2021

Impact of demographics, technology and health systems characteristics on healthcare costs among private health insurers in Kenya.

Mnyapara, Jebidah Mkabili
Strathmore Business School
Strathmore University

IMPACT OF DEMOGRAPHICS, TECHNOLOGY AND HEALTH SYSTEMS CHARACTERISTICS ON HEALTHCARE COSTS AMONG PRIVATE HEALTH INSURERS IN KENYA.

DR. JEBIDAH MKABILI MNYAPARA

REG.NO. HCM/88187/15

Dissertation Submitted to the School of Business in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Business Administration at Strathmore University.

November, 2021

DECLARATION

I declare that this dissertation is my own original work and to my knowledge has not been submitted for an award of a master's degree in Strathmore University or any other University. In my view, this dissertation contains no previously published material by another person except for sections where other authors' material is duly referenced.

Dr. Jebidah Mkabili Mnyapara

Signature:….. ……. Date…24.11.2021

Approval

The thesis of Dr. Jebidah. M. Mnyapara was reviewed and approved by the following:

Dr. Angela Ndunge
Faculty Director,
Lecturer - Organizational Behavior and Leadership
Strathmore University Business School

Signature: …….. Date: ……..

ABSTRACT

Introduction**:** There is a global concern on the rising health care expenditure. Several literatures have attributed this to Gross Domestic Product (GDP) growth, disease prevalence such as the upsurge of both communicable and non-communicable diseases, population growth, an aging population, increasing life expectancy, medical progress and technology advancement, sustained increase in medical insurance coverage, waste, public health expansion initiatives, provider payment mechanisms such as fee for service and rising cost of prescription drugs among others. The rising healthcare cost is ultimately borne by the payers of the healthcare system and more specifically to this study, private health insurers in Kenya.

This study therefore sought to establish the impact of demographics, technology and health systems characteristics on healthcare costs among private health insurers in the Kenya in order to recommend strategies to address these costs. The conceptual framework adopted for this study sought to establish if there was a relation between the dependent variable; private health insurance costs and the independent variables- demographics, technology and health systems characteristics.

Methodology: This was a quantitative mixed study employing both investigative and descriptive statistics; a census based-cross sectional study of the thirty-two (32) private medical insurers in Kenya; twenty-seven (27) medical insurance and five (5) re-insurance companies. Data was obtained from primary sources through a structured questionnaire and secondary data from insurance industry reports and other publications on the topic. Descriptive analysis was conducted using SPSS and data analyzed using mean, frequencies, and standard deviation to enumerate the number of health insurers by variables under study. Correlation analysis was conducted to establish a relation between the dependent variable; private health insurance costs and the independent variables- demographics, technology and the health systems characteristics. Results of the study presented using tables and charts.

Conclusion: The study concluded that health systems characteristics factors have a higher impact on healthcare costs among the private health insurers in Kenya than demographics and technology. However, there are some individual variables within the factors that have a higher impact on healthcare costs such as emerging health risks factors (smoking, tobacco consumption and sedentary lifestyles), increasing prescription drug costs, fraud and abuse, low utilization of primary care gatekeeper and advancing medical technologies. Correlation analysis showed that

technology and health systems characteristics were positively and significantly correlated which means if the two factors were addressed, the healthcare costs of private medical insurers in Kenya would decrease. The same nature of relationship was observed with demographics but the relationship was insignificant.

TABLE OF CONTENT

LIST OF TABLES

VT OMNES
VNVM SINT

LIST OF FIGURES

LIST OF ABBREVIATIONS

AKI	Association of Kenya Insurers
CHE	Current Health Expenditure
FFS	Fee for Service
FY	Financial Year
GDP	Gross Domestic Product
GWP	Gross Written Premium
HCF	Health Care Finance
HMO	Health Maintenance Organization
IRA	Insurance Regulatory Authority
KDHS	Kenya Demographic Health Survey
KNHA	Kenya National Health Accounts
LMIC	Low- and Middle-Income Countries
NCD's	Non-communicable Diseases (NCD's)
NHIF	National Hospital Insurance Fund
OECD	The Organization for Economic Co-operation and Development
OOP	Out-Of-Pocket
SARS	Severe Acute Respiratory Diseases
SDGs	Sustainable Development Goals
TCT	Transaction Cost Theory
THE	Total Health Expenditure
UHC	Universal Health Coverage
WHO	World Health Organization

DEFINITION OF TERMS

Factor: A factor denotes any variable under scrutiny that contributes to a result in a manner that its inclusion or elimination from a process affects the intended outcome. (Oxford Advanced English Dictionary).

Health Maintenance Organizations (HMO): These are organizations that provide healthcare in return for a predetermined fixed insurance premium.

Medical Technology: Defined as drugs, devices, surgical procedures, and organizational support systems within which medical care is given. (Neumann & Weinsten, 1991)

ACKNOWLEDGEMENTS

I would like to thank my family and friends who have supported and encouraged me during this research journey.

Special acknowledgement to my supervisor Dr. Angela Ndunge for her patience & valuable guidance during the writing of this proposal.

Finally, I would like to thank the entire Strathmore Business School fraternity for impacting knowledge and giving me the opportunity to network and build my career life.

CHAPTER ONE: INTRODUCTION

1.1 Introduction

There is extensive consensus that the present path of healthcare expenditure growth is unmaintainable (Henderson, 2015; Phi, 2017; Organization, 2019). The theme of this study is healthcare care costs among private health insurers in Kenya. The study shall look at the impact of demographics, technology and health system characteristics on healthcare costs among private health insurers in Kenya.

Section 1.2 defines the background information on healthcare costs and spending from a Global, Sub-Saharan Africa, Kenya and more specifically Kenyan private health insurer perspective. Section 1.3 covers the problem statement, section 1.4 the research objectives and questions and finally section 1.5 & 1.6 the scope and justification of the study.

1.2 Background to the Study

1.2.1 Outlook of Healthcare Spending

Global health spending as a percentage of Gross Domestic Product (GDP) is projected to be stable at approximately 10.2% through 2023 (Allen, 2019). "The health sector continued to expand faster than the economy between 2010 & 2017, global health spending increased by 3.9 % a year while the economy grew by 3% a year" (Organization, 2019 p.11).

In Africa, healthcare spending was within 5–6 % of GDP over the 2000–2015 period (World Health Organization, 2017). Health spending in Africa faces deficit challenges and as such cannot meet the healthcare financing needs and demands. This is leading to an estimated annual financing gap totaling $66 billion per year. Sluggish economic growth coupled with high public indebtedness have limited the fiscal space. Across Africa, the average debt-to-GDP ratio has deteriorated by 15% in the period 2010 to 2017. Poor allocation of health funds to mitigate impact of poverty has led to overreliance on unpredictable donor funding leading to further deterioration in terms of affordability (Musango, 2013).

Africa's population growth was estimated at an average of 2.6% per annum during period 1990-2015. This was more than twice the world average and it is projected to double between 2015 and 2050 (Musango, 2013). In terms of age structure, the population above 65 years will double

by 2050; and with increased age comes the burden of diseases. (Henderson, 2015; Phi, 2017; Porter, 2017).

There is increased urbanization with 60% of the African population projected to live in the urban centers. This is associated with majority of the dwellers living in the slums. In these densely populated areas, there is inadequate provision of services and infrastructure such as sanitation, access to clean water, electricity, waste management, security, and a higher risk of spread of diseases. (United Nations Department of Economic and Social Affairs, 2019). Africa is also experiencing a double burden of disease with a rise in both communicable and non-communicable diseases (Musango, 2013).

There is a global concern on the rising healthcare expenditure (Ke Xu, 2011; Henderson, 2015; Phi, 2017). Several literatures have attributed this to GDP growth (Allen, 2019; Ke XU, 2011; Phi, 2017), disease prevalence such as the upsurge of both communicable and non-communicable diseases (NCD'S) (Fodeman & Book, 2010; Allen, 2019), population growth (Allen, 2019), aging population (Henderson, 2015; Phi, 2017; Porter, 2017), life expectancy (Phi, 2017); medical progress (Ke XU, 2011; Phi, 2017), medical technology advancement (Ke XU, 2011, Henderson, 2015; Phi, 2017; Porter, 2017), sustained increase in medical insurance coverage and waste (Ke Xu, 2011; Henderson, 2015, Phi, 2017), public health expansion initiatives (Allen, 2019), provider payment mechanisms such as fee for service (Ke Xu, 2011) and rising cost of prescription drugs (John, 2017) amongst others.

To get a deeper understanding on how the above factors affect private health insurers costs in Kenya; the study further grouped these factors into demographics, technology and health system characteristics based on several literatures. Within demographics, the factors investigated were older people in the population; increasing burden of communicable and non-communicable diseases; emergence of health risk factors and moral hazard in the insured population. Under technology, the study investigated advancing medical technology and practices, low utilization of technology and poor process automation. Lastly under health system characteristics, the study looked at low utilization of primary care gatekeeper; increasing fee for service as a payment model; increasing prescription drugs, fraud and abuse.

Higher healthcare spending can have both a positive and negative impact on the economy. For example, when the population is healthy, there is improved capabilities and higher productivity

with associated increased wages. The healthcare sector is also a source of employment to many professionals such doctors, nurses, radiologists, financiers etc.

Some of the negative impacts of higher healthcare costs include higher taxes imposed by the government to finance healthcare which suppresses economic growth and reduces after tax incomes of firms and households, increased government borrowing to finance public health care expenditures which fuels inflation, reduced investment, in infrastructure and education. (The Effect of Health Care Cost Growth on the U.S. Economy)

To the households, higher health care spending can lead to less income to spend on other goods and services, reduced access to health care, bankrupt consumers and deplete retirement savings. (Komisar, 2013).

1.2.3 Outlook of Kenyan Healthcare Expenditure

The Kenyan total health expenditure (THE) was Kes 346 billion (USD 3,476 million) in the Financial Year (FY) 2015/16, an improvement from Kes 271 billion in FY 2012/13. Total health spending in FY 2015/16 was 5.2% of GDP down from 6.8% for the period 2012/13. (Ministry Of Health, 2017)

Kenya spends more on communicable diseases than NCD's like other developing countries. For example, the government expenditure on HIV/AIDS was 20%, reproductive health 13%, malaria 10%, vaccine preventable diseases 10%, respiratory infections 9%, non-communicable 6%, injuries 4% all other diseases 25%. In terms of health expenditure by types of services distributions; curative inpatient was 19%, curative outpatient 37%, medical goods non-specified 3%, preventative 15%, governance, health systems and finance administration 19% (Ministry Of Health, 2017).

The Kenyan Health Expenditure by providers was 36.9% for public facilities, 27% private facilities, 15.8% provider of preventive care, 19.2% providers of healthcare system administration and financing and the rest of the economy at 0.17%.

Kaseje (2006) also identified other challenges facing the Kenyan healthcare system as inefficient allocation and use of the scarce resources, poor health infrastructure, unreliable supply of health commodities and medicines, shortage and mal distribution of health workers, poor management of health quality and productivity and a dysfunctional referral system leading to wastage of resources.

1.3 Problem Statement

The goal of universal health coverage (UHC) is to ensure that every individual has some form of health coverage without necessitating financial ruins or impoverishment. In the recent past, there has been an increasing commitment by many low- and middle-income countries (LMICs) towards achieving this goal. (Sachs, 2012). This noble commitment by world leaders led to the inclusion of UHC in the Sustainable Development Goals (SDGs) in 2015 whose global objective is articulating development priorities until 2030. In Kenya, UHC forms part of the government's Big Four Agenda (Group, 2018). Out of pocket expenditure for healthcare in LMICs still remains a big problem with over 100 million people being pushed into poverty annually. It is critically important to ensure that households are protected from catastrophic expenditure- which is also referred to as financial risk protection. (World Health Organization, 2017)

There is a global concern over increasing cost of health care (Ke Xu, 2011; Henderson, 2015; Phi, 2017). Some of the causes of increased healthcare spending as cited by several literatures include; GDP growth (Ke Xu, 2011; Phi, 2017; Allen, 2019); disease prevalence such as the upsurge of both communicable and NCD'S (Allen, 2019; Fodeman & Book, 2010); population growth (Allen, 2019); aging population (Henderson, 2015; Phi, 2017; Porter, 2017); life expectancy (Phi, 2017) medical progress (Ke Xu, 2011; Phi, 2017); medical technology advancement (Ke Xu, 2011; Henderson, 2015; Phi, 2017; Porter, 2017); sustained increase in medical insurance coverage and waste (Ke XU, 2011; Henderson, 2015; Phi, 2017); public health expansion initiatives (Allen, 2019); provider payment mechanisms such as fee for service (Ke Xu, 2011) and rising cost of prescription drugs (John, 2017) amongst others.

The rising healthcare costs is ultimately borne by the payers i.e., the government in form of taxes and individuals in form of payments from out-of-pocket, medical savings accounts or pooled funds through health insurance and more specifically private health insurance (Kara, 2014).

The burden of increased health care cost is being evidenced in the Kenyan Medical Insurance industry where losses have been reported in the past years despite the annual increment in premiums. The industry's loss ratio has been above 73% over the past five years which is above some of the developing and developed countries (McKinsey & Company, 2017; Insurance Industry Annual Report, 2019). The poor performance is being attributed to other factors such as high claims ratio and fraud (Badat, 2012; Association of Kenyan Insurers, 2013; Muiruri 2014).

