UNIVERSITI PUTRA MALAYSIA

DETERMINANTS AND IMPACTS OF COMMUNICABLE DISEASES ON HEALTH OUTCOME AND ECONOMIC GROWTH IN NIGERIA

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By

ONYECHEGE DECLAN CHIBUEZE

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirement for the Degree of Doctor of Philosophy

December 2021

DEDICATION

This thesis is dedicated to God Almighty the greater of the greatest, also to my family and to my supervisor Asso. Prof. Dr. Norashidah Mohamed Nor.

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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Chairman	**:**	**Associate Professor Norashidah binti Mohamed Nor, PhD**
School	**:**	**Business and Economics**

The Nigerian government has implemented various measures to curtail the high prevalence of communicable diseases. The healthcare industry in Nigeria is working tirelessly to address this concern, but all the undertaken efforts seem fruitless. The fruitless efforts has motivated the researcher to investigate the socioeconomic determinants of communicable diseases in Nigeria. Hence, the first objective of this thesis is to explore the socioeconomic factors (income, education, savings, and final consumption expenditure) related to communicable diseases in Nigeria. The second objective of this thesis is to identify the impacts of communicable diseases on the health outcome in Nigeria. The poor economic outcome in Nigeria is a result of low health outcomes contributed by the high prevalence of communicable diseases in Nigeria. Thus, the third objective of this thesis is to investigate the impacts of communicable diseases on economic growth conditioned on health outcomes.

This study was analysed using the Auto Regressive Distributed Lag (ARDL) model for all the study's objectives. The data collected for this study were secondary and obtained from reliable and other reputable agencies. The period of data estimation was 34 years, ranging from 1985 to 2018. Based on the study's findings, the socioeconomic determinants used in the first objective, proved significant in the HIV/AIDS model. Income proved a significant negative relationship at 1% with HIV/AIDS, while savings, education, and final consumption expenditure had a significant positive relationship with HIV/AIDS at 1%, 10%, and 1%, respectively. For the Tuberculosis model, all the socioeconomic determinants had a positive relationship with Tuberculosis. Nevertheless, only savings and final consumption expenditure were significant at 5% and 10%, respectively. For the second objective, the result proved that HIV/AIDS, had a negative relationship with life expectancy at a 10% significant level. Contrarily, Tuberculosis had an insignificant negative relationship with life expectancy. For the under-5 mortality rate (UMR) model, HIV/AIDS proved to have an insignificant negative relationship with

UMR, while Tuberculosis proved to have a positive relationship with UMR, which was significant at a 1% level.

The third objective study's findings proved an insignificant positive relationship between health outcomes and economic growth. In addition, communicable diseases had significant impacts on economic growth at a 1% significant level in consideration of the interactive variables at minimum, maximum, and mean values of the conditioned variables. In conclusion, the low-income level of Nigerians has been alarming in recent years. An increase in income reduces the prevalence of communicable diseases. The Nigerian government should put more effort into equity in income, a balanced flow of income should be favourable to all citizens. And this can be achieved by increasing workers' minimum wages. Secondly, the Nigerian government should strive to implement free medical care access for its citizens, by providing good medical care services mainly to the people at the grassroots, where communicable diseases are increasing. The dependence on foreign financial assistance can be reduced if Nigeria can improve the local sectors by giving support to the production capacity of these local sectors hence creating employment opportunities for Nigerians.

DETERMINAN DAN IMPAK PENYAKIT BERJANGKIT KE ATAS HASIL KESIHATAN DAN PERTUMBUHAN EKONOMI DI NIGERIA

Oleh

ONYECHEGE DECLAN CHIBUEZE

Disember 2021

Pengerusi　　　:　**Profesor Madya Norashidah binti Mohamed Nor, PhD**
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Kerajaan Nigeria telah mengimplementasikan pelbagai langkah bagi membendung prevalens penyakit berjangkit yang tinggi. Industri penjagaan kesihatan di Nigeria sedang bekerja tanpa jemu-jemu bagi menangani masalah tersebut, tetapi semua usaha yang dilaksanakan tidak membuahkan hasil. Usaha yang tidak membuahkan hasil tersebut telah memotivasikan penyelidik untuk menyelidiki determinan sosioekonomi bagi penyakit berjangkit di Nigeria. Oleh itu, objektif pertama tesis ini adalah untuk meneliti faktor sosioekonomi (pendapatan, pendidikan, simpanan, dan perbelanjaan konsumpsi akhir) berkaitan dengan penyakit berjangkit di Nigeria. Objektif kedua tesis ini adalah untuk mengenal pasti impak penyakit berjangkit ke atas hasil kesihatan di Nigeria. Hasil ekonomi yang teruk ialah akibat hasil kesihatan yang rendah yang disebabkan oleh prevalens penyakit berjangkit yang tinggi di Nigeria. Oleh sebab itu, objektif ketiga tesis ini adalah untuk menyelidiki impak penyakit berjangkit yang terkesan ke atas hasil kesihatan.

Kajian ini telah dianalisis menggunakan model Auto Regressive Distributed Lag (ARDL) bagi semua objektif kajian. Data yang telah dikumpul bagi kajian ini adalah sekondari dan diperoleh daripada agensi yang reliabel dan bereputasi. Tempoh estimasi data ialah 34 tahun, dari tahun 1985 hingga 2018. Berdasarkan dapatan kajian, determinan ekonomi yang digunakan dalam objektif pertama, terbukti signifikan dalam model HIV/AIDS. Pendapatan terbukti mempunyai hubungan negatif yang signifikan pada 1% dengan HIV/AIDS, manakala simpanan, pendidikan, dan perbelanjaan konsumpsi akhir mempunyai hubungan positif yang signifikan dengan HIV/AIDS, masing-masing pada 1%, 10%, dan 1%. Bagi model Tuberkulosis, semua determinan sosioekonomi mempunyai hubungan yang positif dengan Tuberkulosis. Namun begitu, hanya simpanan dan perbelanjaan konsumpsi akhir adalah signifikan, masing-masing pada 5% dan 10%. Bagi objektif kedua, dapatan membuktikan bahawa HIV/AIDS, mempunyai hubungan negatif dengan jangka hayat pada tahap signifikan 10%. Sebaliknya, Tuberkulosis mempunyai hubungan negatif yang tak signifikan dengan

jangka hayat. Bagi model kadar mortaliti di bawah 5 (UMR), HIV/AIDS terbukti mempunyai hubungan negatif yang tak signifikan dengan UMR, manakala Tuberkulosis terbukti mempunyai hubungan positif dengan UMR, yang signifikan pada tahap 1%.

Dapatan kajian objektif ketiga membuktikan hubungan positif yang tak signifikan antara hasil kesihatan dan pertumbuhan ekonomi. Di samping itu, penyakit berjangkit mempunyai impak yang signifikan ke atas pertumbuhan ekonomi pada tahap signifikan 1% dengan mempertimbangkan pemboleh ubah interaktif pada nilai minimum, maksimum, dan min pemboleh ubah terkesan. Kesimpulannya, tahap berpendapatan rakyat Nigeria yang rendah amat membimbangkan sejak kebelakangan ini. Peningkatan dalam pendapatan dapat mengurangkan prevalens penyakit berjangkit. Kerajaan Nigeria harus lebih berusaha bagi kesamarataan pendapatan, aliran seimbang pendapatan harus menguntungkan semua warganegara. Dan aliran seimbang tersebut dapat dicapai melalui peningkatan upah minimum pekerja. Kedua, kerajaan Nigeria harus berusaha untuk mengimplementasikan akses penjagaan perubatan percuma kepada warganegaranya, dengan penyediaan perkhidmatan perubatan yang baik terutama kepada rakyat di akar umbi, di mana penyakit berjangkit masih lagi meningkat. Keterbergantungan kepada bantuan kewangan asing harus dikurangkan sekiranya Nigeria dapat memperbaiki sektor tempatan melalui pemberian sokongan kepada kapasiti pengeluaran bagi sektor tempatan tersebut dan oleh itu mewujudkan peluang pekerjaan bagi rakyat Nigeria.

