

**Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

**PROXIMATE DETERMINANTS OF HEALTHCARE UTILIZATION IN KENYA:**

**A GENDER DISPARITY ANALYSIS**

**BY**

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# Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

## DECLARATION

This work is original and has not been submitted for any degree award in another university.


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## Approval

As University supervisor, this research paper has been submitted with my approval.

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**Dr. Mercy Mugo**

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**DEDICATION**

I dedicate this work to God for through His grace was I able to see my studies to completion. To my mother and husband, thank you for your love and support, it kept me going when I was almost giving up.

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# Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

## TABLE OF CONTENTS

DECLARATION.....	i
ACKNOWLEDGEMENT.....	ii
DEDICATION.....	iii
LIST OF TABLES.....	vi
LIST OF FIGURES.....	vii
LIST OF ABBREVIATIONS.....	viii
ABSTRACT.....	ix
CHAPTER 1: INTRODUCTION.....	1
1.1 Background.....	1
1.2 Health Provision and Utilization in Kenya.....	3
1.3 Statement of the problem.....	6
1.4 Objectives of the study.....	7
1.5 Research Questions.....	7
1.6 Hypothesis.....	8
1.7 Significance of the Study.....	8
CHAPTER 2: LITERATURE REVIEW.....	9
2.1 Introduction.....	9
2.2 Theoretical Literature.....	9
2.2.1 Grossman Human Capital Model.....	9
2.2.2 Behavioral Model of Health Services Use.....	10
2.3 Empirical Literature.....	11
2.3.1 Socio-economic determinants of healthcare utilization.....	11
2.4 Overview of literature.....	15
CHAPTER 3: METHODOLOGY.....	18
3.1 Introduction.....	18
3.2 Theoretical Model.....	18
3.2.1 Binary Logit Model.....	20
3.2.2 Empirical model estimation.....	22
3.3 Data Source and Analysis.....	22
3.4 Measurement of Variables.....	24
3.5 Diagnostic tests.....	25
3.5.1 Test for Multicollinearity.....	25

# Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

3.5.2 Test for Specification error.....	26
3.5.3 Goodness of fit test .....	26
3.5.4 Receiver Operating Characteristic (ROC).....	26
<b>CHAPTER 4: RESULTS AND FINDINGS .....</b>	<b>27</b>
4.1 Introduction .....	27
4.2 Sample Description .....	27
4.3 Descriptive Statistics .....	28
4.4 Correlation analysis .....	32
4.5 Test for multicollinearity .....	33
4.6 Goodness-of-fit test.....	34
4.7 Receiver Operating Characteristic (ROC) .....	34
4.8 Specificity test .....	35
4.9 Logistic Regression results and discussion .....	36
<b>CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>40</b>
5.1 Introduction .....	40
5.2 Summary of findings .....	40
5.3 Conclusion.....	41
5.4 Policy recommendation .....	42
5.5 Limitations of the study .....	42
5.6 Suggestions for further study .....	42
<b>References .....</b>	<b>44</b>

**LIST OF TABLES**

<b>Table 1.1: Total Number of Visits and Utilization Rates .....</b>	<b>4</b>
<b>Table 3.1: Variable Measurements and a priori expectations .....</b>	<b>24</b>
<b>Table 4.1: Socio-economic and Demographic Variables.....</b>	<b>27</b>
<b>Table 4.2: Descriptive Statistics.....</b>	<b>29</b>
<b>Table 4.3: Cross tabulation of Healthcare Utilization and Gender.....</b>	<b>30</b>
<b>Table 4.4: Cross tabulation of dependent variable against independent variables .....</b>	<b>30</b>
<b>Table 4.5: Inter-Correlation Matrix .....</b>	<b>33</b>
<b>Table 4.6: Results of Variance Inflation Factor .....</b>	<b>33</b>
<b>Table 4.7: Hosmer-Lemeshow Test .....</b>	<b>34</b>
<b>Table 4.8: Specificity Test .....</b>	<b>36</b>
<b>Table 4.9: Binary Logit Regression Result for Utilization of Healthcare in Kenya .....</b>	<b>36</b>

**LIST OF FIGURES**

<b>Figure 1.1: Distribution of Outpatient Visits by Sex and Facility Ownership, 2013 .....</b>	<b>4</b>
<b>Figure 1.2: Healthy Life Expectancy (2000 – 2019) .....</b>	<b>5</b>
<b>Figure 1.3: Death Rate by sex (2015-2019) .....</b>	<b>5</b>
<b>Figure 4.1: Receiver Operating Characteristic .....</b>	<b>35</b>



**LIST OF ABBREVIATIONS**

HLE	Healthy Life Expectancy
HSSF	Health Sector Service Fund
KDHS	Kenya Demographic Household Survey
KHHEUS	Kenya Household Health Expenditure and Utilization Survey
KNBS	Kenya National Bureau of Statistics
MOH	Ministry of Health
NHIF	National Hospital Insurance Fund
OBA	Output Based Approach
OLS	Ordinary Least Squares
UHC	Universal Health Coverage
WHO	World Health Organization

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

### **ABSTRACT**

Disparity in healthcare utilization is a challenge not only to the developing countries, but also to developed nations. Progress has been made in understanding the gender-based differences in healthcare utilization, this is because a gender-based approach to healthcare utilization is of essence since women's and men's health react to specific factors differently. Given the challenging health landscape in Kenya, healthcare utilization is an important aspect in improving the health outcome both in the short and long run. Gender, being an important factor in explaining most variations in healthcare utilization plays a key role towards reducing inequalities between men and women. The study aimed to estimate proximate determinants of healthcare utilization across gender in Kenya.

To evaluate how each of the variables influence healthcare utilization in Kenya, a binary logistic regression model was run using Kenya Household Health Expenditure and Utilization Survey of 2013 data. Results indicate that gender of the patient is important in explaining healthcare utilization. Female as opposed to male seek healthcare more, rural living as opposed to urban living also increases the chances of seeking healthcare and also the older the patient, the more likely they are to seek healthcare compared to the younger generation. Moreover, having insurance and the presence of chronic problem increases the chances of seeking healthcare as opposed to not having insurance and no presence of chronic problem.

Based on these findings, the following recommendations are proposed. Policies that reduce the cost of healthcare for the elderly people, promote education for men by offering sensitizations on the benefits of seeking healthcare when they fall ill, and build more public health facilities in the urban areas will go a long way in promoting healthcare utilization. In addition, there is need for the government to revamp NHIF to cover more people, especially those with chronic problems.

## CHAPTER 1: INTRODUCTION

### 1.1 Background

Health is a state of complete mental, physical, and social well-being not merely the absence of disease or infirmity (World Health Organization (WHO), 2021). Additionally, it is generally a condition that is dynamic resulting from constant adaptation and adjustments of the body in response to stress and variations in the environment in order to maintain an inner equilibrium (WHO, 2021). Proximate determinants are the indirect factors that affect healthcare utilization, they can be social or economic. Sen & Östlin (2007) indicate that some of these factors play an important role in shaping inequality in health system.

WHO (2005) defines healthcare utilization as the quantity of healthcare services that an individual uses. Health seeking behavior is the way in which persons behave relative to their health status<sup>1</sup> (WHO, 2005). There are basically three approaches in measuring healthcare utilization including; if a service has been used, how often a service was used per time interval and the overall cost of the services sought (Herrmann et al., 2017). Healthcare utilization has been established as a key component of health with certain significance as a development and public health concern in most developing countries (Obrist et al., 2007; Girma et al., 2011; Saeed et al., 2013; Abaerei et al., 2017). As a result, increased utilization of healthcare services has become a key concern for policy makers and governments in developing countries (Sepehri et al, 2008). In most studies, it is researched in the context of inequality of access and utilization focusing on difference in socio-economic status, gender, nature of illness, education, race or even region (Morris et al., 2005).

Majority of people living in developing countries are unable to access the much-needed healthcare services due to various factors like: affordability and availability of the healthcare services, the healthcare system, distance from healthcare services, quality of healthcare, cultural beliefs, and socio-economic factors (Shaikh & Hatcher, 2004; Asch

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<sup>1</sup> This is an indication of the risk of a patient dying based on the type and number of conditions or socio-economic indicators.

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

et al., 2006; Dias et al., 2011). Households living in countries of middle and low income have limited access to primary and specialty healthcare services. This means they don't benefit from programs aimed at detecting diseases early enough (WHO, 2020).

The problem of inequitable utilization of healthcare services is universal and not only a preserve of the developing countries. For instance, households from Bulgaria use unclear strategies and informal payments to get access to healthcare services (Balabanova & McKee, 2002). In developed nations, similar trends have been observed, where utilization of healthcare services in Spain is related to social class (Garrido-Cumbrera et al., 2010). Dixon et al., (2007) notes that while the use of a general practitioner is largely equitable, specialist care is a preserve of the wealthy in the United Kingdom.

Gender<sup>2</sup> is a significant variable when looking at the health status of an individual, its utilization, its access and the quality of health sought (Doyal, 1995). A number of developing countries face challenges when safeguarding the health status of their population (World Health Organization, 2020). One of the major challenges that policy makers grapple with is gender disparity in health care utilization (Owens, 2008). Alspach (2012) notes that gender disparity in healthcare utilization arises from numerous factors. They include: difference in the manner that male and female report and recognize illness, misunderstanding of benefits and risks of a particular medical procedure, miscalculation of a woman's health risk, cultural biases, explicit discrimination and unconscious prejudice of women. Additionally, utilization of health care services by femininity differs with the healthcare service sought from the practitioner. Adamson et al., (2003) opine that, women will seek medical attention if they discover a lump in the armpit while there is no difference in the number of female and male who would pursue remedial care in case of pain in the chest (Rhodes et al, 2002).

