

THE DETERMINANTS OF HEALTH CARE SEEKING AND BYPASSING OF HEALTH
CARE FACILITIES IN KENYA

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DECLARATION

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

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DEDICATION

I dedicate this course to my dear parents Mr. and Mrs. Abeno; my beloved family of Mr. Wesonga, Lucas and Phyllis.

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ABSTRACT

According to the Constitution of Kenya (2010) and the Kenya vision 2030, everyone has the right to the highest attainable standard of health. In light of this, the health policy expects to make the realization of the right to health by all Kenyans a reality. This is achieved through policy development on health care provision which involves establishment of health care facilities. However, people make deliberate choices for their healthcare needs based on factors such as visiting facilities with good accreditation, visiting facilities which other people have visited and shared experiences of cleanliness, communication with health care workers and many other aspects which may not always come to the limelight. The existing policy on an individual's role in adoption of appropriate health practices and health care seeking behavior leads to realization in the country's health goals. Therefore, this study sought to investigate and estimate determinants of health care seeking and bypassing of health facilities in Kenya. The study has utilized Kenya household health expenditure and utilization survey 2007 with the aid of binary logit model to estimate factors influencing bypassing of health care facilities by patients in Kenya. At 5% significance level; age, no education, belonging to poor or middle wealth quintiles, government ownership of health facilities, satisfaction of waiting times and suffering from chronic illness were found to be statistically significant. However, being elderly, being from a poor wealth quintile, being a public or government health facility and being satisfied with the waiting times respectively reduced the likelihood of bypassing while having no education, belonging to middle wealth quintiles and suffering from chronic illness contributed to the increased probability of bypassing nearby health facility in the process of seeking health care. Based on these findings, the study therefore suggests that there is need for creation of awareness on healthcare services provided by the respective facilities while encouraging population in the middle wealth quintiles to consume health care services at health care facilities located nearby to enhance proper utilization of those facilities. Also, on the other hand, the Government through the State department of Health need to equip health facilities with deliverables and relevant equipment required for patients suffering from chronic conditions.

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LIST OF ABBREVIATIONS AND ACRONYMS

AEC	Accident and Emergency Center
ANC	Antenatal Care
DHS	Demographic Health Survey
HBM	Health Belief Model
ISBR	Institute of Social and Behavioral Research
KHSSP	Kenya Health Sector Strategic Plan
KHHEUS	Kenya Household Health Expenditure and Utilization Survey
KNH	Kenyatta National Hospital
KNBS	Kenya National Bureau of Statistics
MOH	Ministry of Health
MCH	Maternal Child Health
MDGs	Millennium Development Goals
NHA	National Health Accounts
OR	Odds Ratio
PRSP	Poverty Reduction Strategy Paper
VIF	Variance Inflation Factors
WB	World Bank

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Health is a major determinant of economic development. In this respect, many policies have been developed that aim to improve populations' health status. These include the availability and accessibility to health care facilities. Patients and clients all over the world want to receive the best possible treatment for their ailments and illnesses. One of the roles of governments in the healthcare of the population is to ensure access to healthcare for vulnerable populace. At national level, access to healthcare contributes to the improvement of the national health status overall, and to building human capital that yields economic profits through gains in productivity and higher macroeconomic growth. When individuals fall ill, they choose to combat the illness either by going to a health facility, many times within their proximity, or by choosing self-care. Public health services occupy an important position despite remarkable growth of private sector which dominates in ambulatory care both in rural and urban areas.

As stated by Mugilwa *et al*, (2005), increased accessibility to quality health care leads to poverty reduction as a result of time saving as well as in the development of more productive human capital. Accessibility to health care is an integral part of the strategies for poverty reduction, as envisaged in the Poverty Reduction Strategy Paper (PRSP) of many countries. Worldwide, there are notable variations in hospitals ranging from quality of care, to cost and access. People make deliberate choices for their healthcare needs based on factors such as visiting facilities with good accreditation, visiting facilities which other people have visited and shared experiences of cleanliness, communication with health care workers and many other aspects which may not always come to the limelight.

One of the conduits through which health outcomes is measured is client behavior such as utilization of health services and adherence behavior in regard to compliance with treatment regimes, follow-up visits and referrals, as stated by Lindelow and Wagstaff, (2003).

This paper was an attempt to examine from an empirical point of view the health care seeking patterns in Kenya, and bypassing of lower level facilities.

1.2 Statement of the Problem

The Constitution of Kenya (2010) provides that everyone has the right to the highest attainable standard of health and introduces a devolved system of government which should enhance access to services by all Kenyans, particularly those living in the rural and hard to reach areas. In light of this, the health policy expects to make the realization of the right to health by all Kenyans a reality. The policy orientations describe how health service delivery is organized. According to the policy, an individual's role in adoption of appropriate health practices and health care seeking behavior is recognized as a key realization in the country's health goals. The health system is in a stepwise manner so that citizens from wherever they live are able to access health care for manageable cases with complicated cases being referred to a higher level. As stated in the Kenya Health Strategic Plan III (KHSSP III), to reach the nearest health facility, a person needs to cover an average distance of 5km, to access essential health services; KHSSP, (2012).

