THE EFFECTS OF HEALTH STATUS ON LABOUR FORCE PARTICIPATION IN NIGERIA

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A RESEARCH WORK SUBMITTED TO THE DEPARTMENT OF ECONOMICS, FACULTY OF SOCIAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE (B.SC) DEGREE IN ECONOMICS, UNIVERSITY OF BENIN, BENIN CITY.

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CERTIFICATION

This is to certify that this work titled **“THE EFFECT OF HEALTH STATUS ON LABOUR FORCE PARTICIPATION IN NIGERIA”** was carried out by **OBIANUA PEACE OGECHI** with matriculation number **SSC1909382** and has been approved in partial fulfillment of the requirement for the award of Bachelor of Science (B.sc) Degree in the Department of Economics, Faculty of Social Sciences University of Benin, Benin City, under the supervision of the following persons;

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DEDICATION

This project is dedicated to God Almighty for the strength, inspiration, wisdom and knowledge, his guidance and undying love towards me. He has been the source of my strength throughout this program and on His wings only have I soared. I also dedicate this to my parents Mr and Mrs AZUBUIKE OBIANUA and my siblings who encouraged me all the way and whose encouragement have made sure that I give it all it takes to finish that which I have started. May the blessing of God be with them now and always “Amen”.

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TABLE OF CONTENTS

Title Page i

Certification ii

Dedication iii

Acknowledgement iv

Table of Contents v

Abstract

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study 1

1.2 Statement of Research Problem 3

1.3 Research Questions 4

1.4 Research Objectives 5

1.5 Research Hypothesis 5

1.6 Significance of the Study 6

1.7 Scope of the Study 7

1.8 Limitations to the Study 7

1.9 Definition of Terms 7

1.10 Structure of the Study 8

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.1 Conceptual Literature Review 10

2.2 Theoretical Literature Review 22

2.3 Empirical Literature Review 24

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Theoretical Framework 30

3.2 Model Specification 31

3.3 Estimation Techniques 33

3.4 Source of Data 35

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction 36

4.1 Descriptive Statistics 36

4.2 Correlation Analysis 39

4.3 Error Correction Model 44

4.4 Diagnostic Tests 47

4.5 Discussion of Findings 48

4.6 Policy Implications 49

CHAPTER FIVE: SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSSION.

5.1 Summary of Findings 52

5.2 Policy Recommendations 53

5.3 Conclusion 54

REFERENCES 56

APPENDIX 58

ABSTRACT

This study investigates the effect of health status indicators on labour force participation (LFP) in Nigeria from 2000 to 2021. Key health indicators including Life Expectancy Rate (LNLER), HIV Prevalence Rate (LNHPR), Incidence of Malaria (LNMI), and Population Growth Rate (LNPGR) were analyzed to understand their influence on LFP during the specified period. The Correction analysis is used to analyze the linkages between these variables. Augmented Dickey- Fuller (ADF) test was employed to test for stationarity of the variable in the model. Data for this study will be drawn from Central Bank of Nigeria statistical bulletin, the world development indicators and the World Bank Database. The findings reveal a significant negative association between HIV prevalence and LFP, indicating adverse effects on workforce participation. However, associations between life expectancy, malaria incidence, and population growth rate with LFP were inconclusive, highlighting the need for further research. Policy recommendations include targeted interventions to combat HIV/AIDS, improved access to healthcare, enhanced malaria prevention efforts, and support for economic opportunities. Overall, addressing health challenges is crucial for enhancing workforce participation and productivity in Nigeria, requiring evidence-based policies and ongoing monitoring to achieve sustainable development.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

It is impossible to overstate the value of health as a type of human capital. One of a country's most valuable assets is a healthy labor force. Health status is a measure of the persevation of one's health. one of a person's most valuable assets is their health because it enables us to reach our best potential. (Ephraim et al , 2015).

Health is “a state of complete physical, mental and social well-being, and not merely the absence of disease” (WHO). Health can be considered in terms of a person’s body structure and function and the presence or absence of disease or signs; their symptoms and the extent to which the condition affects the person’s quality of life. According to Ajani and Ugwu (2008) In any economy, a healthy workforce and and productive labour force is crucial, particularly when battling poverty. Studies shows that healthy population is a prerequisite for sustainable socio-economic development and that the health of the population is an essential factor for labour productivity, poverty reduction and economic development. Furthermore, poor health suggests that people won't be very productive. Reduced productivity lowers a person's earnings power, which deters the individual from entering the labor market. Nigeria's health indices have mostly stayed below the nation's goals and internationally recognized standard as a result of the inherent weaknesses in the health system (United Nations Development Programme, 2014; Rolle, Osaze and Henry, 2020). In Nigeria,

there are basically three level of health care. Primary, secondary and tertiary health care. The healthcare infrastructure is supported by a number of financial sources, including general taxes, private health insurance, social health insurance, and direct patient payments.

Labour Force Participation refers to all individuals (male and female) of working age who are able to provide labour for the production of goods and services within a given time frame. It is made up of people in the working age range of 15 to 65 who are either employed or unemployed. Individuals who do not fall into this category include retired people, people with disabilities, people who are physically or mentally challenged, people in the economically active population (those aged 15 to 65), people who are unable to work, do not actively seek employment, people who choose not to work, and people who are not available for work. People under the age of 15 are not included in the labor force. This concept complies with the International Labour Organization's standard definition (ILO, 2015).

A nation's ability to participate in the labor force is influenced by its level of health. This illustrated how important health is in deciding a person's labor supply. Because health is both a kind of human capital and because health shock can change people's preferences between work and leisure, people may choose more leisure over work as a result of illness (Olayiwola et al, 2015). According to the convergence theory, an economy that has a higher life expectancy will approach a steady-state growth path faster than one that has a lower life expectancy. It has long been held that

wealth is mostly derived from being well, and the importance of health capital confirms the widely accepted notion that wealthier nations are typically those with better health.(Saif et al, 2019).

Greater involvement in the labour force due to better health is a positive correlation between income growth and health. These health benefits raise productivity, which in turn saves more money for the economy. On the other hand, poor health inhibits capital formation, which impedes the growth of revenue. [Saif et al, 2019]. Research has indicated a positive feedback loop between GDP growth and worker health, with improved health favorably influencing GDP growth. The GDP and worker health are closely related. (Bloom et al, 2004).

In developing nations like Nigeria, where economic growth is largely dependent on a labour-intensive population, the effect of health status on labour force participation is especially noticable. In these kinds of economies, a rise in ill health among people can cause a fall in the labour force, which lowers productivity. Notably, Co-epidemics of malaria and HIV/AIDS continue to wreak havoc on Nigerians' health and labour productivity (Rolle et al, 2020). Nigeria has a high disease burden due to a number of different non-communicable diseases, including hypertension, sickle cell diseases, anemia, mental health issues, blindness, and stroke (Rolle 2020).

1.2 Statement of Research Problem

Nigeria, although having a large population, has demeaning health statistics and a declining labour supply. Attaining high level of economic development by a

nation with a population crippled by pervasive illness of its workforce, high infant and material mortality and low life expectancy will be an illusion (Ephraim, 2015) . The interplay between health status and labour force participation in Nigeria presents a multifaceted challenge with far-reaching implications. Factors such as prevalent infectious diseases, limited access to quality healthcare services, and demographic shifts contribute to variations in individuals' health statuses which in turn impact labour force participation rates, productivity levels, and overall economic growth.

Nigerian government spending on public health over the years has been extremely minimal. According to the WHO, Nigeria does not devote the minimum of 5% of its budget on health. The Nigerian government needs to step up its efforts to combat corruption and increase funding for the provision of healthcare services.

However, considering the significance of good health to humans, lots of studies have been carried out to examine the effect of health status on labour participation or the general well being of humans, therefore this study seeks to investigate the impact of HIV/AIDS, Malaria, life expectancy rate and population growth rate on Labour force participation.

1.3 Research Questions

Sequel to the foregoing discussion, the study seeks to answer the following research questions.

1. How does life expectancy rate influence labour force participation in Nigeria?

2. What is the impact of incidence of malaria on labour force participation in Nigeria?
3. To what extent does the prevalence of HIV/AIDS affect labour force participation in Nigeria?

1.4 Research Objectives

The broad objective of this study to investigate the effect of health status on labour force participation in Nigeria. The specific objectives of the study are to:

1. To assess the relationship between life expectancy rate and labour force participation in Nigeria.
2. To investigate the impact of malaria incidence on labour force participation in Nigeria.
3. To examine the association between HIV/AIDS prevalence and labour force participation in Nigeria.

1.5 Research Hypothesis

Ho: There is no significant relationship between life expectancy rate and labour force participation in Nigeria.

Ho: There is no significant association between malaria incidence and labour force participation in Nigeria.

