



**Strathmore**  
UNIVERSITY

Strathmore University  
**SU+ @ Strathmore**  
University Library

---

Electronic Theses and Dissertations

---

2019

# Effect of Kitui County health insurance cover on the utilization of health services in Kitui County

**Grace A. Rabut**  
*Strathmore Business School (SBS)*  
*Strathmore University*

Follow this and additional works at <https://su-plus.strathmore.edu/handle/11071/6769>

## Recommended Citation

Rabut, G. A. (2019). *Effect of Kitui County health insurance cover on the utilization of health services in Kitui County* (Thesis). Strathmore University. Retrieved from <https://su-plus.strathmore.edu/handle/11071/6769>

This Thesis - Open Access is brought to you for free and open access by DSpace @Strathmore University. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of DSpace @Strathmore University. For more information, please contact [librarian@strathmore.edu](mailto:librarian@strathmore.edu)

**Effect of Kitui County Health Insurance Cover on the Utilization of Health Services in  
Kitui County.**

**Grace Atieno Rabut**

**Master of Business Administration**

**May 2019**

**Effect of Kitui County Health Insurance Cover on the Utilization of Health Services in  
Kitui County.**

**GRACE RABUT**

**MBA /101157**

Submitted in partial fulfilment of the requirement for the award of degree of Master of  
Business Administration (MBA) Degree

**Strathmore Business School**

**MAY, 2019**

## **DECLARATION**

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other university. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the thesis itself.

© No part of this thesis may be reproduced without the permission of the author and Strathmore University

**Grace Rabut**  
May 2019

### **Approval**

The dissertation of Grace Rabut was reviewed and approved by:

Dr. Pratap Kumar (Supervisor)  
Strathmore Business School

Dr. George Njenga  
Dean, Strathmore Business School

Prof. Ruth Kiraka  
Dean, School of Graduate Studies  
Strathmore University

## ABSTRACT

Health financing systems are critical for reaching universal health coverage. This is achieved by raising funds for health, reducing financial barriers to access through prepayment and subsequent pooling of funds in preference to direct out-of-pocket payments. As Kenya renews its focus on achieving Universal health coverage by 2022, Kitui County introduced a customized insurance scheme called Kitui County Health Insurance Cover (KCHIC) in August of 2017. Being the seventh largest county in Kenya, this study focused on Kitui as a unique county with Arid and Semi-Arid climate, high poverty rate and low insurance penetration. The introduction of KCHIC is a reflective consideration of the demographic diversities that are identifiable with the healthcare needs of the county residents. The purpose of this study therefore was to determine the effect of KCHIC on utilization of health services. The objectives were to establish the effect of antenatal care clinic attendance, post-natal care clinic attendance, family planning attendance, child welfare attendance and outpatient department attendance on utilization of health services in Kitui County. Data from District Health Information Systems (DHIS) summary form MOH 717 and hospital health services records were used. Descriptive statistics was used to determine the average monthly mean of the first four months before the introduction of KCHIC and average monthly mean of the first four months after introduction of KCHIC. A paired t-test was performed to establish whether there was any significant difference in the utilization of health services based on number of visits in all the 8 hospitals combined. The findings of the study revealed that KCHIC has had increased utilization of health services. The increased was observed in the post-natal care, child welfare care, family planning and outpatient attendance, however, utilization of services in the antenatal care clinic attendance measured in number of visits by patients had no significance difference in mean before and after the introduction of KCHIC. The study therefore recommends that other studies be carried out on all the hospitals in Kitui County offering services to KCHIC beneficiaries to analyse factor affecting utilization of services across all hospital departments. The study concluded that introduction of KCHIC has increased utilization of health services across the hospitals at independent level in Kitui County.

## LIST OF ABBREVIATIONS

ANC:	Antenatal Care
CHE:	Catastrophic Health Expenditure
CWC:	Child Welfare Care
FP:	Family Planning
HRLS:	Health and Retirement Longitudinal Study
KCHIC:	Kitui County Health Insurance Cover
KIHBS:	Kenya Integrated Household Budget Survey
KNBS:	Kenya National Bureau of Statistics
KNHIS:	Kenya National Health Information System
MoH:	Ministry of Health
NCMS:	New Cooperative Medicinal Scheme
NHIF:	National Hospital Insurance Funds
OOP:	Out-of-pocket Payment
OPD:	Outpatient Department
PNC:	Post-Natal Care
SDGs:	Sustainable Development Goals
UEBMI:	Urban Employee Basic Medical Insurance
UHC:	Universal Health Coverage
UN:	United Nations
URBMI:	Urban Residents Basic Medical Insurance
WHO:	World Health Organization

## **TABLE OF CONTENTS**

<b>DECLARATION.....</b>	<b>ii</b>
<b>ABSTRACT.....</b>	<b>iii</b>
<b>LIST OF ABBREVIATIONS .....</b>	<b>iv</b>
<b>TABLE OF CONTENTS .....</b>	<b>v</b>
<b>LIST OF FIGURES.....</b>	<b>viii</b>
<b>LIST OF TABLES.....</b>	<b>ix</b>
<b>ACKNOWLEDGEMENT.....</b>	<b>x</b>
<b>DEDICATION.....</b>	<b>xi</b>
<b>OPERATIONAL DEFINITION OF TERMS.....</b>	<b>xii</b>
<b>CHAPTER ONE: INTRODUCTION.....</b>	<b>1</b>
1.1 Background of the study .....	1
1.1.1 Health Insurance .....	2
1.1.2 Healthcare Utilization Services .....	3
1.1.3 Kitui County .....	4
1.2 Problem Statement.....	5
1.3 Research Objectives.....	6
1.3.1 General Objective .....	6
1.3.2 Specific Objectives .....	6
1.4 Research Questions.....	6
1.5 Scope of the Study .....	7
1.6 Significance of the Study.....	7
<b>CHAPTER TWO: LITERATURE REVIEW.....</b>	<b>9</b>
2.1 Introduction.....	9
2.2 Theoretical Review .....	9
2.2.1 Andersen Health Care Utilization Model .....	9
2.2.2 Choice Making Model of Health Utilization.....	10
2.3 Empirical Review.....	10
2.4 Knowledge Gap .....	12
2.5 Conceptual Framework.....	13
Figure 2.1 Conceptual Framework .....	13
<b>CHAPTER THREE: RESEARCH METHODOLOGY .....</b>	<b>15</b>
3.1 Introduction.....	15
3.2 Research Design.....	15
3.3 Target Population and Sampling Technique.....	15

3.3.1 Target Population .....	15
3.3.2 Sampling Technique .....	15
3.4 Data Collection .....	16
3.5 Research Quality .....	16
3.6 Data Analysis .....	16
3.6 Ethical Considerations .....	17
<b>CHAPTER FOUR: DATA ANALYSIS, RESEARCH FINDINGS AND INTERPRETATION .....</b>	<b>18</b>
4.1 Introduction.....	18
4.2 Descriptive Statistics.....	18
4.2.1 Findings in all the hospitals .....	18
Table 4.1 Descriptive summary table before/pre-KCHIC in all the hospitals.....	18
Table 4.2 Descriptive summary table after/post-KCHIC in all the hospitals .....	19
4.2.2 Findings by study variables in each hospital .....	19
Table 4.4 Post-natal care clinic attendance.....	20
Table 4.5 Child welfare care clinic attendance.....	21
Table 4.6 Family planning care attendance .....	22
Table 4.7 Outpatient care attendance.....	23
4.3 Paired t-test for difference in average (means) .....	23
Table 4.8 Paired t-test for health utilization across the hospitals .....	24
<b>CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS .....</b>	<b>25</b>
5.1 Introduction.....	25
5.2 Discussion .....	25
5.2.1 Antenatal care clinic attendance and health utilization .....	25
5.2.2 Post-natal care clinic attendance and health utilization.....	26
5.2.3 Child welfare clinic attendance and health utilization.....	27
5.2.4 Family planning and health utilization .....	28
5.2.5 Outpatient department attendance and health utilization .....	29
5.3 Conclusion .....	30
5.4 Recommendations.....	31
5.5 Areas of further studies .....	31
5.6 Limitations .....	32
<b>REFERENCES.....</b>	<b>33</b>
<b>APPENDICES .....</b>	<b>36</b>
APPENDIX ONE: LETTER OF INTRODUCTION .....	36

APPENDIX TWO: LIST OF 8 - SAMPLED HOSPITALS FOR STUDY .....37  
APPENDIX THREE: NACOSTI APPROVAL .....38  
APPENDIX FOUR: AVERAGE MEAN MONTHLY DATA .....39

**LIST OF FIGURES**

Figure 2.1 Conceptual Framework .....13

## LIST OF TABLES

Table 4.1 Descriptive summary table before/pre-KCHIC in all the hospitals.....	18
Table 4.2 Descriptive summary table after/post-KCHIC in all the hospitals .....	19
Table 4.3 Antenatal care clinic attendance .....	20
Table 4.4 Post-natal care clinic attendance.....	20
Table 4.5 Child welfare care clinic attendance.....	21
Table 4.6 Family planning care attendance .....	22
Table 4.7 Outpatient care attendance.....	23
Table 4.8 Paired t-test for health utilization across the hospitals .....	24

## **ACKNOWLEDGEMENT**

I would first like to thank my supervisor Dr. Pratap Kumar for diligently and patiently guiding me through the process of developing this thesis. He consistently allowed this paper to be my own work, and steered me in the right the direction whenever I needed it.

I must express my very profound gratitude to my parents, brothers, sisters and friends and for providing me with unfailing support and continuous encouragement throughout my years of study and through the process of researching and writing this thesis. This accomplishment would not have been possible without them.

Finally, I would also like to acknowledge the faculty of Strathmore Business School, Healthcare management for giving me the support in needed at every step.

## **DEDICATION**

The research thesis is dedicated to my 2 sons Karl and Riley for redefining courage, love and resilience to me. May you grow to be hardworking, innovative and God fearing individuals.