The government also follows a social policy which has an object to ensure the satisfaction of basic needs and the well-being of citizens. It is an expression of socially desirable goals which are expressed by relevant government legislation, government institutions and administrative programs and practices in accordance with specific development objectives, and the attainment of Millennium Development Goals (MDGs) as well as the vision 2030.

However, many patients/clients do not obtain health care from the facilities within their reach, but find care from facilities away from them. This results in increase in health spending for the individuals and families, in terms of spending money and time for travelling to the health facility of their choice; usually not near to them, and productivity losses. Besides, it results in underutilization of certain health facilities that are bypassed when patients seek health care through self-referral to facilities of their choice. To avoid short term and long term adverse effects of seeking health care far, there is need to scientifically establish the critical factors that lead to patients bypassing the nearby health facilities in their demand for health care services.

A study by Muriithi (2008) on the determinants of health seeking in a slum in Kenya yielded results for policy valuation in regard to quality improvements for health facilities in order to provide information on available health services for the population in the slums.

Mwabu (2004) used the choice model to study the demand for out-patient care in a rural part of Kenya, and established that there are strong differences between the probability of illness from the probability of seeking treatment and that it is important to know whether the demand for health care depends upon the underlying illness patterns or the demographics of the population.

Previous studies have shown that bypassing of health facilities takes place even in countries with well-established systems. In Kenya, most of studies done describe health care demand using case studies, but there are few econometric studies to explain bypass behavior in health care seeking.

1.3 Research Questions

- i. What factors are important to patients/clients when choosing between health care facilities for services?
- ii. What are the effects of bypassing health care facilities by patients?

1.4 Study Objectives

1.4.1 General objectives

The primary objective of this study was to identify determinants of health care seeking and bypassing of health facilities in Kenya.

1.4.2 Specific objectives

To achieve the primary objective, the following were the specific objectives:

- i. To identify important factors considered by patients in their choice of health care facility.
- ii. To estimate the effect of bypassing health care facilities by patients.
- iii. To draw policy recommendation based on (i) and (ii) above.

1.5 Justification of the study

The Kenyan health system provides health facilities for primary, secondary and tertiary health care service provision in the levels of health care. Primary care involves prevention of ailments and is provided at household and community levels. Secondary care involves diagnosis and treatment of ailments and is provided at dispensary, health center and district hospital levels, while tertiary care involves referral for chronic conditions and rehabilitation at provincial; now county levels and national hospital levels.

A vivid understanding of health care facility choice decisions for both out-patient and in-patient services will enable an evaluation of the existing health system policy, and ensure proper utilization of health care facilities as envisaged in the health systems policy, as well as to ensure equitable and accessible health for all.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The health belief model, health behavior model and decision making theory have been used to make an attempt at explaining utilization of health care services by patients and clients. Several previous research papers have examined decisions by patients to bypass the nearest hospital. In most of these papers, it follows that patients make autonomous decision to visit a particular hospital, or sometimes engage their service provider in the decision.

2.2 Theoretical Literature Review

2.2.1 Decision making Theory

Young (1971) developed a model on choice making regarding consumption of health services based on various gravities. Later in 1982, he defined decision making is as a cognitive process resulting in selection of a belief or a course of action among several alternative opportunities. This results in a final choice which is based on the values and preferences of the decision maker, upon identifying and choosing alternatives. Studies of medical decision making have sought to understand what people do when faced with illness and typically attempt to account for actions taken to deal with illness as stated by Garro, (1998). This supports the proponents as suggested by Grossman (2010) on health demand as consumption and as an investment good.

2.2.2 Rosenstock's Health Belief Model

The Health Belief Model (HBM) as proposed by Rosenstock (1995) is a psychological model that attempts to explain and predict health behaviors. From its development, it focuses on the attitudes and beliefs of individuals in respect to health seeking behaviors. The view is often that the desired health care seeking behavior is for an individual to respond to an illness episode by seeking first and foremost help from a trained doctor, in a formally recognized health care setting. However, for some illnesses, people choose traditional healers, self-medication, or untrained practitioners above formally trained health care service providers or government health facilities. One of the conduits through which health outcomes is measured is client behavior which comprises care seeking behavior such as utilization of health services and adherence behavior in regard to compliance with treatment regimes, follow-up visits and referrals as stated by Lindelow and Wagstaff, (2005).

2.2.3 Andersen's Health Behavior Model

This theory explains factors that lead to the use of health services. According to Andersen (1995), usage of health services depends on three dynamics thus predisposing factors, enabling factors and need. Predisposing factors include characteristics such as age, race and health beliefs. Enabling factors include family support, health insurance access and one's community, whereas need represents both the actual and perceived need for health care services. The major assumption is that an individual who believes health services are an effective treatment for an ailment is more likely to seek health care.

2.3 Empirical Literature Review

Generally, bypassing has been attributed by other studies to facility quality as stated by World Bank (WB), 1987. In Zimbabwe, the government introduced a fee for patients who bypass lower levels of the health system and raised room fees for private patients in public hospitals in a bid to curb the issue of bypassing health facilities. When patients bypass one health facility to seek health care at another, strong preferences are revealed. In Iringu Rural District in Tanzania, there was evidence of patients understanding of various measures of quality at the facilities that they visit and bypass. Some of the measures were found to be 'unobservable' meaning that health workers would not expect patients to be able to evaluate whether or not the qualities are present simply from visiting the health facilities.

