INFLUENCE OF HEALTH SECTOR FINANCING ON ECONOMIC GROWTH IN KENYA (2000- 2020)

BY

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DECLARATION

Declaration by the Candidate

I declare that this thesis is my original work and has not been presented to any other institution. No part of this thesis may be reproduced without prior or express permission of the author and/or Moi University.

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DEDICATION

I dedicate this thesis to my family, A special feeling of appreciation to my loving Late parents, My siblings Stella Chebet and Anthony Kipchumba for encouragements and who have supported me throughout the process, Aunt Judith Chausiku who has been my best cheer leader.

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ABSTRACT

Economic growth positively impacts population health, providing access to quality healthcare, environmental protection, clean water, and better preventative behavior. However, Kenya's declining growth rate affects health financing, causing many citizens to struggle with access to care due to rising medical costs. This study sought to analyse the influence of health sector financing on economic growth in Kenya. The study was guided by the following specific objectives: to determine the influence of public health financing; health insurance financing; households' health financing and donors' health financing on economic growth in Kenya. The study was guided by transactions Endogenous theory, Wagner's theory and Solow-Swan Exogenous Growth Model. The study was conducted in Kenya. Data used in study was longitudinal data for twenty one years. The study period was from 2000 to 2020. A descriptive and inferential analysis performed where Auto-Regressive Distributive Lag (ARDL) model was used. Analyzed data were presented in the form of tables and discussions. From the analysis it was established that the public health financing coefficient was positive and statistically significant (a=0.1819, p= 0.012<0.05), indicating that one unit increase in public health financing could lead to 0.1819 units in economic growth in Kenya. The health insurance financing indicated a positive and statistically significant (b=0.2935; p = 0.028<0.05), implying that one unit increase in health insurance financing could result in 0.2935 units in economic growth in Kenya. The household health financing was positive and statistically significant (c=0.2958; p= 0.003<0.05), implying that for every one unit household health financing contributed to 0.2958 units to economic growth in Kenya. The donor health financing was positive and statistically significant (d_1= 0.2573 p=0.017<0.05) in a short-run, implying that a unit increase in donor health financing initially contribute 0.2573 units in economic growth in Kenya. However, the long-run effect, donor health financing was negative and statistically significant (d_2=-0.2982 p=0.0.014<0.05) implying one unit increase in donor financing could lead to a reduction of 0.2982 units in economic growth in Kenya. The study showed that adjusted R-squared was 0.9271, implying that the model explains approximately 92.71% of the variation in the economic growth in Kenya. The study concluded that public health financing, health insurance financing, and household health financing were positively related to economic growth in the long run in Kenya. Donor health financing, on the other hand had a positive and significant effect on economic growth while in the long run , the effect was negative and significant. The study recommends that there is need for enhancing domestic health financing sources like public health, health insurance, and household financing, and gradually shifting towards sustainable domestic financing sources. Policymakers should focus on strengthening these domestic sources of health financing to promote sustainable economic development. Future research should incorporate other macroeconomic, demographic, and institutional factors could provide a more comprehensive understanding of the determinants of economic growth.

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ABBREVIATIONS AND ACRONYMS

AFD	Agence Francaise de Development
AFD:	Agence-Francaise de Development
ARDL:	Auto Regressive Distributed Model
BoP	Balance of Payments
CBK:	Central Bank of Kenya
CHE:	Catastrophic Health Expenditure
CLRM:	Classical Linear Regression Model
COVID-19:	Coronavirus Disease 2019
DFID:	Department for International Development
DGIS:	Directorate-General for International Cooperation
DHS:	Demographic and Health Survey
ERS	Economic Recovery Strategy
GDP:	Gross Domestic Product
GNP	Gross National Product
HIV/AIDS:	Human immunodeficiency virus/Acquired immune deficiency syndrome
IEA:	Institute of Economic Affairs
IRA:	Insurance Regulatory Authority
KEPH	Kenya Essential Package of Health
KNBS:	Kenya National Bureau of Statistics
KNH:	Kenyatta National Hospital
LMICs:	Low- And Middle-Income Countries
MOH:	Kenyan Ministry of Health
MTRH:	Moi Teaching and Referral Hospital

NACOSTI:	National Council for Science, Technology, and Innovation
NGO:	Non-Governmental Organization
NHIF:	National Hospital Insurance Fund
ODA:	Official Development Assistance
OLS	Ordinary Least Squares
OOP:	Out-of-Pocket
PPP:	Public-Private Partnership
SBIC	Schwarz's Bayesian information criterion
SDC:	Social Development Committee
UHC:	Universal Health Coverage
UK	United Kingdom
UNAIDS:	Joint United Nations Programme on HIV/AIDS
UNDP:	United Nations Development Programme
UNICEF:	United Nations Children's Fund
USA:	United States of America
USAID:	United States Agency for International Development
USD:	United States Dollar
VAR	Vector autoregressive
VAT:	Value Added Tax
VECM	Vector error correction model
VIF:	Variance Inflation Factors
WHO:	World Health Organization

OPERATIONAL DEFINITION OF TERMS

Donor Health Financing: Refers to the funds made available by international donors or organizations to support the health sector, typically provided in the form of grants or loans for healthcare projects, programs, and infrastructure development. This financing is crucial for supplementing domestic health resources, especially in low-income settings (World Health Organization, 2020).

Economic Growth: The increase in the production of goods and services in an economy over time. This growth is measured by the rise in Gross Domestic Product (GDP), and it can be driven by factors such as an increase in capital goods, labor force, technological advancement, and human capital development (World Bank, 2021).

Health Insurance Financing: Involves the acquisition, management, and allocation of financial resources through both private and social insurance schemes to fund the delivery of healthcare services. This includes contributions from individuals, employers, and the government to cover healthcare costs (Health Insurance Fund, 2021).

Health Sector Financing: A broad term that refers to the process of mobilizing, accumulating, and allocating financial resources to meet the health needs of the population. This includes both public and private sources of funding and covers all aspects of health system

expenditure, such as services, infrastructure, and workforce. (World Health Organization, 2020).

Household Health Financing: Refers to out-of-pocket payments made by households for health services. These payments can be direct and may or may not be reimbursed by third-party sources like insurance. It represents a significant portion of healthcare financing, especially in lower-income settings (National Health Accounts, 2021).

Public Health Financing: The funding used for the delivery of public health functions, including health promotion, disease prevention, and health system strengthening. It encompasses all government spending on healthcare, including public health initiatives, as well as spending by non-governmental organizations (Global Fund for Public Health, 2021).

CHAPTER ONE

INTRODUCTION

1.1 Overview

This chapter discusses the background of the study, the statement of the problem, the objectives of the study,the hypotheses of the study and significance of the study.

1.2 Background of the Study

Economic growth is an increase in the production of economic goods and services compared to a previous period (Gründler & Potrafke, 2019). Growth can generate virtuous circles of prosperity and opportunity. Strong growth and employment opportunities improve incentives for productivity and quality health. Strong economic growth, therefore, advances human development, which, in turn, promotes economic growth. The extent to which a country's economy grows depends on the degree to which the citizens participate in the growth process and health sector (Wochner, 2022).

Economic growth and a nation's financial prosperity are proven to affect population health positively. Populations with greater economic opportunities tend to have ready access to quality healthcare, less exposure to environmental hazards, better access to clean water, and improved opportunities to develop better preventative behaviour patterns (Martin, Grant & D'Agostino, 2020). Health improvements through health financing can lead to increased wealth and poverty reduction. Healthier populations are more economically productive, proactive healthcare leads to a decrease in many of the additive healthcare costs associated with lack of care, improved health represents a real economic and developmental outcome in and of itself, and healthcare spending capitalises on the Keynesian 'economic multiplier effect (Friebe, 2020).

Globally, health is an important determinant of economic growth; a healthy population means higher productivity, thus, higher income per head (World Health Organization, 2018). The importance of human capital to economic growth should be emphasized because it serves as a catalyst for economic growth. There is the contribution of health financing to economic growth. Investments in health through health financing can increase labour productivity, thus increasing incomes and a subsequent increase in the population's well-being. When labour is healthy, their incentive to develop new skills and knowledge is higher because they expect to enjoy long-term benefits (Crist, Mora & Engelman, 2017).

However, when the labour force is characterised by workers with poor health, they turn to have an adverse effect on productivity; this explains the disparity in development in different regions of the world (Piabuo & Tieguhong, 2017). Fifty percent of the economic growth divergence between developing and developed countries is attributed to ill-health and low life expectancy (World Health Organization, 2018). Asian countries are increasingly tackling economic growth by improving health sector service delivery. For example, India's economic growth plan aims to raise economic growth and improve health care through health financing (Meheus & McIntyre, 2017).

In the United States of America (USA), it has been estimated that the increase in life expectancy has contributed an additional United States dollar (USD) 3.2 trillion per year to the national economy (after accounting for increased healthcare costs during that period) (Gordon, 2016). Half of the overall economic growth in the USA can be attributed to improvements in health, as for every additional year of education attained through improved health status, a 15% higher starting wage and a doubling of the rate of subsequent salary increase was attained (Nordhaus, 2020).

In developing countries, a 40% increase in life expectancy is associated with a 1.4% increase in Gross Domestic Product (GDP) per capita, and malnutrition worldwide impacts global GDP negatively by up to 4.7% (Mirvis, 2019). Half the difference between the economic growth rate of the least developed nations in Africa and that of the high-growth countries of East Asia can be ascribed to a combination of disease, demography and geography (World Health Organization, 2019).

The importance of health as a key aspect of the development and economic well-being of individuals and nations is increasingly being recognised in Africa (Annan *et al.*, 2021). This can be seen from a series of reforms by African countries to increase health financing to meet quality health. Developing a sound system for financing health care is one of the key mechanisms to show leaders' commitments and political will and their ability to translate these commitments into results. The desire to develop strong health financing systems is a common objective of all countries. However, the increasing cost of health care, accompanied by the poor economic performance of African economies, makes it difficult to meet this objective (Shackleton, Shackleton & Kull, 2019). The majority of African countries face a severe problem of scarcity of funds to provide quality health care services, with the average total health expenditure in African countries being at US$ 135 per capita, which is only 4.2% of the US$ 3150 spent on health in an average high-income country (World Health Organization, 2020).

Constraints of financing health care in Africa arise principally from the mechanisms and strategies employed in financing health care. More than 40% of total health expenditure is characterised by out-of-pocket household payments, which is a very regressive method of financing health care (Dye *et al.*, 2015). This is principal because reliance on this form of payment creates financial barriers to accessing health services,

increasing the risk of impoverishment. These flaws in healthcare financing account for inefficiencies and disparity in the allocation of healthcare services among nations and between rural and urban areas. The out-of-pocket spending in Botswana is only 8% of the total health expenditure against an average 50% for most low and middle-income countries in Africa. In contrast, Government expenditure on health stands at around US$ 446 per capita, which is higher than the African Region's upper middle-income average of US$ 228 per capita and comparable to that of the upper middle-income countries in the world (Piabuo & Tieguhong, 2017).

One of the important drawbacks to funding of Sub-Saharan countries is poor governance, thus measures to assure a fluid target based expenditure is imperative (Piabuo& Tieguhong, 2017). In countries where poor governance is alarming, as the World Bank states, increasing public spending both from external donors and the government does not necessarily lead to the desired development outcomes (World Health Organization, 2018). Performance based financing can be an important mechanism that potential donors and government agencies can use. It is also believed to increase transparency and accountability in achieving targets (Meessen *et al.*, 2011). It improves the allocative efficiency of resources especially in low-income developing countries where resources are quite limited. Thus an efficient financing mechanism with greater emphasis on the processes leading to the performance goal.

Kenya being part of Africa has recognised the importance of health as a key aspect of economic growth and has come up with Kenya's Vision 2030 (Omamo, Rodrigues & Muliaro, 2018). The goal of Kenya's Vision 2030 for the health sector is to provide equitable and affordable health care at the highest standards to its citizens. Good health is a prerequisite for enhanced economic growth and poverty reduction and a precursor

to realising the vision's social goals. A population's health is critical to a country's development and growth (Health sector working Report, 2012). The provision of health care is seen as a key element of a policy to enhance broad-based economic growth. A country must invest in health, among other areas, if it has to accumulate the human capital necessary for sustainable economic growth. Healthy individuals increase their value in the labour markets. An increase in productivity frees up resources to create new technologies, businesses and wealth, eventually resulting in increased economic growth and human welfare. Health has a positive and significant effect on economic growth (Behuria, 2021).

However, until the Coronavirus Disease 2019 (COVID-19) pandemic, Kenya was one of the fastest-growing economies in Africa, with an annual average growth of 5.9% between 2010 and 2018 (Rwigema, 2020). With a GDP of $95 billion, Kenya recently reached lower-middle income status and has successfully established a diverse and dynamic economy. It also serves as the point of entry to the larger East African market. However, Kenya continues to face significant challenges to sustainable and inclusive economic growth, which have been exacerbated by COVID-19's economic disruptions, alongside long-running challenges, including corruption and economic inequality (Tesso, 2020).

Two-thirds of Kenyans live in poverty, making less than $3.20 per day and have since Kenya's independence. There is a large gap between the rich and poor, with approximately 70 percent of Kenyan families chronically vulnerable due to poor nutrition, food insecurity, and preventable diseases. Many Kenyans suffer from economic inequality while a minority elite continues to exploit their labour, resources, and opportunities (Marcos Barba, van Regenmortel & Ehmke, 2020).

In Kenya, tax revenue is the major source of funds and is a significant major determinant of overall public expenditure (Nganyi, Jagongo & Atheru, 2019). The amount allocated to the health sector by the government needs to be increased to enable it to carry out proper healthcare services. As for instance, over 70% of the Kenyan Ministry of Health (MOH) recurrent budget is used to pay for staff salaries and allowances, leaving only 30% for supplies and other expenses (National development plan 2020). Further, public health expenditure needs to be improved, and there exists a disparity in allocation between rural and urban areas (Mawejje & Francis Munyambonera, 2016).