## OPERATIONAL DEFINITION OF TERMS

- Antenatal care:** Refers a preventive healthcare aimed at providing regular check-up for expectant mothers to treat and prevent potential health problems throughout the course of the pregnancy (MoH, 2014).
- Postnatal care:** Refers to the care given to the mother and her new-born baby immediately after delivery and for the first six weeks of life (MoH, 2014).
- Health care utilization:** Refers to the measure of the population's use of the health care services available to them at a given time in the country (Ekman, 2007a).
- Health Insurance:** Refers to a type of insurance coverage that covers the cost of an insured individual's medical and surgical expenses (Ataguba&Akazili, 2010).

## CHAPTER ONE: INTRODUCTION

### 1.1 Background of the study

Globally, World Health Organization reports that health system resources are coming less from households paying out-of-pocket and more through pooled funds, in particular from domestic government sources (Xu et al., 2018). In low and middle income countries, which are where the vast majority of African countries are ranked, scarcity of funds for health is an even more acute problem (World Health Organization, 2013). Like most of the developing countries, a vast majority of the Kenyan population relies extensively on out-of-pocket payment for health services (Chuma & Maina, 2012). Majority of the Kenyan population has low access to healthcare insurance. Chuma and Maina (2012) identified out-of-pocket payment (OOP) as the leading contributor to catastrophic health expenditure (CHE) among households in developing countries. The estimates by the World Health Organization (WHO) indicate that an average of approximately 5% of the Kenyan households encounter CHE annually (WHO, 2015). Additionally, the WHO (2015) reports that the burden of CHE in Kenya affects over 1.5million people annually.

Quality healthcare is a need that has remained a dream for many people especially those living on one meal per day in the developing nations (Ekman, 2007a). Attempts have been made to introduce health insurances as a way to enable people; especially those living in rural areas to access quality healthcare services as demonstrated by Andersen and Choice making models of health utilization (Kim & Lee, 2016). According to The Kenya Integrated Household Budget Survey (KIHBS) conducted by Kenya National Bureau of Statistics (2018), an estimated 63.5% of the population in Kitui county lives below the poverty line. Contemporary research findings have established that poverty largely affects the access to health besides being a determining factor of the compromised quality of healthcare services delivered.

The rate of unemployment has seen the rise in poverty level of households across the country (Chuma&Maina, 2012). Limitation of access to quality healthcare has mostly affected vulnerable groups, children and women who at times do not seek for medical services of prenatal and post-natal care in such areas in the country (Kitui County) due to high cost involved. Kitui County therefore introduced county health insurance to help this group of people and every household to have access to quality healthcare at affordable cost (County Government of Kitui, 2018). However, the significance of the insurance remains to be seen. This study therefore aimed to bridge this gap and determine how the system has improved

utilization of post-natal care, antenatal care, child welfare, family planning attendance and outpatient attendance health services in the hospitals across the county (Kitui).

### **1.1.1 Health Insurance**

In its most basic identity, health insurance is defined as a financial arrangement that covers the cost of medical care. In recent years, the increasing financial burden associated with high healthcare costs has prompted the development of other definitions of health insurance. This was the observation by Ataguba & Akazili (2010), who stated that across the scholarly definitions developed, health insurance is a method through which the healthcare expenses are paid for. Consequently, health insurance is a type of insurance coverage that covers the cost of an insured individual's medical and surgical expenses. Health insurance is operationalized by a health insurance policy, which is a legal contract between a healthcare beneficiary and a health insurance company. Under this contract, a person subscribes to a plan that stipulates the monthly amount they would pay to access healthcare whenever in need of healthcare services. These monthly payments are referred to as dues or premiums. Access to quality healthcare remains a goal for every country across the world. While developed nations have made steps higher in achieving efficient health utilization through availability of various health insurances, the same cannot be said for the developing nations, especially for the poor and the vulnerable groups (persons with disabilities), women and children alike (Kim & Lee, 2016). While formulating sustainable development goals (SDG), the UN established that an estimated 400 million persons across the world do not have access to at least one of the many essential health services in achieving the millennium development goals.

Additionally, financial is a major barrier for achieving quality healthcare services for many households. It is also estimated that approximately 1.2 billion people are already living in poverty whose cause has been as a result of using health services (Kapologwe, Kagaruki, Kalolo, Ally, Shao, Meshack & Hoffman, 2017). Kenya has not been an exceptional when it comes to healthcare challenges. Even with free medical cover through NHIF, the rate of household uptake for the insurance coverage has been low over the years. As a result, the introduction of UHC by the government was mainly aimed at ensuring that every member in each household is covered under the policy (Kapologwe *et al.*, 2017).

While this is a project that is soon to take off in every county in Kenya, the County Government of Kitui has gone a notch higher by introducing a health insurance cover known as Kitui County Health Insurance Cover (KCHIC) that is affordable for all the residence of the county so as to

easily access healthcare services. The cover was introduced in August of 2017 and has been in operation for close to one and half years now. Achieving efficient health utilization therefore require efficient health financing system which distributes the burden of paying for healthcare according to ability to pay and benefits from health spending on the basis of need.

According to KIHBS (2013), only 17.1% of Kenyans have a form of health insurance. From the comparative survey, Kitui (8.1%) is enlisted as one of the 15 counties in which health insurance penetration is below 9% (Ministry of Health, 2014). The subsequent introduction of KCHIC was aimed at reducing OOP, in extension to improving access to healthcare. KCHIC introduced an insurance that was cheaper than the National Health Insurance Fund (NHIF), which is recognized as medical cover for an overwhelming 88% of the population in Kenya. To assert emphasis on the element of insurance expense minimization, KCHIC required Kitui residents to pay an annual fee of Ksh.1, 000/=. Upon paying this amount, the healthcare system in Kitui would provide access to healthcare services for principle member and his/her dependants. The services would range from ambulance services, in-patient and out-patient services to mortuary services. The KCHIC is a sharp contrast to NHIF that required members to pay a monthly fee and the benefits would be limited to a few services in the hospital. Inasmuch as the decision by the Kitui County Government to introduce a comprehensive health insurance plan that is sensitive to the social, economic and cultural characteristics of its population was widely acknowledged as a step in the right direction.

Being the seventh largest county in Kenya, this study focuses on Kitui as a unique county with Arid and Semi-Arid climate, high poverty rate and low insurance penetration. (KNBS, 2018). The analytical underpinnings of this study portray the dire need for this population to have financial protection against catastrophic health expenditure. As this study hypothesizes, the introduction of KCHIC presents a detailed financial cover that responds to the diverse health needs of Kitui residence. This study aimed to develop an insightful perspective on the effect of the KCHIC on the utilization of health services in Kitui, by considering family planning attendance, child welfare attendance, postnatal care attendance, antenatal care attendance, and outpatient attendance for both male and female as aspects that contribute significantly to the KCHIC utilization.

### **1.1.2 Healthcare Utilization Services**

Health utilization is the measure of the health services used by a population (Ekman, 2007). Primarily, the purpose of measuring health utilisation is to prevent and cure health problems,

but secondarily, this measure is integral in promoting maintenance of health and well-being. Healthcare utilization is influenced not only by demand constraints but also by supply constraints (Ekman, 2007). In some cases, utilization is determined solely by the ability to pay rather than the need for care. This situation has made life difficult for so many individuals who cannot afford certain healthcare services in various healthcare facilities. As a result has led many into financial challenges or poverty (Ataguba & Akazili, 2010). There have been cases of inequity in health service utilization; where those who need health-care services do not get the benefits of such services in many hospitals.

In this context, universal health coverage as well as health insurance is viewed as the best alternative to improving access to health services for many families, more so those in the developing nations (Ekman, 2007). This has been aimed to reduce financial burden in using healthcare cover. While this has been what is often predicted by the individuals who support the theory of health insurance coverage, health insurance does not always provide the expected financial protection for those who are insured, and this is often due to limited insurance cover that may also reduce utilization. The government of Kitui introduced KCHIC which is voluntary for every household and include every member in each household. While these services could be available for every member in the county, determining uptake of the medical services is significant in establishing the effectiveness of such scheme in the county. This paper therefore aimed to bridge the gap by examining the effect of KCHIC on utilization of health services in Kitui County.

### **1.1.3 Kitui County**

Bordering Tana River to the East and South East, TaitaTaveta to the South, Makueni and Machakos to the West, Embu to the North West, and Tharaka and Meru to the North, Kitui County is located in Eastern Kenya that covers an area of 30,496.5 square kilometres. Kitui County shares the border of the Tsavo East National Park with Taita-Taveta County. The infrastructure in the county is better in the urban areas as compared to the rural areas. The advanced road network mainly constitutes gravel surface, which makes up 399.2 kilometres of the roads in the region. The county is administratively divided in to eight sub counties and forty wards as shown in appendix 2.

The average distance between health facilities in Kitui is 9 km, above the 5 km recommended by the WHO. Being an arid/semi-arid region, the geographic positioning and climatic conditions compound the problem of healthcare workers' scarcity in Kitui. As proof, Kitui

County has a doctor to patient ratio of 1:18000 and nurse to patient ratio of 1:2100. Such shortages in healthcare providers negatively affect the quality of healthcare. (County Government of Kitui, 2018)

Kitui County has 287 public and 65 private health facilities that serve a population of 1,134,472. The population comprises of 52% (589,925) females and 48% (544,547) males. The population density is 33 people per square kilometre, with an estimated 277,000 households. Annually, the population growth rate of Kitui County is estimated at 2.2% (County Government of Kitui, 2018). The main question that remains to be answered upon the plan's implementation is: Would the introduction of this health financing alternative translate to improved uptake of care to the residents of Kitui? This is the question that this study sought to answer.

