

DETERMINANTS OF HEALTH INSURANCE CHOICE IN KENYA

By

Kiplagat Jebiwott Isabella

A research paper submitted to the School of Economics, University of Nairobi in partial fulfillment of the requirement for the award of Master of Arts Degree in Economic Policy and Management.



SEPTEMBER, 2011

DECLARATION

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

Signed Kiplagat

Date 27/09/2011

Kiplagat Jebiwott Isabella

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

Signed 

Date 27/9/2011

Dr. Urbunus M. Kioko

Signed 

Date 30/09/2011

Dr. Moses K. Muriithi

ABSTRACT

In Kenya, the out-of-pocket health expenditure by households accounts for around 36 percent of the total expenditure on health. Large out-of-pocket payments may reduce consumption expenditure on other goods and services and push households into poverty. Recently, health insurance has been considered as one of the possible instruments in reducing impoverishing effects of large out-of-pocket health expenditure. In Kenya, health insurance has limited coverage, yet there are various types of health prepayment schemes. The present study examines the determinants of choice of health insurance schemes in Kenya.

The study is based on utility maximization theory which postulates that individuals choose among alternatives depending upon which offers the highest total expected utility. Utilizing the 2008-2009 Kenya Demographic Health Survey (KDHS), we estimate a multinomial logit model and conclude that wealth index, employment status, education level and household size are important determinants of health insurance ownership and choice. Also, lack of awareness prevents many from enrolling in any form of health insurance scheme.

Policies that improve education attainment, living standards and access to information (awareness) among the Kenyans are likely to increase the demand for all the forms of health insurance schemes.

ACKNOWLEDGEMENT

Foremost, I give God all the glory for the strength and perfect health He gave me throughout the Masters degree programme.

I would like to express my deepest gratitude to my supervisors; Dr Urbunus M. Kioko and Dr. Moses K.Muriithi for their tireless support, patience and encouragement from the initial to the final level of development of this research paper. They helped me understand my study more clearly through their technical advice.

I appreciate the Government of Kenya (Ministry of Youth Affairs and Sports) for granting me the opportunity and scholarship to undertake this study. Special thanks to the African Economic Research Consortium (AERC) for facilitating my participation at the Joint Forum for Electives (JFE) programme. This greatly enhanced my knowledge in Economics and Research Methodology, not forgetting their financial support towards the completion of this paper.

I thank my fellow course mates for the exciting discussions and for all the fun we have had in the two years of study. My journey would have been more difficult without their support and encouragement. I offer my regards and blessings to all those who supported me in any respect during the completion of the project.

Last but not least, I am indebted to my family; my husband Mr. Sammy K. Biwott for his continued support and understanding and my children Joy, Jean and Jake for the great sacrifice as I worked on the project.

None of the above persons bears any responsibility for errors or views expressed in this paper.

DEDICATION

To my parents, the Bundotich's and the Chemweno's for their love and thirst for education; to my brother John for taking care of my babies as I attended the JFE programme and finally, to my husband, Sammy and my triple 'J' angels for the encouragement and prayers you made during the whole journey of acquiring the Masters degree.

LIST OF ACRONYMS

CBHI	Community Based Health Insurance
ERS	Economic Recovery Strategy
GDP	Gross Domestic Product
HHH	Head of Household
KNBS	Kenya National Bureau of Statistics
MDGs	Millennium Development Goals
MNLM	Multinomial Logit Model
NDCs	Non-Communicable Diseases
NHIF	National Hospital Insurance Fund
NSHIF	National Social Health Insurance Fund
NSSF	National Social Security Fund
OOP	Out of Pocket
UNDP	United Nations Development Programme
WHO	World Health Organisation

TABLE OF CONTENTS

DECLARATION.....	ii
ABSTRACT.....	iii
ACKNOWLEDGEMENT.....	iv
DEDICATION.....	v
LIST OF ACRONYMS.....	vi
TABLE OF CONTENTS.....	vii
TABLE OF FIGURES.....	ix
LIST OF TABLES.....	ix
CHAPTER ONE: INTRODUCTION	1
1.1. Background to the Problem.....	1
1.2. Health Care Financing in Kenya	2
1.3. Overview of Health Insurance in Kenya.....	5
1.3.1. Voluntary Health Insurance	6
1.3.1.1. Private Healthcare Insurance	6
1.3.1.2. Community Based Health Insurance (CBHI).....	6
1.3.2. Statutory Health Insurance.....	7
1.3.2.1. National Hospital Insurance Fund (NHIF).....	7
1.3.2.2. National Social Security Fund	8
1.4. Statement of the Problem	9
1.5. Objectives of the Study	10
1.6. Justification of the Study.....	11
CHAPTER TWO: LITERATURE REVIEW	13
2.1. Introduction.....	13
2.2. Theoretical Literature.....	13
2.3. Inefficiencies in the Insurance Market.....	15

2.4.	Empirical Literature	16
2.5.	Overview of Literature review	20
CHAPTER THREE: METHODOLOGY		21
3.1.	Introduction	21
3.2.	Theoretical framework	21
3.3.	Model Specification	23
3.4.	Measurement of Variables	25
3.4.1.	Dependent Variable.....	25
3.4.2.	Independent Variables.....	26
3.5.	Data Sources.....	29
3.6.	Study Sample	30
3.7.	Data analysis	31
CHAPTER FOUR: EMPIRICAL RESULTS		32
4.1.	Introduction	32
4.2.	Summary of descriptive statistics.....	32
4.3.	Diagnostic tests	37
4.4.	Estimation Results.....	40
4.5.	Discussion of Results	44
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS.....		49
5.1.	Summary	49
5.2.	Conclusion	50
5.3.	Policy Recommendation	52
5.4.	Limitations of the Study.....	53
5.5.	Areas for Further Research	53
REFERENCES.....		54

LIST OF FIGURES AND TABLES

FIGURES

Figure 1: Government Budget Allocation to Public Health Sector.....	2
Figure 2: Financing Sources for Health Care.....	3

TABLES

Table 3.1: A summary of the study variables.....	29
Table 4.1: Summary statistics	32
Table 4.2: Categories of health insurance owned	33
Table 4.3: Summary statistics for respondents covered by social security (NSSF).....	34
Table 4.4: Summary statistics for respondents covered by NHIF.....	34
Table 4.5: Summary statistics for respondents under private health insurance	35
Table 4.6: Summary statistics for respondents with mutual/community health insurance	36
Table 4.7: Summary statistics for respondents with no insurance cover	37
Table 4.8: Shappiro-Wilk “W” test for normal data	38
Table 4.9: Correlation between individual variables	39
Table 4.10: Multinomial Logit Parameter Estimates (Absolute z-Statistic in parenthesis) ...	41

CHAPTER ONE

INTRODUCTION

1.1. Background to the Problem

Health care financing in developing countries, particularly Africa remain low in relation to the internationally set targets.¹ Although both the developed and developing countries face budget limitations in their health systems, spending on health remains relatively higher in the developed world. According to World Health Organisation (WHO), global spending on health is about 10 percent of global Gross Domestic Product (US\$3.2 trillion). While developing countries account for about 84 percent of the global population and bear the largest burden of illness (90 percent), only 12 percent (US\$ 350 billion) of total global spending occurs in these countries (WHO, 2010).

Most of the health systems in Sub-Saharan Africa are still heavily reliant on out-of-pocket (OOP) spending. The World Health Organisation reported that in 2007, private expenditure² on health accounted for 58 percent of the total health expenditures compared to public share of 42 percent. Unlike in high income countries where only 36 percent of the total private health expenditure is from out-of-pocket payments³, 83 percent of the total private health expenditures, in this region are paid by households at the time of service. In addition, external sources account for 18 percent of total health spending in low income countries and less than 1% in high income countries (WHO, 2010).

¹ In 2001, the Commission on Macroeconomics and Health (CMH) recommended \$ 34 per capita as the minimum requirement for basic health care (WHO, 2001). The African heads of states also committed to devote 15% of total government expenditure to the health sectors in Abuja in 2001.

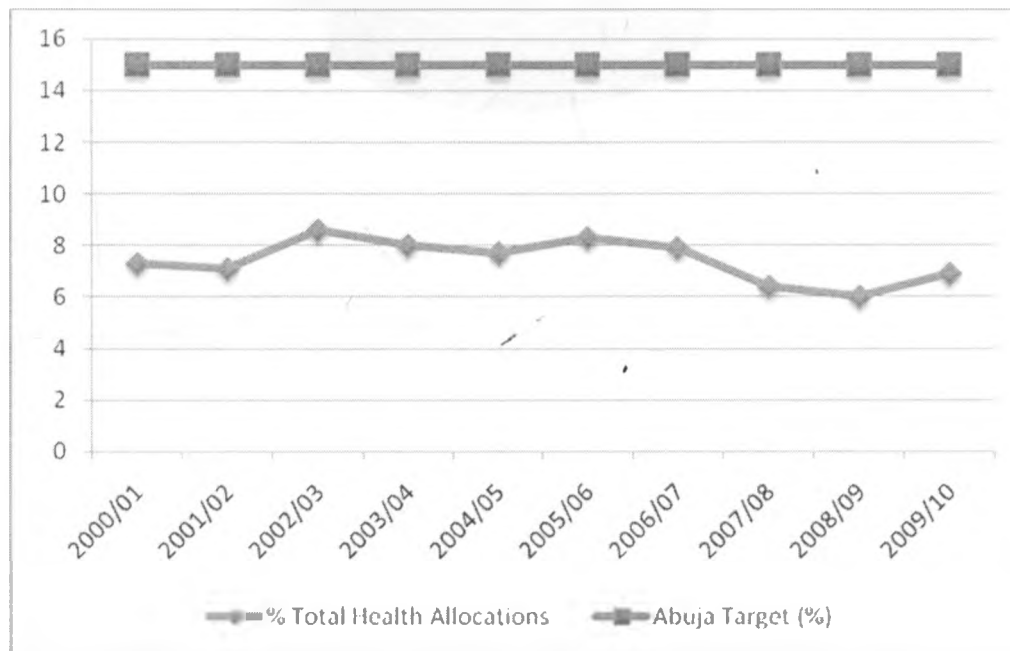
² Private expenditure is an aggregation of both out of pocket expenditure and private prepaid plans.

³ Out-of-pocket health payments refer to the payments made by households at the point they receive health care services. -

1.2. Health Care Financing in Kenya

Kenya's total government expenditure on health sector as a percentage of GDP between the 2004/2005 and 2008/2009 financial years has on average been 1.5 percent (Ministry of Medical Services, 2010). Largely, spending in the public health sector has been between 6 and 8 percent of total government expenditure. This level of funding is not only well below the Abuja declaration target of 15 percent of total government expenditure, but also the Economic Recovery Strategy (ERS) target of 12 percent (Republic of Kenya, 2009).