During the 21<sup>st</sup> century, the world has witnessed a number of issues relating to gender disparity in accessing healthcare services. According to United Nations (2005), females are more vulnerable to social, economic as well as health disadvantages compared to

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<sup>2</sup> Gender refers to socially constructed difference between men and women, including expectation of responsibilities and roles (Doyal, 1995).

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

their male counterparts. Salganicoff and Sobel, (2016) showed that women as opposed to men live longer, but they are also the greatest consumers of health services by the end of their life. Nonetheless, the type of health service sought by females largely influences utilization of health services (Payne, 2009).

In addition to biological differences, gender also influences the health of women and men. These gender expectations and roles attached to men and women lead to differential control over and access to resources, power imbalances, as well as other social positions (Antai et al., 2012). As such, an equity approach to health aims to guarantee that both men and women have the resources they need and equal access opportunities in order to satisfy their respective health needs, rather than equalizing their health outcomes (Whitehead & Dahlgren, 2006). Gender and gender-specific factors, socio-demographic factors as well as lifestyle factors were found to independently determine utilization of healthcare services in Denmark (Jørgensen et al., 2016).

### **1.2 Health Provision and Utilization in Kenya**

Kenya, a developing country, in its constitution provides legal framework towards ensuring a comprehensive right-based approach to health services delivery. It is in the Constitution the highest attainable standard of health, including reproductive health care and the maximum achievable standard of health care service is a right every citizen has (The Constitution of Kenya, 2010). In light of the provisions in the constitution, over the years the Kenyan government has come up with several strategic interventions aimed at fast-tracking the attainment of Universal Health Coverage (UHC) for Kenyans. Some of these interventions include the development Kenya Community Health Strategy 2020-2025, The Kenya Health Policy 2014-2030, revitalization of National Hospital Insurance Fund (NHIF) as well as the output-based approach (OBA) for reproductive health. More initiatives to enhance access to health services included the primer of free maternity services in public health facilities, construction of health facilities and the establishment of Health Sector Service Fund (HSSF) among others (Ministry of Health (MOH), 2015). This has led to a considerable growth in the general healthcare utilization in Kenya as depicted by increased number of hospital visits.

## Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

Table 1.1 below shows that the number of total visits made by households to healthcare providers increased by 4.3 million visits from 2003 to 2013. Similarly, the average number of visits per person annually has increased from 1.9 in 2003 to 3.1 in the year 2013; an increase of 63.16%, implying that there are improvements in health outcome during the review period.

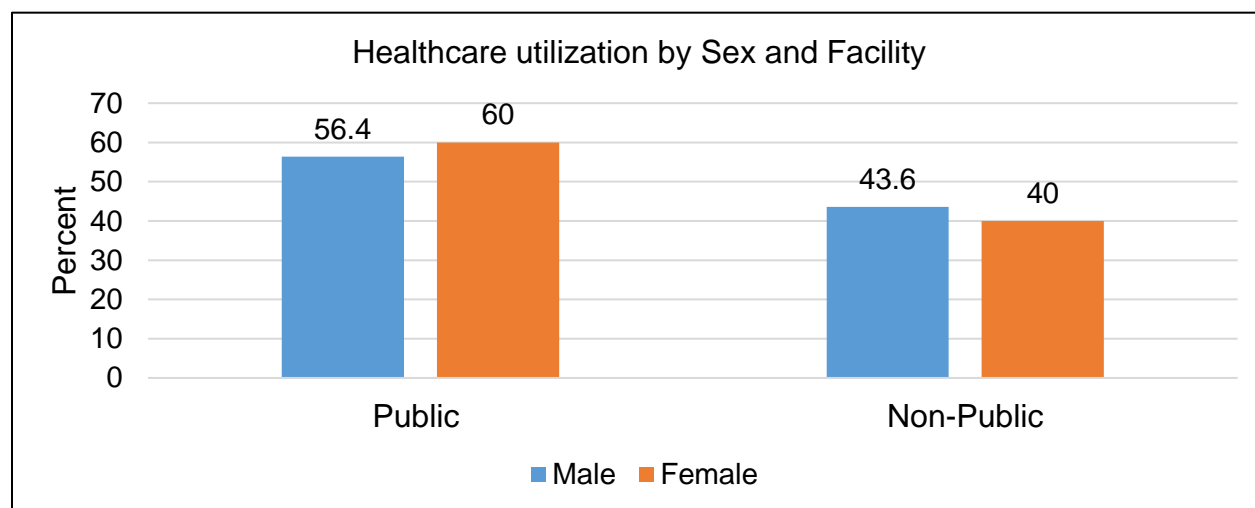
**Table 1.1: Total Number of Visits and Utilization Rates**

<b>Patients Health Utilization Statistics</b>	<b>2003</b>	<b>2007</b>	<b>2013</b>
Average number of visits (per 100 people) in 4 weeks	15	20	24
Average number of visits (utilization rate) per person yearly	1.9	2.6	3.1
Average number of visits by sick people (per 100) in 4 weeks	85	132	122
People who reported were sick but did not pursue healthcare (%)	22.8	16.7	12.7
Total visits made to all healthcare facilities (Numbers in Millions)	4.8	7.4	9.1

Source: Kenya Household Health Expenditure and Utilization Survey KHHEUS (2013)

Figure 1.1, shows the distribution of outpatient visits in Kenya in the year 2013. The data presented shows that the difference in choice of facilities was not significant between female (60%) and male (56.4%) i.e., while 56.4 percent of men utilized healthcare from public health facilities, female were 60 per cent, a difference of only 3.6 per cent. However, it also shows that more men (43.6%) utilized non-public health facilities compared to female (40).

**Figure 1.1: Distribution of Outpatient Visits by Sex and Facility Ownership, 2013**

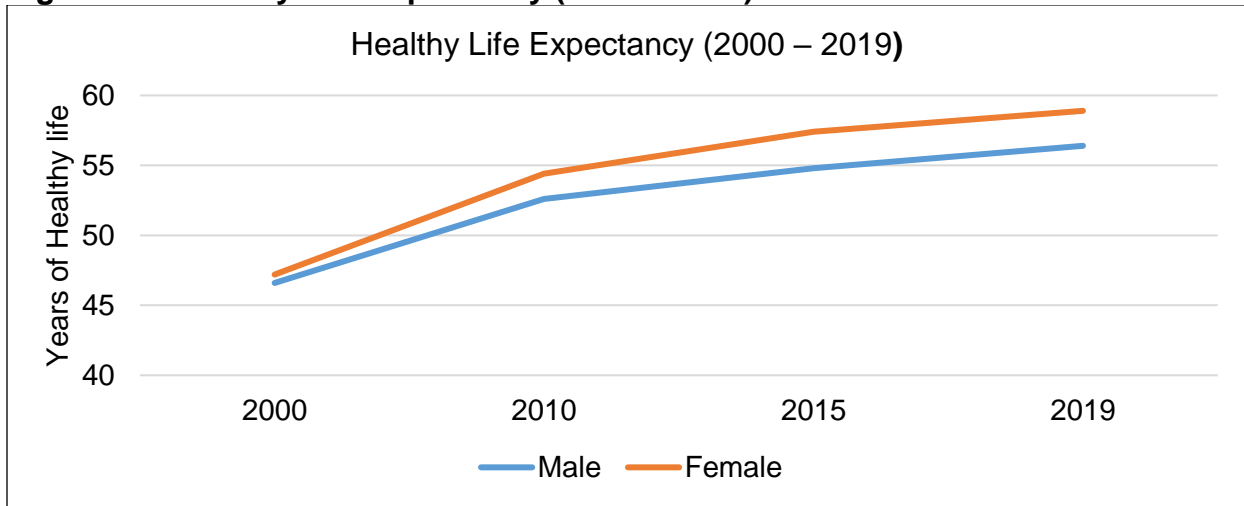


Source: Kenya Household Health Expenditure and Utilization Survey KHHEUS (2013)

## Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

Figure 1.2 shows differences in healthy life expectancy for Kenya by gender. It shows that female as opposed to male experience a higher healthy life over the years. These healthy life expectancies have been rising from 47.2 years in 2000 to 58.9 years in 2019 for female, and 46.6 to 56.4 years in 2000 and 2019 respectively.

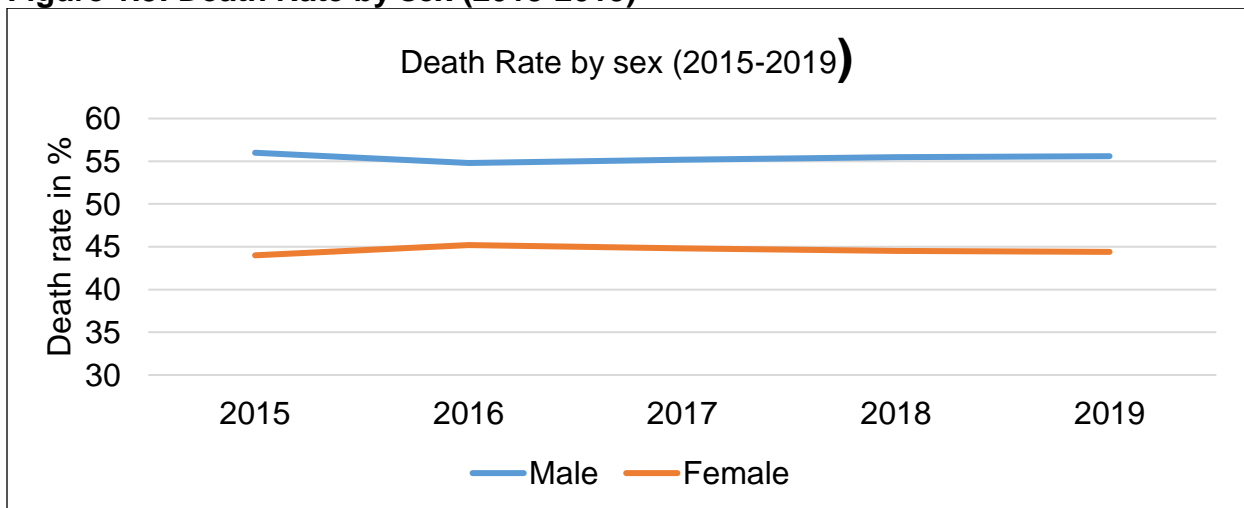
**Figure 1.2: Healthy Life Expectancy (2000 – 2019)**



Source: World Health Organization

The death rate for male has also been higher than that of female as shown in Figure 1.3. From the year 2016, the death rates have almost depicted a constant trend, but with that of men being 10 percent higher than for female.