## **1.2 Problem Statement**

Globally, access to quality healthcare is among the leading priorities that the Sustainable Development Goals (SDGs) targets to use in eliminating the widespread social inequalities, more so in the developing countries. SDGs stipulate the need for countries to achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all. (United Nations, 2017). The primary purpose of universal health coverage (UHC) is to ensure that the population is guaranteed equal access to health services devoid of the risks that expose households to financial vulnerabilities.

However, annually, averagely 150 million people from 44 million households globally are exposed to catastrophic health expenditure. In Africa, the effects of catastrophic healthcare expenditure are intense, given the overwhelming bulk of empirical proof pointing to the low penetration of health insurance. Despite research findings that prove the burden of CHE in developing countries more so in Africa, there are glaring gaps in research about the structural factors that influence the high levels of CHE relative to the low health insurance coverage. For instance, over 75% of individuals from 50% of the at-risk households exposed to CHE are pushed into poverty (Barasa, Maina, & Ravishankar, 2017).

Kenya is among the developing countries whose population still relies extensively on out-of-pocket payment for health, which was highlighted as the leading contributor to catastrophic health expenditure in a recent study by Chuma and Maina (2012). To achieve UHC, Kenya

must have reliable health financing models that are sustainable and responds to the needs of the population.

The introduction of KCHIC is a reflective consideration of the demographic diversities that are identifiable with the healthcare needs of the county residents. The KCHIC, therefore, is a customized model of achieving the UHC benchmarks in Kitui County. Given that the primary purpose of the KCHIC was to provide financial risk protection and improve access to healthcare, this study finds it imperative to determine whether or not the inception of this program has translated into improvements not only in the access to healthcare for the target population but also in the utilization of healthcare services.

### **1.3 Research Objectives**

This section presents the general and specific objectives of the study.

#### **1.3.1 General Objective**

The general objective of the study is to determine the effect of Kitui County Health Insurance Cover (KCHIC) on utilization of health services in Kitui County.

#### **1.3.2 Specific Objectives**

The study enlists its specific objectives as follows:

- i) To find out the effect of family planning attendance before and after the introduction of KCHIC on utilization of health services in Kitui County.
- ii) To determine the effect of antenatal care clinic attendance before and after introduction of KCHIC on utilization of health services in Kitui County.
- iii) To determine the effect of post-natal care clinic attendance before and after the introduction of KCHIC on utilization of health services in Kitui County.
- iv) To find out the effect of child welfare clinic attendance before and after the introduction of KCHIC on utilization of health services in Kitui County.
- v) To assess the effect of outpatient department attendance before and after the introduction of KCHIC on utilization of health services in Kitui County.

### **1.4 Research Questions**

- i) What is the effect of family planning attendance before and after introduction of KCHIC on utilization of health services in Kitui County?
- ii) What is the effect of antenatal care clinic attendance before and after the introduction of KCHIC on utilization of health services in Kitui County?

- iii) Does post-natal care clinic attendance before and after the introduction of KCHIC affect utilization of health services in Kitui County?
- iv) To what extent does child welfare clinic attendance before and after the introduction of KCHIC affect utilization of health services in Kitui County?
- v) How does outpatient department attendance before and after the introduction of KCHIC affect the utilization of health services in Kitui County?

### **1.5 Scope of the Study**

This study focused on the effect of KCHIC on utilization of health services in Kitui County. The study sought to determine effect of family planning attendance, antenatal care clinic attendance, post-natal care clinic attendance, child welfare clinic attendance and outpatient department attendance before and after the introduction of KCHIC on utilization of health services in Kitui County. Descriptive research design was used and secondary data drawn from Kenya National Health Information System (KNHIS), MOH 717 and the hospitals' health services records were also used for making study inferences. Eight (8) sub-county hospitals picked using purposive sampling technique formed the study populace and data was drawn from each hospital. Mean monthly data was based on the first four months before introduction of KCHIC and four months after introduction of KCHIC. Since that KCHIC was introduced in late August 2018, the first four months was May, June, July and August (t-1, t-2, t-3, t-4) while September, October, November and December formed after the introduction months (t+1, t+2, t+3, t+4). A paired t-test for the study was performed across the hospitals to whether there was no significance difference in mean utilization of health services before and after the introduction of KCHIC at a 0.05 level of significance.

### **1.6 Significance of the Study**

The study was significant to the healthcare policy makers as it highlighted the challenges and the achievements that have been made since the introduction of the KCHIC in Kitui County. It also emphasizes on the areas that need to be improved so as to achieve efficient health utilization.

To the academicians, the study provided an additional literature how increase in insurance cover and universal healthcare cover may lead to efficient health service utilization across the country. To the scholars, it may have drawn criticism and discussion on the need for better policies and methodologies of enhancing utilization of health services.

The study highlighted how effective health insurance financing by both the national and county governments can lead to efficient utilization of health services. It provided mechanisms that both the governments can emphasize on so as to efficiently finance health services and make it affordable for each and everyone in the country.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This section of the study presented the existing scholarly work on the topic of the study. It first identified the theories that contribute to the study and explained various studies on empirical review with slight discussion on their methodologies and the study findings. The chapter then provided knowledge gap and conceptual framework.

### **2.2 Theoretical Review**

Theories are past models that tend to explain the belief of certain aspects and connecting them to the topic of the study. For this study, two models were used; Andersen model healthcare utilization model and choice making model of health utilization.

#### **2.2.1 Andersen Health Care Utilization Model**

This is a healthcare services model which was developed by Andersen in 1968. The model in its origin aimed at explaining various factors that effectively lead to the efficient usage of health services at a given time or all time. There are various usage of health services demonstrated by the model such as inpatient care services, outpatient care services, and dental care service among others. The model explains these health care services are in the most case determined by a number of critical factors such as predisposing factors, enabling factors and the need factor (Andersen & Newman, 1973).

Predisposing factors as indicated by Andersen (1968), compose of race, age and health beliefs of the patient or people. By providing an example, people or community who believe health services are an effective way of treatment for an ailment are more likely to seek for medical services at all time. Enabling factors look at the family support that one is having when they are ill or sick, access to health insurance among people, and one's community at large. The theory further explains that family support is critical in explaining health utilization. Even though need for better health services have left many families poor due to high cost of treatment, it has continued to remain a critical factor in determining health utilization (Anderson, 1995).

In relation to the study variables, it may represent both perceived and actual need for health care services among people and an individual. Medical accessibility can be viewed from presence of enabling resources, encouraging people to seek for medication (Andersen & Newman, 1973). This theory gives a variety of reasons that may contribute to healthcare utilization other than health insurance. As this study focuses on how KCHIC has contributed to

utilization of health services, this theory throws weight to the significance of this variable among the other predisposing, enabling and need factors that contribute to health care utilization.

### **2.2.2 Choice Making Model of Health Utilization**

This healthcare model was developed by Young (1981) to explain health service utilization in Mexico. Young (1981) noted that access may be the most important influence on healthcare utilization. The model provides four critical components that must be addressed effectively in order to obtain efficient health utilization. The first component is the perception of gravity which incorporates both the individuals' perceptions and their social network's consideration of illness severity (Young, 1981).

Social networks of a person is critical in establishing the extent to which at times they can seek medication within a given time in case of emergency or duration of sickness (Bertranou, 1998) Financial support offered through social networks is therefore a key. The second component is the knowledge of home treatment or simply traditional treatment (Young & Young-Garro, 1982). In African culture/context, knowing a home remedy that may be efficacious can be effectively utilized by the patients before utilizing professional health care system, and this component is normally preferred by many people, especially in rural and low developed areas where cost of health accessibility is high.

The third aspect of the theory is the faith in remedy. This is explained by a person's belief of efficacy of the treatment for the present illness that he/she is suffering from (Wolinsky, 1988a). Believe can make people seek for medication if they believe that treatment will be effective. The fourth and most important is the accessibility of treatment. This includes cost evaluation by an individual in getting health services (Wolinsky, 1988b). In the context of the current study, this theory is beneficial in explaining the efforts that has been put in place by the County Government of Kitui to ensure that access to health care services is not only affordable but also free for most persons in each household in the county. All these, therefore, align the role of this theory in determining uptake or utilization of health care services in the county.

### **2.3 Empirical Review**

Whery and Miller (2016) did a quasi-experimental study to estimate whether the state Medicaid expansion were associated with increase in insurance coverage, access to and utilization of health care; and self-reported health in the U.S. The design of the study was a comparison of the outcome before and after the expansions. The target population aged between 19-64 years

with family incomes below 13% of the federal poverty level in the 2010-2014 National Health Interview Surveys. Key measurements were health insurance coverage, health insurance utilization, patient clinic, attendants and doctors. The study findings established that medicinal expansion was associated with increased visits of patients and doctors in the hospitals.

Li and Zhang (2013) examined the impacts of health insurance on healthcare utilization among the older persons in China. New programs such as urban employee basic medical insurance (UEBMI), urban residents basic medical insurance (URBMI) and new cooperative medicinal scheme (NCMS) were examples of health insurance examined in the study. A pilot survey data of China Health and retirement longitudinal study (HRLS) was gathered in 2008 with 2685 individuals from 1570 households. Various models were employed for analysis. The study revealed that although the health insurance programs have enhanced health utilization, their impacts have not been effectively utilized across all parts of the country.

Further, Miller (2012) researched on healthcare reforms expanded insurance coverage in Massachusetts in 2006 on health care utilization. Expansion of insurance coverage by different levels of state are normally aimed at enhancing health accessibility and cost reduction for citizens across the country. This paper synthesized the existing study in order to provide new evidence using the National Health Interview Survey. The findings showed that health care reform expansions enhanced people's use of health care services both primary and preventive care, decreased the over reliance on the hospital emergency room as a usual source of care and improved self-reported health.

Kondo Shigeoka (2013) also assessed effects of universal health insurance on health care utilization and supply side responses in Japan. Health care utilization as measured in terms of admissions, inpatient days and outpatient visits to hospitals. Universal health insurance in terms of bed increases number of medical institutions, physicians and nurses. The results showed that with universal health insurance, utilization of health service increased steadily.