Kenya's commitment to prioritizing health for economic growth, as outlined in Vision 2030, is central to its goal of providing equitable and affordable healthcare at the highest standards. Historically, Kenya has been one of Africa's fastest-growing economies, averaging 5.9% annual growth between 2010 and 2018 (Rwigema, 2020), with the GDP reaching approximately $108.04 billion in 2023 (Macrotrends, 2023). However, this growth has been uneven and was notably disrupted by the COVID-19 pandemic, which caused a -0.3% GDP contraction in 2020 (Macrotrends, 2023). The country's economic promise is hampered by severe social challenges, as two-thirds of Kenyans reportedly live on less than $3.20 per day (Marcos Barba *et al.*, 2020), and about 70 percent of families are chronically vulnerable due to poor nutrition, food insecurity, and preventable diseases (Marcos Barba *et al.*, 2020). This inequality is compounded by inadequate public health financing: government expenditure on health as a percentage of total government spending has historically stagnated around 6% to 9% (World Health Organization, 2021), significantly below the 15% Abuja Declaration target. Furthermore, over 70% of the Ministry of Health's recurrent budget is consumed by staff salaries, leaving only 30% for supplies and other vital expenses (National

development plan, 2020). Consequently, majorities of Kenyans rely on private financing, with an estimated 60% of the population unable to afford necessary health services (Barasa *et al.*, 2017), thus worsening key health indicators and highlighting the critical knowledge gap regarding the influence of adequate health sector financing on sustainable, inclusive economic growth.

Majorities of Kenyans, therefore, have to rely on financing their health expenditure privately due to cost sharing in the public hospitals (Barasa, Maina & Ravishankar, 2017). However, since they are poor, about 60% of the population needs help to afford the much-needed health services, thus worsening the health indicators of the country. Therefore the problem is the declining economic growth compounded by inadequate health expenditure. Few studies have been done to determine the influence of health sector financing on economic growth in Kenya. This study aims to bridge this knowledge gap.

1.3 Statement of the Problem

Poor economic growth has been a persistent issue in Kenya since 2018. The country's economy has been experiencing a decline in the growth rate for some time now, and this has affected various sectors, including health financing. Statistics show that the health sector in Kenya is underfunded, and with the current economic climate, this may worsen (World Bank, 2021).

According to the World Bank, the GDP growth rate in Kenya has been declining since 2016, with a recorded growth rate of 4.9% in 2017, 4.4% in 2018, and 4.9% in 2019. This trend is worrying and shows that Kenya is struggling to maintain its economic momentum. The government is struggling to provide basic services due to the slow growth rate, and this has had an adverse effect on health financing in the country. Poor

economic growth has limited the government's ability to allocate funds to different sectors. This has resulted in underfunding and low-quality services in the country (World Bank, 2021).

Government revenue collection in Kenya has dropped significantly since 2018, and this has significantly affected financing in the country. Kenya's tax revenue-to-GDP ratio was 17.7% in 2019, down from 18.1% in 2018, and it declined even further due to the COVID-19 pandemic. This reduction in revenue means that the government has less money to allocate to funds, making the already underfunded sectors such as health worse off (Kenya National Bureau of Statistics, 2021). Despite the underfunding, the demand for healthcare services in Kenya continues to grow year after year. With the current economic climate, more people are seeking healthcare services, and the government is struggling to cater to them. This high demand for healthcare services coupled with underfunding has resulted in longer waiting times, lack of drugs and supplies, and poor quality of care (World Health Organization, 2020). Therefore, there is a need for research on the influence of health sector financing on economic growth in Kenya. This study aims to bridge this knowledge gap.

1.4 Research Objectives

The study was guided by both general and specific objectives.

1.4.1 General Objective

The main objective of this study was to analyze the influence of health sector financing on economic growth in Kenya.

1.4.2 Specific Objectives

1. To determine the influence of public health financing on economic growth in Kenya.

2. To establish the influence of health insurance financing on economic growth in Kenya.
3. To explore the influence of households' health financing on economic growth in Kenya.
4. To assess the influence of donors' health financing on economic growth in Kenya.

1.5 Research Hypotheses

H_{01}: Public health financing has no significant influence on economic growth in Kenya.

H_{02}: Health insurance financing has no significant influence on economic growth in Kenya.

H_{03}: Households' health financing has no significant influence on economic growth in Kenya.

H_{04}: Donors' health financing has no significant influence on economic growth in Kenya.

1.6 Significance of the Study

The significance of this study lies in its potential to illuminate the critical issues surrounding health sector financing in Kenya, particularly within the context of the devolved county governments. The Kenyan health sector has faced numerous challenges, including labour strikes, shortages of medical supplies, and inefficiencies in financial management, all of which have adversely impacted the delivery of healthcare services. These challenges have broader economic implications, as they can hinder productivity, increase mortality rates, and impose significant financial burdens on the national economy. This study aims to provide a comprehensive examination of

the role of health financing in shaping economic growth, with particular focus on the effectiveness of health financing policies in the context of Kenya's devolved governance structure.

Health sector reforms, such as the Health Financing Strategy for Universal Health Coverage (UHC) and the devolution of healthcare services to county governments in 2013, have significantly altered the landscape of health financing in Kenya. This study seeks to assess the extent to which these reforms have influenced economic growth through improved health outcomes and more efficient resource allocation. The findings are anticipated to provide valuable insights for policymakers and healthcare administrators, assisting them in refining health financing strategies to address the persistent challenges in the sector. Furthermore, the study is expected to contribute to the academic discourse on health financing by offering an in-depth analysis of its impact on Kenya's economic trajectory, particularly in relation to poverty reduction and sustainable development.

1.7 Justifications for the Study

The selection of Kenya as the focus of this study is justified by the country's unique health financing landscape, characterized by a combination of public financing, private sector contributions, and substantial donor funding. Kenya has undergone significant reforms in its health sector, especially following the devolution of healthcare services, which has placed the responsibility for health financing at the county government level. These reforms have been pivotal in reshaping the allocation of health resources and in determining how effectively the health sector can contribute to broader economic goals, such as poverty alleviation and national development.

The 21-year period from 2000 to 2020 has been strategically chosen to provide a longitudinal perspective on the evolution of health financing in Kenya. This period includes several key developments, such as the introduction of free maternal healthcare in 2003, the establishment of the National Hospital Insurance Fund (NHIF), and the implementation of pilot programs for Universal Health Coverage (UHC). These milestones provide a critical framework for analyzing the impact of health financing on the country's economic performance. By examining the period in question, the study will offer insights into the long-term effects of health sector reforms on economic growth and the extent to which these policies have facilitated or hindered sustainable development.

The study specifically examines four key sources of health financing: public health financing, health insurance financing, household health financing, and donor financing. These variables have been selected due to their integral roles in shaping the overall structure and sustainability of health financing in Kenya. Public financing, primarily through government allocation, constitutes the largest share of health funding, while health insurance particularly through the NHIF has the potential to expand access to essential healthcare services. Household financing represents the financial burden on Kenyan families, especially in rural areas, where out-of-pocket expenditures are high. Donor financing remains crucial for addressing specific health challenges, such as HIV/AIDS, maternal health, and immunization programs. Each of these financing streams interacts with the others, and understanding their collective impact on economic growth is essential for informing future policy decisions.

1.8 Scope of the Study

The study focused on to analyze the influence of health sector financing on economic growth in Kenya. The independent variables were public health financing, health insurance financing, households' health financing and donors' health financing. The dependent variable was economic growth in Kenya. The study was done in Kenya using secondary data. The study was carried out from the year 2000-2020 because there has seen significant changes in both the health sector and the economy of Kenya due to adoption of 2010 constitution, devolution and vision 2030. During this time, there has been a major increase in government spending on health, as well as a growth in the private health sector. The economy of Kenya has also grown significantly during this period, although there have been some setbacks, such as the 2008 financial crisis.

The study was able to capture the long-term impact of health sector financing on economic growth. This is important because the effects of health financing on economic growth may not be immediate. It may take several years for the benefits of increased investment in health to be realized in terms of economic growth.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

This chapter focuses on literature review. It discusses the concepts, theoretical literature, empirical literature, conceptual framework, summary of literature, critique of existing literature and literature gaps.

2.2 Key Concepts

This section reviewed key concepts which included economic growth and concept of health financing.

2.2.1 Concept of Economic Growth

Economic growth is an increase in the capacity of an economy to produce goods and services, compared from one period of time to another (Cavusoglu, 2016). Economic growth can be measured in nominal terms (not adjusted for inflation) or real terms (adjusted for inflation). It is usually calculated as the percent rate of increase in the real GDP (Igwebuike, Udeh & Okonkwo, 2019). Economic growth is important because it generally leads to higher incomes, improved living standards, and a higher material quality of life for individuals (Lee, Xu & Wu, 2020).

Economic growth can be influenced by various factors, including technological advancements, investment in physical and human capital, improvements in infrastructure, favorable government policies, and international trade (Moroz *et al.*, 2021). Technological advancements can lead to increased productivity, which can boost economic growth. For example, the development of new machines and software can allow businesses to produce more goods and services with the same amount of labor. Investment in physical capital, such as factories and equipment, can also lead to

increased productivity. Investment in human capital, such as education, training health, can also boost productivity by making workers more skilled and knowledgeable and health. Improvements in infrastructure, such as roads, bridges, and airports, can make it easier for businesses to transport goods and services, which can lead to increased economic activity. Government policies can also influence economic growth. For example, government policies that support free trade and investment can create a more favorable environment for economic growth. International trade can also boost economic growth by allowing countries to specialize in the production of goods and services that they are relatively good at producing.

Economic growth can have both positive and negative effects. It can create job opportunities, increase tax revenues for governments, and promote innovation and development (Cheng, Chien & Lee, 2021). This can help to reduce unemployment and improve the standard of living for many people. This can be used to fund public services such as education, healthcare, and infrastructure. Economic growth can promote innovation and development as businesses invest in new technologies and processes. This can lead to new products and services, which can benefit consumers and businesses alike.

However, it can also lead to environmental challenges and income inequality if not managed properly (Cheng, Chien & Lee, 2021).The correlation between economic growth and income inequality is evident both within countries where wealth disparities continue to widen, but also globally where developed nations often exploit underdeveloped ones for their resources which perpetuates an uneven distribution of wealth at a larger scale. Moreover, advancements in technology driven by industrialization has led to irreversible damage inflicted upon environment including

air pollution due to increased car usage or deforestation caused by agricultural activities; all these factors threaten our planet's sustainability if left unchecked.

2.2.2 Concept of Health Financing

Health care financing is the mobilisation of funds for health care services (Chireshe & Ocran 2020). It is the provision of money, funds or resources to the planned activities of the government to maintain people's health. These activities encompass the provision of medical and related services geared toward maintaining good health. The amount of resources allocated for health care in a country is said to be a reflection of health value placement in respect of other categories of goods and services. It has been argued that the nature of health care financing defines the structure and the behaviour of different stakeholders and quality of health outcomes (Cave, Kurz & Arlett, 2019).

Health financing is a core function of health systems that can enable progress towards universal health coverage by improving effective service coverage and financial protection (Chu, Kwon & Cowley, 2019). Today, millions of people do not access services due to the cost. Many others receive poor quality of services even when they pay out-of-pocket. Carefully designed and implemented health financing policies can help to address these issues. For example, contracting and payment arrangements can incentivize care coordination and improved quality of care; sufficient and timely disbursement of funds to providers can help to ensure adequate staffing and medicines to treat patients (Kutzin, Yip & Cashin, 2016).

World Health Organization (WHO)'s approach to health financing focuses on core functions: revenue raising (sources of funds, including government budgets, compulsory or voluntary prepaid insurance schemes, direct out-of-pocket payments by users, and external aid). pooling of funds (the accumulation of prepaid funds on behalf

of some or all of the population). purchasing of services (the payment or allocation of resources to health service providers)

The pattern of health financing is thus linked to the provision of health services. There are various means of health care financing existing across the world, including Nigeria (Assa & Calderon, 2020). These sources include tax-based public sector health financing, household out-of-pocket health expenditure, the private sector (donor funding), health insurance among others. External financing of health care includes grants and loans from donor agencies like the World Bank, the World Health Organization, European Union among others (Olayiwola, Oloruntuyi & Abiodun, 2017). Tax-based health financing is derived from proceeds of tax-based revenue of government across all levels and sectors. Government financed health care is largely a function of its revenue base. In essence, there is a strong positive relationship between the proportions of tax-based health spending and the progressivity of total health expenditure (Abásolo, Saez & López-Casasnovas, 2017).

One of the major advantages of tax revenue is the pooling of health risks across a large contributing population and contributions are spread over a larger share of the population. Out-of-pocket (OOP) health expenditure is the imposition of user-charges at the point of consuming health care services (Masiye, Kaonga & Kirigia, 2016). Out-of-pocket payment also known as household health expenditures accounted for more than 90% cost of accessing health care in Nigeria. Private sector health financing includes donor funding and Public-Private Partnership (PPP) (Ghimire, Ayer & Kondo, 2018). The health donors include United Nations Children's Fund (UNICEF), the World Bank, United Nations Development Programme (UNDP) and Joint United Nations Programme on HIV/AIDS (UNAIDS) among other institutions. The

contribution may be in terms of loans and grants, commodities (drugs, medical equipment), technical expertise, training, research funding among others. Government donation and concession loans (include about 25% non-reimbursement components) is the Official Development Assistance (ODA) that constitute major source of external financing for the health sector in the developing countries (Lee, 2020).

Examples of health-oriented donor agencies are United States Agency for International Development (USAID), the UK's Department for International Development (DFID), Social Development Committee (SDC), Agence Francaise de Development (AFD), Directorate-Genera for International Cooperation (DGIS) among others (Taylor, Schumacher & Davis, 2016). There are also major global public-private partnerships that focus on specific diseases or health conditions which include the Global Fund, the Medicines for Malaria Venture, and the Partnership for Maternal Newborn and Child Health among others. However, a challenge of private sector health care financing is the duplication of financing efforts by the donor agencies and the lack of global coordination among donor agencies in providing aids on health care to the developing countries (Shawar & Crane, 2017).

The principal functions of financial health are to ensure that organizations are held accountable for their financial health (Zietlow *et al.*, 2018). Ksendzova *et al.* (2017) concluded that financial health is reliable and appropriate to evaluate financial health. The Charity Navigator in United Kingdom uses program service ratio and fundraising ratios as a means of measuring the financial health. Program service ratio refers to budget burn out rates on development expenditure obtained by dividing development expenditure and the total expenditure. Fundraising expenses is a ratio of fundraising expenses over the total expenditures (Abou Taleb & Al Farooque, 2021).

Pirozzi and Ferulano (2016) indicate that health sector can use health financing measurement to obtain control of local office efforts and to get the whole organization to work towards the same mission and goals. Budgetary participation affects financial health negatively. The study further observed that organizations to perform creditably, budget and budgeting should facilitate effective utilization of available funds, and provide a benchmark to measure and control financial health.

