DETERMINANTS OF UTILIZATION OF HEALTH CARE SERVICES IN KENYA

BY

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DECLARATION

Declaration by the Student

This research paper is my original work and has not been presented for a degree in any other University.

Signed...................................... Date ....

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Declaration by the Supervisors

This research paper has been submitted for examination with our approval as university supervisors.

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DEDICATION

This research paper is dedicated to my loving Dad, my husband and family for their moral support and endurance during my studies.

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ACRONYMS

NCDs   Non-Communicable Diseases

MOH   Ministry of Health

KHHEUS   Kenya Household Health Expenditure and Utilization Survey

KNBS   Kenya National Bureau of Statistics

WHO   World Health Organization

USAID   The U.S. Agency for International Development

NHIF   National Health Insurance Fund

GoK   Government of Kenya

KHPF   Kenya Health Policy Frameworks

TB   Tuberculosis

HIV/AIDs   Human Immunodeficiency Virus/ Acquired Immunodeficiency

            Syndrome

UHC   Universal Health Coverage

ABSTRACT

There are many factors that influence utilization of health care services. Despite the effort by the government and other stakeholders to improve health care services, utilization of health services in occurrence of disease still remains a major challenge with a significant proportion of the Kenya population embarking on self-medication. The aim of the study is to examine the factors affecting utilization of healthcare services in Kenya and draw policy recommendations based on the findings. The study utilized the probit model to analyze the determinants of utilization of healthcare services in Kenya using the 2013 Kenya Household Health Expenditure and Utilization Survey (KHHEUS) which is a national survey that consisted of 33,675 households. Individual gender, household size, cost per visit, area of residence, wealth index which is a proxy of income and employment status significantly affect the utilization of health care in Kenya as per the findings. Majority of the individuals indicated that the quality of care provided in the facilities visited was good (89%) while the cost of services was relatively high Kshs (440) per visit. The cost significantly increases utilization thus implying that individuals are willing to pay more to receive good quality of health care services hence the need to improve the health systems. It is recommended for the government to invest more on sensitization of the people on issues of nutrition and healthy living conditions since it is evident that those with high wealth index and the employed are less likely to visit a health provider which could be associated to their investment in healthy living lifestyle hence less predisposed to chronic and severe ailments. Lastly, high utilization of health care services by individuals in low wealth index calls for an increase in the number of health facilities that charge subsidized costs and promotion of high quality services in areas with high poverty index.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

There are many determinants of health and health care seeking. Although the determinants are similar across populations, their interaction and influence on people's actions are unique to a population based on the environment they live in (Prosser, 2007). Utilization of health care refers to use of health services by the people. Therefore, physical accessibility to a facility, its ability to provide required health services and patient's ability to pay are all essential determinants of utilization of health care services in case of occurrence of disease.

The Government of Kenya (GoK) focuses on ultimate provision of universal healthcare services to its people. The goal is achievable by striking a balance between available resources and population's health needs. The allocation of limited resources for the health sector in the budget and the high level of inefficiencies in utilization of available resources are a huge hitch to the health sector in harnessing the existing technology to improve health and reduce death (Ministry of Health, 2014). The public hospitals have inadequate basic resources such as human resource, stock of essential drugs and medical supplies, functional ambulances and operating theatres and supplies hence the inadequacy in adherence to the expected norms and standards for delivery of quality services which directly affect the utilization of health care services. Since independence the GoK has worked towards improvement of the health of its people with the number of health facilities increasing rapidly to serve the health needs of the escalating population. Since 1994, the Kenyan health sector has been guided by the Kenya Health policy frameworks (KHPF) that provide directions to promote

improvement of health status in line with the constitutional requirements, vision 2030 development agenda, and global commitments. The current policy, KHPF 2014-2030, focuses on promoting equity, multi-sectoral approach, people centeredness, participation, efficiency, and social accountability in provision of healthcare services in order to improve access to, quality of, and demand for healthcare.

The new constitution of Kenya 2010 delegates the governance and management role to the designated 47 county governments through the devolution. The county governments are responsible for promotion of democracy and accountability healthcare delivery, fostering a flawless service delivery, facilitating independence powers to the people, and improving participation of citizens in decision making on issues related to their health. Despite health being one of the functions that has been devolved, the impact of devolution on utilization of health services is yet to be felt by the citizens since the process is still faced by a lot of teething problems that are associated with a new system.

Majority of the developing countries are still lagging behind in utilization of health care. According to mills et al (2012) the healthcare services in Tanzania, Ghana, Kenya, and South Africa favor the better-off although those people with low income experience the highest burden of illness. According to Chuma & Okungu (2011), the health systems are in the attempt to achieve Universal Health Coverage whereby the preventive, curative, promotive and rehabilitative health services are accessible to all individuals at a cost that they can afford. The provision of health care that protects the individuals who are in need by offering free maternity services, free service delivery at the health centres and dispensaries as well as reducing the cost of health care to

very minimal amounts at the county and referral hospitals is a milestone by the Kenyan Government in increasing utilization and access to health care.

Many people in Kenya are exposed to heavy burden of diseases. The infant and under-five mortality rates in Kenya still remains at 39 out of 1000 and 52 out of 1000 respectively. Moreover, the maternal mortality rate stands at 362 per 100,000 live births annually (KNBS, 2014). Despite the reduction of deaths caused by ailments that can be controlled through immunization, ill-health among children is still rampant with over 40,000 children dying annually due to deficiency of vitamin A, underweight and malnutrition (MOH, 2014). The predominant causes of deaths in Kenya are the infectious diseases and non-communicable diseases. The MOH makes efforts to reduce the burden of disease through the six level health service delivery structure which is hierarchical in nature with the primary care units serving the less complicated cases while the complicated cases are referred to higher levels for specialized care.

Considering the above challenges, utilization of health services is essential in improving both short term and long term health outcomes for Kenyans. Currently, the health facilities are disproportionate with some regions having most facilities and equipment as compared to others. About 77 percent of Kenyans who are sick seek care from qualified health providers indicating that there still exists a large percentage of the population which do not seek medical care despite being sick. Therefore, in order to improve health in Kenya, it is imperative to understand who are the persons that utilize the available health facilities and identify the factors that hinder those who do not seek health care from doing so.

1.2 Statement of The Problem

The health system is working in a stepwise manner to improve accessibility of healthcare services to measure upto the standards stipulated in the Kenya Health Sector Strategic and Investment Plan III (KHSSP III) which requires a person to cover an average distance of 5 km to reach the nearest health facility to receive healthcare services (MOMS and MOPHS, 2012). According to MOH (2014) about 20 percent individuals cover more than 5 km to seek outpatient care thus showing a negative relationship between utilisation of outpatient services and distance to health provider.