Health care insurance is normally voluntary and aimed at ensuring that every member in a society gets equitable health services. Nguyen (2011) measured the impact of voluntary health insurance on health care utilization and out of pocket payments using Vietnam Household Living Standard Surveys in 2004 and 2005. The results revealed that voluntary health insurance helps the insured persons increase the annual outpatients and inpatient visit by around 45% and 70% respectively.

Prepayment schemes are being hailed internationally as part of a broader solution to health care financing problems in low-income countries (Kamuzora & Gilson, 2007). In their study, Barasa *et al.*, (2017) highlighted the need for Kenyan policy makers to prioritize the extension of prepayment mechanisms to more vulnerable groups, specifically the poor, the elderly, those suffering from chronic ailments and those living in marginalized regions of the country. The study was motivated by the statistics showing that 453,470 Kenyans are pushed into poverty annually as a result of direct payments for healthcare. Upon the inclusion of the cost of transport, it is estimated that the number of Kenyans dragged into financial oblivion increases by more than one third to 619,541.

## **2.4 Knowledge Gap**

Health Insurance has become an essential strategy in the healthcare management policies aimed at enhancing healthcare utilization services in many countries; developed and developing ones. According to Miller (2012), expansion of health insurance by different levels of governments normally aimed at enhancing health accessibility and cost reduction for citizens across the country. Most countries on health insurance and health utilization therefore have explored different methodologies mostly on international level.

Multiple cross-sectional studies conducted in similar economic and social backgrounds have established that there are several factors that influence the number of households that register to healthcare insurance in developing countries. According to Kapologwe *et al.*, (2017), socio-demographic characteristics influence the decisions to enrol or re-enrol among households. Kapologwe *et al.*, (2017) cited findings from various studies that identified such factors as the households and community characteristics, such as age of the head of the household, gender and income as determining factors of the households' membership in the micro-health insurance schemes in rural areas.

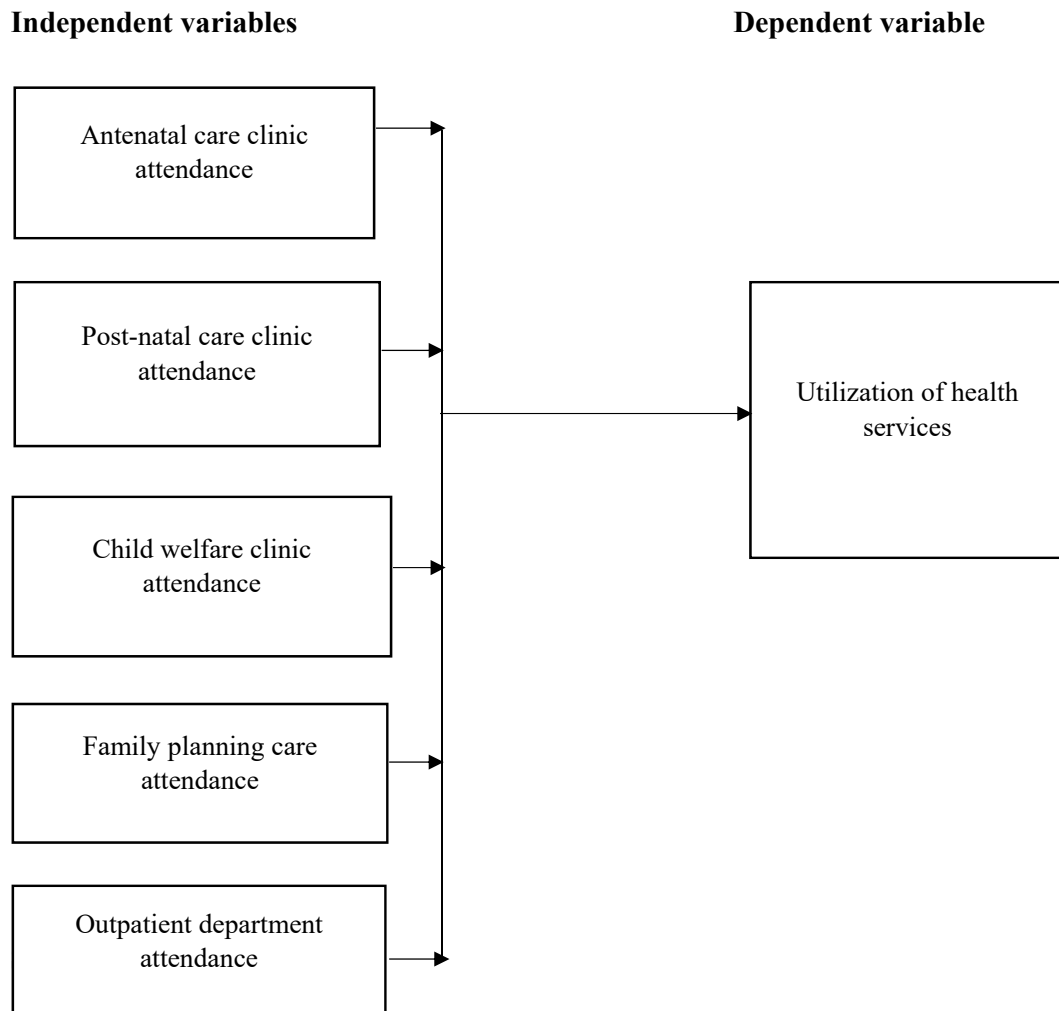
A review of the empirical studies has mainly focused on developed nations; and this could be attributed to their healthcare policies over the decades. While Kenya has adopted such policies towards introduction and management of Universal Healthcare Coverage, Kitui County Government has also introduced health insurance cover aimed at complementing various efforts made by the national governments towards ensuring that every household in Kitui's registered under the insurance scheme and have access to health services. What remains a puzzle therefore is the utilization of these insurance services especially county governments'

insurance services. This study therefore aimed to bridge the gap by establishing the effect of Kitui County Health Insurance Cover (KCHIC) on utilization of health services in Kitui.

## 2.5 Conceptual Framework

This section describes the relationship between independent variables and dependent variable of the study.

**Figure 2.1 Conceptual Framework**



The independent variables of the study comprised of antenatal care, post-natal care, child welfare, family planning and outpatient care. These independent variables were measured by the number of visits by the patients to the hospital over time. An average mean monthly for each variable was determined across all the hospitals before and after the introduction of KCHIC by the County Government of Kitui. Utilization as dependent variables of the study therefore was determined based on the changes in the independent variables. The framework

elaborates that utilization of health services is dependent on the hospital visit attendants in all the 5 clinics-antenatal clinic, postnatal clinic, child welfare clinic, family planning clinic and outpatient clinic. This study focuses on these 5 clinics as important contributors to determining healthcare utilization across the 8 hospitals offering services to KCIC beneficiaries.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

The chapter provides tools for analysis and how data was collected for answering the research objectives. The chapter therefore entails research design, target population and sampling technique, data collection technique, data analysis and ethical consideration.

### **3.2 Research Design**

A study research design entails the procedures and steps that the researcher applied in gathering the information necessary for answering the research questions. It is a plan aimed at assisting the researcher to achieve research objectives effectively. For this study, descriptive research design was adopted. The study aimed to describe how variations in dependent variable are caused by changes in independent variations in the study (Kothari, 2011). It also sought to describe the changes that have been witnessed before and after the introduction of KCHIC in Kitui County.

### **3.3 Target Population and Sampling Technique**

#### **3.3.1 Target Population**

Population is the entire number of persons or objects that the researcher is interested in carrying a study on so as to answer some questions. This study was carried out in Kitui County. With 8 sub-counties in Kitui, there are 14 sub-county hospitals in the county that have been mandated to provide services to KCHIC beneficiaries. Therefore, the target population of the study was all the 14 health facilities in the county.

Exclusion criteria for the study were applied. From the 14 sub-county hospitals in Kitui County, only hospitals with all the data for the first four months before the introduction of KCHIC and the first four months after the introduction of KCHIC were included in the study. This was because any missing data could have affected the quality of data hence affecting the findings of the study.

#### **3.3.2 Sampling Technique**

Sampling technique refers to the method or the procedure that the study used in selecting the appropriate sample size of the research study. Purpose sampling, which is a non-probability sampling technique, was used to select appropriate sample size for the study. Sekaran and Bougie (2016) indicated that this type of sampling technique was appropriate since it provides the researcher(s) with a deliberate choice to make his or her decisions regarding the sample

size of the study. Thus, from the 14 sub-county hospitals, 8 sub-county hospitals were purposively selected for the study.

### **3.4 Data Collection**

According to Fowler (2013), data collection refers to tools that were adopted for gathering information from the target population. The study used secondary data that gathered from KNHIS and MOH 717 which are normally uploaded by the hospitals on a monthly basis. In addition, the data from the health services records was used. Data collection sheet was used and was presented in form of an excel spreadsheet to ease the process of collecting data for the study. These data covered two parts; the first part covered the average mean data of the first four months before introduction of the KCHIC while the second part involved average data obtained for the first four months after the introduction of the KCHIC in all the selected hospitals for the study.

### **3.5 Research Quality**

All research endeavours are subject to limitations that may possibly influence the quality of the study findings as derived from the data analysis. In this research, a blend of qualitative and quantitative methodologies was adopted. The research quality based on the qualitative design of the research was assessed by the dependability and credibility. The secondary data sources used in this research were from derived from official organizations and peer-reviewed articles, factors that make them dependable and credible. In addition, the validity and reliability of the measurement methods and research procedures was used to determine the quantitative quality of the research. This study can suffer an internal validity threat because of the maturation and history effects of the KCHIC. However, the attempts by the study to minimize selection biases that make it possible to generalise the findings to the population ascertain the external validity of the research.