Health care financing entails the collection of financial resources to sustain the delivery of health care services (Chireshe & Ocran, 2020). Government funding is provided to support the planned activities that are intended to uphold public health. These activities encompass the delivery of medical and associated services with the objective of promoting and maintaining optimal health. The distribution of resources for healthcare within a nation is seen as a reflection of the level of importance placed on health relative to other types of goods and services. The correlation between health care financing and the structure, behavior, and quality of health outcomes of different stakeholders has been a topic of discussion (Cave, Kurz & Arlett, 2019).

Health financing is a crucial component of health systems that can support the attainment of universal health coverage by improving the quality and availability of services and protecting against financial burdens (Chu, Kwon & Cowley, 2019). Presently, a substantial proportion of individuals are unable to avail themselves of services due to the financial burden. Many people encounter inadequate service even though they have made direct payments. Strategically designed and implemented health financing policies can efficiently address these issues. Contractual and payment agreements can establish motivations for the coordination of care and improve the overall quality of healthcare. Ensuring prompt and sufficient allocation of funds to

healthcare providers is crucial for maintaining adequate staffing levels and availability of medicines for patient treatment (Kutzin, Yip & Cashin, 2016).

The World Health Organization (WHO) adopts a health financing approach that revolves around core functions: Revenue raising encompasses the diverse methods through which funds are acquired, including government budgets, mandatory or voluntary prepaid insurance schemes, direct payments made by users, and external assistance. Pooling of funds is the act of gathering and amassing prepaid funds on behalf of a portion or the entirety of a population. Procurement of services refers to the process of allocating resources or making payments to health service providers.

The health financing pattern is intricately linked to the provision of health services. Health care financing methods exhibit global variation, including within Nigeria (Assa & Calderon, 2020). The sources of health financing include tax-based public sector funding, household out-of-pocket health expenditure, private sector contributions (donor funding), and health insurance, among other sources. External financing of health care refers to the process of obtaining funds for health care services from external sources, such as donor agencies like the World Bank, the World Health Organization, and the European Union (Olayiwola, Oloruntuyi & Abiodun, 2017). Government-funded health financing relies on tax revenue generated at all levels and across all sectors. The financing of publicly-provided healthcare relies primarily on its revenue streams. The relationship between the percentage of health spending financed by taxes and the level of progressiveness in total health expenditure is strongly correlated (Abásolo, Saez & López-Casasnovas, 2017).

One major advantage of tax revenue is the pooling of health risks among a significant contributing population, with contributions spread out among a larger segment of the

population. Out-of-pocket (OOP) health expenditure pertains to the direct payment of fees by individuals for healthcare services received (Masiye, Kaonga & Kirigia, 2016). The cost of healthcare in Nigeria is primarily covered by household health expenditures, also known as out-of-pocket payments, which account for more than 90% of the total expenses. Private sector health financing includes financial assistance from donors and Public-Private Partnerships (PPP) (Ghimire, Ayer & Kondo, 2018). The health donors comprise institutions such as UNICEF, the World Bank, UNDP, and UNAIDS. Possible forms of contribution include loans, grants, commodities (such as drugs and medical equipment), technical expertise, training, and research funding, among other options. Official Development Assistance (ODA) is a form of external financing for the health sector in developing countries. It consists of government donations and concession loans, which usually have non-reimbursement components of about 25% (Lee, 2020).

Several donor agencies that prioritize health include the United States Agency for International Development (USAID), the UK's Department for International Development (DFID), the Social Development Committee (SDC), the Agence Francaise de Development (AFD), and the Directorate-General for International Cooperation (DGIS), among others (Taylor, Schumacher & Davis, 2016). Moreover, there are notable global partnerships between public and private organizations that specifically focus on particular diseases or health conditions. Some of these organizations include the Global Fund, the Medicines for Malaria Venture, and the Partnership for Maternal Newborn and Child Health, among others. An obstacle in financing private sector health care is the redundant allocation of funds by donor agencies and the absence of global coordination among these agencies in supporting health care in developing nations (Shawar & Crane, 2017).

2.3 Theoretical Review

The study was guided by transactions Endogenous theory, Wagner's theory and Solow-Swan Exogenous Growth Model.

2.3.1 Endogenous Economic Theory

This study was guided by Endogenous Economic Theory developed by Romer in 1990. The theory states that economic growth of a country is primarily the result of internal forces, rather than external ones. It argues that improvements in productivity can be tied directly to faster innovation and more investments in human capital from governments and private sector institutions. There is need to improve the health quality of human capital through health financing in order to enhance economic growth.

As such, they advocate for government and private sector institutions to nurture health care initiatives and offer incentives for individuals and businesses to be more creative, such as research and development (R&D) funding and intellectual property rights. Government policy's ability to raise a country's growth rate if they lead to more intense competition in markets and help to stimulate product and process health financing. There are increasing returns to scale from capital investment, especially in investment in health. The protection of property rights and patents is essential to providing incentives for businesses and entrepreneurs to engage in R&D. Investment in human capital is a vital component of growth.

One of the biggest criticisms aimed at the endogenous growth theory is that it is impossible to validate with empirical evidence. The theory has been accused of being based on assumptions that cannot be accurately measured.

2.3.2 Wagner's Theory

The study was also guided by Wagner's Theory, developed by Wagner in 1883. The Theory states a long-run relationship exists between increased state spending on health and economic growth. The Theory indicates that as public expenditure on health rise, national incomes expands. The law hence predicts that a country can develop its industrial economy by increasing its share of public spending in relation to the gross national product. Musgrave (1969) noted that as progressive states industrialize, they increase the public-sector expenditure, and hence the share of the public sector in the national economy increases. This increase in state expenditure spurs demands in the funded sector, enabling other sectors to increase their production to cater for the created demand.

Wagner (1883) postulated that when the state increases its expenditure in sectors such as health and infrastructure development, this growth triggers growth in the state's economic sectors. Wagner, therefore, fronted the argument that a cause-and-effect relationship exists between the growth of a country's public sector and industrialization and the economy's growth.

Wagner's Theory is applicable in the study since it provides a deeper insight into how health financing can spur increased production in other sectors seeking to satisfy the increased demand in the health sector. This spurs productivity increases in different sectors, thus leading to increased economic growth. Wagner (1883) postulates that the relative growth of the government sector induces industrialization and production in the economy, which leads to economic growth and development. Moreover, government investment in the health sector is expected to influence economic growth in two aspects. The first is when the investment leads to improved health outcomes for the workforce

which makes the workforce more productive. Secondly, government investment in the health sector is expected to increase demand for products and services in the health sector, which in turn is expected to enhance production in other sectors. This study hence hypothesized that health financing would positively affect economic growth.

2.3.3 Solow-Swan Exogenous Growth Model

The study was guided by Solow-Swan Exogenous Growth Model developed by Solow in 1956. The model explains long-run economic growth as a function of labour, capital accumulation and population growth, and productivity growth because of technological progress. The model recognizes human capital as a significant tool for continued endogenous growth. Human capital is accumulated through new skills, knowledge and improved efficiency and productivity of the workforce. In a study estimating the influence of health financing on economic growth, the citizenry's health is considered a constituent of human capital in the aggregate production function.

A diseased labour force has poor performance and high dependence, negatively affecting productivity. When proper healthcare and attention are not available in a country, some diseases can affect the population, which can lower the labour force's productivity (Yu, Xia & Li,2020). Moreover, increased contribution to production in the economy and diseased population negatively affect the economy as it spends what has already been produced without adding any value to the aggregate production. Moreover, since the diseased population requires more care, they waste man hours considering the labour force that cares for such a sickly population. An increase in health financing by the government and non-governmental actors is expected to lead to an increase in healthcare services. This would, in turn, lead to increased health

outcomes for the population. A healthy population is a productive population, and hence productivity would improve.

The Solow-Swan Exogenous Growth Model (Solow, 1956) remains a foundational framework in economic growth theory, explaining long-run economic growth through the accumulation of labor, capital, and technological progress. However, this model has limitations that should be critically examined, especially when applied to health financing and its relationship with economic growth.

One major limitation of the Solow-Swan model is its assumption that technological progress is exogenous, meaning it occurs outside of the economic system and is not influenced by economic or policy factors. In the context of health financing, however, technological progress in healthcare can be influenced by policy decisions, investments, and public health initiatives (Mankiw, Romer, & Weil, 1992). This assumption can be seen as a significant shortcoming, particularly in studies focusing on health, where technological advancements (e.g., in medical technology) directly affect health outcomes and productivity.

The Solow-Swan model treats human capital as a passive factor that accumulates through the exogenous factor of technological progress. However, in more recent growth theories, such as the Endogenous Growth Theory (Romer, 1990), human capital is viewed as an active driver of economic growth. The Solow model's treatment of human capital does not fully account for the role of education, training, and health investments in fostering long-term growth. In the context of health financing, the accumulation of health as human capital is more dynamic and can be influenced by health policy, healthcare investment, and societal choices (Barro & Lee, 2013).

The Solow-Swan model assumes that growth is driven solely by capital and labor accumulation, ignoring the role of institutions, governance, and public policy. However, in the real world, factors like governance quality, healthcare policies, and institutional frameworks significantly affect health financing and economic growth. In countries with weak governance, even large amounts of health financing may not lead to improved health outcomes due to inefficiencies and corruption (Acemoglu & Robinson, 2012). The Solow model fails to address the importance of these institutional variables in the context of health.

The Solow-Swan model assumes that capital and labor will eventually converge across regions, leading to balanced growth. However, this assumption does not hold in many countries, especially when health financing disparities exist. In the case of health financing, some regions may experience better health outcomes due to more substantial investments in healthcare, while others remain underserved. This uneven distribution of resources can exacerbate income inequality and hinder overall economic growth, a nuance that the Solow-Swan model overlooks (Piketty, 2014).

The study applies the Solow-Swan Exogenous Growth Model to analyze the relationship between health financing and economic growth, with the assumption that health is a component of human capital. While the model provides a basic framework to understand how investments in health might improve labor force productivity, the model's limitations, particularly its treatment of technological progress and human capital, should be acknowledged. For instance, health financing can directly influence the efficiency of the labor force by reducing disease burden, as healthier individuals are more productive and contribute more effectively to economic output (Bloom & Canning, 2000). However, the endogenous growth models would offer a more

comprehensive understanding by accounting for the active role of health policy and investments in shaping human capital.

2.4 Empirical Review

The relationship between public health financing and economic growth in Kenya has garnered considerable attention in both academic and policy circles. This review aims to examine existing empirical studies that explore the influence of various forms of health financing public health expenditure, health insurance, household contributions, and donor financing on the country's economic growth. Each objective of this review aligns with examining different dimensions of health financing, focusing on how public health funding, both from government and non-governmental sources, contributes to long-term economic performance in Kenya. This literature review is organized according to the specific objectives of the study, including the influence of public health financing, health insurance financing, household health contributions, and donor financing on economic growth in Kenya. By synthesizing findings from various studies, this review aims to offer a comprehensive understanding of the role that health financing plays in shaping Kenya's economic development.

2.4.1 Public Health Financing and Economic Growth

Public finance is the economic concept that facilitates the fulfillment of governmental functions by focusing on policies to guide resource utilization and financing strategies such as borrowing and taxation (Finkler, Calabrese & Smith, 2022). Public health, as a public sector economic activity, directly associates with these theories and concepts. Public health financing has significant effects on economic growth by reducing costs associated with poor health. According to Chantzaras and Yfantopoulos (2018), poor health reduces productivity and adds an unnecessary burden on the economy. The cost

of ill health, both in terms of direct healthcare spending and indirect costs, such as lost productivity, can be enormous. With improved public health financing, governments can address these costs and invest in productive sectors of the economy, promoting economic growth.

Chantzaras and Yfantopoulos (2018) aimed to analyze the impact of poor health on economic performance and how improved public health financing can alleviate these costs. The study focused on global economies with an emphasis on developing nations, including Kenya as a case study. The period of study spanned from 2000 to 2015, and the authors employed a mixed-method approach, combining quantitative economic modeling with qualitative case study analysis. Their findings indicated that poor health has a significant negative impact on economic productivity, emphasizing the positive role of public health financing in reducing economic burdens caused by ill health.

Additionally, public health financing has been found to have a positive impact on economic growth by reducing health-related poverty. Hallegatte *et al.* (2020) highlight that health shocks can push households into poverty, resulting in a decline in economic growth. By funding public health programs, governments can prevent health shocks and reduce the incidence of poverty, thereby promoting economic growth. The purpose of Hallegatte *et al.* (2020) was to examine the relationship between health shocks and poverty, and how public health financing can mitigate these impacts. The study focused on developing countries, including Kenya, and analyzed data from 2000 to 2018. The authors used a longitudinal regression model to analyze the impact of health shocks on economic growth. The study found a significant negative relationship between health shocks and economic growth, demonstrating that health financing can reduce poverty and boost economic stability.

Financing mechanisms for public health in developing countries are critical in promoting economic growth. According to Barlow (2020), public health financing can be sourced from both domestic and external funding sources. Domestic sources of public health financing include government allocations from national budgets. Barlow (2020) aimed to investigate the role of domestic and external funding in public health financing and its impact on economic growth. The study focused on low- and middle-income countries (LMICs), with a focus on Kenya, and covered the period 2000–2020. Barlow employed an econometric model to analyze the impact of domestic health financing on economic growth. The study found a positive correlation between public health financing and economic growth, noting that domestic financing sources were crucial for sustaining long-term health investments.

However, public health financing faces several challenges that impede its effective operation. According to Wagstaff *et al.* (2018), low public health financing, inadequate allocation of resources, and inefficient use of available resources have undermined the delivery of public health services in many countries. As a result, the health of the population suffers, leading to reduced productivity and economic growth. Wagstaff *et al.* (2018) sought to assess the barriers to effective public health financing and its implications for health outcomes. The study examined several African countries, including Kenya, from 2005 to 2015. The study employed a qualitative approach, interviewing health financing experts and reviewing national health expenditure reports. The study highlighted the inefficiencies in public health financing, pointing to poor resource allocation as a key factor hindering health improvements and economic growth.

Additionally, public health financing faces challenges in ensuring equity in service delivery. According to Krumholz *et al.* (2018), access to public health services is often determined by income status, geographic location, and other socio-demographic factors, leading to disparities in health outcomes. Ensuring equitable access to public health services requires addressing the root causes of these inequities and fostering a culture of accountability and transparency in the health sector. The purpose of Krumholz *et al.* (2018) was to examine the equity of health service delivery and its impact on health outcomes and economic growth. The study focused on African nations, with a particular focus on Kenya, and analyzed data from 2005 to 2018. Krumholz *et al.* used a combination of statistical analysis and fieldwork to assess equity in healthcare delivery. The study found significant disparities in access to health services, which were linked to income inequality and geographic factors, ultimately affecting economic productivity.