Mahinda (2013) in a study on determinants of self-directed referral of patients at Kenyatta National Hospital (KNH), Kenya conducted a cross sectional descriptive study using both qualitative and quantitative data collection methods to explain patterns of patient self-referral at KNH according to socioeconomic status, education level and perception of quality of care offered in lower levels of healthcare. The researcher used chi square test and logistic regression to derive the relationship between the dependent and independent variables. The findings showed that only 27.7% of patients seeking health services at KNH were self referrals with 28.6% of ailments being surgical complications. There was no statistically significant association found between individual factors and self directed referral.

Kanyora (2012) did a study of factors contributing to patients bypassing the 2nd and 3rd levels of primary health care facilities in Kirinyaga district. The study revealed that there was a significant relationship between the age of the respondents and visit to the local facilities ($X^2= 30.1$; $df =1$; $p=0.003$) and also a relationship between the sex of the respondent and visiting the local facility ($X^2=9.6$; $df =1$; $p 0.001$). Again, 96.1% did not visit the nearest

local healthcare facility for medical services. He used the chi square test to establish the relationship between the variables.

Chung *et al* (2009) conducted a case study of antenatal (ANC) care seeking in three rural districts in Tanzania to ascertain if women bypass village services for better maternal health care clinics. They tested the hypothesis that women bypass the nearest primary health facility in order to receive better care for ANC and delivery services elsewhere. They used bivariate and multivariate logistic regressions to examine the maternal characteristics and the contextual factors associated with the odds of bypassing proximate facilities to seek ANC at a relatively distant health facility. From their findings, bypassers were almost five to six times more likely to visit a health centre (OR 4.95; p 0.00) or hospital (OR 6.09; p 0.00) for care than a primary dispensary. Women whose nearest facility was over 1 kilometer away from their home village were found to be more likely to bypass. They recommended for the improvement of the quality of primary health care for Tanzania to accelerate progress toward MDG5.

A study by Kahabuka, Gunnar, Marie, Hinderaker, (2011) in Tanzania on the Utilization of Primary Health Care (PHC) facilities for child care used in-depth interviews to explore possible contributions of different potential factors including quality of services offered at PHC facilities to children's progression to severe disease. They interviewed the caretakers of children who had confirmed diagnosis of severe malaria, very severe pneumonia or acute watery diarrhoea with severe dehydration at admission. The caretakers were required to recall details on actions taken from when they recognised the first symptom of the current child's sickness until the day of admission. Those who utilized their nearer PHC facilities were asked to give full details of what happened at these facilities while those who did not utilize them were asked to give reasons for bypassing them. The analysis of the qualitative data followed the principles of thematic content analysis. 59.2% of the 62.7% interviewed reported having a nearer facility other than the study hospital and had bypassed them during the child's illness, despite having a PHC facility closer to home than the study hospital.

Yaffee *et al* (2012) conducted a survey of patients in a Ghanaian Accident and Emergency Centre (AEC) to study bypassing of proximal health care facilities for acute care. They verbally administered a structured questionnaire to patients attending the AEC over two weeks. They measured several variables including demographics, patients' socioeconomic status, and their main reason for going to the facility, utilization of health care services and

cost of the same. They established a total rate of 33.9%. The factors contributing to this which had statistical significance were age of the patient older than 38 years (OR 2.18, p 0.04), previous visits to the facility (OR 2.88, p 0.01). Those who bypassed had no access to health insurance (OR 0.31, p 0.01), sought care due to injury (OR 0.42, p 0.03). In their view, patients who bypassed near facilities did so for reasons such as their familiarity with the facility, their main reason for attending the facility and their ability to pay through health insurance.

Liu *et al.* (2008) suggests that bypassing is traditionally associated with hospitals in which patients receive medical services from a health care professional or facility located farther away from the one closest to their residence. They conducted a study to understand why patients bypassed a local primary care in rural counties. They analyzed telephone survey data to explain demographic characteristics, travel time and distance to local hospitals and insurance status. They revealed that about 32% of respondents bypassed local primary care facilities. The factors associated with bypass in that study included age of respondent, education level, marital status, satisfaction with the local hospital attended, admission to a hospital in the past 12 months and the size of the hospital. They concluded that reduction of bypass behavior would be directed at the local community or facility level by changing rural residents perception of their local care, helping them gain a better understanding of the function of primary care, and increasing the number of primary care health providers to help retain patients and rural community to stay healthy. From their study, many rural patients seek important hospital services at health care institutions outside their community. They further suggested that in extreme situations, bypass may result in reductions in the number of health care professionals and range of medical services offered, or even hospital closure.

A study by Mushtaq, Gull, Shad, Akram (2011) to seek socio-demographic correlates of the health seeking behaviors in two districts in Pakistan used semi-structured questionnaire which was designed and translated into Urdu (National language of Pakistan). They included age, gender, education level, occupation of interviewee, family members and approximate family income, housing condition; the socio-demographic factors; and health seeking behavior which included consultation about the disease, frequency of visits to a health facility, and reasons for not using the public health services. They described that the main reasons for not using a public health facility as costs, dissatisfaction with quality of care and transportation difficulties due to distance which had previously been indicated as major utilization constraints. Costs occurred as a problem to rural, illiterate and poor respondents

due to economic losses after taking a day off their activities. Poor quality of the health service and not having trust in the health service provider was associated with poor health service utilization, which for both the urban population and the poor caused dissatisfaction with the quality of care. They recommended the need for training health workers in communication skills and sensitizing them to clients' needs, improving the working conditions and providing financial incentives to the public health care workers to motivate them to improve their output in service provision.