### **3.6 Data Analysis**

Analysis refers to the methods and techniques that were used to assess and examine the already gathered data for making study inferences. Using quantitative approach, data was first presented in form of spreadsheet and described based on study variables. For each variable, average monthly mean was calculated for the first four months before and the first four months after the introduction of the KCHIC. Thereafter, the average monthly mean of the first four months before was then compared to the average monthly mean of the first four months after

the introduction of KCHIC at variable level so as to determine utilization of health services across the hospitals in the Kitui County.

The study also conducted paired t-test for the utilization of health services across the hospitals based on the study variables. The paired t-test was used to determine whether there was statistical significant differences in the average mean monthly before (first four months) and first four months after the introduction of KCHIC. The level of significance for the study was 0.05. The null hypothesis for the study in assessing utilization of health services was ( $H_0$ ):  $U_1 = U_2$  and alternative hypothesis ( $H_1$ ):  $U_1 \neq U_2$ .

The null hypothesis implied that there was no statistical significance difference between average mean monthly before and after the introduction of KCHIC. The alternative hypothesis implied that there was a statistical significant difference between average mean monthly before and after the introduction of KCHIC.

### **3.6 Ethical Considerations**

To ensure that the study met ethical standards as set by the university policy and guidelines, the study obtained university stamped letter indicating the purpose and objective of the study. Also, the study obtained the NACOSTI permit letter allowing the researcher to access every health facilities in Kitui County to obtain necessary information for the study. The study also emphasized on the importance of confidentiality and clearly indicated that the information gathered was specifically used for education purposes only.

## CHAPTER FOUR: DATA ANALYSIS, RESEARCH FINDINGS AND INTERPRETATION

### 4.1 Introduction

The study sought to determine the effect of KCHIC on utilization of health services in Kitui County. Secondary data was collected from the 8 sub-county hospitals (see appendix 2). Descriptive statistics was used to determine the average monthly mean for the first four months before introduction of KCHIC (May – August 2018) and the average monthly mean for the first four months after introduction of KCHIC (September – December 2018). The difference was used to explain the utilization of health services in the County.

### 4.2 Descriptive Statistics

#### 4.2.1 Findings in all the hospitals

This section of the study provides a detailed descriptive summary statistics of the population studied in Kitui County. Eight (8) hospitals (see appendix two) were selected to participate in the study since they had all the important data/information for answering the research questions. The study took eight (8) period or months with the period divided into two; the first period represented the first four (4) months before/pre-introduction of KCHIC in all the hospitals for the study. The second period represented the first four (4) months after-post-introduction of KCHIC. Secondary data were gathered and presented in form of antenatal, post-natal, child welfare, family planning and outpatient before and after as the study variables using excel spreadsheet (see appendix four).

Data for the study was based on the number of visits under different categories as captured by study variables in each hospital. Descriptive table summaries therefore was based on the study variables from all the hospitals for the study before/pre and after/post-introduction of KCHIC as shown below

**Table 4.1 Descriptive summary table before/pre-KCHIC in all the hospitals**

<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>
Antenatal	1801	225.125	180.5614
Post-natal	595	74.375	74.29081
Child welfare	4155	519.375	338.008
Family planning	1240	155	85.40659
Outpatient	32636	4709.25	5758.028

**Source: Researcher (2019)**

Table 4.1 was used to describe data for the study before/pre-introduction of KCHIC by county government of Kitui in all the hospitals in the study. Mean was used to show how data was distributed across the hospitals while standard deviation indicated how data was centred from the mean of the study. In the table, the patient visits based on each measurement variable are presented prior to the KCHIC implementation. Results indicate that in all the 8 hospitals of Kitui, there were 1,801 visits for antenatal care, 595 visits for post-natal care, 4,155 visits for child welfare and 1,240 visits for family planning. Outpatient healthcare services formed majority of the hospital visits. The findings established that outpatient across the hospitals had the most distributed data (32636) with post-natal care clinic attendance measured in number of visits having the lowest distribution of data (595). Further, outpatient also had the most centred data with a high standard deviation while post-natal care clinic attendance having the lowest centred data for the study across the hospitals.

**Table 4.2 Descriptive summary table after/post-KCHIC in all the hospitals**

<b>Variable</b>	<b>N</b>	<b>Mean</b>	<b>Std. Dev</b>
Antenatal	1755	219.375	195.7731
Post-natal	965	120.625	143.5807
Child welfare	4507	563.375	416.1583
Family planning	1523	190.375	144.821
Outpatient	32997	5253.125	6488.05

**Source: Researcher (2019)**

Table 4.2 presents the descriptive findings after/post-introduction of KCHIC across the hospitals in Kitui County based on the study variables. Results indicate that in all the 8 hospitals of Kitui, there were 1,755 visits for antenatal care, 965 visits for post-natal care, 4,507 visits for child welfare and 1,523 visits for family planning. The results revealed that outpatient had the highest mean across the study hospitals while post-natal had the lowest mean. This data means that on average, outpatient hospitals visits were common in Kitui hospitals after the implementation of the KCHIC. Moreover, the study established that outpatient had the most centred data as shown by high standard deviation across the hospitals in the study.

#### **4.2.2 Findings by study variables in each hospital**

The section presents the average mean difference between the two periods of the study based on the study variables. In comparison of descriptive summary findings before and after the introduction of KCHIC, the findings clearly revealed that the mean for antenatal across the

hospitals reduced after/post introduction of KCHIC while the mean for post-natal, child welfare, family planning and outpatient increased steadily after the introduction of KCHIC cross the hospitals. The difference illustrates the utilization of the health services between before and after the introduction of KCHIC in the hospitals. The utilization was based on the hospital visits by the patients during the study period.

**Table 4.3 Antenatal care clinic attendance**

<b>Hospital</b>	<b>Average mean monthly before</b>	<b>Average mean monthly after</b>	<b>Difference</b>
Kitui	633	677	Positive
Ikutha	130	147	Positive
Kauwi	280	276	Negative
Mutitu	92	61	Negative
Kanyangi	116	110	Negative
Mwingi	283	207	Negative
Kyuso	130	130	Positive
Migwani	137	147	Positive

**Source: Researcher (2019)**

Table 4.3 indicates the findings on utilization of antenatal care clinic attendance based on the number of visits by the patients to the hospitals before and after the introduction of KCHIC. From the table, there is an equal distribution between the positive and negative uptake of antenatal care from the reported clinical visits. The study findings revealed that the utilization of the antenatal care clinic attendance was positive in Kitui ( $633 < 677 = +44$ ), Ikutha ( $130 < 147 = +17$ ), Kyuso ( $130 < 130 = +0$ ) and Migwani ( $137 < 147 = +10$ ) hospitals after the introduction of KCHIC while the other hospitals experienced positive utilization before than after the introduction. On the other hand, there were negative differences in the utilization of the antenatal care based on clinic attendance in four hospitals, including Kauwi ( $280 > 276 = -4$ ), Mutitu ( $92 > 61 = -31$ ), Kanyangi ( $116 > 110 = -6$ ) and Mwingi ( $283 > 207 = -76$ ). The findings imply that even though there have been changes after the introduction of KCHIC in some hospitals, an even number of the hospitals has not experienced many changes. The findings further depict partial public awareness of the role of KCHIC in financing antenatal care.

**Table 4.4 Post-natal care clinic attendance**

<b>Hospital</b>	<b>Average mean monthly before</b>	<b>Average mean monthly after</b>	<b>Difference</b>
<b>Kitui</b>	220	470	Positive

<b>Ikutha</b>	27	47	Positive
<b>Kauwi</b>	50	105	Positive
<b>Mutitu</b>	160	40	Negative
<b>Kanyangi</b>	22	90	Positive
<b>Mwingi</b>	37	102	Positive
<b>Kyuso</b>	58	43	Negative
<b>Migwani</b>	21	68	Positive

**Source: Author (2019)**

The findings in table 4.4 presented the findings on average mean difference between before and after introduction of KCHIC. The table shows an overall positive influence of KCHIC on post-natal care clinic attendance given that since the implementation of KCHIC, six of the eight facilities included in this study have registered increases in the post-natal care clinic attendance. Among the hospitals that have positive differential averages in post-natal care clinic attendance visits are Kitui ( $220 < 470 = +250$ ), Ikutha ( $27 < 47 = +20$ ), Kauwi ( $50 < 105 = +55$ ), Kanyangi ( $22 < 90 = +68$ ), Mwingi ( $37 < 102 = +65$ ) and Migwani ( $21 < 68 = +47$ ). Only Mutitu ( $160 > 40 = -120$ ) and Kyuso ( $58 > 43 = -15$ ) registered negative differences in the post-natal care clinic attendance. The results revealed that there was a slight positive result on the introduction of KCHIC except for Mutitu and Kyuso hospitals that experienced negative utilization of post-natal care clinic attendance visits. The findings also implied that changes as a result of introduction of KCHIC has not adequately resulted to optimal utilization of health services across the hospitals, hence the need for the government as well the hospitals within Kitui to keep advocating for the benefits of having the cover across all the households in the county.

**Table 4.5 Child welfare care clinic attendance**

<b>Hospital</b>	<b>Average mean monthly before</b>	<b>Average mean monthly after</b>	<b>Difference</b>
Kitui	1063	1338	Positive
Ikutha	347	445	Positive
Kauwi	440	426	Negative
Mutitu	183	148	Negative
Kanyangi	279	355	Positive
Mwingi	1026	1071	Positive
Kyuso	319	251	Negative
Migwani	498	473	Negative

**Source: Author (2019)**

The results revealed that there was positive utilization of child welfare clinic attendance health services after the introduction of KCHIC except in four hospitals as shown in table 4.5. The hospitals in which positive differences in utilization of child welfare clinic attendance were recorded include Kitui (1063<1338= +275), Ikutha (347<445= +98), Kanyangi (279<355= +76) and Mwingi (1026<1071= +45). The other four hospitals: Kauwi. Mutitu. Kyuso and Migwani had negative differences in the utilization of child welfare clinic services despite the introduction of KCHIC. The utilization of the health services was measured by number of visits of patients coming to seek for hospitals services on the child welfare category. The financial cost has seen a number of parents and children having limited access to child welfare services, even during free services across the government hospitals. As such, the study established that KCHIC has made it easy for all the family members in every household to have easy and efficient access to health services in all hospitals in Kitui County. These results imply that child welfare care is not extensively understood by most households in the rural settings, since the uptake of the services are dominant in urban area hospitals. More emphasis should be directed towards increasing the systemic optimization of child welfare care among households in rural areas of Kitui. The results meant that to achieve optimal health utilization among the households in the area, the hospitals must embrace the system so as to efficiently improve its functions in the hospitals.