To ensure that public health financing contributes to economic growth, several strategies must be considered. According to Naher *et al.* (2020), increasing domestic funding for public health services and addressing inefficient use of resources can improve public health financing. Additionally, improving health outcomes through increased access to public health services and reducing inequities can have positive economic impacts. Strategic partnerships between governments, donors, and other stakeholders can also play a critical role in promoting public health financing. Naher *et al.* (2020) aimed to identify strategies for improving public health financing to promote economic growth. The study focused on LMICs, particularly Kenya, and reviewed studies conducted between 2010 and 2020. The research used policy analysis and comparative case studies to assess the effectiveness of various financing strategies. The

study highlighted the importance of efficient resource allocation and equitable healthcare delivery to maximize the economic benefits of health investments.

2.4.2 Health Insurance Financing and Economic Growth

Health insurance financing is essential for improving access to healthcare and fostering economic growth. There are two primary types of health insurance financing: private and social. Private health insurance is funded by premiums paid by individuals or employers, which can be subsidized by the government, but they are typically not free. These plans vary widely in terms of coverage and cost. In contrast, social health insurance is funded by taxes paid by employers and employees, which are often progressive, meaning that higher-income individuals pay a higher percentage of their income in taxes. Social health insurance typically covers a broader range of services and tends to be more affordable than private health insurance plans.

According to Bodenheimer (2019), health insurance financing, particularly through schemes such as private community health insurance, can be efficient in collecting non-salary-related contributions and reducing costs for the poorest populations at the point of delivery. The purpose of Bodenheimer's (2019) study was to assess the efficiency of private health insurance schemes in improving access and reducing financial barriers to healthcare for underserved populations. The study focused on community health insurance schemes in developed and developing countries, including Kenya. The period of study was from 2015 to 2019, and the author utilized a qualitative approach to analyze case studies of successful health insurance schemes. The results indicated that private health insurance could significantly alleviate financial barriers to healthcare, especially in underserved populations, although coverage gaps and affordability issues remained significant challenges.

Private health insurance is increasingly recognized as a key health partner, especially in countries where state institutions are weak or unable to meet all healthcare needs due to financial and human resource constraints. Mladovsky (2020) argues that private sector participation in healthcare can enhance efficiency by alleviating patient loads at public facilities, reducing wait times, and improving overall service delivery. The purpose of Mladovsky's (2020) study was to explore the role of private health insurance in improving healthcare delivery and efficiency in LMICs. The study focused on Kenya, Nigeria, and India between 2010 and 2018, employing a mixed-methods approach to assess the impact of private health insurance on service delivery. The findings highlighted that private sector involvement in healthcare significantly improved service efficiency, although the challenge of maintaining equity in access remained a concern.

A financing mechanism that has gained significant traction is social health insurance, which involves pooling risks and resources to provide coverage for a broad range of health services. Kutzin and Yip (2018) discuss how social health insurance programs can promote economic growth by reducing healthcare costs, improving access to health services, and increasing productivity. Their study aimed to analyze the impact of social health insurance on economic growth in LMICs. The study covered the period from 2005 to 2015 and focused on countries like Kenya and India. Kutzin and Yip employed a longitudinal econometric model to assess the effects of social health insurance on healthcare outcomes and economic productivity. The results demonstrated that social health insurance can promote economic growth by improving health outcomes, thereby increasing productivity.

However, the private health insurance sector in Kenya, which controls about 60% of the market, presents challenges related to coverage and equity. According to Munge, Mulupi, and Chuma (2018), private health insurance in Kenya is primarily concentrated among wealthier individuals, with a concentration index of 0.91 indicating that it is largely inaccessible to lower-income groups. The purpose of Munge *et al.*'s (2018) study was to assess the distribution and equity of private health insurance coverage in Kenya. The study analyzed data from 2005 to 2015, using regression analysis to examine the concentration of private health insurance among different income groups. The findings showed that while private health insurance is more common among wealthier individuals, there is a need for more inclusive policies to ensure equitable access across socio-economic groups.

In terms of public health financing, the National Hospital Insurance Fund (NHIF) in Kenya, which acts as the country's social health insurance scheme, has faced challenges in expanding coverage. Mavole (2019) analyzed the growth and challenges of the NHIF from 2005 to 2010, highlighting its role in increasing health coverage and its efforts toward universal health coverage (UHC). The study found that while the NHIF increased coverage from 9.1% of the population in 2005–06 to higher levels by 2010, issues such as governance, capacity, and the political economy of healthcare financing continued to hinder its expansion. The study suggested that improving the NHIF's capacity and governance is critical to expanding access and improving healthcare outcomes in Kenya.

One of the significant barriers to effective health insurance financing in Kenya is the high reliance on out-of-pocket (OOP) payments, which remains a substantial issue for the majority of the population. The shift from OOP payments to universal access to

healthcare through the NHIF has been a key goal for the government, but this transition has faced substantial challenges. According to Chuma and Okungu (2011), the shift towards universal healthcare financing through NHIF is impeded by issues such as political opposition, lack of capacity, and governance challenges. The purpose of the study was to examine the barriers to achieving universal health coverage through the NHIF. The study reviewed the period 2000–2010 and used qualitative methods, including interviews with policymakers and stakeholders, to assess the main obstacles to NHIF expansion. The study found that although progress was made, political and governance challenges persisted, hindering the full realization of UHC.

Private health insurance, although often a secondary source of financing, can play a supplementary role by providing additional coverage for services not included in public insurance packages. However, issues such as adverse selection, moral hazard, and risk selection persist, as noted by Salim and Hamed (2018) and Hsiao (1995). Salim and Hamed (2018) identified adverse selection as a major challenge, where private health insurance tends to attract sicker populations, driving up the cost of premiums. Similarly, Hsiao (1995) discusses how high administrative costs and inefficiencies within the private health insurance sector can impede the goal of providing affordable and equitable health coverage. Both studies focused on Kenya and other LMICs, with periods of study ranging from 2010 to 2015, employing a mix of qualitative and quantitative methods to analyze the barriers to achieving effective private health insurance schemes.

2.4.3 Households Health Financing and Economic Growth

Out-of-pocket (OOP) payments are defined as direct payments made by individuals to healthcare providers at the time of service use (Jalali, Bikineh & Delavari, 2021). OOP

health expenditures increase the financial burden on households, especially when they are forced to borrow funds from financial institutions to cover medical costs. OOP payments are considered expenditures borne directly by the patient and include cost-sharing, informal payments to healthcare providers, and voluntary health care payment schemes (Aregbeshola & Khan, 2018). These out-of-pocket expenses can significantly impact household income and savings, pushing many families into poverty, especially in low-income countries where OOP is a primary form of health financing (Dumka *et al.*, 2022).

Aregbeshola & Khan (2018) focused on the financial impact of OOP expenditures on households in low-income countries, analyzing whether OOP payments increase household vulnerability to poverty. The study used cross-sectional data from 2016 to 2020, using econometric models to evaluate the correlation between OOP payments and household income levels. The study found that households with higher OOP payments were more likely to fall into poverty, as the costs of healthcare consumed a significant portion of their income. The study emphasized that OOP payments are regressive, with lower-income households facing disproportionately higher healthcare costs.

Countries without universal insurance coverage expose citizens to catastrophic health expenditure (Callander, Fox & Lindsay, 2019). In these countries, households face both direct and indirect healthcare costs, including transport expenses and loss of income due to illness. These expenditures can form a large proportion of a household's total budget, potentially driving them into poverty (Bonafede *et al.*, 2018). The purpose of Callander, Fox, and Lindsay's (2019) study was to analyze the relationship between the lack of universal healthcare coverage and the economic vulnerability of households to

catastrophic health expenditure. Their study covered the period 2010-2019 and used longitudinal data from various developing nations, including Kenya. The findings highlighted that catastrophic health expenditure is a significant cause of household impoverishment in countries without universal health coverage, underlining the importance of health financing reforms to reduce the burden on households.

To cope with health expenditure, people adopt various strategies depending on the magnitude of the costs incurred (Hailemichael *et al.*, 2019). Some households may use savings, sell assets, borrow from family and friends, or even seek loans from financial institutions using collateral (Zhao *et al.*, 2021). The purpose of Hailemichael *et al.* (2019) was to investigate coping mechanisms employed by households facing high healthcare expenditures. The study, conducted in Ethiopia, used a mixed-method approach to assess household strategies. The results indicated that the most common coping strategies involved using savings, borrowing, and reducing consumption, which in turn affected households' long-term financial stability.

OOP healthcare payments can prevent households from seeking necessary medical care, leading to delays in treatment and worsening health outcomes (Salari, Di Giorgio, Ilinca & Chuma, 2019). Reducing OOP payments could contribute to a significant reduction in income poverty (Aregbeshola & Khan, 2018). The World Health Organization (2020) has stressed that high levels of OOP payments violate the principles of vertical equity in health financing, which requires that payments be progressive so that wealthier households contribute more towards healthcare financing. The WHO estimates that catastrophic OOP health expenses affect 150 million people globally every year, pushing an additional 100 million people into poverty (Salari *et al.*, 2019). The purpose of the WHO's (2020) report was to provide a global perspective

on the impact of catastrophic health expenditure, using data from 2015–2020. The findings reinforced the need for health financing systems that protect households from high medical costs.

Sepehri *et al.* (2023) conducted a longitudinal study in rural Vietnam to assess the relationship between household economic growth and healthcare access. The study found that households experiencing economic growth were more likely to use higher-quality healthcare services while spending a smaller percentage of their income on healthcare. The study, which focused on rural areas of Vietnam from 2010 to 2020, employed both qualitative interviews and quantitative survey data to assess the changes in health service utilization. The results suggested that economic growth at the household level improves access to health services, but disparities in income persist, which continue to impact healthcare access in lower-income households.

In Zambia, Ndlovu and Haabazoka (2024) investigated the role of household contributions to health financing in low-income settings, focusing on the financial burden of OOP payments. The study found that out-of-pocket expenses place a significant financial burden on households, especially in rural areas where healthcare access is already limited. The study, conducted between 2015 and 2020, used household survey data and econometric analysis to estimate the impact of OOP payments on household welfare. The study concluded that OOP payments exacerbate inequities in healthcare access and contribute to persistent disparities in health outcomes.

A study by Michael *et al.* (2019) in Ghana explored innovative financing strategies such as health savings schemes and social health insurance. The research showed that such schemes improved equity in healthcare access and allowed more low-income households to afford healthcare services. Michael *et al.* (2019) analyzed data from

Ghana's National Health Insurance Scheme (NHIS) from 2010 to 2020 and used a mixed-method approach to assess the equity impacts of these financing mechanisms. The study highlighted that health savings schemes and insurance programs contributed significantly to increasing healthcare access for poorer households.

In Kenya, the National Health Insurance Fund (NHIF) has played a pivotal role in improving healthcare access for households. Mbau *et al.* (2020) conducted a study to assess the impact of health insurance on health outcomes in Kenya. The study found that insured households had better access to health services and improved health outcomes compared to uninsured households. The research, conducted between 2015 and 2020, utilized both household surveys and health facility data to assess access to care. The study emphasized that expanding insurance coverage would significantly reduce financial barriers to healthcare, particularly for low-income and vulnerable populations, contributing to better health outcomes.

The empirical evidence from these studies reveals a complex relationship between household health financing and economic growth. While economic growth can enhance health financing and improve access to services, significant disparities persist, especially in low-income and rural settings. Addressing these disparities through innovative financing mechanisms and strategic investments in health is essential for achieving equitable health outcomes and fostering sustainable economic growth globally, in Africa, and specifically in Kenya.

2.4.4 Donors Health Financing and Economic Growth

Donor funding is a significant component of healthcare financing in Kenya, providing essential support to both government health budgets and specific health programs, such as HIV/AIDS. In 2009/10, donor funding accounted for approximately 32% of total

health spending, but this decreased to 22% in 2015/2016 (Ministry of Health, 2016). In 2005-06, donor funds contributed 85% of the financing for HIV/AIDS activities in the country. This contribution has grown from 16% in 2001-02 to 35% in 2009-10 (Ministry of Medical Services & Ministry of Public Health and Sanitation, 2010). It is generally believed that an increase in donor funding reduces the reliance on out-of-pocket (OOP) health expenditures, which are a major source of healthcare finance (Jakovljevic *et al.*, 2021). The purpose of the study by Jakovljevic *et al.* (2021) was to assess how donor funding impacts OOP expenditures and health access in developing nations, including Kenya. The research, conducted from 2010 to 2019, utilized time-series analysis to evaluate the correlation between increased donor funding and reduced OOP spending. The study found that as donor funding increases, OOP expenditures decline, providing more financial protection for households and improving overall access to healthcare services.

Donor assistance is often provided by international multilateral organizations, with goals that include promoting accountability, good governance, and peace in developing countries (Mian & Sufi, 2017). This assistance typically includes capital, goods, or services transferred from donor countries to recipient nations, such as grants or concessional loans (Lukio, 2018). There are various forms of development aid: public (ODA), private (NGOs), bilateral, multilateral, and tied or untied funding (Maingi, 2017). These different forms of assistance can support development projects, including health financing. The purpose of Mian & Sufi's (2017) study was to explore the motivations behind donor assistance and its implications for health systems in Sub-Saharan Africa. Conducted between 2010 and 2015, the study found that donor aid is often motivated by both altruistic and strategic interests, and that it can significantly

impact health outcomes, particularly when aligned with the recipient country's priorities.

However, donor-funded initiatives sometimes face criticism for not aligning with the recipient countries' priorities. Nay (2016) noted that donor nations, through international institutions like the UN, World Bank, and IMF, often exert undue influence over global health policies. The purpose of Nay's (2016) study was to investigate the influence of donor countries on global health governance and policy. Conducted from 2015 to 2019, the study used qualitative methods to analyze the political dynamics between donors and recipients. The study found that donor countries often prioritize their strategic interests, which can lead to a mismatch between the needs of recipient countries and the focus of donor-funded health projects. This misalignment can undermine the effectiveness of health financing and hinder sustainable economic growth.

Donor funding for health is often allocated to specific global health functions or country-specific programs, such as global health funds (Ferrand, 2019). These funds are intended to finance targeted health interventions, such as HIV/AIDS programs or immunization campaigns, but they often come with specific conditions. Neumayr & Handy (2019) explored the rationale behind donor funding, emphasizing the desire to finance global public goods and promote international solidarity. Their study, conducted from 2016 to 2020, utilized case studies from Kenya and other LMICs to assess the impact of targeted donor funding. They found that while donor funding is critical for addressing specific health challenges, its effectiveness is often limited by the narrow scope of the interventions funded, which may not align with broader health system needs.