Ho: There is no significant relationship between HIV/AIDS prevalence and labour force participation in Nigeria.

1.6 Significance of the Study

The aim of the study is to providing insights into the complex interplay between health status and labour force participation in Nigeria. The significance include the following:

Firstly, it can inform policymakers, healthcare professionals, and other stakeholders in designing targeted interventions and strategies to enhance health outcomes and promote a more productive labour force in Nigeria.

Secondly, the study aims to contribute to the existing literature on the relationship between health status and labour force participation, specifically in the Nigerian context.

Furthermore, the study can aid in the creation of social welfare programs aimed at enhancing health outcomes and raising labour force participation, especially among vulnerable populations, by identifying the factors that affect labour force participation.

By highlighting areas where actions are required to enhance health outcomes and subsequently increase labour force participation, the study can help shape healthcare provider policies

Additionally, the results of the study will also benefit the broader population. Understanding the relationship between labour force participation and health status helps citizens fight for policies that prioritize healthcare investments, realizing that

these investments have a dual function in promoting economic development and improving health outcomes.

1.7 Scope of the Study

The study is based on investigating the impact of health status on labour productivity in Nigeria using time series data from 2000 To 2021. It specifically delves into the relationship between health status and the efficiency and effectiveness of the labour force. Data for this study will be drawn from reliable sources such as the Central Bank of Nigeria statistical bulletin, the world development indicators and the World Bank Database.

The dependent variable is labour force participation while life expectancy, incident of malaria, Hiv/Aids and population growth rate are the independent variables. In all, the study uses regression analysis to quantify relationship and disparities while controlling for other determinants of labour force participation.

1.8 Limitations to the Study

The study relies on secondary data for analysis and it's findings and the accuracy and completeness maybe subject to limitations. And also the study's scope is restricted by the time period it was conducted.

1.9 Definition of Terms

Health Status: An individual's general well-being, encompassing physical, mental, and social dimensions, is denoted by their health status. It reflects their current health condition, considering any existing illnesses, impairments, or injuries. Additionally,

health status takes into account lifestyle choices, accessibility to healthcare services, and socioeconomic conditions that shape an individual's overall health.

Labour Force Participation: The workforce participation rate indicates the proportion of individuals within a specific age bracket, usually ranging from 15 to 64 years, who actively participate in the job market. This metric reflects the percentage of people in this age group who are either currently employed or actively engaged in seeking employment, showcasing their engagement and involvement in the workforce.

1.10 Structure of the Study

This study is structured in 5 chapters. Chapter 1 contains the introductory text which deals with an overview of health status and labour force participation . Followed by this is the statement of the research problem and then various research questions that this research work seeks to answer, the objectives of the study, the research hypotheses which are stated in their null forms. Following this are the limitations the researcher would encounter during the period of this research, definition of terms and finally the structure of the research work.

Chapter 2 reviews the related literatures to the research. It begins with the conceptual literature, where important concepts pertaining to the work are being defined and discussed. Then there is the theoretical literature, where theories that explains the relationship the work is trying to find is being reviewed and finally, the empirical literature where the researchers finds the gap in literature the work is trying to fill.

Chapter 3 where the theoretical framework is being established. This is accomplished as the researcher would base the work on the most relevant theory from chapter 2 and thereafter, the model specification that would be used to carry out this research.

Chapter 4 sees to the presentation and analysis of empirical data. Here, the data of the research would be analyzed, interpreted and from the result procured; the hypotheses would be tested using both appriori test and statistical tests.

Finally, the concluding chapter, chapter 5, would see to the summary, conclusion and recommendations, based on the objectives of this work.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Conceptual Literature Review

2.1.1 Labour Force Participation

Definition: The percentage of a nation's population that is either employed or actively looking for work is known as labour force participation. The number of people in the labour force as a percentage of the working-age population is known as the labour force participation rate. For statistical purposes, any individuals above a minimum age for which economic activity is surveyed are included in the working-age population, which is defined as those above the legal working age. The working-age population is commonly defined as individuals who are 15 years of age or older for the purpose of international comparison; however, this definition may differ depending on the laws and customs of each country (some may even set an upper age restriction).

It is necessary to quantify unemployment and employment in order to calculate the labour force participation rate. Employment includes people of working age who were paid to work for a brief length of time (a week or a day, for example) whether or not they were actively employed; or self-employed, whether or not they were actively working. Working-age individuals classified as unemployed comprise those who: were available for work (i.e., able to accept paid employment or self-employment); did not work during the reference period (i.e., not employed for pay or self-employed); and sought work (i.e., made recent efforts to acquire employment).

Uses of Labour Force Participation Rate

1. The data of labour force participation rate is essential for comprehending the elements that influence the size and makeup of a country's human resource pool and for projecting the future labor supply.

2. This data is used to create job regulations, determine what kind of training is needed, project the work lifetimes of the labour forces of men and women, and calculate the rates at which people enter and leave the labour force. All of these calculations are important for social security system budgeting.

3. The statistic also helps to understand how different demographic segments' labor markets behave. Trends and levels of labour force participation are impacted by employment possibilities and income needs, which differ depending on the demographic group. For example, research has shown that women's rates of labour force participation vary systematically with age, contingent upon factors such as marital status and educational attainment. Furthermore, there are notable differences in participation rates across people in urban and rural areas as well as different socioeconomic groups.

Limitations

1. Due to differences in conceptions and methods, national data on labour labor force participation may not be directly comparable. The source of the data is the most important element affecting comparability. A restricted set of questions regarding people's economic circumstances are often used to obtain labour force data from

population censuses, with little opportunity for additional research. Because of this, the final data frequently deviates from comparable labour force survey data and can differ significantly throughout nations based on the quantity and kind of questions included in the census. The jobless and, in many jurisdictions, employees in small firms or the unorganized sector who are not covered by the survey or census are excluded from establishment censuses and surveys, which by their very nature can only offer information on the employed population

2. It is widely acknowledged that labour force surveys are the most comprehensive source of labour force statistics for cross-national comparison. Though labour force surveys have advantages, their scope and coverage may contain incomparable elements. This is mainly because of variations in whether or not certain geographic regions are included, as well as whether or not military conscripts are included. There are also variations in how different countries define the labour force idea. This is especially true when it comes to how some categories are treated statistically, including "contributing family workers" and "individuals not employed, available for work but not actively seeking it."

3. Differences in the age ranges used to define the labour force (previously known as the economically active population) may also lead to non-comparability. Certain nations have opted for non-traditional upper age thresholds to be included in the labour force, such as 65 or 70 years old. This can have an impact on general comparisons, especially between older age groups. Last but not least, differences in

the dates to which the data relates and the technique used to average over the year may also affect how comparable the final results are.

2.1.2 Life Expectancy Rate

Life expectancy is a statistical estimate of the average number of years left to live at a particular age is called life expectancy. Numerous factors, including as socioeconomic status, healthcare, genetics, and lifestyle, influence it.

Life expectancy at birth (LEB, or in demographic notation ex, where ex indicates the average life remaining at age x) is the most often used metric. There are two ways to define this. Group Cohort The LEB, or mean length of life, is only calculated for birth cohorts that were born so long ago that every member has passed away. In this scenario, the birth cohort consists of all the people born in a particular year. Observed The mean lifespan of a hypothetical cohort that is presumed to have been exposed, from conception to death, to the death rates indicated for a specific year. For human populations, national LEB data provided by national and international organizations are approximations of period LEB.

When examining population structure and dynamics, individual-based indicators like formal life expectancy are employed in conjunction with aggregate population measures like the percentage of the population in different age groups. Pre-modern societies generally had lower life expectancies for men and women at all ages and higher rates of mortality.

An important indicator of a society's general health and development trajectory is life expectancy, which has an impact on public health programs and policies intended to improve life quality and reduce premature mortality.

2.1.3 Malaria Incidence

Malaria poses a grave threat to human life, transmitted by certain mosquito species. Tropical nations are where it is primarily found. It can be treated and prevented. The parasite that causes the infection is the only thing that spreads from person to person.

There are moderate to life-threatening symptoms. Cough, chills, and fever are considered mild symptoms. Breathing difficulties, exhaustion, disorientation, and convulsions are examples of severe symptoms. People with HIV/AIDS, pregnant women, children under five, and travelers are more likely to get a serious infection. Malaria can be prevented with medication and by avoiding mosquito bites. Treatments can prevent the worsening of mild instances.

Malaria is primarily transmitted to humans via the bites of certain infected female Anopheles mosquitoes. Blood transfusions and contaminated needles also pose potential risks for malaria transmission. Initial symptoms can be subtle, resembling those of ordinary febrile conditions, rendering early diagnosis of malaria challenging. If left unattended, malaria caused by P. falciparum can rapidly escalate into a severe and potentially fatal illness within a day. Preventive measures, such as employing

mosquito nets and insect repellents, along with prompt medical interventions, play a vital role in controlling the spread and severity of malaria.