Muiruri et al identified fraud and cost of care as the most important factors affecting the provision of medical insurance in Kenya. Kubania (2011) strongly attributed demographic structure, fraud, moral hazard, lifestyle diseases to affecting the performance of health insurance sub sector in Kenya. This study did not establish a clear association of these factors to healthcare cost.

Badat (2012) further attributed increasing healthcare cost to inappropriate use of healthcare services, provider payments models that aim at incentivizing over servicing rather than contain costs, fraud, increased non-healthcare expenditure costs. These studies have not looked at factors such as advanced age, burden of communicable and non-communicable diseases, emergence of health risk factors, moral hazard in the insured population, advancing medical technology and practices, low utilization of technology, poor process automation, low utilization of primary care gatekeeper; and increasing prescription drugs on medical insurers health care cost, a gap that this study aims to fill.

The findings from this study will help medical insurance providers devise specific strategies aimed at curbing further increment in healthcare costs. The ultimate effect of reduction in healthcare costs for the insurers will eventually lead to reduced premiums to the clients and making it affordable for more people to be insured (Komisar, 2013).

1.4 Research Objectives

1.4.1 General Objectives

To assess the impact of demographics, technology and health systems characteristics on Private Health Insurance healthcare costs in Kenya.

1.4.2 Specific Objectives

i) To assess the impact of demographics on private health insurance costs in Kenya.
ii) To determine the extent to which technology affects private health insurance costs in Kenya.
iii) To assess the contribution of health system characteristics to private health insurance costs in Kenya.

1.4.3 Research Questions

i) How does demographics impact private health insurance costs in Kenya?

ii) To what extent does technology affect private health insurance costs in Kenya?
iii) What is the contribution of health system characteristics to private health insurance costs in Kenya?

1.5 Scope of the Study

The scope of the study includes all the private medical insurance providers located in Nairobi as all of them have offices located here. The study participants are actuarial managers and excludes the insured population. The study was conducted from January– October 2021.

1.6 Justification of the Study

The study focuses on the impact of demographics, technology and health system characteristic on healthcare costs among private health insurers in Kenya. This is crucial because understanding the key determinants of healthcare expenditure from a payer perspective is important for policy makers in the wake of increasing healthcare costs globally.

For Kenyan medical insurers, profitability has been a major issue with losses being reported in the recent past despite the annual increment in premiums. The industry's loss ratio has been above 73% over the past five years which is above some of the developing and developed countries.

The findings of this study may therefore help medical insurance providers and other stakeholders devise specific strategies to curb further increment in health care costs. The study also provides information to researchers, potential and current scholars on the topic as well as identify other areas of future studies.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

There has been great interest in the study of economics and business on the cost of providing various products and services. This is a major determinant of pricing in a competitive market for maximum results in sales and profits.

This section of literature reviews the theoretical framework adopted by the study, the empirical evidence on the influence of independent variables demographics, technology and health system characteristics on healthcare costs from a global, Africa and Kenyan perspective and health insurance market in Kenya. Finally gaps in research were identified and outlined especially within the local market.

2.2 Theoretical Framework

This study adopts two theories: Production Theory and Principal Agent Theory. These two theories have explained the factors that determine the cost of a product/service by from a health insurer and provider perspective. They have also sought to identify other external factors that might affect the overall costing model for both entities for example providers' desire to maximize profits might lead to over servicing and overcharging (Maciera, 1998; Kutzin, 2001).

Other theories reviewed include Transaction Cost Theory (TCT) and Law of demand and supply. TCT theory states that the optimum organization structure is one that achieves economic efficiency by minimizing the costs of exchange. It further suggests that each type of transaction produces coordinating costs of monitoring, controlling and managing transactions. (Williamson 1979, 1986). This theory has been criticized for overemphasis on cost minimization, belittling costs relating to organizational efficiency, failure to acknowledge the impact social relationships play in economic transactions and applicability in some areas and not others (Klein, 1995; Masten, 1996). This theory was not thus considered for the study.

The Law of demand and supply which explains the relationship between demand and supply and their effect on price (cost) whereby an equilibrium price is achieved when demand and supply are at equilibrium holding all else equal. This theory has some drawbacks such as being grounded on assumptions i.e., unlimited size of market, zero entry barriers and inability to acknowledge or predict market failure. Besides health commodity consumption is affected by other factors such

as uncertainty which significantly affects an individual's choice; for example, one is not sure of when they will get sick, from what ailment and how much it will cost and thus cannot plan or save adequately. There is also information asymmetry, market power by suppliers, government intervention which limits individual's choice (Christos, 2019). Healthcare market cannot therefore be analyzed by this framework and thus this theory was not considered for this study.

2.2.1 Production Theory

In economics, the theory of production and cost states that the cost of a product or service is determined by the total sum of the cost of all the resources that went into making it. Production therefore means transforming inputs (land, labour, machines, raw materials etc.) into an output. An input is defined as a good or service that is being used for production whereas an output is the good and service that comes out of the production process. There are multiple factors to be considered when determining the cost of a product or service. (Dorfman, 2016)

Dorfman (2016) classifies inputs as either fixed or variable. Fixed inputs are those ones that remain constant for a certain level of output and whose supply is inelastic in the short term. They include land, machinery, and certain types of labour. Variable inputs on the other hand change with changes in output and its supply in the short term is elastic and include labour, raw materials, energy fuel etc.

Production function holds that production of a given commodity or service depends on certain specific inputs. A firm's long-run production function is of the form (Q):

Q = f (Ld, L, K, M, T, t)

Where Ld = land and building; L = labour; K = capital; M = materials; T = technology; and t = time. These variables form the independent variables in a firm's actual production function.

Economists further reduced the number of variables for convenience as:

Q= F (K, L) Where K it the capital and L is labour.

Increasing production, Q, will require K and L, and whether the firm can increase both K and L or only L will depend on the time considered for increasing production, that is, whether the firm is thinking in terms of the short run or the long run (Mishra, 2014).

In the Private Health Insurance context, one of the methods of determining the cost of office premium is the formula approach as described below: (Obudho, 2014)

$$PV(claims) + PV(Comm) + PV(Exp) - PV(Inv) = PV(OP) - PV(Pro)$$

PV(Claims) is the present value of the expected claims

PV(Comm) is the present value of the commission

PV(Exp) is the present value of the expected expenses

PV(Inv) is the present value of the expected investment income

PV(OP) is the present value of the annual office premium

PV(Pro) is the present value of the expected profit

Once the insured has paid the premium, the insurer is expected to pay for the unforeseeable medical expenses in the future. In the process of provision of preventive care or treatment of injury or disease, the insurer incurs medical claims costs through the providers. (Green & Rowell, 2011).

Insurance profitability is determined by premiums collected, claims and expenses paid. (Barkat, 2021).

Underwriting income (Profitability) = Premium collected- Claims paid- Expenses.

The Kenyan medical insurance claims loss ratio has been above 73% over the past five years which is above some of the developing and developed countries. (McKinsey & Company, 2017; Insurance Industry Annual Report, 2019). Management expenses annual growth rate has averaged 8.6% in the last 5 years while net commissions averaged 4.6% over the same period (IRA, 2020). The private insurers under study have been underwritten as insurance companies by IRA and not as Health Maintenance Organizations (HMO); which are organizations that provide healthcare in return for a predetermined fixed insurance premium (IRA, 2020). This therefore means the private health insurers must depend on providers for health care provision.

Providers on their hand also incur costs in the provision of healthcare. The total value of the resources used in the provision of health care goods and services is equal to the amount payable to health care providers by the financing schemes for health care goods and services consumed during the accounting period. The below table shows some of the variables considered by providers in the provision of healthcare. (OECD, 2011)

Table 2.1

Classification of factors of health care provision

Code	Description
FP.1	**Compensation of employees**
FP.1.1	Wages and salaries
FP.1.2	Social contributions
FP.1.3	All other costs related to employees
FP.2.	**Self-employed professional remuneration**
FP.3	**Materials and services used**
FP.3.1	Health care services
FP.3.2	Health care goods
FP.3.2.1	Pharmaceuticals
FP.3.2.2	Other health care goods
FP.3.3	Non-health care services
FP.3.4	Non-health care goods
FP.4	**Consumption of fixed capital**
FP.5	Other items of spending on inputs
FP.5.1	Taxes
FP.5.2	Other items of spending

Source: IHAT for SHA 2011.

Note, adapted from*, IHAT for SHA 2011*

The independent variables in this study have been known to increase the cost of healthcare either by increasing the cost of unit cost or increasing utilization of health services (Green & Rowell, 2011)

2.2.2 The Principal Agent Theory

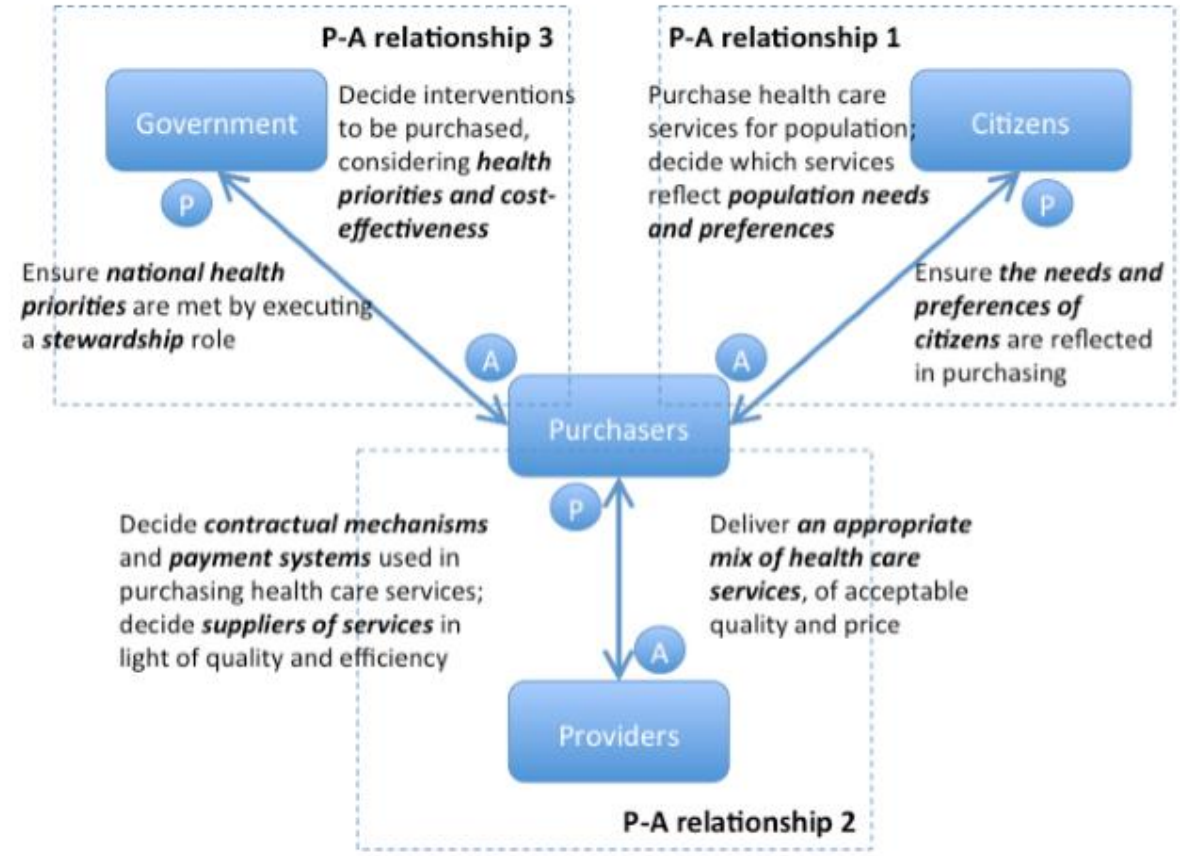
The principal agent theory focuses upon relationships between parties where one delegates some decision-making authority to the other. The principal delegates some decision-making authority to the agent who, in turn, is responsible for maximizing the principal's investment in exchange for an incentive, such as a fee. (Arrow, 1985)

Forder (2005) analyzed the purchasing function of medical insurance in a triple principle- agent relationship. He further examined the role of the purchasers of healthcare in relation to the providers, the citizens and the government as evidenced in the framework below.

The model makes two assumptions: there is a difference in priorities and interests between principals and agents and that agents usually have more information than their principals, which leads to an information asymmetry.

Figure 2.1

Forder et al 2005 conceptual framework



Adapted from (Kara, 2014)

Note, adapted from*, Kara (2014)*

Private health insurers can be considered as the principal and the providers of healthcare services as agents. (P-A relationship 2). The principals rely on agents for the provision of healthcare as they are deemed to have the necessary specialized knowledge or assets. Private health insurers in Kenya do not operate as HMO's and as such outsource for healthcare from providers.

The healthcare provider being the agent is the decision-maker but is incurring little or no risk because any losses will be ultimately borne by the principal who in this case in the health insurer. (Kopp, 2021). The contractual mechanism and payment model used in the provision of healthcare services by providers may minimize the risk of opportunistic behavior or lead to profit

maximization. (Maciera, 1998; Kutzin, 2001). This study sought to establish if use of fee for service as a common payment model and low utilization of primary gate keeper might be contributing to increased health care costs among private insurers in Kenya as this has been evidenced in other markets. (Gerdtham et al. 1998; Gerdtham & Jönsson, 2000).