**Figure 1.3: Death Rate by sex (2015-2019)**



Source: Kenya National Bureau of Statistics, Statistical Abstract various years

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

As a lower middle-income country, Kenya requires a healthy population to aid in sustained economic growth and development as well as poverty reduction. Therefore, utilization of healthcare particularly in the rural areas as well as informal settlements is a top priority of any government that aims to achieve such milestones (Das et al., 2018). Literature has shown that female utilize healthcare more than male (Thompson et. al. (2016); Muriithi (2013)), perhaps this could be the reason why there are higher death rates among male in Kenya than it is among the female as shown in Figure 1.3. There is therefore need for policies that promote utilization of healthcare to consider the gender differences and deal with disparities that exist.

### **1.3 Statement of the problem**

Payne (2006) opine that absence of transparency in the governance of health systems and gender-neutral data could imply that it is rarely possible to assess the extent to which gender has been considered in the delivery of health-related development services and administration. From a policy point of view, Kenya lacks a clear mechanism for addressing the gender differences in healthcare utilization. The impact of different strategies employed by Kenya's healthcare policies have failed to identify the gender differences. Additionally, the governance system overseeing the health policies tend not to explicitly identify the gender differences. This makes it extremely hard to identify the efficiency, health outcomes and implications in terms of cost of such a failure in addressing gender in the utilization of healthcare.

Literature shows that men experience higher death rate and are outlived by women around the world while women are more prone to diseases compared to men in relation to particular conditions and across the lifespan (Payne, 2006). In most countries, although women as opposed to men enjoy a better healthy life expectancy, more years are spent living with disability. Data for 2019 show that Kenya's Healthy Life Expectancy (HLE) at birth for female stood at 58.9 compared to 56.41 for male (World Health Organization, 2021).



## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

Based on the problem of gender inequality outlined above, it is trivial to note that any health system that fails to address the gender inequality has potential of producing a range of consequences, including premature mortality and poorer health among those facing the inequalities. According to Malmusi, Vives, Benach & Borrell (2014), the existence of a gender inequality in healthcare utilization has the potential of inflicting persistence of mortality and morbidity among the affected gender, reduced user satisfaction with the services sought leading to inefficient use of services, in turn affecting the outcomes of health.

Most studies reviewed have focused on the general determinants of healthcare utilization behavior including age and gender and very few looked into how these factors differ between women and men. Moreover, these studies may not be used to generalize the whole population since the results of the studies are regionally demarcated. The studies were conducted only in the rural areas and in other countries whose traditions may not necessarily be similar to Kenya's. This study attempted to close this gap by outlining determinants of healthcare utilization from a gender perspective as well as outlining the gender differential in healthcare utilization in Kenya. The findings would thereafter inform policies on gender differentials for an effective healthcare system.

### **1.4 Objectives of the study**

The broad objective of the study was to estimate proximate determinants of healthcare utilization across gender in Kenya. Detailed objectives:

- i. To explore the factors that influence health care utilization by gender;
- ii. To determine factors affecting health care utilization by gender in Kenya;
- iii. To analyze gender differentials in healthcare utilization; and
- iv. To provide policy recommendations

### **1.5 Research Questions**

In addressing the objectives, this study attempted to respond to the following question;

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

- i. What factors influence health care utilization by gender?

### **1.6 Hypothesis**

The difference in healthcare utilization between men and women is not significant.

### **1.7 Significance of the Study**

Specific literature in Kenya, on the proximate determinants of healthcare with a gender disparity analysis of households is relatively scarce. This study will be of importance in adding knowledge to the existing literature and data.

Outcomes of the study will be of meaningful to researchers who will be interested in the study area in the future as this area has received limited attention. Additionally, the findings will be used as the basis for further research where other researchers will be able to explore and extend it. The study will also suggest or recommend areas for further research from the findings.

Moreover, unmasking the gender disparities in healthcare utilization behavior of a household will be of great importance to policymakers and health service providers especially in the management of healthcare facilities. From the findings, the healthcare service providers will be able to make policies that will promote use of healthcare services. The government will also come up with policies and programs that create opportunities that result to increase in use of healthcare services based on the study findings. In return, the government will have a productive population and save on the resources lost as a result of prolonged effects of sickness.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 Introduction**

Theoretical works on determinants of healthcare utilization related studies are reviewed in this chapter of the study. It also presents a review of empirical literature considering past studies, their findings, relevance and gaps that are filled.

### **2.2 Theoretical Literature**

#### **2.2.1 Grossman Human Capital Model.**

Economic theory on demand for healthcare is mostly centered on Grossman Human Capital approach. According to Grossman model, the demand for medical care and other health inputs is derivative of the basic demand for health. Generally, demand for a particular type of healthcare service produced by a given supplier is the quantity of the service that individuals are ready to acquire as a function of the uniqueness of the buyers and all the sellers (Grossman 1972; Grossman 2000).

Individuals produce health through factors that are comparable to factors of production in the theory of the firm. The factors are: consumption of market and non-market goods and services such as exercise, nutrition, healthcare, education as well as lifestyle choices. When better health is an output, it regarded as an investment good, through a flow of disease-free days which permits both non-market and market activities, and a consumption good in utility or better well-being (Grossman, 1972).

Health makes consumers feel better hence enters their preference/utility function and becomes a consumption commodity. The amount of work and leisure time available to consumers is determined by the state of health and consequently health becomes an investment commodity. Consumers get more time for work and leisure when the number of sick days reduce. As such, the monetary value of the decrease in the number of sick days gives us the yield to investment in health. Therefore, the demand for healthcare services is for good health not the services by itself (Grossman, 1972). In this regard, analyzing the demand for healthcare services as being derived from the individual's

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

demand for good health provides a foundation for determining the factors to be included in a model specifying the demand for healthcare services and for postulating their effects.

Becker (2007) posits that healthcare needs of the consumer, the way they perceive their needs and the barriers to accessing the healthcare service affect demand for healthcare. Schultz (2010) also argues with Grossman (1972) that health is a significant component of human capital and as a result, good health will definitely increase the chances of an individual being involved in income generating activities. This leads individuals to demand good health.

Schultz (2010) states that at an individual level, demand for health is mainly influenced by factors like lifestyle choices, purchased medical outputs, unobserved biological determinants, and non-medical purchase inputs as well as other socio-economic factors. These factors can further be broken down into individual factors (like sex, age, and congenital conditions) and lifestyle choices (including drinking, eating and physical exercises). Other determinants include an individual's living and working conditions, education and healthcare services.

### **2.2.2 Behavioral Model of Health Services Use**

The model is founded on seminal works of an American medical sociologist and health service researcher Ronald Andersen. According to this model, collective influence of environmental and personal factors as well as enabling resources explain the patterns of healthcare utilization. Andersen (1995) explains that the framework envisages that an individual's utilization of healthcare depends on three components namely: need, predisposing and enabling factors.

Andersen (1995) explains the components as follows: first, based on predisposing factors, individuals utilize healthcare services even before the beginning of an illness. Predisposing characteristics consists of demographic variables such as age and gender that add to the biological foundations of needs for healthcare service. Similarly, there are belief variables, which include values, attitudes as well as knowledge that an individual possess regarding health and healthcare services, which impacts need perceptions of

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

healthcare services. Finally, there are social structure variables that contribute to healthcare need, these aspects include education, occupation, ethnicity as well as culture (Andersen, 1995).

Secondly, Andersen (1995) –explains the enabling factors as consisting of variables that play supporting roles in fulfilment of person’s need of healthcare. These variables represent community resources and family attributes that must exist in order for people to use healthcare services. They include transportation issues, health insurance, individual income, religion and availability of healthcare facilities.

Thirdly, Andersen (1995) explains the component of need as follows: While the illness level looks into the immediate ground for use of healthcare services by an individual, this consists of perceived illness and evaluated illness for the individual.

Based on the theories reviewed, this study will adopt the Grossman Human Capital Model. This is because the economic model of consumer choice outlines the means through which people can translate their perceived healthcare needs into an economic demand for healthcare. As such, consumers will compensate their demand for healthcare services both as investment good and also as consumption goods. This is the basis of the Grossman Human Capital Model.

### **2.3 Empirical Literature**

This segment provided a review of specific studies undertaken with regard to gender differentials in healthcare utilization.

#### **2.3.1 Socio-economic determinants of healthcare utilization**

The socio-economic status of an individual is centered on factors like income status, education level, and demographic variables like gender, age and place of habitation. An individual’s socio-economic status has a substantial influence on utilization behavior since it affects the need, response and recognition to symptoms, access to health services in addition to knowledge of disease (Anderson, 1973). Further review of the socio-economic determinants of healthcare utilization are expounded below.