Gotsadze *et al.* (2019) classified donor funding into two categories: aid for global health functions and country-specific aid. The purpose of the study was to assess the effectiveness of donor funding in health research and development, particularly for diseases affecting impoverished populations. The research, conducted in 2018, employed a combination of data analysis and case studies from Kenya, with a focus on HIV/AIDS funding. The study found that while donor funding has had a positive impact on health outcomes in Kenya, it remains crucial for improving the alignment between donor contributions and the health priorities of recipient countries. The study recommended better coordination between donor organizations and national governments to enhance the effectiveness of health aid.

McDonough and Rodríguez (2020) conducted a scoping review on donor transitions and health financing in countries moving from low to middle-income status. The purpose of the study was to examine the challenges faced by countries in maintaining health system funding as donor contributions decline. The study, conducted from 2015 to 2020, highlighted the need for effective leadership and strategic planning to ensure that health financing transitions from donor support to sustainable domestic funding. The research found that countries transitioning to middle-income status often face significant challenges in maintaining health system stability, which can hinder economic growth. It emphasized the importance of planning for the reduction of donor funding to ensure continued health system sustainability.

Witter *et al.* (2019) discussed the impact of donor funding on health system performance and economic growth. The purpose of their study was to assess the link between donor health financing and health outcomes in low-income countries. The study, conducted between 2016 and 2019, used econometric modeling to analyze the

effect of donor funding on health outcomes and economic growth. The results indicated that donor funding, when properly allocated, can significantly improve health outcomes, which in turn fosters a healthier, more productive workforce and contributes to broader economic development.

Lehoux *et al.* (2019) analyzed global health financing instruments and identified key challenges, such as inefficiencies and a lack of country ownership. The purpose of their study was to evaluate the effectiveness of global health financing instruments and their impact on recipient countries' economies. Conducted between 2015 and 2020, the study found that inefficiencies in donor funding allocation and the lack of country ownership of health financing programs undermined the effectiveness of donor contributions. The study called for greater efficiency in the allocation of funds and better alignment with national health priorities to support sustainable economic growth.

Behera and Dash (2020) found that increased health spending, including donor contributions, correlates with improved economic performance. Their study, conducted in 2019, analyzed the relationship between health financing and economic growth in Kenya. They found that strategically targeted donor funds could improve health system performance and drive economic growth by enhancing labour productivity. The study emphasized the importance of aligning donor funds with national health priorities to maximize their economic impact.

Alice (2024) highlighted the declining trend in donor health funding in Sub-Saharan Africa, with domestic spending failing to compensate for the shortfall. The study revealed that this funding gap poses significant risks to health systems and economic stability in the region. Alice (2024) called for increased domestic health financing and

alternative funding sources to ensure the sustainability of health systems and continued economic development.

Ilesanmi and Afolabi (2022) examined the sustainability of health programs funded by donors in Africa, focusing on the integration of donor funding into national health strategies. The research, conducted from 2017 to 2021, found that without adequate domestic financing, the fragility of health systems could undermine economic growth. The study emphasized the need for robust domestic funding mechanisms and strategic alignment of donor assistance to ensure long-term health system sustainability.

The empirical evidence suggests that while donor health financing plays a crucial role in enhancing health outcomes, challenges such as declining donor support, the need for effective transitions to domestic financing, and the integration of donor funds into national health strategies remain significant hurdles, particularly in Africa and Kenya. Addressing these challenges is essential for leveraging health financing to foster sustainable economic development.

2.5 Literature Gaps

From the reviewed literature, it is evident that minimal studies have specifically addressed the influence of health sector financing on economic growth in Kenya. While several studies on health financing and economic growth have been conducted in various regions, very few focus directly on Kenya's context, particularly with regard to the specific sectors of health financing (such as public, private, household, and donor contributions). Notably, a study by Macaia and Lapão (2017) focusing on African countries, found that 36 out of the 46 countries in Sub-Saharan Africa are facing a shortage of Human Resources for Health (HRH), which significantly impacts the effective allocation and utilization of health financing, but this study did not explore

the direct relationship between health financing and economic growth in Kenya. Another study by Odoemene (2018), which focused on the Niger Delta region, highlighted that much of the available funds are diverted from sustainable development projects, such as factories and regenerative ventures, and instead shared among former militants, thus not contributing to long-term economic growth. While these findings touch on issues related to health and economic outcomes, they do not directly address the influence of health sector financing on economic growth in Kenya. Lastly, a study by Shabbir & Wisdom (2020) found that financial performance is positively and significantly correlated with financial policies regarding financial leverage, dividend policy, and stock market development, but did not explore the impact of health financing on national economic performance.

The current literature lacks comprehensive studies that specifically focus on how different components of health sector financing, such as public health funding, health insurance, household financing, and donor contributions, influence economic growth in Kenya. This gap in the literature has been a motivating factor for this study, which aims to specifically analyze the influence of health sector financing on economic growth in Kenya. To illustrate this gap more clearly, the following table summarizes the results of the studies reviewed for each objective of this study and highlights the key findings. This Table 2.1 also demonstrates the lack of direct focus on the influence of health sector financing on economic growth in Kenya.

Table 2.1 Literature Gaps

Study	Focus Area	Key Findings	Relevance to Health Financing and Economic Growth in Kenya	Gap Identified
Macaia & Lapão (2017)	HRH shortage in Sub-Saharan Africa	36 out of 46 countries in Sub-Saharan Africa face HRH shortages, impacting health service delivery.	While relevant to health sector challenges, the study doesn't explore health financing's link to economic growth in Kenya.	Does not directly relate health financing to economic growth.
Odoemene (2018)	Niger Delta region in Nigeria	Donor funds are misallocated, with former militants benefiting, limiting the potential for economic growth.	Focuses on misallocation of funds in a specific region and does not explore health financing's role in economic development in Kenya.	Does not focus on health sector financing or its impact on economic growth.
Shabbir & Wisdom (2020)	Financial performance and policies	Found a positive correlation between financial performance and policies related to financial leverage, tax policies, etc.	Focuses on financial policies but not specifically on health financing and its direct link to economic growth in Kenya.	Does not focus on the influence of health financing on economic growth.

The above-reviewed studies illustrate that while there are several studies on health and economic growth in different contexts, there is a clear gap in research specifically analyzing how health sector financing across its different components directly influences economic growth in Kenya. The current study aims to fill this gap by providing a focused analysis of the impact of public health financing, health insurance, household health financing, and donor funding on Kenya's economic growth. This gap is critical because understanding how health financing interacts with economic growth in Kenya is crucial for informing policy and enhancing the sustainability of health financing in the country.

2.6 Conceptual Framework

The hypothesized relationship between the independent variables and the dependent variable is depicted in the conceptual framework.

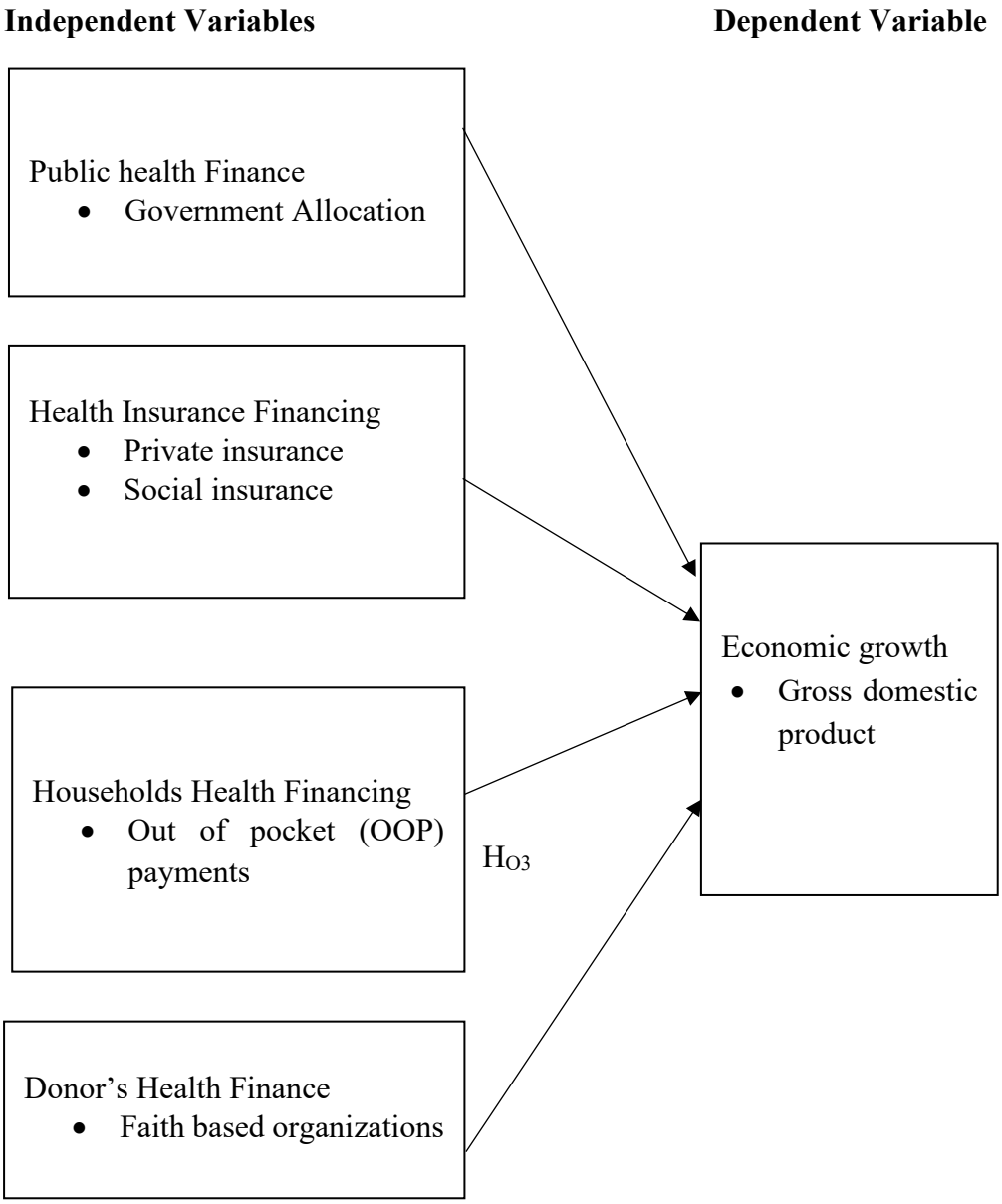

Figure 2.1 Conceptual Framework

The conceptual framework illustrates a conceptual framework for a study investigating how different sources of health financing influence economic growth. The framework identifies four key categories of independent variables the factors hypothesized to cause a change all of which are shown to affect the dependent variable, Gross Domestic

Product (GDP). This structure suggests the study aims to determine the overall impact of a nation's health financing profile on its economic performance.

The independent variables are categorized by their origin. The first two categories, Public Health Finance (specifically Government Allocation) and Health Insurance Financing (including Private and Social insurance), represent structured, often mandatory, systems for pooling funds. The third category, Households Health Financing (measured by Out-of-Pocket, or OOP, payments), captures the direct, non-pooled costs borne by individuals. The final category, Donor's Health Finance (from sources like Faith-based organizations and other aid), represents external funds flowing into the health sector. The central hypothesis of the model is that the level and composition of funding from these four distinct sources collectively act as determinants of the dependent variable: Economic Growth, which is formally measured by Gross Domestic Product (GDP).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Overview

Research methodology means the theory of how research should be undertaken. This section describes the research design, study's population, sampling techniques, model specification and measurement of the variables, data collection, data analysis, and ethical consideration.

3.2 Research Philosophy

The philosophy of the study aligns with positivism, which is based on the premise that the world can be understood through objective observations and empirical evidence. Positivism is commonly associated with quantitative research methods, where the researcher strives to maintain objectivity, avoid bias, and use systematic approaches to uncover causal relationships. This philosophical stance supports the use of statistical and numerical data to explore the influence of health sector financing on economic growth in Kenya.

The research adopts a positivist philosophy because it focuses on examining the measurable and observable effects of different components of health financing (such as public health funding, health insurance, household contributions, and donor funding) on economic growth. It assumes that social phenomena, like the impact of health financing on economic growth, can be quantified through data analysis. The positivist approach also posits that the researcher can remain detached and objective, ensuring that the findings are based on evidence rather than personal beliefs or interpretations.

In line with positivism, this study utilizes deductive reasoning, starting with the hypothesis that health sector financing positively influences economic growth in

Kenya. The study then tests this hypothesis by collecting and analyzing data to either confirm or refute the hypothesis. Quantitative methods, such as surveys and statistical analysis, will be employed to gather numerical data and draw conclusions based on the evidence.

By following a positivist philosophy, this study aims to produce generalizable results that can be used to inform policy decisions regarding health financing and its relationship to economic growth in Kenya. This approach emphasizes the importance of objectivity and the use of reliable data sources to ensure that the findings are valid and credible.

3.3 Research Design

The research design is the overall strategy chosen by the researcher to integrate the various components of the study coherently and logically, ensuring that they effectively address the research problem. According to Kothari (2014), the research design serves as the blueprint for collecting, analyzing, and interpreting data. The nature of the research problem and the data collected influences the choice of a research design.

In this study, an explanatory research design was adopted. Explanatory research is aimed at explaining the causes or reasons behind a phenomenon. In the context of this study, the explanatory design was chosen because it allows for an in-depth understanding of the causal relationships between health sector financing and economic growth in Kenya. By using an explanatory design, this study seeks to determine how different components of health sector financing such as public health funding, health insurance contributions, household health financing, and donor funding directly influence economic growth over time. The design also allows for hypothesis testing,

specifically whether increases in health sector financing lead to improved economic outcomes in Kenya.

The study employs longitudinal research methods, which are characterized by the collection of data over an extended period. A longitudinal design is particularly suitable for understanding trends and patterns over time, which is crucial when examining the long-term effects of health financing on economic growth. The emphasis in this design is on gathering data at various time points, generally from the same participants, which in this case includes data on health financing and economic growth from 2000 to 2020. As stated by Cockcroft, Goldschagg, and Seabi (2019), longitudinal designs are valuable when the research focuses on change over time, and this aligns with the aim of this study to observe how health financing influences economic growth over a 20-year period.

The choice of an explanatory research design, combined with a longitudinal approach, is motivated by the need to establish cause-and-effect relationships between the variables, as opposed to merely exploring them. The study's focus on examining how variations in health sector financing impact economic growth in Kenya necessitates a design that can capture changes and trends over time while allowing for the identification of causal patterns. This design is particularly effective in addressing the research problem and achieving the study’s objectives.