Billing fraud & provider moral hazard has also been associated with increased healthcare spending as providers might adopt these strategies in view of maximizing profits (Neumann & Weinsten, 1991; Kubania, 2011; Muiruri, 2014). In the medical insurance sector 10-30% of healthcare spending is lost to medical fraud (Dabbo, 2015, slide 10). These factors shall also be explored by the study.

2.3 Empirical Evidence

2.3.1 Introduction

Adopting the perspective that demographics, technology and health system characteristics are impacting private health insurers costs in Kenya, literature review focused on the impact of these factors on costs from a global, Sub Saharan and Kenya perspective. Further, a review of literature on private health insurance in Kenya was also conducted.

2.3.2 Factors contributing to increased healthcare spending

2.3.2.1 Demographics

Demographics are statistical data about a population characteristic for example the age, gender and income of the people within the population. It includes information on lifestyle, employment status, accident rate and density of population per region. Understanding the changes in population size, age, race and ethnicity is very important as it affects the health-care resources required, the overall cost of care, and the associated conditions with each population. (NHS Employers, 2019)

Changing demographics with an increase in the share of old population has been associated with higher healthcare spending. This is because as one ages, so is the likelihood of suffering from a myriad of medical conditions that call for longer term treatment (Henderson, 2015). Offering health care to the mounting elderly population is a challenge for administrations and health schemes. Total life expectancy is expected to rise from approximately 74 years in 2018 to 75 years in 2023.

Those above the age of 65 will reach 686 million, or 12% of the global population. Expenditure on the world geriatric care market will likely exceed around US$1.4 trillion by 2023. (Allen, 2019)

Changes in diseases prevalence such as the upsurge of both communicable & NCD'S is being experienced globally. (Allen, 2019; Fodeman & Book, 2010). In 2017, more than 60 percent of the burden of disease resulted from NCD'S, with 28 percent from communicable, maternal, neonatal and nutritional diseases and just over 10 percent from injuries. (Global Burden of Disease Study, 2017)

With over 425 million afflicted with diabetes in 2017, the number is projected to rise to 629 million by 2045. Dementia which impacts more than 50 million aged 60 and above is projected to hit 82 million by 2030 and reach 152 million by the year 2050. (Allen, 2019)

The effect of the chronic disease is being felt also in developing countries in sub-Saharan Africa with Ampath-Kenya expecting related deaths to double by 2030. Kenya spends more on communicable diseases than NCD's like other developing countries at 49 % & 9% respectively (Ministry Of Health, 2017).

Watson (2020) recommends reviewing how healthcare benefits are managed both in normal times and during emergencies, especially now that the world is being faced by the Covid-19 pandemic. The impact of Covid-19 on overall medical cost was initially unknown, but newer studies are emerging and addressing the gap. The American Hospital Association estimates a financial impact of $202.6 billion in lost revenue for America's hospitals and healthcare systems, or an average of $50.7 billion per month. (Kaye, 2020)

NCD's are associated with lifestyle-related factors such as smoking, diet, obesity, hypertension and lack of exercise. NCD's are also contributing to majority of the top 10 global grounds of death. (Allen, 2019; Phi, 2017). Prevention is always better than cure and health sector can save a lot of money by reducing the number of people who require medical care. Additionally, The Academy of Nutrition and Dietetics in the United States divulges that proper planned vegetable and vegan diets are healthful and nutritionally adequate. (Melina, Craig & Levin, 2016).

Income and social status are also important determinant of health; where higher income and social status have been linked to better health. (Larrimore, 2011; World Health Organization, 2017). With disposable income one can purchase medical cover as a way of mitigating risk.

Fodeman and Book (2010) attributed increased healthcare spend to sustained increase in medical insurance coverage and waste. It is known that health insurance removes financial barrier to the insured and can lead to moral hazard. Moral hazard takes place when a party insulated from risk may behave differently than they would behave if they were fully exposed to the risk. There are two types of moral hazard (consumer moral hazard) where the insured may demand for more services than required and (provider induced demand) where there is unnecessary service provision by the healthcare providers. (Neumann & Weinsten, 1991; Muiruri, 2014).

2.3.2.2 Technology

Neumann & Weinstein (1991) broadly defines medical technology as drugs, devices, surgical procedures, and organizational support systems within which medical care is given. The direct cost of a capital-embodied technology includes not only the capital cost itself but also the operating costs required to implement it such as training, insurance, maintenance, and space. Additionally, a new technology may also affect the utilization of other health services. These effects constitute the "induced" costs and savings of a technology which may or may not be beneficial to the healthcare system.

Improvement in medical technology can either increase or reduce health care spending. If newer treatments are developed for untreatable conditions highly likely this will increase health care costs. Newer treatments developed to replace existing treatments might lower or increase the average cost of care, but the overall cost is determined by the total number of patients treated. The United States Newhouse (1993), Cutler (1995), Ginsburg (2004) and congressional Budget (2008) have examined this issue and concluded that about one half of the increase in medical spending is due to the introduction of new technology.

Ke Xu (2011) concluded that technological progress and variation in medical practice were major determinants in the level and growth of health expenditure. In depth studies have been done by The Organization for Economic Co-operation and Development (OECD) countries but literature from non-OECD countries has not considered technological progress as a covariant, this is due to limited reliable data on technological advances.

Mesko (2017) has argued that technology contributes highly to the rise in health care cost. With advancement in medical technologies, digital communications and disruptive innovations becoming inseparable from providing best healthcare practices. A paradigm shift is impending, with healthcare systems globally becoming financially untenable. The progress that technology

has made in digital health such as genome sequencing and smartphone enabled Electrocardiogram (ECG) renders them commercially available.

Additionally, Mesko (2017) concluded that currently, health technology is advancing in an unprecedented pace, making work easier to countless people in the health sector, at the same time high-cost rate of medication reflecting largely on the patients and insurers. Disruption in medical technologies like artificial narrow intelligence, robotics, telemedicine and genomics are helping medical practitioners access healthcare information easily with a click of a button, give instructions and even consult one another even in the middle of surgery. “Digital transformation is revolutionizing different industries at a faster than the anticipated pace. Despite the success with digital transformation in other industries, insurance companies are yet to join the bandwagon” (Insurance Outlook Report-East Africa, 2019, p. 24)

The World Health Organization (2010) estimated that 20% to 40% of total health expenditure is wasted due to inefficiencies in the system. Some of these inefficiencies such as corruption and fraud can be resolved by adoption of new technology. (Chisholm, 2010)

There is a key role of information technology in the provision of medical insurance in Kenya according to Muiruri (2014). In his empirical study, he recommends private health insurers to adopt technology so as to develop new ways of selling medical insurance and claims processing to curb fraud which is a major issue for medical insurance providers. (Association of Kenyan Insurers, 2013). Kubania (2011) study demonstrated that health insurers in Kenya are adopting and investing in newer technology to curb technological issues affecting the performance of this industry.

2.3.2.3 Health Systems Characteristics

The World Health Organization (2000) redefined health system as “all activities whose primary purpose is to promote, restore, and maintain health.” A health system therefore comprises of all organizations, institutions, and resources (elements) that are devoted to producing health actions. These do include patients, families, and communities, Ministries of Health, health care providers, health services organizations, pharmaceutical companies, health financing bodies etc. (World Health Organization, 2007)

How service provision is structured can determine the overall healthcare spend. The use of primary care gatekeepers in service provision has been associated with lower health care spend. (Ke Xu, 2011). The role of primary health care gatekeepers by private health insurers in Kenya shall be addressed by this study.

Provider payment mechanisms is an important factor in strategic purchasing. The choice of payment mechanism can impact healthcare expenditure in different ways (Boxall, 2011). The chosen mechanism may minimize the risk of opportunistic behavior or lead to profit maximization. (Maciera, 1998; Kutzin, 2001). Fee-for-service systems tended to lead to higher expenditure on average than capitation systems (Gerdtham, 1998; Gerdtham & Jönsson, 2000).

Rajkumar (2020) reported an expected increment in global spending on prescription drugs in 2020 to ~$1.3 trillion; the United States alone spending ~$350 billion. This is projected to be 3-6% in annual increment rate worldwide. This is being attributed largely to cancer treatment which has increased by more than 10% in the each of the past five years. In 2018, cancer drugs global spending was $ 150 billion. Some of other causes attributing to increasing prescription expenditure in the United States is increased drug use, changes in utilization of newer expensive drugs and price increment by manufacturer prices for the existing drugs (Kreling, 1997). Prescription drugs prolong and improve a patient's quality of life but with rising population, and upsurge of diseases demand leads to rising cost for patients, the insurer, and the public healthcare systems (Vyas, 2019).

In Sub-Saharan Africa, 70-90% of the drugs consumed in most countries is imported. This is higher than countries such as China and India where it is about 5- 20%. This fact put a strain on the government and household's income on already limited foreign exchanges (Conway, 2019).

In Kenya, generic drugs were sold at a lower retail price than innovator drugs although there was a large price difference which appeared grossly exaggerated for the target poor population. This fact would hinder access of the innovator drug due to the high prices (Ongarora, 2019).

Wasteful spending is another factor being attributed by billing fraud and defensive medicine. In the United States, it is estimated that healthcare fraud could be contributing to USD $300 billion loss as at 2018. " (Association)". The value of the market globally was USD 679.18 million in 2018 and is expected to reach USD 2.6 billion by 2024. (Intelligence, 2019). In the medical insurance sector 10-30% of healthcare spending is lost to medical fraud (Dabbo, 2015, slide 10).

Billing fraud is usually perpetrated by the healthcare provider with the aim of maximizing profits. It ranges from providers billing for uncovered services, up coding, double billing, misrepresenting, unbundling claims, miscoding, billing for unnecessary services, and prescribing specific branded name drugs to receive a kickback amongst others (Dabbo, 2015, slide 6).

Defensive medicine is whereby physicians may make redundant tests and procedures to do away with the risk of being charged. It is a common problem in the western countries with about 2-10% of healthcare spending being attributed to defensive medicine (Roberts & Hoch, 2009).

2.3.3 Outlook of Health Insurance in Kenya

According to Judy and Robert (2005) in any assurance business, insured or policyholder, is the person or entity purchasing the insurance policy. On the other hand, the insurer is the firm selling the insurance. The sum of cash charged for a certain amount of insurance supervision is referred to as the premium.

In Kenya, the population that has some form of health insurance stood at 17% with 88% of the population covered by NHIF leaving 11% for private health insurance. (Ministry Of Health, 2017). NHIF has been in existence since 1966. Enrollment into the scheme is voluntary for the informal sector and obligatory for the formal sector. (NHIF 2014, Public notice). As at end of June 2018, there were a total of 7.7 million principal members which is about 25 million Kenyans. (National Hospital Insurance Fund, Performance Report, 2018).

According to Insurance Regulatory Authority (2020), there were 32 medical insurance providers in Kenya: 27 under medical insurance and 5 under re-insurance companies. Contribution towards private health insurance in Kenya is voluntary. Wang'ombe (1994) catalogues into two units; the first one is employment-based insurance which is undertaken by employers on behalf of their employees as part of the employee benefit package. And the second category also referred to as direct private medical insurance is where insurance cover is taken out by individuals. This by proportions was 71% and 29% respectively according to a study conducted by Muiruri (2014).

There has been an increment of about 70% in Gross Written Premium in the medical insurance industry over the past five years. In 2019, the industry had a GWP of Kes 42.3 billion which was a 5.2% increment compared to the previous year and 70% increment in comparison to 2014. In terms of profitability, the medical insurance industry has been loss making with underwriting

profits only recorded in 2017 and 2019 at Kes 83 million and 140 million, respectively. (Insurance Industry Annual Report, 2019).

Muiruri (2014) identified other challenges affecting the provision of medical insurance in Kenya such as fraud, cost of healthcare, and lack of knowledge on medical insurance, moral hazard, adverse selection, competition, information technology, skills and competency of staff and claims management. Badat et al, identified similar factors such as rising costs, increasing fraud and high claim ratios. In the same report, the author proposed a mix of strategies private health insurers could adopt to help contain or reduce healthcare costs such as "incentivizing use of appropriate health care services, alignment of service provider reimbursement and quality of care, limiting fraudulent activity and containing non-healthcare expenditure". (Badat, 2012, Discussion section, Paragraph 2)

According to KPMG (2020) most medical insurers are currently shielded from Covid-19 related costs as their products have exclusion clauses for communicable diseases and epidemic/ pandemics. This product enhancement was developed after Severe Acute Respiratory Diseases (SARS) outbreak of 2003 (KPMG, 2020). In Kenya for instance, The National Hospital Insurance Fund (NHIF) withdrew paying for Covid-19 bills incurred at private hospitals and has limited the treatment to public hospitals due to the cost of care. (Alushula, 2020).

2.3.4 Outlook of Private Health Insurance Costs in Kenya

Medical claims cost (expenses) are costs incurred in the prevention through wellness initiatives or treatment of injury or disease. These can be incurred either as outpatient or inpatient. Outpatient costs are not limited to doctor consultations, prescriptions, procedures, radiological examinations, glasses and contacts, crutches, wellness initiatives etc.

Inpatient costs are related to surgical procedures, inpatient hospital stays and includes physician and nursing fees, medications and supplies etc. (Green & Rowell, 2011). The insurer pays for these benefits in form of reimbursement of actual expenses (up to the insured limit), cash payments, or the direct provision of services through its own existing provider panel.

Commercially, claims represent by far the largest single cost to insurers; up to 80% of all premiums being spent on claims' payment and associated handling charges. The claims loss ratio

is the percentage of claims costs incurred in relation to the premiums earned. (Hayes, 2020). By keeping these claims costs under control, an insurance company can price competitively without sacrificing its profit margins (Green & Rowell, 2011).