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

**Gender:** A major issue facing most developing countries in terms of demand for healthcare is gender disparity; majority of males than females are seeking and utilizing healthcare (Buor, 2004; Prosser 2007; Saeed et al., 2013). Gender as a demographic factor, therefore influences the choice of healthcare uptake in most developing countries. In rural areas, especially, where traditions are still observed, and also the existence of gender discrimination is likely to influence healthcare utilization and health seeking behavior. Such a situation together with the low income puts the healthcare utilization by females at a serious risk (Saeed et al., 2012).

Similarly, Galdas et al. (2005) and Currie & Wiesenberg (2013) studies show that disparities in gender roles considerably influence trends of health-seeking behavior between females and males. The fact that the differences and similarities in masculine beliefs across men informs the understanding of the disparities in healthcare utilization depicts that. Based on Galdas et al., (2005) and Currie & Wiesenberg, (2013), women feel more constrained in access to healthcare facilities and are largely unlikely to identify warning signs of disease. Culture and defined social roles place women on relatively lower social value, thereby making it hard for them to go to healthcare facilities (Prosser, 2007). However, these studies (ibid) may not be used to generalize the whole population since the results of the studies are regionally demarcated as they were conducted only in the rural areas and in other countries whose traditions may not necessarily be similar to Kenya's.

Thompson et. al. (2016) found that more women stated they visited their primary healthcare provider for their health concerns compared to men. However, a study by Mwabu et al., (1993) established that men as opposed to women were less constrained with the issue of user fee and distance as factors that reduced demand for healthcare. While trying to investigate the determining factors of health seeking behavior in Kibera slums of Nairobi, Muriithi (2013) found choice of health provider is affected by gender with women having higher chances of visiting a health provider than men. Hutchison (1999) established that households whose women were more educated were more likely to seek curative healthcare. The reviewed studies do not agree in their findings in relation to gender especially when matched with other factors that determine health utilization.

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

**Education:** A number of studies: Buor (2003), Ssewanyana et al (2004) and Saeed et al (2012) focusing on education as a determinant of healthcare utilization conducted in developed and developing countries showed high education status is associated with greater use of healthcare, especially clinic visits and preventive visits. Conversely, the studies argue that less severe diseases like chronic diseases are experienced by more educated people. Moreover, individuals with relatively higher levels of education are expected to attend healthcare facility compared to those with low levels or no education at all (Michael et al., 2011; Wellay et al., 2018). Females' education level significantly influences their uptake of healthcare as well as the health outcome of their household (Arthur, 2012). In most of the developing economies, females' level of education appears to be low compared to the males. However, this is changing especially with females in the young cohorts who are climbing the occupational ladder and increasingly becoming educated (Geitona et al., 2007).

**Income level (Wealth index):** Studies have shown that income is a substantial factor in determining utilization of healthcare services as it increases accessibility to all forms of healthcare (Geitona et al., 2007; Kimani et al., 2016; Mwami & Oleche, 2017). These studies further revealed that most of the insured individuals have higher income compared to those who are not insured and therefore are likely to use primary healthcare facilities. Since any form of healthcare arises at a cost, a person's income directly influences health seeking behavior in the sense that, people with relatively high income can either pay for the healthcare services directly or by purchasing insurance (Jowett et al., 2004; Kuire et al., 2015). High wealth index was positively associated with maternal healthcare utilization, that is, persons in poorer wealth levels have less probability to pursue cure in a health facility (Chepkorir, 2014).

In employment, gender inequality is exhibited by gender-based wage gaps, occupational segregation as well as women's unbalanced representation in higher unemployment rates unpaid work and informal employment (Núñez & Chi, 2013). In most Low-Middle Income countries, majority of the workforce in agriculture are women and they are often unpaid (Food and Agriculture Authority, 2011). Even for equivalent work, women are still paid about 25% lower than their male counterparts (WHO, 2019). It is these unequal access

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

to the formal labour force that deny many women an opportunity to access health or other social protection benefits. As a result of these gender inequalities in access to formal employment and income, social status in society and access to economic resources, they are more prone to poverty (WHO, 2019).

**Place of Residence:** Place of residence has been established to be substantial in healthcare-seeking behavior. Secondary factors like availability and access to healthcare services, educational level, and income status have been found to influence differential healthcare patterns between urban and rural residents (Van der Hoeven et al., 2012). Moreover, dissimilarities in socioeconomic variables between urban and rural households in Setswana communities of South Africa may influence the availability, access, quality and reasonable pricing of healthcare services in those areas. The study further established that there was a significant difference in the socioeconomic variables and beliefs about healthcare utilization patterns which favored urban settlers. This was mainly because there were more healthcare options and better healthcare services in urban areas than in the rural areas.

**Age:** Elderly people tend to use more healthcare services than younger ones, though this is not distributed across the whole population. For instance, Adamson et al. (2003) have shown differences in health seeking behavior with age, where elderly person's diagnosed with chronic illness are likely to seek multiple healthcare, with preference to non-traditional healthcare. On the contrary, Ahmed et al., (2000) established that between elderly and the young the variances in health-seeking patterns in Bangladesh was minor.

**Chronic disease:** Persons suffering from a chronic diseases are highly likely to seek healthcare compared to those without the chronic diseases. Even though a positive relationship was established, this relationship was not significant in explaining healthcare utilization pattern (Mwami & Oleche, 2017). Moreover, a study by Rijken, Van Kerkhof, Joost Dekker and Schellevis, (2005) established that presence of chronic disease is connected to higher levels of healthcare utilization, individuals who have been diagnosed with chronic disease are likely to utilize health care services more compared to persons



## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

who have never been diagnosed with a chronic disease by 0.5 percent though it is not significant.

**Marital Status:** Marital status plays a significant role in explaining the healthcare utilization behavior. Previous research has shown that being married as opposed to either being divorced/single/widowed increases the likelihood of healthcare utilization (Chepkorir, 2014; Pandey et al., 2019; Bjørnelv, Edwin, Fretland, Deb and Aas, 2020). For instance, Pandey et al., (2019) found that compared to those who are not married, the married couples had trends of higher odds of having outpatient visits to a healthcare facility. While Bjornelv et al., (2020) established that married patients utilized more healthcare services at the secondary and primary healthcare levels compared to their unmarried counterparts in Norway.

**Employment Status:** Healthcare utilization especially among women of reproductive age is associated with the employment status of a patient positively. For instance, Ameyaw et al., (2017) and Chepkorir, (2014) noted that being employed and maternal healthcare utilization had a positive association.

**Insurance:** Insurance plays a critical role in the determination of healthcare utilization by patients. Having insurance cover as opposed to being without an insurance cover increases the likelihood of using a healthcare service (Abera et al., 2017; Mwami, 2016; Oladipo, 2014).

### **2.4 Overview of literature**

Reviewed literature on determinants of healthcare utilization revealed there is a need for empirical studies that establish proximate factors that influence healthcare utilization from a gender perspective. Several studies done especially in developing countries had mainly focused on factors that influence the decision to seek healthcare in general. These factors only gave the connection between the dependent variables and independent variable, but failed to say anything about the disparities in utilization among different groups. For example, studies conducted outside Kenya had mainly focused on factors that impacted health seeking behaviour (Saeed et al., 2013 and Kuuire et al., 2015 in Ghana; Wellay et

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

al., 2018 in Ethiopia) just highlighted the direction of relationship but not how the categories of the factors differed when it came to utilization of health. Similarly, studies conducted in Kenya had either analyzed the healthcare demand in general (Muriithi, 2013), or factors that affected healthcare utilization (Kimani et al., 2016; Mwami & Oleche, 2017). This brought to light the limited empirical studies on the gender disparities in healthcare utilization across the globe.

Methodologically, studies conducted in this area had used varied estimation techniques to establish the factors impacting utilization of health care services. These included, Binary logistic regression (Geitona et al., 2007; Girma et al., 2011; Saeed et al., 2013 and Kuuire et al., 2015), multinomial logit (Muriithi, 2013; Welay et al., 2018 in Ethiopia), stepwise multiple regression (Abaerei et al., 2017), multiple logistic regression (Prosser, 2007). The stepwise multiple regression however, leads to bias in parameter estimation, inconsistency in model estimation algorithm and overreliance on a single best model. It is for this reason as well as the nature of the dependent variable that the logit model was chosen for this study.

There were variations in the scope of the reviewed studies, with some of the studies conducted in rural (Prosser, 2007), urban slum areas (Muriithi, 2013), while others were regional (Girma et al., 2011; Welay et al., 2018). Some of these studies were regionally determined as the surveys only focused on either rural areas or urban areas, or just a selected area in a country, therefore making it hard to generalize the findings for the entire population. To attempt to fill his gap, the study uses a nationwide survey covering the whole of Kenya not just focusing on rural and urban areas individually.

Studies conducted in Kenya to study healthcare utilization had either used data from 2007 or 2013 Kenya Household Health Expenditure and Utilization Survey (KHHEUS). This study uses the most current data set from KHHEUS 2013 survey, which had not been used to investigate determinants of healthcare utilization in Kenya from a gender perspective.

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

In summary, some of the factors identified from literature as determinants of healthcare utilization were social and economic variables. The reviewed literature analyzed very few of these variables. This study focused on incorporating several socio-economic variables to see how they interacted to influence the healthcare utilization, taking into consideration the gender interplay in the utilization. Moreover, the reviewed literature had focused only on the tendency between independent and dependent variable. This gap is filled by this study as it looks at gender disparity in healthcare utilization using the most recent data.

