberia and Ivory Coast, etc in knowing where to target in trying to improve life expectancy and to increase adequate spending skills on healthcare in sustaining their economic growth. The countries mentioned as developing countries are measure based on their low human development index.

1.8 Definition of Terms

- **Economic Growth**

Economic growth refers to a rise in the output of commodities and services from one duration of time to the next. It could be quantified in nominal or real (inflation-

adjusted) terms. Generally, aggregate growth has been quantified in measures of the gross national product (GNP) or domestic product (GDP). However, other methods are also employed.

- **Life expectancy at birth**

Life expectancy is described as how long an infant will assume to live at aggregate if the overall mortality rate does not improve. Life expectancy is among the most widely used measures of the state of health. Improvements in life expectancy at birth could be associated with a variety of causes, from increasing living conditions, healthier diets, and better schooling, as well as increased access to healthcare.

- **Mortality rate or death rate**

This is a function of the number of fatalities or causalities (generally or attributed to a specific cause) in a specified community, which is proportional to the amount of that population, per unit of time.

- **The birth rate**

The birth rate in a period is calculated by dividing the total number of births per 1,000 people by the periodic duration in years. The proportion of births is often derived from a uniform registration system for births, populations' counts from a census, and estimates using specific demographic methodologies.

- **Public expenditure on health**

Simply means spending on healthcare for the benefit of the people in a particular country which is financed and sustained through public capital or resources.

1.9 Structure of the Study

The arrangement of this study covers six chapters. The first chapter gives an introductory part of the study, the background of the study, the objective of the study, the problem of the statement, Research hypotheses, methodology of the research, the

significance of the study, and definitions of terms. Chapter two covers the literature review. Chapter three covers the overview of the Nigerian economy and health sector. Chapter four emphasizes the methodology and data presentation. Chapter five gives empirical results and discussion of the data presented while chapter six gives the summary, major findings, conclusion, and policy recommendations to the study.

Chapter 2

THEORETICAL AND EMPIRICAL LITERATURE

2.1 Literature Review

This chapter focuses on the findings, methods, limitations, theories, and research gaps by various researchers related to this study. Since the research would be restricted to the Nigerian economy, the literature will also consider some sub- Saharan regions in Africa.

Nevertheless, the views of theorists concerning the related literature from other continents will be considered. Studies have been carried out for decades related to this research by different researchers, targeting how the Nigerian government, policymakers, public and private sector could influence healthcare services, environment, and health status positively, which aid as an indicator in sustaining economic growth and development. With the above statement, scholars also explore the contributions of government towards economic sustainability most importantly for the period of health crises. Furthermore, a group of reviewed literature over the years examined the nexus between public health expenditure and health outcome in such a way that affects mortality and life expectancy at births.

Alhassan , Adedoyin, Bekun, and Agabo (2020), mentioned the study of Kim and Lane (2013), the research studied (17) countries from 37 countries as a member of OECD between 1973 – 2000 adopting a Linear mixed – model to logically estimate

connections linking government health productivity and health status outcomes to its impact on United States healthcare policy. An empirical analysis approach was used to investigate the relationship between life expectancy and infant mortality. Mainly the findings showed a positive and negative result, there is no linkage between government health spending and the death rate. A strong connection between government spending on health and life expectancy was revealed. Given the above findings, (Doğan, Tülüce, & Doğan, 2014) pointed out some relationship relating to age dependency ratio and healthcare expenditure, 15 OECD countries were used to examine the expenditure on health between 1995 – 2011 using ARDL econometric method. The research resulted in a positive age dependency on health care expenditures, although an unanticipated impact on a drop-in expenditure is evident in the growing number of young employees.

Osakede (2020), generally, an increase in health expenditure should lead to enhanced health outcomes; nevertheless, empirical evidence is equivocal in this respect. Various studies have already shown varying findings, with some suggesting positive outcomes and others have had no noticeable influence (Edeme et al., 2017; Rana et al., 2018; Kim and Wang, 2019). The impacts of public health expenditure on healthcare outcomes are considerable for various indicators of health, most notably infant mortality, with no discernible influence on maternal deaths as a determinant of health outcome. Rana et al (2018) attempts were made to give more perspective into the unsatisfactory discussions over whether increasing health spending improves health outcomes by adjusting for levels of income across nations. The outcomes in this example indicated a greater relationship between health expenditure and health outcomes in low-income nations than in high-income countries. The effects are solely visible in newborn deaths, with no discernible influence on maternal deaths.

Oluwaseun (2020), cited the studies of (Santerre, Grubaugh, & Stollar, 1991; Berger, & Messer, 2002; Wilson et.al.,2009) generally, there appears toward being considerable variability in the precise link that exists among public health care spending and health outcomes. According to several research, government health spending has little effect on health outcomes. In contrast to the foregoing, several research discovered substantial positive correlations among government healthcare expenditures and healthcare outcomes, and their results suggested that public health expenditure decreases infant mortality rates (INFM) (Olaniyan, Onisanwa, & Oyinlola, 2013a; 2013b; Farag et al., 2013). Oni (2014) cited the (Aguayo-Rico, Guerra-Turrubiates, Montes, Estudios, & Monterrey, 2005; Philips (2005), life expectancy has risen and infant deaths has decreased constantly in all regions of the world during the last fifty years, with the exception of Sub-Saharan Africa in the 1990s. Healthy lifestyle may stimulate the economy by allowing individuals to be even more efficient, lots of low nations. Ill health, on the other hand, can stifle economic progress by lowering the effectiveness and number of labor.

Dhrifi (2019) mentioned the study of Musgrove (1996) and Filmer & Pritchett (1997) stated that there is no impact of government expenditure on health infant/child mortality. The study reviewed that government expenditure on healthcare in the country is not an influence or reason towards decreasing infant death. Researchers believe that many variables describe practically discrepancy in infant death or mortality such as inequality, income, women's education, and also an indicator used as a degree to estimate or measure problems relating to growth and development which could be referred to as ethnolinguistic fragmentation. It is also discussed that

improving and increasing government health spending, strategies, and plans towards achieving and enhancing economic growth and development, the act to decreasing deprivation and inequality income of the masses, and relatively intensifying educational capacities of women has estimable influence to reduce child death.

Wagstaff, Van Doorslaer, and Watanabe (2003) reveal that government bodies and establishment in expanding of good strategy are essential factors that influence government health spending concerning the production sector. Roberts and Bogg (2004) supported the view of Musgrove (1996) and Filmer and Pritchett (1997) also reveal that children who came from low earners family or households fundamentally go through some growing, developmental, and health-related challenges from birth which also expand health problems at the long run or as they grow in ages. Various health researchers have empirically emphasized poverty and mortality, it is very important to justify the nexus which both ways: poverty increases ill- health, and ill health allows poor people poorer because of their income level. This will not allow low earners to enjoy equal accessibility and adequate health services in the country. Many works of literature have analyzed that simply because of income inequality and many factors, the lower household may not able to afford healthcare services compared to their higher-income counterparts, and they are more likely to delay seeking treatment.

Ngangue and Manfred (2015) highlights the work of Barro and Sala-i-Martin (1992), Acemoglu and Johnson (2007), and Madsen (2012) explaining how investment in health serves as a predominant source of income in the country. They suggested two models as first, viewing health as an element of human capital and also viewing health as a parameter or an indicator of economic growth. The models clarified that increasing

health (Mohamed, 2018) healthcare services increases labor outcome i.e; productivity, and also invariably motivates the masses to invest in human capital. It is said that an increase in life expectancy, in the long run, is termed to have a long-term investment in education which would result in the gathering of knowledge for the masses.

Ibikunle (2019) critically mentioned the study of Ogungbenle, Olawumi, and Obasuyi (2013), their study reveals that health expenditure by the government and life expectancy at birth, and life expectancy and growth, no directional connectedness. In the same study, they stated therefore that there is a strong and bidirectional connection between government health expenditure and growth in Nigeria during the periodic years of 1975-2003. The research of Taskaya and Demirkiran investigated the health care resources and also spending on the health structure in Turkey using a larger technique of testing interconnections. The outcome shows a direct relationship between gross domestic products to spending on health and not vice versa (Mohamed, 2018).

Nixon and Ulmann (2006); Ulmann (2006) significantly suggest that spending on health and the number of medical doctors have made substantial influence to the improvement and development in infant death or mortality, spending on health care has reasonably influence to life expectancy in the countries covering the period 1980-1995. Furthermore, it has been reported that public healthcare spending as a ratio of GDP will not play a crucial role in deciding child fertility rates. They offer a comprehensive overview of reviewed papers that focused on the connections between health inputs and health outcomes. They reached a conclusive point that spending on health care and the number of medical doctors had made a substantial contribution to improving child mortality.

Ogungbenle, Olawumi, and Obasuyi (2013) mentioned the study of Cremisux et al (1999) where they survey the interconnections between various health indicators i.e; life expectancy, infant mortality rates, and both government and private GDP expenditure on health care using a cross-sectional time series from 1978- 1992. To support the study of Cremisux et al (2005) reviewed the study using time series between the period of 1981-1998, however, per capita expenditures on healthcare services has been broken down into three categories: government expenditure on medicinal products, private expenditure on medicinal products and non-medical expenditure on health care.

Dhrifi (2018) found that there is no health spending effect on infant mortality. The study also suggests that offspring naturally introduced to restricted/low-procuring families are bound to experience the ill effects of birth and to cause wellbeing hazards as they age. While various scientists have distinguished the relationship of hardship and mortality is important to take note of that this association is in two ways: "Destitution prompts unfortunate and undesirable makes needy individuals poor." It is additionally important to be aware of the social and monetary holes in admittance to medical care offices. There is a lot of examination that, contrasted with requests, people in lower financial networks are less inclined to get to medical services than their higher-pay peers, and are bound to try not to get help.