Symptoms of Malaria Incidence

Initial symptoms of malaria commonly include fever, headache, and chills, typically emerging 10–15 days post-infection. While symptoms may remain mild in some individuals, particularly those with prior malaria exposure, it's crucial to seek timely testing due to the potential for less specific symptom presentation. Certain types of malaria carry a heightened risk of severe complications or fatality. Groups with heightened susceptibility include infants, children under five, expectant mothers, travelers, and individuals with compromised immune systems, such as those infected with HIV or AIDS. Severe symptoms to watch out for include:

1. Extreme weariness and fatigue.
2. Reduced awareness
3. Several convulsions
4. Breathing difficulties
5. Urine that is bloody or dark
6. Jaundice (skin and eyes turning yellow).

Severe symptoms should be treated immediately with emergency care. If malaria is mild, therapy can prevent the infection from getting worse.

Prevention of Malaria

By taking medication and avoiding insect bites, malaria can be avoided. See a physician about using medications like chemoprophylaxis prior to visiting regions where malaria is prevalent.

- Reduce your risk of malaria by staying away from mosquito bites
- When you sleep in an area where malaria is prevalent, use a mosquito net.
- After sunset, apply insect repellents with DEET, IR3535, or Icaridin.
- Employ vaporizers and coils.
- Put on safety gear.
- Make use of window screens.

2.1.4 HIV/AIDS

What is HIV?

Human immunodeficiency virus is referred to as HIV. HIV damages immune system cells, making it more difficult for your body to fight off other illnesses. Acquired immunodeficiency syndrome (AIDS) can result from HIV infection when the immune system is significantly compromised.HIV is referred to as a retrovirus because it inserts its instructions into your DNA backward.

What is AIDS?

The last and most dangerous stage of HIV infection is AIDS. Individuals suffering from AIDS have severely compromised immune systems and extremely low

levels of certain white blood cells. They might also be suffering from other ailments that point to the development of AIDS. Among them are:

I. Sore throat

II. Night sweats

III. Mouth sores, including yeast infection (thrush).

IV. Swollen lymph glands

V. Diarrhea

Stages of HIV

Stage 1: The initial, acute phase of HIV infection typically evolves over a span of several weeks to months, eventually transitioning into a chronic or symptomless state

Stage 2: HIV latency (characterized by absence of symptoms). This phase may endure for a decade or more. Throughout this period, individuals may remain unaware of their HIV status, although they retain the capacity to transmit the virus.

Stage 3: If left untreated, the majority of individuals infected with HIV will contract AIDS. A small number of these individuals may develop AIDS within a short period after contracting the infection. However, some individuals (known as long-term nonprogressors) may remain in good health for a decade or even two decades after infection.

Those with AIDS have an impaired immune system as a result of HIV. Consequently, they have an elevated risk of acquiring infections that are uncommon in

individuals with robust immune systems. These infections, referred to as opportunistic infections, can affect various bodily organs and are often caused by:

- Bacteria
- Virus
- Fungi
- Protozoa

Treatment

HIV/AIDS is managed with medications that impede the virus's replication. This therapy is referred to as antiretroviral therapy (ART). In the past, individuals with HIV would initiate ART once their CD4 count diminished or they experienced HIV-related complications. Presently, HIV therapy is suggested for all individuals with HIV, regardless of their CD4 count. Two treatment categories exist:

1. Oral medications are prescribed for those initiating therapy.
2. Injections may be administered to individuals with an undetectable viral load or those who have achieved viral suppression for at least 3 months. Injections are given monthly or bi-monthly.

Periodic blood testing is crucial to monitor viral levels in the bloodstream (viral load), ensuring its reduction or suppression. The objective of treatment is to minimize the HIV virus in the blood to a level that eludes detection. This is referred to as an undetectable viral load.

2.1.5 Population Growth Rate

The population growth rate signifies a rise in the number of individuals residing within a designated region during a defined timeframe. This phenomenon can be assessed on a local scale within a neighborhood, at a national level within a country, or on a global scale encompassing the entire planet. Demographers typically calculate it as a proportional rise in the total population size, expressed either annually or over a specified duration. The rate of population growth serves as a numerical representation of the variation in a population's size within a specified time frame. It is generally depicted as a percentage.

A positive population growth rate reflects an expansion in the population's numbers, while a nagative rate indicates a decrease. Births, deaths, immigration, and emigration all influence the population growth rate. It serves as a crucial indicator for demographic studies, urban planning, and policymaking as it offers insights into population patterns and helps anticipate future needs in areas like healthcare, education, and infrastructure development.

2.1.6 Health Status

According to the World Health Organization's perspective, a comprehensive state of health incorporates optimal physical, mental, and social well-being, enabling individuals to engage in meaningful lives that positively impact society and the economy. While defining health in absolute terms remains a challenge, its assessment often involves metrics like life expectancy, mortality rates, emotional stability, and

social integration. Health has emerged as a pivotal factor in determining economic productivity and human capital growth. Conversely, compromised health conditions can pose significant barriers to economic development and societal advancement. As posited by Bloom and Canning (2004), health not only directly enhances human well-being but also serves as a catalyst for boosting income levels and overall societal flourishing.

Factors Affecting Health Status

Health conditions are impacted by an array of elements, notably:

1. Genetic inheritance
2. Personal habits (encompassing dietary choices, physical activity, substance use, stress management techniques, etc.)
3. External influences such as pollution, healthcare accessibility, and workplace circumstances
4. Socioeconomic criteria including income, educational attainment, job prospects, access to healthcare, and social connections affect health discrepancies. Individuals from disadvantaged socioeconomic backgrounds may face challenges accessing high-quality medical care and resources conducive to healthy lifestyles.
5. Sociocultural factors, incorporating values, traditions, and societal well-being determinants (including bias, discrimination, and community connections), influence health-related practices and healthcare resource availability.

Measures to Improve Health Status

Improving one's overall well-being demands a comprehensive strategy that encompasses various aspects of health. Here are some possible approaches:

1) Sustaining a well-rounded dietary regimen can confer multifaceted benefits. Prudent nutritional choices can act preemptively or remedially for certain health conditions, including cardiovascular disorders, cerebrovascular incidents, and type 2 diabetes. Additionally, it can promote weight loss and lower cholesterol levels.
2) Guarantee equitable access to healthcare services, including preventive measures, screenings, inoculations, and treatment options, regardless of socioeconomic or geographic factors.
3) Bolster knowledge of health literacy, disease prevention, management of chronic conditions, and underscore the importance of regular check-ups and screenings.
4) Implement measures to mitigate exposure to environmental hazards, enhance air and water quality, cultivate environmentally friendly practices, and promote healthy built environments.
5) Elevate healthcare systems by broadening access to medical services, refining the caliber of care provided, curtailing wait times, and prioritizing patient-centric approaches

2.2 Theoretical Literature Review

2.2.1 Human Capital Theory

Human capital theory refers to enhancing human productivity and efficiency with a greater emphasis on education, health and training. The study of human resources constitutes the study of human capital. It discusses the formation of economic value based on how our society functions.

Becker's research (1964) underscored the critical link between human capital and not only formal education and training but also health. He emphasized that enhancing these factors elevates workforce capabilities and economic output.

Becker (1964) promoted the significance of connecting human capital to education and healthcare, factors that elevate worker quality and output. Consequently, nations with sustained income growth have consistently increased investment in these areas. Balancing education with a wholesome health status optimizes worker efficiency. Becker emphasized human capital development, stating: "I will address an alternative form of capital. Schooling, technical training, health services, and ethical education contribute to human capital by enhancing knowledge and well-being, which augment an individual's earning potential over their lifetime. Becker's human capital theory seeks to explicate income disparities based on personal attributes, education, and health, both individually and societally. Thus, education and healthcare must be viewed as a form of investment in human resources with direct benefit to societies.

2.2.2 Andersen Behavioral Model

Anderson's behavioral model was developed by Ronald M. Andersen in 1968. Anderson's behavioral model for health services utilization provides a theoretical structure to understand access to and utilization of health service, and to recognize the factors that impact a person's decision to use or not use existing health services. This behavioral model predicts that a sequence of predisposing, enabling, and need factors influence person's utilization of health service. As stated by the model, predisposing factors are social and demographic structures. Enabling factors assist people to use services (e.g., resource availability). For instance, income, examined age, education, gender, marital status, employment status, access to free services, and the availability of those services. Factors such as need motivate people to use the service. For example, disease conditions, illness, or physical conditions.