**CHAPTER 3: METHODOLOGY**

**3.1 Introduction**

To establish the proximate determinants of health care utilization, the approach used is outlined in this section. Additionally, model specification and estimation, the data used, measurement of variables and data analysis are also presented.

**3.2 Theoretical Model**

Economic models of consumer choice outline the means through which people can translate their perceived healthcare needs into an economic demand for health care. This demand for a particular healthcare service is based on the amount of service that individuals are prepared to get as a function of the properties attributed to the consumer and the suppliers. Therefore, consumers will contemplate their demand for healthcare services both as investment good as well as a consumption good (Grossman, 1972).

The demand for healthcare services was based on the Human Capital models outlined by Grossman (1972). The theory posits that a consumer assigns income to a number of needs that maximizes their utility. In this study, an individual's utilization of healthcare is dependent on the decision to seek or not seek healthcare when they fall ill subject to their production function and budget constraints. Following Grossman (1972), an individual's optimization problem can be characterized by a utility maximization function of the form

$$U = f(C, X, H) \dots \dots \dots (1)$$

In this case:

U is the utility of the healthcare service consumer

C is the consumption commodity with no direct impact on their health, but gives utility to a consumer;

X is the health-related commodity directly affecting health of the consumer

H is the person's health status

## Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

The ill individual maximizes utility subject to budget constraint and health production function. The budget constraint is defined as;

$$Y = CP_c + XP_x + RP_r \dots\dots\dots (2)$$

Where

- Y is the income;
- C represents the consumption commodity;
- X represents health-related goods;
- R represents individual's healthcare status;
- $P_c$ , represent the price of consumption goods;
- $P_x$ , represents the price of health-related goods; and
- $P_r$ , represents the prices of individual healthcare.

The health production function is then written as:

$$H = f(R, X, S) \dots\dots\dots (3)$$

Where R represents individual healthcare, X represents health-related commodity and S represents predisposing factors like socio-economic and demographic characteristics of individuals who are sick, they include marital status, age, gender education level and income; the features of health system like service quality, cost of the service, and the time taken in the facility; health-related factors like health status rating and chronic illness; and enabling factors like insurance coverage and accessibility.

Optimization problem is solved using the outlined equations (1, 2 and 3) yields a Langragian function:

$$L = \{U - f(C, X, H)\} + \lambda_1 \{H - f(R, X, S)\} + \lambda_2 \{Y - CP_c - XP_x - RP_r\} \dots\dots\dots (4)$$

Equation 4 yields the demand function which when solved provides the ideal values of  $C^*$ ,  $X^*$  and  $H^*$ . These values maximize the buyer's utility; who is a sick person. Demand function for utilization of healthcare which is obtained by solving equation (4) is:

**Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

$$R_h = f(P_C, P_x, P_r, Y, S) \dots\dots\dots (5)$$

Where  $R_h$  is demand for individual healthcare services,  $P_C, P_x, P_r, Y, S$  are as well-defined in equation 2. This shows healthcare services utilization by an individual depends on income, socio-economic and demographic features of persons who fall ill, price of goods and services, enabling factors and health system characteristics.

**3.2.1 Binary Logit Model**

In order to determine factors that affect healthcare utilization by gender in Kenya, the study used a binary logit model as outlined below. The idea behind the use of a logit model is the fact that, the functional relationship being investigated is binary in nature. Under this model, an individual who is ill seeking health care takes the value (1) and not seeking health care taking the value (0). In this regard, making use of standard linear regression is felt inappropriate and therefore ruled out. The standard logit model therefore, employing maximum likelihood method is the obvious choice because the functional form of our model is non-linear.

Let  $P_i$  represent the probability of person who falls ill seeking health care, hence the probability of not seeking health care is given as  $1 - P_i$ . Cognizant of the fact that we actually do not observe  $P_i$ , but instead we recognize the outcome  $Y=1$  if an individual seeks health care and  $Y=0$  if they don't, then we have:

$$\Pr(Y_i = 1) = P_i \dots\dots\dots (2)$$

$$\Pr(Y_i = 0) = 1 - P_i \dots\dots\dots (3)$$

Probability of a person seeking health care is set as;

$$P_i = E(Y = 1 | X) = \frac{1}{1 + e^{-(\beta_0 + \beta'X)}} \dots\dots\dots (4)$$

Where,  $\beta$  and  $X$  is a vector of their respective coefficients and independent variables respectively.

## Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

For simplicity of comprehending and expression, equation 4 is shortened as:

$$P_i = E(Y = 1 | X) = \frac{e^{(\beta_0 + \beta'X)}}{1 + e^{(\beta_0 + \beta'X)}} \dots\dots\dots(5)$$

Therefore, the probability a person not seeking health care can be:

$$(1 - P_i) = E(Y = 0 | X) = \frac{1}{1 + e^{(\beta_0 + \beta'X)}} \dots\dots\dots(6)$$

It is noted from equation 5 and 6 that  $P_i$  ranges from 0 to 1 and is non-linearly related not only to the parameters but to regressors thus triggering some estimation problems in as far as ordinary least squares (OLS) estimation technique is concerned.

These equations are nevertheless reformulated in terms of the odds ratio of the probability of an individual seeking health care to probability of an individual not seeking health care as follows:

$$\left( \frac{P_i}{1 - P_i} \right) = \frac{1 + e^{(\beta_0 + \beta'X)}}{1 + e^{-(\beta_0 + \beta'X)}} \dots\dots\dots(7)$$

$\left( \frac{P_i}{1 - P_i} \right)$  is simply the odds ratio in favor of an individual seeking health care and can thus be simplified as follows;

$$\left( \frac{P_i}{1 - P_i} \right) = e^{(\beta_0 + \beta'X)} \dots\dots\dots(8)$$

Taking the natural logarithms of equation 8 we get the logit model and observe that the log of the odds ratio,  $L$ , is not only linear in  $X$ , but also in the parameters;

$$\ln\left( \frac{P_i}{1 - P_i} \right) = L_i = \beta_0 + \beta' X \dots\dots\dots(9)$$

# Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

## 3.2.2 Empirical model estimation

Based on the findings from previous studies and the reviewed literature together with the choice of data, the study estimated the following econometric model:

$$\ln\left(\frac{P_i}{1-P_i}\right) = L_i = \beta_0 + \beta_1AGE + \beta_2GEN + \beta_3EDU + \beta_4MRST + \beta_5EMP + \beta_6INSR + \beta_7CHRO + \beta_8RES + \beta_9INCL + \mu_i \dots \dots \dots (10)$$

Where:

$L_i$  was the dependent variable based on probability of a person seeking health care when they fell ill: 1 if an individual sought health care and 0 otherwise,  $\beta_i$  are the coefficients of determination, while  $\mu_i$  is the error term. The variable labels, measurements and a priori expectations were given in Table 3.1

To analyze the gender differentials in healthcare utilization, the study undertook a cross tabulation of the variables of determination. Cross tabulation is a quantitative research method used to analyze the connection between two or more variables. It offers a way of comparing and analyzing the results for one of more variables with the results of another. In this case, it was used to establish the gender differential in healthcare utilization.

## 3.3 Data Source and Analysis

To analyze the proximate determinants of health care utilization in Kenya, the study made use of 2013 Kenya Household Health Expenditure and Utilization Survey (KHHEUS). The survey which is a county and national representative sample is based on a National Sample Survey and Evaluation Programme (NASSEP) master file. Based on NASSEP master file, a total of 33,675 households were drawn for this survey. The 33,675 sample was divided into rural (814) and urban (533) clusters and a systematic sample of 25 households was selected for the survey.

The survey explores the health seeking behavior, out-of-pocket health spending, use of healthcare services, as well as health insurance exposure of Kenyan household. It is however important to note that Wajir, Mandera and Garissa were not included in the



## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

sample because KNBS had not updated the NASSEP by the time of survey. STATA version 15 was used to analyze data.

Data was analyzed after a set of variable constrictions was undertaken. In this process, a number of variables were generated through the *recode* command in STATA. For example, age was recorded to include only those who are 18 years and above, marital status was recorded into two categories; Married/living with spouse and never married/divorced/widow/other, education level was recorded into six categories; nursery, primary, post-primary/vocational, Secondary, College/University and Informal (e.g. madrasa). Employment status was recorded into two categories; employed (formal and informal employment) and unemployed (seeking work/homemaker/students/others)

## Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

### 3.4 Measurement of Variables

**Table 3.1: Variable Measurements and a priori expectations**

Variables	Source variable form KHHEUS	Measurement	A Priori Expectation	Source of evidence
Dependent Variable				
Seeking Health care	Q17	Dummy variable taking 1 if an individual sought health care and 0 otherwise		
Independent Variables				
Age	Q6B	Continuous variable	An older a person is likely to seek health care when they fall sick	Adamson et al., (2003)
Gender of Patient	Q4	1-Female 0-Male	Compared to men, Female are more likely to seek healthcare	Muriithi (2013) and Thompson et. al. (2016)
Marital Status	QB10	1- Married/living with partner 2- Divorced 3- Widowed 4- Never Married 5- Other	Married individuals are likely to seeking health care as opposed to the unmarried	Chepkorir., (2014)
Education level	Q8	1. Nursery 2. Primary 3. Post primary/vocational 4. Secondary 5. College and University 6. Informal (e.g., Madrassa	Educated individuals have higher chances of seeking health care	Michael et al., (2011); Wellay et al., (2018)
Employment Status	Q 11	1. Working (formal/informal employment) 2. Unemployed	Employed individuals are highly expected to seek health care if they fall ill	Ameyaw et al., (2017) and Chepkorir., (2014)
Insurance cover	insured	Dummy variable 1 if an individual is covered by insurance; 0 otherwise	Individuals with insurance cover tend to seek health care more when sick compared to those without insurance	Abera et al., (2017); Mwami., (2016); Oladipo., (2014)
Area of residence	rurb	Dummy variable 0-Rural 1-Urban	Urban dwellers have a higher probability to seek	Van der Hoeven et. al. (2012)

## Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

Variables	Source variable form KHHEUS	Measurement	A Priori Expectation	Source of evidence
			health care as opposed to rural dwellers	
Chronic	Chronic	Dummy variable with 1 for presence of chronic disease and 0 otherwise	People with the presence of a chronic diseases are highly likely to seek healthcare compared to those without the chronic diseases	Rijken, et al., (2005)
Income level (Wealth Index)	w_index	1. Poorer 2. Second 3. Middle 4. Fourth 5. Richest	People with high levels of income are more likely to seek healthcare compared to those of low levels of income	(Chepkorir., 2014)

### 3.5 Diagnostic tests

Diagnostic tests were conducted to ascertain whether the data fits the model. When carrying out regression analysis, one may not have surety of whether the obtained results represent the realities. The diagnostic tests include:

#### 3.5.1 Test for Multicollinearity

Logistic regression assumes that Multicollinearity among the explanatory variables is not a severe problem. Multicollinearity exist when an explanatory variable is correlated with another explanatory variable. Presence of multicollinearity would reduce the power of coefficients and hence weakens the p-value in identifying the significant independent variables. Therefore, making it difficult to test the individual effects of independent variables on dependent variable. Its existence results to estimates that are unreliable. If multicollinearity is found to be a problem, there are a number of approaches to use to correct for the same including; dropping the highly correlated predictors, or by undertaking a Principal Component Analysis to reduce the number of variables. Variance Inflation Factor (VIF) was used by this study to test for multicollinearity presence.

### **3.5.2 Test for Specification error**

Logit of the outcome variable as assumed by logistic regression is a linear combination of the independent variables. The test aims at ensuring the model is properly specified so that no additional predictors that are statistically significant except by chance. Violation of this condition may imply that either the model is not correctly specified or some relevant variables have been omitted, and as such the findings from such a model cannot be relied upon for making any meaningful conclusion. To correct for this, then there is need to include the instrumental variables or proxies for the omitted variables. To undertake this test, a linktest was run and output examined.

### **3.5.3 Goodness of fit test**

This test shows whether the data to be used fits well in the model. In this study, Hosmer-Lemeshow test was used. The Hosmer-Lemeshow test calculates whether observed event rates match expected event rates in sample population. Based on this test, a model fits well if the significance value is more than 0.05.

### **3.5.4 Receiver Operating Characteristic (ROC)**

The Receiver Operating Characteristic (ROC) Curve was employed to examine the predictive power of the model. A more bowed curve represents a greater the predictive power. This means the area beneath the curve is often used as a measure of the predictive power. Models with low predictive power have an area less than 0.5; perfect models have an area 1.

## CHAPTER 4: RESULTS AND FINDINGS

### 4.1 Introduction

Results are presented and discussed in this chapter. Demographic information of the respondents forms the beginning of the chapter followed by analysis, presentations, interpretation, discussion of research findings focusing on respondents' socio-economic and demographic characteristics, and finally the logistic regression results.

### 4.2 Sample Description

The sample of the study was based on 64,489 respondents. The table 4.1 shows a bulk of the respondents were female (52%). Of the respondents, 63% were residing in the rural area, about 52% had primary education and 60% were married and living with their partners.

**Table 4.1: Socio-economic and Demographic Variables**

<b>Discrete Variables</b>	<b>Percent</b>
<b>Gender</b>	
Female	52.03
Male	47.97
<b>Residence</b>	
Rural	63.08
Urban	36.92
<b>Education Level</b>	
Nursery	0.42
Primary	52.26
Vocational	1.01
Secondary	33.17
College/University	12.52
Informal (e.g. Madrasa)	0.62
<b>Marital Status</b>	
Not married/divorced/widowed	39.52
Married/Living with partner	60.48
<b>Chronic problem</b>	
Not Present	86.91
Present	13.09
<b>Employment Status</b>	
Not Employed	36.48

## Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

Employed (Formal/Informal)	63.52
<b>Wealth Index</b>	
Poorest	23.17
Second	20.14
Middle	20.81
Fourth	20.39
Richest	15.49
<b>Insurance Status</b>	
Not Insured	83.05
Insured	16.95

*Source: Author analysis of the KHHEUS 2013 data*

Majority of the respondents (87%) indicated that they did not have any chronic problem, and about 64% were either formally or informally employed. Most of the respondents (23%) were falling in the poorest wealth index quantile, followed by middle fourth and second wealth index quantiles at 20.81%, 20.39%, 20.14% respectively. Majority of the respondents (83) indicated that they are not insured.

### 4.3 Descriptive Statistics

A descriptive statistics analysis was undertaken before undertaking the regression analysis. Presentation of the mean, standard deviation, maximum and minimum of the variables of interest is shown in Table 4.2 using descriptive statistics

## Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

**Table 4.2: Descriptive Statistics**

Variable	Observation	Mean	Std. Dev.	Min	Max
<b>Healthcare Utilization</b>					
Did not Seek Healthcare	12,787	0.158	0.365	0	1
Sought Healthcare	12,787	0.842	0.365	0	1
<b>Gender</b>					
Female	64,489	0.52	0.5	0	1
Male	64,489	0.48	0.5	0	1
<b>Residence</b>					
Rural	64,489	0.631	0.483	0	1
Urban	64,489	0.369	0.483	0	1
<b>Education Level</b>					
Nursery	53,270	0.004	0.065	0	1
Primary	53,270	0.523	0.499	0	1
Vocational	53,270	0.01	0.1	0	1
Secondary	53,270	0.332	0.471	0	1
College/University	53,270	0.125	0.331	0	1
Informal (e.g. Madrasa)	53,270	0.006	0.079	0	1
<b>Marital Status</b>					
Not married/divorced/widowed	64,489	0.395	0.489	0	1
Married/Living with partner	64,489	0.605	0.489	0	1
<b>Chronic</b>					
Not Present	64,489	0.869	0.337	0	1
Present	64,489	0.131	0.337	0	1
<b>Employment Level</b>					
Not Employed	64,489	0.365	0.481	0	1
Employed (Formal/Informal)	64,489	0.635	0.481	0	1
<b>Income Level</b>					
Poorest	64,489	0.232	0.422	0	1
Second	64,489	0.201	0.401	0	1
Middle	64,489	0.208	0.406	0	1
Fourth	64,489	0.204	0.403	0	1
Richest	64,489	0.155	0.362	0	1
<b>Insurance</b>					
Not Insured	64,489	0.831	0.375	0	1
Insured	64,489	0.169	0.375	0	1
Age	64,489	37.21	16.052	18	99

*Source: Author analysis of the KHHEUS 2013 data*

From table 4.2, 18 and 99 years were the lowest and highest ages respectively. The standard deviation was 16.02 and mean age of the respondents was 37 years. The

## Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

standard deviation for the gender variable is 0.5 implying that there is no great variation between male and female.

### Healthcare utilization and gender of the patient

The third objective sought to analyze gender differentials in healthcare utilization. In order to do so, a cross tabulation was done on the two variables and results presented. From Table 4.3, it is clear that more female (64%) sought healthcare compared to their male counterparts (36%), and this relationship was found significant at 99% significance level with a chi2 statistics of 53.66.

**Table 4.3: Cross tabulation of Healthcare Utilization and Gender**

Gender	Did not Seek Healthcare	Sought Healthcare
Female	1,117 (55%)	6,865 (64%)
Male	907 (45%)	3,898 (36%)

*Pearson Chi2 = 53.66 Prob = 0.0000*

### Healthcare Utilization and other explanatory variable

Table 4.4 show the relationship between healthcare utilization and the independent variables. The findings show a significant difference in healthcare utilization with respect to gender, marital status, presence of chronic problem, wealth index and insurance status. More married respondents sought healthcare when they fell ill than those who were either single, divorced or widowed. More of those with chronic problem (86%) sought healthcare more than those who indicated that they don't have the chronic problem (83%).

**Table 4.4: Cross tabulation of dependent variable against independent variables**

	Did not seek Healthcare	Sought Healthcare
<b>Gender (N=12787) ***</b>		
Female	14%	86%
Male	19%	81%
<b>Residence (N=12787)</b>		
Rural	15%	85%
Urban	16%	84%
<b>Education Level (N=10125)</b>		
Nursery	18%	82%
Primary	14%	86%



## Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

Vocational	17%	83%
Secondary	14%	86%
College/University	16%	84%
Informal (e.g. Madrasa)	14%	86%
<b>Marital Status (N=12787) **</b>		
Not married/divorced/widowed	17%	83%
Married/Living with partner	15%	85%
<b>Chronic problem (N=12787) ***</b>		
Not Present	17%	83%
Present	14%	86%
<b>Employment status (N=12787)</b>		
Not Employed	17%	83%
Employed (Formal/Informal)	16%	84%
<b>Wealth index (N=12787) ***</b>		
Poorest	20%	80%
Second	15%	85%
Middle	14%	86%
Fourth	15%	85%
Richest	15%	85%
<b>Insurance Status (N=12787) ***</b>		
Not Insured	17%	83%
Insured	13%	87%

*Source: Author analysis of the KHHEUS 2013 data*

With regards to Gender, of all the female respondents who were interviewed, majority of them (86%) indicated that they sought healthcare when they fell ill with 14% indicating that they did not seek. Looking at the males who were interviewed, about 81% of them indicated that they sought healthcare services when they fell ill with only 19% indicating that they did not seek healthcare. This indicates that majority of the respondents actually sought healthcare.

