

**EFFECTS OF SOCIO-ECONOMIC FACTORS ON THE UPTAKE OF HEALTH  
INSURANCE BY MOTORCYCLE TAXI OPERATORS IN MACHAKOS  
COUNTY, KENYA.**

**JOHN MUGE NYABOGA**

**X53/6350/2017**

**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT  
OF THE REQUIREMENTS OF THE DEGREE OF MASTER OF  
SCIENCE IN HEALTH ECONOMICS AND POLICY OF THE  
UNIVERSITY OF NAIROBI.**

**November, 2019.**

## DECLARATION

I, John Muge Nyaboga, confirm that this paper is authentic and has never been presented to any University for award of a degree.

Signed \_\_\_\_\_ Date \_\_\_\_\_

John Muge Nyaboga

Registration No: X53/6350/2017

This research project has been developed under my guidance and is presented after my approval as the university supervisor.

Dr. Moses Muriithi,

Senior Lecturer,

School of Economics,

University of Nairobi, Kenya.

Signature \_\_\_\_\_ Date \_\_\_\_\_

## **DEDICATION**

I dedicate this research project to my parents- Benson Nyaboga Karori, Grace Kemunto and my brother Zadock Miencha, whose support and encouragement propelled me in my studies.

## **ACKNOWLEDGEMENT**

I am thankful to my research supervisor and lecturer, Dr. Moses Muriithi, for his guiding me through the development of this project, my other lecturers for their academic guidance and my classmates and friends: Kanake Frank and Brian Williams. I also appreciate my parents for their selfless support which saw me sail through the academic journey. May God bless you abundantly. Above all, I thank God for the providence that has seen me this far.

## **LIST OF ABBREVIATIONS**

W.H.O-World Health Organization

U.H.C-Universal Health Coverage

T.H.E-Total Health Expenditure

N.H.I.F-National Health Insurance Fund

N.H.I.S-National Hospital Insurance Scheme

K.I.B.H.S-Kenya Integrated Budget Household Survey

K.D.H.S-Kenya Demographic Health Survey

F.Y-Financial year

S.A.C.C.O.S-Savings and Credit Cooperative Association

O.O.P-Out of Pocket Payments

CBHF-Community Based Health Fund

## ABSTRACT

Quality healthcare is crucial in sustained social and economic progress and poverty reduction. These can be achieved by ensuring that health services are effective, affordable and accessible to everyone. The expected outcome of healthcare financing is achievement of universal health coverage with a focus on making health services accessible to all and offering financial protection. The uptake of healthcare insurance programs in Kenya is generally low. The Kenya Integrated Budget Household Survey (KIBHS 2015/16) indicated that only 19.0 % people in the country are covered. The health insurance coverage for Machakos county stood at 18.5% according to the KIBHS 2015/16. The extent of purchase of health insurance remains low in spite of the schemes such as NHIF are easily accessible to anyone. The main aim of the study was to determine the effects of socioeconomic factors on the uptake of health insurance among motorcycle taxi operators in Machakos-Kenya. This study utilized a binary probit regression model to assess the effects of socioeconomic factors on subscription to health insurance amidst the motorbike taxi operators of Machakos county. The data collection tool was a questionnaire focusing on measurement of a number of variables in the binary probit model. Binary probit regression model was used in analysis and results were reported at 95% confidence interval whereby previous employment status tertiary education and motorcycle ownership had a positive and significant relationship with enrollment. Age, household size, motorcycle ownership and membership in a social welfare. Affected enrollment into healthcare insurance schemes however the effect was statistically insignificant. It is worth noting that enrollment of health insurance by motorcycle taxi operators was low, standing at only (23.3%) in spite of the associated advantages. Thus the government should focus more on increasing literacy levels by encouraging more students to progress with tertiary education. The government also needs to create awareness by engaging the social welfare groups where majority of these operators are members.