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May, 2022
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This thesis was submitted to the Senate of the Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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vii

Declaration by graduate student

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ix

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

1.1 An Overview

The prevalence of diseases in society is a big concern. This has necessitated the need to study the determinants associated with the prevalence of diseases. There are two types of determinants, namely medical and non-medical. Diseases are abnormal conditions which affect parts of or the whole body of an organism or host. Furthermore, diseases deteriorate the health outcome of humans, turning them into non-active and non-productive members of society. Diseases are not caused by external forces instead, they emanate from the body system of organisms caused by existing viruses or any unwanted living parasites in the organisms (WHO, 1952). The two major types of diseases are communicable diseases (CDs) and non-communicable diseases (NCDs). CDs[1] can be transmitted to a person through direct contact with an affected person or discharges from the affected person either by indirect means or by a vector. On the other hand, NCDs are not transmitted from one person to another and they are characterised by their long existence in their host, hence, they do not have a complete cure but can be managed with good medical treatment. Examples of NCDs are hypertension, diabetes, cancer, and cardiovascular diseases. This study focused on CDs and non-medical determinants of CDs, i.e. the socioeconomic determinants of diseases.

CDs are also known as infectious diseases that exist mainly due to microorganisms (such as bacteria, viruses, parasites, and fungi) which can spread from one person to another. Certain CDs are carried in the mouth, throat, nose, respiratory tract, and blood. These CDs are characterised by their fast progression in their host if not treated, however, they are easily eliminated through adequate treatment. Nevertheless, some of these diseases are not curable, such as human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS). Other CDs are tuberculosis (TB), pertussis (whooping cough), cholera, malaria, etc.

Concerning the international community, various commitments have been made to improve health and the healthcare system and to tackle health issues, especially in developing countries such as Nigeria. The key goal of a healthcare system is to have improved health outcomes. Nonetheless, human health is hard to measure because it transcends beyond mere sickness since it embodies the complete soundness in both the mental and physical aspects of a man (WHO, 1948)[2]. The quality of any healthcare

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[1] Communicable diseases spread from one person to another through a variety of ways, including contact with blood and bodily fluids, breathing in an airborne virus, and being bitten by an insect (Alameda County Public Health Department (ACPHD), 2018).

[2] In 1948, the World Health Organization (WHO) defined the concept of health as 'a state of complete physical, mental and social well-being and not merely the absence of diseases or infirmity'.

1

system is measured by the health outcomes[3] of the people. Health outcome problems, the persistent increase in health expenditures, and the healthcare system inefficiency are serious challenges faced in Nigeria.

Studies on economic growth have recognised the favourable growth effects on human health (Barro, 1991; Mankiw et al., 1992). In contrast, earlier literature on economic growth reported that the accumulation of physical capital, labour, and the advancement in technology are significant factors determining an economy's growth and development since labour, technology, and the investments in physical capital and its accumulation are considered the primary sources of economic growth (Solow 1956). Nigeria has been experiencing a poor economy over the past several years. CDs, which are very rampant in Nigeria, have been accused as the major cause of poor health outcome that has affected economic growth, as reported by the Global Status Report on NCD and CD (2010) and WHO (2011).

The impact of CDs is immense, and these diseases affect the country by directly influencing the health and life of the people. Moreover, CDs impact the society and the political system and plans of Nigeria. In Nigeria, important sectors such as the education sector and health sector, which are sectors for sustainable growth and development, have experienced the loss of vital and qualified personnel, most notably due to HIV/AIDS, TB, and other CDs (United Nations (UN) and World Health Organization (WHO), 2013).

1.2   Background of The Study

Two of the most dangerous CDs in Nigeria are HIV/AIDS and TB. HIV/AIDS cases have been increasing over the years and since this disease is characterised as incurable, many personnel in government offices have lost their lives. Nigerians still suffer in ignorance of this deadly disease even though HIV/AIDS is a dangerous and incurable disease and exists among Nigerians. As such, it is crucial to study the socioeconomic determinants of this CD.

Similarly, TB exists among Nigerians and those affected by this disease are absent from social and economic duties, especially at their places of work. TB is a deadly disease because of its easy mode of contamination, imposition of great difficulty on the economy, and highly inconvenient administration of medication to patients. Health practitioners find it hard to administer the treatment to victims because of poor infrastructure and the lack of vehicles and personal protective health materials, such as gloves and face mask, to prevent them from being infected by TB. Most of the time, TB patients are isolated in the bushes, and this makes it difficult to administer their

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[3] 'Changes in the health of an individual, group of people or population which are attributable to an intervention or series of interventions' (Frommer, Rubin & Lyle, 1992). The predominant health outcomes used in the literature are infant, under-five mortalities, and life expectancy (Cremieux et al., 2005; Chung & Muntaner, 2006).

medication. These economic inconveniences and the cost of treatment are the reasons this study has chosen TB among other existing CDs in Nigeria in which its socioeconomic determinants are vital to be examined.

On the other hand, the priority of every human is good health. Improving health has been relevant to man before health became documented as one of the factors for human capital that fosters economic growth. Nigeria has invested to produce better health outcomes within their limited resources but some of these health investments have been wrongly utilised by the leaders, resulting in the lack of a suitable healthcare system in Nigeria.

The decrease in national savings, slow increase of economic growth, and the loss of productivity potential among the citizen have led to the efforts of the health sector focused on prevention, diagnosis, and treatment of the CDs to be unsuccessful, resulting in the increase of expenditure for the provision of health care equipment and medical services. The economic burden of CDs and the lack of good health are great barriers to Nigeria's economic growth and development.

1.2.1 The Determinants of CDs

Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS)

About 40.3 million Nigerians were living with HIV/AIDS in 2005, making Nigeria the world's third-largest disease-burdened country. Not only that, Nigeria is the second-largest HIV/AIDS epidemic country in the world and one of the countries with the highest rates of new HIV infections in Sub-Saharan Africa. Those who live with HIV/AIDS in Nigeria are mostly unaware of their status (UNAIDS/WHO, 2005). In 2017, approximately 150,000 people died from HIV/AIDS in Nigeria while in 2018, about 1.9 million people were living with HIV. The six states which account for 41% of people living with HIV in Nigeria are Kaduna, Akwa Ibom, Benue, Lagos, Oyo, and Kano. The South-South zone in Nigeria stands at a 5.5% prevalence of HIV whereas the lowest prevalence (1.8%) occurs in the South-East zone and only 33% of people living with HIV/AIDS in Nigeria have access to the antiretroviral treatment (ART) (UNAIDS, 2018).
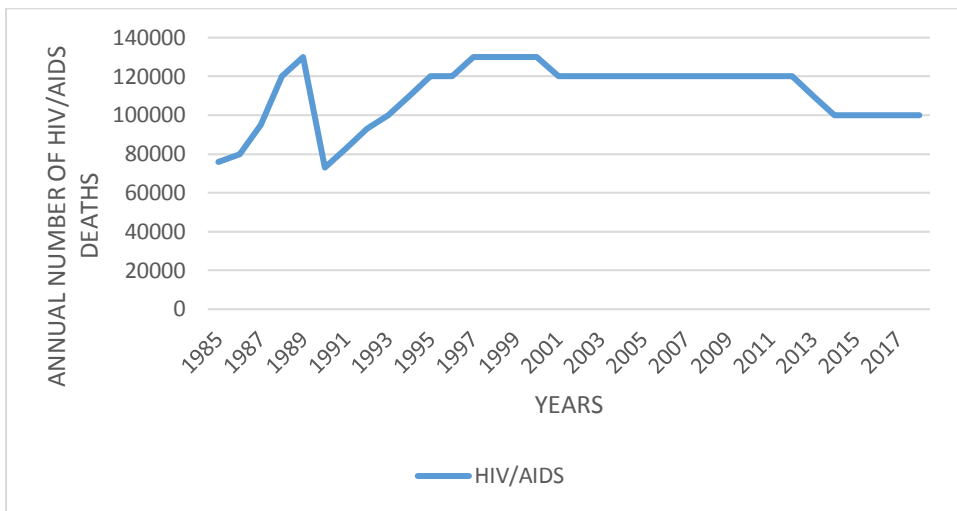
Figure 1.1 : AIDS-related Death in Nigeria from 1985–2018 (All Ages)
(Source : UNAIDS 2018)
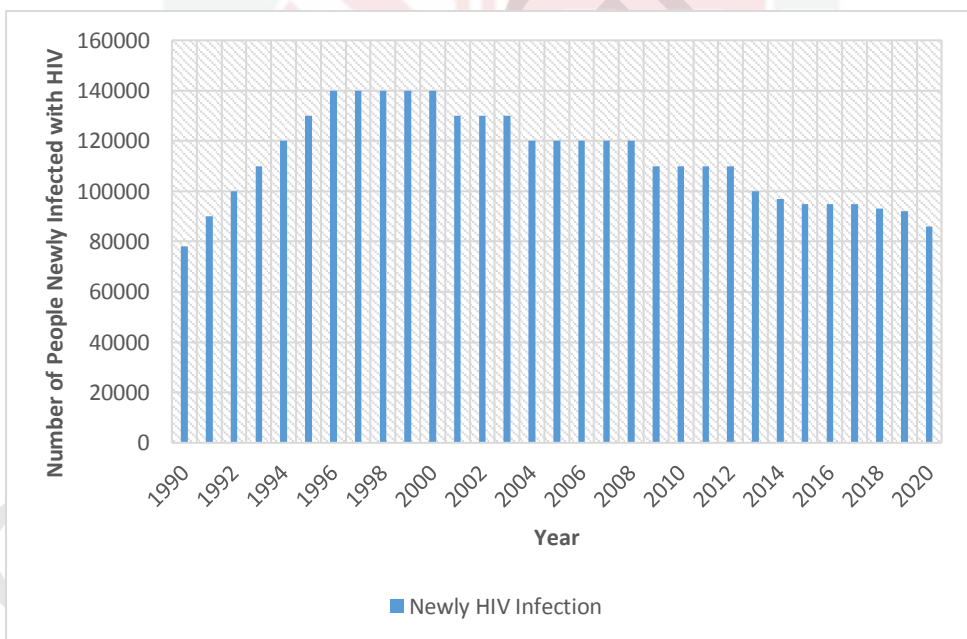
Figure 1.2 : Annual New HIV Infections in Nigeria from 1990–2020 (All Ages)
(Source : World Bank 2021)