Figure 1: Government Budget Allocation to Public Health Sector (Ministries of Medical Services and Public Health Services)

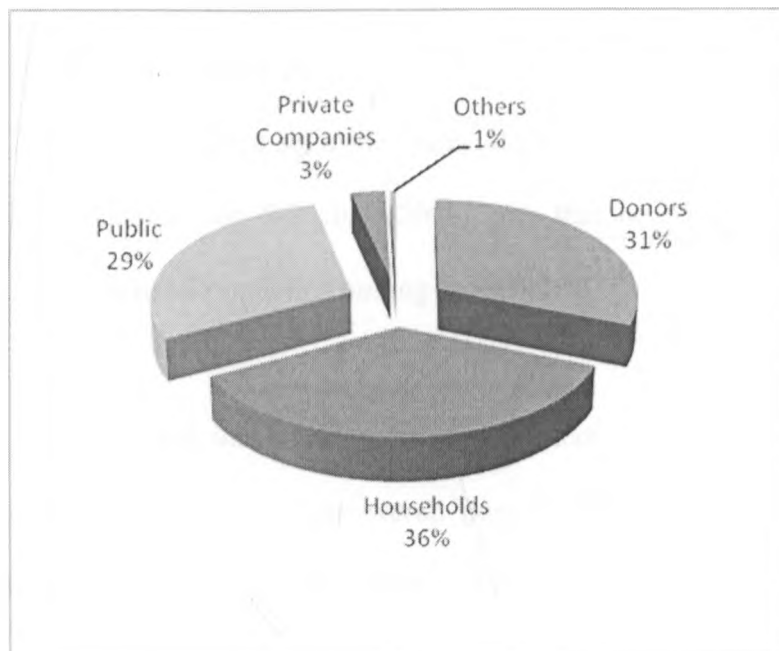


Source: Ministry of Medical Services, 2010

Health financing in Kenya is characterized by a high out-of-pocket expenditure. The National Health Accounts Statistics (2005/2006) indicate that out-of-pocket expenditure as a proportion of total expenditure stands at 36 percent while public expenditure as a proportion of total health

expenditure is 29 percent. Thirty one percent of the total health expenditure comes from the development partners while the private companies contribute 3 percent.

Figure 2: Financing Sources for Health Care



Source: National Health Accounts, 2005/06

Clearly, out-of-pocket (OOP) financing remains a dominant source of health financing in Sub-Saharan Africa, Kenya included. Large out-of-pocket payments are both a burden and a barrier to accessing healthcare (Saksena et al., 2006). Out-of-pocket expenditures especially by poor households often lead to catastrophic⁴ expenditures and impoverishment. They also discourage use and reduce coverage of available health care services, both of which are important in improving health outcomes. Evidence from Kenya indicates the negative impact of user fees⁵ on

⁴ Health care spending is defined as 'catastrophic' if it exceeds some fraction of household income or total expenditure in a given period, usually one year. There is no consent on its threshold. Past studies used a threshold of between 5% and 20% of total household income. More recent studies have applied a threshold of at least 40% of total household income.

⁵ User fees are a form of out OOP payment ((McIntyre, 2007).)

utilization of healthcare services (Mwabu et al., 1995; Mbugua et al., 1995; Ministry of Medical Services & Ministry of Public Health and Sanitation, 2009).

To enhance access to health care, health insurance is emerging as the most preferred form of health financing mechanism in countries like in Kenya where private out-of-pocket expenditures on health care are significantly high and cost recovery strategies affect access to healthcare (WHO, 2000). It helps households to set aside financial resources to meet costs of medical care in the event of illness. Pabblo and Schieber (2006) note that health insurance improves risk pooling thus enhancing financial protection among households.

On the other hand, lack of health insurance promotes deferment in seeking care, non-compliance of the treatment regime and results in an overall poor health outcome (Hadley, 2002). The challenge facing developing countries therefore is to shift from OOP financing to pooling of risk arrangements and to ensure effective financial protection and coverage.

Different health financing policy initiatives have been undertaken in Kenya, all aimed largely at addressing affordability and access to health care services. Immediately after independence, the government abolished user fees and introduced the policy of 'free health for all'. This policy, dominant in the 1970s and 1980s saw a rapid expansion of the healthcare infrastructure, and improvements in health and social indicators. During this period, health financing system was supported primarily via general tax revenue. With the growing population and worsening socio-economic and political factors, a severe crisis of health and social development unraveled in the 1990s (UNDP, 2002). As a result of the crisis, the government's objectives and commitments to free healthcare provision for all eroded dramatically forcing it to implement a cost-sharing

scheme in 1989. However, user fees were suspended for outpatient care in 1990, stirred by concerns about social justice, only to be re-introduced in 1992 because of budgetary constraints (Collins et al., 1996). In June 2004, the Ministry of Health stipulated that health care at dispensary and health centre level is free for all citizens, except for a minimal registration fee in government primary health facilities.

The need for health insurance in Kenya has been recognized by policymakers for quite some time now, as exemplified by the establishment of NHIF in 1966 through an Act of Parliament. The most significant event in the recent past has been the government's interest in social health insurance as a health financing mechanism and its possible implementation in Kenya. The aim is to ensure equity and access to healthcare services by all Kenyans.

1.3. Overview of Health Insurance in Kenya

According to Pabblo and Schieber (2006), the four main health insurance mechanisms which can be used to pool health risk and promote prepayment are: state-based systems, social health insurance, community-based health insurance and voluntary (private) health insurance. Health insurance can also be categorized into two, depending on its membership. Mandatory Health Insurance (NHI) is an insurance system in which the law requires certain population groups or entire population to adhere to. On the other hand, voluntary insurance carries no such legal requirement (McIntyre, 2007).

Kimani et al., (2004) noted that the main objective of both private and public health system has been to insure Kenyans against health risks that they may encounter in future. Following the

criterion suggested by McIntyre (2007), we can classify broad categories of health insurance schemes in Kenya are as follows:

1.3.1. Voluntary Health Insurance

1.3.1.1. Private Healthcare Insurance

Health insurance is considered private when the third party (insurer) is a profit organisation (Republic of Kenya, 2003a). In private insurance, people pay premiums related to the expected cost of providing services, that is, people who are in high health risk groups pay more, and those at low risk pay less. Cross-subsidy between people with different risks of ill health is limited.

Wang'ombe et al., (1994) identify two categories of private health insurance in Kenya: direct private health insurance and, employment based insurance. Nderitu (2002) notes that direct private health insurance is very expensive and only the middle and high-income groups can afford.

In the employment-based plans, the employer provides care directly through employer-owned on-site health facility or through employer contracts with health facilities or healthcare organizations. These are both voluntary health schemes and are not legislated by the government.

1.3.1.2. Community Based Health Insurance (CBHI)

This form of health insurance, sometimes called 'mutual health insurance', 'community based prepayment scheme' or 'micro-insurance' has become widespread in Africa and Asia in the recent past (McIntyre, 2007). CBHI is organized at the community level. Premiums paid by households are generally not based on individual risk assessments unlike in the case of private

health insurance. Asenso-Okyere et al., (1997) note that community based schemes provide insurance coverage for the rural communities which are unlikely to benefit immediately from either a social or private health insurance scheme.

Community based health insurance scheme is not yet far developed in Kenya. Since its introduction in 1999, about 32 schemes have been set up so far with about 170 000 beneficiaries covered, (Mathauer et al., 2008).

1.3.2. Statutory Health Insurance

1.3.2.1. National Hospital Insurance Fund (NHIF)

The NHIF was established by an Act of Parliament in 1966 as a department in the Ministry of Health, which oversaw its operations, but responsible to the government Treasury for fiscal matters. Initially, the Act provided for the enrollment in the NHIF of all salaried persons earning a net salary of Kshs. 1000 per month and above in the formal sector.

Over the years, the original Act of Parliament has been reviewed to accommodate the changing health care needs of the Kenyan population, employment and restructuring in the health sector. In 1972, the Act was amended to incorporate informal sector members on voluntary basis. The current NHIF Act was restructured in 1998 to cater for both in-patient and out-patient care (section 22 of NHIF Act, 1998), but outpatient services are not yet operational.

Though the NHIF is meant to be a health insurance scheme after the amendment of the NHIF Act in 1998, it is still a hospital insurance scheme since it only pays for inpatient services only.

Currently, NHIF pays more than half of a typical inpatient bill in private-for-profit sector in urban areas. Although benefit rates have been increased since the onset of the cost-sharing programme, the Fund's reimbursement levels remain a small proportion of the total costs of care in many for-profit facilities

The relevance of NHIF has been questioned in the light of access and affordability of healthcare for the poor, together with its coverage. It is for this reason that the Kenyan Government has proposed a scheme that is supposed to address fundamental concerns regarding equity, access, affordability and quality in the provision of health services in the country. The proposed mandatory social health insurance scheme, seeks to transform the NHIF into a National Social Health Insurance Fund (NSHIF) to provide health insurance cover to both outpatients and inpatients. The main objective of the Fund is to facilitate the provision of accessible, affordable and quality healthcare services to all its members irrespective of their age, economic or social status (Republic of Kenya, 2003b). Efforts to replace the NHIF with the National Social Health Insurance Fund (NSHIF) in 2006/07 were unsuccessful when the Act of parliament on the system failed to receive presidential assent (Ministry of Medical Services & Ministry of Health and Sanitation, 2009).

1.3.2.2. National Social Security Fund

The National Social Security Fund (NSSF) was established in 1965 by the National Social Security Fund Act, Chapter 258. The Fund was intended to serve as the 1st pillar of social security for Kenyan workers. Besides providing financial security, the fund provides members with basic security against contingencies such as employment injury, maternity, illness and/or

disability and death. The fund covers both employees in the formal and informal sector and membership is voluntary.

Despite this broad mandate, the NSSF has been criticized for discriminating against the unemployed and other categories of workers such as the casual workers.

1.4. Statement of the Problem

The high OOP expenditure in Kenya creates financial barrier and makes access to health care a big problem for the majority of the people living below the poverty line that account for about 45.9 percent of the Kenya's population. The cost of health care remains an important problem. The 2007 Kenya Household Expenditure Survey reports that 37.7 percent of Kenyans who were ill and did not seek care were hindered by cost of health care. The situation is likely to be worse with the country facing a looming epidemic of chronic diseases, also known as non-communicable diseases (NDCs) such as cardiovascular disease, hypertension, cancers, and diabetes. This epidemiological shift implies a likely escalation of health care costs.

From the background section, different forms of prepayment schemes exist in Kenya, all of whose membership have some voluntary component. Unfortunately only about 10 percent of the population has some form of health insurance (Ministry of Medical Services & Ministry of Public Health and Sanitation, 2009). In particular, only 7 percent of women and 11 percent of men aged between 15 and 49 are covered by medical insurance (KNBS, 2010b). This implies that a huge segment of Kenyans are still not covered. Thus, access to health care is largely a

function of individual ability to pay for the majority of Kenyans. This accelerates poverty and hence is an important challenge, both for the economic development and attainment of Millennium Development Goals (MDGs).