**Table 4.6 Family planning care attendance**

<b>Hospital</b>	<b>Average mean monthly before</b>	<b>Average mean monthly after</b>	<b>Difference</b>
<b>Kitui</b>	351	350	Negative
<b>Ikutha</b>	183	157	Negative
<b>Kauwi</b>	90	99	Positive
<b>Mutitu</b>	86	111	Positive
<b>Kanyangi</b>	154	181	Negative
<b>Mwingi</b>	113	469	Positive
<b>Kyuso</b>	133	114	Negative
<b>Migwani</b>	130	42	Negative

**Source: Researcher (2019)**

Table 4.6 sought to determine utilization of family planning health services using average mean attendance of the patients in the hospital. The study illustrates that even with the introduction of KCHIC in the hospital, utilization of health services in regards to family planning has not been effective as most of the hospitals have experienced reduced family planning attendance

in the hospital. The family planning services has been provided by the health stakeholders across various public health hospitals to help enhancing easy and faster access to the people living in rural areas, where access to health insurance is low.

**Table 4.7 Outpatient care attendance**

<b>Hospital</b>	<b>Average mean monthly before</b>	<b>Average mean monthly after</b>	<b>Difference</b>
<b>Kitui</b>	15780	20197	Positive
<b>Ikutha</b>	4018	2546	Negative
<b>Kauwi</b>	1674	1848	Positive
<b>Mutitu</b>	889	845	Negative
<b>Kyangi</b>	1181	1559	Positive
<b>Mwingi</b>	11673	7901	Negative
<b>Kyuso</b>	1027	5385	Positive
<b>Migwani</b>	1424	1744	Positive

**Source: Researcher (2019)**

Outpatient care attendance was determined for both male and female in the hospitals; comprising of under-five (5) years and above 5 years of age. The findings established that there was positive utilization of outpatient care attendance in the hospital after introduction of KCHIC across the hospitals by the county government of Kitui. Only three hospitals; Mwingi, Mutitu and Ikutha had a decreased outpatient attendance after the introduction of KCHIC. The insurance cover by the county government of Kitui made it possible for people of all races and background to have equal access to health services, unlike before that the cost of accessing health services were high for many households. The implication of the findings is that across the hospitals, the system has not been adequately used to improve hospital performance measured by patient attendance.

#### **4.3 Paired t-test for difference in average (means)**

The study conducted a paired t-test for the utilization of health services across the hospitals based on the study variables for the first and last four months of the study. The paired t-test was used to determine whether there was statistical significant differences in the average mean monthly before (first four months) and first four months after the introduction of KCHIC. The level of significance for the study was 0.05. The null hypothesis for the study in assessing utilization of health services was ( $H_0$ ):  $U_1 = U_2$  and alternative hypothesis ( $H_1$ ):  $U_1 \neq U_2$ .

Therefore, the null hypothesis implied that there was no statistical significance difference between average mean monthly before the introduction of KCHIC and the average mean monthly after the introduction of KCHIC.

The alternative hypothesis implied that there was a statistical significant difference between average mean monthly before the introduction of KCHIC and the average mean monthly after the introduction of KCHIC. The level of significance between the KCHIC study periods indicated the period that had a significant utilization of health services across the hospitals.

Therefore, paired t-test for the study was presented across all the hospitals considered for the study using all the variables to clearly illustrate utilization of health services as shown in table 4.8

**Table 4.8 Paired t-test for health utilization across the hospitals**

<b>Variables</b>	<b>Average pre-KCHIC</b>	<b>Average post-KCHIC</b>	<b>Difference</b>	<b>Sig.</b>
Antenatal	225.125	219.375	Negative	0.3306
Post-natal	74.375	120.625	Positive	0.0432
Child welfare	519.375	563.375	Positive	0.0416
Family planning	155	190.375	Positive	0.0292
outpatient	4709.25	5253.125	Positive	0.0468

**Source: Researcher (2019)**

The findings in table 4.8 indicates the paired t-test statistics for the utilization of health services before and after the introduction of KCHIC across 8 hospitals in Kitui County. The average mean monthly utilization of health services after the introduction of KCHIC were all positive for post-natal, child welfare, family planning and outpatient care attendance except for the antenatal care clinic attendance which had a negative effect of utilization. Further, the p-values for all the study variables were below 0.05 significance level of the study except for antenatal which had a  $p > 0.05$  across the hospitals.

The  $p < 0.05$  for post-natal, child welfare, family planning and outpatient care attendance across the hospitals therefore implied that there was statistical significant difference in average mean monthly utilization of health services before and after the introduction of KCHIC. As a result, the findings illustrated that the KCHIC enhanced utilization of health services across the hospitals. Further, a  $p > 0.05$  illustrated that there was no significant difference in average mean monthly utilization of antenatal health services before and after the introduction of KCHIC

across the hospitals for the study. Therefore, the implication of the results is that there has been slight changes in the hospitals as a result of introduction of KCHIC.

## **CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

The chapter presents the discussion of the findings as presented in data analysis. The study then compares the findings with the previous studies on utilization of health services. Further, a conclusion of the research study is made from the discussion of the findings, and recommendations of the study. Areas of further research and limitations of the study are discussed.

### **5.2 Discussion**

This study sought to determine the effect of KCHIC on utilization of health services in Kitui County. KCHIC was introduced in late August 2017 and the study established an average mean monthly for the first four months before and after the introduction of the KCHIC in various hospitals in the County (see appendix two). First, descriptive summary statistics was established for the study variables across the hospitals pre-introduction of KCHIC using mean and standard deviation. Secondly, descriptive summary statistics was also established to show the mean and standard deviation post-introduction of KCHIC in various hospitals altogether. The study focused on five objectives; to determine the effect of antenatal care clinic attendance, post-natal care clinic attendance, child welfare clinic attendance, family planning clinic attendance and outpatient department attendance before and after the introduction of KCHIC on utilization of health services in Kitui County. The measurement for the study variables was based on the number of visits by patients to the hospitals on a monthly basis for the study period. Average mean monthly therefore was used to represent pre-KCHIC and post-KCHIC period of the study. A paired t-test for difference in average (mean) was determined to indicate the level of health services utilization across the hospitals with 0.05 level of significance. The discussion of the study is therefore based on the research findings and on each research objective.

#### **5.2.1 Antenatal care clinic attendance and health utilization**

Access to affordability health care has remained a dream for many, especially expectant mothers. While the government has made various attempts to provide accessibility to this group of people in the community, their level of health services utilization has remained very low. From the descriptive summary findings on pre-introduction of KCHIC, the study findings

established that utilization of antenatal care clinic attendance health services was effective compared to the post-introduction of KCHIC across the hospitals. This could be attributed to the fact that over the years, antenatal care clinic attendance has been a free health services that all patients in that category have access to.

A paired t-test for difference in mean/average results established that there was no significant mean difference in antenatal care health services utilization pre-introduction and post-introduction of KCHIC across the hospitals with a  $p >$  level of significance. This therefore implied that even with the introduction, the uptake of health services measured by number of services for antenatal care clinic attendance was almost similar to the previous utilization without KCHIC in the hospitals. This results assumed that there could have been effective hospital policies towards advocating for pregnant mothers to easily access antenatal care services in the hospital, hence leading to continuous similar uptake even after introduction of KCHIC. The results therefore disagreed with the findings of Wherry and Miller (2016) whose findings indicated that increased insurance schemes enhances health utilization.

Further, the study findings was determined in each hospital to show the difference in average mean monthly before and after the introduction based on antenatal care clinic attendance. The study revealed that for hospitals such as Kitui, Ikutha, Mwingi and Migwani had a positive average mean differences. This implied that the introduction of KCHIC in each hospitals could have enhanced the level of health utilization. However, the level of positive difference in average mean monthly was minimal to explain the optimal utilization of antenatal care clinic attendance in the hospitals. Moreover, the introduction of KCHIC also saw a negative difference average mean monthly in utilization of antenatal care health services in hospitals such as Kauwi, Mutitu and Kanyangi. However, the negative difference in mean was also minimal across the hospitals.

### **5.2.2 Post-natal care clinic attendance and health utilization**

Post-natal care is the care given to the mother and her new born baby immediately after the delivery for some times. Access to health care services especially post-natal has seen a number of casualties for many mothers and their new born babies. This study sought to find out health utilization in Kitui County in relation to post-natal care clinic attendance before and after the introduction of KCHIC. The findings revealed that the utilization of post-natal care clinic attendance has been positive across the hospitals as revealed by the pre/post – introduction of KCHIC descriptive summary results. The study established a high mean after the introduction

of KCHIC than before, suggesting that there has been improved hospital visits after the KCHIC.

Moreover, a paired t-test was performed to establish the significance difference average mean monthly before and after the introduction of KCHIC. The study findings revealed that there was significance difference in average mean monthly post-natal care health services utilization before and after the introduction of KCHIC across the hospitals in the study. The study established that post-introduction of KCHIC saw increased post-natal health services utilization than before with a  $p <$  the significance level, suggesting that utilization of health services in regard to post-natal care attendance has been high. The findings of the study concurred with the previous findings of Barasa *et al.*, (2017) who stated that insurance covers enhance health utilization.