3.4 Model Specification

Auto Regressive Distributed Model (ARDL) model to be applied in this study. An autoregressive distributed lag (ARDL) model is an ordinary least square (OLS) based model which is applicable for both non-stationary time series as well as for times series with mixed order of integration. The ARDL cointegration technique is used in

determining the long run relationship between series with different order of integration (Pesaran and Shin, 1999, and Pesaran *et al.* 2001). The reparameterized result gives the short-run dynamics and long run relationship of the considered variables. One of the advantages of ARDL test is that it is more robust and performs better for small sample size of data which suitable for this research. The annual time series data of public health financing, Health insurance financing, households health financing and donors health financing was used. The dependent variable was economic growth to measured using GDP.

Auto regressive distributed lag model for economic growth (GDP) is formulated in equation:

$$\Delta Y_t = \beta_0 + \sum_{t=1}^{n} \alpha_t \Delta Y_{t-1} + \sum_{t=1}^{n} \alpha_t \Delta X1_{t-1} + \sum_{t=1}^{n} \alpha_t \Delta X2_{t-1} + \sum_{t=1}^{n} \alpha_t \Delta X3_{t-1} + \sum_{t=1}^{n} \alpha_t \Delta X4_{t-1} + \varepsilon \quad \text{.....3.1}$$

Where;

Y- Economic growth

β_0 - Constant showing GDP growth rate in absence of health sector financing

X_1– Public health financing

X_2– Health insurance financing

X_3 – Households health financing

X_4 – Donors health financing

T – Time period (2000-2020)

ε - Error term

Further, estimation of parameters showed that If the one time series y(t) depends on past values of itself [y(t-1), y(t-2).... y(t-p)] and past values of one other time series x(t-1), x(t-2)... x(t-q) then the researcher can use an ARDL to forecast future values of y(t)

So, the model looked like:

$$y(t) = m + a1 * y(t-1) + a2 * y(t-2) + ... + b1 * x(t-1) + b2 * x(t-2) + ... + u(t)$$

Theoretical Model Specifications for ARDL was

$$Y = \int (X_1, X_2, X_3, X_4)$$

Where,

Y= economic growth

X_1= public health financing

X_2= Health insurance financing

X_3 = households health financing

X_4 = donors health financing

The ARDL model would allow researchers to test for the presence of a long-run relationship between health sector financing and economic growth, as well as the short-run dynamics of the relationship. The model would also allow researchers to control for other factors that may affect economic growth, such as investment, and trade.

The ARDL model has several advantages over other econometric models. First, it is relatively easy to estimate, even with limited data. Second, it is robust to misspecification of the model. Third, it can be used to analyze a variety of data types, including time series data, panel data, and cross-sectional data.

3.5 Target Population

The study was conducted in Kenya, utilizing longitudinal data spanning a period of twenty years (2000-2020). This period was selected due to the need to gather current and comprehensive data on healthcare financing, which is essential for understanding

the trends, impacts, and changes in the sector over time. Additionally, the twenty-year window provides a sufficiently large dataset to perform inferential analysis and assess the long-term effects of health financing on economic growth.

The choice of the 2000-2020 period is particularly important for capturing the evolving nature of health sector financing in Kenya, which has seen significant changes due to reforms, increased donor involvement, the expansion of health insurance schemes, and various public-private partnerships. The inclusion of this period ensures that the study reflects the most current and relevant data, particularly in light of the Kenyan government's efforts toward universal health coverage (UHC) and reforms in health financing.

However, it is important to acknowledge that the choice of a long time series (2000-2020) introduces certain statistical challenges, notably the loss of degrees of freedom ($n-k-1$), where "n" represents the number of observations and "k" is the number of explanatory variables used in the model. With 21 years of data, the potential loss of degrees of freedom can result in less precise estimates for the parameters of the model, which could lead to larger standard errors of the estimated coefficients. As the number of explanatory variables increases, the degrees of freedom available for testing the statistical significance of these variables decreases, which may reduce the reliability of hypothesis tests. This issue is particularly important in regression analysis, where more parameters (such as those representing different stakeholders in health financing) can exacerbate the problem of multicollinearity and increase the uncertainty in the estimates.

To mitigate this issue, careful consideration was given to the selection of explanatory variables and the inclusion of relevant data that would maximize the efficiency of the

model while minimizing the risk of overfitting. This included ensuring that only the most relevant variables, which have a clear theoretical justification, were included in the model to balance between model complexity and statistical power. Additionally, techniques such as robust standard errors were employed to account for potential heteroscedasticity or misspecification, which can further inflate the standard errors.

3.6 Sampling and Sample Size

Since the study used secondary data there were no sampling to be carried out because all data was used.

3.7 Data Collection

Data collection is an essential part of the research process. According to Punch (2005), data collection is "the process of gathering and measuring information on variables of interest in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes. The study attempted to investigate the relationship between health financing and economic growth in Kenya. The study collected secondary data from available and credible sources on the trends and values of the study's selected variables. Data were gathered from the Kenya National Bureau of Statistics (KNBS), the Institute of Economic Affairs (IEA), the World Bank, the Ministry of Finance, Ministry of Health Kenya, the Ministry of Devolution and Planning, Central Bank of Kenya (CBK), Insurance Regulatory Authority (IRA), NHIF, Household Survey of Health Care Utilisation and Expenditure of 2014 and WHO. Only authentic data sources such as the government's economic entities, ministries, and renowned entities such as the World Bank was used to ensure the validity of the information to be gathered. Aside from physical access to publications, many online resources, was used for the study.

The study used government publications such as the economic survey, the Demographic And Health Survey (DHS), and others. Because the researcher had no control over any variable in the study, the study relied on current and historical economic conditions such as GDP, public investment in health, private investment in health, and international non-governmental organization (NGOs)' investment in health in 21 years (2000-2020). A data collection sheet (Appendix I) was used to collect the necessary data. Table 3.1 indicates the data tcollected and the source for each.

Table 3.1 Data Collection

Type of data	Source	Period
Public health financing	Ministry of Health Kenya – Ministry of Finance	2000-2020
Health insurance financing	CBK, IRA and NHIF	2000-2020
Households health financing	Household Survey of Health Care Utilisation and Expenditure	2000-2020
Donors health financing	World bank, KNBS,WHO	2000-2020
Economic growth	Kenya National Bureau of Statistics – Economic survey Ministry of Health Kenya – Ministry of Finance	2000-2020

Source: Author (2023)

To correlate the allocation of the county and national government on health sector is to look at the overall amount of money that is being allocated to the health sector from both the county and national levels. This was done by calculating the percentage of the total budget that is allocated to the health sector. If the percentage of the budget that is allocated to the health sector is increasing, then this could be a sign that the government is prioritizing the health sector and that this could have a positive impact on economic growth. The flow of funds is as in Figure 3.1.

```
A[Government] -- Tax Revenue --> B[Consolidated Fund]
B -- Budget Allocation --> C[Ministry of Health]
C -- Budget Allocation --> D[County Governments]
D -- Budget Allocation --> E[County Health Departments]
E -- Budget Allocation --> F[County Health Facilities]
F -- User Fees, Donor Funding, Insurance, Other Sources --> G[Health Facilities]
G -- Service Delivery --> H[Population]
```

Figure 3.1 flow of funds to health sector

The Figure 3.1 shows that the Government collects tax revenue, which is deposited into the Consolidated Fund. The Budget Allocation is made from the Consolidated Fund to the Ministry of Health, which oversees the national health sector. The Ministry of Health further allocates the budget to County Governments, which are responsible for health services in their respective regions. County Governments allocate funds to County Health Departments, which manage health services at the county level. County Health Departments then allocate funds to County Health Facilities, such as hospitals and health centers. Health Facilities receive funds from various sources, including user fees, donor funding, insurance, and other sources. The funds received by Health Facilities are used for service delivery, benefiting the population.

In addition, the flow of funds to national hospitals (Kenyatta National Hospital (KNH) and Moi Teaching and Referral Hospital (MTRH)) is that the Ministry of Health Kenya allocates funds to the national hospitals based on their approved budgets. The national hospitals receive the funds from the Ministry of Health Kenya through the National Treasury. The national hospitals use the funds to provide healthcare services to their patients, to purchase medical supplies and equipment, and to maintain their facilities.

3.8 Measurement of Variables

Measurable research variables are required to test hypotheses, make inferences, and draw conclusions. The operationalization of research variables is required for measurement. "operationally defining a concept to render it measurable is done by

looking at the behavioral dimensions, facets, or properties denoted by the concept," according to Sekaran and Bougie (2016). These are then translated into observable and measurable elements to develop an index of measurement of the concept". Thus, operationalization entails reducing research variables to their empirical measurements. The variables were operationalized in Table 3.2.

Table 3.2 Data Measurements

Type	Variable	Measurement	Source
Independent variable	Public health financing	✓ Government spending/Allocation	Ifeagwu, Yang, Parkes-Ratanshi and Brayne (2021).
Independent variable	Health insurance financing	✓ Private insurance, social insurance	Suchman, Hart and Montagu (2018).
Independent variable	Households health financing	✓ Out of pocket (OOP) payments	Kastor and Mohanty (2018).
Independent variable	Donors health financing	✓ Faith based organizations and NGOs	Mwaambi (2017)
Dependent variable	Economic growth	✓ Gross domestic product (GDP)	Kuznets (2019).

Source: Author (2023)

3.9 Diagnostic Tests

Diagnostic tests are critical to ensuring that the Classical Linear Regression Model (CLRM) assumptions are satisfied, as valid inference and reliable conclusions about the coefficients (betas) depend on fulfilling these assumptions. Pesaran (1974) emphasized that a model can only be considered a true representation of the data if it satisfies all the CLRM assumptions. However, as Wolde-Rufael (2010) argues, even if there are minor deviations from these assumptions, the model can still be used, provided

the deviations are not severe enough to undermine the validity of the results. This study used both pre-estimation and post-estimation diagnostic tests to assess the model's reliability and ensure the assumptions are met.

Before estimating the model, several pre-estimation diagnostics were conducted to evaluate the assumptions of the CLRM. The first key assumption is multicollinearity, which occurs when the independent variables are highly correlated with each other. This can distort the coefficient estimates and inflate standard errors. To assess multicollinearity, the Variance Inflation Factor (VIF) was computed for each independent variable. A VIF value greater than 10 suggests high multicollinearity, requiring the removal or adjustment of the correlated variables. Another important assumption is model specification. This assumption ensures that the chosen independent variables and the model's functional form are correct. The Ramsey RESET test was performed to check for potential misspecification, such as omitted variables or incorrect functional forms, which could lead to biased estimates.

Additionally, the autocorrelation of residuals was tested, as it is crucial for ensuring that error terms are independent. To test for first-order autocorrelation, the Durbin-Watson statistic was calculated, with a value close to 2 indicating no autocorrelation. Heteroscedasticity where the variance of residuals changes across levels of the independent variables was checked using the Breusch-Pagan test. If heteroscedasticity is present, it can distort the estimates and lead to incorrect inference. The Shapiro-Wilk test was used to test the normality of the residuals, an important assumption for conducting reliable hypothesis testing. A significant result from this test would suggest a departure from normality, indicating the need for data transformation or the use of robust methods.

After the model estimation, several post-estimation diagnostics were conducted to further evaluate the model's reliability. One of the most important tests was for the stability of the model, which ensures that the relationships between the variables remain consistent over time. The CUSUM (Cumulative Sum) test was employed to detect any structural breaks or shifts in the parameters. If the CUSUM statistic falls outside the critical bounds, it suggests that the model may be unstable, requiring adjustments. Another critical post-estimation diagnostic test was for serial correlation in the residuals. The Breusch-Godfrey test was used to assess higher-order autocorrelation, which can lead to inefficient estimates and inflated standard errors if present.

The goodness of fit was evaluated using the R-squared and adjusted R-squared values, which indicate how well the model explains the variance in the dependent variable. Higher R-squared values suggest that the model is effective at capturing the variability of the outcome variable. Finally, the Likelihood Ratio (LR) test was conducted to assess the adequacy of the model. This test compares the fitted model to a restricted version and determines whether adding parameters improves the fit significantly. If the LR test indicates a significant improvement, it suggests that the model is appropriately specified.

3.10 Ethical Consideration

Ethical considerations emphasis on data collection, respondents' privacy, and the use of the data collected. The researcher sought a letter of introduction from School of Business and Economics, Moi University. Thereafter, the introduction letter was used to obtain National Council for Science, Technology, and Innovation (NACOSTI) permit to allow for data collections.

CHAPTER FOUR

RESEARCH FINDINGS, PRESENTATION AND DISCUSSION

4.1 Overview

This chapter presents the data analysis process, findings and the discussion of the findings. Data analysis entails exploratory analysis of the dependent variable as well as the independent variables. The exploratory analysis includes the descriptive statistics, growth plots and overlain plots. After presentation of the results, a discussion is provided relating the findings to the theoretical and empirical literature.

4.2 Descriptive Analysis

The data provides a detailed overview of health financing in Kenya, focusing on various funding sources and their statistical characteristics. It encompasses four primary categories: public health finance, health insurance financing, household health financing, and donor health finance. Each category is analyzed based on the number of responses (N), minimum, maximum, mean, and standard deviation, offering insights into the state of health financing in the country. The study findings are presented in Table 4.1

Table 4.1 Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Dev
Public health Finance	21	12.39	31.16	22.9821	6.57624
Health Insurance Financing	21	13.34	20.23	17.3056	2.29762
Households Health Financing	21	5.9	39.57	19.0093	11.2751
Donor's Health Finance	21	2.97	16.97	11.9169	5.18786
GDP	21	12.71	100.66	48.7376	30.0712
Valid N (listwise)	21				

Source: Researcher (2024)

The study findings in Table 4.1 on public health finance, revealed that the descriptive statistics for public health finance revealed that the data contained 21 responses, with

funding levels ranging from a minimum of 12.39 million KES to a maximum of 31.16 million KES. The mean value stood at 22.98 million KES, indicating a relatively stable level of funding. However, the standard deviation of 6.58 million KES suggests variability in funding levels, which could be indicative of disparities in resource allocation across regions or health services. This variability may point to a need for more equitable distribution of public health funds. The findings align with Falchetta et al. (2020), which noted inconsistencies in Kenya's public health expenditure, particularly regional disparities, suggesting the need for better resource allocation to ensure equal access to health services.