Many explorations have exhibited a solid relationship between well-being consumption and well-being capital in the course of the most recent decade (Baldacci and others, 2004). Others revealed the inverse Filmer and Pritchett (1999), and a few, for example; Baldacci, Guin-Siu, and Mello (2003), the discoveries have been appeared to rely upon the kinds of information and estimation strategies utilized. This

last segment shows that the estimation of well-being use to the ailment of the populace, determined by death rates and newborn child passing, is still to a lesser extent sure. Well-being consumption has been appeared to diminish newborn child death rates. Berger and Messer (2002) found that newborn child mortality depends on wellbeing consumption simultaneously and the kind of arrangement for health care coverage.

2.2 Theoretical Review

There are numerous theories behind government spending; these theories offer the structure within which thoughts & ideas concerning the topic are structured. Among the theories pertinent to this research are:

2.2.1 Wagner's Law

Adolph Wagner (1883) proposed the Law of the Increasing Extent of government Activity almost a century ago. He claimed that the reach of governance tends always expand with increasing levels of long - term economic growth term. Wagner's theory, which has become established as Wagner's Law, concerns with the significance of government activities increasing. Wagner, there are three major reasons to anticipate an increase in the range of public engagement. First, when countries grow, the complex of lawful interactions and communications increases, together with economic growth and population densities, and this requires governments to create the regulatory system that will follow the rising complex of contacts between economic units.

Second, when income goes up, nations want more schooling or education, recreation, a more fair distribution of money, and in overall, more government services. Lastly, the technical demands of an organized economy necessitate greater quantities of capital formation infrastructure than are available from the private sector, necessitating government intervention to bridge that vacuum. Experimentally, Wagner's rule has been examined in different of nations, and the findings are somewhat different.

Abizadeh and Gray (1985) examine the period 1963-1979 and discover that wealthy nations supported Wagner legislation while poorer nations did not. Examining different nations and historical periods to uncover little evidence for the law (Chang, et al 2004; Afexentiou and Serletis 1996; Akitoby et al 2006; Diamond 1977). Wu et al. (2010), on the other hand, show massive support for Wagner's rule using a sample of 182 nations from 1950 to 2004.

Wagner's theory concerning Canada has been examined by Afxentiou and Serletis (1991) and Ahsan et al. (1996), with conclusions largely in favor of the law but (Muthy, 1993; Ashworth 1994; Lin and Hayo, 1995; Mann, 1980) discovered a mixed outcomes for Mexico. Yousefi and Abizadeh (1992) evaluated the law for the United States, with conclusions that are usually favorable to the law. Tobin (2005) discovers support for the law when concentrating on China. For instance, Asseery, et al. (1999) on Iraq, Magazzino (2010) on Italy and Chlestone and Kollias (1997) on Greece. Hence, Gupta and Verhoeven (2001), focusing on healthcare and schooling spending, discover wasteful spending in a group of 37 African nations; and Abu-Bader and Abu-Qarn (2003). Discover an adverse, bidirectional causal link among defense spending and economic growth and development in Syria, Egypt and Israel.

2.2.2 Keynesian's Thought

According to this theory, government spending may be controlled effectively influence the level of federal revenue, with an increase in public spending resulting in a rise in national production.

2.2.3 Displacement Theory

This idea was proposed by Jack Wiseman and Allen T. Peacock in 1962. According to this idea, government spending does not rise at a predictable velocity but rather in Jerks and Steps. Thus according Wiseman and Peacock (1962), disruptions such as

health issues can cause a rise in public spending, like that of the health situations like; Covid-19 pandemic, tuberculosis, HIV/AIDS which has led to a rise in government expenditures on health. However, with greater spending, the government frequently falls short of income, resulting in a rise in taxation, even when it is unfavorable to residents This study is based on Wagner's Law, a notion that states that a rise in government spending stimulates economic growth..

Chapter 3

NIGERIAN ECONOMY AND ITS HEALTH SECTOR

3.1 Government Health Expenditure

Government spending on health comprises capital and recurrent spending on government (local and central) expenditures, foreign borrowing, and contributions of foreign organizations and non-governmental establishments and community (or obligatory) healthcare insurance funds. Overall public spending needs actual spending to improve the quality of healthcare services and/or the utilization of healthcare goods and facilities among many of the public by the aforementioned metropolitan and local/municipal authorities; additional budgetary agencies, social assistance systems, and governments. The health status can be funded by domestic and foreign intervention/funding. Life expectancy and death rate etc are the major common health indicators relating to health problems, particularly in Nigeria.

It serves as the health indicator because the government put in place measures adopted to gather data on every individual age at a point of death. The figures collected at the time of death can be used in forecasting national life expectancy. Most researchers use life expectancy to describe the health condition of a nation. Likewise, the concept of a structure of government expenditure indicates that the position of public expenditure is expanding as the fiscal purpose to adjust to new demands of the country (Sunday & Adeleye, 2017). Public expenditure has been categorized into (2) types namely; defense (security) and health following the findings of Solanki and Sen (2015),

insecurity has been a national issue over decades. The government had adopted many strategies to curb or reduce the crime rate spending over N4.63 trillion on national security in the year 2015. It was also asserted that government health amenities (imported laboratory machines, affordable health services, recreating of new hospitals) are mainly funded by the government through the process of taxation and donations. Though, the health sector is the core sector of the economy which is predominantly funded by the government (Obansa & Orimisan, 2013). Studies on economic growth have convincingly demonstrated the importance of health in affecting economic prospects, particularly, at the micro-stage. It is proposed that ceteris paribus, healthier employees are more likely to be able to work longer hours and be more effectively and efficiently than their less healthy colleagues, earning more than infection employees. According to Babatunde (2012), inadequate health facilities, sickness, and disease are shortening people's working lives and lowering their lifetime incomes.

3.2 The Effects of Life Expectancy on Economic Growth and Healthcare Spending

The significant effects of life expectancy and mortality rates on economic growth including health care services determinants have been well established on a level-by-level basis. There are several mechanisms by which life expectancy impacts economic growth from a theoretical point of view. First, happier people improve their wealth by becoming more involved, emotionally active and more dynamic psychologically, and also more resilient. The second approach to improve economic growth and raise productivity is by enhanced savings (Bloom & Canning, 2000). When life expectancy has increased, people prefer to spend more in their lifetime. For instance, a 10-year rise in lifespan is seen to contribute to a 4.5% increase in savings (Bloom, Canning & Sevilla 2004).

Third, improving individuals' health status will contribute to enhanced sustainable growth by higher levels of schooling. Healthier people prefer to spend much more improving their talents to earn better incomes than less sensible people do. They are outfitted with front-line technology for specialized health care and act as knowledge-generation resource centers. In many nations, the life expectancy of individuals especially at birth has improved over decades. Studies reveal that an increase and investment in the health of the people and well-being improves an individual's life expectancy in the country. Furthermore, the Life span of well-being or improved standards of healthcare of a country, as life expectancy is closely related to social welfare, public performance, and increased growth (Ali & Ahmad, 2014). Life expectancy in recent years has seen growing patterns at the global level, even though it varies from country to country. The rise in life expectancy is attributed to improved work conditions, preventive and maternity care, expanded schooling, and an increase in per capita income.

Life expectancy also explains a country's healthcare outcomes that are influenced by multiple socio-economic and environmental factors. When researching several factors that contribute to life expectancy, the emphasis is primarily on wealth disparity, economic prosperity, and health care. Macroeconomic factors have powerful effects on life expectancy, with increasing inflation decreasing domestic bargaining power and a downward increase in domestic long-term life expectancy. A variety of policy concerns related to life expectancy that concern fertility, inter-generational transitions, sustainable growth, social stability, and investing in human resources. Several of the key goals of the welfare system is to have a safe climate and provide food to the people and stable macroeconomic conditions, so researching life expectancy is very relevant for policymakers and decision-makers.

3.3 Nigerian Health Care Sector: Overview

Nigeria is the most populous Africa country, with a population of more than 200 million people of a Gross domestic product of $375.75 billion in 2017. Nigeria's GDP per capita at purchasing power parity (PPP) in 2017 was US$5874.71 (World Bank, 2018). North-West, North-Central, South-South, North-East, South-East, and South-West are the six geopolitical zones of the country. Nigeria has a federal structure with over 36 states across the country, 774 local government areas (LGA's), and multi-ethnic societies. Particularly, Rogers and Pilgrim (2005), affirm that health care systems are categorized as individuals and organizations which is aimed to meet the healthcare needs of the target population. Up to 60 percent of health facilities are privately owned and 40 percent by the health system (FMH, 2010). The three tiers of government are responsible to transform and sustain the effectiveness of the sector, but there exists a weak relationship between the levels of government due to the sharing of responsibility towards revamping the sector. Kress et al. (2016), Nigeria’s main healthcare system is intended to shape the backbone of the nation's medical system, but the system has struggled to offer primary medical care to the population due to issues with inadequate budget distribution, degradation of poor infrastructure, terrible government structure, poor infrastructure, and poor sustainability of health staff. Nigeria also has poor well-being estimates when compared to Africa norms, with a life expectancy of 55.2 years, the mortality rate of under 5 at 104.3 per 1000 live births, a maternal death pace of 814 for every 100,000 live births, and a neonatal death pace of 34.1 per 1000 live births 1000 births of life.

Nigeria's well-being or health situation has been compressed and relatively low with other developing nations across the world. Based on statistical analysis, life expectancy is 52years in 2011 (World Bank, 2011), while the mortality rate in total

was around 14% in the same year respectively. It is estimated that 124 out of 1,000 new births do not last past 5 years of age, 39.56% of males and 42.25% of females live to 65 years of age and about 3 million people (aged 15-49) are diagnosed with HIV/AIDS. Nigeria has a significant stock of health staff equal to those of Egypt and South Africa. Nevertheless, the births among eligible health workers are projected to be 39% of the overall birth rate.

The change towards expenditure reveals that only an amount is spent on health in Nigeria. In 1997, these were calculated that 4.6 percent of gross domestic product was invested in health care. The proportion improved to 6.6 percent in 2005 and 5.8 percent in 2009. This figure is an indication of a lack of interest on the part of the government in providing healthcare services and resources. The available figures show that the total healthcare spending represents a higher proportion towards pocket expenditure.