The Andersen Behavioral Model could be employed to understand the influence of these elements(employment, demographic distribution, income e.t.c) on individuals' choices to engage in the labor force, considering the significance of health conditions and the use of healthcare services. For instance, if individual are employed it means that they will have the income they need to be able to afford these basic health care services which will lead to a better and improved health status, which might shape attitudes towards participation in the labor force. Imperative characteristics, encompassing perceived health status and intensity of illness, might

have a direct impact on individuals' abilities to work and their decisions to engage in the labor force and cumulative lead to improvement in economic growth.

2.2.3 Neoclassical Theory of Labour Supply

According to the neoclassical theory of individual labor supply, income and leisure are a source of individual's utility. People view labor as a negative necessity to generate income for spending. The derived assumptions of economic theory assume that effort near the periphery has a utility-decreasing effect. According to this theory, individuals decide whether to participate in the labor force based on the trade-off, wherein an individual chooses the best labor supply to maximize utility between wages and leisure. As wages increase, more individuals are likely to enter the labor force, seeking to take advantage of the higher earnings. Conversely, if wages decrease or if the opportunity cost of working rises (e.g., due to increased non-labor income or improved social benefits), some individuals may choose to exit the labor force or reduce their participation.The individual utility loss brought on by labor time is implicitly assumed because working hours require a reduction in free time.

2.3 Empirical Literature Review

Several studies have examined the relationship between health status and labour force participation. Mushtaq, Mohsin and Zaman (2013) investigated the effects of health on labour force participation for Pakistan for the period (1975–2011). The study employed the Autoregressive Distributed Lag Model cointegration technique to estimate both short-run and long-run elasticities, whereas the Wald

coefficient restriction test was used to determine the dynamic relationship between the variables. The study revealed that health significantly influences labour force participation, however, Pakistan could not derive maximum benefit from human capital development due to poor health outcomes.

Belachew and Kumar (2014) in their study draw upon data from five National Health Surveys (NHSs) of Australia to examine the association between self- assessed health status and labour force participation utilizing logistic regression model, and controlled for other variables such as age, period and cohorts. Their results showed a significant positive association between health status and labour force participation, with the effects stronger for female than male. There was also a strong negative relationship between major chronic diseases (arthritis, cancer, asthma, diabetes and heart disease) on both male and female's labour force participation. They also reported cohorts effect for both male and female, with lower probability to participate in the labour force noticed among the youngest cohorts.

Jacob Novignon et al (2015) investigated a macro level relationship between population health status and labour force participation in sub-Saharan Africa. The study used panel data covering 46 countries from 1990 to 2011. A dynamic panel data model was estimated using the generalized method of moments. The results show that population health status (measured by life expectancy at birth) relates positively with labour force participation. The relationship was significant for total and female labour force participation. The findings call for improved population health status following

the importance of labour force participation at the macro levels. Improved labour force contributes to the economic performance of a country at the macro level. Effective policy efforts should be directed towards providing facilities that will improve population health hence providing enough healthy time to participate in the labour force.

Aminu (2010) using the General Household Survey (GHS) data of 1998/99 and 2007/2008 to estimate the determinants of labour force participation and earnings in wage employment in Nigeria with Probit model, Multinomial logit model and the Mincerian human capital model and including household variables such as the presence/absence of an elderly female in the household which is hypothesized to have a positive effect on both male and female participation rate in the wage employment sector of Nigeria to verify his hypotheses. The study found that the presence of elderly female persons increases the probability of labour force participation across all sectors of wage employment for males and females in the 2007/08 GHS data set while it has negative and positive influences in private and public sectors respectively in 1998/99 data sets. The estimation from the Mincerian human capital model shows the influence of the traditional human capital variables – education (both total and disaggregated by levels), experience and its square, and urban/rural residence) – on the different wage employment sectors studied for the 1998/99 and 2007/08.

Habibe Günsel Doğrul (2015) This study contributes to the literature by investigating the relationship between health status and labour force participation in

Turkey. A two-stage estimation method is applied separately for working age groups of men and women.The results suggest that health positively and significantly affects the labour force participation for all age-gender groups as expected. The effect is larger for older men and younger women. The study also finds that labour force participation has significant positive effect on health for younger men and significant negative effect on health for older women. This suggests that rationalization type of endogeneity may exist only for younger men.

Irequi Bohorquez, Melo –Becerra, and Teressa (2016) examined the relationship between health status and labour force participation drawing data from the first wave of the Columbian Longitudinal Survey. The estimation technique addressed possible potential endogeneity between the two variables. The results revealed two-way relationships between health status and labour force participation so that healthy people were more likely to engage in labour force participation, and those who engaged in the labour force were more likely to be healthier. However, significant differences were uncovered when separate analyses were undertaken for separate age groups and gender. The results highlight the importance of public policy to improve good health and consequently improve labour force participation and economic growth performance.

S. O. Olayiwola, Bayo Adedokun and S. O. Abiodun (2019) This study examines the impact of life expectancy and ill-health on labour force participation in Nigeria using data from World Development Indicators. Two models of labour supply

decision using two-stage instrumental variable estimation method with main predictors of health on labour market performance: life expectancy, incidence of malaria, tuberculosis, HIV/AIDS were employed to examine the effects of health on labour force market participation. The results show that increase in life expectancy will increase labour force participation by about 33% without controlling for other household characteristics and by about 83% when control for other household characteristics. Also, reduction in diseases like Malaria, HIV/AIDS and Tuberculosis will increase labour supply and productivity. Thus, it was concluded that ill-health has negative impact on industrialization through reduced economic output due to decline labour supply. It was therefore suggested that public sector must play an important role in key areas like labour market, education and rural-urban migration to improve the health of the labour force and hence overall productivity. Higher priority should also be given to tackling widespread diseases with low mortality burdens, but considerable effects on productivity.

Rolle Remi Ahuru, Efegbere Henry Akpojubaro (2020) This study investigated the effect of illness, disability and other socio-demographic factors on labour force participation among Nigerian households. This study is cross-sectional in which secondary data from the General Household Survey (2015/2016) was used for the analysis. A representative sample of 4,200 household heads was used for the analyses. Both predictive and descriptive analyses were undertaken. Binary logistic regression was used to investigate predictors of labour force participatio among the household

heads. The data revealed that 52.1% of respondents were engaged in labour force. Controlling for other variables, the various forms of disabilities, ill-health, body injury, gender and educational attainment were significant determ

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Theoretical Framework

Andersen's Behavioral Model

This study adopts the Andersen behavioral model to analyze the impact of health status on labour force participation. The model provides a comprehensive framework for understanding healthcare utilization behaviors by considering the interplay of predisposing, enabling, and need factors and how these factors can influence individuals choices to engage in the labour force considering the significance of health condition and the use of healthcare services. The Andersen Behavioral Model could be employed to understand the influence of these elements(employment, demographic distribution, income e.t.c) on individuals' choices to engage in the labor force, considering the significance of health conditions and the use of healthcare services. For instance, if individual are employed it means that they will have the income they need to be able to afford these basic health care services which will lead to a better and improved health status, which might shape attitudes towards participation in the labor force. Imperative characteristics, encompassing perceived health status and intensity of illness, might have a direct impact on individuals' abilities to work and their decisions to engage in the labor force and cumulative lead to improvement in economic growth. In this framework, the level of

labour force participation is determined by factors including; Life expectancy rate, incident of malaria, prevailance of HIV/AIDS and population growth rate.

3.2 Model Specification

To evaluate the effect of health status on labour force participation in Nigeria, a multiple regression model will be used. The dependent variable is labour force participation while the independent variable is life expectancy rate and other controlled variable such as incidence of malaria, prevailance of HIV/AIDS, Population Growth Rate.

The model is thus written as:

General Form

LFP = f (LER, MI, HIV, PGR)...…...... (1)

Where;

LFP represents Labour Force Participation

LER represents Life expectancy rate

MI represents Incidence of malaria

HIV represents Prevalence of HIV/AIDS

PGR represents Population Growth rate

Specific Form

$LFP = \beta 0 + \beta 1LER + \beta 2MI + \beta 3HIV + \beta 4\ PGR$………….. (2)

Econometric Form

$LFP = \beta 0 + \beta 1LER + \beta 2MI + \beta 3HIV + \beta 4PGR + Ut$……(3)

Where:

$\beta 0$ = Constant term

$\beta 1$ = Regression coefficient of Life expectancy ratio

$\beta 2$ = Regression coefficient of incidence of malaria

$\beta 3$ = Regression coefficient of Prevalence of HIV/AIDS

$\beta 4$ = Regression coefficient of Population growth rate

Ut = Error Term

Economic or Apriori Expectation

Life Expectancy Rate (LER): Theoretically, it is expected that life expectancy rate has a positive relationship with the labour force participation rate. This signifies that a higher life expectancy rate will lead to a higher labour force participation because the longer people live could be as a result of the better health system which would lead to a higher labour force participation rate i.e $\beta 1 > 0$.