In determining the level of utilization of post-natal care clinic attendance health services in each hospital, the results of the study revealed that almost all the hospitals in Kitui County under the investigation saw an increased or positive difference in average mean monthly of health utilization post-introduction of KCHIC; Kitui, Ikutha, Kauwi, Kanyangi, Mwingi and Migwani hospitals. With Kanyangi and Migwani hospitals experienced highly positive difference in mean/average post-introduction of KCHIC than others. The study also revealed that Mutitu and Kyuso hospitals had a negative difference in mean/average post-introduction of KCHIC; hence concluding that in these two hospitals, utilization of post-natal care clinic attendance was higher pre/before introduction of KCHIC than post-introduction of KCHIC.

### **5.2.3 Child welfare clinic attendance and health utilization**

Cases of mortality rate especially among infants and young children have been reported in areas where accessibility to health services have been minimal. Having taken this into consideration, the County Government of Kitui introduced KCHIC to allow easy access to child welfare clinic services for every household at an affordable cost. The study findings indicated that introduction of KCHIC saw an increased child welfare clinic attendance health services utilization across the hospitals than before. This was based on the higher mean established in post-introduction of KCHIC than before; suggesting that the insurance cover has made it easier for many household members in Kitui County to have efficient access to health services at an affordable cost. The findings therefore agreed with the findings of Kondo and Shigeoka (2013) who noted that universal health insurance increases utilization of health services.

In addition, the study established that there was significance difference in mean/average child welfare utilization of health services before and after the introduction of KCHIC across the hospitals by the county government of Kitui. This was revealed by the  $p <$  level of significance. As such, the study indicated that post-introduction of KCHIC saw a positive mean difference or increased child welfare health services utilization than before to suggest that insurance covers enhance health services. This finding was supported by the previous work of Nguyen (2011) who established that voluntary health insurance by the government to the people increases uptake of health services leading to high level of utilization.

While there was increased utilization of child welfare health services across the hospitals in the county of Kitui, the study also established that other hospitals saw a decreased utilization of child welfare clinic attendance after the introduction of KCHIC in the hospitals. In Kauwi, Mutitu and Kyuso, utilization of health services was very high during the period before introduction of the insurance cover than before. The study therefore argued that the hospitals and health policy makers should find out the causes of this decreased utilization of health services in regards to child welfare clinic attendance so as to aid in minimizing mortality rates that has been high in infants and young children.

#### **5.2.4 Family planning and health utilization**

The study findings established that utilization of family planning health services were positive post the introduction of KCHIC cross the hospitals than before as indicated in descriptive summary post results. The study established a high mean than before which may suggest that the introduction of KCHIC cross the hospitals provided an avenue and easy access to utilization of family planning attendance health services across the hospitals in the study. The increase was significant enough to show that the effect of KCHIC has been positive.

Family planning health services has been given much interest over the years especially in developing countries. Most people are poor and cannot take care of all the children that they have. As a result, the county government of Kitui introduced KCHIC to assist the people of Kitui with family planning services. This study found out that there was significance difference in mean/average utilization of family planning health services before and after the introduction of KCHIC across the hospitals. This was revealed by a  $p <$  level of significance for the study in pared t-test results. The findings established that there was positive family planning care attendance post-introduction of KCHIC than before, suggesting that utilization of health

services was enhanced. The results were in agreement with the study of Miler (2012) who said that expansion of health insurance covers increases utilization of health services.

Further, the introduction of KCHIC did not entirely led to increased health utilization across the hospitals, especially family planning attendance as the study established. The results indicated that before the introduction of KCHIC, other hospitals such as Migwani, Kyuso, Ikutha, and Kitui had positive/high utilization of family planning health services than after the introduction of KCHIC which saw a decreased/negative utilization. Further, it was recorded that Migwani experienced high negative drop in utilization of family planning services while Kitui had the least negative after the introduction of KCHIC by the county government of Kitui. Even though the difference were insignificant, the study results supported the findings of Li and Zhang (2013) who concluded that insurance covers does not automatically translates to increased utilization of health services.

### **5.2.5 Outpatient department attendance and health utilization**

People in developing nations rarely visits hospitals for check-ups and treatments due to high cost involved in accessing several health services. The study findings established that introduction of KCHIC has seen increased utilization of outpatient health services across the hospitals in Kitui County. The results in descriptive summary table established that there was increased utilization of outpatient health services measured in number of visits to the hospitals per patient after the introduction of KCHIC than before. This was based on a high mean established on post-KCHIC than before. The findings concurred with the study findings of Ataguba and Akazili (2010) whose study findings revealed that introducing UHC has enabled even family living in poverty level to have equality in accessing health care services, leading to increased utilization of outpatient health services in many countries.

A paired t-test performed by the study to reveal whether there is significance difference in mean/average of utilization of outpatient health services before and after the introduction of KCHIC revealed that, there was indeed statistical significance difference in mean/average utilization of outpatient attendance health services across the hospitals; as indicated by a  $p <$  level of significance for the study. This implied that introduction of KCHIC across the hospitals has made it easy for every member in each household to have affordable health services and can seek for health advice anytime without incurring unnecessary expenses in Kitui County. The study findings therefore concurred with the findings of Miller (2012) whose study

concluded that with introduction of insurance schemes to boost accessibility of health services, the utilization of health services can increase significantly over the period.

However, in an attempt to determine utilization of outpatient services in each hospital, the study also found out that there was an insignificant effect of KCHIC in some hospitals. This was based on the established reduction of health services utilization in various hospitals such as Ikutha, Mutitu, and Mwingi hospitals after the introduction of KCHIC. The study therefore indicated that there was high utilization of outpatient health services in these hospitals before than after the introduction of KCHIC. Various reasons could be developed to support the variations caused such as the inability of people to clearly understand the benefits of the system to them in totality and in respect to efficient health accessibility.

### **5.3 Conclusion**

From the discussion of the study, a number of conclusions have been made. First, the study concluded that introduction of KCHIC has had a positive effect on health utilization than before in various hospitals. Overall, the study established that KCHIC has been positive on health services utilization with a higher mean after its introduction than before which had a lower mean. This means that the concept of KCHIC has seen increased health services utilization across Kitui County, hence the policy makers and the management must continue championing for its agenda.

The study also concluded that utilization of antenatal care clinic attendance health care services decreased across the hospitals based on the paired t-test results, with a  $p >$  level of significance. The study therefore concluded that there was no significance difference in mean/average utilization of antenatal care health services across the hospitals before and after the introduction of KCHIC.

The study also concluded that there was statistical significance difference in mean/average utilization of health services such as post-natal, child welfare, family planning and outpatient services before and after the introduction KCHIC. The study established positive difference in utilization of these health services across the hospitals post-introduction of KCHIC than before. The benefits of the insurance scheme is when known by people since it agitates for affordable healthcare for all, whether reach or poor in the county. As a result, the study concludes that if well implemented, KCHIC can result to increased utilization of health services in Kitui County.

#### **5.4 Recommendations**

The study aimed to determine the effect of KCHIC on utilization of health services in Kitui County. A paired t-test was determined to estimate the difference in mean/average on utilization of health services before and after the introduction of KCHIC, with a statistical level of significance being 0.05. A number of recommendations were therefore made.

To the policy makers and healthcare stakeholders, the study recommends that a well formulated and implemented insurance cover policy can be effective in increasing health services utilization in both county and national governments. As a result, there is need for the policy makers to re-look at the benefits and successful factors which can efficiently make KCHIC to function properly, especially in the hospitals that has seen decreased health utilization after its introduction.

To the county government and national government, the study recommends that a number of health insurance covers should be formulated and implemented to complement the benefits of KCHIC as an insurance scheme that has allowed the people of Kitui to easily gain access to various health services in the county at an affordable rate. This should be replicated to other county governments in Kenya since majority of the people living in rural areas do not have efficient health accessibility health resulting to low health services utilization.

To the academicians and scholars, the study recommends that a number of studies need to be established to indicate other alternative insurance covers that can be introduced to improve health care accessibility and utilization as well as their effects to the utilization of health services across the country (Kenya).

#### **5.5 Areas of further studies**

This study was carried out in Kitui County to determine the effect of newly introduced health insurance called KCHIC on utilization of health services in the County with specific timeframe of first four months before introduction and first four months after introduction. This study therefore recommends that another study be carried out to cover a timeline of more than four months before and after.

The study also recommends that another study be undertaken on the same topic but using primary data. This study used secondary data drawn from the hospital health services records, MOH77 and KNHIS, and did not consider using primary data from the hospitals so as to understand the decisions behind the introduction of the insurance cover in the hospital. Additionally, another study should be carried out to determine challenges affected the KCHIC

and health utilization in the county (Kitui). Moreover, the study recommends that a new study be done but on all the hospitals in Kitui County since that this study only covered 8 hospitals with five variables. Other variables should also be investigated.

### **5.6 Limitations**

This study was limited to the eight (8) hospitals in Kitui County only and did not involve other hospitals. The hospitals were considered effective for the study to their availability of health data records for the desired period of the study. Unlike other hospitals that did not meet the criteria of having enough data for the study. Further, the study established health services utilization using antenatal care clinic attendance, post-natal care clinic attendance, child welfare clinic attendance, family planning clinic attendance and the outpatient department clinic attendance. Other health utilization categories were not covered. These five aspects of determining health services utilization formed research objectives.