3.4 Health and Economic Growth in Nigeria

Access to the health care system serves as a major role and policy to sustain high economic growth in Nigeria. The threat of infections such as COVID-19, HIV/AIDS, Tuberculosis, infant mortality/morbidity, and Malaria is considered to delay economic development in undeveloped and developing countries. Any nation, therefore, devotes an immense amount of public funds to health care provision believing this would improve the health of the citizenry so that they can contribute meaningfully to economic growth and development (Kiross, Chojenta, Barker, & Loxton, 2020). One of the major reasons for inadequate and inappropriate government expenditure in some developed and developing countries is bad budgetary implementation, corruption, and mismanagement of funds (World Bank, 2020). In Africa, focusing on the Nigerian economy often invested in health services through public spending, the health outcomes of Nigerians are consistently and extremely classified low. Nigeria has been

ranked 74th among 115 countries based on a variety of chosen health metrics (World Bank, 2020).

The institutional element encompasses treatment centers (clinics), and household organizations; insurance firms, and schemes that pay for healthcare services, organized and controlled plans which include health maintenance organizations (HMOs), is a type of health insurance plan that offers healthcare services through a network of doctors in exchange for a monthly or annual charge, and preferred provider organizations (PPOs); and entitlement programs. Professional schools that prepare students for employment in health-related fields, community health, public health, environmental health, dentistry, and allied health professions such as nursing are examples of such institutions. Organizations and affiliated groups that carry out research and supervise or oversee the delivery of healthcare services are as follows, authorization and credentialing providers and the organizations, local, state, and national professional bodies, and companies that manufacture modern medicine, machinery, and pharmaceutical products.

Nigeria's health industry is large, which includes the six health organizations namely; public, private organizations strictly on profit-making, community-based organizations (CBOs), non-governmental organizations (NGOs), faith-based organizations (FBOs), and traditional/ orthodox health care providers. The health industry is quite diverse, encompassing both unlicensed and regulated providers varying from midwives and individual medication dealers to modern hospitals. Privately owned institutions account for 38% of all licensed facilities in the FMOH health facilities database, with primary care accounting for 75% and secondary care accounting for 25%. (World Bank, 2005). Because of the industry's complexities and

the nation's convoluted federal administrative system, administration in the healthcare sector has been extremely difficult during the previous two decades. Each layer of the federal administrative system is conceptually independent with resource management. Nonetheless, their connection has been fraught in the health care industry. Health is on the concurrent legislative list in the United States Constitution, which permits the federal, state, and local governments to adopt varied and possibly overlapping duties for policy formulation, regulation, and provision.

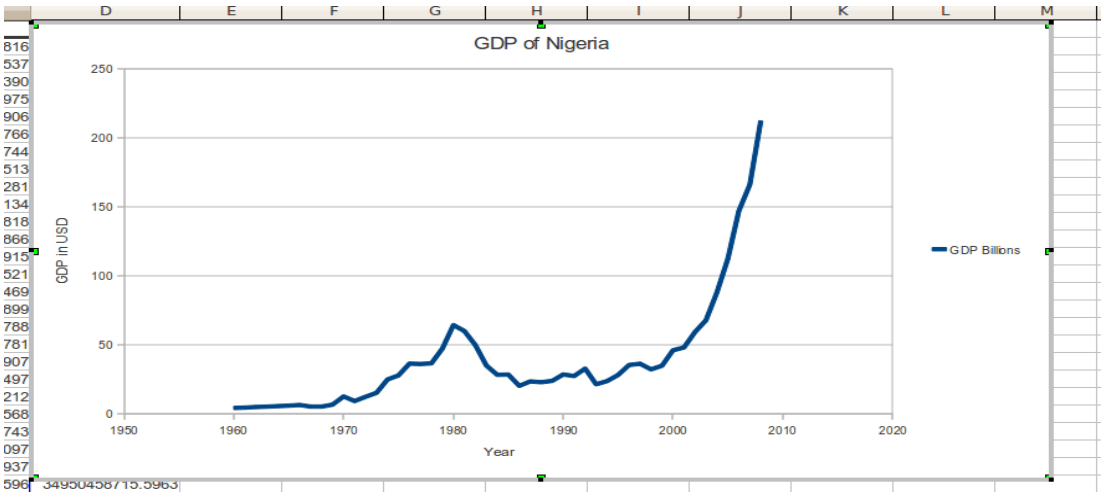

Figure 3.1: Economic Growth Indicators in Nigeria. Source: World Development Indicators (2020).

3.5 Problems Facing the Health Sector in Nigeria

Lowel et al (2010), many factors contributed to the failure of a good healthcare system in sub-Sahara Africa over the years. Personal health challenges, on the other hand, have received a lot of proper responsiveness and care over decades because of higher knowledge of the negative influences and a clearer understanding of the link between health and economic growth. The following are the fundamentals impediments to the general contributions of the health system to growth in Nigeria which includes; inadequate participation and customer awareness, lack of laboratory equipment,

inadequate machinery and infrastructural development, poor resource and management, inadequate reward and incentives, and lack of equitable and long-term healthcare financing.

- **Inadequate Participation and Customer Awareness**

The majority of healthcare users are uninformed about the services offered and their entitlements with healthcare delivery, due to the absence of a constitution or bill of rights for consumers (claimants) and suppliers (duty bearers). The importance of the household in sickness prevention and management is also undervalued or underfunded by government initiatives. Intervention strategies should be conducted both in the health system and in the home. Families and communities should be strengthened to raise knowledge about the need for meaningful engagement in their own and their children's health care**.**

- **Lack of Laboratory Equipment**

In Nigeria, almost all of the facilities supplied by the national government in both the primary and secondary health care sectors need to be upgraded and restructured to offer optimal health for students in the school setting. For example, primary health center facilities are more equipped than those integrated healthcare facilities and certain secondary level hospitals, although technology is frequently inadequate. In comparison to primary-care sectors, most secondary sectors have competent clinical research scientists or professionals. Because of the lack of professional supervision, there is only little quality significance control of workshop tests in secondary amenities and none in primary amenities**.**

- **Inadequate Infrastructure and Machinery**

Basic infrastructure is scarce, including health care systems. This might be due to a shortage of finances, but there are still issues even when significant increases in money are provided, as in the case of the international funds to combat HIV/AIDS,

malaria, and tuberculosis. Nationwide acquisition and drug management systems that are effective and accountable are becoming an increasingly important part of the health system action agenda. The healthcare services provided will decide the regular supply of medications and apparatus, as well as the required structure at the institution stage.

The lack of portable electricity and water, as well as faulty equipment and insufficient medical supplies, diagnostics, and other range issues, is all too prevalent in several areas around the country. The Nigerian health type is dominated by insufficient and unhealthy conditions health facilities, particularly at the primary health care (PHC) level. Most states lag in infrastructures such as structures, machinery, materials, and supplies, and unequal distribution of available amenities is common in many areas. Fake, inferior, contaminated, and unaffordable medications are common across the country. Because of irregular supply, non-availability of several basic necessary and specialty medications, and other health supplies, most people now rely on drug importation. Furthermore, there is a disorder in medication administration as a result of non-compliance with pharmaceutical rules that need to be updated. Although essential to the improvement of services, the provision of medications and vaccinations alone cannot establish systems or assure the quality of care, but health personnel cannot operate without the necessary facilities and resources to execute their jobs (HERFON, 2006; FMoH, 2004; Travis et al, 2004).

- **Poor Human Resources and Management**

Though human capitals are not the main predictor of a country's bad health status, a health sector cannot function without competent staff. Each country should, at the absolute least, have a national workforce strategy in place to create long-term medical systems that fulfill public healthcare requirements. These plans should seek to give

every household access to a health worker who is enthusiastic, skilled, and supported. To increase the functioning of the healthcare system, personnel should be hired from and encouraged for work in their area if possible.

- **Inadequate Reward and Incentive**

Over time, healthcare providers' income has deteriorated, reducing their energy to the point that over 21,000 Nigerian doctors are practicing overseas, despite a severe physician shortage in Nigeria. Healthcare employees are paid pitiful wages (approximately 75% less than that of a doctor even in Eastern Europe), face instability, and have tremendous workloads, yet lack the most basic resources and have little opportunities for growth. Doctors worry about "brain waste" and seek greater professional growth chances in nations with stronger medical facilities. Nigeria is one of Africa's leading exporters of medical personnel.

- **Lack of Equitable and Long-Term Healthcare Financing**

Aside from the amount invested in health care funding, the major questions raised include how the healthcare system is supported and what percentage of contributions come from consumers individually through insurance premiums. The WHO promotes the notion whatever finance mechanism a nation selects should not prevent users from getting and using services. In most situations, this means that payment at the time of service must be removed or at least tied to the ability to pay.

Table 3.1: National Health Indicator

	2003	2005	2008	2015	2020 Target
Population	124 million	150.3 million	158 million	181.1 million	207 million
Life expectancy at birth	46.5	48.25	47	53.11	55.02 years
Total fertility rate (TFR)	6.04	5.98	5.9	5.7 children	5.2
Modern method CPR	8%	8.90%	10%	36%	43%
Unmet need for FP	17%	34%	20%	0%	

Maternal Mortality Ratio	800/100,000 LB	545/100,000 LB	840/100,000	800/100,000 LB	814/100,000
Women with at least 4 antenatal care (ANC) visits	48%	47%	47.50%	45%	50%
Births delivered by a skilled provider	43%	35%	39%	40%	100%

To make a significant improvement in the health system in Nigeria, the following challenges must be concretely addressed:

1. The slight degree of political obligation to medical care by most Nigerian administrations, particularly as portrayed by the regular ventures abroad to look for clinical consideration by holders of political and public office, combined with the helpless medical services financing and poor sectoral allotment/delivery to the wellbeing area at different degrees of government.
2. Inadequate protection and well-being of medical services laborers in their working environment, and different Nigerians for the most part.
3. Infrastructural and hardware shortages and frailty in the medical care area.
4. Inadequate financing and monetary arrangements for well-being; It is troubling that regardless of the clarion call of the NMA for improved asset distributions to the wellbeing area, the 2014 wellbeing spending plan is not exactly the 2013 wellbeing spending plan and undeniably not exactly the specified 15% of the National financial plan as specified in the 2001 Abuja assertion of African Heads of State.
5. Nigeria’s mass poverty is worsening
6. Poor rate absence of Universal Health Coverage for Nigerians.
7. Pervasive dishonesty in the field of health and wellness.