Considering the aforementioned, a sound understanding of factors determining choice of health insurance is clearly necessary and is thus the main purpose of this study. The few studies available in Kenya have dealt with situations in which individuals and households choose to be members of health insurance scheme or not (Owando, 2006; Mathauer et al, 2008). To the best of my knowledge, this is the first study to explore factors determining choice of different alternatives of health insurance schemes in the country, thus allowing for the fact that an individual can choose amongst a number of alternative schemes.

1.5. Objectives of the Study

This study aimed at identifying the factors that influence choice of health insurance schemes among individual Kenyans. Specific objectives were:

1. To determine socio-economic factors influencing choice of health insurance schemes in Kenya.
2. To determine the role of information on the choice of health insurance schemes in Kenya.
3. To analyze the effect of covariate factors on the probability of choosing particular types of health insurance schemes in Kenya
4. To suggest policy recommendations based on findings in 1, 2 and 3 above.

1.6. Justification of the Study.

Health insurance schemes are increasingly recognized as alternative mechanisms to finance health care provision. This study comes at a time when there is considerable debate about potential health financing reforms, ranging from the possible introduction of social health insurance, user-fees with exemptions/waivers for the poor, the role of the private sector and voluntary health insurance, and the size and structure of the Health sector budget (Ministry of Medical Services & Ministry of Public Health and Sanitation, 2009).

There have been controversies on implementation of the proposed health financing reforms between the government and key stakeholders among them the private sector and development partners. Thus, this study is useful not only for academic purposes but also for policy making in the health sector. The outcome of this study may supplement the policy makers with information to design, implement and monitor the health insurance policies that improve the health status of all Kenyans. The Ministry of Finance may make use of the study to fill the gap in funding health care services while the Ministries of Medical Services and Public Health & Sanitation may examine the ways of reallocating financial resources to bridge the gap between the poor and the rich. On the other hand, the Non-Governmental Organisations (NGOs), donors and other partners in health financing will be provided with valuable information that could help them to specify which health care system is appropriate for the country.

In a nutshell, the study will provide an understanding by researchers, planners and policy makers, not only on factors affecting purchase or non-purchase of health insurance but also on choice of alternative forms health insurance schemes in Kenya.

Unlike other studies in the country, this study uses the multinomial logit to estimate individual choice of health insurance amongst various alternatives. Moreover, the study utilizes a new set of data (KDHS 2008/09) which is collected by the Kenya National Bureau of Statistics (KNBS) and included information on health insurance for the first time.

This paper is structured as follows: chapter two gives the theoretical and empirical literature review. The methodology used to investigate health insurance choice is introduced in chapter three. Empirical results on determinants of health insurance choice are discussed in chapter four. Finally chapter five summarizes and discusses policy implications.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter reviews the studies that have been conducted in the area of our interest. It is divided into two sections: theoretical literature and empirical literature.

2.2. Theoretical Literature

The demand for health, health services and health insurance all build on conventional economic theory of demand. Demand for health insurance is a doubly derived demand. First, demand for health services is derived from demand for health and the expected ability of health care to contribute to improved health (Grossman, 1972). Second, the demand for health insurance is derived from the demand for health services (Besley in Jowett, 2004). He further notes that individuals maximise their utility within their budget constraints, health being one of the many goods contributing to utility. By investing in goods that improve health, one achieves better health, which in turn leads to both a consumption gain, that is, being healthy enables a range of activities to be achieved, and an investment gain, that is, better health increases lifetime earnings.

People demand health care just like any other consumer good or service, because it provides utility for them. However, unlike the demand for other goods and services, the demand for health care is unpredictable and uneven (Arrow, 1973). This fact places the household's income at a risk since the cost of healthcare randomly reduces the disposable income. The conventional theory of demand for health insurance argues that risk-averse people gain from the risk reduction

offered by insurance coverage, that is, people can reduce the variability of their financial losses resulting from irregular and unpredictable medical expenditure by participating in a pooling arrangement. More precisely, purchase of health insurance coverage reduces financial risk (Neun and Santerre, 2004).

A number of theoretical studies analyzing the role of uncertainty in the demand for health care and health insurance have been conducted. Dandoni and Wagstaff (1990) applying the Grossman's (1972) pure consumption model of the demand for health analyzed the effects of uncertainty on demand for health care. They established that under likely assumptions, greater uncertainty results in an increase in demand for health care.

Koç (2004) modeled the effects of uncertainty (in pretreatment health and in the productivity of health care) and increases in risk aversion on demand for health insurance. Following the modeling of health insurance by Cameron et al. (1988) and Cutler and Zeckhauser (2000) they found out that demand for health insurance increases with increase in both the risk in the distribution of the pretreatment health and in uncertainty about the productivity of healthcare.

Nyman (1999) points out that people do not necessarily purchase health insurance to avoid risk but to a large degree, because of an underlying access motive. He observes that health insurance coverage provide financial access to medical care that some people could not otherwise afford because of their low income relative to the costs of many medical procedures. Nyman's theory argues that an individual gives up a premium payment and the corresponding consumption of

other goods and services when healthy, to receive an income transfer from those who remain healthy when he/she becomes ill.

The access motive has been analyzed by studies among them Cameroon et al. (1988). Modeling the interdependence between health insurance and health care demand decisions under uncertainty, they note that the individual may choose only between a discrete number of mutually exclusive health insurance policies.

2.3. Inefficiencies in the Insurance Market

Adverse Selection

In the insurance market, we face asymmetry of information, that is, insured individuals know more about their health status than insurers do. Since people only buy insurance if the benefit exceeds the price, riskier persons (those in worse health) are more likely to purchase insurance or purchase higher coverage, other factors held constant, since the expected benefits are greater than those of the healthy persons. This situation is referred in the insurance economy to as adverse selection (Akerlof, 1970).

Moral Hazard

This refers to the tendencies for individuals to make purchases that are partly or fully paid by other, that is, it is the substitution effect of spending more on health care when its price is low.

Moral hazard may either be ex ante or ex post. Ex ante moral hazard refers to the effect of insurance on preventive actions taken before states of sickness occur, such as healthy lifestyles, preventive care, or early detection of diseases. In contrast, ex post moral hazard captures the size

of the financial loss or cost of treatment because of insurance coverage and may show up in terms of longer hospital stays and additional visits to health care providers. (Folland, Goodman and Santo, 2004).

Pauly (1968) modeled inefficiency in the insurance market induced by moral hazard. Assuming a fixed individual demand curve for health care and a constant marginal cost of production, he concludes that there is an efficient optimum for an uninsured patient. On the other hand, if the same individual were insured, the marginal cost of health care would exceed the consumer's willingness to pay for the extra units, and inefficiency would in so doing be introduced.

According to David de Meza (1983), an ill consumer's demand curve is not the same when insured as when uninsured. He observes that the reimbursement of medical expenses provided by insurance shifts the demand curve outward just as a cash transfer would. The consumer's willingness to pay thus increases with insurance coverage.

2.4. Empirical Literature

Kirigia et al. (2005), using data from the 1994 South African Health Inequalities Survey (SANHIS) examined the relationship between health insurance ownership and the demographic, economic and educational characteristics of South African women. Applying binary logistic regression technique, they found out that economic factors among them income, white collar occupation and being gainfully employed were significant determinants of health insurance ownership. Similarly, demographic factors (age, age squared and household size) and social factors (education and marital status) were significant predictors of health insurance ownership.

Other important determinants of health insurance coverage included environmental rating, residence, smoking, alcohol use and contraceptive use.

The 2002 Jamaican Survey of Living Conditions was used to model the determinants of private health insurance coverage. Bourne and Kerr-Campbell (2010), using logistic regression to estimate the determinants of health insurance coverage, found out that social standing, durable goods, income, marital status, area of residence, education, social support, crowding, psychological conditions, retirement benefits, living arrangements, the number of males in the household and good health determined health insurance coverage.

Nketiah-Amponsah (2009) investigated the determinants of public health insurance among women aged 15-49 in Ghana using primary data collected in three districts in Ghana in 2008. Using the logit model the paper concludes that marital status, income, age, religion and access to television and newspapers are the most significant determinants of women's insurance coverage. In addition, health inputs like medical personnel and health infrastructure increase demand for health insurance and health care. Another study using primary data was conducted in Ghana by Sarpong et al., (2010) to explore the association between socio-economic status and subscription to the Ghanaian National Health Insurance Scheme (NHIS). Applying logistic regression, they concluded that economic well being and distance to the closest health facility were important determinants of National health insurance coverage.

Gius (2010), using data from the 2008 National Health Interview Survey (NHIS) estimated the logistic model for determinants of health insurance coverage for young adults in the US. They

posit that socioeconomic factors among them, age, sex, race, employment, area of residence, cost of insurance and beliefs held about health insurance are important in determining the health insurance coverage.

In Malawi, Makoka et al., (2007), based on a logistic regression found income and education as significant determinants of private health care where public health services are free. This study used primary data collected from Blantyre and Zomba cities in 2003.

A working paper study by Bhat and Jain (2006) examined factors which affect both the decision to purchase insurance and the amount of health insurance purchase in a micro health insurance scheme setting. The primary data used for this study was collected from the Anand district in Gujarat. Using probit model and ordinary least squares techniques, they found out that age, household income, health expenditure, perception about the design and coverage of illness in health insurance policy, knowledge, information and awareness about health insurance, number of children were important determinants of health insurance purchase decision and amount of spending on insurance.

Takeuchi et al., (1998) estimating the logistic model for factors associated with health insurance coverage among Chinese Americans in Los Angeles county found out that marital status, length of stay in the United States, education, employment and household income were important factors determining health insurance coverage.

Hopkins and Kidd (1992), utilizing data from the 1989-90 National Health Survey examined the socio-economic variables which influence the demand for health insurance under medicare in Australia using the binary logit model. They conclude that age, income, health status, material wellbeing and geographical location are important determinants of decision to purchase insurance.

Sanhueza and Ruiz-Tagle (2002) sought to understand the determinants of peoples enrolment decision into private and public health insurance alternatives in Chile. Using the Chilean National Characterization Survey (CASEN) for 1996 and estimating probit models, they established that the most important factors determining decision to buy health insurance are income, age of the household head, health status, gender composition of the household and access to private providers. Torch and Claudia (2001), also in Chile explored the determinants of choice between public and private health insurance. The study utilized data from the 1990 and 1996 CASEN surveys. Estimating a logistic model, they established that the choice of health insurance is determined by income, expected expenditure (price) and area of residence. Other important factors were worse health status as signaled by age or sex.

Cameroon et al., (1988) investigated the interrelationship between demand for healthcare and the demand for health insurance. Utilizing the 1977-78 Australian Health Survey micro-level data they estimated a logistic model and concluded that the demand for healthcare is more related to the individual's health status rather than to the health insurance, while the demand for health insurance is determined by the individual's income.