Prevalence of HIV/AIDS: An increase in the prevailance of malaria will lead to a decrease in the labour force participation rate. This implies that individual affected with HIV/AIDS will be too weak to work compared to those who are free from HIV/AIDS which will result in a decrease in the labour force participation rate. Hence, it is expected that a nagative relationship exist between prevailance of HIV/AIDS and the labour force participation rate i.e $\beta 1 < 0$.

Incidence of Malaria: As anticipated based on the Apriori expectation, it is expected that a nagative relationship exist between the incidence of malaria and the life

expectancy ratio. This implies that a higher incidence of malaria will lead to a decline in the labour force participation rate because malaria is a awakening illness that can induce chills, fever, exhaustion, and muscle aches, among other symptoms that can seriously impair a person's capacity to work. Thus, leading to a decline in the labour force participation rate i.e $\beta1 < 0$.

Population Growth Rate: In accordance with the Apriori expectation, a positive relationship is expected to exist between the population growth rate and labour force participation rate. This means that an increase in the population growth rate will lead to an increase in the labour force participation rate because young people might be joining the working-age population in greater numbers and also a growing population can create increased demand for goods and services, which in turn may stimulate economic growth and lead to the creation of new job opportunities which would result in an ncrease in the labour force participation rate i.e $\beta1 > 0$.

The apiriori sign are: $\beta0 > 0$ or < 0, $\beta1 > 0$, $\beta2 < 0$, $\beta3 < 0$, $\beta4 > 0$.

3.3 Estimation Techniques

3.3.1 Unit Root Test

A unit root test in time series analysis determines if a particular time series variable has a unit root or is non-stationary. To test for a unit root in time series, The Augmented Dickey-Fuller (ADF) test was developed by Dickey (1979) and Fuller (1983) which is known today as the Gold standard (1981) will be employed.The augmented Dickey- Fuller test that there is a unit root in an Auto- regressive model,

which implies that the data series is not stationary. The alternative hypothesis is generally stationarity or trend stationarity but can be different depending on the version of the test being used. In the event that a series requires one difference to become stationary, it is deemed integrated of order I(1).

3.3.2 Co-Integration Test

The second stage involves testing for co-integration between time series variable. Cointegration represents a statistical concept employed to determine the long-run equilibrium connection between multiple time series variables. In econometrics, it's commonly utilized to examine the interactions between variables that may exhibit non-stationary characteristics individually, yet maintain a steady long-term relationship when examined collectively. many time series. Nobel laureates Robert Engle and Clive Granger first presented the idea in 1987, following the publication of the spurious regression hypothesis by British economists Paul Newbold and Granger.

3.3.3 The Error Correction Model

Once the existence of cointegration has been empirically established among the series, an Error Correction Model (ECM), initially accepted and implemented by Sargan (1964) and subsequently popularized by Engel and Granger (1969), is implemented to rectify any disequilibrium in the short-run. The error correction model integrates the short-run dynamics and long-run equilibrium relationship between cointegrated variables.

3.4 Source of Data

Data for this study will be drawn from Central Bank of Nigeria statistical bulletin, the world development indicators and the World Bank Database.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

This chapter presents the research findings in line with the empirical model suggested in chapter four above. It further estimates the overall significance of the model and the significance of the individual variables. The research findings are discussed as follows

4.1 Descriptive Statistics

Descriptive statistics are summarized statistical coefficients that describes or explains a given data set, which can be either a representation of the entire or a sample of a population. Descriptive statistics are broken down into measures of central tendency, measures of variability (spread) and sometimes measures of normality. These measures help to provide some basic and useful information about the variables in question the measures employed here includes, the mean, median, maximum, minimum, standard deviation, skewness, kurtosis, and the Jarque-Bera statistic.

The Mean measures the average of a given set of data observations or series. The median captures the middle value of a series of observation. The maximum is simply the data point that holds the highest value in the series. The standard deviation is a measure of spread or dispersion or variability from the mean. Skewness is a measure of symmetry or asymmetry of a given series. If series is symmetric, it means that is equally distributed to the left and to the right. However, if a series is

asymmetric, it connotes that it has a longer tail to the left (negatively skewed) or it has a longer tail to the left (positively skewed). Kurtosis is a measure of the peakedness or flatness of a given series or data distribution. A kurtosis coefficient of 3 implies that the series has a mesokurtic distribution, while a kurtosis coefficient greater than 3 implies that the series has a Leptokurtic distribution (highly peaked), and a kurtosis coefficient less than 3 implies a platykurtic distribution (flattened).

Table 4.1a: Descriptive Statistics

	HPR	LER	LFP	MI	PGR
Mean	1.672727	50.95455	58.01364	355.3400	2.603636
Median	1.650000	51.12500	59.81500	361.8800	2.610000
$ Maximum	2.100000	56.08000	60.07000	418.0400	2.680000
Minimum	1.300000	46.27000	53.91000	292.5400	2.500000
Std. Dev.	0.227160	3.028166	2.312928	50.68463	0.060517
Skewness	0.370510	-0.045464	-0.528298	-0.053327	-0.225202
Kurtosis	2.298280	1.772089	1.613203	1.205349	1.676200
Jarque-Bera	0.954728	1.389696	2.786299	2.962803	1.792369
Probability	0.620417	0.499150	0.248292	0.227319	0.408124
Sum	36.80000	1121.000	1276.300	7817.480	57.28000
Sum Sq. Dev.	1.083636	192.5655	112.3423	53947.57	0.076909
Observations	22	22	22	22	22

Source: Authors computation using eviews 10

The descriptive statistics provided in Table 4.1a offer valuable insights into the variables examined over the study period. These statistics encompass mean, median, maximum, minimum, standard deviation, skewness, kurtosis, Jarque-Bera statistic, and related probabilities for each variable: HPR (HIV Prevalence Rate), LER (Life

Expectancy Rate), LFP (Labour Force Participation), MI (Incidence of Malaria), and PGR (Population Growth Rate).

The mean values across the study period reveal the average levels of each variable: HPR at 1.6727, LER at 50.9546, LFP at 58.0136, MI at 355.3400, and PGR at 2.6036. Examining the median values provides further insight into the central tendencies of the distributions, indicating the middle points: HPR at 1.6500, LER at 51.1250, LFP at 59.8150, MI at 361.8800, and PGR at 2.6100.

When considering the maximum values recorded during the study period, notable peaks are evident: HPR at 2.1000, LER at 56.0800, LFP at 60.0700, MI at 418.0400, and PGR at 2.6800. In contrast, the minimum values observed offer insights into the lower bounds of the variables: HPR at 1.3000, LER at 46.2700, LFP at 53.9100, MI at 292.5400, and PGR at 2.5000.

Furthermore, the standard deviation values provide an indication of the dispersion of data points around the mean: HPR at 0.2272, LER at 3.0282, LFP at 2.3129, MI at 50.6846, and PGR at 0.0605. Analyzing skewness reveals the asymmetry of the distributions, with HPR positively skewed, while LER, LFP, MI, and PGR exhibit slight negative skewness.

Moreover, the kurtosis coefficients signify the tailedness of the distributions. While HPR exhibits slightly leptokurtic distribution, LER, LFP, MI, and PGR display distributions with moderate tailedness.

Lastly, the Jarque-Bera statistic assesses the normality of the distributions. While all variables show no significant departures from normality based on their respective p-values, LER, LFP, and PGR exhibit relatively more normal distributions compared to HPR and MI.

4.2 Correlation Analysis

Correlation is a statistical measure or coefficient which indicates the direction and magnitude of the relationship existing between two or more variables of interest. The analysis of Correlation is an important statistical toot that measures magnitude and direction of the relationship between two or more variables. Correlation analysis is a useful tool for pre-test analysis, however it does not show causality. The correlation among the relevant variables used in this research work is given in the table 5.2 below

Table 4.2: Correlation Matrix

	LFP	HPR	LER	MI	PGR
LFP	1				
HPR	0.70061	1			
LER	-0.76869	-0.97839	1		
MI	0.926839	0.827126	-0.88931	1	
PGR	-0.26532	-0.39426	0.330616	-0.2747	1

Source: Author's computation using Eviews 10

The correlation matrix presented in Table 4.2 provides insights into the relationships between the Labour Force Participation (LFP) variable and other variables: HPR (HIV Prevalence Rate), LER (Life Expectancy Rate), MI (Incidence of Malaria), and PGR (Population Growth Rate).

There is a strong positive correlation of 0.7006 between LFP and HPR, suggesting that as HIV prevalence rate increases, there tends to be an increase in labour force participation. Conversely, there is a strong negative correlation of -0.7687 between LFP and LER, indicating that as life expectancy rate increases, there tends to be a decrease in labour force participation.