8. Weak Primary and Secondary degrees of care with a frail reference framework and the effect of the bureaucratic arrangement of government on medical services conveyance.
9. Inadequately constructed information Communication Technology and Health Management Information System, as well as a poor data set
10. Unbridled and unpredictable ad of homegrown and restorative items on the electronic and print media.

3.6 Growth-Health Relationship in Nigeria

Aghion, Howitt, and Murtin (2010), over time, evidence revealed the nexus between health and growth has expanded. In asserting whether health is important to productivity and growth, three pathways have been suggested. It is assumed that, first, increased life expectancy would lead to increased domestic and national savings, which will lead to increased accumulation of capital, which will lead to increased growth. Second, increased life expectancy may suggest greater spending on education (either by individuals or by parents), implying greater human capital development, which is likewise predicted to transfer to growth. Increasing health increase the motivation to get an education since investments in education may be absorbed over more than a longer working career. Healthy learners also had reduced absence and stronger cognitive performance, resulting in a better education for a given level of education. It is believed that low mortality rates translate to a low birth rate, which slows population expansion and so leads to greater per capita GDP. Third, it is believed that improved health will lead to increased production, more creativity, and advanced healthcare adaptability. Happier people do better at work. They can work harder and for longer periods, as well as think more clearly. The below diagram theoretically describes the relationship between health and growth.

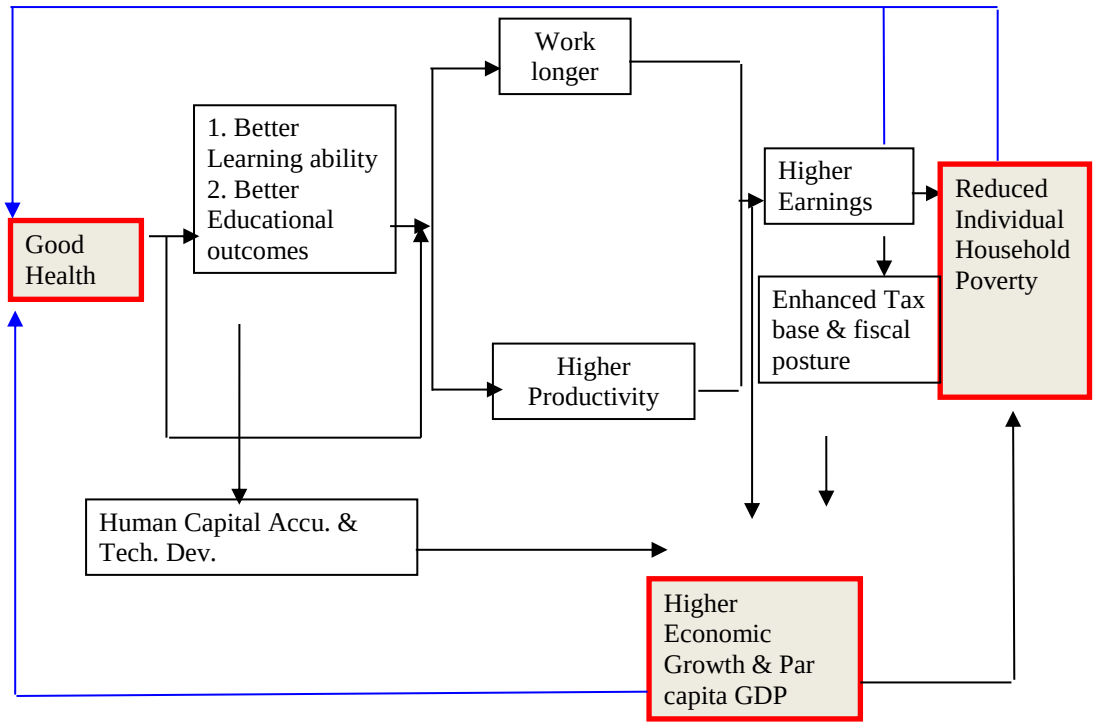

Figure 3.2: Relationship between Health and Growth

Generally, while exploring the connection between health and economic growth, one might consider health to be a special type of human asset (Weil, 2007). As a result, health is becoming a normal element of productivity, with output now believed to be associated with improving health (measured, say, by a rise in life expectancy of a particular country) (Aghion, et al., 2010). Furthermore, it may be claimed that a greater stock of health positive impact on economic growth by encouraging technological Thus, product development is predicted to be positively connected to health, namely the or average level of life expectancy in a given nation. The current macroeconomic literature regarding health and revenue has used both methods.

3.7 Reforming Health Sector in Nigeria

Reforming the health sector can be seen as the vital transformation in strategies, plans, policy, regulations, and financial affairs, availability of public services which are controlled by the government and are meant to align with the execution of the health system in other to yield optimum health for the citizens. World Health Organization

(2010), health sector reform is described as a preserved practice of vital change in policies and institutional patterns supervised by the government which is meant to enhance the completion of the health sector and improves the well-being of the population. World Bank (2010), the reform aims to make health services available and easy to afford without cost. It also involves curtailing of diseases, especially on the effect of malaria scourge HIV/Aids epidemic, and different communicable several other diseases.

The major concern to the government to promote growth in the country is to make health care services available and affordable for the citizenry. Prior to the above-mentioned statement, the government has some targeted health care goals and aims in the parts of efficiency, effectiveness, coverage and basic primary health care, education particularly in areas of women, purchasing power, comfortable housing, family management, and culture (Uzochukwu et al., 2015).

There are various ways to reform which are decentralization and Centralization, health care assessment and primary care places, the appointment of new duty, improving management and orientation. No matter the approach used, the goal of reform is to make available health care services that are intended towards getting results based on available facts for efficient and effective results. It is to inflate the available health services for the quality of care and patient satisfaction.

Nigeria's health system has undergone many institutional reforms, most notably the announcement of the National Health Policy (NHP) in 1988, a strategy to achieving optimal health for all Nigerians. This in turn has urged the government to put in efforts

to attain the desired goal of optimum health for every Nigerians to be productive both socially and economically (Puldu, 2015).

The Federal Ministry of Health (FMoH) responded to the devastating health status by showing commitment and willingness to get a comprehensive health status by showing commitment and willingness to get a comprehensive health sector reform. The National Economic Empowerment and Development Strategy (NEEDS), MDGs, and NEPAD implemented a new reform in 2003. This policy was later revised in 2004 with the review of been established which includes setting goals and targets and other things that could serve as guidelines of the FMOH and also the State Ministry of Health (SMOH) for a specific period of four years (2004- 2007). When the government vowed to "improve the well-being of Nigerians as a significant element in the country." These health services are efficient, effective, of high quality, and inexpensive to Nigerians. The reform was aimed by the Federal Government to raise life expectancy in Nigeria to 65years and reducing children's mortality to 50 per 1000 births. The following are included in the policy:

a) Improving the National Health System (NHS) and its managerial processes.
b) Availability of health resources which include financial, human, and infrastructural resources.
c) To curtail the effects of diseases due to wretchedness' and other health-related problems which include tuberculosis, malaria, Hiv/Aids, and reproductive ill-health.
d) Establishing a quality assurance system
e) Registering and regulating traditional and other health providers.
f) Putting in place a trustworthy system to make available and distribute drugs without cost.

g) Creation of awareness to every consumer of their rights and obligations.

h) The setting of effective association with all health sectors.

Different actions were put in place in other to generate effective results but other demerits still existed. There is a need for improvement in accessing basic health services and amenities, most importantly for the less privileged is attainable if the reviewed health sector reform program is monitored effectively by the presidency and those who are to monitor it with total commitment. The major obstacles are ways of restructuring PHC and getting in touch with the health bill, which states the duty of the various levels of government by the concerned bodies into law.

Government executes ways of tackling the derailing health problems by adopting various health policy which is meant to transform the healthcare system. These measures put in place are documented in the human capital development, its concern is majorly on providing education, health, and social safety which are crucial to achieving the desired outcome. Human capital outcomes in Nigeria remain stagnant when compared to other nations at similar levels of development. According to the World Health Organization (WHO), the country's healthcare system is ranked 191 out of 201 worldwide. In the northeastern areas of Nigeria, the mortality rate for children is 260/1000. It is one of the largest in the world. Approximately 2.6 million people, or 4.4 percent of those aged 15 to 49, are infected with HIV/AIDS (FMoH, 2004).

One of the various health policy alternatives to be put in place is to subdue the transformation sectors to model generally acceptable health transformation around our special national culture and institutions. This will strengthen the management capacity of the National Primary Health Care Development Agency (NPHDA) to

direct Primary Health Care (PHC) policy, and also the establishment of the health. Referral system within 24 months in each state. It will also bring towards enhancing human resources for avoiding mother's and child death and bringing more resources to which will help to address funding gaps for health sector activities. Furthermore, health agencies that are funded by the public should set their expenses on major priorities which must address basic public health services, with proper services at secondary or tertiary stages.