Escare and Kapur (2005) conducted a study exploring the determinants of inpatient hospital service in rural California. They estimated the determinants of hospital choice for patients in rural areas and employed the conditional logit model to analyze the study of hospital choice. The study showed that patients were more likely to seek healthcare from hospitals near their homes, hospitals with larger scope and hospitals which offered more services and technologies. Despite these factors being adjusted, the patients had a propensity to bypass rural hospitals in favor of large urban hospitals, because offering additional services and technologies would increase the share of rural residents choosing rural hospitals only slightly. In their findings, limited service offerings resulted in some rural residents to use urban hospitals. Again, older patients were more likely to choose the closest hospital while those with chronic conditions were more likely to their closest rural hospital to find specialized treatment. They concluded that patients were less likely to choose rural and small urban hospitals than urban hospitals after controlling for all measurable hospital characteristics, services and technologies. As such, rural patients prefer urban hospitals for reasons above and beyond their larger size and more extensive technological capabilities.

Humphreys and Weinad, (1991) investigated factors behind accessibility of general practice in rural Australia. They used paired comparisons to elicit respondents' attitudes relating to their decision to consult a doctor. They found out that bypassing of the local health care was attributed to being dependent on the characteristic of the health care provider; including his/her training and qualification, experience, reputation, range of medical services offered and fees. They suggested that for rural residents, geographical distance was not the sole or even the most important determinant in their choice of general practice care; rather, they will seek the services of a general physician with whom they feel comfortable. They concluded that bypassing is also related to place of residence of the user and indicated that the incidence of bypassing significantly differs in community size, and may be high in small rural communities.

The Institute of Social and Behavioral Research (ISBR) (1992) reported that bypassing of PCPs occurred most frequently in smaller Kansas communities. Thirty five percent of those living in communities of 1,000 or less reported bypassing; this figure dropped to 16% and 11% for residents of communities of 1,000 - 4,000 and more than 4,000 respectively. Areas with low population density or are experiencing population decline experience greater incidence of bypass. Such areas may lose qualified physicians or health workers because the population size may not support them and may underutilize health facilities as stated by Paul and Nellis (1996).

Akin and Hutchinson (1999) explored health-care facility choice and the phenomenon of bypassing in Sri Lanka. They undertook a random effects probit estimation to examine the relationship between individual and facility characteristics and whether an individual bypassed a facility. They stated that individuals are assumed to make decisions about visiting or not visiting a health facility, based on a range of attributes which include facility characteristics, the price of medical consultation, and the number of hours open. Bypass of health care facilities occur many times when patients seek health care services away from the rural hospitals. They did a multivariate estimation to examine the effect of each factor with all other factors statistically controlled.

Denton, (1999) undertook a study in Colorado where conditional logistic regression model was employed. It was established that rural patients considered receiving health care services in facilities equipped with modern diagnostic equipment, which are seldom available at those local hospitals. The rural Colorado residents were not only found to lack awareness about the capabilities, but also lacked belief that rural members could do anything to affect change in their health system. There was a serious decline in occupancy rates for all hospitals, which was more serious for rural than urban hospitals as a result of bypass.

Varkevisser and Geest, (2006) used individual patient level hospital utilization data in examining the decisions made by Dutch patients to bypass the nearest hospital for orthopedics and neurosurgery in Netherlands. They used logit model with iterative procedures and the maximum-likelihood estimation technique. They found out that bypassed hospitals for orthopedics' care was 38% and Neurosurgery was 54%. The estimation results of the logit model used revealed that extra travel time and hospital waiting time performance significantly affected the decisions made by patients to visit or bypass the hospital closest to their homes. From their findings, patients were more likely to bypass the hospital nearest to

them when the hospital was a tertiary referral centre or a University hospital. Besides travel time and hospital attributes, patient attributes such as age and social status also significantly affected hospital bypass decisions.

Gauthier and Wane, (2008) undertook a study on bypassing health providers in revealing price and quality of health care in Chad. They observed that the search of health services perceived as better related to a patient's needs alongside willingness and ability to pay for care. They stated that bypassing can be seen as an important manifestation of consumer power. The study found out that bypassing was more intensive in urban areas, although rural patients also bypassed, it was to small extent. They realized that patients seek better and more adapted services and are willing to invest substantial time and travel cost and pay higher service costs to obtain those higher quality services. They also found out that higher-income patients wield more consumer power by bypassing more. While rural facilities were often overcrowded despite their low quality, urban public facilities were underutilized given that they would generally be bypassed to the benefit of private providers.