In Kenya, the claims ratio in Quarter 4-2020 averaged 73% in comparison to 74.1% in the previous year (IRA, 2020; IRA, 2021). This compares favorably with Malaysia's at 73% (Muller, 2020). Claim ratio in South Africa was reported at 70% whilst Nigeria was 72% although other dynamics must be factored like HIV prevalence, crime statistics and fraud in the Sub-Saharan region. (KPMG, 2019). Over the past five years, mature markets have reported a 5% lower claims ratio than the developing markets. (McKinsey & Company, 2017).

Administrative costs can be classified according to Thorpe, (1992); Chu & Trapnell, (2003) and Merlis, (2009) as transaction-related costs (premium collection, claims processing), benefits management (plan design, quality assurance, performance assessments), selling/marketing costs (underwriting, advertising, sales commissions), and regulatory/compliance costs (taxes, reserve requirements).

Administrative costs are an essential spending category to factor whenever computing total health insurance expenditure and is sometimes overlooked; it is worth to note that these costs must be kept at a minimal for health insurance to be profitable (WHO, 2010). The key performance ratios appertaining to administration have been contracting gradually over the last five years. Management expenses annual growth rate has averaged 8.6% in the last 5 years while net commissions averaged 4.6% over the same period (IRA, 2020).

2.4 Conceptual Framework

The conceptual framework of this study was grounded on literature review which views general factors affecting the cost structure of medical insurance firms and explained by the production theory where:

PV (Claims) + PV (Commission) + PV (Expenses) - PV (Investment)= PV (Office Premium)- PV(Profit)

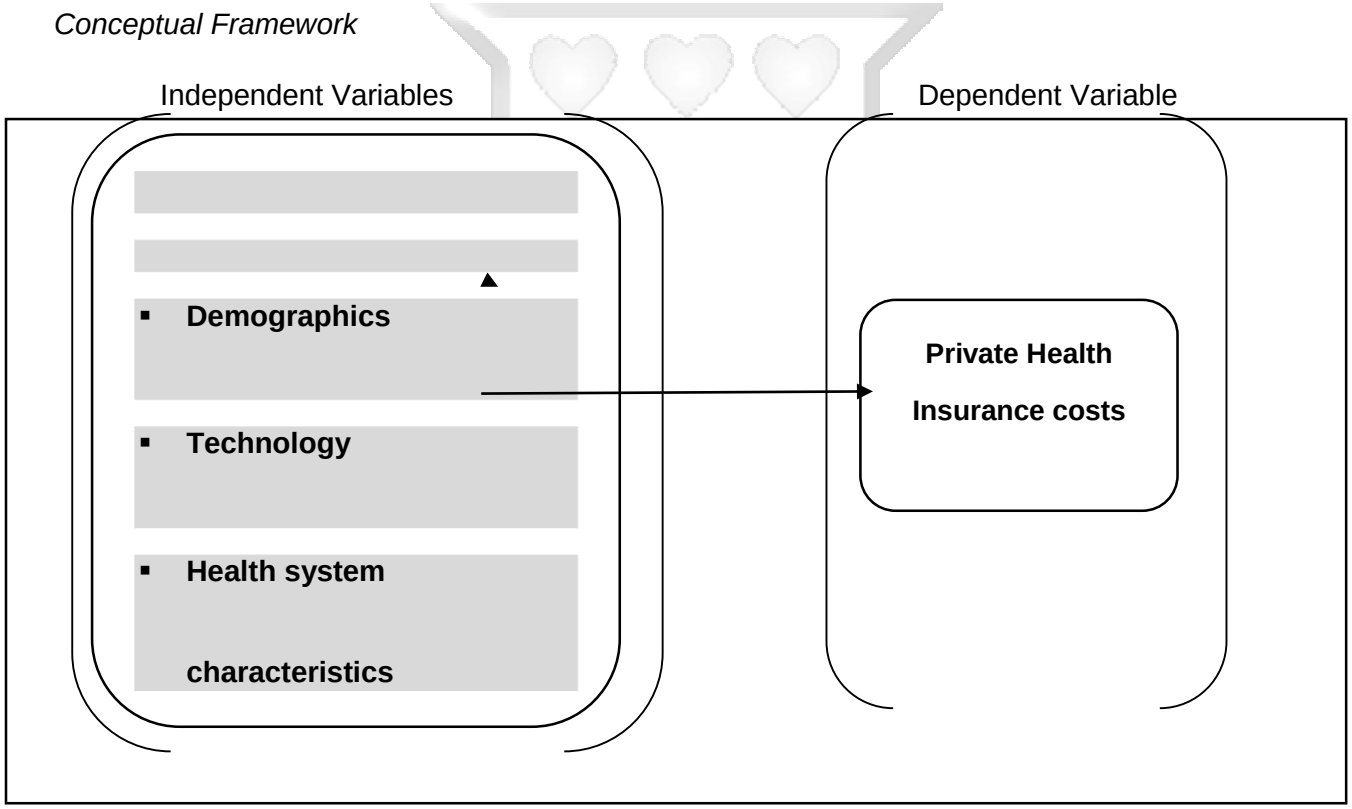
The function of claims is viewed to be affected by the independent variables demographics, technology and health system characteristics.

Health insurers in Kenya depend on providers for the provision of healthcare as they do not operate as HMO's. Providers on the hand are not willing to incur any risk and thus will pass all the costs the payers (Kopp, 2021). The cost of care can also be affected by providers' opportunistic behavior if no appropriate risk mitigations are taken by the principle in this case, the health insurer.

The key dependent variable is private medical insurers healthcare cost. This framework posits a central role of the interactions of the medical insurers with effects of external factors seeing that this may not be related to one factor, but interaction of the variables as diagrammatically presented below.

Figure 2.2

Conceptual Framework



Note, adapted from, *literature review*

2.5 Operationalization of the Conceptual Framework

Table 1.1

Operationalization of variables

	Item	Operational definition	Dependent variable	Questions
A	**Demographics**	• Changing demographics (More older people in the population above 65years) • Disease pattern (Increased burden of Communicable and NCD's) • Emergence of risk factors of health (Tobacco, alcohol consumption, sedentarism etc.) • Moral hazard in the insured population.	**Private Health Insurance healthcare costs**	9A
B	**Technology**	• Advancing medical technologies • Advance in medical practices • Low utilization of technology • Poor process automation		9B
C	**Health system characteristics**	• Utilization of primary care gatekeepers • Utilization of fee for services as a payment model • Increasing prescription drugs cost • Fraud and abuse		9C

Note, adapted from, *Literature review*

2.6 Gaps in Knowledge

As documented above, empirical studies on the various factors impacting on healthcare costs exist. However, majority of these are foreign and are based on studies in the United States, other OECD's and developing countries (Judy & Robert, 2005; Ke, 2011; Inwood, 2015; Giang 2017; John, 2017).

These studies have not looked at the effect of demographics and disease burden which have been shifting rapidly. For example, in Kenya the median age was 20 years in year 2019, this means that studies done five years before were dealing with demographics that were significantly different. (Wang'ombe, 1994; Badat, 2012; Muiruri, 2014).

From the reviewed literature, rapid technology changes bring about new ways of dealing with disease burdens. Technologies such as Internet of Things (IOT) which increases the utility of smart or wearable medical devices may shift focus from curative to preventive approaches which may increase or reduce health insurance costs. Same would apply to the application of telemedicine, 4G and 5G connectivity and there is need therefore for continuous studies to capture any new knowledge. (Mesko, 2017; Christiansen, 2017).

Emerging disease burdens such as COVID-19 pandemic is perceived to have changed the health services consumption behaviors and the general impact of this on health insurance costs were factors that this study explored. (KPMG, 2020)

Literature reviewed failed to focus on private medical insurance in the Kenyan context except for a few studies by Kubani and Muiruri et al. Muiruri's study on the challenges affecting the uptake and provision of medical insurance in Kenya identified cost of care as one of the main challenges but this study did not elaborate in detail on the causal factors. Kubania (2011) strongly attributed demographic structure, fraud, moral hazard, lifestyle diseases to affecting the performance of health insurance sub sector in Kenya. This study did not establish a clear association of these factors to insurers' healthcare cost. This is a gap that this research sought to fill in addition to providing current information on factors driving private health insurance cost in the 20s decade.

This study therefore sought to assess the impact of demographics, technology and the health system characteristics on healthcare costs among private health insurance companies in Kenya.

CHAPTER THREE-RESEARCH METHODOLOGY

3.1 Introduction

This chapter defines the research design, target population and sampling methods to be employed in this study. It further describes in detail the data collection methods, instrumentation, analysis and presentation.

Lastly, an outline of research quality was ensured, ethical considerations, limitations and delimitations of the study acknowledged.

3.2 Research Design

The study design adopted for this study was quantitative mixed cross-sectional design; both investigative and descriptive. The choice of investigative design was informed by limited local knowledge on the impact of demographics, technology, and health system characteristics on healthcare costs among private medical insurers in Kenya. The objective of investigative research is to delineate issues affecting a researchers' interest during research (Kothari, 1992).

The study is also descriptive in nature as these studies describe characteristics of objects, people, groups, organizations, or environments. The study therefore aimed there at describing the impact of demographics, technology and health system characteristics on healthcare costs among private health insurers in Kenya. Quantitative approaches have been used in previous studies to identify the challenges in the uptake and provision of medical insurance and external environmental challenges affecting the performance of health insurance sub sector in Kenya (Kubania, 2011; Muiruri, 2014).

3.3 Population of the study

There are 56 licensed insurance companies in Kenya (IRA, 2020).

3.3.1 Target Population

The study was a census and included all the thirty-two (32) medical insurance providers in Kenya: twenty seven (27) under medical insurance and five (5) re-insurance companies (IRA, 2019).

One actuarial manager was selected from each of the 32 private medical insurance companies. This is because they were deemed to possess knowledge on private insurance cost structure and

its determinants. The number of medical insurers was controllable and thus a census study was carried out.

3.3.2 Inclusion /Exclusion criteria

This study included all the actuarial managers from the 32 medical insurance companies.

3.4 Data Collection Strategy

Both primary and secondary data was used. Primary data was collected using a structured questionnaire which consisted of closed ended questions. This approach was selected as it would give the respondents enough time to respond to the questions at the same time help the researcher gather information on the research topic. This tool was selected as it is easy to administer, it can aid in quick data collection and analysis and it has been used in other studies within the same context (Kubania, 2011; Muiruri, 2014).

The questionnaire was structured to capture demographic data of the participants, the health insurance profile and participants belief on the contribution of the independent variables demographics, technology and health system characteristics to private health insurer costs in Kenya. A five-point Linkert scale was used to allow the respondents to tick the response appropriate to them.

Secondary data was obtained from insurance industry reports and other publications on medical insurance.

3.5 Data Analysis

The data collected was cleaned, and codes allocated to each answer to produce a coding frame, which was fed into SPSS and analyzed using means, frequencies, and standard deviation to enumerate the number of health insurers by variables under study.

To investigate the link between the variables and influence of costs, the Chi-square test of liberation was computed on the specific variables under demographics, technology and health system characteristics affecting healthcare cost among private medical insurers in Kenya and the relationship reflected significant for P cost between 0.00 and 0.05 level of sureness.

The data was presented using tables, pie charts and graphs.

3.6 Research Quality

This study considered three main aspects of research quality namely, validity, reliability and objectivity.

3.6.1 Study Validity

The study validity was measured using content validity, construct validity, overall model fit and assessed using tools used in another study (Dimba, 2009).

Content validity was maintained by ensuring extensive literature on empirical evidence of the variables demographics, technology and health system characteristics and association to health care cost from a global, Africa and Kenyan perspective.

Construct validity was adopted to appraise validity of operationalized variables in the study. The research tool was advanced from the conceptual framework adopted by this study. Construct validity was carried out using exploratory factor analysis to understand the extent to which the variables under study explain the variance in the various factors.

3.6.2 Study Reliability

To ensure study reliability the questionnaire was tested among a pilot of 5 individuals from the population under study with Cronbach's alpha coefficient of more than 0.7 considered acceptable. This was deemed important as the feedback helped the researcher modify the tool to enhance reliability.

Table 2.1

Reliability Test

Variable	Cronbach's Test Results
Demographics	0.72
Technology	0.76
Healthcare Characteristics	0.84

The research assistants were adequately trained prior to administering the questionnaire with the view of minimizing response bias.

3.6.3 Study Objectivity

To minimize bias, the investigator sought to conduct a critical review of literature from different sources. Therefore, the opinion shared in this paper is based on scientific views and not the investigator views.

3.7 Ethical Issues in Research

Prior to proceeding to collect data for this research, ethical approval was sought from Strathmore Business School Ethics Committee and The National Commission of Science and Technology Innovation. Once approval was granted, the researcher informed the participants of their rights as far as the study was concerned and a consent to participate in the study sought. The participants were required to append their signature if in agreement with the study and granted an opportunity to opt out at any period of data collection.

Confidentiality of the data obtained was maintained in the entire study period. Proper referencing of the literature used in this study was done to give credit to the respective authors.

3.8 Dissemination of Results

The results of this study shall be published in digital repositories for further reference to scholars, researchers, and insurance industry stakeholders.

3.9 Limitation of the Study

According to (Bowling, 2014), descriptive studies cannot provide robust evidence on the cause-and-effect relationship, but the researcher hopes the generated hypothesis can pave way for further analytical studies.