In Nigeria, 240,000 adolescents aged 10 to 19 years have HIV, which represents 7% of the total number of people with HIV. The prevalence of HIV among this group varies

4

regionally with 4.3% of 15–19 years old living with HIV in the South-South zone compared to 1.3% in the South-East zone (WHO, 2016). The mortality rate in Nigeria among this group is rising. Various factors increase HIV vulnerability among young people, including lack of knowledge and appropriate sexual reproductive health services. Besides, sex workers' activities contribute to the high rate of HIV infections in Nigeria. Sex work is illegal in Nigeria, and this makes it difficult for sex workers to disclose their health status to health care workers. Consequently, they infect their customers, especially those who fail to use a condom. The law in Nigeria also causes sex workers to be more vulnerable to abuse by law enforcement agencies (UNAIDS & WHO, 2018).

Based on Figures 1.1 and 1.2, mixed epidemic of HIV exists in Nigeria. This implies that HIV prevalence among the people there is high and there are certain groups which are more vulnerable to being infected with HIV compared to the rest of the population. Despite this high vulnerability and risk of HIV, reports showed that only 2% of males and 4% of females between the ages of 15 and 19 years had tested for HIV in 2017. Furthermore, 220,000 children aged 0 to 14 years were living with HIV in Nigeria, while 1.8 million children were orphaned by AIDS, negatively impacting their health, safety, and well-being. It has been estimated that 20% of orphans and children with HIV do not attend school and 18% are sexually abused (UNAIDS, 2018).

In Nigeria, 58% of the women population is estimated to be living with HIV. Women and girls are affected by HIV mostly due to gender inequality that exists in Nigerian society, culture, and law. Divorced women or formerly married women have a higher risk of contracting HIV because of fewer economic opportunities and high rates of sexual exploitation. It was estimated that HIV prevalence among formerly married women was about 5.9%, i.e. almost double compared to the prevalence among married and never-married women, which was estimated to be 3.4% (UNAIDS, 2018).
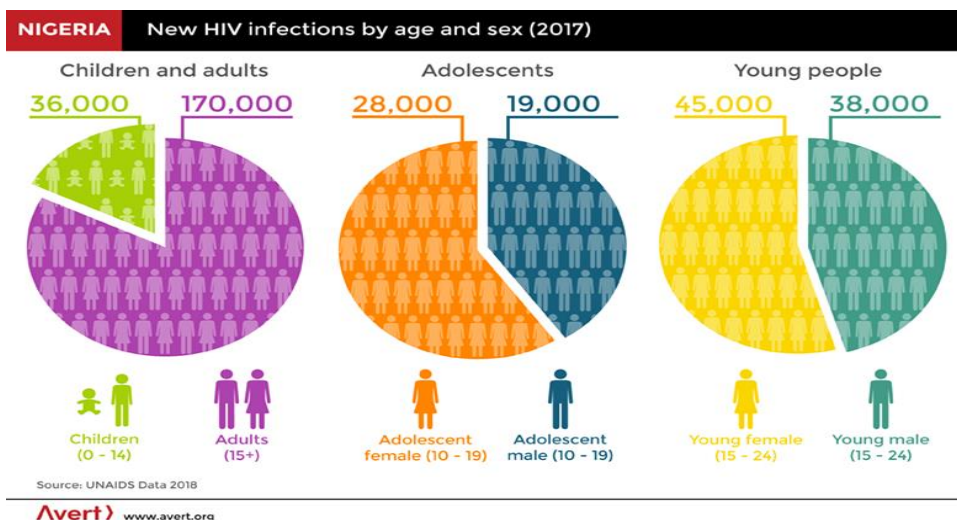
Figure 1.3 : New HIV Infections by Age and Sex in Nigeria in 2017
(Source : UNAIDS 2018)

Figure 1.3 illustrates the new HIV infections by age and sex in Nigeria in the year 2017. According to UNAIDS (2018), 33% of people living with HIV started receiving treatment in 2017, the year treatment for HIV was made available in Nigeria after many years of HIV prevalence. Moreover, 26% of children living with HIV were placed on ART, and 24% had achieved viral suppression. AIDS-related deaths in Nigeria have remained high, for instance, about 150,000 deaths were recorded in 2017 due to poor treatment coverage and adherence. Furthermore, Nigeria is far from meeting the global target of enrolling around 90% of people living with HIV on ART.

The need to address HIV/AIDS in Nigeria is urgent because the burden of AIDS mortality has shifted to the poorest and most marginalised segments in Nigeria (WHO, 2003). This has a heavy economic impact on society. According to WHO, the economic burden of AIDS on Nigeria is approximately 32 million disability-adjusted life years (DALYs). Each AIDS death was estimated to have resulted in 34.6% DALYs lost on average in 1999 (WHO, 2003).

Tuberculosis (TB)

TB is a disease that causes deaths all over the world. In 2016, 10.4 million people fell ill with TB, and 1.7 million died from the disease (including 0.4 million people with HIV). Over 95% of TB deaths occur in low- and middle-income countries (WHO, 2015). Seven countries account for 64% of the total deaths, with India leading the count, followed by Indonesia, China, the Philippines, Pakistan, Nigeria, and South Africa (WHO, 2015). TB is a leading killer of HIV-positive people, and in 2016, 40% of HIV deaths in Nigeria were due to TB (WHO, 2016).

TB is an airborne infectious disease caused by bacteria that mostly affects the lungs. It is a preventable and curable disease. According to WHO, in 1993, one-third of the world's population (about 2 billion people) was infected with TB bacteria. Among those infected with TB, about 9 million become sick each year with active TB that can spread to others. TB generally affects people living in poor settings or rural areas who have no access to clean water, i.e. mostly those living in Africa and Asia. This disease is a great challenge to developing countries because it affects people during their productive years, and most of the deaths (about 90%) as a result of TB occur in developing countries.