The health services provided in the dispensaries, health centres and hospitals in Kenya are highly subsidized and the patients pay very minimal user fees or none at all for health services rendered. Despite the public facilities offering services at minimized costs, there is still a large proportion of Kenyans (13 percent) that do not seek health care services from a qualified personnel in case of ill health (MOH, 2014). Therefore, there is need to establish the critical factors that cause patients not to seek healthcare from a qualified health personnel in occurence of illness.

A study by Ellis & Mwabu (2004) used the choice model to estimate demand for out-patient healthcare in rural areas in Kenya. The study found out that there exists huge difference between probability of illness and probability of seeking healthcare and that it is imperative to know if the demand for health care depends on underlying illness or population demographics. Previous studies show that there exist multitudes of correlates that influence utilization of health care services but what is not clear is whether some of these factors have been addressed with the implementation of the various policies that focus on improving health services and systems.

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Previous studies have shown that there are problems of use of healthcare services even in coutries with well established health systems with the cases of self-medication increasing rapidly. There are disparities in the different studies on utilization of health care services in Kenya in that some have omitted some essential variables; others have geographical demarcation while others have used a different dataset for analysis. The ministry of health have implemeted many policies like the "right to health for all" with the aim of achieving equitable access to health care services. Therefore, acquiring knowledge on factors that influence utilization of health and medical services in Kenya based on the most recent data set is imperative as it will guide on existing gaps from the client perspective.

1.3 Objectives of the study

1.3.1 General Objective

The primary objective of this study was to investigate the determinants of utilization of health care services in Kenya.

1.3.2 Specific objectives

The specific objectives of the study were:

i.   To examine the factors affecting utilization of healthcare services in Kenya.

ii. To develop policy recommendations based on conclusions of the research findings

1.4 Study justification/rationale

The study was projected to provide information that is of paramount importance to a variety of stakeholders in the health sector. They include but not limited to the public, policy makers, and academia. The study enlightens the policy makers, both at the

National and County Government of the factors that determine the utilization of health care services in Kenya for proper planning and decision making in the health sector.The study further provide information that guides the policy makers on allocation of resources for provision of equitable preventive, curative and rehabilitative services to different regions in attempt to make progress towards the Universal Health Coverage (UHC) which is an agenda that has raised great concern for all states and government in the world. The community will be informed of the inadequacies in utilization of health care especially by the poor and those in the rural areas despite the high rate of morbidity affecting the particular group of individuals.

1.5 Organization of the Research Project

The research project consists of five chapters whereby chapter one is the introduction, chapter two is literature review and chapter three is research methodology chapter four is data analysis, interpretation and results and chapter five is summary of findings, conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Theoretical Review of Literature

This section outlines the various theories of utilization of health care services. The theories that were discussed are the Suchman's theory of stages of illness and medical care, Mechanic's theory of help seeking behavior and Parson's theory of sick role.

2.1.1 Theory of Sick Role

The theory of sick role explains the rights and responsibilities that are particularly for the people who are ill. According to Parson (1951) the society adapts and allows for some level of deviation from the norm for those who are diagnosed with any form of illness. The theory of sick role provides four main components that govern that a sick individual is exempted from performing the regular roles and activities, the sick individual do not willfully get to their state of illness and necessary assistance should be accorded to them to enhance their recovery, having an illness is recognized as being in undesirable condition and that the individual should receive medical care and comply with the treatment to facilitate their recovery.

According to Scarince (2003) Parsons states two rights and two responsibilities that are awarded to a sick person. The patient has a right to be granted leeway by the people in the society in which they live in regard to performance of normal activities and also possess the right for no blame for their illness. Nevertheless, it is the responsibility of the patient to make recovery their priority and also their responsibility to seek medical attention from a health provider for recovery from their

condition. These rights and responsibilities are temporally as they are only effective for the period of illness.

With subsequent criticism of the theory, the society has differed with some of Parson's considerations that viewed a sick person as a helpless being. Today, the society reasonably accommodates the sick and those with disability by creating favorable working conditions for those who are terminally ill or disabled but can work (Scarince, 2003).

2.1.2 Mechanic's theory of help seeking behavior

Mechanic's theory of help seeking behavior defines illness behavior as the presence of a state of health that triggers concern of an individual to seek help for the symptoms exhibited. Mechanic (1995) asserts that different people respond differently to various bodily indications. This theory is therefore concerned with the way in which people monitor their body states, interpret symptoms and make decisions to utilize health care. He defines illness behavior as a socio-cultural response which individuals' exhibit based on lessons learnt, their social jurisdictions and the past experiences. The response given to certain signs and symptoms is determined by the contextualized definition of the present situation (Mechanic, 1978). Individuals who are close can also influence the decision taken by the sick person.

The determinants of illness behavior include symptoms perception, nature, interpretation and their residual category (Mechanic, 1978). The perception is influenced by recognition and visibility of the symptoms, their perceived danger, cultural assumptions, knowledge level and the available information. The nature of

the symptoms further influences decisions based on the extent to which they affect one's work, family and social networks. The persistence and frequency of the symptoms also affect the illness behavior as they act as the measure for the level of tolerance for the symptoms. One interprets the symptoms based on the availability of basic needs and other needs vis-à-vis illness response. The residue category includes the financial and psychological costs which can either be in form of time, money, effort requirement, stigma and humiliation among many others (Matehesi, Meulemans, & Timmerman, 2005).

2.1.3 Suchman's theory of stages of illness and medical care

Suchman's theory provides the five stages of decision making process taken by an individual in an attempt to determine whether or not to seek health care. The five stages are; symptoms experience, assumption of sick role, seeking medical care, dependent- patient role and finally recovery and rehabilitation (Suchman, 1965).The first stage of symptoms experience orients the individual to the illness through physical changes observed, severity of the change, emotional reaction, denial, acceptance all which lead to delay thus increasing the severity of the symptoms with time. During the second stage, the individual discovers his or her lay referral system and validates the sick role hence seeks for treatment options (Oreskovic, 2015).

It is in the third stage that the individual seeks assistance from a health professional. The period taken on this stage is dependent on whether the patient accepts or refuses to confirm their sick role. Those who are parochial take longer than those who are cosmopolitan. Acceptance leads to the fourth stage of dependent-patient role. At this level some patients are resistant and incompliant to treatment regimen but gradual

approach to normal roles is achieved when the physician and the patient are working towards the same goal of recovery. The fifth stage involves recovery and rehabilitation where the person recovers and if the illness has no cure they assume the role of a chronically ill person (Rebhan, 2015).