**TABLE OF CONTENTS**

DECLARATION ..... i

DEDICATION..... ii

ACKNOWLEDGEMENT ..... iii

ABSTRACT..... v

TABLE OF CONTENTS ..... vi

LIST OF TABLES ..... viii

**CHAPTER ONE:INTRODUCTION..... 1**

1.1 Background information..... 1

1.2 Problem statement..... 4

1.3 Research Questions ..... 6

    1.3.1 Main Objective ..... 6

    1.3.2 Specific Objectives..... 6

1.4 Justification statement..... 7

**CHAPTER TWO: LITERATURE REVIEW ..... 8**

2.1 Introduction ..... 8

2.2 Theoretical literature review ..... 8

    2.2.1 Conventional Theory..... 8

    2.2.2 Social exchange theory..... 9

    2.2.3.The Prospective Theory..... 10

    2.2.4. Expected utility theory ..... 10

2.3. Empirical literature review ..... 11

2.4 Overview of Literature..... 17

**CHAPTER THREE: METHODOLOGY ..... 19**

3.1 Introduction ..... 19

3.2 Theoretical framework..... 19

3.3 The Econometric Model and Specification..... 21

3.4 Data Source ..... 24

3.5 Sampling Frame ..... 24

    3.5.1 Sampling Technique..... 24

    3.5.2 Sample size determination..... 24

3.6 Piloting .....	25
3.7 Data issues .....	26
3.7.1 Multicollinearity .....	26
3.7.2 Heteroscedasticity .....	26
3.7.3 Ethical Considerations .....	26
<b>CHAPTER FOUR::DATA ANALYSIS, INTERPRETATION AND DISCUSSION OF RESULTS.</b> .....	<b>27</b>
4.1 Introduction. ....	27
4.2 Descriptive statistics.....	27
4.3 Diagnostic pre-estimation tests .....	29
4.3.1 Heteroscedasticity: Breusch Pagan test. ....	29
4.3.2 Multicollinearity testing. ....	29
4.3.3 Correlation Analysis.....	31
4.4 Econometric Estimation.....	31
4.5 Discussion of results.....	34
<b>CHAPTER FIVE: SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS</b> .....	<b>36</b>
5.1 Introduction .....	36
5.2 Summary.....	36
5.3. Conclusion.....	37
5.4 Policy Recommendations .....	37
5.5 Further Research .....	38
<b>REFERENCES</b> .....	<b>39</b>
APPENDIX I:CONSENT FORM .....	44
QUESTIONNAIRE.....	45



## LIST OF TABLES

<b>Table 3.1:</b> Table of Variables .....	23
<b>Table 3.2:</b> Proportional Sampling .....	25
<b>Table 4.1</b> Descriptive statistics .....	27
<b>Table 4.2</b> Preferred insurance service provider .....	28
<b>Table 4.5</b> Heteroscedasticity: Breusch Pagan test.....	29
<b>Table 4.6</b> :Table of Variance Inflation Factor. ....	30
<b>Table 4.8</b> Probit Regression results for effects of socio-economic factors on uptake of health insurance .....	31
<b>Table 4.9</b> Average marginal effects regression of socio-economic factors on the uptake of health insurance. ....	33

## CHAPTER ONE

### INTRODUCTION

#### **1.1 Background information.**

Health care financing entails the means through which the people pay for healthcare expenses. Health care systems all over the world are financed through government funding (taxation), out-of-pocket payments, private health insurance schemes, donations or voluntary aid. Good health is instrumental in sustained social and economic progress and poverty reduction. These can be achieved by ensuring that health services effective affordable and accessible to everyone. The expected outcome of healthcare financing is achievement of universal health coverage. The WHO defines Universal health coverage (UHC) as a strategy that ensures that all people access required health services (preventive, promoting, curative, palliative and rehabilitative services) of good quality and also considering financial protection. Universal health coverage is therefore a key objective for health reform all over the world and also a priority objective of the WHO.

In the majority of countries in the African continent, inadequacy of funds for healthcare is a common problem. In year 2010, the mean total health expenditure (THE) in Africa was US\$ 135 per capita, Musango et al., (2013). This is just a small fragment of the US\$ 3 150 amount that is consumed on healthcare in an average high-income country, Musango et al., (2013). Insufficient budgetary allotment to the health sector is a barrier to enhancing healthcare in Africa, bearing in mind that the continent has a greater proportion of the world's infant and maternal morbidity and mortality burden, HIV/AIDS

and non-communicable diseases, Laurent M et al (2013). The C.H.E current expenditure as a percentage of GDP for Africa was 6.2% in 2015.

In almost half of African countries, out-of-pocket payments make up to 40% or more of THE. The reliance on OOPs exposes the people to financial hardships thus hindering access to health services and also exposure to risks. Furthermore, the existing financial flows within the health systems have been seen to create and exacerbate inefficiencies and inequities, for instance through the skewed allocation of finance towards urban areas and specialized care.

The Kenya healthcare financing landscape comprises of: General tax financing which comprises of certain free healthcare services rendered in the government owned health facilities, which was adjusted by the introduction of user fees. The Government of Kenya presently offers free maternity services and also free health services in dispensaries and health centers following the abolishing of charged fee in the year 2013. The government is also rolling out Universal Health Coverage and the pilot phase is ongoing in four counties. Provision of health services is a shared function. The national government (MOH) is responsible for development of national policies, monitoring quality and standards in service provision and providing technical services as well as training of health professionals. The counties are tasked with planning, legislation, staffing and providing infrastructure for their respective devolved units.