Furthermore, there is a very strong positive correlation of 0.9268 between LFP and MI. This implies that as the incidence of malaria increases, there is a significant increase in labour force participation. On the other hand, the correlation between LFP and PGR is weak, with a coefficient of -0.2653. This suggests that as population growth rate increases, there tends to be a slight decrease in labour force participation.

Labour force participation tends to increase with higher HIV prevalence rates and incidence of malaria, while it decreases with higher life expectancy rates. The relationship between labour force participation and population growth rate is weak, indicating only a slight tendency for decreased participation as population growth increases.

Unit root test

In order to carry out the co-integration test, it is necessary to first ascertain the stationarity of the variables. Therefore, this study employs the use of the Augmented Dickey Fuller test to check for the stationarity of the variables employed in the model. In carrying out a unit root test, the order of integration is important as it helps in determining long run relationships among variables. Therefore, the null hypothesis

that the variable has a unit root is tested and if the absolute values of the test statistics are greater than the critical values, the null hypothesis is rejected. This implies that the variable is stationary. If the absolute values of the test statistics are however less than the critical value, we fail to reject the null hypothesis. This implies the presence of a unit root and it shows that the variable is non-stationary. The unit root tests as well as the order of integration of the variables at level, are shown in the table below.

Table 4.3.1: Unit Root Test result

	LEVEL		FIRST DIFFERENCE			
VARIABLES	ADF TEST STATISTIC	ADF CRIT. VAL. 5%	ADF TEST STATISTIC	ADF CRIT. VAL. 5%	ORDER OF INTEGRATION	REMARK
lnHPR	-1.069408	-3.029970	-5.333538	-3.029970	I(1)	Stationary
lnLER	-0.265201	-3.012363	-4.953682	-3.020688	I(1)	Stationary
lnLFP	-1.713195	-3.020683	-4.292034	-3.020688	I(1)	Stationary
lnMI	-1.108669	-3.020686	-3.491309	-3.065585	I(1)	Stationary
lnPGR	-3.028115	-3.020686	-	-	I(0)	Stationary

Source: Author's computation using eviews 10

The unit root test results in Table 4.3.1 indicate the stationarity of variables in their level and first difference forms. The natural logarithms of HIV Prevalence Rate (lnHPR), Life Expectancy Rate (lnLER), Labour Force Participation (lnLFP), and Incidence of Malaria (lnMI) are all integrated of order 1 (I(1)), demonstrating stationarity after differencing. Conversely, the natural logarithm of Population Growth Rate (lnPGR) is stationary without differencing (I(0)), suggesting stability in its original form. These findings imply that the variables exhibit consistent behavior over

time, facilitating their use in time series analysis without the risk of spurious results stemming from non-stationarity.

Co-integration Test

Having performed the unit root tests, the next test to be carried out is the co-integration test which tests if the two or more non-stationary time series are stationary over time and move in the same direction in the long run. It can therefore be seen as the statistical implication of the existence of a long run relationship between economic variables. This test make use of two statistics for the decision rule. These are the Trace statistic and the Max-Eigen Value. For the first, if the Trace statistic is greater than the critical value at the given level of significance it implies that the variables are co-integrated. However, if the Trace statistic is less than the critical value at the given level of significance, we conclude that the variables are not co-integrated. The same decision rule applies when comparing the Max-Eigen value with the critical values.

Table 4.3b Johansen co-integration test (Trace)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.975853	190.8559	69.81889	0.0000
At most 1 *	0.908810	116.3844	47.85613	0.0000
At most 2 *	0.865132	68.48826	29.79707	0.0000
At most 3 *	0.590929	28.41913	15.49471	0.0003
At most 4 *	0.409680	10.54181	3.841466	0.0012

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's computation using eviews 10

The Johansen co-integration test (Trace) in Table 4.3b examines the presence of co-integrating equations among the variables. It compares eigenvalues with critical values to determine the number of co-integrating equations. Rejection of the null hypothesis at the 0.05 significance level indicates the presence of co-integration. The test suggests at least five long-term relationships among the variables, providing evidence of stable links suitable for dynamic modeling and forecasting.

Maximum Eigenvalue

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.975853	74.47156	33.87687	0.0000
At most 1 *	0.908810	47.89612	27.58434	0.0000
At most 2 *	0.865132	40.06913	21.13162	0.0000
At most 3 *	0.590929	17.87732	14.26460	0.0129
At most 4 *	0.409680	10.54181	3.841466	0.0012

Max-eigenvalue test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's computation using eviews 10

The Maximum Eigenvalue test, as shown in the table, complements the Johansen co-integration test by examining the maximum eigenvalue statistic. Like the Trace test, it evaluates various hypothesized numbers of co-integrating equations. Rejection of the null hypothesis at the 0.05 significance level indicates the presence of co-integration. In this case, the test also suggests the existence of at least five long-term relationships among the variables, affirming stable links suitable for dynamic modeling and forecasting.

4.3 Error Correction Model

To formulate the error correction model, also recognized as the short-run model, it is imperative to begin by differencing the variables until they attain stationarity. Subsequently, the error correction terms, derived from the residuals of the long-run equation, are integrated into the model. It is noteworthy that the error correction term is lagged by one period. The resulting findings are depicted in the table below:

Table 4.4: ECM Regression Result Summary

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002625	0.009195	2.285498	0.0092
D(LNLER)	-0.6723	1.035613	-0.64918	0.526
D(LNHPR)	-0.15011	0.086336	-3.73863	0.0026
D(LNMI)	0.167416	0.083365	2.008227	0.063
D(LNPGR)	-0.06514	0.409521	-0.15906	0.8757
ECM(-1)	-0.58767	0.202933	-2.89586	0.0111
R-squared	0.608261	Mean dependent var		-0.00249
Adjusted R-squared	0.477681	S.D. dependent var		0.015069
S.E. of regression	0.01089	Akaike info criterion		-5.96692
Sum squared resid	0.001779	Schwarz criterion		-5.66849
Log likelihood	68.65268	Hannan-Quinn criter.		-5.90215
F-statistic	4.658152	Durbin-Watson stat		1.718348
Prob(F-statistic)	0.009136			

Source: Author's computation using eviews 10

The error correction model (ECM) regression results in Table 4.4 provide significant insights into the relationship between the Labour Force Participation (LFP)

and various factors, including Life Expectancy Rate (LER), HIV Prevalence Rate (HPR), Incidence of Malaria (MI), and Population Growth Rate (PGR).

The coefficient of the error correction term (ECM(-1)) is negative and statistically significant at the 1% level, indicating a robust adjustment mechanism towards long-term equilibrium, where approximately 58.77% of deviations between short-run and long-run models are corrected within a period.

The coefficient of determination (R-squared) is 0.6083, suggesting that about 60.83% of the variability in Labour Force Participation (LFP) is explained by the variability in the explanatory variables. Additionally, the adjusted R-squared is 0.4777, indicating that 47.77% of the variability in LFP between short-run and long-run models is accurately captured.

Individually assessing coefficient estimates, it is observed that the coefficient associated with changes in Life Expectancy Rate (D(LNLER)) is statistically insignificant, implying no substantial impact on LFP. Conversely, the coefficients related to changes in HIV Prevalence Rate (D(LNHPR)) and Incidence of Malaria (D(LNMI)) are statistically significant at the 1% and 10% levels, respectively, suggesting their significant impact on LFP. However, the coefficients associated with changes in Population Growth Rate (D(LNPGR)) and the lagged ECM term are statistically insignificant at the conventional levels.

Based on the ECM regression results, the constant term (C) indicates that if all explanatory variables are held constant, the Labour Force Participation (LFP) would

increase by approximately 0.0026 units. However, this coefficient is statistically significant at the 1% level.

The change in Life expectancy rate (D(LNLER)) coefficient suggests that a one-unit increase in the logarithm of life expectancy rate is associated with a decrease of approximately 0.6723 units in Labour Force Participation (LFP). However, this coefficient is statistically insignificant at the conventional levels (p = 0.526), indicating uncertainty in the impact of changes in life expectancy rate on LFP.

The change in HIV Prevalence Rate (D(LNHPR)) coefficient implies that a one-unit increase in the logarithm of HIV prevalence rate is associated with a decrease of approximately 0.15011 units in LFP. This coefficient is statistically significant at the 1% level (p = 0.0026), supporting the expectation that higher levels of HIV prevalence negatively impact LFP.

The change in Incidence of Malaria (D(LNMI)) indicates that a one-unit increase in the logarithm of incidence of malaria corresponds to an increase of approximately 0.167416 units in LFP. However, this relationship is statistically insignificant at the conventional levels (p = 0.063), suggesting uncertainty in the impact of changes in malaria incidence on LFP.