Nigeria ranks 10th among 22 countries in the world with a high burden of TB. In 2010, WHO estimated 210,000 new cases of all forms of TB in Nigeria, which was equivalent to 133 per 100,000 of the population. However, there were about 320,000 prevalent cases of TB in 2010, which was equal to 199/100,000 cases. The TB programme in Nigeria aimed to halve the TB prevalence and death rates by 2015. The TB death rate reduced from 11% in 2006 to 5% in 2010 (WHO, 2010). Nevertheless, Nigeria still failed to achieve the Millennium Development Goals (MDGs) target. Since the inception of the leadership of President Muhammed Buhari in 2015, the whole TB programme failed, and TB prevalence became worse due to poor economic outcomes among the people.
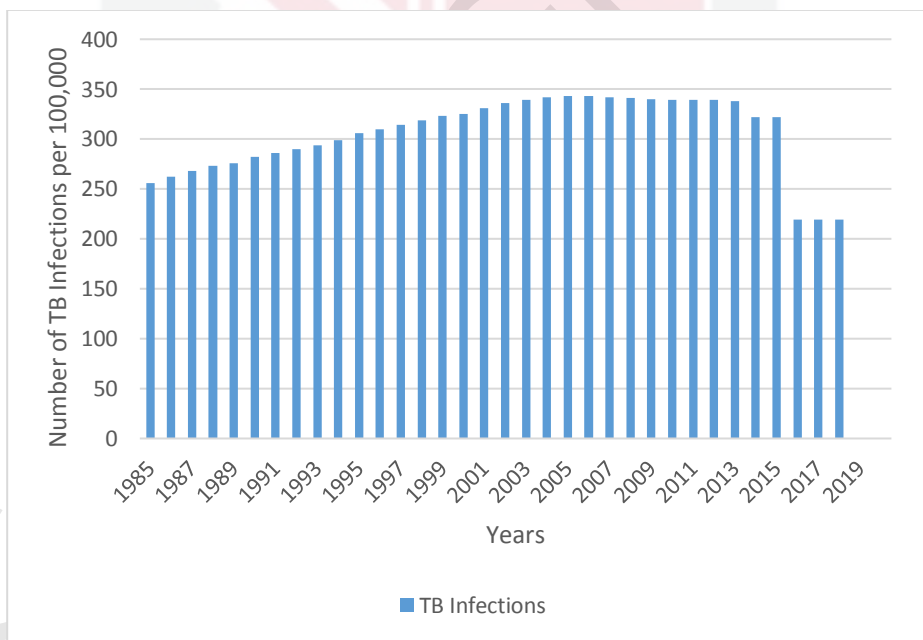
Figure 1.4 : Annual Number of TB Infections per 100,000 People in Nigeria (1985–2018)
(Source : Federal Ministry of Health Nigeria FMOHN 2019)

7

Figure 1.4 presents the annual number of TB infections for every 100,000 people in Nigeria, from 1985 to 2018. The control of TB in Nigeria is coordinated by the National Tuberculosis and Leprosy Control Programme (NTBLCP) in line with the 'Stop TB Partnership' initiatives whose ultimate target is to eliminate TB as a public health problem (less than 1 case per million population) by the year 2050. The Nigerian government has failed to observe (or even if they observed, they failed to take immediate action) that in Nigeria and consequently the burden of infectious diseases, such as TB, is alarming. The TB disease in general continues to make costly disruptions to trade and commerce in every region of Nigeria (FMOH, 2003).
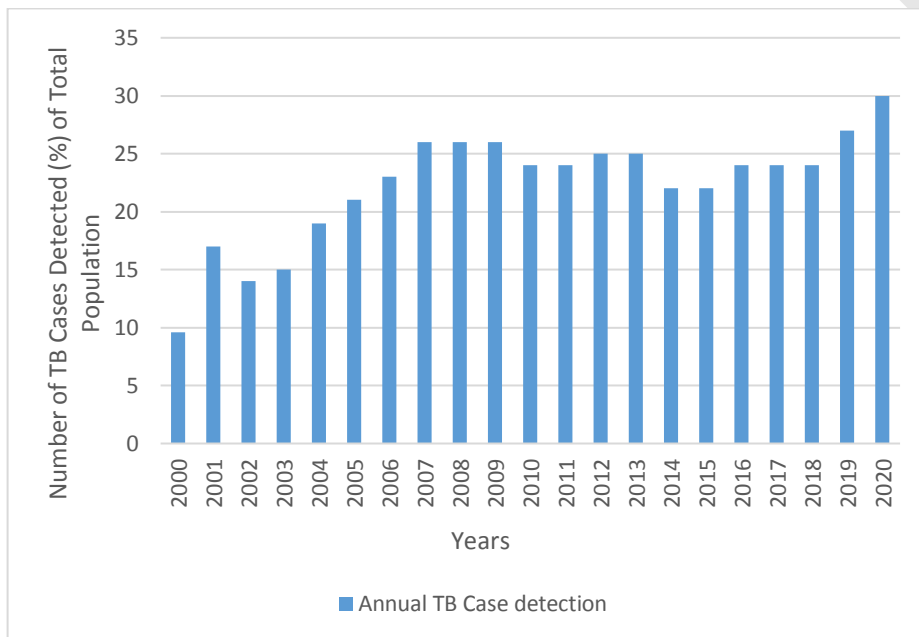
Figure 1.5 : TB Case Detection Rate (% of All Forms) in Nigeria (2000–2020)
(Source : World Bank 2021)

Figure 1.5 illustrates the number of detected TB cases in Nigeria from 2000 to 2020. According to WHO, Benue has a high TB burden due to the high HIV prevalence in that state. Besides, the age groups commonly affected by TB are the most productive age groups, with the 25–34 age group accounting for 33.6% (15,303) of the smear-positive cases registered in 2010 (WHO, 2015).

In Nigeria, the impact of CDs on health development or improvement has been neglected. Moreover, the Nigerian government is not putting much effort to reduce the prevalence of CDs. Even most Nigerian researchers have focused on NCDs and their implications on economic growth and development. The burden of CDs has already weakened the protective abilities of Nigeria and contributes further to political destabilisation besides slowing down social and economic development, leading to civil

8

conflicts in recent times. Therefore, this study aimed to investigate the social determinants of CDs in Nigeria.

There are numerous socioeconomic determinants of CDs. In this study, the socioeconomic determinants of CDs were used as the independent variables to expose the relationship between CDs and their socioeconomic determinants in Nigeria.

Education: The education system of Nigeria follows the 6-3-3-4 structure, which means the recipient of education will spend 6 years in primary school, 3 years in junior secondary school, 3 years in senior secondary school, and 4 years in the university to acquire a bachelor's degree. According to the United Nations Children's Fund (UNICEF), primary education is compulsory and free in Nigeria, but about 10.5 million children aged 5–14 years old do not attend school. In Nigeria, only about 61% of children aged 6–11 years old regularly attend primary school and only 35.6% of these children receive early childhood education.

Education is believed to have a relationship with CDs. This is because education is a good mechanism by which diseases produce inequalities among the people in the same society because of its association with poverty, which exposes the masses to the prevalence of CDs by reducing resistance to infection due to the lack of or limited income which is inadequate to fight against the CDs' prevalence (E Regidor et al., 2002). This agrees with the human capital theory which states that every human being can improve his earning and productive capacity through the acquisition of greater education and skills. The higher the educational attainment, the greater the chances of gaining employment which will then contribute to adequate/higher income, good standard of living, intake of healthy food and clean water as well living in a good environment, which will help to stop the prevalence of CDs. Therefore, there is an important association between education and CDs.

Gross Domestic Product per capita (GDP/C): The GDP/C measures a country's economic output that accounts for the number of people in that country. GDP/C is obtained by dividing the country's GDP by its total population. It is a good measure of a country's standard of living and it explains how prosperous a country is to its citizen. In Nigeria, the GDP/C was recorded at 2,396.30 United States dollars (US$) in 2018. Compared to the GDP/C of other countries, Nigeria's GDP/C is equivalent to only 19% of the world's average. This proves that Nigeria has a low standard of living despite being classified as a low middle-income country (World Bank, 2019). Poor standards of living lead to an increase in the prevalence of CDs. According to the human capital theory, the increase in income via higher acquired education helps to curtail as well as control the prevalence of CDs. People who can afford medical charges are those who can go to the hospital when they are infected with CDs. Since income has a vital association with CDs, income is a good determinant of the existence and prevalence of CDs in Nigeria.

9

Gross Domestic Savings (SA) (% of GDP): In December 2017, Nigeria's SA was about 15.5% of the GDP. The previous years recorded about 13.1%, which was lower. The yearly update of Nigeria's SA from 1981 to 2017 indicates that an average of 44.4% has been saved over the years. Savings is a component of income. It is equal to investment (the I-S balance) and a decrease in savings due to low income leads to a decrease in investment. Health investment accrued from savings is important for improving the health outcome by spending to stop or curtail the prevalence of CDs under the demand and supply of health theory (Grossman, 1972a).

Savings are also money saved for a rainy day. For example, a rainy day can be the sudden prevalence of CDs, and when there are no savings, the infected people will continue to live with the diseases because they could not immediately afford to pay for the treatment. Therefore, savings, which is a component of income, has an important relationship with CDs. Nigeria's SA has been fluctuating over the years which means there is no constant rate, hence, there is no adequate channel of expenditure for health, such as the fight against CDs, whereby Nigeria spends based on economic and health outcomes. Recently, Nigeria has been classified as a consumer country rather than a productive country (World Bank, 2018). A country in which its consumption is higher than its production has no future and this is a good reason CDs are rampant in Nigeria.