Apart from the health sector reform in Nigeria, institutional reforms were also important because they are needed to support and enhance the sector's institutional ability and managerial practice of Federal, state, and local government levels for maximum performance in the provision of basic health services and amenities. In addition, health sector reforms will be less effective when the required institutional arrangements are not conducive to the attainment of stated health objectives and goals. Effective institutional reform must work towards addressing these (3) critical areas which are:

a) Structural change
b) Funding change
c) Service delivery change

In 2020, Nigeria has been regarded as the most populous country in the African continent with an overpopulation of 206 million people and a wide area of 923,768 sq. kilometers of geographical landmass (NPC, 2020). Nigeria connected with various countries such as Chad, the Republic of Benin, and Cameroon. The nation is divided into 36 states which include the Federal capital territory (FCT) Abuja, with Local Government Areas (LGAs) of 774. By nature, Nigeria is blessed with a diverse

landscape, structure, and viable agricultural production or agro-climatological environments. Although, due to natural abundant resources, the Nigerian economy has not undergone the requisite strategic, systemic, and institutional reforms to ensure rapid and sustained development conducive to an adequate minimum standard.

United Nations (2001), Nigeria as a giant of Africa has been referred to the under-developed country since Nigeria as a country has failed in various sectors of the economy to a point where the quality or value of a life of the average masses has eroded increasingly towards significant numbers of citizen below an acute poverty level. Although life expectancy in Nigeria had gradually risen to hit a level of 53% in 1991, it was recorded that 48.2% years for the females and 46.7% for males in 1999. In reality, Nigeria's reproductive health status is critical.

In 2020, data showed that infant mortality accrued to 59.181 death per 1000 birth which a reduction of 2.44% from 2019. The percentage of infant mortality in 2019 was 60.662 death per 1000 live births which also reduce by 2.38% in 2018. The nation is among the highest mortality rates in the world, and the prevalence of sexual diseases is thought to be high in Nigeria, despite the lack of evidence (Anyanwu, 2007).

It is quite unfortunate, the involvement of the government towards facilitating the health sector in terms of overall capital investment has been very inadequate, and the sector is facing a variety of simple structural issues that lead to the sector's poor results. Mismanagement of financial resources and human capital, insufficient coverage, insufficient number of staff are among the major sectoral issues.

Based on the different geo-political zone, it was estimated that the highest under-five mortality rates were found in the northern part; North West and North East while the lowest were found in the southern part; South West and South East. There are problems to the above issues which include inadequate access to healthcare services, HIV/AIDS, the difficulties include a shortage of maternity care, teen pregnancy, negative cultural influences, a shortage of health staff, and other infrastructural development (Particularly in rural areas). By the end of 2003, it was projected that 3.2 million to 3.8 million Nigerian adults and children were infected with HIV/AIDS. Highly pervasiveness of raw sexually transmitted infections called (STIs), sexual networking practices, ineffective use of a condom, poor health status, literacy, stigmatization, low status of women constitute factors influencing the quick spread of HIV/AIDS in Nigeria. As viewed from any perspective, the Nigerian health sector has not been performing effectively which affects the lives of people in the country, the sector must be given quick attention by the three-tier of government in Nigeria.

Chapter 4

METHODOLOGY AND DATA ANALYSIS

4.1 Introduction

The study uses the econometric method using time series data from the period of 1985-2020 (35years) to achieve or validate the stated objectives in the study. The gathering of data was obtained from a secondary source that is, World Bank Development Indicators. Testing for stationarity using - (Augmented Dickey-Fuller (ADF) and Phillips – Perron (PP) which are conducted for the stationarity of the series, Autoregressive distributed lag (ARDL) co-integration method is assumed to show the presence of the long-run connection among the variables; Life expectancy, mortality rate, public health expenditure on growth. Error correction model (ECM) Estimation method is used in the study to apprehend the possible instability or disequilibrium in the short run and the speed of adjustment of the variables considered towards their long-run path. Pairwise Granger causality analysis and line graph are used to show the causality between all the variables. In this study, real gross domestic product (RGDP) is used as a proxy to measure growth and it represents the dependent variable. Explanatory variables are death rate, life expectancy, birth rate, and government health expenditure.

4.2 Model Specification

Howitt (2005), cited the Schumpeterian theory of growth to model the effect of health on the economy in Nigeria.

RGDP = f (GF, HE, LE, FR) (1)

- RGDP = Real gross domestic product
- GF = gross fixed capital formation
- HE = health expenditure
- LE = life expectancy at birth
- FR= fertility rate
- ε = error term α = the intercept

The study would modify the above the model

RGDP = f (LEF, HXEP, DRT, BRT) (2)

Where;

- RGDP= Growth in Nigeria which is proxy by real gross domestic product (GDP constant 2010 US$)
- LEF = Life expectancy
- DRT = Death Rate
- BRT = Birth Rate
- HXEP= Public health expenditure

The random variables form of the model is as follows:

Equation (ii) functional form above may be rewritten more specifically as:

RGDP= α_0 + α1lef + α_2 hxep+ α3drt+ α4brt + Ut (3)

The a priori expectation indicators signs for $\alpha 1 - \alpha 4$,

Where; α0 is the constant and Ut is the error term (unobserved)

4.3 Testing for Stationary

Time series data in some cases are not stationary, this asserts that the variance, mean, and covariance of the set data are not time-invariant Gujarati (2009). Regressing time series data assumes that series are stationary which means that mean, variance remains

unchanged throughout time, covariance is determined only by the distance between the two periods and not by time. Researchers and econometricians face threats in analyzing non-stationary series in which the regression outcomes may become spurious. Therefore, Augmented Dickey-Fuller (ADF) tests were used to test stationarity.

4.3.1 Dickey-Fuller (AD) & Augmented Dickey-Fuller (ADF) Tests

The Dickey-Fuller (DF) test was introduced in 1979 by Dickey and Fuller. The test shows that the null hypothesis of DF which indicates that there is an existence of unit root in an AR model denotes that stationarity does not exist concerning the data series while the alternative hypothesis is typically stationarity, however, this might vary based on the version of the test being performed. In addition, because it only includes the AR (1) for the series, the Dickey-Fuller test is considered one of the weakest tests for the existence of unit root. This is a very difficult and rigorous assumption to make. Series, in most cases, have a long history with their historical occurrences. As a result, there could be two techniques to dealing with autocorrelation. These are two approaches; parametric and non-parametric. The Augmented Dickey-Fuller (ADF) test is a superior parametric test, whereas the Philip and Perron test is a non- parametric test.

Augmented Dickey-Fuller (ADF) is a revised method of Dickey- fuller test for stationarity. ADF test aims to mitigate spotted deficiencies in capturing higher-order auto-correlation functions. In scenarios, where e_t is not white noise, the ADF adjusts for the unit root measure, meaning that there might be a similarity bias in the error expression. The equation of ADF for testing unit root is shown below;

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \cdots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t, \quad (4)$$

Where $\boldsymbol{\alpha}$ stands for the constant, β stands for the intercept. Avoiding the problems of serial correlation among the random variable, lagged differences are determined empirically. This is to avoid a biased estimation of δ. Greene (2003), states that one of the advantages of the Augmented Dickey-Fuller approach permits a higher-order autoregressive process. The equation of ADF above can be solved using either the frequently used model of trend and drift, or just trend, as well as the least commonly used model neither, which has neither trend nor intercept. In the ADF test, the null hypothesis is $H_{0:}$ δ=0 which means the series has unit root (Nonstationary) while the H_1 which is the alternative hypothesis is $H_{1:}$ δ < 0 (Stationary).

4.3.2 Phillips- Perron Test

Philip (1987) and Perron (1988) developed Phillips-Peron technique for the purpose of testing stationarity of the time series. In analyzing time series, null hypothesis is used for time series which are integrated in order of 1. It is based on the Dickey–Fuller (DF) null hypothesis test. The Phillips–Perron test corrects the t-test statistic in a non-parametric manner. The test is resilient to nonspecific autocorrelation and heteroscedasticity in the test equation's disturbance process. In order to specify a model correctly, to know whether the variables exhibit random walk or pure walk, we employ both ADF and PP to test the presence of unit root. In practice, the null hypothesis (H_o) in unit root testing asserts that there is no unit root, implying that the series is not stable. On the other hand, rejecting null hypothesis at levels (for instance, δ =0), taking the first differencing would be the next step for a stationary of the time series. The alternative hypothesis asserts that there is no unit root, implying that the variables are stationary.

4.4 Co-integration Test

A co-integration technique is used to analyze if two or more time series are correlated. In certain circumstances, most macroeconomic variables such as RGDP, life expectancy, public government expenditure, death rate, and birth rate are not unchanging in their degrees of formation, since might show a correlation or/and seasonality. After establishing the order of integration of the variables, Johansen co-integration test is carried out to analyze the long-run nexus of the variables in the model.

4.4.1 The Engel Granger and Johansen Tests

Engel and Granger (1993) & Granger (1981) suggested a co-integration test to establish long-run nexus between series**.** Johansen (1990) trace statistic identifies the existence of a co-integrating vector among many variables. The Engel Granger (1987) method is also a co-integration technique which is generally regarded as weaker than the Johansen test. Johansen and Juselius statistic is implemented to resolve the problem relating to the endogeneity of explanatory variables, allowing error correction model (ECM) and autoregressive distributed lags (ARDL) restrictions.

4.4.2 Autoregressive Distributed Lag Model (ARDL) Bounds Testing

In estimating a relationship of time series that is stationary at different integrated orders I (0) and I(1) or mixed stationarity, ARDL is a powerful statistical tool for the estimation. Bounds testing uses F and t-statistics, an extension approach of ARDL modeling. It is important to test the significance of the lagged levels of the variables in a univariate equilibrium correction system when a trend or first difference is stationary. Therefore, the aforementioned method is used to study the short and long-run nexus among the variables. It estimates the tendency of the variables to move together over the long run. Co-integration is assumed (rejection of null hypothesis) if

the observed F-statistic is greater than the critical values of the lower I (0) and upper I (1) bounds.