The change in Population Growth Rate (D(LNPGR)) coefficient suggests that a one-unit increase in the logarithm of population growth rate is associated with a decrease of approximately 0.06514 units in LFP. This coefficient is statistically

insignificant (p = 0.8757), indicating uncertainty in the impact of changes in population growth rate on LFP.

Overall, the model's F-statistic of 4.6582 is statistically significant at the 1% level, indicating that the model as a whole is statistically acceptable. Additionally, the Durbin-Watson statistic of 1.7183 suggests the absence of autocorrelation in the model's residuals.

4.4 Diagnostic Tests

Table 4.5 Presentation of diagnostic tests

Variable	Model coefficients
Breusch-Pagan-Godfrey Prob	0.2691
Breusch-Godfrey Serial Correlation LM Test:	0.1057
Jarque-Bera Prob.	0.8949
Ramsey Reset Test	0.1779

Source: Author's computation using Eviews 10.

The diagnostic tests in Table 4.5 evaluate various aspects of the regression model's performance and potential issues such as heteroscedasticity, serial correlation, normality of residuals, and misspecification. Firstly, the Breusch-Pagan-Godfrey Test examines heteroscedasticity in the residuals, with a probability value of 0.2691 suggesting no significant evidence of heteroscedasticity at the conventional significance level of 0.05. Secondly, the Breusch-Godfrey Serial Correlation LM Test investigates serial correlation in the residuals, with a probability value of 0.1057 indicating no significant evidence of serial correlation at the 0.05 significance level. Thirdly, the Jarque-Bera Test assesses the normality of residuals, with a probability

value of 0.8949 suggesting no significant departure from normality at the 0.05 significance level. Lastly, the Ramsey Reset Test examines misspecification by testing whether including additional terms improves model fit, with a probability value of 0.1779 indicating no significant evidence of misspecification at the 0.05 significance level. These results collectively suggest that the regression model is statistically robust, with no significant issues detected, affirming its suitability for inference and prediction.

4.5 Discussion of Findings

The investigation into the effect of health status indicators on labour force participation (LFP) in Nigeria from 2000 to 2021 provides valuable insights into the relationship between these variables. The analysis focused on key health indicators including Life Expectancy Rate (LNLER), HIV Prevalence Rate (LNHPR), Incidence of Malaria (LNMI), and Population Growth Rate (LNPGR) to understand their influence on LFP during the specified period.

The coefficient associated with the change in Life Expectancy Rate (D(LNLER)) suggests a negative association between life expectancy and LFP, indicating that as life expectancy increases, LFP tends to decrease. However, this coefficient is statistically insignificant at the conventional levels ($p = 0.526$), indicating uncertainty in the impact of changes in life expectancy on LFP.

Conversely, the coefficient linked to the change in HIV Prevalence Rate (D(LNHPR)) indicates a significant negative association between HIV prevalence and

LFP, suggesting that higher HIV prevalence rates are associated with reduced LFP levels. This finding is statistically significant at the 1% level ($p = 0.0026$), aligning with expectations and highlighting the adverse effects of HIV/AIDS on workforce participation.

On the other hand, the coefficient for the change in Incidence of Malaria (D(LNMI)) suggests a positive but statistically insignificant association with LFP, indicating uncertainty regarding the impact of malaria incidence on workforce participation. This finding underscores the complexity of the relationship between malaria incidence and LFP, requiring further investigation.

Lastly, the coefficient for the change in Population Growth Rate (D(LNPGR)) indicates no significant association with LFP, suggesting that changes in population growth rate do not significantly influence workforce participation. This result underscores the need for nuanced approaches to understand the intricate dynamics between population growth and LFP.

Overall, while HIV prevalence appears to have a significant negative impact on LFP in Nigeria, the effects of life expectancy, malaria incidence, and population growth rate on LFP are inconclusive and require further research. These findings underscore the importance of addressing health challenges, particularly HIV/AIDS, to enhance workforce participation and productivity in Nigeria.

4.6 Policy Implications

The investigation into the effect of health status indicators on labour force participation (LFP) in Nigeria from 2000 to 2021 offers valuable insights that can inform policy decisions and interventions aimed at promoting workforce participation and public health in the country.

Given the significant negative association between HIV prevalence and LFP, policymakers should prioritize comprehensive strategies to combat HIV/AIDS and mitigate its adverse effects on workforce participation. This may include scaling up HIV prevention programs, expanding access to testing and treatment services, and implementing workplace policies that protect the rights and support the inclusion of people living with HIV/AIDS in the labour force.

While the relationship between life expectancy and LFP is inconclusive, efforts to improve healthcare infrastructure, strengthen primary healthcare systems, and enhance access to quality healthcare services can contribute to improving overall health outcomes and potentially positively impact workforce participation. Additionally, investing in health education and disease prevention initiatives can help raise awareness and promote healthier lifestyles, potentially reducing the burden of preventable diseases on the labour force.

The uncertain association between malaria incidence and LFP underscores the need for continued investment in malaria control and prevention efforts. This includes sustained funding for vector control programs, distribution of insecticide-treated bed nets, and ensuring access to prompt diagnosis and effective treatment for malaria cases.

Targeted interventions in high-burden areas can help reduce malaria-related absenteeism and improve workforce productivity.

Furthermore, while population growth rate shows no significant association with LFP, policymakers should adopt holistic approaches to address population dynamics, including family planning programs, education initiatives, and economic opportunities for youth. These measures can help manage population growth rates and ensure sustainable workforce participation in line with economic demands.

Overall, a multi-sectoral approach that integrates health, education, and employment policies is essential for promoting workforce participation and improving health outcomes in Nigeria. Policymakers should prioritize investments in healthcare infrastructure, disease prevention, and education while addressing social and economic determinants of health to create an enabling environment for increased workforce participation and productivity.

CHAPTER FIVE

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSSION.

5.1 Summary of Findings

The investigation into the Effect of health status indicators on labour force participation (LFP) in Nigeria from 2000 to 2021 provided valuable insights into the relationship between these variables.

- There was a negative association between life expectancy and LFP, suggesting that higher life expectancy rates may lead to decreased LFP levels. However, this relationship was statistically insignificant ($p = 0.526$), indicating uncertainty in its impact on LFP.
- A significant negative association was observed between HIV prevalence and LFP, indicating that higher HIV prevalence rates are associated with reduced LFP levels. This finding was statistically significant at the 1% level ($p = 0.0026$), highlighting the adverse effects of HIV/AIDS on workforce participation.
- The relationship between malaria incidence and LFP was positive but statistically insignificant, indicating uncertainty regarding its impact on workforce participation.
- Changes in population growth rate showed no significant association with LFP, suggesting that variations in population growth rate do not significantly influence workforce participation.

5.2 Policy Recommendations

- Targeted HIV/AIDS Interventions: Given the significant negative association between HIV prevalence and labour force participation (LFP), policymakers should prioritize targeted interventions to combat HIV/AIDS and reduce its impact on workforce participation. These interventions could include widespread education and awareness campaigns, access to affordable and quality healthcare services, and comprehensive HIV prevention and treatment programs.
- Improve Access to Healthcare: Enhancing access to healthcare services, particularly in regions heavily affected by diseases such as HIV/AIDS and malaria, is crucial for improving health outcomes and subsequently increasing labour force participation. Governments should invest in healthcare infrastructure, expand health insurance coverage, and promote preventive measures to reduce the burden of disease on the workforce.
- Enhance Malaria Prevention and Treatment: While the relationship between malaria incidence and LFP is inconclusive, addressing malaria remains essential for promoting overall health and well-being. Policies should focus on improving access to insecticide-treated bed nets, indoor residual spraying, and effective antimalarial medications. Additionally, efforts to address

environmental factors contributing to malaria transmission should be prioritized.

- Support Economic Opportunities: To mitigate the potential negative impact of health status indicators on labour force participation, policymakers should implement strategies to create economic opportunities and promote inclusive growth. This may include investing in education and skills development programs, promoting entrepreneurship and small-scale enterprises, and fostering an enabling business environment to generate employment opportunities.
- Strengthen Health Monitoring and Research: Continued monitoring of health status indicators and their impact on labour force participation is essential for evidence-based policymaking. Governments should invest in robust health surveillance systems and support research initiatives to better understand the complex interactions between health, socio-economic factors, and workforce participation. This will enable policymakers to develop targeted interventions and policies tailored to specific health challenges and demographic group

5.3 Conclusion

The investigation into the effect of health status indicators on labour force participation (LFP) in Nigeria from 2000 to 2021 has provided valuable insights into the complex relationship between health and workforce dynamics. While the study found a significant negative association between HIV prevalence and LFP, indicating

the detrimental effects of HIV/AIDS on workforce participation, the findings regarding other health indicators such as life expectancy, malaria incidence, and population growth rate were inconclusive.