2.4 Overview of literature review

Limited literature exists in studies on health care bypassing especially in Kenya. However, based on the available literature from other regions, we are able to classify factors that lead to bypassing of health care facilities into three categories: that is user characteristics, provider characteristics and place characteristics. Most of them made an assumption that patients often bypassed their local health care facilities and travelled to other hospitals where health care was perceived to be superior and high quality, Escare and Kapur (2005) which contradicts with others who link bypassing with rural areas and low quality of care, Gauthier and Wane (2008). Also, we observe some studies relying mostly on a single specialized hospital based data which prompts these studies to be biased, Varkevisser and Geest, (2006). On the other hand, some scholars like Gauthier and Wane, (2008) have contrary opinions (from e.g. Akin and Hutchinson, 1999) that patients are sensitive to service prices and that medical expenditure that affects choice of facilities.

In many countries, the decision on the hospital a patient seeks health care services when ill, lies on the patient themselves, or in consultation with their doctor or any other health care service provider. However, this issue has not been given much attention by most reviewed studies. For the most part, as observed from the literature, patients not only seek better and more adapted services but also are willing to invest substantial time and travel cost associated

with high pay to obtain those higher quality services. This is likely to cause a serious challenge as more people might be pushed to catastrophic impoverishment associated with more health care expenditures. Therefore, our study will explore bypassing and health seeking behaviors to inform policy on distribution of health care services appropriately.

Therefore this study will endeavor to explore the factors for health seeking and bypassing of health care facilities using the Kenya household expenditure and utilization survey which is a national survey unlike other studies which either use a hospital survey or a case studies. This will contribute to the literature and the fact that most studies we have reviewed reveals that bypassing is mostly an urban phenomenon, we shall inform policy on allocation of public health resources between urban and rural areas.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter presents the description of the theoretical framework, model estimation, definition of variables and their expected respective sign and the data source.

3.2 Theoretical Model

Grossman (1972), suggests that an individual would wish to have more healthy days and feel happier. This pushes an individual to consider consumption of health services (let us make an assumption that these services are sought from health care facility when one is ill).

Having sought medical intervention, a patient will obtain his utility from being healthy and will, thus, have more healthy and productive days. This will lead a patient in choosing either to consume professional health services offered by health facility j, located near or health facility k, located far from his place of residence. The expected health status (Y_{ik}) by an individual due to consumption of health care services in facility k is a function of his personal characteristics for example; income levels, age, education levels etc as shown below;

$$Y_{ik} = y_{ik}(X_i) \tag{1}$$

Where Y_{ik} is as described above and X_i are individual characteristics.

Therefore, from equation 1 above, a patient deriving his utility (U_{ik}) from consuming health services by choosing different alternatives of health care facilities will be as represented below;

$$U_{ik} = f(y_{ik}) + \varepsilon_{ik} \tag{2}$$

Where U_{ik} is utility derived by patient i from facility k and y_{ik} is the health status of individual i derived from consuming health services obtained from health facility k which is located far and ε_{ik} is the stochastic random term indicating factors behind utility regarding health facility k which are not utilized by our model.

3.3 Model Estimation and model specification

To elucidate the effects of bypassing of health care facilities by patients as demonstrated by utility theory in the previous section, our study used binary logit regression model which lies between the interval of between 0 and 1. This is a probabilistic distribution where we are

interested in interpreting the bypassing of health care facility j for k as the probability of either choosing to utilize health care services from health facility j provided other independent factors.

In our model, we made an assumption that the error term takes a logistic distribution. Since we cannot observe the latent variable y^* , we can consequently not be able to estimate its variance. However, the model is helpful as it can show whether the identified factors motivating bypassing behavior as well determine or influence the probability of observing an event. We shall further assume that there exists a linear relationship between the unobservable variable y^* and explanatory variables (X_i) represented as:

$$y^* = X_i\beta + \mu \quad 3$$

Where y^* is unobserved variable

X_i is a pool of independent variables indicated by equation 1 above.

β are parameters to be estimated

μ is the random error term

The equation 3 above is linked to the unobservable variable y^* and the observed binary variable y (indicating the probability)

$$y = \begin{cases} 1 & \text{if } y^* > T \\ 0 & \text{if } y^* \leq T \end{cases} \quad 4$$

Where y is the probability of bypassing health facility j and 1 if one utilizes health services from health facility k and 0 if one consumes health services from health facility j located near the patient. T represents the limit beyond which one is said to have bypassed a nearby health facility (zero in our case due to the kind of model we are using).

The probability of observing an event (bypassing) is given by;

$$prob(Y_i = 1) = prob(\mu > -X_i\beta') = 1 - F(-X_i\beta') \quad 5$$

It is important to note that from equation 5 above $F(X\beta) = \Lambda(-X_i\beta')$ is the cumulative distribution function which leads to the following maximum likelihood function below;

$$L = \prod_{Y=0} \Lambda(-X_i\beta') \prod_{Y=1} [1 - \Lambda(-X_i\beta')] \quad 6$$

The following is our logit model specification;

$$\text{Prob}_i = \Lambda(Z_i) = \Lambda(\alpha + X_i\beta') = \frac{1}{1+e^{-Z_i}} = \frac{1}{1+e^{-(\alpha+X_i\beta')}} \quad 7$$

The model specification for factors influencing bypassing behavior will be as shown below;

$$Y_{ik} = f(\text{Pac}, \text{Pc}, \text{Rc}, \mu)$$

Where Y_{ij} is the dependent variable indicating individual i utilizing health services from health facility j .

Pac is the vector representing patient characteristics like age, gender among others.

Pc is a vector for provider characteristics like ownership of health facility, accommodation capacity among others.