2.2 Empirical review of literature

Ellis & Mwabu (2004) carried out a study on the demand of outpatient medical care in the rural Kenya. The study utilized a four-level nested logit model with the individual having to choose from four choices which are; whether or not to report an illness, whether or not to seek formal treatment, the specific provider to visit and the means of transport to the health provider. They found out that the quality of the facility, the cost of services offered, income of the household, the travel costs, and travel time affect the choices that individual's make with regard to the facility from which to seek health care. Nevertheless, the study has existing gaps in that the survey was carried out in rural areas only and did not include health insurance as one of the variables which will be addressed in this study.

A study carried out by Acton (1975) found out that in instances when the user charges for health services are zero or close to zero, the time required to consume the services rations utilization of the health services. Also, some studies indicates that the demand for health care services is independent on the travel time and price of services (Akin et al. 1986; Heller, 1982). This is contrary to most of the studies which show that travel time and prices indeed effect utilization of health services (Gertler et al. 1987; Lavy & Quigley, 1993; Mwabu et al.1993; Ellis & Mwabu, 2004). The studies vary depending on the methods of model estimation, countries where the studies were

carried out, number and type of investigated variables which contributes towards the discrepancies in the final results. For example, Lavy & Quigley (1993) model the static conditional provider choice whereas Heller (1982) model the number of visits to health provider.

Prosser (2007) carried out a study on health and medical services utilization with specific concern on the factors that affect health care seeking behaviour and individual unmet health needs of individuals. The study used univariate analysis and multiple logistic regression analysis to investigate the outcome variable. The findings indicate that education and literacy levels, gender, distance, costs of seeking treatment, and time taken are the main factors that influence utilization of medical services in rural areas. Nevertheless, the study failed to assess the impact of quality of care, health insurance and disease severity in utilization of health care. In addition, the study results are regionally demarcated as the survey focussed only on rural areas.

Bakeera et al. (2009) carried out a study on to determine the perceptions and factors that affect health services use in Uganda. According to the results health service delivery, health seeking process and social resources are imperative determinants of utilization of healthcare services. The survey used qualitative study design with the data being analysed using content analysis and the Health Access Livelihood Framework used in examination and interpretation of findings. Specifically, income availability, health literacy, affordability of means of transport, social networks, and poor staff attitude were identified as the most predominant factors that influence utilization. This study was quite informative since the technique used sought responses from the respondents using open ended questions which were used in Focus

group discussion hence able to get first hand opinions from the interviewees without restrictions by the questionnaire. Nevertheless, there are inadequacies in that the study was conducted in three villages in the same Health Sub-District hence the results cannot be generalized to the general population.

Manzoor, Hashmi, & Mukhtar (2009) investigated the determinants and patterns of utilization of health care services by the learned individuals through a survey that was conducted on postgraduate students. The findings indicate that majority of the respondents seek health care from private health facilities as compared to the public sector. In consistency with majority of the previous studies, the survey indicated that most of the Pakistan women prefer private health providers more than men. The reasons for seeking health care from private health facilities include short waiting time, easy accessibility, availability of drugs, adequate staff, better staff attitude and flexible and longer opening hours. Marital status of the respondent had a significant association with the choice of health provider since majority of the married people have preference for private health facilities with a large number opting for specialists. Nevertheless, most unmarried individuals seek health care from general practitioners.

Moreover, it was noted that the choice for specialists rather than general practitioners changed with increased income, advanced age and high education level. This study was carried out on a selected group of people hence the inadequacy in generalization of the results to the general population.

Muriithi (2013) investigated on the determinants of health-seeking behaviour in Nairobi slums. The data used for the study was collected in Kibera slum. He used the

multinomial logit model in data analysis. He found out that distance has a significant negative effect on choice of health provider with increased distance increasing the likelihood of self-treatment; gender affects choice of health provider with the females having a higher likelihood of visiting a health provider than their male counterparts; and user fees decreases the likelihood of seeking health care from a formal health professional. The factors that had significant positive impact on seeking health care from a health provider include trust, wealth, size of household, education, quality of care, and increased information on health service quality. The current study borrows a lot from this study, but with changes in the factors considered. The most outstanding factor that will be considered in this study is health insurance.

Gakii (2013) utilized the 2007 Kenya Household Health Expenditure and Utilization Survey (KHHEUS) to investigate on the demand for health care in Kenya. The main aim was to identify the impact of health insurance on health care utilization, health status and the choice of health provider. The study used the probit model of health care decisions and health production conditional to presence of illness. The findings indicate that there is a positive relationship between health insurance and the health status of population. Moreover, health insurance increases the probability of seeking medical care in occurrence of illness and increases demand for private rather than public health care providers. The study provided thorough information on the influence of having insurance cover in utilization of health care.

Nevertheless, there exists gaps in that there are other non-insurance factors that affect utilization and this study comes in handy to address the gap. Moreover, the study

utilized the 2007 KHHEUS while this study will use the 2013 KHHEUS thus giving insights of health care utilization based on latest data.

Otieno & Macharia (2014) carried out a study in Homa Bay County to investigate the factors that affect utilization of health care services in the area. They used both qualitative and quantitative data with a sample of 384 household interviews and 16 Key Informant Interviews. The study revealed that quality of care, accessibility, health financing, service delivery and equity are the main factors that affect the health seeking behaviour of the people living in the County. The study recommends the government to improve infrastructure in health facilities, increase budget allocation on health services, hire more trained health personnel and improve drugs and medical supply. Nevertheless, the study did not include the health insurance variable which will be addressed in this study. Moreover, it is not possible to generalize the results with regard to other Counties since the study only covered a specific geographical region which has unique characteristics.

Adam & Awunor (2014) carried out a study in a rural community called Anegbette in Southern Nigeria to determine the factors and perceptions that affects utilization of health care services in the region. A descriptive cross-sectional survey was carried out through administration of structured questionnaire to the respondents. The findings indicate that perception of poor quality by the people, inaccessibility to health facility and inadequacy of the available services such as inadequate staff, negative attitude by the staff and lack or high cost of drugs are the main determinants of utilization of health care services. Additionally, the results indicated that there is no statistical significant relationship in utilization of medical services with reference to socio-

demographic variables such as age, gender and education level which is contrary to most of the other studies in the country. Nevertheless, the study results could not be generalized to the entire country since the data covered only the village of interest whose characteristics are unique.

Oladipo (2014) carried out a study on utilization of health services in urban and rural areas with a thorough exploration of the existing disparities and their implication on management and planning of healthcare delivery systems. The factors were divided into need, predisposing, enabling and health services which amounted to 31 variables. The data was analyzed using cross tabulation and factor analysis in a 4-stage model of use of healthcare services. It was found out that 12 of the variables were the most dominant predictors of health services utilization. They include quality of care, health insurance, availability, proximity, symptoms, disease, income, family size, age, sex, education, and beliefs. All the need variables covered in this study showed importance but disease and symptoms were more powerful than the health status and disability days. Most of the factors identified to be predictors of utilization are included in the current study hence enhancing comparison between Nigeria and Kenya.