In the context of health insurance financing, the mean value was 17.31 million KES, with a narrower range (minimum of 13.34 million KES and maximum of 20.23 million KES) and a low standard deviation of 2.30 million KES. This suggests a more consistent level of funding in this area, possibly due to the influence of the National Health Insurance Fund (NHIF), which is the dominant health insurance provider in Kenya. However, the relatively low mean implies that a significant portion of the population may still be uninsured or underinsured, limiting overall access to healthcare. This finding supports Simiyu (2021), which pointed out that although NHIF covers a substantial portion of the population, many people remain outside of the coverage scope, thereby exacerbating challenges in health financing.

Household health financing presents a more concerning picture, with a mean of 19.01 million KES and a high standard deviation of 11.28 million KES, reflecting substantial variability in household contributions. The minimum recorded contribution was 5.90 million KES, while the maximum was 39.57 million KES, indicating significant income disparities and varying access to healthcare services. This variability suggests that out-

of-pocket expenditures (OOP) remain a major source of financial strain for many households, particularly low-income households. These findings align with Tandon and Reddy (2021), who highlighted that OOP payments are a significant burden for households in Kenya, with many unable to afford necessary healthcare without resorting to loans or selling assets.

When examining donor health finance, the data showed a mean of 11.92 million KES, with a range from 2.97 million KES to 16.97 million KES. The standard deviation of 5.19 million KES suggests moderate variability, which could reflect fluctuations in donor priorities or changes in the global economic climate. While donor funding is still an important aspect of health financing, the lower mean indicates a growing reliance on domestic funding sources. This is consistent with the findings of Cherrier (2020), which noted the decreasing reliance on donor funding and the need for increased domestic health investments to ensure sustainability.

Lastly, the GDP data reveals significant economic variability, with a mean of 48.74 billion KES, a minimum of 12.71 billion KES, and a maximum of 100.66 billion KES. The high standard deviation of 30.07 billion KES underscores the disparities in economic performance across the sample. Economic variability directly impacts health financing, as higher GDP tends to correlate with increased investment in public health. This aligns with Yang (2020), which indicated that higher GDP is typically associated with increased government health expenditure. The Kenya Health Financing Strategy aims to increase public health expenditure as a percentage of GDP, targeting 5% by 2030. This finding suggests that economic growth plays a crucial role in ensuring better health financing and addressing disparities in access to healthcare.

4.3 Running Correlation Analysis

Correlation denotes the degree of connection between two variables. A strong correlation indicates a robust relationship between two or more variables, whereas a weak correlation suggests a minimal connection between the variables. The Pearson Correlation is the most commonly utilized form of correlation coefficient. The results are presented in Table 4.2.

Table 4.2 Correlation Analysis

	Economic growth	**Public health**	**Health insurance**	**Households health**	**Donors health**
Economic growth	1				
Public health	0.8138	1			
Health insurance	0.9004	0.73	1		
Households health	0.6527	0.5062	0.5703	1	
Donors health	0.3875	0.1157	0.3075	0.2259	1

The study findings in Table 4.2 indicated that public health financing and economic growth had a positive strong and statistically significant correlation (r= .8138 p<0.01). The findings from the study indicate a strong, positive and statistically significant correlation between health insurance financing and economic growth (r=.9004; p< 0.01). The study established that there exist a strong, positive and statistically significant correlation between households health financing and economic growth (r=.6527**; p< 0.01). The study established that there exist a moderate, positive and statistically significant correlation between donors health financing and economic growth (r=.539**; p< 0.01).

4.4 Diagnostic Tests

The diagnostic tests carried out in this study were autocorrelation test, heterogeneity tests, normality test and multicollinearity.

4.4.1 Autocorrelation Test

Test for Autocorrelation was done through the Durbin-Watson test. The Durbin-Watson d-statistic (7, 20) = 1.938224. Therefore, the Durbin-Watson statistic for the ARDL model is 1.938224, which indicates that there is no autocorrelation in the residuals. A Durbin-Watson statistic value between 1.5 and 2.5 is considered to be relatively normal, and values outside this range could be a cause for concern. In this case, the value of 1.938224 is within the normal range, suggesting that there is no autocorrelation in the residuals of the ARDL model. The Durbin-Watson test is widely used in regression analysis to detect the presence of autocorrelation in residuals (Mukherjee & Laha, 2020). It is particularly effective for time series data and is straightforward to calculate and interpret. A value close to 2 indicates no autocorrelation, while values significantly lower or higher suggest positive or negative autocorrelation, respectively. A study by Islam and Toor (2019) evaluated the performance of the Durbin-Watson test among other methods for detecting autocorrelation. It found that the Durbin-Watson test provided unbiased estimates and performed well under various conditions, reinforcing the reliability of the test in identifying autocorrelation in residuals. While the Durbin-Watson test is effective, it has limitations, particularly in regression analyses that involve cross-sectional data (Asiamah *et al.*, 2021). The test is primarily designed for time series data, and its effectiveness diminishes when applied to data that does not adhere to a one-dimensional order. Therefore, in certain contexts, the Durbin-Watson statistic may not provide a conclusive assessment of autocorrelation.

4.4.2 Heterogeneity Tests

The Heterogeneity Tests Results are presented in Table 4.3.

Table 4.3 Heterogeneity Tests Results

Test	chi2	df	p-value
Heteroskedasticity	20	19	0.3946
Skewness	5.63	6	0.4656
Kurtosis	1.87	1	0.171
Total	27.51	26	0.3831

The study results in Table 4.3 showed that a chi-square statistic of 20.00 with a p-value of 0.3946, which indicates that there is no evidence of heteroskedasticity in the residuals of the ARDL model. This means that the variance of the residuals is constant, which is a desirable property for a regression model. The null hypothesis of homoskedasticity is not rejected, with a chi-square statistic of 27.51 and a p-value of 0.3831. This further supports the conclusion that there is no evidence of heteroskedasticity in the residuals of the ARDL model. Research emphasizes the importance of homoskedasticity for the validity of regression results. When the residuals exhibit constant variance, it ensures that the estimates of coefficients are efficient and that standard errors are valid (Kelly, 2019). The findings reinforce this principle, indicating that the model's assumptions hold true. Lewis (2022) argue that failing to detect heteroskedasticity does not guarantee that the model is correctly specified. They suggest that even with high p-values, it is essential to examine the residuals visually (through plots) and consider alternative tests for heteroskedasticity, such as the Breusch-Pagan or White tests.

4.4.3 Normality Test

The study used the Shapiro-Wilk test while testing the assumption of the normality of the population distribution. If Prob>z values are greater than 0.05, the data is a normal distribution (Tabachnic, 2001). Normality assumptions tests are presented in Table 4.4.

Table 4.4 Normality Test Results

Variable	Obs	W	V	z	Prob>z
Economic growth	21	0.96711	0.806	-0.436	0.66852
Public health financing	21	0.92599	1.814	1.204	0.11438
Health insurance financing	21	0.96151	0.943	-0.118	0.54699
Households health financing	21	0.92077	1.942	1.341	0.08990
Donors health financing	21	0.96388	0.885	-0.246	0.59735

The study findings in Table 4.4 revealed that the economic growth had Shapiro-Wilk value= 0.96711 which is relatively close to 1, suggesting no strong evidence against normality. Prob>z (0.66852) is greater than 0.05, further supporting the idea that the study cannot reject the null hypothesis of normality. While public health financing had Shapiro-Wilk value= 0.92599 which is slightly lower than in y. Prob>z (0.11438) is still greater than 0.05, indicating no clear evidence against normality. Similar health insurance financing Shapiro-Wilk value=0.96151 and Prob>z (0.54699) suggests no strong rejection of normality. Households' health financing Shapiro-Wilk value=0.92077 which is lower than other variables, Prob>z (0.08990) is significant at the 0.05 level. Both Shapiro-Wilk value=0.96388 and Prob>z (0.59735) for donor's health financing point towards no clear evidence against normality. Therefore, there is no strong evidence to reject normality for any of the variables at the conventional 0.05 significance level.

The Shapiro-Wilk test is a widely used method for assessing the normality of data distributions. Khatun (2021) shows that the test has good power properties and is effective in detecting departures from normality, especially for small to medium sample sizes. González-Estrada and Cosmes (2019) suggests that Shapiro-Wilk values closer to 1 indicate a better fit to the normal distribution. Studies emphasize the importance of interpreting p-values in the context of the chosen significance level. In this case, the p-values for economic growth (0.66852), public health financing (0.11438), health

insurance financing (0.54699), and donor's health financing (0.59735) are all greater than the conventional significance level of 0.05, indicating no strong evidence against the null hypothesis of normality. Some studies suggest that the Shapiro-Wilk test may be sensitive to sample size, with larger samples more likely to reject the null hypothesis of normality even when the departure from normality is small (Demir, 2022).

4.4.4 Multicollinearity

Kerlinger (2011) defines multicollinearity as a situation where two or more independent variables exhibit a high degree of correlation, which can adversely impact the outcomes of multiple regression analyses. Variance Inflation Factors (VIF) were used to assess multicollinearity. The findings are displayed in Table 4.5.

Table 4.5 Multicollinearity Results Test

Variable	VIF	1/VIF
Public health financing	2.27	0.440297
Health insurance financing	2.63	0.379573
Households health financing	1.53	0.651658
Donors health financing	1.15	0.872306
Mean VIF	1.90	-

The study results in Table 4.5 revealed that all variables have VIF values well below 5, with the Mean VIF at 1.90, suggesting that multicollinearity is not a major issue among the independent variables in the ARDL model. VIF values below 5 generally indicate that multicollinearity is not a significant concern. Liou and Mulualem (2019) indicate that VIF values below 5 typically suggest that multicollinearity is not a significant concern, while values above 10 indicate severe multicollinearity that may warrant corrective measures. A mean VIF below 2 suggests a low degree of multicollinearity across the independent variables, which is desirable in regression analysis. Multicollinearity can inflate the variance of the coefficient estimates, making them unreliable (Kyriazos & Poga, 2023). However, when VIF values are low, as in this case,

it indicates that the regression coefficients are likely to be stable and statistically significant, which aligns with the findings of other studies that emphasize the importance of monitoring VIF in regression models. While VIF values below 5 are generally acceptable, some researchers argue that even lower thresholds (for example, 4) might indicate potential multicollinearity issues that require further investigation, especially in certain contexts or datasets where multicollinearity is more prevalent.

4.5 Performing Bounds Cointegration Test

The output provided is the result of performing an Autoregressive Distributed Lag (ARDL) bounds cointegration test. The ARDL model is used to investigate the long-run and short-run relationships between economic growth and four independent variables: public health financing, health insurance financing, households health financing, and donors health financing.

Table 4.6 Bounds Cointegration Test Results

	Coef.	**Std. Err.**	**t**	**P>|t|**
ADJ				
y				
L1.	-0.88603	0.098454	-9.00	0.000
LR				
Public health financing	0.249009	0.080783	3.08	0.008
Health insurance financing	0.478093	0.141574	3.38	0.005
Households health financing	0.228259	0.10316	2.21	0.044
Donors health financing	0.136273	0.11405	1.19	0.252
SR				
_cons	-0.20748	0.323708	-0.64	0.532
Number of obs	20			
R-squared	0.8669			
Adj R-squared	0.8194			

The study results in Table 4.6 revealed that the R-squared value is 0.8669, indicating that the model explains 86.69% of the variation in the dependent variable. The adjusted R-squared is 0.8194, which adjusts for the number of predictors in the model. The coefficient of the lagged dependent variable (economic growth) is -0.8860309, which

is negative and statistically significant (p-value < 0.001). This suggests that there is a long-run relationship between the variables and that any deviations from the long-run equilibrium was corrected at a speed of 88.60% per period.

Public health financing has a positive and statistically significant coefficient of 0.2490086 (p-value < 0.01), indicating that a 1-unit increase in public health financing is associated with a 0.2490086-unit increase in economic growth in the long run. Health insurance financing has a positive and statistically significant coefficient of 0.4780931 (p-value < 0.01), suggesting that a 1-unit increase in Health insurance financing is associated with a 0.4780931-unit increase in economic growth in the long run.

Households health financing has a positive and statistically significant coefficient of 0.2282588 (p-value < 0.05), implying that a 1-unit increase in households health financing is associated with a 0.2282588-unit increase in economic growth in the long run. Donors health financing has a positive but statistically insignificant coefficient of 0.1362733 (p-value > 0.05), suggesting that its long-run relationship with economic growth is not statistically different from zero. The constant term (-0.207478) represents the short-run intercept, which is not statistically significant (p-value > 0.05).

Table 4.7 Pesaran/Shin/Smith (2001) ARDL Bounds Test

Statistic	10%	5%	1%	p-value
F	3.020 4.368	3.810 5.416	5.907 8.184	0.000 0.000
t	-2.589 -3.695	-3.003 -4.203	-3.903 -5.312	0.000 0.000
F*	18.236			
t*	-8.999			

The F-statistic is 18.236, which is more extreme than the critical value for I (0) regressors at the 1% level. This indicates that there is strong evidence of a long-run

relationship between the variables. The t-statistic is -8.999, which is more extreme than the critical value for I (0) regressors at the 1% level. This also indicates strong evidence of a long-run relationship. This implies that there is evidence of a long-run relationship between the economic growth (y) and the four health financing variables (x1, x2, x3, x4). This suggests that these variables are cointegrated, meaning that they share a long-term equilibrium relationship.

The bounds testing approach for cointegration, as proposed by Pesaran, Shin, and Smith (2001), is widely recognized for its effectiveness in determining long-run relationships among variables in the presence of different integration orders (Badshah & Bulut, 2020). This is consistent with other empirical studies that have demonstrated how health financing positively impacts economic outcomes, reinforcing the idea that investments in health can lead to improved economic performance. This finding is consistent with literature that emphasizes the importance of the error correction term in ARDL models, which reflects how quickly the system returns to equilibrium after a shock. While the ARDL model is flexible and robust, it is essential to ensure proper model specification (Kripfganz & Schneider, 2023). If the model is mis specified, it could lead to biased estimates of the long-run relationships.

4.6 Estimating the ARDL model

An ARDL (Autoregressive Distributed Lag) model estimated to assess the impact of various health financing sources on economic growth in a sample ranging from 2001 to 2020 with 20 observations.