The generalized ARDL (p,q) model is specified.

$$Y_t = Y0j + \sum_{i=i}^{p} \delta j\, Yt = i + \sum_{i=0}^{q} + \beta j X t = i + Ujt \quad (5)$$

Where Y_t is a vector and the variables in (X_t) are permitted to be simply I (0) or I (1) or co-integrated and are coefficients; Y is the constant, j=1.....k, p, q are optimum lag orders, and Ujt is a vector containing the unseen error components (serially uncorrelated or independent). The dependent variable's lagged values, as well as the present and lagged values of another exogenous variable in the model, determine its behavior.

- p lags: used to describe the response variable
- q lags: utilized for independent factors
- The lag period for p and q may not be the same.

4.5 Error Correction Model (ECM)

The error correction model is one of the series analysis models which is widely used for data with a long-run typical stochastic pattern, also known as co-integration. The ECM is a technically guided method that can be used to estimate both the short-term and long-term impact of one time series on another. The term error-correction refers to the fact that perhaps the error, or change from a long-run equilibrium, affects the short-run dynamics of the previous time. Thus, ECM assesses directly the velocity at which a response variable returns to equilibrium following a change or an increase in other variables.

$$\Delta Y\ t = \delta + \gamma \Delta X\ t-1 + \alpha EC\ T\ t-1 + \varepsilon\ t \quad (6)$$

Where; ECT is named error correction term. It measures deviations from the long-run equilibrium between Y and X. It is found that ECMs can be carried out with OLS, though, sophisticated techniques have been developed the deviation from the long-run equilibrium relationship in the previous period. Note that the ECM is balanced in the sense that all variables in it are I(0)Therefore, no danger of spurious regression. However, all variables in the ECM are I(0) only if Y and X are co-integrated, so that the linear combination $ECT=Y-\beta\ 0-\beta\ 1\ X$ is I(0). This is essentially the Granger Representation Theorem again: if Y and X are co-integrated.

4.6 Diagnostic Test

The model was submitted to diagnostic tests to provide some degree of consistency in the results. This test confirms that the series conceded the normality, autocorrelation and heteroscedasticity tests.

4.7 Granger Causality Test

Granger causality is a hypothesis test to determine one time series or variable is useful in forecasting another. Normally, regressions show basic correlations, but Clive Granger (1969) stated that in economics, causation might be validated by analyzing the capability or ability to predict future values of a time series based on previous values of another time series Granger-causality is best stated as "predictability" or, as Granger later argued in 1977, "temporally related," therefore to use the term "causal" alone is a misconception. Instead of determining whether X causes Y, the Granger causality determines if X predicts Y.

4.7.1 Pairwise Granger Causality Test

In this study, if two or more variables are stationary, co-integrated, and also identify their order of integration, It is important to examine the causal effect i.e; direction of causality among the economic series. When macroeconomic variables are co-

integrated, granger causality must exist, for instance, real gross domestic product to life expectancy and vice versa or both in both directions.

Chapter 5

RESULTS AND ANALYSIS

5.1 Introduction

This chapter explains the empirical results of the study. In this chapter, various methods were employed. Through the process of testing for the unit root, Augmented Dickey-Fuller (ADF) and Phillips- Perron (PP) tests were used to determine the stationarity of the series and order of integration. An autoregressive distributed lag (ARDL) model was used to validate the long-run connections among the series. Error correction model (ECM) was also used to establish the short-run and long run nexus. Also; Granger causality test is done in determining the causation relationship among variables.

Table 5.1: The Descriptive Statistics Results

	LRGDP	LLEF	LHEXP	LDRT	LBRT
Mean	26.16037	3.887912	7.740878	3.787178	3.787178
Median	26.08466	3.860317	8.251317	3.822089	3.822089
Maximum	26.89112	3.995113	13.01243	3.875359	3.875359
Minimum	25.45632	3.825223	2.566556	3.62966	3.62966
Std. Dev.	0.50796	0.064943	3.428294	0.073241	0.073241
Skewness	0.187278	0.483594	-0.29767	-0.87004	-0.87004
Kurtosis	1.475847	1.588077	1.732515	2.265532	2.265532
Jarque-Bera	3.695002	4.393468	2.941418	5.351012	5.351012
Probability	0.157631	0.111166	0.229763	0.068872	0.068872
Sum	941.7733	139.9648	278.6716	136.3384	136.3384
Sum Sq. Dev.	9.030804	0.147615	411.3621	0.187748	0.187748
Observations	36	36	36	36	36

Descriptive statistics show the central tendency (mean, median, and mode) and variability (maximum, minimum, std. dev., skewness and kurtosis) of the distribution

of variables. From the table, the outcome of the mean shows the average values for each variable that is, LRGDP (26.160), LLEF (3.887), LHEXP (7.740), LDRT (3.787), and LBRT (3.787). The median explains the middle values of the series while the maximum and minimum reveal the highest and lowest figures in each of the variables specified. Real GDP shows the highest value while LLEF shows the lowest value from the table above.

The standard deviation shows the deviations from the sample mean for each of the variables. Skewness for a normal distribution 0 and kurtosis of 3. The distribution reflects skewed distribution since the mean and median show different figures. The variables (LRGDP and LLEF) are positively and left-skewed because the values of the mean are greater than the median values. While others (LHEXP, LDRT, and LBRT) are negatively skewed because the mean of the variables is less than the median. The skewness statistics for the variables explicitly validate this positive and negative skewness. The broad ranges imply that the distributions of all variables vary greatly.

5.2 Unit Root Tests (ADF Test)

Table 5.2: Augmented Dickey-Fuller Test

Variables	Level	1st difference	Order of integration
LRGDP	0.8158	0.0108**	I(1)
LLEF	0.0029**	0.3169	I(0)
LHEXP	0.7130	0.0000***	I(1)
LDRT	0.0789	0.0000***	I(1)
LBRT	0.9346	0.0000***	I(1)

Note: The log length is determined by the Schwarz information criterion (SIC) as selected by E-views 10, *, **, *** indicate 1%, 5%, 10% level of significance respectively.

In table 2 we observe the unit root test (ADF) for all the variables. The above outcomes show that all the variables of the series are integrated with I(1) except for LLEF, which is stationary at the level form I(0), and also significant at 1% (with constant) and 5% (with constant and trend). Prior to the stationarity, we reject the existence of null hypothesis (H_o) of the variables regardless of the level form and first differencing.

Table 5.3: Unit Root Test (ADF output)

	At Level					
		LRGDP	LLEF	LHEXP	LDRT	LBRT
With Constant	t-Statistic	-0.7664	-4.1935	-1.0791	0.3642	-0.1594
	Prob.	***0.8158***	***0.0029***	***0.7130***	***0.9783***	***0.9346***
		n0	***	n0	n0	n0
With Constant & Trend	t-Statistic	-1.3017	-3.6439	-1.3066	-2.6393	-1.4742
	Prob.	***0.8705***	***0.0446***	***0.8697***	***0.2665***	***0.8195***
		n0	**	n0	n0	n0
Without Constant & Trend	t-Statistic	2.6390	1.3673	-0.685	-1.7318	-1.2396
	Prob.	***0.9972***	***0.9540***	***0.4130***	***0.0789***	***0.1935***
		n0	n0	n0	*	n0
	At First Difference					
		d(LRGDP)	d(LLEF)	d(LHEXP)	d(LDRT)	d(LBRT)
With Constant	t-Statistic	-3.6091	-1.9261	-5.7915	-9.4083	-6.2901
	Prob.	***0.0108***	***0.3169***	***0.0000***	***0.0000***	***0.0000***
		**	n0	***	***	***
With Constant & Trend	t-Statistic	-3.5004	1.4270	-6.0358	-9.6317	-6.4766
	Prob.	***0.0553***	***0.9999***	***0.0001***	***0.0000***	***0.0000***
		*	n0	***	***	***
Without Constant & Trend	t-Statistic	-2.2356	-0.8354	-5.8611	-8.964	-6.0766
	Prob.	***0.0264***	***0.3464***	***0.0000***	***0.0000***	***0.0000***
		**	n0	***	***	***

5.3 Unit Root Tests (PP Test)

Table 5.4: Phillips-Perron Test

Variables	**Level**	**1st difference**	**Order of integration**
LRGDP	0.9171	0.0145**	I (1)

LLEF	0.9911	0.0347**	I (1)
LHEXP	0.6967	0.0000***	I (1)
LDRT	0.9706	0.0000***	I (1)
LBRT	0.9473	0.0000***	I (1)

Note: The log length is determined by the Schwarz information criterion (SIC) as selected by E-views 10, *, **, *** indicate 1%, 5%, 10% level of significance respectively.

We observed from Table 3 above that all the variables are not stationary in their level form when verified with the three models (with constant, with constant & trend, and without constant and trend) of Phillips Perron. Based on the outcome of all the models, for PP test, null hypotheses could not be rejected which reveal non stationarity. The first differencing is necessary in order to maintain the stationary characteristics of the variables. We could able to reject the null hypothesis, after performing the first differencing all variables became stationary.

Table 5.5: Unit Root Test (Phillips- Perron Output)

UNIT ROOT TEST RESULTS TABLE (PP) TI						
Null Hypothesis: the variable has a unit root						
At Level						
		LRGDP	LLEF	LHEXP	LDRT	LBRT
With Constant	t-Statistic	-0.2859	0.7274	-1.1205	0.2279	-0.049
	Prob.	0.9171	0.9911	0.6967	0.9706	0.9473
		n0	n0	n0	n0	n0
With Constant & Trend	t-Statistic	-1.6091	-2.2538	-1.3066	-3.5612	-1.4742
	Prob.	0.7689	0.4468	0.8697	0.5582	0.8195
		n0	n0	n0	n0	n0
Without Constant & Trend	t-Statistic	4.4482	2.8114	-0.6827	-2.0977	-1.3436
	Prob.	1	0.9982	0.414	0.4462	0.1626
		n0	n0	n0	n0	n0
At First Difference						
		d(LRGDP)	d(LLEF)	d(LHEXP)	d(LDRT)	d(LBRT)
With Constant	t-Statistic	-3.4876	-1.7258	-5.7915	-11.3428	-6.2919

	Prob.	0.0145	0.0347	0	0	0
		**	**	***	***	***
With Constant & Trend	t-Statistic	-3.3581	-1.3784	-6.0734	-32.3781	-6.5934
	Prob.	0.0742	0.0246	0.0001	0	0
		*	***	***	***	***
Without Constant & Trend	t-Statistic	-2.0883	-1.0936	-5.8611	-8.964	-6.0765
	Prob.	0.037	0.2429	0	0	0
		**	n0	***	***	***

Note: The next method is to validate if there exist any possible long-run nexus between the economic time series using Johansen and bounds co-integration tests (BCT) which are the next test in this study.