The study did not investigate other macro factors on health care cost such as GDP growth and public health expansion initiatives. This is an area that can be explored by further studies.

The results of this study cannot be generalized to represent the entire private health insurance in Kenya as the study only focused on the private health insurance which covers 17% of the population and the rest is covered by the NHIF. Besides, this study only focused on private health insurers and omitted other financiers of health care in Kenya such as the government, out of pocket, these categories can be considered in future studies.

CHAPTER FOUR: PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This chapter outline the results of data collection. Firstly, it presents the respondents' and private medical insurers' profile. Secondly it presents descriptive analysis of the research findings and lastly inferential analysis of the data.

4.2 Research Findings

4.2.1 Response Rate and Respondents Profile

Out of the 32 targeted respondents, 19 completed the questionnaire which gave a response rate of 59%. According to the table below, it is evident that majority of the respondents were male (63.2%) while the female constituted 36.8 %.

Table 3.1

Respondents profile by Gender

Gender of the respondents	Frequency	Percent	Valid Percent	Cumulative Percent
Male	12.0	63.2	63.2	63.2
Female	7.0	36.8	36.8	100.0
Total	**19**	**100**	**100**	

Table 5 shows the span of years that the respondents have spent in the insurance firm and it varied from less than 5 years at 47.4%, 6 -10 (26.3%), 11-15 (10.5%), to over 16 (15.8%).

Table 4.2

Respondents Span of Time in the Insurance Firm

Span of years that the respondents have been in the Insurance Firm.	Frequency	Percent	Valid Percent	Cumulative Percent
0 – 5	9.0	47.4	47.4	47.4
6 -10	5.0	26.3	26.3	73.7
11-15	2.0	10.5	10.5	84.2
Over 16	3.0	15.8	15.8	100.0
Total	**19**	**100**	**100**	

4.2.2 Kenyan Private Medical Insurance Firm Profile

Table 6 shows that the majority (73.7%) respondents worked for insurance firms that have been existence for more than 10 years, 5-10 years (21.1%) and 0-4 years (5.3%).

Majority (73.7%) of the firms have more than 40 employees with the least (26.3%) having 31 -40 employees.

Majority (60%) of the firms had over 70% of medical business volume domiciled from corporate employer-based insurance, between 50% to 69% (20%) while 40-49% (20%) meaning that individual based business contributes less to medical insurance than corporates. Corporates contributed 63% compared to Individuals (37%) as indicated in figure 3.

Table 5.3

Profile of Insurance Firms by Existence, Employees and Source of Business Volume

Length of existence of the insurance company	*Frequency*	*Percent*	*Valid Percent*	*Cumulative Percent*
0-4	1	5.3	5.3	5.3
5-10	4	21.1	21.1	26.3
Above 10	14	73.7	73.7	100.0
Total	19	100.0	100.0	

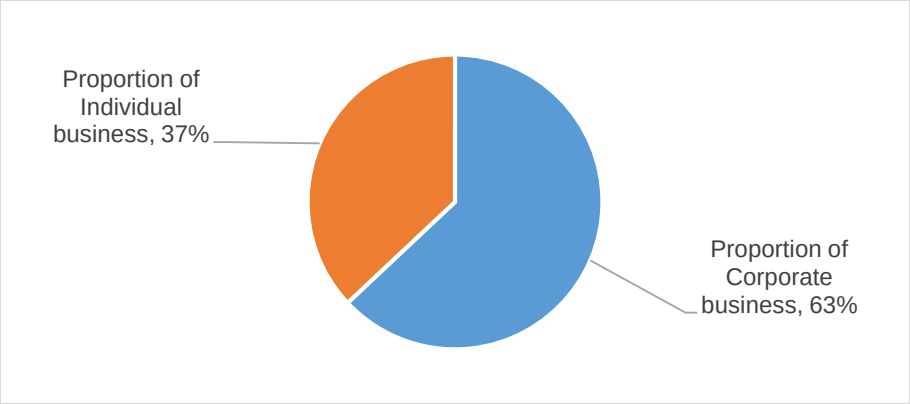
Number of employees	*Frequency*	*Percent*	*Valid Percent*	*Cumulative Percent*
31-40	5	26.3	26.3	26.3
41 and above	14	73.7	73.7	100.0
Total	19	100.0	100.0	

Volume of Corporate to Individual Business	*Frequency*	*Percent*	*Valid Percent*	*Cumulative Percent*
Above 70%	*9*	*60.0*	*60.0*	*60.0*
50% to 69%	3	20.0	20.0	80.0

40%-49%	3	20.0	20.0	100.0
Total	15	100.0	100.0	

Figure 4.3

Proportion of Corporate and Individual Business



4.3 Demographics

4.3.1 Older people in the population (>65 years)

Table 7 shows that majority of the respondents (53%) rated average on the impact of older population on private health insurance costs. We had (21%) strongly disagreeing, (5%) disagreeing, about a fifth (21%) agreeing and none of the respondents strongly agreed to this statement. The mean score of 2.74 indicates old age was perceived to be moderately contributing to private health insurers' healthcare cost.

Table 6.4

Older people in the population (> 65years)

Statement	**n**	**% of participants**
Strongly disagree	4	21
Disagree	1	5
Average	10	53
Agree	4	21
Strongly agree	0	0
Total	**19**	**100**
Mean	**2.74**	

Standard Deviation	**1.05**

Notes. n= number of participants %= percentage

4.3.2 Increasing burden of communicable diseases

Table 8 below shows that increasing burden of communicable diseases was viewed to be a notable factor in increasing healthcare cost with a mean score of 3.26 out of 5 and almost half (48%) of the respondents agreeing that it contributes to increasing health costs. Eleven percent of the respondents strongly agreed while 37% agreed and (32%) rated this factor as average on cost impact. A few (11% each) either strongly disagreed or just disagreed with the statement.

Table 7.5

Increasing burden of communicable diseases

Statement	**n**	**% of participants**
Strongly disagree	2	11
Disagree	2	11
Average	6	32
Agree	7	37
Strongly agree	2	11
Total	**19**	**100**
Mean	**3.26**	
Standard Deviation	**1.15**	

Notes. n= number of participants, %= percentage

4.3.3 Increasing burden of non-communicable diseases

Table 9 shows that increasing burden of non-communicable diseases was viewed as a significant factor increasing private health insurers' costs with a skew towards strong sentiments. It had a mean score of 3.21 out of 5 with majority (53%) agreeing to this statement (11% strongly agreed while 42% agreed) and a few (11%) indicating average rating. About a third (32%) of the respondents disagreed while 5% strongly disagreed.

Table 8.6

Increasing burden of non- communicable diseases

Statement	**n**	**% of participants**

Strongly disagree	1	5
Disagree	6	32
Average	2	11
Agree	8	42
Strongly agree	2	11
Total	**19**	**100**
Mean	**3.21**	
Standard Deviation	**1.18**	

Notes. n= number of participants, %= percentage

4.3.4 Emergence of health risk factors (Tobacco & alcohol consumption, sedentarism)

Table 10 shows that emergence of health risk factors such as tobacco & alcohol consumption, sedentarism etc. was viewed as a significant factor increasing healthcare cost with a strong sentiment. It had a mean score of 3.95 out of 5 with majority (58%) agreeing to the statement (37% strongly agreed while 21% agreed) and a few (42%) indicating average rating. None of the respondents disagreed with the statement denoting that this factor increases healthcare costs according to the industry players, this is also evidenced by the low standard deviation of 0.91 that is below 1.

Table 9.7

Emergence of health risk factors

Statement	**n**	**% of participants**
Average	8	42
Agree	4	21
Strongly agree	7	37
Total	**19**	**100**
Mean	**3.95**	
Standard Deviation	**.91**	

Notes. n= number of participants, %= percentage

4.3.5 Moral hazard in the insured population

Table 11 shows that Moral hazard in the insured population was viewed as a significant factor increasing healthcare cost with a strong sentiment. It had a mean score of 3.58 out of 5 with majority (58%) indicating average rating with 26% agreeing and 16% strongly agreeing. None of the respondents disagreed with the statement denoting that this factor increases health costs among the industry players, this is also evidenced by the low standard deviation of 0.77 that is below 1.

Table 10.8

Moral hazard in the insured population

Statement	**n**	**% of participants**
Average	11	58
Agree	5	26
Strongly agree	3	16
Total	**19**	**100**
Mean	**3.58**	
Standard Deviation	**.77**	

Notes: n=number of participants, %= percentage

The demographic factors can be ranked in order of perceived impact towards increasing private health insurance costs in Kenya as follows;

1. Emergence of health risk factors such as tobacco & alcohol consumption & sedentarism
2. Moral hazard in the insured population
3. Increasing burden of non- communicable diseases
4. Increasing burden of communicable diseases
5. Increasing aging population

The ranking show that health risk factors are viewed to contribute the greatest towards increasing costs of healthcare than moral hazard in the insured population and non-communicable and communicable diseases.

4.4 Technology

4.4.1 Advance in medical technologies

Table 12 shows that advancing medical technologies was viewed to be contributing towards increasing healthcare costs in a notable way with a mean score of 3.74 out 5. There was high proportion of actuaries (68%) agreeing that this is a driver of costs with 26% agreeing strongly and 42% agreeing, a few (16%) indicated this as an average factor, and (11%) disagreed while 5% disagreed strongly.

Table 11.9

Advancing medical technologies

Statement	**n**	**% of participants**
Strongly disagree	1	5
Disagree	2	11
Average	3	16
Agree	8	42
Strongly agree	5	26
Total	**19**	**100**
Mean	**3.74**	
Standard Deviation	**1.15**	

Notes. n= number of participants, %=percentage

4.4.2 Advance in medical practices

Table 13 shows that advance in medical practices contributed more towards increasing healthcare costs with a mean of 3.42 out of 5. Majority (53%) agreed to this statement with 16% agreeing strongly while 5% rated it as average, those who disagreed were 11% while 16% disagreed strongly. The high standard deviation of 1.35 show disparity in opinions indicating lack of consensus among actuaries on impact of medical advances on health costs.

Table 12.10

Advance in medical practices

Statement	**n**	**% of participants**
Strongly disagree	3	16

Disagree	2	11
Average	1	5
Agree	10	53
Strongly agree	3	16
Total	**19**	**100**
Mean	**3.42**	
Standard Deviation	**1.35**	

Notes. n= number of participants, %= percentage

4.4.3 Low utilization of technology

Table 14 shows that Low utilization of technology was rated as average on impacting cost of healthcare by majority (53%) and a mean of 2.94 out of 5. A few of the actuaries strongly disagreed (11%) with a similar proportion disagreeing strongly. A few (16%) agreed while 5% agreed strongly.

Table 13.11

Advance in medical practices

Statement	**n**	**% of participants**
Strongly disagree	2	11
Disagree	2	11
Average	10	53
Agree	3	16
Strongly agree	1	5
Total	**19**	**100**
Mean	**2.94**	
Standard Deviation	**1.00**	

Notes. n= number of participants, %= percentage

4.4.4 Poor process automation

Table 15 shows that poor process automation was viewed to have average impact on increasing cost of healthcare with 39% rating it so, 22% disagreed, 16% agreed while others agreed strongly (5%). The mean score was 3.22 with a low standard deviation of 0.88 showing consensus among the respondents.

Table 14.12

Poor process automation

Statement	n	% of participants
Strongly disagree	0	
Disagree	4	22
Average	7	39
Agree	6	16
Strongly agree	1	5
Total	**19**	**100**
Mean	3.22	
Standard Deviation	.88	

Notes. n= number of participants, %= percentage

The technology factors can be ranked in order of perceived impact on increasing private health insurance healthcare costs in Kenya as follows;

1 Advancing medical technologies
2 Advance in medical practices
3 Poor process automation
4 Low utilization of technology

The ranking shows that advancing medical technology and practices was viewed to contribute more towards increasing costs of healthcare than automation and low utilization of technology.

4.5 Health Systems Characteristics

4.5.1 Low utilization of primary care gatekeeper

Table 16 shows that low utilization of primary care gatekeeper was rated as a notable contributor towards increasing healthcare costs with a mean of 3.74 out of 5 with majority (58%) agreeing. Some agreed strongly (21%), others agreed (37%) with the same proportion indicating average ratings. Slightly more than a third (37%) disagreed while 5% disagreed strongly.

Table 15.13

Low utilization of primary care gatekeeper

Statement	n	% of participants
Strongly disagree	0	0
Disagree	1	5
Average	7	37
Agree	7	37
Strongly agree	4	21
Total	**19**	**100**
Mean	**3.74**	
Standard Deviation	**.87**	

Notes. n= number of participants, %= percentage

4.5.2 Utilization of fee for service as a payment model

Table 17 shows that utilization of fee for service as a payment model was found to moderately increase costs of healthcare with a mean of 3.58 out of 5. On agreement, a few strongly agreed (16%), others agreed (32%), almost half (47%) of the respondents rated it as average while 5% disagreed. This a factor had a low standard deviation of 0.84 indicating consensus.

Table 16.14

Utilization of fee for service as a payment model

Statement	n	% of participants
Strongly disagree	0	0
Disagree	1	5
Average	9	47
Agree	6	32
Strongly agree	3	16
Total	**19**	**100**
Mean	**3.58**	
Standard Deviation	**.84**	

Notes. n= number of participants, %= percentage

4.5.3 Increasing prescription drug costs

Table18 shows that increasing prescription drug costs was noted to have notable effect on healthcare costs with a mean score of 3.84 out of 5. Most of the respondents (69%) agreed to this statement (with 16% agreeing strongly and 53% agreeing) and (32%) rated as average. None of the respondents disagreed to this factor. Low standard deviation of 0.69 shows consensus on the cost impact of prescription drug costs.