Owando (2006) carried out a study on factors influencing the demand for health insurance in Kenya. Using the probit model, he found out that age, self evaluated health status, marital status, income, level of educational attainment, household size, risk behavior and employment status were important determinants of health insurance ownership in Kenya.

Another study by Mathuer et al., (2008) conducted an analysis on determinants of demand for Social Health Insurance of informal sector workers in Kenya using content analysis of Focus Group Discussions (FGDs). They established that lack of information on NHIF and inability to pay were the major barriers to NHIF enrolment.

2.5. Overview of Literature review

The literature review reveals that socio economic factors, knowledge/awareness about health insurance, health status and health expenditure are the major determinants of demand for health insurance. While most of these studies were based either on one type of health insurance or on the yes/no decision to own health insurance, this study extends the literature on two margins: one, by estimating a model using a recent, national sample of households providing information on different forms of health insurance. Second by using the multinomial logit model, this paper is the first to examine the health insurance determinants while allowing for heterogeneity of choices in the Kenya.

CHAPTER THREE

METHODOLOGY

3.1. Introduction

This chapter discusses the study framework. It will describe the model specification, the data sources, description of dependent and independent variables used in this study together with their expectations a priori and data analysis.

3.2. Theoretical framework

The theory of demand for health insurance is based on expected utility maximization theory introduced by Von Neumann and Morgenstern in 1944. Although frequently criticized, this theory is most commonly used in models of decision-making under risk (Schneider, 2004). Conventionally, individuals are assumed to be risk averse. They, thus, purchase health insurance to avoid the financial risk of lacking money to fund medical care in future. Nonetheless, the benefits gained from health insurance coverage is not only limited to the avoidance of uncertain risk but also its ability to make health care accessible (Nyman, 1999).

The theory of expected utility maximization postulates that individuals will choose between alternatives depending upon which offers the highest total expected utility. In the context of health insurance, there are two possible states of the world: the healthy state where one is not ill and the unfortunate state which can be described as the event of illness or fear of illness serious enough to require an individual or family to pay the full cost of necessary and efficient medical care solely out of current income or wealth. Health insurance can only be utilized in the case of

illness. As a result, the utility of any form of health insurance in case of an occurrence of this state (illness) is greater than in the case of well-being.

The existence of illness is considered as a random event that influences individual's utility. The course of this event can be set as π when illness occurs and $1 - \pi$ when illness does not occur. Formally, if Y_1 is the original income or wealth level and a loss of $Y_1 - Y_0$ occurs because a person becomes ill and must spend that amount of otherwise disposable income or wealth on health care, then expected utility without insurance is:

$$Eu_{\text{uninsured}} = \pi u[Y_1 - (Y_1 - Y_0)] + (1 - \pi)u(Y_1) \\ = \pi u(Y_0) + 1 - \pi u(Y_1) \dots\dots\dots(i)$$

The theory of choice under uncertainty asserts that risk-averse individuals will always purchase insurance offered at an actuarially fair premium. Additionally, in the absence of moral hazard, the optimal level of coverage is the expected value of the loss, that is, the individual will choose a level of coverage that yields expected out-of-pocket expenses of zero. If Y^* is the expected value of the income given a particular level of health care spending, such that the actuarially fair premium payment is $Y_1 - Y^*$ then expected utility of insurance with a payoff that covers the entire loss is:

$$Eu_{\text{insured}} = \pi u[Y_1 - (Y_1 - Y_0)] + (Y_1 - Y_0) - (Y_1 - Y^*) + (1 - \pi)u(Y_1 - (Y_1 - Y^*)) \\ = \pi u(Y^*) + (1 - \pi)u(Y^*) = u(Y^*) \dots\dots\dots(ii)$$

If the marginal utility of income is diminishing, the consumer is better off purchasing health insurance and avoiding loss, $Y_1 - Y_0$. Thus the expected-utility maximizing consumer would purchase insurance coverage for those expenditures if:

$$u(Y^*) > \pi u(Y_0) + 1 - \pi u(Y_1) \dots\dots\dots(iii)$$

Individuals choose the insurance that maximizes their expected utility. An individual will, thus, choose a particular insurance type say, j over another insurance type say, k, if the expected utility of (j) is greater than the expected utility of (k). The utility comparison is expressed as:

$$U_{i,j} = U_{i,j} > U_{i,k} \text{ for all } k \neq j \dots\dots\dots(iv)$$

Where $U_{i,j}$ is the perceived benefit of ownership of insurance type j by individual i while $U_{i,k}$ is the benefit of purchase of insurance type k by the same individual i.

3.3. Model Specification

The decision to buy health insurance is formulated in two interrelated choices. First, the choice is related to the decision to buy or not the health insurance. Second, if the decision to buy health insurance is positive, then one makes a choice amongst the various alternatives of health insurance schemes available. This study concentrates on the latter form of choice.

In this study, multiple outcomes are observed for choice of type of health insurance; (National Health Insurance Fund/ employer based, National Social Security Fund, private health insurance, Community Based Health Insurance or remaining uninsured). Discrete choice models are used in

such scenarios where the decisions are made based on various options (Green, 2000; Maddala, 1983).

Multinomial logit model is considered most suitable when a study uses a discrete dependent variable which takes unordered outcomes⁶. This is because it is simple, easy to estimate and interpret and provides cross elasticities (Greene, 2000). We estimate a multinomial logit model (MNL.M) to examine the socio-economic factors associated with health insurance schemes choice in Kenya. In this model, it is assumed that individuals know all the attributes of each health insurance alternative. They thus choose the alternative that maximizes their utility.

We assume that, for each alternative health insurance scheme j , head of household (HHH) i utility function can be expressed in a linear model as follows:

$$U_{ij} = X_i\beta_j + \varepsilon_{ij} \dots\dots\dots(v)$$

Where, $i = 1, \dots, n$ heads of households and $j=0, \dots, j$ alternatives.

X_i represents all the factors (individual or household characteristics) that could affect health insurance choice. The following factors were included: age, gender, marital status, employment status, highest level of education attained, size of household, access to information, cigarette smoking status and wealth index. β_j is a vector of parameters associated with the independent variables whereas ε_{ij} is the error term.

The probability that j will be chosen is:

$$\begin{aligned} p(y_i = j) &= p(U_{ij} > U_{ik}) \forall k \neq j \\ &= p(\varepsilon_{ik} - \varepsilon_{ij}) \leq x_{ij}\beta_j - x_{ij}\beta_k \forall k \neq j \dots\dots\dots(vi) \end{aligned}$$

⁶ We assume that the error term is independent of predictors and has the standard logistic distribution.

Assuming that the terms $\varepsilon_{i,j}$ are independently and identically standard extreme value distributed then equation (vi) yields a multinomial logit model which takes the form:

$$Pr ob(y_i = j) = \frac{\exp(x_{i,j}\beta_j)}{\sum_{j=0}^J \exp(x_{i,k}\beta_j)} \dots\dots\dots(vii)$$

Where $Y_{i,j}$ is the probability of the i^{th} household choosing outcome j , x_i is a vector of observations affecting the outcomes, β_j is the coefficient to be estimated and J is the number of alternatives. Household heads (HHH) will be characterized as making one choice among five mutually exclusive outcomes: to purchase National Health Insurance Fund/Health insurance through employer, to purchase National Social Security Fund scheme, to purchase private health insurance, to purchase community based health insurance scheme or remain uninsured.

The choice probabilities are given by estimating log-likelihood for multinomial model (with independent observations) which is of the functional form:

$$Log L = \sum_i \sum_j y_{i,j} \log P_{i,j} \dots\dots\dots(viii)$$

3.4. Measurement of Variables

3.4.1. Dependent Variable

The dependent variable is the various forms of health insurance schemes whose outcomes are categorized into five mutually exclusive states: insured under National Health Insurance Fund/ employer based, insured under social security, insured under private health insurance, insured under mutual or community based health insurance or not insured at all. “No health insurance”

outcome was set as the base category, with the effect of explanatory factors on the choice of other outcomes (insurance schemes) being compared to this group.

3.4.2. Independent Variables

Demographic and socio-economic variables were used to reflect individual and household preferences. They include: age, gender, marital status, employment status, highest level of education attained, size of household, access to information, cigarette smoking status and wealth index. These explanatory variables were measured as follows:

Education

Grossman (1972) explains that education increases the efficiency of production of health, that is, those who are better educated may not only have greater knowledge and understanding of health information, but are also capable of making better health-related decisions or formulating better mixtures of health inputs. It is therefore expected that education may impact directly on the insurance decision via its role in health decision-making.

This indicator is defined as the highest level of schooling attended by the household head and is categorized into: none, primary, secondary and tertiary/ higher than secondary.

Knowledge and awareness about insurance forms

Similarly, access to information through the media was investigated. Advertising through mass media may influence the decision to choose the form of health insurance that an individual will undertake. Insurance products are advertised through print and audio media channels (television,

newspapers, radio, billboards et cetera). Thus we suppose that, access to these different types of media becomes an important variable to investigate. In the KDHS 2008, respondents were asked to note down which media channels they usually access and since data for access to print media was more convenient to work with, it was used to measure awareness. The frequency of reading newspaper or magazine was categorized into: not at all, less than once a week, at least once a week and almost every day.

Age and other Family Characteristics

Age is a variable associated with every measure of health issues and is therefore vital to consider in health related discourses. Age may act as an important factor of probability to insure not only because it is a variable associated with high indirect risk vulnerability and thus increased expected medical consumption but also because it is also associated with increased stock of wealth. Age of the household head will be treated as a continuous variable ranging from eighteen to forty nine years.

Specific family characteristics, relating to both family size and makeup, may influence medical need and material welfare. For instance, presence of more family members, particularly dependants, may lead to a lower family wealth stock and hence lower the tendency to insure. This variable is investigated by considering the number of children in a household.

Economic welfare (wealth index)

Empirical studies have cited income (which is a proxy for economic welfare) and wealth as important determinants of selection into health insurance (Bourne and Kerr- Campbell, 2010; Nketiah-Amponsah, 2009; Sarpong et al., 2010; Hopkins and Kidd, 1992). Wealth and higher income generally decreases the opportunity cost associated with the purchase of health

insurance. Proxies of economic welfare among them occupation, land ownership and characteristics of dwelling place were potential candidates for economic welfare to be used in this study. But the best among them was wealth index measured on the following scale: poorest, poorer, middle, richer and richest.

Gender

These demographic variables are found important in the literature of health insurance (Bhat and Jain, 2006; Kong, 2010). Males are expected to bear a different preference for insurance schemes from their female counterparts. Gender variable was measured as a dummy variable capturing whether the respondent was male or female.

Employment Status

Theorists and empirical works (see for example Kirigia et al., (2005) suggest that employment status may be linked to tendency to insure against health risk. Employed individuals may be enabled by higher incomes but also their level of exposure. We argue that, employed respondents will find themselves in certain insurance schemes (like NHIF) not of their own volition but by statutory requirements on the employer. Still employment status may explain why individuals prefer certain insurance schemes to others.