5.4 Johansen Co-integration Test

The variation of the variables measured in this study is essential since all were not stationary at their level form I(0) using the Augmented Dickey-Fuller unit root test. All variables were stationary after the first differencing. The Johansen co-integration test will determine the necessity for a probable long-run connection.

Table 4: Johansen Result, Unrestricted Co-Integration Rank Test (Trace)

Economic indicators	Eigen Value	Trace Sta.	(0.05) Critical Value	Prob.**	Hypothesized No of CE(S)
LRGDP	0.517274	74.083	69.81889	0.0219	None*
LLEF	0.434826	49.32058	47.85613	0.0362	At most 1*
LHEXP	0.330491	29.91948	29.79707	0.0484	At most 2*
LDRT	0.24955	16.27834	15.49471	0.038	At most 3*
LBRT	0.1744	6.517557	3.841466	0.0107	At most 4*

Trace test shows 5 co-integrating eqn(s) at the 0.05 level, *signifies rejection of the hypothesis at the 0.05 level.

Table 4 reveals five existence of co-integrating vectors in the model. The probability value (p-value) guides us to make a rejection decision. Since the p-values of all the

variables are less than 0.05 level of significance, the null hypothesis is rejected in the study. This indicates that there is a long-run nexus among the log of real gross domestic product (LRGDP) of the predicted variable in the model and the response variables in the study. This also allows us to verify the long-run relationship using the bound co-integrating test using F- statistic as a decision rule.

5.5 Bounds Co-Integration Test

Since all the variables are all I (1) using Phillips Perron (PP), a bounds test is also performed to verify the cointegration among variables. It is better to perform the following test for the long-run relationship. The suitable co-integration test is the Bounds test which was introduced by Pesaran, Shin, and Smith (2001). The Bounds test decision rule rejects the null hypothesis of co-integration at the level of significant 10%, 5%, and 1% respectively. For instance, if the F-statistic is greater than the estimated critical level for the upper bound I (1), it shows that there is co-integration. This indicates that the variables have a long-run connection. Then, the null hypothesis is rejected.

Table 5:6: The Bound Co-Integration Test

Test statistics	Value	Significance	I(0)	I(1)
F-statistics	16.09	10%	2.46	3.46
K(dof)	4	5%	2.94	4.08
Sample size	35	1%	4.09	5.53

In Table 5, the outcome of the ARDL Bound test shows that the F-statistic which is (16.09) is greater than the upper bound value which is (4.08) at a 5% level of significance. Thus, it indicates that there is an existence of co-integration, that is, there is a long-run relationship between life expectancy, mortality rates, public expenditure, and economic growth in Nigeria.

Table 5.8: F-Bound Test Output

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	16.09306	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
Actual Sample Size	35		Finite Sample: n=35	
		10%	2.46	3.46
		5%	2.947	4.088
		1%	4.093	5.532

5.6 Error Correction Model

Since the previous tests show the existence of a long run relationship, we estimate an ECM to check the speed of adjustment. The ECM becomes required after the bounds co-integration test which reveals a long run. There is a requirement to verify for short-run causation and the stability that the ECM test requires. The ECM method is used in determining the rate of adjustment of the variable under consideration toward their long-run equilibrium path. We have to run a short-run model with the lag ECT, that is, the error correction term as an independent variable. The ECT coefficient must be negative and statistically significant, suggesting short-run causation and potential convergence, as well as the temporal efficiency of the error-correcting process.

Table 5.9: (ECM) Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.015323	0.009521	1.609449	0.1191
D(LRGDP(-1))	0.480125	0.197154	2.435279	0.0218
D(LLEF(-1))	1.400561	1.361373	1.028785	0.3127
D(LHEXP(-1))	-0.002219	0.003619	-0.61302	0.545
D(LDRT(-1))	-0.144231	0.089115	-1.618479	0.1172
D(LBRT(-1))	0.266677	0.206561	1.291031	0.2076
ECT(-1)	-0.18575	0.08709	-2.13286	0.0422
R-squared	0.385459	Mean dependent var		0.041571
Adjusted R-squared	0.248894	S.D. dependent var		0.037795
S.E. of regression	0.032756	Akaike info criterion		-3.818222
Sum squared resid	0.02897	Schwarz criterion		-3.503971

Log likelihood	71.90977	Hannan-Quinn criter.	-3.711053
F-statistic	2.822537	Durbin-Watson stat	2.291424
Prob(F-statistic)	0.028998		

The ECT, also known as the speed of adjustment is (-0.18575) percent, as shown in Table 6 above. The ECT is predicted to be negative and significant at 1%, implying that the value of RGDP will converge to its long-run value by 18.58% by using public health spending, mortality rate, and life expectancy as response variables. The speed indicates the proportion of long-run imbalance of the response variables that are adjusted and corrected in each period. The coefficient of determination was able to explain 38 percent of the variance in real GDP as described by life expectancy, mortality rate, and public health spending. This implies that the remaining 62 percent is governed by factors not included in the model. In addition, the F-statistic is larger than the crucial threshold, allowing us to reject the null hypothesis. As a result, the F-statistics value indicates the model's combined significance and accurate specification.

5.7 Diagnostics Test

Table 5.10: Heteroscedasticity Test: Breusch-Pagan-Godfrey

Heteroscedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.56407	Prob. F(4,31)	0.2085
Obs*R-squared	6.045318	Prob. Chi-Square(4)	0.1958
Scaled explained SS	4.964715	Prob. Chi-Square(4)	0.2909

In this research, a structured test for heteroscedasticity using the Breusch-Pagan-Godfrey method is required. The p - value is used in the test. No problem of heteroscedasticity if null hypothesis is accepted given a probability value less than 5% and reject if it is greater than 0.05 level of significance.

Table 5.11: Serial Correlation

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	12.70821	Prob. F(2,29)	0.0001
Obs*R-squared	16.81461	Prob. Chi-Square(2)	0.0002

The Breusch Godfrey serial Correlation Langranger Multiplier test was used in this investigation, as well as the results indicated that the null hypothesis of serial correlation was rejected. This demonstrates that the model is free of the auto-correlation problem.

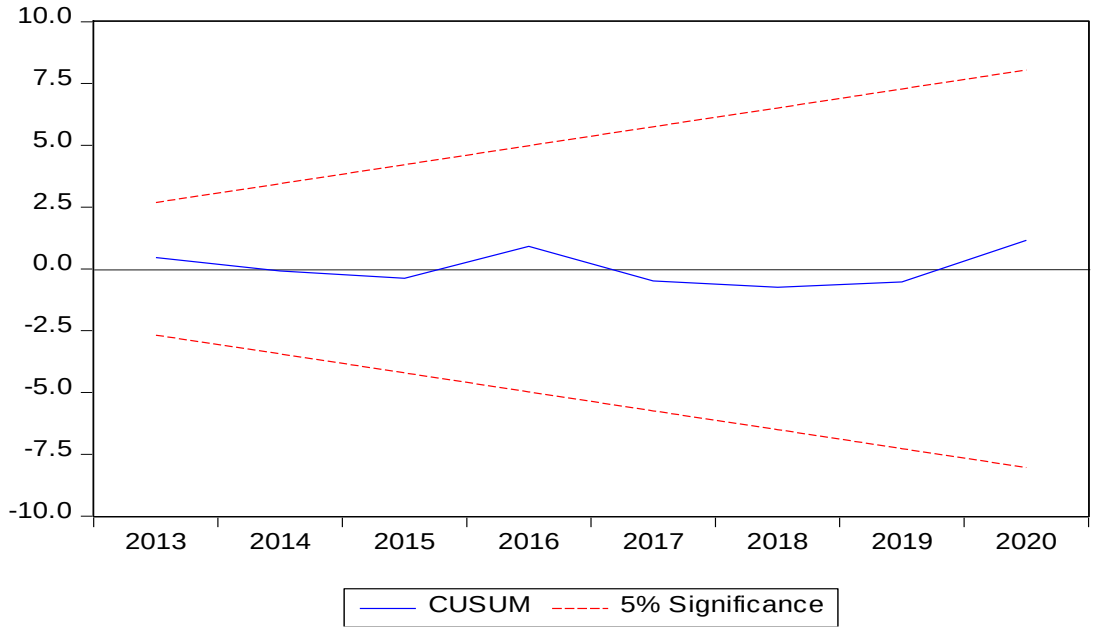

Figure 5.1: Recursive Tests (Model Stability)