Looking at utilization by area of residence, majority of those interviewed from the rural areas (85%) sought healthcare compared to 15% who did not seek healthcare. On urban dwellers, most of them (84%) sought healthcare while only 16% indicated that they did not seek healthcare when they fell ill.

On education level, majority of those with primary, secondary and informal education (86%) each indicated that they sought healthcare when they fell ill compared to the 14% who did not seek healthcare. Those with nursery (82%), vocational (83%) and university

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

education (84%) indicated that they sought healthcare while 18%, 17% and 16% respectively did not seek healthcare.

With regards to marital status, about 83% of those who were either not married, divorced or widowed indicated that they sought healthcare compared to only 17% who did not seek. While about 85% of those who were married seeking healthcare when they fell ill compared to the 15% who did not seek.

On presence of chronic disease and healthcare utilization, majority of those who specified they had chronic diseases (86%) sought healthcare more than those who did not have chronic diseases (83%). On employment, majority of those employed (84%) sought healthcare when they fell ill compared to those who did not seek. Additionally, most of those who are not employed (83%) also sought healthcare when they fell ill. These findings reveal that most of the employed sought healthcare compared to those who are not employed.

Looking at the income categories, compared to other levels majority of those who sought healthcare (86%) when they fell ill were from the middle wealth quartile with the least seeking group being from the poorest wealth index (80%). This finding would be expected, given the cost of healthcare. The other income quartiles had most the respondent seeking healthcare services when they fell ill at 85% each.

Moreover, insurance was a significant factor in explaining variation in healthcare utilization among the respondents, with the respondents who are insured seeking healthcare more (87) than those who are not insured (83%). However, the difference in healthcare utilization with respect to employment status, education level and place of residence was not statistically significant.

### **4.4 Correlation analysis**

Inter-correlation analysis between the different sets of independent variables was carried out and presented in this section. Correlation analysis is normally used to establish the link between two variables, that is the coefficient lies between strong negative correlation

## Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

(-) and perfect positive correlation (+). Table 4.3 results shows that the strength of correlation between most variables are weak based on the Pearson correlation, thereby producing small effects ( $\pm.1$ ) and only four variables producing moderate effects ( $\pm.3$ ). Results show that, income level and place of residence have significant positive and moderate correlation with a correlation of 0.490, income level and education level have a significant positive and moderate correlation with a correlations coefficient of 0.370, insurance status and education level have a significant positive and moderate correlation with a correlation coefficient of 0.302, finally, insurance status and income level also had a significant positive and moderate correlation , with a correlation coefficient of 0.354.

**Table 4.5: Inter-Correlation Matrix**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Age	1.000								
(2) Gender	0.001	1.000							
(3) Residence	-0.088*	0.007	1.000						
(4) Education Level	-0.137*	0.065*	0.194*	1.000					
(5) Marital Status	0.227*	0.008	-0.005	-0.110*	1.000				
(6) Chronic	0.270*	-0.077*	-0.002	-0.056*	0.022*	1.000			
(7) Employment Level	0.255*	0.173*	0.023*	-0.100*	0.294*	0.061*	1.000		
(8) Income Level	-0.073*	0.004	0.490*	0.370*	-0.007	0.004	0.068*	1.000	
(9) Insurance	0.007	0.008*	0.153*	0.302*	0.125*	0.013*	0.110*	0.354*	1.000

Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Source: Author analysis of the KHHEUS 2013 data

### 4.5 Test for multicollinearity

Multicollinearity is said to exist in a model when the independent variables are correlated. This correlation can adversely affect the regression results leading to wrong estimates. This is because the presence of multicollinearity inflates the variance of the parameter estimates. We assess whether multicollinearity is a problem despite the inter-correlation results showing very weak correlation among variables. In this case, variance inflation factor (VIF) values that are larger than 10 implies that high correlation among the independent variables could bias the outcome.

**Table 4.6: Results of Variance Inflation Factor**

Variable	VIF
Income Level	1.49
Education Level	1.27
Residence	1.25

## Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

Insurance	1.24
Age	1.20
Employment Level	1.11
Chronic	1.10
Marital status	1.07
Gender	1.05
<b>Mean VIF</b>	<b>1.2</b>

Table 4.6 shows that mean variance inflation factor is 1.20. This therefore shows that the model has no multicollinearity problem and the estimates can be relied upon.

### 4.6 Goodness-of-fit test

The test tells us whether the data we intend to run fits well in the model. In binary logistic regression, Hosmer-Lemeshow test is used. The Hosmer-Lemeshow test calculates whether observed event rates match expected event rates in sample population. Based on this test, a model fits well if the significance value is more than 0.05. From the results in table 4.7, the significance value is 0.2152 which is greater than the p-value of 0.05, this implies that the model fits well and the estimates can be relied upon.

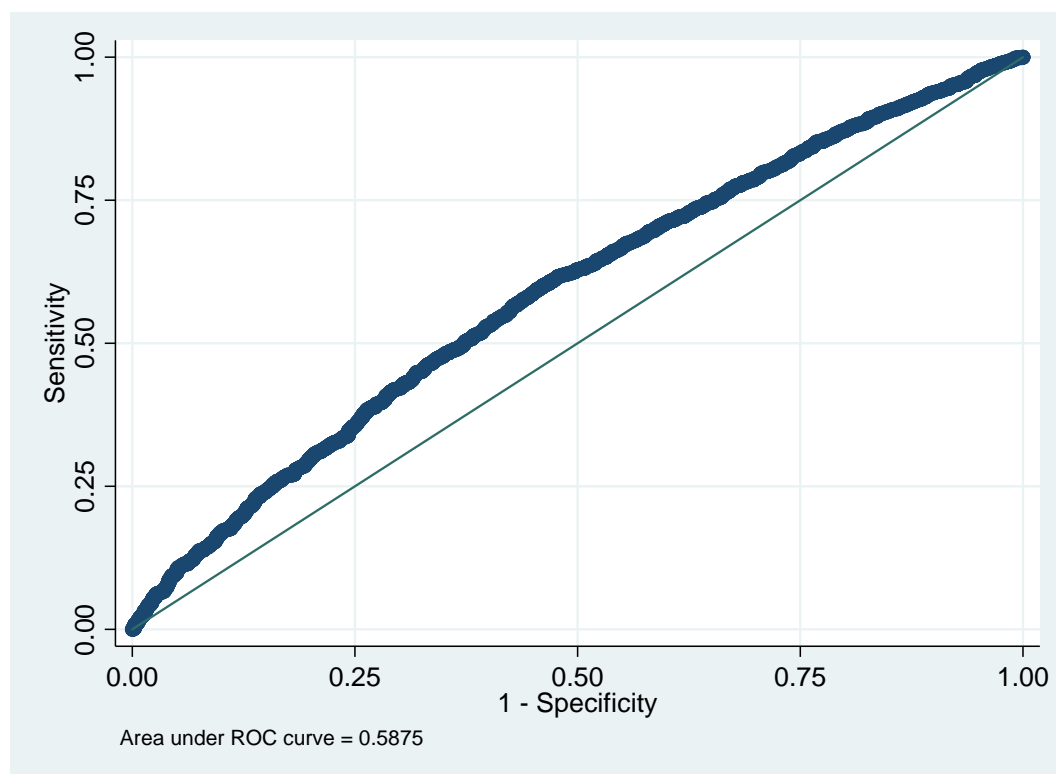
**Table 4.7: Hosmer-Lemeshow Test**

Test	
Number of observations	10125
Number of groups	10
Hosmer-Lemeshow chi2(8)	10.77
Prob > chi2	0.2152

### 4.7 Receiver Operating Characteristic (ROC)

Receiver operating characteristics curve was used in determining the predictive power of the model. The area under the curve indicates the predictive power of the model. The greater the predictive power, the more bowed the curve. For models with high predictive power, the area under the curve is greater than 0.5 while a perfect model has an area of 1. Figure 4.1 shows that the area under the ROC curve is 0.5875, implying that the model has high predictive power.

**Figure 4.1: Receiver Operating Characteristic**



### 4.8 Specificity test

To establish whether the model is properly specified, a specificity test was conducted using link test. This test is used to identify whether there is a specification error. The link test shows that properly specified models have no additional predictors that are statistically significant except by chance. The link test uses the linear predicted values ( $\hat{y}$ ) and linear predicted value squared ( $\hat{y}^2$ ) as the predictors used to rebuild the model. Ideally, if the model is properly specified, then the predicted value squared should not have much predictive power. If the predicted value squared is significant, then it implies that either a relevant variable has been omitted or basically the link function is not properly specified. In this case, from table 4.8, it is evident that both the predicted value ( $\hat{y}$ ) and the predicted value squared ( $\hat{y}^2$ ) have significance levels that are greater than the p-value of 0.05, this implies that the model is properly specified and therefore the estimates can be relied upon.

**Table 4.8: Specificity Test**

Healthcare Utilization	Coef.	Std. Err.	z	P>z
_hat	0.045	0.982	0.050	0.963
_hatsq	0.272	0.279	0.980	0.329
_constant	0.813	0.848	0.960	0.338

#### 4.9 Logistic Regression results and discussion

To estimate the equation, binary logit model was used. Discussions around findings focussed on odd ratio and significance of estimated coefficients. The binary logit regression results show how the dependent variable (Healthcare Utilization) is related with each of the regressors.

The second objective was to determine factors affecting health care utilization by gender in Kenya. In Table 4.9, findings of the binary logit regression are presented.