Final Consumption Expenditure (FCE): FCE is an expenditure made by all the components (government, households, and enterprises) in the economy, with the economic interest focused within the country. The FCE is made on goods and services with the benefit of direct satisfaction of the individual needs or collective needs of all the members of the country. According to the Keynesian Aggregate Expenditure Model, people either consume or save their income. Therefore, income equals to consumption plus savings. If income increases, then, consumption and savings will also increase. When income remains constant or does not increase, then, the increase in FCE decreases savings and the decrease in savings leads to a decrease in investment because savings equal to investment. Consequently, this will lead to an increase in the prevalence of CDs because there is not enough money saved for rainy days or invested to combat the prevalence of CDs. Therefore, FCE has a vital relationship with CDs via the level of income since expenditure is a component of income.
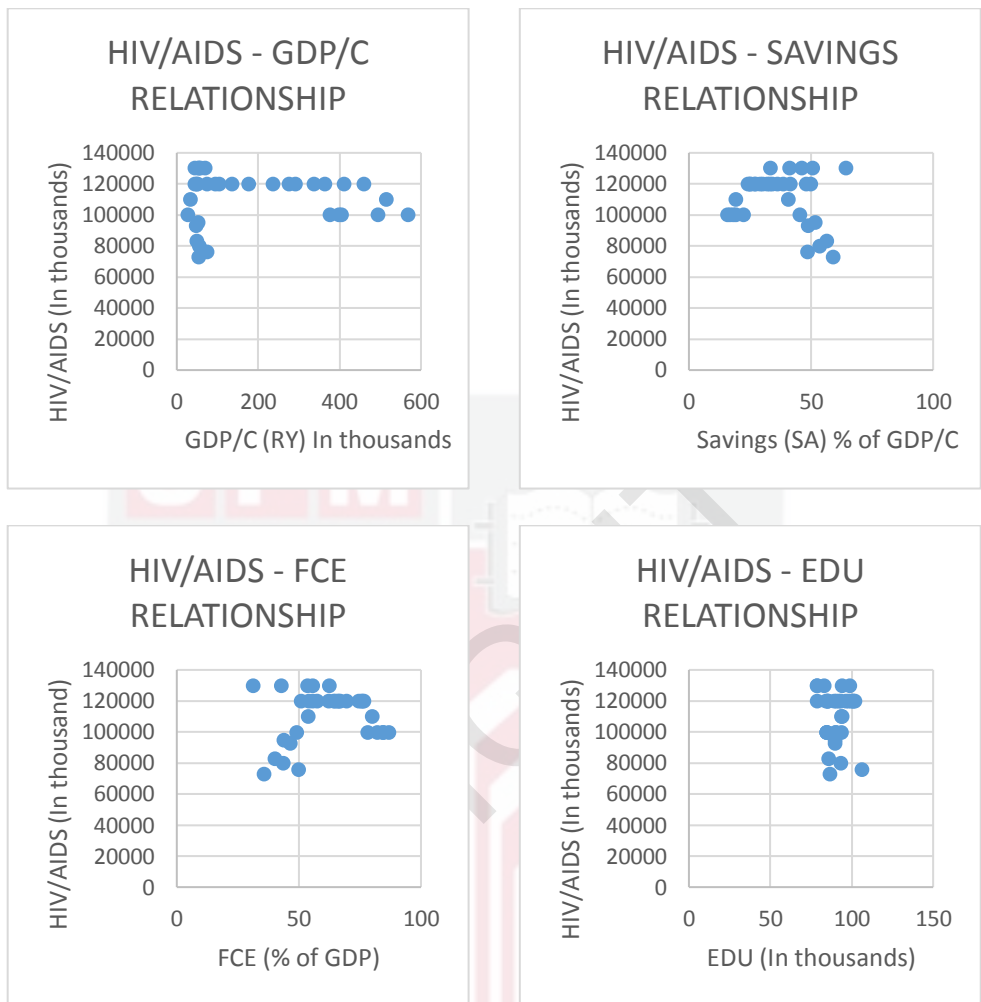
Figure 1.6 : Scatter Plots Linking the Socioeconomic Determinants with HIV/AIDS (1985–2018)
(Source : WDI World Bank Database 2020)

Figure 1.6 shows the scatter plots for HIV/AIDS and the independent variables (determinants) of this study. By considering the possible direction of each relationship, HIV/AIDS was plotted against the four determinants for the years 1985 to 2018. The first panel is of HIV/AIDS and GDP/C, and it shows a positive linear relationship in the short run and a negative linear relationship in the long run. This means that in the short run, an increase in HIV/AIDS can lead to an increase in GDP/C, but in the long run, an increase in HIV/AIDS will lead to a decrease in GDP/C. The second panel is of HIV/AIDS and SA, which is a percentage of GDP/C. The explanation for this panel is similar to the one for the first panel. Next, the third panel is of HIV/AIDS and FCE. This panel shows a positive linear relationship, which implies that an increase in HIV/AIDS will lead to an increase in FCE. Finally, the fourth panel is of HIV/AIDS and education

(EDU). The panel indicates a negative relationship between HIV/AIDS and EDU. This implies that improvement in education by creating more awareness of HIV/AIDS will reduce its prevalence in Nigeria.

On the other hand, Figure 1.7 presents the scatter plots for TB and the determinants of CDs in Nigeria. These plots reveal how TB is linked with each determinant. The first panel shows the relationship between TB and GDP/C and depicts a positive linear relationship in the short run and a negative linear relationship in the long run. This implies that the continuous prevalence of TB will decrease the GDP/C in the long run but not in the short run. Next, the second panel illustrates the relationship between TB and SA, and this relationship's outcome is the same as between TB and GDP/C. The third panel shows the scatter plot between TB and FCE. This panel depicts a positive linear relationship between TB and FCE within the period of observation. Thus, an increase in TB will lead to an increase in FCE. The fourth and last panel presents the relationship between TB and EDU. It shows a positive relationship between TB and education, which means an improvement in education and awareness of TB may not reduce TB prevalence. This could be due to TB's mode of infection, which is by air. When infectious diseases are transmitted by air, the means to avoid them become minimal since human beings need air for survival. Hence, irrespective of awareness created through education, the prevalence of such diseases will be high.
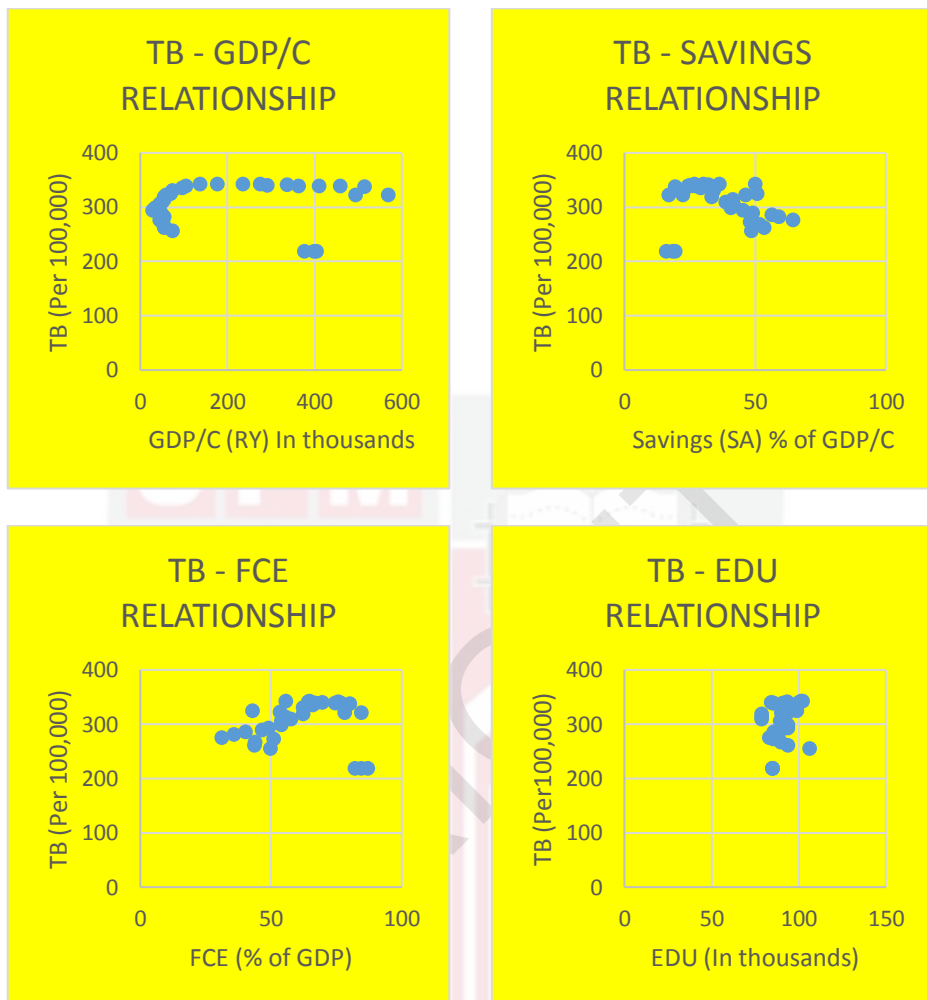
Figure 1.7 : Scatter Plots Linking the Socioeconomic Determinants with TB (1985–2018)
(Source : WDI World Bank Database 2020)

In summary, the relationships between HIV/AIDS and its socioeconomic determinants depicted some inconsistencies because of the irregularities in Nigeria's economy, poor education, low income, and continuous prevalence of HIV/AIDS that is connected with its mode of transmission, making the disease somewhat unavoidable by some Nigerians who are not educated and could not afford the protective measures associated with the HIV transmission mode. Furthermore, the inconsistencies over time between TB and its socioeconomic determinants are attributed to the poor economic settings and outcomes resulting from poverty, low income, and other socioeconomic variables relating to and affecting Nigerians. These reasons motivated this study to determine the socioeconomic factors/determinants which might positively or negatively affect the prevalence of CDs in Nigeria.