Smoking Status

This variable is used to investigate risk aversion. Theory indicates that risk averse persons are more likely to purchase insurance than risk lovers. Cigarettes smokers are assumed to be risk lovers and are thus less likely to purchase health insurance. Smoking status variable was measured as a dummy variable indicating whether the respondent smokes or not.

Table 3.1: A summary of the study variables

Variable	Expected Sign	Measurement
Dependent Variable		
Health insurance schemes dummies	-	Categories of health insurance schemes: NHIF, CBHI, NSSF, Private and None (nominal)
Independent/ Explanatory Variables		
Education	Positive (+)	Highest level of education obtained by the household head. Categorized into: 0=none, 1=primary, 2=secondary and 3= higher
Knowledge/awareness	Positive (+)	Dummies on household access to newspaper or magazine (0= not at all, 1= less than once a week, 2= at least once a week and 3= almost every day)
Age	Positive (+)	Age of the household head in years ranging from 15-49
Household size	Negative (-)	Number of household members
Area of residence	Positive (+)	A dummy variable (1=urban,0=rural)
Gender	Negative (-)	A dummy variable (1=male, 0= female)
Employment status	Positive (+)	A dummy variable (1= currently working 0=otherwise)
Wealth index	Positive (+)	Ordinal ranging from 1= poorest, 2= poorer, 3= middle, 4= richer and 5= richest
Smoking Status	Negative (-)	Dummy variable (1 = yes, 0 = no)

3.5. Data Sources

The study utilized secondary data drawn from the 2008-09 Kenya Demographic Health Survey (KDHS). The survey data is a national representative sample survey of 8,071 women aged between 15-99 years and 14,463 men aged between 17 and 98 years of age selected from 400

sample points (clusters) throughout Kenya. Data collection was done from the month of November, 2008 to February, 2009, using the interview method where a questionnaire was administered.

The 2008-2009 KDHS for the first time included questions pertaining to health insurance, besides detailed information on a series of personal characteristics including age, gender, marital status, area of residence, highest level of education attained, access to print and audio media, wealth index and health related behaviors of each member of the household in addition to the household head characteristics.

3.6. Study Sample

We used data from the Kenya Demographic and Health Survey (KDHS) in 2008/2009 covering 22,534 households. KDHS is a national survey which is conducted after every five years with information on demographics, education, health, employment (on an individual level), income, assets, expenditure (on a household level) and a range of community-level infrastructural and institutional variables.

For the first time, the 2008/09 KDHS collected valuable information on types of health insurance for surveyed households. These types of health insurance are: mutual or community, National Health Insurance Fund (NHIF) which is employer provided, National Social Security Fund (NSSF) which is national social protection, private or commercial insurance and finally lack of any insurance cover.

The KDHS 2008/2009 has hundreds of variables. From the vast list of variables we selected only the variables that were relevant to this study. the following variables for the household head

(HHH) were chosen: education level, size of household, age, gender, level of awareness about insurance, wealth index, employment status, area of residence (whether urban or rural), whether the respondent smokes cigarette and the insurance type undertaken

3.7. Data analysis

Statistical Analysis software (STATA), which is a programming-based analytical tool that is widely used in analysing health statistics, was used to analyse the data. Joint significance was tested using Chi-square statistic while individual significance of variables was evaluated using T-test. Inferential statistics was used to establish which factors might affect choice of health insurance among individual households.

A limitation of MNLM is the independence of irrelevant alternatives (IIA), that is, it is assumed that the utility of a choice option is independent of the attributes of other alternatives of the choice set. Therefore, underlying assumption of Multinomial Logit model (MNLM) is that the ratio of the probabilities of two alternatives j and k depends only on alternatives j and k and not on the presence of any other alternative (IIA property) (Green, 2000). A Hausman test procedure was performed and we verified that this assumption was upheld for the data under study.

CHAPTER FOUR

EMPIRICAL RESULTS

4.1. Introduction

This chapter presents descriptive statistics of the study data and important findings of the research. The chapter also lays the foundation for discussion.

4.2. Summary of descriptive statistics

Descriptive statistics provide an important exploratory procedure that enables the researcher have a feel of the data set. The first technique was to find out how the variables were labeled and how the value labels were coded. Most of the variables were ready for analysis without any transformation. Cases of those variables with missing responses were dropped before conducting summary statistics and normality checks.

Table 4.1: Summary statistics

Variable	Number of Observations	Mean	Standard deviation	Min	Max
Age of the household head in years	22386	35.20348	8.244548	15	49
Area of Residence (1=urban, 0=rural)	22386	.2065577	.4048443	0	1
Level of education	22386	1.011212	.756483	0	3
Household size (number of members)	22386	6.074064	2.549428	1	19
Gender (1=male, 0=female)	22386	.6412937	.4796315	0	1
Awareness (access to media)	22386	.4463057	.8025523	0	3
Wealth index	22386	2.779282	1.452462	1	5
Smoking status	22386	.0044224	.0663555	0	1
Employment status	22386	.6393282	.4802062	0	1

The KDHS 2008/2009 had a total of 22,534 respondents, although this study utilizes 22,386 cases since some of them were dropped during data cleaning. Interpreting the mean, most of the respondents had primary level of education, the average household had 6 members, most households were male headed (64%) and the mean age of household head was 35 years. On average respondents rarely read or heard information about insurance from media, most respondents belonged to the middle category of wealth index and 63.9% of respondents were currently working. Rather than being covered by mutual or community insurance, employer based (NHIF), social security (NSSF) or private cum commercial insurance, majority of sampled respondents were not insured at all. Results of table 4.7 confirm that nearly 94% are uninsured.

Table 4.2: Categories of health insurance owned

Health Insurance Scheme	Frequency	Valid percentage	Cumulative percentage
National Social Security Fund	262	20.5	20.5
National Health Insurance Fund	717	56.0	76.5
Private	172	13.4	89.9
Community based	130	10.1	100

From table 4.2, it is clear that most respondents are covered by the National Health Insurance Fund. This could be attributed to the fact that this form of health insurance scheme is mandatory to employees in the formal sector. It should be noted that those in the informal sector can enroll in the NHIF on voluntary basis. Community based health insurance schemes are the least owned perhaps because they are highly based on mutual trust and cannot admit strangers.

Table 4.3: Summary statistics for respondents covered by social security (NSSF)

Variable	Mean	Standard deviation	Min	Max
Age of the household head in years	37.76718	7.196423	22	49
Area of Residence (1=urban, 0=rural)	.4503817	.4984841	0	1
Level of education	1.98855	.8234253	0	3
Household size (number of members)	5.70229	2.388333	1	11
Gender (1=male, 0=female)	.6832061	.4661167	0	1
Awareness (access to media)	1.450382	1.041026	0	3
Wealth index	4.232824	.8183661	2	5
Smoking status	0	0	0	0
Employment status	.8473282	.3603592	0	1

Overall, the academic achievement of HHH covered by NSSF was secondary school level and based in the rural areas. The average size of household was 6 members; most were male headed (68%), 37 years old with at least weekly media awareness of insurance. Their wealth index is the “richer” category with nobody being in the poorest category. A high 85% were in employment and there were no smokers in this group.

Table 4.4: Summary statistics for respondents covered by NHIF

Variable	Mean	Standard deviation	Min	Max
Age of the household head in years	36.92887	6.991952	18	49
Area of Residence (1=urban, 0=rural)	.4476987	.4976042	0	1
Level of education	2.156206	.825996	0	3
Household size (number of members)	5.338912	2.314227	1	11
Gender (1=male, 0=female)	.5997211	.4902968	0	1
Awareness (access to media)	1.446304	1.111885	0	3
Wealth index	4.317992	.9331705	1	5
Smoking status	.0013947	.0373457	0	1
Employment status	.8702929	.3362155	0	1

In this category, the average respondent is male (60%) with secondary level of education, residing in rural areas and in the richer wealth index as is the case with HHH in NSSF cover. The range of wealth index is slightly wider than in NSSF and includes the poorest lot. A larger proportion is employed (87%) while average age is slightly lower, that is, 36 years. Another difference is that 0.1% of respondents in this group are smokers.

Table 4.5: Summary statistics for respondents under private health insurance

Variable	Mean	Standard deviation	Min	Max
Age of the household head in years	37.19186	7.247774	19	49
Area of Residence (1=urban, 0=rural)	.7965116	.4037681	0	1
Level of education	2.424419	.7723945	0	3
Household size (number of members)	5.05814	2.218237	1	13
Gender (1=male, 0=female)	.872093	.3349613	0	1
Awareness (access to media)	2.30814	1.01067	0	3
Wealth index	4.831395	.5928939	2	5
Smoking status	.0116279	.107517	0	1
Employment status	.6802326	.4677481	0	1

The typical HHH under private health insurance is likely to be a 37 year old urban male employee with secondary school and tertiary levels of education. Their household is smaller with 5 members. He/she has weekly access to publicity of insurance products and belongs to the richest wealth index category (ranging from of “poorer” towards the “richest” wealth index). 68% of the respondents are in employment while 1.2% are smokers in this group. This scheme records the lowest employment and highest smoking proportions among respondents with insurance cover. Perhaps they are business people in self set-up income earning activities, but

they are also in a position to finance their perilous health habits granted they are the richest group.

Table 4.6: Summary statistics for respondents with mutual/community health insurance

Variable	Mean	Standard deviation	Min	Max
Age of the household head in years	36.82308	7.918642	21	49
Area of Residence (1=urban, 0=rural)	.3769231	.4864901	0	1
Level of education	1.669231	.6396276	1	3
Household size (number of members)	5.723077	2.452701	1	11
Gender (1=male, 0=female)	.6307692	.4844634	0	1
Awareness (access to media)	1.007692	.9843437	0	3
Wealth index	3.992308	1.096125	1	5
Smoking status	0	0	0	0
Employment status	.9076923	.2905796	0	1

Among households with mutual/ community health insurance cover, the typical HHH has secondary level of education and is in the richer wealth index group. The average household has 6 members with near the total (ninety one per cent) being in employment. Given their high economic status, it is possible they also engage in non white-collar income opportunities. The lowest ranked person with this category of health insurance cover belongs to the poorest wealth index but no one in this group smokes cigarettes.

Table 4.7: Summary statistics for respondents with no insurance cover

Variable	Number of Observations	Mean	Standard deviation	Min	Max
Age of the household head in years	21132	35.099	8.294782	15	49
Area of Residence (1=urban, 0=rural)	21132	.1898542	.392195	0	1
Level of education	21132	.9471891	.7019872	0	3
Household size (number of members)	21132	6.115938	2.554817	1	19
Gender (1=male, 0=female)	21132	.6399773	.480018	0	1
Awareness (access to media)	21132	.3845353	.7348639	0	3
Wealth index	21132	2.686589	1.425633	1	5
Smoking status	21132	.0045429	.0672492	0	1
Employment status	21132	.6276737	.4834361	0	1

The highest proportion (94% or 21,132 out of 22,286) household heads said they had no insurance cover. Notably, unlike their counterparts, the uninsured group has unfavorable social economic characteristics. This lot had very large households (6 members) with less than primary school level of education and almost no awareness of insurance; 63% are in employment. Less than 1% smokes cigarettes. The range of age and household size is widest in this category of uninsured respondents.