2.3 Summary of reviewed literature

Despite the Kenyan government commitment in improving the health system with an increase in the number of health facilities and reduction of user charges to very minimal amounts which includes offering free health services at dispensaries and health centres, the level of non-utilization of health care services when a person becomes sick is still high. The previous studies show that socio-economic factors and accessibility of quality health care are the most significant barriers to utilization of

health services. Solutions are yet to be established to solve the problems of the barriers resulting from unavailability of quality services especially in rural and marginalized areas, physical inaccessibility and financial barriers of utilization.

Previous studies show that there exist multitudes of correlates that influence utilization of health care services but what is not clear is whether some of these factors have been addressed with the implementation of the various policies that focus on improving health services and systems. Most of the studies give varied results depending on the variables used, the country of study and the model used. In order for the health sector to bring about broad improvements in health in Kenya, it is important to comprehend who is currently using the available health facilities, and identify the factors that prevent those who do not seek care from doing so. This study came in handy to provide essential information that will guide on the steps and policies being implemented to increase utilization of healthcare in occurrence of disease with the use of the most recent data set KHHEUS 2013 which has not been used to investigate the determinants of utilization of health care services in Kenya to the best of my knowledge.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter provides details on the methodology and research design to be employed in the study. It includes the theoretical model, econometric model, the specific model that wa used to derive the desired results, the definition of variables used in data analysis and the description of the data source utilized in the study.

3.2 Theoretical model

The demand for health care services was based on the theory of consumer behavior. The theory presumes that a consumer allocates his income to the different competing needs with the aim of maximizing utility. In this study a sick person's utilization of health care services was dependent on the decision to visit or not to visit a health care provider subject to his or her production function and budget constraints. Therefore, the optimization problem is utility maximization which was given by the function:

$$U = f(C, Z, H)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

Where U represents Utility of the consumer of health care services; C represents consumption goods which give utility to an individual but have no direct impact of their health; Z represents health related goods that directly affect the health of an individual; and H represents the health status of the individual. The sick person tries to maximize utility subject to health production function and the budget constraint. The budget constraint was given by;

$$Y = CP_c + ZP_z + IP_I\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

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Whereby Y represents the income, C is the consumption good, Z is the health related good and I is the individual health care. P_c , P_z and P_I represent the price of the consumer good, health related goods and individual health care respectively.

The health production function was given by;

$$H = f(I,Z,S)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

Where I is the individual health care, Z is the health related goods and S represent the predisposing factors such the demographic and socio-economic characteristics of the sick individual which include age, education level, income, marital status and gender; the characteristic of health system such as time taken in the facility, cost of services, and quality of services offered; health factors such as chronic illness and health status rating; and enabling factors such as accessibility and insurance coverage.

Solving the optimization problem using equation 1, 2 and 3 yields the Langragian function which is expressed as follows;

$$L = \{U - f(C,Z,H)\} + \lambda_1\{H - f(I,Z,S)\} + \lambda_2\{Y - CP_C - ZP_Z - IP_I\}\ldots\ldots\ldots\ldots(4)$$

Equation (4) gives the demand function and solving it gives the optimal values of C*, X* and H* which maximizes the utility of the consumer which is in this case the sick individual. The reduced form of the demand function for utilization of health care services by a sick individual is obtained by solving equation (4) which yields:

$$I_h = f(P_C, P_Z, P_I, Y,S)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(5)$$

Where I_h is the demand for individual health care services while Pc, Pz, P_I, Y, S are as defined above. Therefore, this indicates that the utilization of health care services by an individual is dependent on the price of goods and services, income, demographic and socio-economic characteristics of the sick person, characteristic of health system and enabling factors.

3.3 Econometric model

The study employed the probit model to analyze the determinants of utilization of healthcare services in Kenya since the dependent variable is binary in nature. This type of regression is probabilistic and the dependent variable takes two values ranging between 0 and 1. According to Machio (2008) the binary-choice models is based on the assumption that individuals have to choose between two alternantives and the choice of any of the two is dependent on the certain factors. In our case, the error term takes the standard normal distribution. We assumed that the probality of an individual utilizing or not utilizing the healthcare services is determined by an underlying response variable. The probit model was expressed as

$$\text{Prob}(Y = \frac{1}{X} = \Phi(X'\beta)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\text{(6)}$$

Whereby Prob denotes probability, Φ denotes the cumulative standard normal distribution function and β is a vector of the parameters that are to be estimated. Lets observe some variable say Y which takes the values between 0 and 1 and define the latent variable Y* as:

$$Y^* = X_i\beta + \varepsilon\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\text{(7)}$$

Where Y* is the dependent variable of utilizing or not utilizing healthcare services

X_i are the independent variables that determine utilization such as age, income, education level, quality of health services, time among others

β are the coefficents to be estimated

ε is the error term that is normally distributed with N(0,1)

Here, the dependent variable Y can be observed if y>0 which signifies utilization, and y=0 which signifies no utilization. i.e.

$Y_i=$ $\begin{cases} 1, & \text{if a sick person visited a health provider} \dots\dots\dots\dots\dots\dots\dots\dots\dots(8) \\ O, & \text{Otherwise} \end{cases}$

Therefore the probability that Y=1 given X is estimated using the standard normal cumulative function which was illustrated by the equation below.

$$\text{Prob}(y_i = \frac{1}{X} = \Phi(S) = \int_{-\infty}^{-s}(2\pi)^{-1/2}e^{-S^2/2}ds\dots\dots\dots\dots\dots\dots\dots\dots(9)$$

where $S = X_i\beta$

The standard normal trasformation $\Phi(S)$ constraints for the probabability to lie between 0 and 1.

Equation (8) can be interpreted as probability expressed as conditional probability that a sick person utilizes healthcare services given certain identified factors X_i.

The above model was estimated using the likelihood function given as:

$$L = \prod_{i=1}^{n}\Phi(X_i\beta)^{y_i}[1 - \Phi(X_i\beta)]^{1-yi}\dots\dots\dots\dots\dots\dots\dots\dots\dots.(10)$$

Nevertheless it is convenient using the log likelihood function given as:

$$\ln = \sum_{i=1}^{n}\{y_i \ln[\Phi(X_i\beta)] + (1 - y_i)\ln[1 - \Phi(x'_i\beta)]\}\dots\dots\dots\dots\dots(11)$$

Therefore, we look for $\hat{\beta}$ estimates that maximizes the log likelihood function.