The statistically insignificant associations between life expectancy, malaria incidence, and population growth rate with LFP underscore the need for further research and nuanced approaches to understand their impacts on workforce participation. Additionally, the positive but statistically insignificant association between malaria incidence and LFP suggests the complexity of the relationship and highlights the importance of continued efforts to combat malaria and its socioeconomic implications.

Overall, the findings emphasize the importance of addressing health challenges, particularly HIV/AIDS, to enhance workforce participation and productivity in Nigeria. Policymakers should prioritize targeted interventions, improve access to healthcare services, enhance disease prevention efforts, and promote economic opportunities to create an enabling environment for increased workforce participation and improved health outcomes.

By addressing these challenges and implementing evidence-based policies, Nigeria can work towards achieving sustainable economic development, improving public health, and fostering inclusive growth for its population. However, ongoing monitoring, research, and policy adjustments are essential to effectively address the evolving health and workforce dynamics in the country.

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APPENDIX

Research Data

year	PGR	LER	MI	HPR	LFP
2000	2.5	46.27	418.04	2.1	60.07
2001	2.51	46.51	407.76	2.1	60.05
2002	2.52	46.84	392.94	2	59.88
2003	2.54	47.24	391.66	1.9	59.85
2004	2.56	47.72	401.15	1.9	59.81
2005	2.59	48.25	407.79	1.8	59.82
2006	2.61	48.81	410.96	1.8	59.89
2007	2.63	49.37	412.44	1.7	59.94
2008	2.65	49.91	413.09	1.7	59.99
2009	2.66	50.42	400.18	1.7	59.99
2010	2.67	50.9	373.26	1.7	59.98
2011	2.68	51.35	350.5	1.6	60.02
2012	2.68	51.79	328.05	1.6	57.56
2013	2.68	52.23	308.18	1.6	55.11
2014	2.67	52.67	297.34	1.6	54.8
2015	2.65	53.11	292.54	1.5	54.4
2016	2.63	53.54	293.92	1.5	53.91
2017	2.61	53.95	297.96	1.5	54.88
2018	2.59	54.33	299.02	1.4	55.81
2019	2.56	54.69	300.44	1.4	56.66
2020	2.54	55.02	313.76	1.4	56.87
2021	2.55	56.08	306.5	1.3	57.01

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.432501	Prob. F(5,15)	0.2691
Obs*R-squared	6.786804	Prob. Chi-Square(5)	0.2370
Scaled explained SS	3.317995	Prob. Chi-Square(5)	0.6511

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares

Date: 04/26/24 Time: 10:02
Sample: 2001 2021
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.58E-05	9.64E-05	0.475200	0.6415
D(LNHPR)	2.89E-05	0.000905	0.031920	0.9750
D(LNLER)	0.002584	0.010856	0.238058	0.8151
D(LNMI)	-0.001510	0.000874	-1.727476	0.1046
D(LNPGR)	-0.006356	0.004293	-1.480718	0.1594
ECM(-1)	0.001616	0.002127	0.759750	0.4592

R-squared	0.323181	Mean dependent var	8.47E-05
Adjusted R-squared	0.097575	S.D. dependent var	0.000120
S.E. of regression	0.000114	Akaike info criterion	-15.08303
Sum squared resid	1.95E-07	Schwarz criterion	-14.78459
Log likelihood	164.3718	Hannan-Quinn criter.	-15.01826
F-statistic	1.432501	Durbin-Watson stat	3.001839
Prob(F-statistic)	0.269125		

Breusch-Godfrey Serial Correlation LM Test:

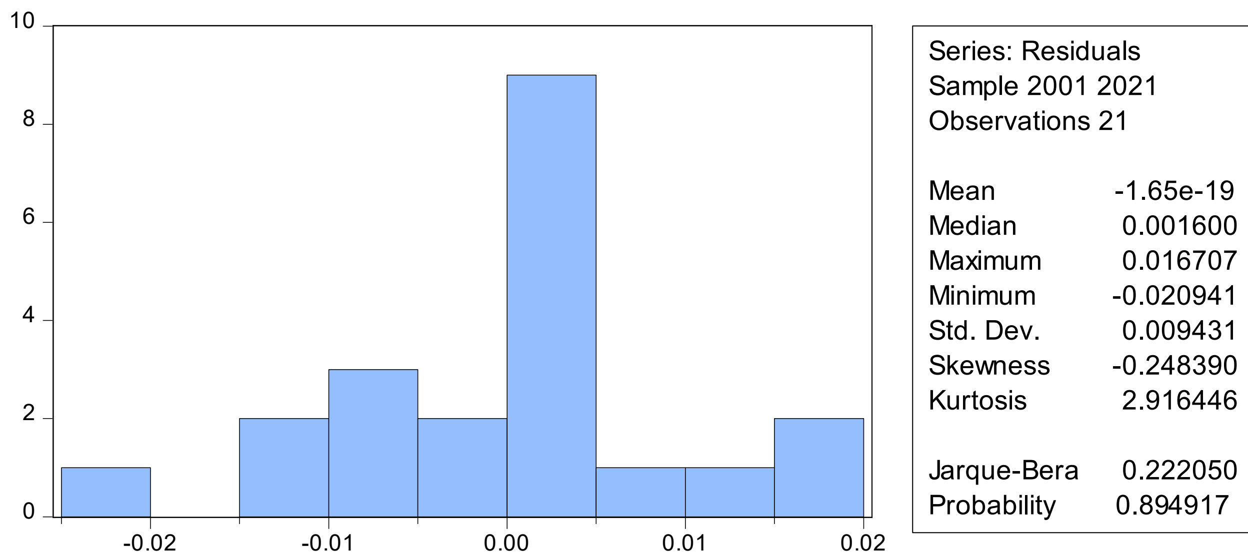
F-statistic	2.684866	Prob. F(2,13)	0.1057
Obs*R-squared	6.138596	Prob. Chi-Square(2)	0.0465

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 04/26/24 Time: 10:04
Sample: 2001 2021
Included observations: 21
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001168	0.009853	0.118585	0.9074
D(LNHPR)	0.068581	0.097572	0.702873	0.4945
D(LNLER)	-0.019032	1.160020	-0.016406	0.9872
D(LNMI)	-0.056766	0.079317	-0.715680	0.4868
D(LNPGR)	-0.089136	0.375378	-0.237457	0.8160

ECM(-1)	-0.525909	0.357069	-1.472852	0.1646
RESID(-1)	0.889672	0.383937	2.317232	0.0374
RESID(-2)	0.116375	0.427093	0.272482	0.7895

R-squared	0.292314	Mean dependent var	-1.65E-19
Adjusted R-squared	-0.088748	S.D. dependent var	0.009431
S.E. of regression	0.009841	Akaike info criterion	-6.122201
Sum squared resid	0.001259	Schwarz criterion	-5.724288
Log likelihood	72.28311	Hannan-Quinn criter.	-6.035844
F-statistic	0.767105	Durbin-Watson stat	2.258626
Prob(F-statistic)	0.624354		



Ramsey RESET Test
Equation: UNTITLED
Specification: D(LNLFP) C D(LNHPR) D(LNLER) D(LNMI) D(LNPGR) ECM(-1)
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.418420	14	0.1779
F-statistic	2.011917	(1, 14)	0.1779
Likelihood ratio	2.819794	1	0.0931

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.000224	1	0.000224
Restricted SSR	0.001779	15	0.000119
Unrestricted SSR	0.001555	14	0.000111

LR test summary:

	Value
Restricted LogL	68.65268
Unrestricted LogL	70.06258

Unrestricted Test Equation:
Dependent Variable: D(LNLFP)
Method: Least Squares
Date: 04/26/24 Time: 10:10
Sample: 2001 2021
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003658	0.008930	0.409625	0.6883
D(LNHPR)	-0.121516	0.085960	-1.413637	0.1793
D(LNLER)	-0.508528	1.008982	-0.504001	0.6221
D(LNMI)	0.115042	0.088735	1.296469	0.2158
D(LNPGR)	-0.200535	0.407702	-0.491867	0.6304
ECM(-1)	-0.373197	0.247873	-1.505595	0.1544
FITTED^2	-17.94231	12.64950	-1.418420	0.1779

R-squared	0.657483	Mean dependent var	-0.002490
Adjusted R-squared	0.510690	S.D. dependent var	0.015069
S.E. of regression	0.010541	Akaike info criterion	-6.005960
Sum squared resid	0.001555	Schwarz criterion	-5.657786
Log likelihood	70.06258	Hannan-Quinn criter.	-5.930397
F-statistic	4.478983	Durbin-Watson stat	1.308652
Prob(F-statistic)	0.009793		