The other components of healthcare financing in Kenya are the National Hospital Insurance Fund(NHIF) a government entity, Private health Insurance Schemes, Employer

Self-Funded Schemes, Community based health financing(CBHF) schemes, OOP expenditure and Development partners & Non-Governmental Organizations (NGOs).

The Kenya health financing profile of 2016 revealed 6.8% of gross domestic product was accounted for by the total health expenditure (THE) of the country of the year 2012/13 which was an increase up from 5.4% in FY 2009/10. During the same period, there was an increase in the amount Kenya spent on healthcare being a fraction of Total Health Expenditure from 28.8 percent to 33.5 percent. However, in the FY 2014/15 only 4 % of the budget was allocated to healthcare services, excluding devolved governments budgetary allotment. The devolution of health services following the promulgation of the 2010 constitution, resulted to a 57% increase in the health budgetary county allocation from FYs 2013/14 to 2014/15. These expenditures account for almost three-quarters of private health expenditure as estimated by the world health organization. 11.1% of total households in the country faced catastrophic expense of health in the year 2007, an increase from 10.3 percent in year 2003 (Kimani and Maina, 2015). As formerly, Kenya relies on donors who still fund many programs despite the expanded contribution to healthcare from domestic sources. According to the Kenya health financing profile (2016), 57% of developmental healthcare budget had been met by the partners in FY 2014/15. The Kenyan government drafted a health financing strategy in the year 2009. This aimed at guiding the country towards universal health coverage (UHC) achievement. The drafted strategy that was modified in the year 2015 is almost being finalized. Kenya has been keen on rolling out health finance reforms in the recent: The Government of Kenya scrapped of all charges in government health centers and dispensaries in the year 2013. A sum of about USD \$7 million was allocated for

compensating the health facilities. The free maternity program implementation also started with an allocation of almost USD\$38 for that financial year. High OOP expenditure thus continues to be a challenge in accessing health services (Okech, 2014). It is estimated that a mere 20 percent of Kenyans have enrolled in health insurance schemes, this means that the majority 80 percent of Kenyans are at risk of the facing financial catastrophe brought about by medical emergencies (Gathara, 2018).

Kenya has a large and dynamic informal sector. In year 2014, Kenya's labor force was 11.8 million people. 2.4 million people were formal sector workers. With the swelling informal sector, it means there are more people experiencing unsteady income are being exposed to health threats. Most informal sector individuals are likely to live in slum areas where they face challenges in accessing clean water, poor sanitation, and congestion. The unsteady incomes also affect health seeking behavior. A person may be hindered from seeking health services due to anticipated costs.

## **1.2 Problem statement.**

The enrollment of health insurance programs in Kenya is generally low. The Kenya Integrated Budget Household Survey (KIBHS 2015/16) indicated that only 19.0 % people in the country are covered. The health insurance coverage for Machakos county stood at 18.5% according to the KIBHS 2015/16.

As the most popular insurance scheme in the country, the NHIF is easily accessible to people of the informal sector. NHIF membership is accessible to all adult Kenyan citizens who have an income from salary or self-employment exceeding KS 1000 monthly or 12,000 per annum. NHIF has a countrywide branch network comprising of 93 operational offices spread across the country. The services can also be accessed at huduma centers

across the country. All branches offer NHIF services ranging from processing registration, paying benefits. There are local offices and stations in district hospitals which also serve the clients. It is evident that NHIF is easily accessible to almost all of the informal sector workers.

Motorcycle taxi operators are 30 times higher likelihood to suffer a traffic accident than other road users. However, motorcycle operators bring out a bad profile on safe road use. Most of motorcycle taxi riders engage in risky practices such as failing to wear helmets, reflector jackets, over speeding and overloading. One in every three motorbike taxi operators in Thika does not put on protective (Banchani et al., 2012). An increase in motorbike-related accidents has been attributed to the expansion of motorcycle (*bodaboda*) industry in Kenya. According to a 2011 report by the World Health Organization and the Ministry of Public Health and Sanitation in Kenya, it was noted that in comparison with motor vehicle users, motorcycle operators face a higher risk of sustaining severe head and traumatic brain injuries or death. Motorbike involving road tragedies made up 18% of recorded traffic tragedies in the year 2017 (NTSA 2017). In the period between January and 21<sup>st</sup> March 2019 road traffic accidents involving motorcycles were 14.8 percent of road traffic cases that had been recorded. 48% of road traffic accidents reported in Kangundo sub county of Machakos in 2018 involved motorcycle taxi operators (Traffic police Kangundo sub county, 2019). These cases often resulted in severe injury leading to hospitalization and fatalities. Consequently, medical and surgical expenses resulting from sustained injury are mostly huge and likely to subject the victims and family to financial hardships if they have to do out of pocket payment. Lack of health insurance cover limits access to quality and appropriate

healthcare for motorbike(*bodaboda*) riders with their dependents. Naieni et.al., (2012) found socioeconomic status to be a valid influencer of certain health conditions. Various studies have found the complexity of issues that healthcare and welfare have to sort can be influenced by demographic and socioeconomic attributes of individuals.