The probit model facilitates in interpretation of the significance of coefficients and the sign. It is therefore appropriate to estimate the marginal effects in order to interpret both the sign and magnitude. The marginal effects shows the change in probability of y=1 per unit change in independent variable X. It is calculated as

$$\partial p/\partial xj = \Phi(X'\beta)\beta j \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (12)$$

The marginal effect is estimated in two forms; either for average person in the sample x or as average of individual marginal effects. In this case the average of individual effects estimated was given as:

$$\partial p/\partial xj = [\{\sum F'(X'\beta'(X'] \beta\beta j \ldots \ldots \ldots \ldots \ldots \ldots \ldots (13)$$

3.4 Model Specification

Healthcare services are either utilized or not in the occurence of disease hence the use of probit model since it is a binary variable. Here, we assumed that the probability of an individual utilizing or not utilizing healthcare services is determined by some identified factors (independent variables) as shown below.

$$U_h = \beta_0 + \beta_i X_i + \ldots\ldots + \beta_n X_n + \varepsilon \ldots \ldots \ldots \ldots \ldots \ldots \ldots (14)$$

Where

U_h represent the utilization

B_i are the coefficients to be estimated

ε is the error term

X_i is a vector for independent variables which are the predisposing factors such as the demographic and socio-economic characteristics of the sick individual, the characteristic of health system, health factors and enabling factors.

Therefore, the estimatable model was specified as:

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$$Utilization = \beta_0 + \beta 1gend + \beta 2age + \beta 3educ + \beta 4mstatus + \beta 5hsize + \beta 6chronic +$$
$$\beta 7emp + \beta 8hstatus + \beta 9\cos + \beta 10wealth + \beta 11residence + \beta 12dist + \beta 13qoc$$
$$+ \beta 14insur + \varepsilon\ldots\ldots\ldots\ldots\ldots\ldots.(15)$$

Where; **gend** represents gender, **age** represents age, **educ** represents educational level, **mstatus** represents marital status, **hsize** represents household size, **chronic** represents chronic diseases, **emp** represents employment, **hstatus** represents health status rating, **cos** represents cost of services, **wealth** represents income(wealth index), **residence** represents place of residence, **dist** represents distance, **qoc** represents quality of care and **insur** represents insurance cover.

3.5 Definition of Variables

Table 3.1 shows the variables that were used in data analysis. The dependent variables was the visiting a qualified health provider and several independent variables was used to estimate the model.

Table 3.1: **Definition of Variables**

Variable	Description	Expected Sign
Dependent Variables		
Visiting a qualified health provider	This will be coded as: Utilization(U_h) =1 if a sick individual visited a qualified health provider and 0 if otherwise	
Independent Variables		
Gender	Gender: male=1 Female=0	Negative
Age	Age of the individual in years	Positive
Education level	Secondary and above=1;otherwise=0	Positive
Marital status	Living with partner/spouse=1; Otherwise=0	positive
Household size	Number of individuals living in the household	Positive
Chronic diseases	Present=1; Otherwise=0	Positive
Employment	A dummy variable measured as: Formal employment or self-employed=1;Otherwise=0	Positive
Health status Rating	A dummy variable measured as: 1 if Good health (very good, good and satisfactory) =1; 0 if poor health	Negative
Cost of services	Continuous variable measured by total amount spent on treatment/ services received	Negative
Income (Wealth Index)	A dummy variable measured as: Rich=1; Otherwise=0	Negative
Place of residence	A dummy variable measured as: Urban=1; Rural=0	Positive
Distance	A continuous variable measured by distance covered to get to health provider (KMs)	Negative
Quality of care	Satisfied=1; 0 otherwise	Positive
Insurance cover	Present=1;0 otherwise	Positive

The dependent variable was the individual's visit to a qualified health provider in occurrence of disease in the last four weeks and was coded 1 if a sick person sought healthcare from a qualified health personnel and 0 if otherwise.

The independent variables were divided into predisposing factors, characteristics of health system, health factors, and enabling factors. The predisposing factors were the demographic and socio-economic characteristics of the sick individual which include gender, age, education level, marital status, household size, employment status, income and place of residence. The characteristic of health system included quality of services offered and cost of services. The health factors include chronic illness and health status rating. The enabling factors include accessibility and insurance coverage. For assessment of differences in health seeking behavior, chronic diseases and self-rating on one's health status was used as objective health measure.

3.6 Data Source

This study used the 2013 Kenya Household Health Expenditure and Utilization Survey (KHHEUS) which is a national survey that was developed on a multistage sampling design platform and maintained by the Kenya National Bureau of Statistics (KNBS). The sample covered 44 counties with the exemption of Mandera, Garissa and Wajir counties since they were missing in the KNBS National Sample Survey and Evaluation Programme (NASSEP) master frame. Moreover, the sample diversely covered both the rural and urban regions in the country. The sample consisted of 33,675 households which were grouped into 1347 clusters that were further divided into 533 urban and 814 rural clusters. Moreover, a systematic sample of 25 households was selected from each cluster. The study used a cross-sectional research

design since it describes a subgroup or population of interest, was carried out to investigate the health seeking behavior and out-of-pocket spending of households in Kenya and was carried out within a short period (July 9–August 14, 2013). The study is usually carried out after every 5 years and used a comprehensive questionnaire. The questionnaire covers eight sections that aids in colleting information on utilization of health services within four weeks that preceeded the survey, illness episodes, health expenditures, household characteristics, inpatient service use in the past 12 months and corresponding expenditures as well as health insurance coverage. The data analysis was based on those individuals that reported that they had been ill in the last four weeks prior to the date interviewed. The survey data was adequate for this study since it contained all the variables that were required for analysis. KHHEUS dataset was advantageous in that it allowed for generalization of results since it provides national level data.

3.7 Diagnostic Tests

The following tests were carried out before estimating the regression model;

3.7.1 Multicollinearity

The study tested the existence of multicollinearity. It employed calculation of correlation matrices to test for the relationship between dependent and independent variables as well as among the independent varaibles. According to Mukras (1993), inclusion of highly correlated variables may result to inflated coefficients which affect the interpretation of results. Therefore, they have to be dropped so as to authenticate the results.

3.7.2 Heteroscedasticity

Regression usually assumes that the variance of the errors is constant across the observations. Heteroscedasticity test is essential as it tests the constant variance of the errors failure to which will result to spurious output. It is sometimes called heterogeneity of variance and was corrected by use of robust standard errors in probit regression. It was essential to correct heteroscedasticity as it impacts on the standard errors that are used in hypotheses testing.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 Introduction

In this chapter, we present the research findings for this study. First, the descriptive statistics are presented followed by the findings on the determinants of utilization of health care services in Kenya.