Rc is a vector for rural characteristics like geographical location of the facility and means of transport.

μ is the error term.

The multivariate model shall be as expressed below;

$$Y_{ik} = \beta_0 + \beta_1 \text{Age} + \beta_2 \text{noeduc} + \beta_3 \text{mseceduc} + \beta_4 \text{poorest} + \beta_5 \text{poor} + \beta_6 \text{middle} + \beta_7 \text{mstatus} + \beta_8 \text{female} + \beta_9 \text{govt} + \beta_{10} \text{wt} + \beta_{11} \text{C} + \epsilon_{ik}$$

Where: Y_{ik} = is the patient bypassing health facility j for k .

Age = age of the patient in years, no educ.= respondent has no formal education level; msec educ.= respondent has more than secondary education, female = female gender, wt = respondent is very satisfied with waiting times, govt. = health facility is owned by the government, poorest = respondent belongs to the poorest wealth quintile, poor = respondent belongs to poor wealth quintile, middle = respondent belongs to middle wealth quintile, m status = marital status, C = respondent suffers from a chronic illness and e = error term.

3.4 Definition of variables and their Expected signs

Table 3.4: Definition of variables and their Expected signs

Study Variables	Measurement	Expected sign
Dependent Variable		
Bypassing health facility j for another health facility k of the same category.	This shall be a dummy variable which takes the value 1 if an individual bypasses one or several facilities of the same rank and 0 if individual utilizes health care services in the nearest health facility of the same rank	
Explanatory variables		
Age	Age of patient in years	Negative (Escare and Kapur, 2005)
Education	Education = 1 if primary, secondary or tertiary education and 0 if no education	Negative (Liu et al. 2008)
Wealth quintiles	The socioeconomic status of households is classified as either poorest, poor, middle, rich or richest	Positive (Gauthier and Wane, 2008)
Employment	Employment status =1 if in formal employment and if in informal employment	Positive (Liu et al. 2008)
Marital status	Marital status = 1 if married and 0 if not married	Positive (Liu et al. 2008)
Distance	Distance in Kilometers to the nearest health facility	Negative (Escare and Kapur, 2005)

<i>*Definition of variables and the expected signs continued</i>		
Ownership of health facility	Ownership of health facility = 1 if public health facility and 0 if private health facility regardless of the category	Positive (Jose and Kapur, 2009)
Gender	Gender of the patient = 1 if Female and 0 if male	Positive (Liu et al. 2008)
Waiting time	Time taken by patient between arrival and being attended by the physician	Positive (Varkevisser and Geest, 2006)
Payment for services	1 if patient paid for health care service; 0 otherwise	Negative (Humphreys and Weinad 1991)
Type of illness	Type of illness = 1 if chronic and 0 if Acute	Negative (Escare and Kapur, 2005)

3.5 Data Source

This study will use Kenya household health expenditure and utilization survey 2007 (KHHEUS) which contains information on health status of the population as well as health seeking behavior which reveals the burden faced by households in their efforts to meet their health needs. The household survey uses a nationally representative sample generates national estimates.

The sampling frame for this survey included the then eight administrative provinces which were subdivided into 70 districts were subdivided into divisions and the divisions split into locations and locations split into sub-locations. A stratified sample of 8,844 households was reached, with 6,060 interviews carried out in the rural and 2,784 in the urban centers.

As stated in the NHA report (2008), the data were collected from the selected households using the face-to-face interview method. The survey collected information with regard to household membership alongside demographic variations, health status, health seeking pattern and health expenditure among others. The information on health seeking pattern comprised the use of health

care facilities. The respondents were required to answer to the questions relating to the characteristics of the health facilities and their demographic characteristics.

This is important to our study investigating the relationship for example the distance to the nearest health facility, cost of health service provision, means of transport, gender of the patients, type of illness, accommodation capacity, income levels, employment status, marital status, education levels among other variables of interest related to health care seeking behavior and utilization.

The survey is conducted after every four years where information on health expenditures by the population is collected. This survey is conducted by the Ministry of Health in an effort to understand the health seeking behavior of households and estimate contribution made by the households to total health spending.

CHAPTER FOUR: EMPIRICAL FINDINGS

4.1 Introduction

This chapter presents the descriptive statistics, an assessment of correlation and empirical estimates. The binary logit model is used to analyze the determinants of health care seeking and bypassing of health care facilities in Kenya.

4.2 Descriptive statistics

The specific statistics under consideration are the means, standard deviations, maximum and minimum values. In our study, attending health facilities far away from the respondent's homes is a proxy of by passing behavior. Since most variables are binary in nature, they only assume values of zero and one. The age variable, however, is a discrete variable indicating the respondent's age in completed number of years. The oldest respondent was 93 years old while the youngest was below one year, however, the study considered respondents from the age of 15 years. The average age of the respondents under study was approximately 36 years. About 10% of the sampled population reported that the health facilities they attend were far from their homes with 73.3% reporting that the health facility was owned by the government. About 2% of the sampled population was very satisfied with the waiting times in the health facilities that they attend and only 0.3% indicated that they were not satisfied at all. The distribution in relation to payment for health services was such that 3.4% of the sampled population reported to have paid for health services. In regards to the distribution of illness, only 0.8% reported to have suffered from HIV/AIDS, TB or diabetes.