1.2.2 Health Outcome and CDs

Health outcome[4] is a term broadly used in the healthcare industry. The meaning of this term varies according to the user and the context.

Health outcome can be measured using the rate of morbidities (illnesses), mortalities (deaths), or life expectancy of the people in society. The outcome measures are mortality, patient experience, readmission, etc. There are various factors related to health outcome which influences health. Some of these factors are quality of medical care received, availability of good jobs for a better income, clean water, affordable housing and food, etc. Government programmes and policies in society influence these health factors.

There are four indicators that can be used to measure health outcome, namely, life expectancy, under-5 mortality, infant mortality, and maternal mortality. This study used life expectancy and under-5 mortality as indicators to measure the health outcome in Nigeria. Health outcome is also defined as 'a planned measurement described in the study protocol that is used to determine a change in health status as a result of interventions on participants in a clinical trial' (University of Waterloo Research Ethics Boards (REBs), 2020). Indicators used to measure health outcome are infant mortality and under-5 mortality rates which are the probability of a newborn baby dying before reaching the age of one and five years, respectively, per 1,000 live births. On the other hand, maternal mortality ratio is the number of women who die due to related cases of pregnancy complications or 24 days after pregnancy termination per 100,000 live births (World Health Statistics, 2009). Lastly, life expectancy is the number of years a newborn baby is expected to live when the prevailing pattern of mortalities at the time of birth remains unchanged (WHO, 2009).

These two indicators were chosen because observing a good relationship between CDs and health outcome would take several years, and based on their definitions, the two indicators chosen suited this study. This is unlike infant mortality rate which is only for a year and maternal mortality rate which is only for 24 days. Furthermore, there is no complete data available for maternal mortality rate in Nigeria for the years examined in this study. Thus, the two indicators chosen would help this study to overcome the ideology in existing literature indicating that no one indicator (variable) could solely represent the health outcomes of a given people in a given society (Goodman, Gerald & Musgrave, 2004).

Life expectancy: Life expectancy is a major indicator of Nigeria's health status. In 2009, the average life expectancy of Nigerians was 54 for women and 53 for men (WHO, 2009), while the average life expectancy in the African region was 54 years, which was the same as in Nigeria. Next, in 2000, the average life expectancy in Nigeria was 48

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[4] Health outcome means 'a change in the health status of an individual, group, or population which is attributed to a planned intervention or series of interventions, regardless of whether such an intervention was intended to change health status' (WHO, 1998, p. 10).

years, whereas for the African region it was 50 years. This means that from 2000 to 2009, there was an increase in the life expectancy of Nigerians. In 2015, the life expectancy for males was 53.4 and for females, it was 55.6, while the average life expectancy was 54.5, which gave Nigeria a world life expectancy ranking of 177 out of 195 countries in the world (WHO, 2015). Thus, the life expectancy in Nigeria has shown relative improvement over the years, yet, more needs to be done for Nigeria to keep pace with other countries.
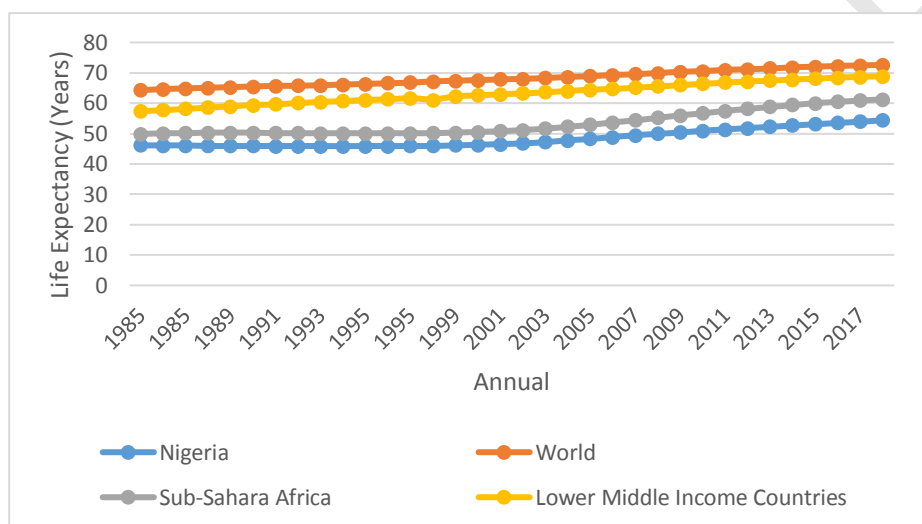
Figure 1.8 : Life Expectancy of Nigeria, the World, Sub-Sahara Africa, and Lower-middle-income Countries (1985–2018)
(Source : WDI World Bank Database 2020)

Nigeria is a country in Sub-Sahara Africa and is classified as a lower-middle-income country (World Bank & UN, 2016). This country's life expectancy is below the global life expectancy according to the Population Division of the Department of Economic and Social Affairs of the United Nations (2018). As shown in Figure 1.8, there is a huge gap between Nigeria's life expectancy and those of the world, Sub-Sahara Africa, and lower-middle-income countries over the years. These differences have been regular over the years and have created a research gap for investigations regarding the impact of CDs on health outcome (life expectancy) in Nigeria.

Under-5 Mortality Rate: The under-5 mortality rate measures a child's survival five years after birth. It also exposes the economic, social, and environmental conditions children live in, as well as their health care in society. Under-5 mortality rates[5] are generally used to identify vulnerable populations which are affected by the incidence and prevalence of diseases in society. Nigeria's under-5 mortality rate fell gradually from

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[5] Under-5 mortality rate is defined as 'the probability of a child dying between birth and exactly five years of age, expressed per one thousand live births' (UNICEF, 2021).

281.4 deaths per 1,000 live births in 1970 to 117.2 deaths per 1,000 live births in 2019 and 95.12 deaths per 1,000 live births in 2020. This means that in 2020, approximately one out of ten Nigerian children never reached the age of 5 (WHO, 2021). It is important to understand that the under-5 mortality rate is not a rate (that is, dividing the number of people at risk during a certain period by the number of deaths). Instead, it explains the probability of death based on the life table and is expressed as the rate per 1,000 live births (WHO, 2021). Under-5 mortality rate 'is the probability of a child born in a specific year or period dying before reaching the age of five, if subject to age-specific mortality rates of that period' (WHO, 2021).
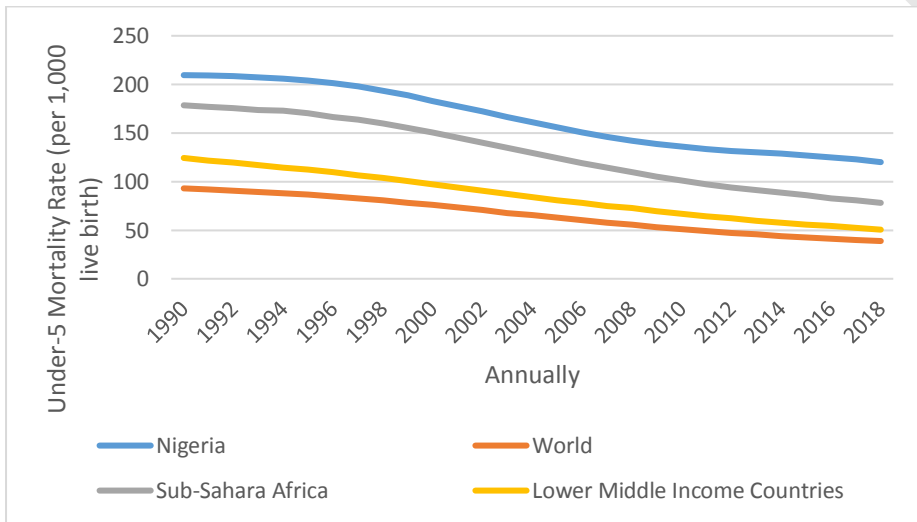
Figure 1.9 : Under-5 Mortality Rate of Nigeria, the World, Sub-Sahara Africa, and Lower-middle-income Countries (1990–2018)
(Source : WDI World Bank Database 2020)