Table 17.15

Utilization of fee for service as a payment model

Statement	**n**	**% of participants**
Strongly disagree	0	
Disagree	0	
Average	6	32
Agree	10	53
Strongly Agree	3	16
Total	**19**	**100**
Mean	**3.84**	
Standard Deviation	**.69**	

Notes. n= number of participants, %= percentage

4.5.4 Fraud and abuse

Table 19 shows fraud and abuse is viewed to contribute towards increasing private health insurers costs as indicated by the mean score of 3.84 with majority (63%) agreeing to this statement (37% agree and 26% strongly agree). 32% of the respondents rated this as average while (5%) strongly disagreed. Low standard deviation of 0.9 shows a consensus on the cost impact of fraud and abuse.

Table 18.16

Fraud and Abuse

Statement	n	% of participants
Strongly disagree	0	
Disagree	1	5
Average	6	32

Agree	7	37
Strongly Agree	5	26
Total	**19**	**100**
Mean	**3.84**	
Standard Deviation	**.90**	

Notes. n= number of participants, %= percentage

Health system characteristics factors can be ranked in order of perceived impact on increasing private health insurer costs in Kenya as follows;

1 Increasing prescription drug costs
2 Fraud and abuse
3 Low utilization of primary care gatekeeper
4 Utilization of fee for service as a payment model

The independent variables were averaged to arrive at a mean score for each factor under study, it emerged that health characteristics (3.75 out of 5) ranked highest in contributing to increasing health insurance costs, then demographics (3.4) followed closely by technology (3.3).

4.6 Correlation Analysis

Correlation analysis was conducted to understand the extent to which the variables under study are related to each other. Table 4.17 below shows that technology factor was highly, positively and significantly correlated to health system characteristics with a Pearson correlation coefficient of 0.933 with a .000 significance level meaning that if the two factors were addressed cost of private medical insurance would decrease. Demographics were also positively correlated to technology (0.102 with 0.677 significance) and health system characteristics (0.035) but the relationship was not significant as indicated by significance levels of 0.677 and 0.888 respectfully.

Table 19.17

Correlation Analysis

Correlations

	Demographics	Technology	Health System Characteristics

Demographics	Pearson Correlation	1	.102	.035
	Sig. (2-tailed)		.677	.888
	N	19	19	19
Technology	Pearson Correlation	.102	1	.933**
	Sig. (2-tailed)	.677		.000
	N	19	19	19
Health System Characteristics	Pearson Correlation	.035	.933**	1
	Sig. (2-tailed)	.888	.000	
	N	19	19	19

**. Correlation is significant at the 0.01 level (2-tailed).

4.7 Factor Analysis

Factor analysis was conducted to understand the extent to which the variables under study explain the variance in the various factors. The first step was to apply principal component analysis (PCA) as a method of extraction and derived what is shown in Table 20. From the below thirteen principal components, five of the factors extracted explain 81% of the variance.

Table 20.18

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.301	25.391	25.391	3.301	25.391	25.391
2	2.365	18.190	43.581	2.365	18.190	43.581
3	2.127	16.358	59.939	2.127	16.358	59.939
4	1.690	12.996	72.935	1.690	12.996	72.935
5	1.047	8.053	80.988	1.047	8.053	80.988
6	.861	6.621	87.609			
7	.668	5.138	92.747			
8	.424	3.265	96.012			
9	.216	1.661	97.672			
10	.112	.858	98.531			
11	.082	.633	99.164			

12	.067	.518	99.682
13	.041	.318	100.000

The five components were further deconstructed to indicate the contribution of each variable studied to each of them as shown below.

Table 21.19

Component Matrix

	Component				
Factors	1	2	3	4	5
Older people in the population (> 65years)	**.684**	-.015	-.510	-.051	-.256
Increasing burden of communicable diseases	.416	**.617**	.502	.124	-.177
Increasing burden of non- communicable diseases	**.555**	.539	.061	.298	.352
Emergence of health risk factors (Tobacco & alcohol consumption, sedentarism etc.)	-.460	.148	.059	**.613**	.281
Moral hazard in the insured population	-.181	-.489	.245	.211	**.615**
Advancing medical technologies	.021	**.678**	.278	-.529	.261
Advance in medical practices	**.657**	.189	-.187	-.467	.396
Low utilization of technology	**.767**	-.549	-.014	-.138	.011
Poor process automation	**.603**	-.338	.460	.349	.060
Low utilization of primary care gatekeeper	-.380	-.321	**.689**	-.271	-.224
Utilization of fee for service as a payment model	.265	-.567	**.395**	-.428	.159
Increasing prescription drug costs	.007	.302	**.726**	-.095	-.158
Fraud and abuse	**.715**	-.074	.252	**.**507	-.200

Notes. Extraction Method: Principal Component Analysis.

a. 5 components extracted.

Based on the factor loadings shown above the five components can be named as follows

1. **Advancement**- constituted by advanced age, increasing burden of non- communicable diseases, advance in medical practices, low technology utilization, poor process automation, fraud and abuse.
2. **Medical protocols**- Advancement in medical technologies, increasing burden of communicable diseases.
3. **Business model**- Utilization of fee for service, low utilization of primary care gate keeper, increasing prescription drug costs.
4. **Emerging Risks**- Emergence of health risks factors.
5. **Morality**- moral hazard in the insured population.

4.8 Chi Square Analysis

Chi square analysis was conducted to evaluate the relationship between the various variables under demographics, technology and health system characteristics with gender of respondent, number of employees (staff) and years of existence of participating insurance firms. Where the value was less than 0.05, the relationship was considered as significant. According to the analysis most of the variables studied were not significantly related with the three exceptions based on the significant value of Pearson Chi-square, likelihood ratio and linear by linear association values.

There were only three exceptions, in the first case being technology factors variable –poor process automation which had a likelihood ratio (LR) of 8.5 and a significant value of 0.038 as indicated in table 19 below. A relatively high likelihood ratio of 10 or greater will result in a large and significant increase in the probability of an insurance company with 31- 40 staff, viewing poor process automation as a key driver of increasing health costs. A LR of 5 moderately increase the probability of insurance company with 31- 40 staff viewing low automation as driver of increasing costs, A LR of 2 only increases the probability a small amount. This means that there is a moderately high likelihood that low process automation is a key driver of increasing health costs for insurance companies with 31- 40 staff, this relationship is significant. This also means that insurance companies with lean staff view poor automation as a key driver of healthcare costs and most likely costs of doing business compared to companies with more than 40 staff. The

participating insurance companies fitted in two categories 31-40 employees and above 40 employees).

Table 22.20

Chi-squire analysis, Poor process automation by staff count

Crosstabulation Demographics: Company's Staff Count		**Variable: Poor process automation**				
		Disagree	Average	Agree	Strongly agree	Total
STAFF COUNT	31-40	1	0	3	1	5
	41 and above	3	7	3	0	13
Total		4	7	6	1	18

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.785[a]	3	.079
Likelihood Ratio	8.454	3	.038
Linear-by-Linear Association	2.997	1	.083
N of Valid Cases	18		

a. 7 cells (87.5%) have expected count less than 5. The minimum expected count is .28.

The second exception was still on technology factors- Low utilization of technology variable where younger firms viewed low technology utilization as a key driver of health costs with a relatively high LR of 9.7 and significance of 0.3, indicating the relationship is positive though not significant. It had a linear-by-linear association ratio of 4.8 with a significance value of 0.03 showing the linearity is significant (*see table 20 below).*

Table 23.21

Chi-squire analysis, Low Utilization of Technology by Years of Existence

Crosstabulation Demographics: Company's years of existence		Variable: Low utilization of technology				
		Disagree	Average	Agree	Strongly agree	Total
Years of Existence	0-4	0	0	0	1	0
	5-10	0	0	2	1	1
	Above 10	2	2	8	1	0
Total		4	7	6	1	18

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.662[a]	8	.222
Likelihood Ratio	9.675	8	.289
Linear-by-Linear Association	4.756	1	.029
N of Valid Cases			

a. 14 cells (93.3%) have expected count less than 5. The minimum expected count is .06.

The third exception was on health system characteristics factors- Utilization of fee for service payment model variable where males viewed this as a key driver of health costs with a moderately high LR of 7.8 and significance value of 0.05, indicating the relationship is significant. This means that male actuaries had stronger sentiments than female ones on this payment model being a key driver of increasing healthcare costs (*see table 21 below).*

Table 24.22

Chi-squire analysis, Utilization of fee for service as a payment model by gender

Crosstabulation Demographics: Gender of Respondent		**Variable: Utilization of fee for service as a payment model**				
		Disagree	Average	Agree	Strongly agree	Total
GENDER	Male	0	7	2	3	12
	Female	1	2	4	0	7
Total		1	9	6	3	19
	Value	df	Asymp. Sig. (2-sided)			
Pearson Chi-Square	6.585[a]	3	.086			
Likelihood Ratio	7.835	3	.050			
Linear-by-Linear Association	.357	1	.550			

a. 7 cells (87.5%) have expected count less than 5. The minimum expected count is .37.

CHAPTER FIVE: DISCUSSIONS

5.1. Introduction

This chapter summarizes the results of the study responding to the objectives then draws conclusions thereafter. It further looked at the results and relation to existing theories and previous literatures. Finally, the study's recommendations for policy implication shall be discussed and limitations of the study and areas for further research outlined.

5.2 Discussion of the Results

The study revealed that majority of the respondents were male and they had spent more than 16 years working in these insurance firms. It also showed these firms had been in existence for more than 10 years and had majority of the medical business domiciled in corporate employer- based insurance and several studies have shown identical results (Kubania, 2011; Muiruri 2014).

The study sought to assess the impact of specific variables under demographics, technology and health system characteristics on Private Health Insurance costs in Kenya.

5.2.1 Discussion on how demographics impact private health insurance costs in Kenya

The findings indicate that demographic factors impact private medical insurance costs in Kenya with various aspects contributing to this with varying degrees. These aspects were ranked in order of perceived impact on increasing healthcare insurance costs. Emergence of health risk factors such as tobacco & alcohol consumption was rated to have the highest impact, this was followed by moral hazard in the insured population, then the burden of non-communicable diseases, followed closely by burden of communicable diseases and lastly older population.

The findings of this study in relation to health risk factors such as smoking, diet, obesity, hypertension and lack of exercise contributing to increased health care cost is congruent to several literature that have linked lifestyle factors to NCD's which are contributing to majority of the top 10 global grounds of death. (Allen, 2019; Phi, 2017). Other studies conducted in the same context showed that lifestyle diseases strongly affected the performance of medical insurance companies in Kenya (Kubania, 2011)

Moral hazard in the insured population was also noted to contribute greatly towards increasing private health insurers cost in Kenya. These findings are similar to studies conducted by Fodeman and Book (2010) where the authors attributed increased healthcare spend to sustained increase in medical insurance coverage and waste. This is solely because health insurance removes financial barrier to the insured and this may lead to more demand for healthcare services. (Neumann & Weinsten, 1991; Kubania, 2011; Muiruri, 2014). According to principle agent theory, the provider being the agent may adopt certain strategies to maximize profits such as overservicing in alignment to the insurer's demand for healthcare services. This further affects the overall cost of health care as these costs shall be passed to the insurer ultimately (Kopp, 2021).

The findings of this study contradict other literatures where changing demographics with an increase in the share of old population has been associated with higher healthcare spending. (Allen, 2019). Advanced age has been associated with higher likelihood of suffering from a myriad of medical conditions that call for longer term treatment (Henderson, 2015). However, the low agreement level observed in this study may have to do with the lower proportion of people aged over 65 years in Kenya which suggests that the elderly population is too low to be a significant driver of increasing healthcare spending in the Kenyan market (Kenya National Bureau of Statistics, 2019). This study findings contradicts similar research conducted in the same context whose objective was to establish if aging population affected the performance of private health insurance companies in Kenya. (Kubania, 2011)

5.2.2 Discussion on the contribution of technology towards private health insurance costs in Kenya

Technology factors were perceived to be increasing health insurance costs in Kenya. Advancing medical technology and practices was viewed to contribute the greatest towards increasing costs of healthcare than low process automation and low utilization of technology which were found to affects costs negatively for more established or large players than the younger smaller ones.

The findings from this study are in accordance with the literatures which state that investment in technology creates "induced" costs and savings of a technology which may or may not be beneficial to the healthcare system. (Neumann & Weinstein, 1991). Other studies with similar results include Ke Xu, (2011) & Mesko (2017) which concluded that technological progress and variation in medical practice were major determinants in the level and growth of health expenditure. Besides advancement in medical technologies, digital communications and disruptive innovations becoming inseparable from providing best healthcare practices.

Low utilization of technology was also noted to contribute to health care costs among the private health insurers to some extend according to this study. The World Health Organization (2010) estimated that 20% to 40% of total health expenditure is wasted due to inefficiencies in the system. Some of these inefficiencies such as corruption and fraud can be resolved by adoption of technology. (Chisholm, 2010). Muiruri (2014) highlighted a key role of information technology in the provision of medical insurance in Kenya whereas Kubania (2011) demonstrated that health insurers in Kenya are adopting and investing in newer technology to curb technological issues affecting the performance of this industry.