Table 4.1 Descriptive statistics

VARIABLE	N	Mean	SD.	Min	Max
Health facility is far from respondent's home	14,297	0.097	0.153	0	1
Respondent's age (A)	28,492	36.158	8.220	15	93
Respondent had to pay for health services (P)	14266	0.034	0.180	0	1
More than secondary education (S)	32,553	0.058	0.234	0	1
Respondent belongs to the poorest wealth quintile	32,553	0.006	0.076	0	1

<i>*Descriptive statistics continued</i>					
VARIABLE	N	Mean	SD	Min	Max
Respondent belongs to poor wealth quintile	32,553	0.011	0.103	0	1
Respondent is middle wealth quintile (M)	32,553	0.755	0.430	0	1
Female gender (F)	35,974	0.454	0.498	0	1
Nearest facility is owned by the government (G)	14,280	0.733	0.442	0	1
Respondent is very satisfied with the waiting time (VS)	14,275	0.019	0.137	0	1
Respondent is not satisfied with the waiting time (NS)	14,275	0.003	0.074	0	1
Respondent suffers from a chronic illness (C)	35,974	0.008	0.090	0	1

N = the sample size; SD =standard deviation; Min = minimum value; Max = Maximum value

4.3 Correlation Analysis

Correlation coefficients were used to show the relationship between dependent and independent variables and among independent variables. Coefficients with values greater than zero indicate a positive relationship while coefficients with values less than zero indicate an inverse relationship. From the correlation matrix in Table 4.2, it was noted that respondent's age, having more than secondary education, belonging to poorest and poor wealth quintiles and female gender are negatively correlated with by passing behavior. It is also noted that many independent variables are lowly correlated with correlation coefficients less than 0.6.

Since high correlation between the independent variables (Multicollinearity) could introduce bias in regression estimates, we assess whether the high correlation is likely to be problematic. We utilize the Variance Inflation Factors (VIF) to this effect. In this case, values of VIF greater than 10 imply that high correlation between the independent variables could bias our estimates. This assessment suggests that high correlation between independent variables is not likely to introduce bias (see Table 4.3).

Table 4.2 Correlation matrix

	Y	A	S	G	P	F	M	NS	Poor	Poorest	C
Y	1.0000										
A	-0.6517	1.0000									
S	0.5102	-0.5764	1.0000								
G	-0.5259	0.6459	-0.5045	1.0000							
P	-0.1595	0.1631	-0.0955	0.0409	1.0000						
F	-0.1939	0.1923	-0.1372	-0.0099	-0.0019	1.0000					
M	0.6930	-0.4132	0.5460	-0.3311	-0.1477	-0.1706	1.0000				
NS	0.2252	-0.2096	0.3413	-0.2808	-0.0300	0.0046	0.3603	1.0000			
Poor	-0.1913	0.5173	-0.5075	0.3408	0.1429	0.1219	-0.5442	-0.3315	1.0000		
Poorest	-0.1595	0.5532	-0.5127	0.3482	0.0999	0.1953	-0.5021	-0.1225	0.3386	1.0000	
C	-0.1665	0.1932	-0.1547	0.1422	-0.0019	0.0585	-0.1536	-0.0809	0.0999	0.1354	1.0000

Table 4.3 Variance Inflation Factors

VARIABLE	VIF	1/VIF
Respondent's age	4.34	0.230
Respondent's has more than secondary education	2.10	0.475
Respondent is very satisfied with the waiting times	2.03	0.494
Nearest facility is owned by the government	1.54	0.647
Female gender	1.50	0.665
Respondent is not satisfied with the waiting times	1.32	0.759
Respondent belongs to poor wealth quintile	1.11	0.898
Respondent belongs to the poorest wealth quintile	1.05	0.957
Respondent suffers from a chronic illness	1.19	0.837

4.4 Empirical results**Table 4.4 Estimated coefficients**

INDEPENDENT VARIABLE	Coefficient	t-statistic
Respondent's age	-0.049***	-7.51
Respondent has more than secondary education	0.159	0.76
Respondent belongs to the poorest wealth quintile	-2.619**	-2.10
Respondent belongs to poor wealth quintile	-1.958**	-2.21
Respondent had to pay for health services	1.873***	7.74
Female gender	-0.398*	-1.89
Nearest facility is owned by the government	-0.831***	3.80
Respondent is very satisfied with the waiting times	-1.123**	-2.05
Respondent is not satisfied with the waiting times	0.089	0.28
Respondent suffers from a chronic illness	1.342***	3.20

* p-values<0.10; **p-values<0.05; ***p-values<0.01

From Table 4.4 above, it can be seen that respondent's age, belonging to the poorest wealth quintile, poor wealth quintile, nearest facility is owned by the government and being satisfied with the waiting times are negatively associated with by passing behavior. On the other hand,

not satisfied with waiting times, having to pay for health services and suffering from a chronic illness are associated with by passing behavior. However, in order to determine the changes in probability associated with each of the modeled factors, interpretation follows the average marginal effects (See Table 4.5).