The descriptive statistics of the study variables are presented in table 4.1. We note that the descriptive statistics are reported for discrete variables and for continuous variables, in this case the continuous variables were individual age, household size, cost per visit and distance per visit.

4.2 Descriptive Statistics

Table 4.1: Summary statistics of the study variables

Variable	Obs	Mean	Std. Deviation	Min	Max
Utilization (1=sick person visited a health provider)	23995	0.862	0.3441	0	1
Gender of individual (1=Male)	24033	0.435	.4958	0	1
Marital Status(1=Married)	10527	0.641	.4798	0	1
Wealth satus (1=Rich)	10556	0.1250	.3306	0	1
Employment (1=Employed)	10556	0.875	.3306	0	1
Education level (1=Secondary and above)	8282	0.398	.4895	0	1
Care quality (1= satisfied)	10332	0.887	.3160	0	1
Health insurance (1= Insured)	24013	0.168	.3160	0	1
Residence (1=Urban)	24013	0.355	.4783	0	1
Health rating 1=Good health)	23859	0.905	.2939	0	1
Chronic (1=Chronic present)	24013	0.184	.3873	0	1
Household size	24,013	5.15	2.4674	1	22
Individual age	24,013	25.99	22.606	0	99
Cost per visit	10364	440.99	1820.91	0	60000
Distance per visit	9676	6.73	27.969	0	1000

Source: Authors computation from KHHEUS, 2013.

Table 4.1 shows that majority of the individuals who sought health care were female (56.5%) and 91% of them considered themselves to have a good health status rating. This may be attributed to the fact that most of the individuals were in the productive age range with majority of them having an average age of 25 years. On average, they covered a distance of 6 km to get to the facility.

It is evident from the results that for those who utilized healthcare services 64% of the household heads were married or living with the spouse, 88% of the household heads were in formal or informal employment and 40% of the household heads had at least secondary education. On average, those who visited a health provider came from families with 5 household members and 86 % of them are poor.

In assessment of the characteristics of a health system that affect utilization, it was observed that the average cost of services per visit to a health provider is Kshs. 440 per visit with 89% of the individuals indicating that they were satisfied with the quality of care provided. Of those who sought healthcare services from a health provider, 35% were from the urban areas, 18% suffered from a chronic illness and 17% had an insurance cover.

4.3 Diagnostic test

4.3.1 Heteroskedasticity

Appendix 1 shows the results for heteroskedasticity test. The p-value of the chi square is equal to 0.0001 which is less than 5 percent significance level. This means that the model suffers from heteroskedasticity. To correct for heteroskedasticity, robust standard errors test was used when running the model.

4.3.2 Multicollinearity

The results indicated that there was no multicollinearity since most correlation coefficients were below the absolute value of 0.6 as required. Appendix 2 shows this relationship. Education level, insurance cover, distance per visit, place of residence, cost per visit, chronic disease and age were found to be positively correlated with utilization of health services conditional to presence of disease. All the other variables were negatively correlated with the predicted variable.

4.4 Econometric analysis

This section presents the findings of the econometric analysis. To achieve the main objective of the study, probit model was estimated. The results are indicated in appendix 2. The probit model was followed by computation of the respective marginal effects as indicated in table 4.2. The dependent variable was utilization of health care services if a sick individual visited a health provider.

Table 4.2: Marginal effects

	dy/dx	Std.Err	P>|z|
Gender of individual (1=Male)	-0.0180	0.0047	0.000
Age	0.0001	0.0001	0.681
household size	-0.0090	0.0009	0.000
Chronic (1=Chronic present)	0.0052	0.0054	0.334
Health rating 1=Good health)	0.0047	0.0073	0.515
cost per visit	0.0001	0.0000	0.038
Residence (1=Urban)	-0.0097	0.0050	0.050
distance per visit	0.0001	0.0001	0.371
Health insurance (1= Insured)	0.0047	0.0058	0.415
Care quality (1= satisfied)	-0.0107	0.0063	0.089
Wealth satus (1=Rich)	-0.0268	0.0142	0.058
Employment (1=Employed)	-0.0293	0.0069	0.000
Marital Status(1=Married)	-0.0072	0.0059	0.218
Education level (1=Secondary and above)	0.0003	0.0056	0.959
dy/dx is for discrete change of dummy variable from 0 to 1			

Source: Authors computation from KHHEUS, 2013.

The analysis results show that the gender, household size, cost per visit, area of residence, wealth index and employment significantly determine the utilization of health care services in Kenya ($p<0.05$).

In line with our expectations, individual's gender exerts a negative effect on healthcare utilization. As revealed by the marginal effects in table 4.2, being a male significantly reduces the probability of utilizing health care services from a qualified provider by 1.8 percent compared to a female.

In instances where the head of the household is married, the household members are less likely to utilize heath care by 0.72 percent as compared to a household whose head is not married. This may be associated with the fact that majority of the household heads are male, who are not likely to seek health services from a health provider, hence influencing decisions by other household members

Household size is a highly significant determinant of utilization of health care services. The results indicate that a unit increase in household size significantly decreases the probability of utilizing health care services by 0.9 percent. Similarly, the area of residence significantly influence utilization of health care services whereby a household member residing in an urban area is less likely to utilise health care services compared to a household member residing in rural areas by 0.97 percent.

The study analysis based on poverty levels proxied by household wealth index indicates that wealth index has a negative effect on utilization of healthcare services in Kenya. A household belonging to the rich class is less likely to utilise the health care services compared to a poor household by 2.7 percent. This was found to be significant.

Similarly, the economic activity of an individual is critical in determining the utilization of health care services. This was captured by employment aspect. The results reveal that employment significantly reduces the likelihood of utilizing health care services from a qualified provider by 2.9 percent compared to an individual who is unemployed.

Age of the individual positively affects utilization of health care. An additional year of an individual increases the probability of utilizing health care services by 0.01 percent but it is not significant. Similarly, individuals who have contracted chronic disease are more likely to utilize health care services compared to those who have not contracted chronic disease by 0.5 percent though it is not significant.

Education level of the household head positively affects health care utilization. The findings reveal that an individual from a family led by a household head who has a high education level is 0.03 percent more likely to utilize health services compared to one who comes from a family led by a household head with low education level. Nevertheless, the variable was not significant.

Health status rating results indicate that an individual with a good health status rating is more likely to seek health care services compared to a person with poor health status rating by 0.47 percent though it is not significant. In addition, the study assessed the effect of the quality of health care services provided. The results indicate that those satisfied with the health care quality are less likely to utilize health care services compared to those who are unsatisfied with the health care quality by 1.07 percent though it is not significant.