4.3. Diagnostic tests

Shapiro-Wilk Normality test

The Shapiro-Wilk “W” test for normality of data has a threshold of 0.7 for the W statistic. Figures above this threshold indicate normally distributed data whereas figures below point to

non-normal distribution. Significant results ($p\text{-value} < 0.05$) confirm such conclusion for the associated variable.

Table 4.8: Shappiro-Wilk “W” test for normal data

variable	“W”- Value	z-Statistic	P-Value
Age of the household head in years	0.97951	14.479	0.00000
Area of Residence (1=urban, 0=rural)	0.99972	2.731	0.00316
Level of education	0.99435	10.961	0.00000
Household size (number of members)	0.97081	15.445	0.00000
Gender (1=male, 0=female)	0.99997	-3.338	0.99958
Awareness (access to media)	0.97519	15.002	0.00000
Wealth index	0.99324	11.452	0.00000
Smoking status	0.97992	14.424	0.00000
Employment status	0.99997	-3.429	0.99970

The findings indicate that all variables have the required ‘W’ statistic for normal distribution of data. However two variables, gender of household head and employment status, have insignificant results, obviously due to the fact that they are binary response variables with only two outcomes.

Correlation Analysis

A correlation coefficient measures the association between two or among more variables in terms of direction and strength of that relationship. The coefficient ranges from negative one and positive one with values near absolute value of one being strong correlation and those near zero being weak correlation.

Table 4.9: Correlation between individual variables

	Health Insurance Scheme	Age of HHH	Area of residence	Household size	Gender	Awareness	Smoking status	Employment status	Wealth index	Education level
Age of HHH	-.0474 (.000)	1								
Area of residence	-.1373 (.0000)	-.0870 (.0000)	1							
Household size	.0567 (.0000)	.0968 (.0000)	-.1941 (.0000)	1						
Gender	0.0027 (.6914)	-.1132 (.0000)	.0298 (.0000)	.2357 (.0000)	1					
Awareness	-0.2672 (.0000)	-.0530 (.0000)	.3208 (.0000)	0.1424 (.0000)	.0452 (.0000)	1				
Smoking status	0.0098 (.1427)	.0287 (.0000)	.0059 (.3770)	0.0191 (.0043)	-.0274 (.0000)	-.0077 (.2490)	1			
Employment status	-0.1029 (.0000)	.1535 (.0000)	.0087 (.1944)	-.0639 (.0000)	-.0317 (.0000)	.1388 (.0000)	-.0074 (.2669)	1		
Wealth index	-.2347 (.0000)	-.0271 (.0001)	.6080 (.0000)	-.2765 (.0000)	.0281 (.0000)	.4314 (.0000)	-.0140 (.0365)	.1432 (.0000)	1	
Education level	-.3110 (.0000)	-.0313 (.0000)	.2637 (.0000)	(.1996) (.0000)	.0650 (.0000)	.5435 (.0000)	-.0179 (.0074)	.2148 (.0000)	.4978 (.0000)	1

From the results of correlation analysis, we note that wealth index and area of residence are significantly correlated (0.6080). The level of education was also significantly correlated with awareness /access to information (0.5435). While the high correlation among the covariates suggests that one of them should be dropped, the degree of relationship is low (below 0.7 and not very far from 0.5). Given the importance of the variables, they were included in the estimation results. None of the other variables show chances of multi-collinearity and there is no zero correlation, thus they were good determinants of demand for health insurance.

The variable measuring the preferred insurance scheme was nominal (neither continuous nor ordinal) which means correlation between explanatory variables and insurance scheme wasn't really meaningful. Key findings from the correlation results are that, older household heads associate with higher employment, more smoking, less wealth, less education and rural residence; also, youthful people are more aware of insurance products, schemes and benefits of

taking cover. These findings may be verified by regression analysis at which stage we establish the cause-effect relationship.

4.4. Estimation Results

The objective of the paper was to analyze the determinants of choice of health insurance scheme based on demographic and socio-economic characteristics. Since the dependent variable took unordered categorical outcomes (social security (NSSF), employer based/ NHIF, private, mutual/community based and none), multinomial logit was adopted as the analytical technique with the “uninsured” response as the base outcome, the results of which appear in table 4.10.

Table 4.10: Multinomial Logit Parameter Estimates (Absolute z-Statistic in parenthesis)

Variables	Mutual health insurance scheme	NHIF	NSSF	Private Scheme
	Coefficient estimates (Z-statistic in parentheses)			
Age of the household head in years	.0222788 (1.85)	.0278586 (4.75)	.0432073 (4.84)	.0496907 (4.21)
Area of Residence (1=urban, 0=rural)	-.4077704 (-1.71)	-.6810813 (-6.18)	-.5329659 (-3.22)	-.0146245 (-0.06)
Household size (number of members)	.0944595 (2.63)	.0636886 (3.38)	.0964773 (3.73)	.0314379 (0.76)
Gender (1=male, 0=female)	-.1242023 (-0.62)	-.4114029 (-4.44)	-.0740667 (-0.51)	.9029793 (3.67)
Awareness (access to media)	-28.66355 (0.64)	.1839111 (3.80)	.3156126 (4.29)	.8672582 (7.98)
Smoking status	-28.66355 (0.00)	-1.241515 (-1.19)	-29.91801 (-0.00)	.9665184 (1.22)
Employment status	1.3463 (4.21)	.6199323 (5.14)	.5570649 (3.10)	-.5404963 (-2.88)
Wealth index	.5930883 (5.56)	.7967485 (13.60)	.6961255 (8.11)	1.183682 (5.69)
Level of education: <i>Primary (educ 1)</i>	18.9315 (27.86)	2.189133 (4.30)	.3714824 (1.01)	1.087127 (1.05)
<i>Secondary (educ 2)</i>	19.93027 (28.08)	3.109718 (6.06)	1.616458 (4.83)	1.434436 (1.38)
<i>Higher (educ 3)</i>	19.77884 (28.28)	4.810729 (9.27)	2.648063 (6.60)	3.115381 (2.98)
Constant	-28.54312 /	-10.56511 (-17.65)	-10.45539 (-17.87)	-14.60791 (-10.35)
Log likelihood = -4514.4763; Number of obs = 22386; LR chi2(44)=330 Prob > chi2 = 0.0000; Pseudo R2 = 0.2681				

The likelihood of the model is the probability that you would observe the dichotomous (actually multichotomous) outcomes of the sample, given the coefficient estimates. The logit and probit algorithms maximize the logarithm of this likelihood, and since the probabilities lie between zero and one, then the log likelihood is always negative. Our maximum log likelihood of obtaining multi-outcomes of insurance types from the sample is -4514.4763 whose test Chi-statistic is calculated by the following formula.

$$\chi^2 = -2[\ln L(\text{constrained}) - \ln L(\text{unconstrained})] \sim \chi^2(j) = 330.734$$

Since the calculated chi-square statistic is highly significant at 1%, then the null hypothesis that the constrained model is correct is rejected. In other words the probability in the upper tail beyond the calculated statistic is smaller than the significance level chosen for the test. Hence our independent variables are important covariates to the model (compared to the model with intercept alone).

Interpretation of regressor coefficients depends on whether the variable is binary or continuous. Whereas the coefficient of continuous predictors can be interpreted directly, that of binary nominal variables becomes the power of the exponential constant thus requires transformation.

The effect of education is phenomenal in favor of mutual schemes. Assuming all other things held constant, a respondents with primary, secondary and tertiary education attainment have $\exp(18.9)$, $\exp(19.9)$, $\exp(19.7)$ respective higher odds of choosing mutual or community insurance above those with no education. An additional member into the household increases the odds by .09, males have a $\exp(-0.124) = 1.1$ times less relative risk of choosing community insurance over females. Higher media publicity of insurance reduces the odds of choosing mutual insurance; a level rise in wealth index increases the odds by 0.59 while employed HH heads have $\exp(0.135) = 1.1$ better odds of choosing mutual over no-insurance compared to the unemployed. As a result, mutual schemes could be considered as a normal good. Finally,

smoking cigarettes⁷ contribute $\exp(-28.66)=0.0$ or zero change in odds of choosing mutual/community based cover.

Interpreting coefficients of choice of NHIF cover, we find that, *ceteris paribus*, a respondents with primary, secondary and tertiary education attainment have $\exp(2.18)=8.8$, $\exp(3.11)=22.2$, $\exp(4.81)=122$ respective better odds of choosing NHIF scheme than those with no education. An additional member into the household increases the odds by 0.064; males have a $\exp(.4114)=0.7$ less odds of taking up employer schemes. Age of HH heads and awareness of insurance products increases chances of choosing NHIF with an extra year contributing 1.0 and awareness 1.2 to the odds; Smoking reduces odds of choosing NHIF by $\exp(-1.24)=0.3$ times; wealth index is more important positive determinant here than for choosing mutual security. Employees are twice likely [$\exp(.62)=1.9$] to choose employer based cover than their unemployed colleagues. This is not a surprising observation since those employed in the formal sector must enroll in this scheme due to statutory requirements.

Compared to lack of education, *ceteris paribus*, primary level, secondary level and tertiary levels have $\exp(.37)=1.5$, $\exp(1.6)=5$ and $\exp(2.6)=14$ times higher chances of taking up social security. If everything else were assumed unchanged, addition of one more member into a household increases their relative risk ratio of choosing NSSF by .096 units, males have a $\exp(-.074)=0.9$ less odds of choosing social security. An extra year in age contributes .043 to the odds of choosing social security cover. More frequent access to insurance information via media has 0.315 higher odds of choosing social security while smoking reduces the odds. Those in higher

⁷ This study used smoking cigarettes as a proxy for consumers' attitudes towards health risk.

wealth index have 0.7 higher odds whereas the employed have higher odds $\exp(0.557)=1.7$ of choosing social security, ceteris paribus.

In the case of private health or commercial insurance scheme, attaining primary level, secondary level and tertiary level of education increases chances of taking up private health insurance by $\exp(1.09)=3.0$, $\exp(1.43)=4.2$ and $\exp(3.1)=22.5$ times, ceteris paribus. Unlike in the other forms of health insurance schemes, males have a higher relative risk ratio of $\exp(0.90)=2.5$ times of choosing private health insurance. A year extra increase in age increases chances of choosing private/commercial insurance by 0.049 units. A level increase in awareness raises the odds by 0.87 whereas a level rise in wealth index increases the odds by 1.18 units. Smoking status increases the chances of choosing private schemes by 2.7 times; rural residents are least likely to choose this scheme and employment decreases probability of taking private cover (being employed has 0.5 times less contribution to choice of private scheme than being unemployed).