Table 4.8 Autoregressive Distributed Lag

	Coef.	Std. Err.	t	P>|t|	[95% Interval]	Conf.
Economic growth						
L1.	0.268623	0.097007	2.77	0.016	0.059052	0.478194
Public health financing	0.181852	0.062148	2.93	0.012	0.047591	0.316114
Health insurance financing	0.293525	0.118979	2.47	0.028	0.036486	0.550564
Households health financing	0.295786	0.080362	3.68	0.003	0.122175	0.469397
Donors health financing	0.257311	0.094483	2.72	0.017	0.053193	0.461429
L1.	-0.29819	0.105024	-2.84	0.014	-0.52508	-0.0713
_cons	0.003823	0.274214	0.01	0.989	-0.58858	0.596227
Number of obs	20					
F (6, 13)	41.28					
Prob > F	0.0000					
R-squared	0.9501					
Adj R-squared	0.9271					
Log likelihood	41.13882					
Root MSE	0.0384					

The study findings in Table 4.8 revealed that the F-statistic (41.28) is significant with a p-value of 0.0000, indicating that the model jointly explains a statistically significant portion of the variation in economic growth. The R-squared (0.9501) and adjusted R-squared (0.9271) are both high, suggesting that the model explains a large proportion of the variance in economic growth. This aligns with findings from Yang (2020), who highlighted that higher GDP often correlates with increased public health investment, suggesting a robust relationship between economic growth and health financing. The high R-squared in this study indicates that the model effectively captures the relationship between health financing and economic growth in Kenya, similar to how Yang noted that economic growth is typically linked to enhanced public health spending.

Furthermore, the coefficient for past economic growth (0.2686) is positive and statistically significant (p-value = 0.016), implying that past values of economic growth

positively impact current economic growth, indicating a level of persistence. This finding agrees with Cherrier (2020), who emphasized the persistence in economic growth as a result of sustained investments, including those in the health sector. However, it contrasts slightly with Wai (2021), who found that the effect of past growth was not as significant in some African economies. Nonetheless, the overall finding here reflects the general view that economic growth has momentum, which is consistent with literature on growth persistence.

The coefficient for public health financing (0.1819) is positive and statistically significant (p-value = 0.012), indicating that an increase in public health financing leads to an increase in economic growth. This finding is consistent with Tandon and Reddy (2021), who argued that increased public health expenditure positively impacts economic growth by reducing healthcare-related poverty and improving workforce productivity. Similarly, Harris and Libardi Maia (2022) in Thailand found that enhanced public health financing is crucial for long-term economic stability and growth. Therefore, the study agrees with the literature suggesting that investments in public health foster economic development by creating healthier, more productive populations.

The coefficient for health insurance financing (0.2935) is positive and statistically significant (p-value = 0.028), indicating that an increase in health insurance financing is associated with an increase in economic growth. This finding supports Simiyu (2021), who emphasized the critical role of health insurance in Kenya, particularly through the National Health Insurance Fund (NHIF). Simiyu’s study found that expanding health insurance coverage contributes to better health outcomes, which in turn drives productivity and economic performance. Therefore, this study's results align

with the notion that improving health insurance coverage can lead to enhanced economic outcomes.

Similarly, the coefficient for household health financing (0.2958) is positive and statistically significant (p-value = 0.003), suggesting that higher household health financing contributes to increased economic growth. This is consistent with Tandon and Reddy (2021), who noted that household health financing, particularly in developing economies, remains a significant portion of health expenditure. Wolde-Rufael (2010) also argued that out-of-pocket health expenses can contribute to economic productivity in the short run, though they may impose long-term economic burdens on households. The positive short-run effect (coefficient = 0.2573, p-value = 0.017) and the negative long-run effect (coefficient = -0.2982, p-value = 0.014) of donor health financing also align with Cherrier (2020), who pointed out that donor funding can spur economic growth in the short term but can become unsustainable in the long run if it is relied upon excessively.

The model also revealed that donor health financing has a positive short-run effect (coefficient = 0.2573) and a negative long-run effect (coefficient = -0.2982), suggesting that while an increase in donor funding leads to higher economic growth initially, over-reliance on donor funding may hinder growth in the long term. These finding echoes concerns raised by Rim and Tassot (2019), who discussed how donor dependency can undermine long-term health system sustainability and economic growth. Their study highlighted that in the long run, external funding sources may not be reliable, particularly when donors shift priorities or reduce their funding levels. Similarly, Deem (2019) argued that donor funding, while important in the short term, often leads to inefficiencies and dependency in the long run.

The coefficient for the constant term (0.0038) is statistically insignificant (p-value = 0.989), implying that the model does not have a statistically significant constant term. This result contrasts with the findings of Wai (2021), who observed that the constant term in similar models was significant, indicating a baseline level of growth irrespective of the independent variables. This disparity may be attributed to differences in model specifications or the economic context between the countries studied.

4.7 Hypotheses Testing

The research hypotheses were tested using the significance level of the coefficients. The research aimed to test the hypothesis with an aim of failing to reject or rejecting the relationship between independent and the dependent variables with significant level of 0.05. The research hypothesis for the study included;

Hypothesis 1 (H_{01}) stated that: Public health financing has no significant influence on economic growth in Kenya**.** The coefficient for public health financing is positive and statistically significant (p-value = 0.012), indicating that an increase in public health financing leads to an increase in economic growth. Therefore, we reject the null hypothesis and conclude that public health financing has a significant positive influence on economic growth in Kenya.

Hypothesis 2 (H_{02}) stated that: Health insurance financing has no significant influence on economic growth in Kenya. The coefficient for health insurance financing is positive and statistically significant (p-value = 0.028), suggesting that a rise in health insurance financing is associated with an increase in economic growth. Therefore, we reject the null hypothesis and conclude that health insurance financing has a significant positive influence on economic growth in Kenya.

Hypothesis 3 (H_{03}) stated that: Households' health financing has no significant influence on economic growth in Kenya. Rejected. The coefficient for households' health financing is positive and statistically significant (p-value = 0.003), implying that higher household health financing contributes to increased economic growth. Therefore, we reject the null hypothesis and conclude that households' health financing has a significant positive influence on economic growth in Kenya.

Hypothesis 4 (H_{04}) stated that: Donors' health financing has no significant influence on economic growth in Kenya. Donor health financing has a positive short-run effect (coefficient = 0.2573, p-value = 0.017), indicating that an increase in donor health financing initially leads to higher economic growth. However, the long-run effect is negative and statistically significant (coefficient = -0.2982, p-value = 0.014), suggesting that in the long run, relying heavily on donor health financing might hinder economic growth. Therefore, we partially reject the null hypothesis and conclude that donor health financing has a significant positive short-run influence but a significant negative long-run influence on economic growth in Kenya.

The ARDL model results suggest that public health financing, health insurance financing, and households' health financing have significant positive influences on economic growth in Kenya, both in the short run and long run. Donor health financing has a positive short-run effect but a negative long-run effect, implying potential drawbacks of over-reliance on this source of funding.

Table 4.9 Summary of Hypotheses Test Results

Hypothesis		β-value	p-value	Decision rule
$H_{01:}$	Public health financing has no significant influence on economic growth in Kenya.	β_1=0.1819	p=0.012<0.05	Rejected the null hypothesis
$H_{02:}$	Health insurance financing has no significant influence on economic growth in Kenya.	β_2=0.2935	p=0.028<0.05	Rejected the null hypothesis
$H_{03:}$	Households' health financing has no significant influence on economic growth in Kenya.	β_3=0.2958	p=0.003<0.05	Rejected the null hypothesis
$H_{04:}$	Donors' health financing has no significant influence on economic growth in Kenya.	β_{4a}=0.2573	p=0.017<0.05	Rejected the null hypothesis

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATION

5.1 Overview

This chapter presents the summary of key research findings. It outlines conclusions resulting from those findings. Lastly, it covers the recommendations put forward relative to study objectives and areas suggested for further research.

5.2 Summary of Findings

This study sought to analyze the impact of various health financing sources on economic growth in Kenya, using the Autoregressive Distributed Lag (ARDL) model to examine both short-run and long-run effects. The results from the model estimates revealed that public health financing, health insurance financing, and household health financing all have positive and statistically significant relationships with economic growth in both the short run and the long run. Specifically, the short-run coefficients for these variables suggest immediate positive effects on economic growth. The long-run effects indicate that sustained investment in public health, health insurance, and household health financing contributes significantly to economic growth, reflecting a broader trend seen in other economies as well, such as in Tandon and Reddy (2021).

However, the model also found that donor health financing has a positive short-run effect but a negative long-run effect. The short-run coefficient (0.2573) was statistically significant, indicating that an increase in donor health financing initially boosts economic growth. But the long-run coefficient (-0.2982) suggests that over-reliance on donor funding could hinder economic growth in the long term. This finding supports the concerns raised by Cherrier (2020) and Deem (2019) about the potential drawbacks of excessive dependence on donor funding.

Additionally, the ARDL bounds test provided strong evidence of a long-run relationship between economic growth and the health financing variables, showing that they are cointegrated, indicating a shared long-term equilibrium relationship. The results of these tests are consistent with findings in other studies, such as those by Falchetta et al. (2020), which highlight the complex but important relationship between health financing and economic outcomes.

In summary, the model estimates clearly indicate that domestic health financing sources such as public health financing, health insurance financing, and household health financing are key drivers of economic growth, while donor financing may only serve as a short-term contributor.

5.3 Conclusions

The study concludes that This study concludes that public health financing, health insurance financing, and household health financing significantly contribute to economic growth in Kenya, especially in the long run. These findings underscore the critical importance of strengthening domestic sources of health financing. The study also confirms the findings of Simiyu (2021) and Tandon and Reddy (2021), who argued that robust health financing systems, particularly through domestic mechanisms, have a positive and lasting impact on economic growth.

However, donor health financing, while positively impacting growth in the short run, has a negative long-run effect, which suggests that Kenya should gradually reduce its reliance on donor funding. This aligns with Cherrier (2020), who noted that over-reliance on donor funding could undermine long-term sustainability and growth.

The findings highlight that long-term sustainable economic growth depends on strengthening domestic health financing systems. Policymakers in Kenya must focus

on increasing domestic investment in healthcare and transitioning toward self-sufficient financing models to avoid the volatility associated with donor dependency. These results are also consistent with Rim and Tassot (2019), who discussed the long-term risks of donor dependency in Sub-Saharan Africa.

5.4 Recommendations

Policymakers should focus on enhancing public health financing, expanding health insurance coverage, and increasing household contributions to health financing. The findings suggest that these domestic financing sources have a positive and significant impact on economic growth. This could involve increasing the government's health expenditure as a proportion of GDP, expanding the National Health Insurance Fund (NHIF) to cover more of the population, and encouraging households to contribute through innovative health savings schemes.

While donor funding has provided significant support in the short term, its negative long-run effect in this study suggests the need for a strategy to reduce reliance on donor funding. Policymakers should diversify financing mechanisms and gradually transition to domestic funding sources. This could include strengthening public-private partnerships (PPPs), encouraging local philanthropic contributions, and leveraging taxation systems to increase health spending.

NGOs and international institutions play a key role in health financing in Kenya. However, there is a need to improve coordination between the government, international donors, and NGOs to ensure that donor funds are aligned with national health priorities. Policymakers should foster partnerships with these entities to strengthen Kenya's health systems, ensure accountability, and focus on long-term sustainability. Reports and publications from institutions like the World Health

Organization (WHO) and the World Bank should inform the design of evidence-based health financing policies.

In addition to increasing financial resources, policymakers should focus on improving health system infrastructure, access to healthcare, and health workforce development. By strengthening the health system, these investments will have a more significant impact on economic growth. This approach should include the development of primary healthcare systems, the integration of health programs, and the promotion of preventive healthcare.

5.5 Limitations and Delimitations

This study was delimited to the Kenyan context and focused on the period between 2000 and 2020. While this specific focus provided a thorough examination of health financing trends in Kenya, it limited the generalizability of the findings to other countries with different political, economic, and healthcare systems. As a result, the conclusions drawn may be more pertinent to Kenya or nations with similar health financing structures, particularly in sub-Saharan Africa.

A key limitation encountered in the study was the availability and reliability of data. Despite efforts to source information from government reports, international organizations, and health financing institutions, data gaps existed, particularly in rural and underserved regions, where healthcare financing was often inadequately reported. This lack of complete data may have affected the depth and precision of the analysis. Additionally, variations in how key variables, such as public health spending and private sector contributions to health financing, were defined and measured by different reporting bodies posed challenges in standardizing the data. These discrepancies in measurement limited the ability to compare certain variables consistently.

Furthermore, the replicability of the study's findings was constrained by the unique nature of Kenya's health financing system. While the study provided a detailed analysis of the Kenyan experience, the results were shaped by factors specific to the country's health reforms, economic structure, and governance systems. Therefore, the findings could not be directly applied to countries with vastly different health systems or economic conditions. However, the study's insights into the complexities of health financing in a developing country may offer valuable lessons for other nations facing similar challenges.

5.6 Areas for Further Research

The current study used a relatively short time period (2001-2020) and small sample size (20 observations). Future research should aim to analyze a longer time series and larger sample to provide more robust and generalizable findings.

The study looked at the national-level relationship between health financing and economic growth. Further research could explore potential sectoral (for example, agriculture, industry, services) or regional differences in these relationships.

The current study focused on the direct relationships between health financing and economic growth. Incorporating other macroeconomic, demographic, and institutional factors could provide a more comprehensive understanding of the determinants of economic growth.

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APPENDICES

Appendix I Data Collection Sheet

Year	Public health financing	Health insurance financing	Households health financing	Donors health financing	GDP
2000					
2001					
2002					
2003					
2004					
….					
…..					
…..					
…..					
2022					

Source: Author (2023)

Appendix II University Letter

MOI UNIVERSITY
POSTGRADUATE OFFICE
SCHOOL OF BUSINESS AND ECONOMICS

Tel: 0722271134
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P.O. Box 3900
Eldoret.
Kenya

RE: MU/SBE/PGR/ACD/21B

DATE: 5th September 2023

TO WHOM IT MAY CONCERN:

RE: DIANA CHEPCHIRCHIR- MS/ECON/5856/22

The above named is a bonafide student of Moi University School of Business and Economics, undertaking **Master of Arts in Economics.**

She has successfully completed the coursework, defended her proposal, and is proceeding to the field to collect data for her research titled: ***"Influence of Health Sector Financing on Economic Growth in Kenya."***

Any assistance accorded to her will be highly appreciated.

Yours faithfully,

SCHOOL OF BUSINESS & ECONOMICS MOI UNIVERSITY P.O. Box 3900 ELDORET 30100

DR. RONALD BONUKE
POSTGRADUATE CHAIR, SB&E

/vc

Appendix III NACOSTI Letter

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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Date of Issue: **26/October/2023**

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In recognition for passing the University's plagiarism

Awareness test for Thesis **entitled INFLUENCE OF HEALTH SECTOR FINANCING ON ECONOMIC GROWTH IN KENYA** similarity index of 8% and striving to maintain academic integrity.

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Awarded by

Prof. Anne Syomwene Kisilu

CERM-ESA Project Leader Date: 05/09//2024