**Table 4.9: Binary Logit Regression Result for Utilization of Healthcare in Kenya**

Healthcare Utilization	Odds ratio	Standard. Error.	z-value	p-value
<b>Gender</b>				
Female	1.619***	0.095	8.26	0.000
<b>Residence</b>				
Urban	0.835***	0.055	-2.74	0.006
<b>Education Level</b>				
Primary	1.376	0.466	0.94	0.345
Vocational	1.165	0.508	0.35	0.727
Secondary	1.463	0.500	1.11	0.265
College/University	1.218	0.427	0.56	0.574
Informal (e.g. Madrasa)	1.379	0.635	0.70	0.485
<b>Marital Status</b>				
Married/Living with partner	1.054	0.066	0.84	0.402
<b>Presence of Chronic</b>				
Present	1.197***	0.083	2.60	0.009
<b>Employment Status</b>				
Employed (Formal/Informal)	1.00	0.068	0.01	0.994
<b>Income Level (Wealth Index)</b>				
Second	1.168	0.111	1.64	0.102
Middle	1.123	0.106	1.24	0.216
Fourth	1.117	0.110	1.13	0.260
Richest	1.134	0.132	1.07	0.283
<b>Insurance</b>				

## Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis

<b>Insured</b>	1.318***	0.108	3.37	0.001
<b>Age</b>	1.003*	0.002	1.66	0.097
Constant	3.957***	1.401	3.89	0.000
Mean dependent var	0.856	SD dependent var	0.351	
Pseudo r-squared	0.014	Number of observations	10,125	
Chi-square	117.273	Prob > chi2	0.0000	
Akaike crit. (AIC)	8262.941	Bayesian crit. (BIC)	8385.7	

*Significance: \*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$*

From the results, five variables are significant in explaining healthcare utilization. Most of variables in this study have the expected signs and are in agreement with the previous studies. Healthcare utilization can be explained by the variables in the model by about 1.4 percent of the variation because results from empirical analysis give a pseudo-R-squared of 0.014. Additionally, the model variables jointly explain variations in the dependent variable because the Wald chi-square statistics has a significance level of 1%.

Gender of the patient, age of the respondent, area of residence, insurance status and presence of chronic problem influence healthcare utilization. Gender has a positive significant effect on healthcare utilization among adult Kenyans. Holding all other factors constant, being female as opposed to being male increases the chances of seeking healthcare by 1.619. This implies that female who fall ill seek healthcare more than their male counterparts. The finding is further supported by the cross tabulation which indicated that more female than male sought healthcare when they fell ill. These findings are in line with the expectation, which indicated that female as opposed to male are more likely to seek healthcare when they fall ill. The findings also support the findings of Thompson et. al. (2016), who concluded that more women stated that they visited their primary healthcare for health concerns compared to men.

Age of the patient was also found to have a positive significant effect on health seeking behaviour. While holding other factors constant, a one-year increase in age of the respondent intensifies the odds of seeking healthcare by 1.003 times. This means that the older one becomes, the greater the chances of visiting a health facility when they fall ill. These findings are in line with the expectations. Moreover, the findings support the argument brought about by Adamson et al., (2003), who established that elderly individual

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

with chronic illness were more likely to seek multiple healthcare. This can further be explained by older age being characterised by emergence of several complex health states which tend to occur at later stages of life.

Area of residence was found to have a negative and significant effect on healthcare utilization. Holding all other factors at their mean, living in urban as opposed to living in the rural area reduces the odds of seeking healthcare by 0.835 times. This implies that, those who stay in the rural have higher chances of visiting a healthcare facility when they fall ill compared to those who live in the urban areas. These findings contradict the earlier expectations, which pointed to higher utilization of healthcare facilities among the urban dwellers as opposed to rural dwellers. Nonetheless, the findings can be attributed to the fact that, in as much as there are several healthcare facilities in urban areas, most of them are privately owned and the costs are higher thereby limiting people from accessing such, unlike in rural areas where majority of healthcare facilities are public and hence relatively affordable.

Having insurance had a positive significant effect on healthcare utilization in Kenya. This relationship was found to be significant at 99% confidence level. Being insured as opposed to not being insured increases the chances of seeking healthcare services by 1.318 times. This implies that respondents with insurance cover are highly likely to seek medical assistance when they fall ill, these findings are expected since the insurance takes care of the healthcare cost, thereby easing the burden of out-of-pocket cost. The findings are in agreement with previous findings by Abera et al., (2017); Mwami, (2016); and Oladipo, (2014), who found that having insurance cover was significant in explaining healthcare utilization.

Presence of chronic problem was also found to significantly influence healthcare utilization among adult population in Kenya. Presence of chronic problem increases the likelihood of seeking healthcare by 1.197 times. The findings support the cross tabulation results, which indicated that majority of those who sought healthcare when they fell ill were actually those with chronic problems. These findings are in concurrence with the



## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

previous findings by Rijken, et al., (2005) who established that the existence of a chronic diseases increased healthcare services uptake.

## **CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Introduction**

Summary of findings, conclusions and policy recommendations are stated in this chapter. In addition, limitations of the study and possible areas for further research are outlined.

### **5.2 Summary of findings**

Five factors are revealed to influence healthcare utilization in Kenya as revealed by the findings. These factors are gender of the patient, age of the patient, area of residence, insurance status as well as presence of chronic problem. Holding other factors constant, it was established that the odds of seeking healthcare when one falls ill are 1.619 times higher for females than for males, this relationship is significant at 1%. This could be because female especially in the urban areas tend to visit healthcare more, this trend could be linked to other factors like education level of the female.

Older people have higher chances of seeking healthcare compared to younger generations. Findings show that the odds of seeking healthcare when one falls ill is 1.003 times higher for older patients than it is for the younger ones. These findings attest to the fact that as people get older, there are some lifestyle diseases that manifest themselves in them, this leads them to seek healthcare more.

Further, the findings reveal that place of residence is an important factor when it comes to healthcare utilization. The odds of seeking healthcare when one falls ill is 0.835 times lower for those staying in urban than for those staying in the rural. This implies that there are higher chances for those living in the rural to seek healthcare when they fall ill than for those in the urban. The reason for this could be because in rural areas majority of the health facilities are public, which are relatively affordable, unlike in the urban areas where majority of the health facilities are privately owned and the costs are relatively higher.

Insurance plays a significant role in determining whether one seeks healthcare or not. The odds of seeking healthcare is 1.318 times higher for those with insurance cover than those without the insurance cover. This means that those with insurance cover are more

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

likely to seek healthcare when they fall ill compared to those that don't have insurance cover. Finally, it was noted that those with chronic problem tend to seek healthcare more than those who don't have chronic problems.

### **5.3 Conclusion**

This study sought to estimate the proximate determinants of healthcare utilization across gender in Kenya. In doing, the study sought to explore the factors that influence health care utilization by gender, determine factors affecting health care utilization by gender and analyze gender differentials in healthcare utilization. Conventional knowledge has it that gender of the patient, age, marital status, and presence of chronic problem, insurance status, employment status, income level, education level and place of residence have influence on health seeking behavior. In support of this knowledge, analysis of 2013 Kenya Household Health Expenditure and Utilization survey data, it was clear that gender, age of the respondent, place of residence, presence of chronic problem and insurance status are important factors in explaining healthcare utilization.

Female patients tend to seek healthcare more than their male counterparts. This is evident by both the cross-tabulation results and the logistic regression which showed that female as opposed to male are likely to seek healthcare when they fall ill. Older patients tend to seek more healthcare than the younger generation, this was depicted by both the cross-tabulation results and the logistic regression outputs. Living in the rural as opposed to living in the urban increases the chances of seeking healthcare, this was shown by about 87% of those living in the rural seeking healthcare compared to 86% for those in the urban. Having an insurance cover and the presence of chronic problem both leads to increased healthcare utilization in Kenya.

Therefore, given the findings of the study, it is clear that there exists gender differential in utilization of health in Kenya making gender a desirable component in designing healthcare policies and reforms.

### **5.4 Policy recommendation**

Based on the findings, this study offers the following recommendations:

- i. To ensure healthy population, the government through the Ministry of Health needs to consider paying NHIF for persons who are aged 60 years and above. This is after age had a significant effect on healthcare utilization,
- ii. Findings revealed that female tend to seek healthcare more than male when they fall ill. Therefore, to encourage male to seek healthcare when they fall ill, the government through the ministry of health to offer education programs to men on the need to visit a qualified health facility when ill.
- iii. Area of residence was found to significantly influence healthcare utilization in the country, with those who stay in the rural visiting healthcare facilities more than those in urban. To enhance healthcare utilization, both the national and county government needs to set up more public healthcare facilities in the urban areas.
- iv. Insurance status was found to significantly influence the healthcare utilization in Kenya. Therefore, this call for the government to ensure that the planned universal healthcare coverage is fully implemented and the cost significantly reduced. This can be achieved through revamping the National Hospital Insurance Fund by allocating more funds by the National Treasury.

### **5.5 Limitations of the study**

This study intended to use the Kenya Household Health Expenditure and Utilization Survey for 2017, however, the data has not yet been released for use in public since the report is yet to be officially launched. Therefore, this study used data that was released in 2013 which may not reflect the current position of the country in terms of factors on healthcare utilization.

### **5.6 Suggestions for further study**

Ordinarily it would be expected that people in urban areas would seek healthcare more than persons in the rural areas and this was not the case of Kenya. It's important to

## **Proximate Determinants of Healthcare Utilization in Kenya: A Gender Disparity Analysis**

consider factors that hinder urban dwellers from not visiting healthcare providers. Moreover, future studies should consider using the most recent data to try and understand the factors that determine the use of healthcare

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