4.5. Discussion of Results

Age

The effect of age on demand for health insurance is positive across all forms of health insurance schemes indicating that purchase of health insurance relative to being uninsured increases with age. Economic theory predicts that stock of health depreciates at a decreasing rate with increase in age. Older individuals thus tend to increase their investments in health (health insurance included) in order to decrease the rate of health depreciation. This could be confounded by other variables such as education and income which are likely to increase with age. The results are similar to those by Kirigia et al. (2005) in South Africa, Bhat and Jain (2006) in Gujarat, Gius

(2010) in the US and Owando (2006) in Kenya among others. But we find some relative difference in that older people are more likely to choose NSSF (which is statutory) and private schemes (which they can afford in agreement with life-cycle hypothesis). We also note that the age variable is not statistically significant for mutual health insurance scheme.

Gender

Gender has a significant bearing on choice of insurance schemes. To begin with, males form the majority of respondent without cover, indicating that males are risk takers. The coefficient on gender dummy is negative and statistically significant in mutual, NHIF and NSSF suggesting that being male decreases the likelihood of insuring oneself relative to no insurance. It is hypothesized that females especially at the reproductive age demand more medical services and are hence more likely to purchase insurance cover more than men. Indeed a decade ago, the study by Bourne and Kerr-Campbell (2010) in Jamaica determined that health insurance coverage is partly a function of the number of males in a household. And choice of insurance schemes discriminates against gender with males preferring private options whereas females have preference for mutual/community and employer-based schemes. Mutual schemes are based on trust and it connotes that this aspect plays a role in determining female choice of health insurance cover.

Access to media

Higher media publicity of insurance reduces the odds of choosing mutual insurance – mutual schemes do not need any media marketing since they are mainly local social security/self help groups formed by friends or family. The results are however statistically insignificant (p -value=0.521). Access to information was a significant determinant for choice of NHIF, NSSF

and private health insurance. These findings are not surprising since, Nketiah-Amponsah (2009) in Ghana and Bhat and Jain (2006) in Gujarat realized that awareness and knowledge about health insurance were significant determinants of health insurance coverage. Similarly, the study by Mathuer et al., (2008) on demand for Social Health Insurance of informal sector workers in Kenya established that lack of information was a major barrier to enrolment. Access to information therefore becomes a vital component of increasing uptake of health insurance cover.

Wealth index, Income and Employment Status

Wealth index variable has the expected sign and is statistically significant. The current work reveals that those in the poorest wealth index are less likely to take health insurance. A rise in wealth index significantly increases the odds of choosing all the four types of insurance scheme. This is an indication that health insurance is a normal good. We also notice that wealthier people will choose private schemes more than any other option. The findings concur with those by Bourne and Kerr-Campbell (2010). Employed people are more likely to be covered by mutual and NHIF than private and NSSF. Obviously, employees are twice likely to choose employer based cover than their unemployed colleagues which is because employers are mandated to insure their workers.

Education

As expected, education increases the probability of taking up insurance of all types with more educated individuals intending to insure. The results are in line with the hypothesis that educated people have the ability to not only to acquire skills and knowledge but also to make informed choices on health related matters among them purchase of health insurance to avoid catastrophic health expenditures. This important role played by education is well documented by Grossman

(1972). Similar results were obtained by Kirigia et al., 2005; Kidd and Hopkins, 1996; Nketiah-Amponsah, 2009 and Bourne and Kerr-Campbell, 2010 among others. The results however indicate that education is most responsive in mutual schemes. Also, we realize that individuals taking up private insurance belong to the highest wealth index, are relatively older with a higher awareness and the highest education level than the rest. Individuals taking up mutual community schemes belong to the lowest education level than the rest.

Household size

The study established that larger sized households associate more with NSSF and mutual fund schemes whereas smaller households associate with private schemes in agreement with previous works. For instance, Bhat and Jain (2006) who studied factors which affect the decision to purchase insurance as well as the amount of health insurance bought in micro health insurance scheme settings of Gujarat found the number of children to be an important determinant. The findings however differ from those of Kirigia et al., (2005).

Residence

Rural residents are more likely to be in mutual and statutory schemes. Kenyan villages have more tendencies for residents to come together in social self help groups which explain their preference for mutual cover. Concerning statutory cover, NHIF has in last 5 years done aggressive marketing in the villages which has increased coverage there. Urban residents are most likely to be in private health cover, perhaps because they can afford it. Residence has been found to-determine choice of health insurance by previous works; see Hopkins and Kidd (1992) and Torch and Claudia (2001) in Chile, for example.

Smoking habit

Across all the insurance schemes, smokers are found less likely to take cover than non smokers, with private schemes taking the bulk of their cover (although statistically insignificant). It is likely that either they hide this habit from insurers (information asymmetry), are risk takers and therefore less likely to take up insurance cover or they are able to finance this risky health habit since we notice that private insurance scheme has people in the richest wealth index most of whom are in informal sectors. Smoking variable may be viewed as proxy for expected health consumption in which case, a positive coefficient parameter suggests presence of moral hazard (Kirigia et al., 2005 and Owando, 2006). On the other hand, it may be seen as a proxy for risk aversion as is the case with this paper. Our results echo those of Kidd and Hopkins (1996) who interpret the negative coefficient as evidence that less risk averse individuals are less likely to purchase health insurance cover.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary

The study aimed at investigating and analyzing determinants of choice of various insurance schemes available to Kenyans, with the recognition that information and awareness is a key variable in insurance buying process. Using a multinomial logistic model on KDHS 2008/09 data set, we were able to estimate relationships of demographic and other covariates on choice of mutual, employer based, social security and private/commercial insurance, as well as lack of any.

The estimation results from this study show that wealth index, education and employment status had were found to be statistically significant variables (at 90% confidence level) in determining the type of insurance scheme the respondents own. The positive coefficients on these variables indicate that being educated, wealthy and employed increases the probability of being covered by the different forms of health insurance schemes.

The coefficient on awareness is positive and significant in the choice of NHIF, NSSF and private health insurance. This suggests that information about insurance and its benefits is a key factor in determining the insurance coverage and choice of health insurance. Thus, more awareness helps household heads in making an informed choice about health insurance purchase.

Gender variable has an impact on insurance cover and also on the choice of different insurance schemes. Females are more likely to take insurance cover and when they do, they will tend to go for communal schemes. On the contrary, males are not likely to take up cover and when they do they will prefer private, voluntary schemes.

Age has a statistically significant positive effect on NHIF, NSSF and private scheme. This implies that uptake of the three forms of health insurance coverage increase with age. Household size is another important demographic variable. The results indicate that this covariate has a statistically positive effect on mutual, NHIF and NSSF.

Smokers are less likely to take cover than non smokers, with their most subscribed scheme being private health insurance. Theory predicts that drug users and smokers are risk lovers and will therefore not prioritize taking insurance cover against unforeseen ill health as observed in the study.

5.2. Conclusion

We notice that over 90 percent of the respondents do not have health insurance. This is a category of respondents at a youthful age bearing the lowest education attainment, are smokers with relatively low employment status but, worst of all, have the lowest wealth index (poorest). For those with insurance cover, majority are in statutory insurance types, these are, employer based NHIF and NSSF. Hence, it is possible that they are covered not by choice but by state requirements.

The study examined the determinants of health insurance choice. This was prompted by realizing that, less than ten percent of Kenyans were covered against health risks, meaning they were limited to perilous out of pocket payments for medical care. Furthermore, too much focus has been put on statutory social health insurance forgetting other crucial forms of cover available to

the citizens, such as community based health schemes. Thus, the main innovation of this study lies in the analysis of factors determining health insurance coverage while allowing for choice amongst alternative insurance schemes.

From the results, education and employment status are positively related to health insurance cover and choice across all forms of health insurance schemes. Wealth index is also an important factor in health insurance ownership decisions. The role of government in investing in basic education (primary and secondary level of education) and in job creation for the youth is critical in improving health insurance coverage.

The results of this study suggest that a very important factor in health insurance choice is related to awareness and information about health insurance. This determinant is particularly important in demand for NHIF, NSSF and private scheme. However, the effect of information/awareness variable on health insurance choice needs to be interpreted with caution since there are chances that it is likely to be correlated with education and wealth index.

The demographic factors which include age, gender and household size are important determinants in health insurance choice. Age is an important determinant for NSSF as it is for NHIF and private health insurance. As for gender, female prefer NHIF, NSSF and mutual health insurance unlike men whose preference lies in private health insurance. Large households have lower wealth index and are more likely to be insured under the NSSF, NHIF and Mutual health insurance scheme while smaller households are insured with the private health insurance.

On smoking, the results though insignificant, may be an indication that the respondents do not give the right information to the insurers (the problem of information asymmetry). This perhaps could be due to the fact that premiums could be based on smoking status of individuals.

5.3. Policy Recommendation

Findings after profiling respondents by insurance schemes have several pointers. First, the most important factors to target when designing policy instruments for health insurance uptake in Kenya are: size of household, wealth index, education/awareness and employment. To increase uptake of the insurance scheme will require policies that facilitate schooling and a raise in the living standards of Kenyans.

Secondly, individuals without insurance cover are found at a youthful age bearing the lowest education attainment, are smokers with relatively low employment status but, worst of all, have the lowest wealth index (poorest). There is need to initiate strategies that promote employment among the youth or create opportunities for them to procure income generation.

From the study, lack of awareness on the various forms of health insurance negatively affects the decision on health insurance coverage. Building awareness about health insurance coverage is vital. There is need to increase awareness levels on risk protection and risk reduction for risk takers (male and smokers) - media, ministry, scheme providers' adverts and social marketing activities become helpful.

Other than concentrating on Social Health Insurance only, the government should also focus on developing other forms of health insurance. For instance, focus should be placed to ensure more

private sector participation in provision of health insurance. But this should also be coupled with enhancing competitive behavior to encourage development of inventive and affordable insurance policy covers. Different policies and channels of promotion of insurance uptake are required for rural and urban areas.

5.4. Limitations of the Study

The main weakness of the study is that the data did not contain insurance specific attributes such as premiums, benefits covered and the type of health facility where individuals insured under various forms of health insurance sought cover. Thus, important explanatory variables were left out of the estimated results. This situation can lead to biased results.

5.5. Areas for Further Research

There is need for studies in the following in Kenya:

- The study investigated the demand side determinants of health insurance choice and found that the size of household, wealth index, education/awareness and employment were important determinants. The gap in supply side determinants of health insurance choice exist. There is need therefore for research studies that include the supply side factors in particular the attributes of the various health insurance schemes.
- This study did not investigate the access motive of health insurance. An understanding of the effect of various forms of health insurance on demand for health care is thus necessary.