Table 4.5 Average Marginal Effects

INDEPENDENT VARIABLE	Coefficients	t-statistics
Respondent's age	-0.0010***	-7.74
Respondent has more than secondary education	0.0015	0.76
Respondent belongs to the poorest wealth quintile	-0.035**	-2.07
Respondent belongs to poor wealth quintile	-0.034**	-2.23
Respondent has to pay for health services	0.030***	7.72
Female	-0.004*	-1.90
Nearest facility is owned by the government	-0.011***	-3.78
Respondent is very satisfied with the waiting times	-0.013**	-2.95
Respondent is not satisfied with the waiting times	0.0002	0.76
Respondent suffers from a chronic illness	0.035***	3.21

* p-values<0.10; **p-values<0.05; ***p-values<0.01

A one year increase in age is associated with a decrease in the probability of bypassing behavior by 0.10% holding all the other factors constant. This is in line with the finding by Escare and Kapur (2005). Older people are not likely to have stringent preferences on the type of health facility they attend. Nevertheless, this probability is less than 1% implying that age might not be an important factor that determines bypassing behavior.

The probability of by passing behavior increases by 30% for respondents who had to pay for health services. This implies that the cost of health services is an important determinant of health care seeking and bypassing behavior.

The socioeconomic status of households is also a significant determinant of bypassing behavior. Belonging to poor wealth quintile decreases the probability of bypassing behavior by 3.4% holding all the other factors constant. On the other hand, the probability of bypassing behavior increases by 3.1% ceteris paribus. Other findings by Gauthier and Wane (2008) also established

a positive association between education attainment levels and bypassing behavior. This corresponds with findings in the DHS report (2004) in a discussion on economic status measures and wealth index on maternal child health (MCH) which suggested that use of health facilities was higher in those of the highest wealth quintile in comparison to those of the poorest/lowest wealth quintile.

The average marginal effect of government facility is -0.011. This implies that respondents are less likely to bypass government health facilities as compared to the private facilities, faith based organizations and NGO owned health facilities. This finding contradicts the findings by Jose and Kapur (2009) who established that respondents are more likely to bypass government facilities as compared to the other facilities. However, the reason for this contradictory finding for Kenya could lie in the high health care costs associated with private facilities.

Respondents who are very satisfied with the waiting times are not likely to bypass health care facilities. The average marginal effect is -0.013. This implies that the probability of bypassing behavior reduces by 1% for respondents who are very satisfied with the waiting times holding all the other factors constant. Since being very satisfied is an indicator of contentedness, our findings are consistent with a priori expectations.

The average marginal effect of chronic illness is 0.035. This implies that the probability of bypassing health facilities increases by about 4% for respondents suffering from HIV, TB and diabetes, holding other factors constant. Since individuals with chronic illnesses have specialized needs, they are more likely to attend particular health facilities, which may not be necessarily be near their homes.

4.5 Assessing overall model fitness

The Log-likelihood chi square test is used to determine if the slope coefficients are simultaneously equal to zero. The test statistic is 1640.42 with a p-value of 0.000. This implies that the model contains significant independent variables.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1 Introduction

This chapter contains the summarized findings, policy recommendations, limitations of the study and suggested areas of further research.

5.2 Summary of the study findings and conclusions

This study explored the factors that contribute to the bypassing of health facilities by patients in Kenya. The study used Kenya Demographic and Household Survey 2008 with binary logit regression model employed as an estimation technique. The study variables included the age of the respondent, education levels, wealth quintiles, ownership of the health facility, waiting times, chronic illness, whether patient paid for services, education levels, marital status, and gender of the respondent. The findings from the analysis at 5% and 1% levels of significance, age of the respondent, being in either poor or poorest wealth quintiles, health facility owned by government, payment for health services, satisfied with the waiting times at the health facility and respondents suffering from chronic illness were found to be statistically significant. On the other hand, more than secondary education level and not satisfied with the waiting times was found to be statistically insignificant. It was further revealed that age of the respondent, belonging to the poor and poorest wealth quintiles, health facility belonging to the government and if respondents are satisfied with waiting times contributed to the decline in the bypassing behavior while seeking health care by patients in Kenya. If patients had no education, belonged to the middle wealth quintile or if patient suffers from chronic illness led to increase in the bypassing behavior.

5.3 Policy Recommendations

It was evident that some patients do not obtain health care from the facilities within their reach. Based on the results, the government should consider improving the quality of services in the bypassed health facilities in order to increase their utilization and reduce bypassing health facilities while seeking healthcare. This is because it may lead to increase in health spending for the individuals and families, in terms of spending money and time for travelling to the health facility of their choice; usually not near to them, and productivity losses.

To avoid bypass, providers of services in health facilities need also to educate or create awareness to the people they serve on the importance of utilizing health services from health facilities located near them.

To prevent people with chronic illnesses from bypassing health care facilities near them, the government through the state department of health should consider equipping those facilities by providing them with deliverables and relevant equipment to improve diagnosis, treatment and monitoring of the patients' illness as well as complications associated with the chronic illnesses thus minimize the logistic challenges those patients could be experiencing.

5.3 Limitations of the study

Despite the study identifying the factors that contribute to bypassing of health facilities, the choice to bypass lower level health facilities to higher level facilities and vice-versa has not been addressed due to data limitation.

5.4 Areas for further studies

The study considered health seeking behavior and how it relates to bypassing of nearby health facility at the national level. In the wake of devolution of health services in the country, to inform policies on resource allocation at county levels, we recommend similar studies to be undertaken.

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