Distance has a positive effect on utilization of health services. Individuals who cover long distance to the facility are more likely to utilize health care by 0.01 percent though it is not significant. Moreso, an increase in user fee significantly increases the probability of seeking health services from a qualified health provider by 0.01 percent. Similarly, individuals with a health insurance cover are more likely to seek

health care services from a qualified health provider as compared to those without an insurance cover by 0.47 percent though it is not significant.

4.5 Discussion of results

The analysis results show that demographic variables are more likely to influence utilization of health care services compared to health systems, predisposing and enabling factors. Of the health systems factors, only the cost of services was significant and the probability of seeking health services from a health provider increases with increase in price. This shows that individuals are likely to visit a health provider irrespective of price in search of satisfactory health services.

From the findings, being a male reduces the likelihood of seeking healthcare as compared to a female. Further, the effect of gender was found to bear significance with the sign conforming to study's expectation. This finding concurs with the results by Mwabu et al. (1993) in Kenya and Muriithi (2013) in Kenya who also found out that women have a higher likelihood to seek health care from the providers of modern care relative to self–treatment.

Assuming that health is a normal good, an increase in user fee is expected to reduce utilization of health care services. On the contrary, the results indicate that an increase in user fee increases the probability of seeking health services from a qualified health provider. This concurs with the findings of Gakii (2013) whose results indicate that if user fees were to rise, the probability of seeking care at private and mission clinics would increase. This contradicts the demand theory. The plausible reason behind this is the positive relationship between user fees and quality of care. The findings are contrary to the findings by Ellis and Mwabu (2004) and Kimani, Mugo & Kioko

(2016) who found out that user fees has a significant negative effect on health care service utilization.

A family with many household members is less likely to utilize health services. The results are in agreement with Gakii (2013) who observed that a large family is less likely to utilize health services from a qualified provider. The plausible explanation to this is that the members of a large family are likely to compete for the available resources hence forego visiting a health provider in occurrence of disease.

Older individuals have high chances of visiting a health facility as compared to younger individuals. At old age, the individual health is likely to deteriorate thus informing the increased utilization of health care services as an individual ages up. This concurs with the results by Muriithi (2003) who found out that the effect of age on utilization of professional health care services is positive relative to self-treatment. In addition, the results agree with Adam & Awunor (2015) who found out that there is no statistical significant association in the utilization of health services with regard to age.

Further, the study findings posit that the uptake of health insurance is likely to increase utilization of health care services in Kenya. This is possible because an individual with health insurance coverage do not incur expenditure in health hence seeks health care from a qualified health provider even with less severe symptoms. This finding is in line with that of Gakii (2013) who found that increasing the health insurance coverage increases the demand for health facility.

Health status rating analysis indicates that individuals with a good health status rating are more likely to seek health care services. A good health rating signifies that they are more comfortable with the health care that they receive which could be an incentive for them to regularly visit the health care facilities.

An increase in distance increases the likelihood to visit a health care provider. The results are in agreement with those of Awiti (2014) who found out that there is a positive effect of distance on the probability of visiting a modern health care provider. The plausible reason is that majority of the people by-pass nearer facilities and receive treatment facilities that are far away mainly due to quality of care concerns. Gakii (2013) results supports this since they show that an increase in distance to health facilities increases probabilities of visiting private and mission providers. A study by Ensor et al. (2001) in Bangladesh and another one by Develay, Sauerborn and Diesfeld (1996) in Burkina Faso shows that the individuals living near urban areas often bypass the nearby facilities to seek care in urban areas which are perceived to provide better quality services.

Chronic ailments increase the chances of an individual visiting a health provider. This finding is in accordance with the findings by Kimani, Mugo & Kioko (2016) who found out that an increase in chronic illnesses increases the likelihood of the individual seeking health care services from a qualified health provider. The plausible explanation is that a chronic disease require immediate routine management thereby prompting one to visit a health provider on realizing symptoms.

Household whose heads have high level of education will tend to utilize health care services more than the households whose head have low education levels. This is consistent with the expected in that education trades-off ignorance. As such, a more educated household head is more likely to understand the importance of regular check-ups for his or her household members, as well as the importance of being healthy. Similar to the results, several studies (Cisse, 2006; Adam & Awunor, 2015; Kimani, Mugo & Kioko, 2016) found out that higher level of education has a positive effect on the utilization of health care services from a qualified health provider. This is not surprising since the educated people are likely to comprehend and appreciate the benefits of seeking health care services from a qualified provider hence demand it. This is in accordance with Zyaambo et al. (2012) who suggests that higher education level is assumed to equip the individual with increased awareness of symptoms, illness and the available health services hence demand it if affected.

The findings posit that the poor are more likely to seek health care services as compared to the rich. Justification to this is that the poor are more likely to be exposed to health hazards such as malnutrition, unhealthy living conditions and other health hazard factors which significantly contribute towards contracting diseases. They are therefore more likely to seek healthcare services compared to their counterparts from the rich households.

Area of residence was also found to be significant in influencing the utilization of health care services in Kenya with the urban dwellers portraying less chances of utilization of health care services. The results are in line with those of Gakii (2013) who found out that living in an urban area decreases the probability of visiting a

health provider. Therefore the individuals in urban areas are more likely to use self-treatment compared to those living in rural areas mainly because of their busy schedule and only seek qualified health services on severe illnesses.

The study reports that the rich are less likely to utilize health care services in Kenya compared to the poor. Similarly, an employed individual is less likely to utilise health care as compared to an individual who is not employed. The findings are in agreement with some studies such as Schwartz et al. (1998); Akin et al. (1986); Heller (1982); and Lindelow (2005) who found that income has no significant effect on seeking health services from qualified provider. For instance, Heller (1982) found that unlike other developing countries, income is not a barrier to health care access in Malaysia and has minor impact on a household decision to utilize medical care. The findings are also in agreement with those of Gakii, 2013 and Kimani, Mugo & Kioko, 2016 who found out that employment significantly reduces demand for health services. The probable reason is that opportunity cost of time is high for the employed hence tend to use self-medication which is less time consuming. The results may reflect the Kenyan situation since majority of the people are in informal sector where failure to work implies lost earnings. Moreover, most of the individuals in the formal sector invest more in their health and nutrition hence rarely contract diseases since they are healthy.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the findings in relation to determinants of utilization of health care services in Kenya. The chapter provides decisive conclusions based on the findings, gives policy recommendations and further areas of research to fill the gaps.

5.2 Summary of the findings

The main objective of the study was to investigate the determinants of utilization of health care services in Kenya. To achieve this, the study used the 2013 Kenya Household Health Expenditure and Utilization Survey (KHHEUS) which is a national survey carried out by the Kenya National Bureau of Statistics (KNBS). The data was used to fit the probit model with the dependent variable being the utilization of healthcare services conditional to presence of illness.