5.2.3 Discussion on to what extent health system characteristics affect private health insurance costs in Kenya

Health system characteristics factors were perceived to positively impact healthcare costs with increasing prescription drug costs and fraud being seen as having higher impact on costs than low utilization of primary care gatekeeper and low utilization of fee for service as a payment model in that order.

Increasing prescription drug costs was a major contributor to private health insurance costs. This is congruent with Rajkumar (2020) who reported an expected increment in global spending on prescription drugs in 2020 to ~$1.3 trillion; with the United States alone spending $350 billion. This is projected to be 3-6% in annual increment rate worldwide. In Sub-Saharan Africa, 70-90% of the drugs consumed in most countries is imported which comes at a higher cost a fact puts a strain on the government and household's income with already limited foreign exchanges power (Conway, 2019). In Kenya, generic drugs were sold at a lower retail price than innovator drugs although there was a large price differential which appeared grossly exaggerated for the target poor population. This fact would hinder access of the innovator drug due to the high prices (Ongarora, 2019).

The study findings support the literature where health care fraud value in the market globally was estimated at USD 679.18 million in 2018 and was expected to reach USD 2.6 billion by 2024. (Intelligence, 2019). In the medical insurance sector 10-30% of healthcare spending is lost to medical fraud (Dabbo, 2015, slide 10). Billing fraud is usually perpetrated by the healthcare provider with the aim of maximizing profits. Similar studies in the same context have shown fraud as a major challenge in the provision of medical insurance and strongly affecting the performance of medical insurance in Kenya (Kubania, 2011; Muiruri, 2014).

Low utilization of primary gatekeepers in service provision was also a contributor of increasing healthcare cost according to this study. This is alignment to a study conducted by Ke XU (2011) where the author associated this factor to lower healthcare spend.

The study also associated fee-for-service systems with higher private insurers cost. This finding is similar to other studies where FFS system was associated with higher expenditure on average than capitation systems (Gerdtham et al. 1998; Gerdtham & Jönsson 2000). The contractual mechanism and payment model used in the provision of healthcare services may minimize the risk of opportunistic behavior or lead to profit maximization (Maciera, 1998; Kutzin, 2001). In this case fee for service system and low utilization of primary gate keepers by insurers seemed to promote over utilization of healthcare services with subsequent increase in cost of healthcare.

5.3 Conclusion

Health system characteristics have a higher impact on increasing private health insurance costs in Kenya while demographics and technology have a moderate impact respectively.

There are some individual variables however within the factors that have demonstrated a higher impact on health insurance costs in order of frequency as; emerging health risks factors (such as smoking & tobacco consumption, sedentary lifestyles), increasing prescription drug costs, fraud and abuse, low utilization of primary gatekeeper and advancing medical technologies.

Further analysis shows that health insurance costs of smaller (based on employee base) and younger insurance companies are more likely to be increased by low technology utilization and poor process automation than larger companies.

5.4. Implications of the Study for Theory, Policy and Practice

The main objective of the study was to assess the impact of demographics, technology and health system characteristics on Private Health Insurance healthcare costs in Kenya. This study has filled a gap that existed before where other comparative studies were conducted in OECD and other developing countries. This helps to improve the existing theories by incorporating the Kenyan context which is useful for theory and academics.

Policy makers will find the findings useful in understanding the drivers of private insurance healthcare costs in Kenya. The Government of Kenya, through Ministry of Health can use the

findings to give more focus areas on lifestyle related factors, increasing prescription drug costs and fraud as key contributor of healthcare costs. They can also use the findings in developing health education programs as a way of inculcating appropriate health improvement behaviours and practices among various target groups to mitigate against the increasing healthcare costs. The Insurance Regulatory Authority (IRA) that regulates the insurance firms will find useful insights in this study especially while reviewing medical insurance contracts for its licensees.

Managers of medical insurance firms and actuaries in Kenya will also find the study insightful in improving the current medical insurance underwriting practices. The managers should focus on improving technology and health care system characteristics factors as they were found have high likelihood of reducing private healthcare insurance costs. The findings can assist the insurers at an individual or through the Association of Insurers of Kenya (AKI) formulating specific initiatives aimed at reducing the overall insurance health care costs specifically addressing the main factors.

5.5. Recommendations for Further Research

The results indicated that aging population is an average driver of increasing healthcare costs while literature from other markets indicate this factor as a major driver. Further research is required in future when the structure of population in Kenya changes to have a greater proportion of residents above the age of 65 years of age.

Given, the survey was conducted during Covid-19 pandemic similar research maybe be carried out in future to see how factors such as an aging population, communicable and non-communicable diseases would be rated as drivers of health costs for private health insurers during non-pandemic times.

Further studies to establish the effect of these factors on healthcare costs to other healthcare financiers such as Kenyan government, social health insurance provider (NHIF) and other out of pocket expenditures is recommended. Further studies can seek to establish the effect of other macro factors such as GDP growth and public health expansion initiatives on health care cost in the Kenyan Context.

Longitudinal studies can also look at the impact of the specific factors on healthcare costs in Kenya.

LIST OF REFERENCES

Alan D. Kaye, C. N. (2020). Economic impact of COVID-19 pandemic on healthcare facilities and systems: International perspectives. *Elsevier Public Health Emergency Collection*.

Allen, D. S. (2019). *2020 global health care outlook- Laying a foundation for the future.* Deloitte Development LLC.

Arrow, K. J. (1985). The economics of agency. *Harvard Business School Press*, 37-51.

Association of Kenyan Insurers (2017). *AKI Insurance Annual Report for 2017*. Nairobi.

Association of Kenyan Insurers. (2013). Health Insurers Fraud Survey Report. Association of Kenyan Insurers.

Barkat, S. (2021, February 18th). *How Do Health Insurance Companies Make Money?* Retrieved from HealthCareInsider: https://healthcareinsider.com/how-health-insurance-companies-make-money-60577

Bertalan Meskó, 1,2 Zsófia Drobni,3 Éva Bényei,4 Bence Gergely,5 and Zsuzsanna Győrffy2 (2017). *Digital health is a cultural transformation of traditional healthcare.*

Bowling, A. (2014). *Research methods in Health- Investigating health and health services*. Mc Graw Hill-Open University Press.

Boxall, A. M. (2011). What are we doing to ensure sustainability of the health system? Department of parliamentary services Australia.

Chu, R.C., & Trapnell, G.R. (2003). Study of the administrative expenses and actuarial ideals of small health plans. Washington: Small Business Administration.

Christiansen. L. (2017). *Commodification of Healthcare and its Consequences*. World Review of Political Economy, 8(1), 82-103. doi:10.13169/worlrevipoliecon.8.1.0082

Christos I, Areti T, Konstantinos K, Lambrini K (2019) Theories of Supply and Demand, Problems and Peculiarities in the Healthcare Sector: Its Effects on Health Policy. J Healthc Commun Vol.4 No.3:5

Dabbo, I. (2015). *Control measures on fraud and abuse in the region's healthcare industry*

Dan Chisholm, D. B. (2010). *Improving health system efficiency as a means of moving towards universal coverage.* World Health Organization. [PowerPoint slides]. Forward Together.

David H. Kreling, D. A. (1997). *Why Are Prescription Drug Costs Rising?* Wisconsin Family Impact Seminars .

Dennis Ongarora, J. K. (2019). Medicine Prices, Availability, and Affordability in Private Health Facilities in Low-Income Settlements in Nairobi County, Kenya. *Pharmacy (Basel)*.

Dimba, B. A. (2009). The Influence of Employee Cultural Orientations on the Relationship between Strategic Human Resource Management Practices and the Performance of Large Multinational Manufacturing Organizations in Kenya: Unpublished PhD project, Strathmore University, Nairobi, Kenya.

Dorfman, Robert. "Theory of production". *Encyclopedia Britannica*, 1 Apr. 2016, https://www.britannica.com/topic/theory-of-production. Accessed 23 May 2021.

Fatima Badat. (n.d.). *Kenya's Health Insurance Industry: Challenges and Reforms*. Retrieved from Africa Outlook: https://www.africaoutlookmag.com/industry-insights/article/587-kenyas-health-insurance-industry-challenges-and-reforms/

Fodeman, J. and Book. R.A. (2010). *Bending the Curve": What Really Drives Health Care Spending.* February 17, 2010. Health Care Reform Report.

Forder J., R. R. (2005). Theories of purchasing. In R. R. Figueras J., Purchasing to improve health systems performance (pp. 83-102). European Observatory on health systems and policies series.

Gerdtham, U.G. & Jönsson, B., 2000. International comparisons of health expenditure: theory, data, and econometric analysis. In A. J. Culyer & J. P. Newhouse, eds. Handbook of Health Economics. Amsterdam: Elsevier, pp. 11-53.

Gerdtham, U.G. et al., 1998. The determinants of health expenditure in the OECD countries: a pooled data analysis. In P. Zweifel, ed. Health, The Medical Profession, and Regulation. Boston: Kluwer Academic Publishers, pp. 113-134.

Global Burden of Disease Study. Seattle: Institute for Health Metrics and Evaluation (IHME). (2017).

Green, M., & Rowell, J. (2011). Thoughtful health cover: A leader to billing and settlement. Clifton Park, NY: Delmar Cengage Learning.

Group, W. B. (2018, April). *Policy Selections to grow the Big 4- Releasing Kenya's Private Sector to Drive All-encompassing Growth and speed up Poverty* Decline. Word Bank Group.

Harriet Komisar. (2013). *The Effects of rising healthcare costs on middle-class economic security.* Washington DC: AARP Public Policy Institute (PPI).

Hayes, A. (2020, November). Investopedia.

https://www.investopedia.com/terms/l/loss-ratio.asp

Henderson, J. W. (2015). *Health Economics and Policy.* (6th Ed.).

Impact Insurance (n.d). Expanding access to NHIF health insurance for informal sector workers in Kenya.

http://www.impactinsurance.org/partner/fsdk/

Insurance Outlook Report-East Africa. Deloitte. (2019)

Insurance Regulatory Authority (2018). *Insurance Industry Report for the Period October – December 2018*. Nairobi: Insurance Regulatory Authority.

Insurance Regulatory Authority (2018). *IRA Annual Report 2018*

Insurance Regulatory Authority (2019). *IRA Annual Report 2019*

Insurance Regulatory Authority (2020). *Licenced Insurance Companies 2020*. Nairobi: Insurance Regulatory Authority.

Insurance Regulatory Authority (2021). *Insurance Industry Quarterly Claims Statistics for the Period.* October – December 2020. January 2021.

Intelligence, M. (2019). *Healthcare Fraud Detection Market-Growth, Trends, and Forecast (2019-2024)*. Mordor Intelligence.

Judy F. A & Robert L. B. (2005). Danger and Assurance. Culture of Actuaries, United States of America

Kara, H. (2014). Researching purchasing to achieve the promise of universal coverage. Retrieved from RESYST.

Kaseje, D. (2006, November 2). Healthcare in Africa: Challenges, Opportunities, and an emerging model for improvement. Retrieved from https://www.wilsoncenter.org/sites/default/files/Kaseje2.pdf.

Kawabata K, Xu K, Carrin G. Preventing impoverishment through protection against catastrophic health expenditure. Bull World Heal Organ2. 2002; 80: 612.

Ke Xu, P. S. (2011). *The determinants of Health Expenditure- A country Level Panel Data 20Analysis.* Geneva: World Health Organization.

Kopp, C. M. (2021, April Friday). *Investopedia*. Retrieved from Investopedia: https://www.investopedia.com/terms/a/agencytheory.asp

Kothari, C. R (2000). *Research Methodology, Methods and Techniques.* New Age International (P) Limited Publishers.

Kothari, C.R. (1992). *Research Practice: Means and* Systems. (2nd Ed.) Kushiro, Prakshan.

KPMG. (2020). *Do insurers have COVID-19 covered?* Retrieved from KPMG: https://home.kpmg/xx/en/home/insights/2020/03/do-insurers-have-covid-19-covered.html

Kubania, B. K. (2011). External environmental challenges affecting the performance of health insurance sub sector in Kenya (Doctoral dissertation).

Kuria, J. M. (2014). Challenges in the Uptake and Provision of Medical Insurance in Kenya. Trials in the Uptake and Delivery of Medical Insurance in Kenya. Nairobi, Nairobi, Kenya.

Kutzin, J. (2001). A descriptive framework for country level analysis of healthcare financing arrangements. Health Policy, 171-204.

Larrimore, J. (2011). Does a Higher Income Have Positive Health Effects? Using the Earned Income Tax Credit to Explore the Income-Health Gradient. *The Milbank Quartely*, 694–727.

Laurent Musango, J. N. (2013). *State of Health Financing in the African Region.* Brazzaville: World Health Organization.

Maciera, D. (1998). Income distribution and the public-private mix in healthcare provision: The Latin American case. InterAmerican Development Bank.

McIntyre D. Beyond fragmentation and towards universal coverage: insights from Ghana, South Africa and the United Republic of Tanzania. Bull World Health Organ. 2008; 86(11):871–6.

Masten, S. (1995). 'Introduction to Vol. II: Oliver Williamson and Scott Masten eds. Transaction Cost Economics, Brookfield, VT, Edward Elgar.

Melina V, Craig W, Levin S (1980). *Position of the Academy of Nutrition and Dietetics: Vegetarian Diets*. J Acad Nutr Diet. 2016 Dec; 116(12):1970-1980. Doi: 10.1016/j.jand.2016.09.025. PMID: 27886704.