## REFERENCES

- Andersen, R. & Newman, J. F. (1973). Societal and individual determinants of medical care utilization in the United States. *Milbank Mem Fund Q Health So*, 51 (1)
- Andersen, R. (1968). Healthcare service model: explaining factors determining accessibility to healthcare utilization. *Journal of health social behaviour*, 30 (4).
- Andersen, R. (1995). Revisiting the behavioural model and access to medical care: does it matter? *J Health Social Behaviour*. 36 (1): 1–10. [Doi:10.2307/2137284](https://doi.org/10.2307/2137284)
- Ataguba, J.E. and Akazili, J. (2010). *Health care financing in South Africa: Moving towards universal coverage*, *Continuing Medical Education* 28 (2): 74–78
- Baicker, K., Congdon, W. J., & Mullainathan, S. (2012). Health insurance coverage and take-up: lessons from behavioural economics. *The Milbank Quarterly*, 90(1), 107–134. <https://doi.org/10.1111/j.1468-0009.2011.00656.x>
- Barasa, E. W., Maina, T., & Ravishankar, N. (2017). Assessing the impoverishing effects, and factors associated with the incidence of catastrophic health care payments in Kenya. *International Journal for Equity in Health*, 16(1), 31. <https://doi.org/10.1186/s12939-017-0526-x>
- Bertranou, F.M. (1998). Health care services utilisation and health insurance coverage. *Revista de análisis económico* 13 (2): 25–30.
- Chuma, J., & Maina, T. (2012). Catastrophic health care spending and impoverishment in Kenya. *BMC Health Services Research*, 12(1), 413. <https://doi.org/10.1186/1472-6963-12-413>
- County Government of Kitui. (2018). *County government of Kitui county integrated development plan 2018-2022; Transforming Kitui for Inclusive and Sustainable Development KENYA towards a Globally Competitive and Prosperous Nation*.
- Ekman, B. (2007a). Catastrophic health payments and health insurance: Some counterintuitive evidence from one low-income country. *Health Policy* 83 (2–3): 304–313.
- Ekman, B. (2007b). The impact of health insurance on outpatient utilization and expenditure: Evidence from one middle-income country using national household survey data. *Health Research Policy and Systems* 5 (1): 1–15.

- Kamuzora, P., & Gilson, L. (2007). Factors influencing implementation of the Community Health Fund in Tanzania. *Health Policy and Planning*, 22(2), 95–102. <https://doi.org/10.1093/heapol/czm001>
- Kapologwe, N. A., Kagaruki, G. B., Kalolo, A., Ally, M., Shao, A., Meshack, M. ... Hoffman, A. (2017). Barriers and facilitators to enrolment and re-enrolment into the community health funds/Tiba Kwa Kadi (CHF/TIKA) in Tanzania: a cross-sectional inquiry on the effects of socio-demographic factors and social marketing strategies. *BMC Health Services Research*, 17(1), 308. <https://doi.org/10.1186/s12913-017-2250-z>
- Kenya National Bureau of statistics. (2018). *Kenya Integrated Household Budget Survey 2015-2016*, 1–189.
- Kim, H.-K., & Lee, M. (2016). Factors associated with health services utilization between the years 2010 and 2012 in Korea: using Andersen's Behavioral model. *Osong Public Health and Research Perspectives*, 7(1), 18–25.
- Kondo, A., & Shigeoka, H. (2013). Effects of universal health insurance on health care utilization, and supply-side responses: evidence from Japan. *Journal of Public Economics*, 99, 1-23.
- Li, X., & Zhang, W. (2013). The impacts of health insurance on health care utilization among the older people in China. *Social science & medicine*, 85, 59-65.
- Matsi, M. M. (2015). *Views and Perceptions of Healthcare Workers on the National Health Insurance at Pietersburg-Mankweng Tertiary Hospital*.
- Miller, S. (2012). The effect of the Massachusetts reform on health care utilization. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, 49(4), 317-326.
- Ministry of Health (2014). *Kenya Household Health Expenditure and Utilization Survey 2013*
- Wherry, L. R., & Miller, S. (2016). Early coverage, access, utilization, and health effects of the affordable care act Medicaid expansions: A quasi-experimental study. *Annals of internal medicine*, 164(12), 795.
- Wolinsky, F. (1988a). The Sick Role Concept. In *The sociology of Health* (2nd ed., 101-116). Belmont, CA: Wadsworth.

- Wolinsky, F. (1988b). Seeking and Using Health Services. In *The Sociology of Health* (2nd ed., 117-144). Belmont, CA: Wadsworth.
- World Health Organization, W. B. (2015). *First global monitoring report tracking universal health coverage*.
- Young, J. C. (1981). *Medical Choice in a Mexican Village*. New Brunswick, NJ: Rutgers University Press.
- Young, J. C., & Young-Garro, L. Y. (1982). Variation in the Choice of Treatment in Two Mexican Communities. *Social Science and Medicine*, 16(16): 1453-1465
- United Nations. (2017). *The Sustainable Development Goals Report*. Retrieved from <https://sdgactioncampaign.org/wpcontent/uploads/2017/07/TheSustainableDevelopmentGoalsReport2017.pdf>
- World Health Organization. (2013). *STATE OF HEALTH FINANCING IN THE AFRICAN REGION*. Retrieved from <https://www.afro.who.int/sites/default/files/2017-06/state-of-health-financing-afro.pdf>
- Xu, K., Soucat, A., Kutzin, J., Brindley, C., Maele, N. Vande, Touré, H., ... Siroka, A. (2018). *Public Spending on Health: A Closer Look at Global Trends*. Retrieved from <http://apps.who.int/bookorders>.

## APPENDICES

### APPENDIX ONE: LETTER OF INTRODUCTION



26<sup>th</sup> April 2019

Dr. RABUT, GRACE ATIENO  
P.O. Box 50219-00200,  
Nairobi.  
rabutgrace@yahoo.com

Dear Dr. Rabut,

REF **Protocol ID:** SU-IERC0346/19 **Student No:** 101157

**THE IMPACT OF COUNTY HEALTH INSURANCE ON UTILIZATION OF HEALTH SERVICES, CASE OF KITUI COUNTY.**

We acknowledge receipt of your application documents to the Strathmore University Institutional Ethics Review Committee (SU-IERC) which includes:

1. Study Protocol submitted 7<sup>th</sup> March 2019
2. Cover letter listing all submitted documents 7<sup>th</sup> March 2019
3. Proposal declaration page signed by supervisors 7<sup>th</sup> March 2019

The committee has reviewed your application, and your study "*The impact of County Health insurance on utilization of health services, case of Kitui County.*" has been granted approval.

This approval is valid for one year beginning **26<sup>th</sup> April 2019** until **26<sup>th</sup> April 2020**

In case the study extends beyond one year, you are required to seek an extension of the Ethics approval prior to its expiry. You are required to submit any proposed changes to this proposal to SU-IERC for review and approval prior to implementation of any change.

SU-IERC should be notified when your study is complete.

Thank you

Sincerely,

Prof Florence Oloo  
Secretary  
Strathmore University Institutional Ethics Review Committee



APPENDIX TWO: LIST OF 8 - SAMPLED HOSPITALS FOR STUDY

<i>Sub-County</i>	<i>Hospitals</i>
<i>Kitui Central</i>	1. Kitui County Referral Hospital
<i>Kitui South</i>	2. Ikutha Sub-County Hospital
<i>Kitui West</i>	3. Kauwi Sub-County Hospitals
<i>Kitui East</i>	4. Mutito Sub-County Hospitals
<i>Kitui Rural</i>	5. Kanyangi Sub-County Hospital
<i>Mwingi Central</i>	6. Mwingi Hospital
<i>Mwingi North</i>	7. Kyuso Sub-County Hospital
<i>Mwingi West</i>	8. Migwani Sub-County Hospital

APPENDIX THREE: NACOSTI APPROVAL



**NATIONAL COMMISSION FOR SCIENCE,  
TECHNOLOGY AND INNOVATION**

Telephone: +254-20-2213471,  
2241349, 3310571, 2219420  
Fax: +254-20-318245, 318249  
Email: [dp@nacosti.go.ke](mailto:dp@nacosti.go.ke)  
Website: [www.nacosti.go.ke](http://www.nacosti.go.ke)  
When replying please quote

NACOSTI, Upper Kabere  
Off Waiyaki Way  
P.O. Box 30623-00100  
NAIROBI-KENYA

Ref. No. **NACOSTI/P/19/25042/30081**

Date: **16<sup>th</sup> May, 2019**

Dr. Grace Atieno Rahut  
Strathmore University Business School  
P.O. Box 59857-00200  
**NAIROBI.**

**RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on "*The impact of County Health Insurance on utilization of health services, cases of Kitui County*" I am pleased to inform you that you have been authorized to undertake research in **Kitui County** for the period ending **16<sup>th</sup> May, 2020**.

You are advised to report to **the County Commissioner and the County Director of Education, Kitui County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit a **copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

  
**DR. MOSES RUGUTT, PHD, OGW**  
**DIRECTOR GENERAL/CEO**

Copy to:

The County Commissioner  
Kitui County.

The County Director of Education  
Kitui County.

#### APPENDIX FOUR: AVERAGE MEAN MONTHLY DATA

The calculated data for the study based on the average mean monthly before the KCHIC (May, June, July and August 2018) and average mean monthly after KCHIC (September, October, November and December 2018)

<b>Hospital</b>	<b>ANC- Before</b>	<b>ANC- AFTER</b>	<b>PNC- BEFORE</b>	<b>PNC- AFTER</b>	<b>CWC- BEFORE</b>	<b>CW- AFTER</b>	<b>FP- BEFORE</b>	<b>FP- AFTER</b>	<b>OPD- BEFORE</b>	<b>OPD- AFTER</b>
Kitui	633	677	220	470	1063	1338	351	350	2269	2610
Ikutha	130	147	27	47	347	445	183	157	331	182
Kauwi	280	276	50	105	440	426	90	99	480	576
Mutitu	92	61	160	40	183	148	86	111	253	272
Kanyangi	116	110	22	90	279	355	154	181	207	114
Mwingi	283	207	37	102	1026	1071	113	469	998	686
Kyuso	130	130	58	43	319	251	133	114	123	79
Migwani	137	147	21	68	498	473	130	42	376	507