Figure 1.9 displays the under-5 mortality rates of Nigeria, the world, Sub-Sahara Africa, and lower-middle-income countries. The figure shows the high disparity between Nigeria and the world, Sub-Sahara Africa, and lower-middle-income countries. This means that the under-5 mortality rate in Nigeria is still high despite its slow decrease over the years. Nonetheless, considering the time, energy, and resources committed to the MDGs, it is important to investigate the impacts of CDs on health outcomes in Nigeria if the sustainable development goals (SDGs) are to be achieved before 2030. Thus, it is imperative to examine the relationship between health outcome and CDs in Nigeria, due to the high under-5 mortality rate and its slow rate of decrease, low life expectancy and its slow rate of increase, and the high rate of the prevalence of CDs in Nigeria.
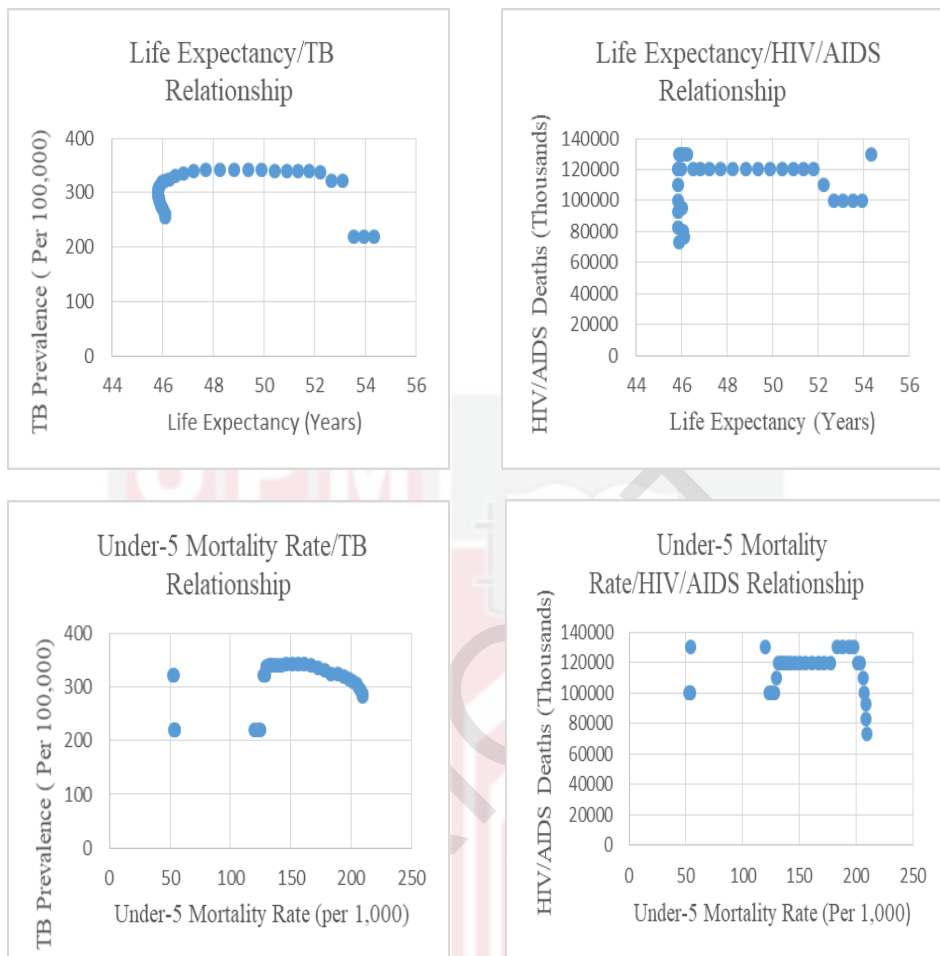
Figure 1.10 : Scatter Plots for Health Outcome and CDs in Nigeria (1985–2018)
(Source : WDI World Bank Database 2020)

Figure 1.10 presents the scatter plots displaying the relationships between life expectancy and HIV/AIDS and TB and between under-5 mortality rate and HIV/AIDS and TB. The sample period for life expectancy was from 1985 to 2018, while for under-5 mortality rate it was from 1990 to 2018. The first panel (1985–2018) shows a negative linear relationship which depicts a decrease in life expectancy when HIV/AIDS and TB increase. The second panel (1990–2018) also indicates positive linear relationships between under-5 mortality rate and HIV/AIDS and TB, which imply that an increase in HIV/AIDS and TB leads to an increase in the under-5 mortality rate. These relationships are possible since an increase in CDs causes ill health, which may lead to death if not treated, thereby, resulting in a decrease in life expectancy and an increase in the under-5 mortality rate, which is generally a poor health outcome.

17

1.2.3   Economic Growth, Health Outcome and CDs in Nigeria

Economic growth[6] is measured as the percentage rate of increase in real gross domestic product (GDP). GDP is a good indicator of economic growth. It helps to determine a country's economic health or wellbeing. Furthermore, it is seen as the measure of other economic variables that influence the economic growth of a country; hence, GDP is commonly used as a measure of economic growth. This study used GDP per capita[7] (GDP/C) expressed in US$ to represent economic growth. GDP/C is more reliable than GDP as the measure of economic growth because GDP is expected to rise with the increase in the population. If GDP is used without considering the population, the result could be incorrect. Nigeria is characterised as a middle-income country with a mixed economy and emerging market, focusing on manufacturing expansion, financial, service, technology, communications, and entertainment sectors. This nation is ranked the 27th largest economy in the world in terms of nominal GDP, as well as the 22nd largest country in terms of purchasing power parity (PPP). Nigeria's GDP/C in 2016 was $2,457.79 (currently in US$). Over the past 59 years since Nigeria got her independence, the value of this indicator has fluctuated between $92.96 in 1960 and $2,563.10 in 2019 (World Bank Data Base, 2020).

On the other hand, health outcome is also a good indicator of a country's economic growth. When a country's inhabitants are educated, it has a higher chance of having a good health outcome. A healthy population leads to an increase in the productivity and national output, increase in national income, increase in savings, increase in the accumulation of capital, reduction in poverty, reduction of CDs, improvement of life expectancy, as well as overcoming the problem of capital shortage, which exists in Nigeria.

Figure 1.11 illustrates the scatter plots for health outcome (under-5 mortality rate and life expectancy) and economic growth (GDP/C) in Nigeria from 1985 to 2018. The first panel from the right, shows a positive linear relationship between life expectancy and economic growth, which means that an increase in life expectancy will lead to an increase in economic growth. Meanwhile, the second panel from the right, indicates a negative relationship between under-5 mortality rate and economic growth in Nigeria, which implies that an increase in economic growth will lead to a decrease in the under-5 mortality rate.

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[6] Economic growth is the increase of goods and services produced in a country over a given time considering the population of that country (World Bank, 2020). Besides, economic growth is an increase in the production of economic goods and services, compared from one period to another (Investopedia Team, 2021).
[7] GDP per capita is defined as the GDP of a country divided by the population of that country (World Bank, 2020).

Figure 1.11 : Scatter Plots for Economic Growth and Health Outcome in Nigeria (1985–2018)
(Source : WDI World Bank Database 2020)

It is pertinent to understand that CDs contribute to the high toll of the burden of diseases in Nigeria. The indirect relationship between CDs and economic growth has been proven through the impact of CDs on health outcome considering the method of research analysis and investigations applied in this study. Health outcome is believed to have a positive linear relationship with economic growth. The effect of CDs on health outcome is indirectly affecting economic growth because health outcome and economic growth are correlated. Considering the indirect impact of CDs on economic growth, it is vital to engage in a deep study to determine why CDs are a cause of the fall of the Nigerian economy, health-wise and find out their causes and a solution to control their prevalence. Other factors that affected or contributed to the economic growth of Nigeria were used in this study, namely, population and gross capital formation.