Merlis, M. (2009). Simplifying management of health cover. Washington: Nation-wide Academy of Social Insurance/National Academy of Municipal Administration/Robert Wood Johnson Foundation.

Michael Conway, T. H. (2019, January 10th). *www.mckinsey.com*. Retrieved from www.mckinsey.com: https://www.mckinsey.com/industries/public-and-social-sector/our-insights/should-sub-saharan-africa-make-its-own-drugs#

Ministry of Health. 2017. Kenya National Health Accounts 2015/2016. Nairobi, Kenya

Mishra, P. T. (2014). *Managerial Economics- Lecturer No 17: Theory of Production.* Retrieved from http://nptel.ac.in

Mugenda, A. G. (2008). Social science research: Theory and principles. Nairobi, Applied Research and Training Services.

Muiruri, S.K.J. (2014). *Challenges in the uptake and provision of medical insurance in Kenya*; Unpublished MBA Project; University of Nairobi.

Nassiuma D. K. (2000). *Survey sampling: Theory and methods*. Njoro, Kenya: Egerton University Press.

National Hospital Insurance Fund (2018) - *Strive towards universal health coverage for all Kenyans.*

Neumann, P. J., & Weinstein, M. C. (1991). The Diffusion of New Technology: Costs and Benefits to Health Care. In P. J. Neumann, & M. C. Weinstein, *The Changing Economics of Medical Technology.* Washington DC: National Academies Press.

NHCAA (n.d). National Health Care Anti-Fraud Association.

https://www.nhcaa.org/resources/health-care-anti-fraud-resources/the-challenge-of-health-care-fraud.aspx. (n.d.)

Obudho, S. (2014, June 14th). *Learning how to price health insurance products.* Retrieved from Future Actuaries: https://futureactuaries.wordpress.com/2014/06/20/learning-how-to-price-health-insurance-products/

OECD/World Health Organization/Eurostat (2011), “Classification of Factors of Health Care

Provision (ICHAFP)", in A System of Health Accounts: 2011 Edition, OECD Publishing, Paris. DOI: https://doi.org/10.1787/9789264116016-11-en

Organization, W. H. (2019). *Global Spending on Health: A World in Transition.* Geneva: World Health Organization.

Patrick Alushula. (2020, July Tuesday). NHIF stops Covid-19 bill payout in private hospitals. *Business Daily*.

Phi, G. (2017). *Determinats of Health Expenditure in OECD Countries.*

Rother, J. (2016). Top of the Administration's Agenda: Stem the Rising Cost of Healthcare. Generations: *Journal of the American Society on Aging, 40(4), 30-37*. Doi: 10.2307/26556244

Schmitz, A. (2012, December 29). *Theory and Applications of Economics (v.1.0)*. Retrieved from https://2012books.lardbucket.org/books/theory-and-applications-of-economics/

Sachs JD. Achieving universal health coverage in low-income settings. Lancet.

2012; 380(9845):944–7.

(n.d.). *The Effect of Health Care Cost Growth on the U.S. Economy.*

Thorpe, K.E. (1992). Inside the black box of administrative costs. Health Affairs, 11(2), 41-55

U.S. Congress, Office of Technology Assessment. Strategies for Medical Technology Assessment. GPO Stock No. 052-003-00887-4, Washington, D.C: U.S. Government Printing Office, 1982.

United Nations. Sustainable development goals: 17 goals to transform our world. 2015.

[Online]. Available: http://www.un.org/sustainabledevelopment/. Accessed: 25 Mar 2016.

Vincent Rajkumar, S. The high cost of prescription drugs; causes and solutions. *Blood Cancer J.* **10,** 71 (2020). https://doi.org/10.1038/s41408-020-0338-x

Vyas, S. (2019). *Disease Prevention with a Plant-based Lifestyle*. In Herrmann K. & Jayne K. (Eds.), Animal Experimentation: Working towards a Paradigm Change (pp. 124-148). LEIDEN, BOSTON: Brill. Retrieved November 13, 2020, from http://www.jstor.org/stable/10.1163/j.ctvjhzq0f.11

Wang'ombe J, D. Mwaniki, P. Mitula, M. Mugo, D. Nzoya, L .Muasya, E.Muchunga, H. (1994), Capacity of nongovernmental providers in delivery of healthcare in Kenya, Nairobi: DANIDA

Willistowerswatson (n.d.). Global Health Care Benefit Cost Increases Will Vary Widely In 2020.

https://www.willistowerswatson.com/en-TH/News/2019/11/global-health-care-benefit-cost-increases-will-vary-widely-in-2020-says-wtw

World Health Organization. (2010). Health systems financing: The path to universal coverage. World Health Organization.

World Health Organization (2019). *World-wide Expenditure on Health: An Ecosphere in* Change.

World Health Organization (WHO). (2010). *Administrative costs of health insurance schemes: Exploring the reasons for their variability*. Discussion Paper Number 8 - 2010. Department "Health Systems Financing" (HSF) Cluster "Health Systems and Services" (HSS)

World Health Organization, T. W. (2017). *Tracking Universal Health Coverage: 2017 Global Monitoring Report.* Geneva: World Health Organization, The World Bank.

World Health Organization. WHO | Health systems financing: the path to universal coverage. Geneva: World Health Organization; 2012.

World Health Organization. (2007). *Strengthening Health Systems To Improve Health Outcomes.* Geneva: World Health Organization.

World Health Organization. (2017, February). Retrieved from World Health Organization: https://www.who.int/news-room/q-a-detail/determinants-of-health/

World Health Organization (N.D). Medicine prices in Kenya.

http://haiweb.org/wp-content/uploads/2015/07/Kenya-Summary-Report-Pricing-Surveys.pdf/

LIST OF APPENDICES

APPENDIX A: TIMELINE OF ACTIVITIES

ACTIVITY	21-Jan	21-Feb	21-Mar	21-Apr	21-May	21-Jun	21-Jul	21-Aug	21-Sep	21-Oct
Proposal writing										
Ethical review and approval										
Pilot test										
Data collection										
Data analysis										
Report writing										
Thesis preparation										
Dissemination of results										

APPENDIX B: PARTICIPANT INFORMATION AND CONSENT FORM

IMPACT OF DEMOGRAPHICS, TECHNOLOGY AND HEALTH SYSTEM CHARACTERISTICS ON HEALTHCARE COSTS AMONG PRIVATE HEALTH INSURERS IN KENYA

SECTION 1: INFORMATION SHEET

Investigator: Dr. Jebidah Mkabili Mnyapara

Institutional Affiliation: Strathmore Business school

SECTION 2: INFORMATION SHEET- THE STUDY

2.1Objective of the study

The purpose of this study is to assess the impact of the demographics, technology and health system characteristics on private health insurance health care costs in Kenya. This study shall recommend strategies that can be adopted to reduce health care costs in the sector.

2.2 Study procedures

Participation in this study is voluntary. If you choose to participate, you shall be required to sign as appropriate in the consent form. Thereafter you will be required to respond to the enclosed questionnaire, and it will require about 10 minutes to complete. You are free to change your mind at any point without giving reasons.

2.3 Eligibility of the study

Since this is a census of the private medical insurers in Kenya. One actuary manager from each company shall be selected to participate in the study as they are deemed to have knowledge on the researcher topic of interest.

Not eligible for the study are the insured members of these private medical insurers in Kenya.

2.4 Involvement

You will be approached and requested to take part of the study once you are clear with the study objectives and what is required of you. If in agreement, you will be required to sign the consent form and respond to the questionnaire to the best of your capability.

2.5 Risks or discomfort

There are no risks in participating in the study. All your information shall be handled with utmost confidentiality.

2.6 Benefits of participating in the study

Since this study is focusing on Kenyan private health insurance costs, the researcher feels the findings might interest the participants as they are one of the stake holders in the industry. A copy of the study outcomes may be sent to you upon request.

2.7 Data confidentiality

The information given will be used for academic purposes ONLY. The data collected will be handled with strict privacy and your names will not be revealed to third parties. All research records will be stored in a locked cabinet only accessible by the researcher.

2.8 Problems or Questions

For any questions related to this study, feel free to contact me on the following address.

Dr Jebidah.M. Mnyapara,

P.O BOX 8755-00100,

Phone 0729 265 505: mnyaparajane@gmail.com

For further assistance on this research, you may ask independently:

The Secretary–Strathmore University Institutional Ethics Review Board, P.O. BOX 59857- 00200, Nairobi, email ethicsreview@strathmore.edu, Tel number: +254 703 034 375

Participant's declaration

I have read and understood all the material presented to me for this study. I do hereby consent to participate in the study voluntarily.

Participant's signature: …….. Date: …….

Witness signature: ……Date: ……....

APPENDIX C: QUESTIONNAIRE

SECTION A

1. Name (Optional)……..

2. Sex Male ……M

Female ……F

3 The Name of the Employer (Optional) _____

4 Number of years the Company been in existence?

Years	***Tick one***
0-4	
5-10	
Above 10	

5 How many staff does your company have?

No. of Staff	***Tick one***
1-10	
11-20	
21-30	
31-40	
41 and above	

6. Which one defines your duty in the Company? _____

7. Show the span of time that you have been in this Firm.

Time in Years	*Tick one*
0 – 5	
6 - 10	
11- 15	
Over 16	

8. What is the volume of medical insurance business written in the year ended 31st Dec 2020 (in percentage)?

Business mix	**%**
Corporate business (Employer based)	
Individual business	
Total	

SECTION B

9. To what extent do you support the following statements as causes of increasing healthcare cost among private health insurers in Kenya, using the scale given below?

1–Strongly disagree 2–Disagree 3–Average 4–Agree 5–Strongly agree

A. Demographics					
A1 Older people in the population (> 65years)	1	2	3	4	5
A2 Increasing burden of communicable diseases	1	2	3	4	5
A3 Increasing burden of non- communicable diseases	1	2	3	4	5
A4 Emergence of health risk factors (Tobacco, alcohol consumption, sedentarism etc.)	1	2	3	4	5
A5. Moral hazard in the insured population	1	2	3	4	5
B. Technology					
B1 Advancing medical technologies	1	2	3	4	5
B2 Advance in medical practices	1	2	3	4	5

B3 Low utilization of technology	1	2	3	4	5
B4 Poor process automation	1	2	3	4	5
C. Health system characteristics					
C1 Low utilization of primary care gatekeeper	1	2	3	4	5
C2 Utilization of fee for service as a payment model	1	2	3	4	5
C3 Increasing prescription drug costs	1	2	3	4	5
C4 Fraud and abuse	1	2	3	4	5

Thanks respondent.

APPENDIX D: LIST OF RESPONDENT FIRMS

	MEDICAL INSURANCE COMPANIES
1	AAR KENYA
2	ALLIANZ
3	APA
4	BRITISH AMERICAN
5	CIC
6	FIRST ASSURANCE
7	GA INSURANCE COMPANY
8	HERITAGE
9	ICEA LION
10	JUBILEE HEALTH INSURANCE
11	KENINDIA
12	KENYAN ALLIANCE
13	MADISON

14	PACIS
15	RESOLUTION HEALTH
16	SAHAM
17	SANLAM
18	TAKAFUL
19	TAUSI
20	TRIDENT
21	UAP
22	METROPOLITAN CANNON
23	FIDELITY
24	GEMINIA
25	KENYA ORIENT
26	MONARCH
27	XPLICO

	MEDICAL REINSURER COMPANIES
1	CONTINENTAL REINSURANCE
2	EAST AFRICAN REINSURANCE
3	GHANA REINSURANCE COMPANY
4	KENYA REINSURANCE CORPORATION
5	WAICA REINSURANCE KENYA LIMITED

APPENDIX E: BUDGET

BUDGET

RESEARCH BUDGET	DESCRIPTION	UNITS	DURATION/ NUMBER	UNIT COST	GRAND TOTAL
Personnel					
Research assistant		2	5	2,000	10,000
Statistician		1	1	15,000	15,000
Printing					
Consent form	Actuarial managers		32	10	320
					25,320

APPENDIX F: ETHICAL REVIEW APPROVAL

Strathmore UNIVERSITY

13th July 2021

Dr Mnyapara Jebidah,
mnyaparajane@gmail.com

Dear Dr Mnyapara,

RE: Impact of Demographics, Technology and Health System Characteristics on Healthcare Costs Among Private Health Insurance in Kenya

This is to inform you that SU-IERC has reviewed and **approved** your above **master's** research proposal. Your application reference number is **SU-IERC1055/21**. The approval period is **13th July 2021 to 12th July 2022**.

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 48 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 48 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and also obtain other clearances needed

Yours sincerely,

for: Dr Virginia Gichuru,
Secretary; SU-IERC

13 Jul 2021

Cc: Prof Fred Were,
Chairperson; SU-IERC

Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email admissions@strathmore.edu www.strathmore.edu

APPENDIX G: NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION (N.A.C.O.S.T.I) APPROVAL

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 858404

Date of Issue: 12/July/2021

RESEARCH LICENSE

[redacted]

This is to Certify that Dr.. Jebidah Mkabili Muyapara of Strathmore University, has been licensed to conduct research in Nairobi on the topic: IMPACT OF DEMOGRAPHICS, TECHNOLOGY AND HEALTH SYSTEM CHARACTERISTICS ON HEALTHCARE COSTS AMONG PRIVATE HEALTH ENSURERS IN KENYA. for the period ending : 12/July/2022.

License No: NACOSTI/P/21/11668

858404

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.