REFERENCES

- Akerlof G. (1970). "The Market for 'Lemons: Quality Uncertainty and the Market Mechanism". *Quarterly Journal of Economics*. 84: 488-500.
- Arrow, K. (1963). "Uncertainty and the Welfare Economics of Medical Care." *The American Economic Review*. 53 (5):941-973.
- Asenso-Okyere, W., Osei-Akoto, I., Anum, A. and Appiah, E. (1997). "Willingness to Pay for Health Insurance in a Developing Economy. A Pilot Study of the Informal Sector of Ghana Using Contingency Valuation." *Health Policy*. 42: 223-237.
- Bhat, R. and Jain, N. (2006). "Factoring Affecting the Demand for Health Insurance in a Micro Insurance Scheme." *Indian Institute of Management Ahmedabad, India*. W.P. No. 2006-07-02
- Bolduc, C., Muller, R. and Lacroix, G. (1996). "The Choice of Medical Providers in Rural Benin: A comparison of Discrete Choice Models". *Journal of Health Economics*. 15:477-498.
- Bourne, P. and Kerr-Campbell, M. (2010). "Determinants of Self-rated Private Health Insurance Coverage in Jamaica." *Health*. 2(6):541-550.
- Cameroon, A., Trivedi, P., and Piggott, J. (1988). "A Microeconomic Model of the Demand for Health Care and Health Insurance in Australia". *The Society for economic Analysis Limited*. LV: 85-106
- Carrin, G., Matheuer, I., Xu, K. and Evans, D. (2008). "Universal Coverage of Health Services: Tailoring its Implementation." *Bulletin of the World Health Organization*. 86:857-863.
- Collins, D., Quick, D., Musau, N., Kraushaar, K. and Hussein, M. (1996). "The Fall and Rise of Cost Sharing in Kenya: The Impact of Phased Implementation." *Health Policy and Planning*. 11(1):52-63
- Dardanoni, V., and A. Wagstaff. (1990). "Uncertainty and the Demand for Medical Care". *Journal of Health Economics*. 9: 23-38.
- De Meza, D., (1983). "Health Insurance and the Demand for Medical Care". *Journal of Health Economics*, 2(1): 47-54.

- Folland, S., Goodman, C., and Santo, M. (2004). *The Economics of Health and Health Care*, (4th Edition). Upper Saddle River, Pearson Prentice-Hall.
- Gius, M. (2010). "An Analysis of Health Insurance Coverage of Young Adults." *Gius, International Journal of Applied Economics*. 7(1): 1-7.
- Green, W.H. (2000): *Econometric Analysis*. New York: Macmillan Publishing Company.
- Grossman, M. (1972). "On the Concept of Health Capital and the Demand for Health." *The Journal of Political Economy*. 80(2):223-255.
- Hadley, J. (2002). "Sicker and Poorer: The Consequences of Being Uninsured". *The Henry J Kaiser Family Foundation*.
- Hausmajn. A. and McFadden, D., (1984) "Specification Tests for the Multinomial Logit Model," *Econometrica*, 52 : 1219-1240.
- Hausmajn. A., (1978) "Specification Tests in Econometrics," *Econometrica*, 46 : 1251-1271.
- Hopkins, S. and Kidd, M. (1996). "The Determinants of the Demand for Private Health Insurance under Medicare." *Applied Economics*. 28: 1623-1632.
- Jowett, M. (2004). "Theoretical Insights into the Development of Health Insurance in Low-Income Countries." *Centre for Health Economics. University of York*. DP No. 188.
- Kenya National Bureau of Statistics (KNBS). (2010). *Kenya Demographic and Health Survey 2008-2009*. Calvento, Maryland: KNBS and ICF Macro
- Kenya National Bureau of Statistics (KNBS). (2010). *ECONOMIC SURVEY 2010*. Nairobi: Government Printer.
- King, G., Tomz, M. and Wittenberg J. (2000). "Making the Most of Statistical Analyses: Improving Interpretation and Presentation," *American Journal of Political Science*, 44(2), 347-361.
- Kimani, D., Muthaka, D. and Manda, D. (2004). "Health Care Financing Through Health Insurance: The Shift to A National Social Health Insurance Scheme." *Kippra*. DP. No. 42
- Kirigia, j., Sambo, L., Nganda, B., Mwabu, G., Chatora, R. and Mwase, T., 2005. "Determinants of Health Insurance Ownership Among South African Women". *BMC Health Services Research*. 5(17): 1-10

- Koç, Ç. (2004). "The Effects of Uncertainty on the Demand for Health Insurance". *The Journal of Risk and Insurance*. 71(1): 41-61.
- Long, J. S., and J. Freese (2001): *Regression Models for Categorical Dependent Variables Using Stata*. Stata Press, College Station, Texas.
- Maddala, G. (1983). *Limited-Dependent and Qualitative Variables in Econometrics*, New York, Cambridge University Press.
- Makoka, D., Kaluwa, B. and Kambewa, P. (2007). "Demand for Private Health Insurance Where Public Health Services are Free: The Case of Malawi." *Journal of Applied Sciences*. 21:3268-3273.
- Matheuri, I., Schmidt, J. and Wenyaa, M. (2008). "Extending Social Health Insurance to the Informal Sector in Kenya. An Assessment of Factors Affecting Demand." *International Journal of Health Planning and Management*. 23: 51-68.
- Mbugua, J., Bloom GII. and Segall MM. (1995). "Impact of User Charges on Vulnerable Groups: The Case of Kibwezi in Rural Kenya." *Social Science and Medicine*. 41 (6): 829-835.
- McIntyre, D. (2007). *Learning from Experience: Health Care Financing in Low- and Middle-Income Countries*. Geneva, Global Forum for Health Research.
- Mwabu, G., Mwanzia, J. and Liambila, W. (1995). "Charges in Government Health Facilities in Kenya: Effect on Attendance and Revenue." *Health Policy and Planning*. 10:164-170.
- Ministry of Health (2004). *Sessional Paper on National Social Health Insurance in Kenya*. Nairobi: Ministry of Health.
- Ministry of Medical Services & Ministry of Public Health and Sanitation (2009). *Kenya Household Health Expenditure and Utilisation Survey Report 2007*.
- Ministry of Medical Services (2010). *Facts and Figures*. Nairobi: Ministry of Medical Services.
- Moustafa, A., Hopkins, C. and Klein, B. (1971). "Determinants of Choice and Change of Health Insurance Plan." *Medical Care*. IX (1):32-41.
- Muriithi, M. (2009). "The Demand for Health Care in a Nairobi Slum: The Role of Quality and Information". PHD Research Paper, Nairobi: Unpublished.
- Ndiritu, M. (2002). "Health Insurance for the Informal Sector: A Case of the Jua Kali Artisans". Master of Public Health Thesis, University of Nairobi.

- Neun, P. and Santerre, R.(2004). *Health Economics: Theory, Insights and Industry Studies*. South-Western, Thompson
- Nketiah-Ampomensah, E. (2009). "Demand for Health Insurance Among Women in Ghana: Cross Sectional Evidence." *International Research Journal of Finance and Economics*. Issue 33
- Nyman, J.A. (1999). "The Value of Health Insurance: The Access Motive." *Journal of Health Economics*. 18: 141–52.
- Owando, S. (2006). "*Factors Influencing the Demand for Health Insurance in Kenya: A Case Study of Nairobi City*." MA Research Paper, Nairobi: Unpublished.
- Pabblo, G. and Schieber, G. (2006). "*Health Financing Revisited: A Practitioners' Guide*." Washington DC, World Bank.
- Pauly, M. (1968). "The Economics of Moral Hazard: Comment". *American Economic Review*.58 (3): 531–537.
- Propper, C. (1989). "An Econometric Analysis of the Demand for Private Health Insurance in England and Wales." *Applied Economics*. 21(6): 777-92.
- Republic of Kenya. 1989. *The National Social Security Fund Act, Chapter 258*. Nairobi. Government Printer.
- Republic of Kenya. 1999. *Kenya Gazette Supplement, Acts, 1999. The 65 National Hospital Insurance Fund Act, 1998*. Nairobi. Government Printer
- Republic of Kenya 2002. *National Development Plan 2002-2008: Effective Management for Sustainable Economic Growth and Poverty Reduction*. Nairobi. Government Printer
- Republic of Kenya. 2003a. *National Social Health Insurance Fund Bill:Arrangement of Clauses*. Nairobi. Kenya
- Republic of Kenya. 2003b. *The National Social Health Insurance Strategy Prepared by the Task Force on the Establishment of Mandatory National Social Health Insurance*
- Republic of Kenya. 2006. *National Health Accounts*. Nairobi. Government Printer
- Republic of Kenya. 2009. *End Term Review of the Economic Recovery Strategy for Wealth and Employment Creation (ERS) 2003-2007*. Nairobi. Kenya.

- Saksena, P., Xu, K. and Carrin, G. (2006). "The Impact of Universal Insurance on Catastrophic health Expenditure: Simulation Analysis for Kenya." *EIP/HSF Discussion Paper Series*. Geneva. WHO. DP. No 8.
- Sanhueza, R. and Ruiz-Tagle, J. (2002). Choosing Health Insurance in a Dual Health Care System: The Chilean Case." *Journal of Applied Economics*. 1:157-184.
- Sarpong, N. (2010). "National Health Insurance Coverage and Socio-economic Status in a Rural District of Ghana." *Tropical Medicine and International Health*. 15(2):191-197.
- Schneider, P. 2004. Why Should the People Insure: Theories of Decision_Making in the Context of Health Insurance. *Health Policy and Planning*. 19(6): 349-355
- Takeuchi, D., Chung, R. and Shen, R. (1998). "Health Insurance Coverage among Chinese Americans in Los Angeles County." *American Journal of Public Health*. 88: 451-453.
- Torche, A. and Sappeli, C. (2001). "The mandatory Health Insurance System in Chile: Explaining the Choice between Public and Private Insurance." *International Journal of Health Care Finance and Economics*. 1: 97-110
- United Nations Development Programme (UNDP), Kenya (2002). *Kenya Human Development Report 2001: Addressing Social and Economic Disparities*. Nairobi: UNDP.
- Wang'ombe, D., Mwaniki, P., Mitula, M., Mugo, D., Nzoya, L., Muasya, E. and Muchunga, H. (1994). "Capacity of Non Governmental Providers in Delivery of Healthcare in Kenya". *Health Sector Support Programme*. Nairobi: Ministry of Health.
- World Bank 1993. *World Development Report 1993. Investing in Health*. New York: Oxford University Press.
- World Health Organisation. 2000. *World Health Report 2000. Health System: Improving Performance*. Washington D.C. World Bank
- World Health Organisation. 2001. *Macroeconomics and Health: Investing in Health for Economic Development* Geneva. WHO
- World Health Organisation. 2005. *Sustainable Health Financing, Universal Coverage and Social Health Insurance: World Assembly Resolution WHA 58.33*. Geneva. World Health Organisation
- World Health Organisation. 2010. *World Health Statistics 2009*. Geneva. WHO