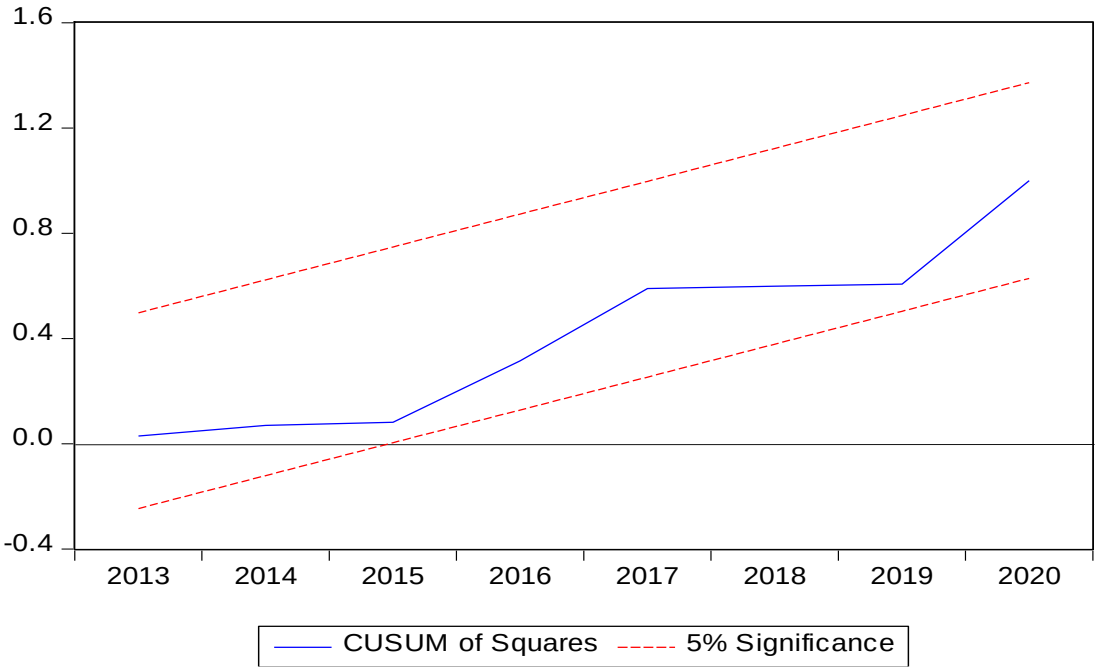

Figure 5.2: Recursive Tests

Recursive estimates used to check for the model stability test known as cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) following the study of Brown et al. (1975). The model stability considered short and the long term changes through the residuals. Since the blue plotted line is within the critical values less than of 5% significance level, this means that model of the regression is stable.

5.8 Granger Causality Test

In carrying out a Granger causality test, two variables are usually measured and analyzed together, while testing for their relationship. The following are likely the outcomes of the analyses. Thus;

- Granger causation from variable Yt to variable Xt is a unidirectional approach.
- Granger causation from variable Xt to variable Yt is unidirectional.
- Bidirectional causality
- There is no causation.

Table 9: Paidrwise Granger Causality

Null Hypothesis:	Obs	F-Statistic	Prob.	decision	Type of causality
LLEF does not Granger Cause LRGDP	34	3.52975	0.0425	Reject Ho	Bi-directional causality
LRGDP does not Granger Cause LLEF		5.90394	0.0071	Reject Ho	Bi-directional causality
LHEXP does not Granger Cause LRGDP	34	3.73890	0.0359	Reject Ho	Uni-directional causality
LRGDP does not Granger Cause		2.08222	0.1429	DNR Ho	Uni-directional causality
LBRT does not Granger Cause LRGDP	34	3.75743	0.0354	Reject Ho	Uni-directional causality
LRGDP does not Granger Cause LBRT		2.71040	0.0833	DRN Ho	Uni-directional causality
LDRT does not Granger Cause LRGDP	34	2.06493	0.1451	DNR Ho	Uni-directional causality
LRGDP does not Granger Cause LDRT		6.82971	0.0037	Reject Ho	Uni-directional causality
LHEXP does not Granger Cause LLEF	34	3.66651	0.0381	Reject Ho	Uni-directional causality
LLEF does not Granger Cause		3.21663	0.0547	DNR Ho	Uni-directional causality
LBRT does not Granger Cause LLEF	34	0.39697	0.676	DNR Ho	Uni-directional causality
LLEF does not Granger Cause LBRT		5.91277	0.007	Reject Ho	Uni-directional causality
LDRT does not Granger Cause LLEF	34	0.03935	0.9615	DNR Ho	Uni-directional causality
LLEF does not Granger Cause LDRT		6.98049	0.0034	Reject Ho	Uni-directional causality
LBRT does not Granger Cause LHEXP	34	4.11932	0.0266	Reject Ho	Uni-directional causality
LHEXP does not Granger Cause LBRT		0.16201	0.8512	DNR Ho	Uni-directional causality
LDRT does not Granger Cause LHEXP	34	1.88854	0.1694	DNR Ho	Uni-directional causality
LHEXP does not Granger Cause LDRT		0.06824	0.9342	DNR Ho	Uni-directional causality

LDRT does not Granger Cause LBRT	34	3.94255	0.0306	Reject Ho	Uni-directional causality
LBRT does not Granger Cause LDRT		0.27394	0.7623	DNR Ho	Uni-directional causality

Decision rule: reject H_0 if P-value < 0.05. Key: DNR = Do not reject.

Bi-directional causality exists between the log of real gross domestic product and life expectancy which means that gross domestic product granger cause life expectancy and vice versa. The two variables' p-values are less than 0.05 level of significance which means that the null hypothesis is rejected. Thus, other the outcome shows the existence of unidirectional causality among variables. As a result, the null hypothesis should be rejected. Therefore, the analysis seems to have one-way causation.

Chapter 6

FINDINGS, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This study uses ADF, bounds test, Granger causality, and Error correction model to investigate the significance of life expectancy, public health expenditure, and mortality rates in maintaining and attaining economic growth in Nigeria. Various scholars in the field of health economics and other related fields had many debates among themselves on how an effective health system and ability to access it could increase life expectancy and reduce death rates through government health expenditure in an economy. In many studies, it is also viewed that many factors such as daily exercise, balanced diet, socioeconomic factors; income, employment, and happiness including functional health care would positively influence life expectancy, regardless of these influences, living conditions, wide environmental and cultural are classified to individual behavior and also considered as a determinant of health.

6.2 Findings and Conclusion

In this study, one of the main aims is to see the effects of life expectancy, public health expectancy, mortality rate on economic growth in Nigeria. The research finding demonstrates that life expectancy at birth has a considerable positive influence on economic growth. Interestingly, this support the Granger causality testing which found that there is a bi-directional connection between the two variables. The above result showed the life expectancy at birth has a significant effects on economic growth which means an increase in factors such as (stabilized sanitation policies, lifestyle and

genetics choices etc) that influences life expectancy, the stable the Nigerian economy. It is a direct relationship. Hojiman (1996), Younger (2004), Anand and Rewillion (1993) studies supported the above findings where they found a direct connections or nexus which occur between life expectancy (LEB) and gross domestic product (GDP). In contrary, Oni (2012) founds that Life expectancy has no significant effect on economic growth.

The research findings revealed that the mortality rate has a co-integrating relationship with economic growth and there is existence of uni- directional causality between the variables. The implication of this is that mortality rate may influence economic growth and economic growth has no causation on mortality rate in Nigeria. This conclusion implies that although the country's mortality rate becomes constant, it may impede growth in the economy through the workforce channel.

The results of the ARDL bound test technique show co-integration connection between the variables that is; health spending and economic growth revealed that health expenditure does not granger caused economic growth and vice versa. Invariably, it showed an adverse influence on economic growth. However, the influence has been determined to be insignificant. These conclusions indicate that health spending is a critical component that may be used to boost the Nigerian economy's economic growth. It suggests that Nigeria may benefit from the adaptability of her work force if more efforts are put toward strengthening the healthcare sector.

On the other hand, the findings and conclusion focused on the causality relationship the independents variables namely; life expectancy, public health expenditure and mortality rates.

The study finds and concludes realistically and sequentially that there uni-directional causation nexus between life expectancy and government health care spending in Nigeria over time. In improving life expectancy in Nigeria, the government must focus on how to establish policies to divert health spending on factors that will increase life expectancy in Nigeria. This finding is consistent with the findings of research conducted by (Berger & Messer, 2002; Crimieux et al., 1999; Kee 2001; Crimeux et al., 2005) who discovered a statistical significance link among, for example, child death rates, life expectancy, and maturity death rate health condition and both government expenditure and per capital income.

The results of this study are consistent with the findings of other studies that have found that government health spending decreases death rates such as newborn, maternal, and under 5 mortality rates, among others. This claim is confirmed by the results of the ARDL limits test and the granger causality test.

Lastly, the analysis discovered uni-directional causation among death rates and life expectancy, demonstrating that death rate does not affect life expectancy. It always shows that a high mortality rates have become the consequence of the failure of the government to allocate adequate funding to the healthcare system in order to enhance life expectancy in the economy.

6.3 Policy Recommendations

The following suggestions were made in light of the study findings:

- The government has to step up its efforts by raising the amount of its budgetary allocation to the health sector in order to meet WHO's recommended proportion for the country's yearly budget. The Nigerian Government should raise and completely restore public spending on health to include more health services, medicines, hospitals, and supplies, among other things). This can be

accomplished by proper channeling of resources to the appropriate uses, as well as adequate management of resources to discourage fraud and assist in the advancement of health care.

- After channeling more resources to Nigeria's health care system to increase life expectancy, well-being, and healthy labor force etc, government should create employment opportunities and also restructuring social security system to increase years living of the citizen without paying premium after the retirement.
- The Nigerian government should enact policy requiring the allocation of healthcare resources to initiatives programs that would improve life expectancy. It is proposed that the Federal government of Nigeria (FGN) prioritize investment in human capital growth by providing healthcare facilities, workforce preparation, supervising and assessing, and making access to healthcare facilities accessible. Engaging in these activities will also ensure the availability of skilled workers, it will also result in an improvement in the higher productivity capability and economic development.
- Given that the health sector in Nigeria is clearly poorly funded and poorly developed, this is a call for the government to increase capital expenditure in the nation's healthcare industry, with such investment decisions aimed toward combating major death-causing diseases and infections, tuberculosis, and influenza, which tend to shorten the nation's life expectancy.
- To address the high mortality rates in remote regions, the government must help increase and provide healthcare facilities and personnel. As a result, the government need to be more concerned about the threat to people's lives and property. All of this would decrease anxiety and disaster deaths, as well as the threat of attacks against people and property, thereby increasing the lifespan of

working people' existing and contributing to higher efficiency and economic growth in Nigeria.

- To meet the country's demand in line with the Millennium Development Goals, the government would then have to work in collaboration with the private sector to provide quality and quantitative health care (MDGS).

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