Population is the total number of people living in a common area at a given time (UN, 2020). Nigeria has been indicated as the most populous country in the world, with a population equivalent to 2.57% of the total world population (WHO, 2016). In 2020, the population of Nigeria was 206,139,587 people (World Bank, 2021). Next, gross capital formation consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, etc.), plant, machinery, and equipment purchases, and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Meanwhile, inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and 'work in progress'. The gross capital formation data are currently in US$ (World Bank, 1998).

In summary, this study investigates the socioeconomic determinants of CDs, the impacts of CDs on health outcome, and the extent CDs affected Nigeria's economic growth via health outcome.

1.3   Problem Statement

Nigerians have been suffering from CDs such as HIV/AIDS and TB over the years. These CDs have affected many Nigerians and burdened the government through expenditures to stop the prevalence of those CDs. The rampant and increasing cases of CDs have become worrisome to the government and Nigerians. Although, some health facilities in Nigeria have done their best to control and reduce the prevalence of CDs, but it seems that their efforts are fruitless. In some cases, relying only on the medicines cannot control the prevalence of the diseases, certain social elements can probably support the lowering of the prevalence of these CDs. Such social elements are the provision of clean water, a good environment to live in, and adequate social amenities such as good roads and a constant electricity supply. All these social amenities were termed socioeconomic determinants of CDs in this study.

According to the social determinants of health (SDH) theory, socioeconomic determinants or factors help to control the prevalence of CDs. When these factors are in a poor state, the prevalence of CDs might increase. Over the years, Nigeria has been experiencing poor socioeconomic environment. Poor or no water supply, bad roads, poor health facilities, epileptic power supply, etc. have become the order of the day in Nigeria. The presence of poor socioeconomic environment in Nigeria could be the reason for the high increase in the prevalence of CDs there. Therefore, this study aimed to identify the socioeconomic determinants of CDs in Nigeria.

On the other hand, the health outcome of Nigerians over the years has been poor. People are dying daily due to the prevalence of CDs such as HIV/AIDS and TB. It was estimated that 2,886 per 100,000 people died annually as a result of HIV/AIDS in Nigeria (WHO, 2010). The life expectancy of Nigerians in 2011 was 52, and it experienced a slow increase, with the crude death rate estimated to be 14% in the same year. Furthermore, it was statically estimated that 124 out of 1,000 new births do not survive beyond the age of 5 (WHO, 2015). In Nigeria, only 39.56% of the males and 42.25% of the females survive up to the age of 65 years. If this trend continues without any appropriate measures being taken, the situation may become worse in Nigeria. Thus, the need to control the incidence and prevalence of CDs in Nigeria is crucial and must not be neglected anymore. The health outcome of Nigerians is dwindling, and they are dying due to the high prevalence of CDs. Hence, this study aimed to examine the impacts of CDs such as HIV/AIDS and TB on the health outcome of Nigerians.

Nigeria has been experiencing a slight increase in economic growth over the years. However, it is pertinent to understand that the gross domestic product (GDP) of Nigeria is poor compared to other Sub-Sahara African countries. The poor GDP has resulted in poor health outcome and a high prevalence of CDs in Nigeria. Moreover, there is a slow

decrease in infant and under-5 mortality rates, a slow increase in life expectancy, and an increase in TB and HIV/AIDS in Nigeria. The inability to afford medical and reliable treatment for children and adults suffering from these diseases makes the situation worse. The low GDP in Nigeria has resulted in more than half of the Nigerian population living below the poverty line. The provision of adequate funding for good health care by households or by the government has become a difficult task. For example, data on total expenditure of health showed that out of pocket expenditure constituted a higher proportion (60.4%) than public expenditure (36.7%) in 2011 in Nigeria (Federal Ministry of Health Nigeria, 2013). Thus, it is important to examine the direct and indirect effects of CDs on economic growth via health outcome.

1.4 Research Questions

Based on the issues caused by CDs (HIV/AIDS and TB) in Nigeria and the inability of the Nigerian government in combating these diseases, this paper aimed to answer the following research questions:

1. What are the socioeconomic determinants of CDs?

2. What is the impact of CDs on the health outcome?

3. Is the impact of CDs on the economic growth conditional on the health outcome?

1.5 Research Objectives

The general objective of this research was to investigate the socioeconomic determinants of CDs (i.e., HIV/AIDS and TB) and the impact of CDs on the health outcome and economic growth in Nigeria. The specific objectives of this study were:

1. To identify the socioeconomic determinants of CDs.

2. To analyse the impact of CDs on the health outcome.

3. To examine whether the impact of CDs on the economic growth is conditional on the health outcome.

1.6 Significance of the Study

There is a lack of literature on the socioeconomic determinants of CDs in Nigeria. Therefore, this study would contribute to the literature pertaining to the socioeconomic determinants of CDs in Nigeria. Socioeconomic determinants of CDs can help the policymakers in Nigeria to understand that not only the medical determinants such as the provision of hospitals and equipment and human resources are the factors needed to control CDs prevalence in Nigeria. This study would expose the importance of living in a healthy environment, having clean drinking water, living in a good house, steady

21

power/electricity supply, good roads, provision of good recreational activities, and affordable food resources.

Additionally, only a few studies on CDs focused on the causes and consequences of CDs. Past studies have neglected the determinants or factors that influence the prevalence of CDs. For example, HIV/AIDS is one of the CDs in Nigeria which have caused the death of many people. HIV/AIDS is transmitted either through sex or the blood of an infected person mistakenly mixed with the blood of a healthy person through cuts on the body of both persons. Moreover, if such determinants are exposed and solved, the prevalence of HIV/AIDS in Nigeria will be minimal. In consideration, first, this study examined the determinants or factors contributing to the continued existence of CDs and explain why they continued existing irrespective of the serious efforts by the Nigerian government to prevent the prevalence of these CDs, which previous researchers might not have addressed.

Second, there are only a few studies on CDs in Nigeria. Most of the prior studies in Nigeria focused on NCDs, therefore, this study focused on CDs to highlight the impacts of CDs on the health outcome of the people in Nigeria. Furthermore, this study contributed to the existing literature by exposing the relationship that exists between CDs and health outcome in Nigeria. The health outcome of Nigerians has been dwindling over the years. Their life expectancy is low compared to other countries in Africa. Their negligence and ignorance of CDs as well as the inability to avoid and cure these CDs when infected have become a big problem in Nigeria. As such, this study would contribute to the awareness of the impact of CDs on health outcome and reveal that negligence of CDs is dangerous and can cause death.

Third, since most previous studies on health outcome and economic growth concentrated on the direct relationship between health and economic growth, this study would explore the indirect relationship between CDs and economic growth conditional on health outcome in Nigeria. The indirect impacts of CDs on economic growth via health outcome will be elaborated hence this will be contributing to policy implementations which would then lead to Nigerians not neglecting CDs. These can enable the Nigerian government through the Federal Ministry of Health (FMOH) and other health allied agencies such as WHO and UNICEF to offer some solutions to the problems that caused Nigeria to be unable to fulfil the MDGs targets for HIV/AIDS and TB, as well as not being able to control these diseases. This study would help policymakers understand the core socioeconomic determinants of CDs in Nigeria. Finally, this study would help policymakers prepare economic policies capable of guaranteeing economic growth, by dealing with the CDs since their determinants have been exposed; hence, this would lead to good health outcome and increased economic growth in Nigeria.

22

1.7   Scope of the Study

This research focused on HIV/AIDS and TB, which were chosen among other CDs in Nigeria to highlight the socioeconomic determinants of CDs, besides identifying the impact of CDs on health outcome and the indirect impact of CDs on economic growth conditional on health outcome. Geographically, Nigeria was the field of study. This research used time-series data and based on data availability and the variables investigated, this study examined data from 1985 to 2018.

1.8   Organisation of the Thesis

Chapter One presents the overview and background of the study, the problem statement, and the research questions and objectives. This chapter also highlights the significance of the study and the scope of the study. Chapter Two discusses the theoretical and empirical reviews of the literature on the main issues of the study i.e. socioeconomic determinants of CDs (HIV/AIDS and TB), CDs, health outcome relationship, and the indirect impacts of CDs on economic growth conditional on health outcome in Nigeria.

Chapter Three presents the methodology of the study. It explains the conceptual frame work, empirical model specification, variables, sources of data and the data analysis method. The following chapter, Chapter Four, presents and discuss the empirical findings of the study. Finally, Chapter Five presents the summary of the study, some policy implications, limitations and suggestions for further research.

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106

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