The key variables under consideration in the model were: the gender of the individual, the individual's age, the size of the household, whether the individual has experienced chronic illness, the health rating by the individual, cost per visit to the health facility, distance per visit, whether the individual has health insurance, the quality of the healthcare, the wealth index of the household, employment of the individual, individual's marital status, and lastly the individual's education level. Cost of services, gender, household size, residence, wealth index and employment status were found to be significant. The rest of the variables were not significant though the marginal effects were informative on the magnitude and sign.

From the findings, the demographic factors such as age of the respondent and the education level increase the likelihood of utilizing health services. On the other hand, high income, being married, a large family size, being male, residing in urban areas and being employed decreases the likelihood of utilizing health services from a qualified provider.

The analysis of predisposing factors shows that being chronically ill and having a good health status rating increases the likelihood of visiting a health provider. Similarly, the enabling factors such as distance covered and presence of insurance cover increases the likelihood of visiting a health provider.

Lastly, the health systems characterisitics considered in the study shows that an increase in cost of services increases the probability of utilizing health care services while high quality of care decreases the likelihood of visiting a health provider.

5.3 Conclusion

The health of the society is one of the essential non-income indicators of poverty implying that to reduce poverty and increase productivity we have to improve health for all people.

It is evident from the findings that the demographic variables are more important in influencing the probability of seeking care. This implies that sensitization among the affected groups is paramount to reduce instances of self-medication which most likely than not makes the health of the person worse-off.

An increase in cost of services increases utilization of health services which is contrary to most of the past surveys. This indicates that the people are willing to spend more to receive quality health care. It is therefore essential to focus on quality of health services which act as a barrier to health care utilization.

5.4 Recommendations

5.4.1 Policy Implication

The results of this study show some interesting phenomenon. A number of the policy implications can be cited with regard to the significant variables. The findings posit that male individuals are less likely to utilize health services as compared to their female counterparts. This therefore calls for sensitization among the male gender on the need to utilize the health services in occurence of disease to avoid a worse-off health state . Further, in terms of population distribution, the finding calls for the need to provide more health services to the areas where the female are the majority since the utilization of the existing health facilities in such areas is likely to be high.

The area of residence is significant in determining the level of utilization of healthcare services in Kenya. With this regard, rural dwellers are more likely to utilize health care services compared to urban dwellers. This calls for efforts by the key stakeholders to provide more health facilities in the rural areas in order to effectively serve the masses residing in the rural areas.

Employment is a key determinant of utilization of health care services in Kenya. The negative relationship between employment and utilization signifies a dire need for the

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government to create a good working environment that encourage the individuals to seek health care when sick to promote a healthy working nation.

The wealth index which is a proxy of income reports that the rich households are less likely to utilize health care services compared to the poor households. This calls for the health programmes and initiatives geared towards provision of more health care services for all irrespective of their wealth status. Moreso, the government should consider construction of more facilities as well as improvement of the facilities in areas with high poverty index since the poor population is the highest consumer of health services.

5.4.2 Recommendation for Further Research.

The study considers the determinants of utilization of health care services in Kenya. However, there is need for more studies in examining the utilization of health services by type of health provider to lay a comparison between the government, private and private-not-for profit providers. This will help in identifying the type of health facilities that should be improved to favour utilization of health services. Further studies should also focus on the impact of devolution on improvement of utilization of health services in Kenya.

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APPENDICES

Appendix 1: Heteroskedasticity test

Heteroskedasticity test	
chi2(14) = 44.08	Prob > chi2 = 0.0001

Appendix 2: Probit Model Estimates for Utilization of Health Care Services from a Qualified Health Provider in Occurrence of Disease

	Coefficient	Robust Std.Err	z	P>|z|
Gender of individual (1=Male)	-0.1665	0.0430	-3.860	0.000
Age	0.0005	0.0012	0.370	0.681
household size	-0.0856	0.0081	-10.53	0.000
Chronic (1=Chronic present)	0.0502	0.0528	0.870	0.342
Health rating 1=Good health)	0.0437	0.0654	-0.310	0.504
Cost per visit	0.0001	0.0000	2.030	0.043
Residence (1=Urban)	-0.0901	0.0449	-2.000	0.045
distance per visit(one way)	0.0010	0.0011	0.890	0.370
Health insurance (1= Insured)	0.0454	0.0570	0.820	0.426
Care quality (1= satisfied)	-0.1084	0.0683	-1.570	0.112
Wealth satus (1=Rich)	-0.2194	0.1014	-2.190	0.031
Employment (1=Employed)	-0.2971	0.0755	-3.940	0.000
Marital Status(1=Married)	-0.0681	0.0550	-1.230	0.216
Education level (1=Secondary & above)	0.0027	0.0531	0.060	0.959
Constant	2.3389	0.1168	23.72	0.000
Significant at 5 percent and 1 percent

Number of obs = 9669

Wald chi2(14) = 188.11

Prob > chi2 = 0.000

Pseudo R2 = 0.0426 | | | | |

Appendix 3: Correlation Matrix

	utilization	gender	age	household size	chronic	health rating	cost per visit	residence	distance per visit	Insurance	quality of care	education level	marital status	employment	wealth index
utilization	1.000														
gender	-0.073	1.000													
age	0.038	0.005													
household size	-0.123	0.096	0.140	1.000											
chronic	0.010	-0.124	0.264	0.046	1.000										
health rating	-0.005	0.047	-0.269	-0.063	-0.262	1.000									
cost per visit	0.034	0.013	0.050	0.010	0.091	-0.048	1.000								
residence	0.007	-0.001	-0.167	-0.197	-0.030	0.060	0.052	1.000							
distance per visit	0.017	-0.014	0.076	0.011	0.055	-0.019	0.305	-0.041	1.000						
Insurance	0.014	0.035	-0.050	-0.075	-0.002	0.089	0.088	0.124	0.061	1.000					
quality of care	-0.022	0.032	-0.048	-0.028	-0.082	0.077	0.032	0.042	0.011	0.044	1.000				
education level	0.007	0.072	-0.205	-0.110	-0.072	0.124	0.052	0.196	0.019	0.340	0.052	1.000			
marital status	-0.072	0.480	0.003	0.334	-0.089	0.052	0.023	-0.081	0.005	0.103	0.000	0.067	1.000		
employment	-0.012	0.095	-0.106	0.027	-0.022	0.133	-0.020	0.000	-0.004	0.081	-0.006	0.034	0.080	1.000	
wealth index	-0.026	0.116	-0.135	0.018	-0.037	0.143	-0.024	0.006	-0.012	0.081	0.002	0.042	0.080	0.4382	1.000