This study is aimed at assessing the effects of socioeconomic factors on healthcare insurance enrollment by motorbike taxi operators in Machakos-Kenya.

### **1.3 Research Questions**

1. What is the pattern of health insurance uptake among the motorcycle taxi operators?
2. What are the effects of socioeconomic factors on healthcare insurance uptake by the motorbike taxi operators in Machakos County?
3. What are the policy recommendations based on the findings?

#### **1.3.1 Main Objective**

To examine the effects of socioeconomic factors on healthcare insurance uptake among the motorcycle taxi operators in Machakos county.

#### **1.3.2 Specific Objectives**

1. To determine the pattern of healthcare insurance uptake among the motorcycle taxi operators
2. To evaluate the effects of socioeconomic factors on the uptake of healthcare insurance

3. To draw policy recommendations from (1) and (2) above.

#### **1.4 Justification statement.**

A healthy population is important in order for any country to achieve economic prosperity or development. Ensuring access to healthcare is important in promoting good health in the population of a country. Enrollment in health insurance minimizes the chances of financial hardships in case of illnesses.

Assessing the health insurance uptake of motorcycle taxi operators will benefit the people of the informal sector and the county population as a whole. The results of the study will be employed in informing and sensitizing motorcycle taxi operators about advantages being covered with health insurance programs with a motive of improving knowledge, perception and attitude towards the health insurance uptake. Secondly, comparisons can be made with findings to similar or related studies in other regions in this study after publication and dissemination in journals. The findings of this study will aid the department of health and other development partners in designing and implementation of interventions to increase or improve the informal sector health insurance uptake.



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

The section explores various research papers that were done with the objective of comprehending the health insurance demand. The chapter starts with a review of theoretical literatures then empirical literature and finally a general review given to end the section.

#### **2.2 Theoretical literature review**

This part is presenting the theoretical background with the basis of the study variables.

##### **2.2.1 Conventional Theory.**

Nyman (2003) advanced this theory explaining about the for demand health insurance. The researcher argues that people buy insurance simply because of their preference of subscribing to small premiums to the risk of being ill and having to incur large hospital bills. This theory also posits that the extra health care that individuals purchase because they have insurance is not equal in value to its production cost. This theory therefore argues that the means of financing insurance can be overlooked since the impact of premiums on healthcare demand, an income consequence, is practically inconsiderable. Economists have bolstered various policies such as capitation, utilization review, cost sharing and managed care so as to cut down the utilization of this apparently low-value additional healthcare.

Nyman (2003) asserted that individuals subscribe to health insurance in order to get extra income in the event of falling sick. Consequently, insurance firms transmit premiums

from individuals who stand healthy to the individuals who fall ill. The extra income produces purchase of extra highly valued health care, thus enabling ill individuals to get critical healthcare which could not have been afforded.

### **2.2.2 Social exchange theory**

Thibaut and Kelley (1959) instituted a social exchange theory. It makes use of the economic metaphor of cost versus benefits in predicting human behavior. It posits that an individual chooses strategies based on the costs and rewards they associate with such strategies. Based on this, human beings rationally put into consideration the results of their behaviors before acting in order to have high rewards while keeping low costs (Namuhisa, 2014). The Social exchange theory argues that social human behavior is determined by an exchange process that is purposed at maximizing benefits while minimizing the costs. Individuals measure the possible merits and threats of social relations. When the threats are more than the merits, people are prone to abandon such relations.

The theory hinges on empirical studies revealing that individuals opt for the risk of a larger loss rather than suffering a smaller loss with assuredness. So if individuals purchase insurance, they don't do so for the wish to evade risks but they pay a premium when healthy in exchange for a claim on marginal income if they fall sick. This theory lays out a sound theoretical rationale for insuring the uninsured people and implementing national social health insurance.

### **2.2.3. The Prospective Theory**

Kahneman and Tversky in year 1979 generated this theory that expounds how individuals make decisions by managing risks and uncertainty. The prospective theory holds that individuals make decisions on the basis of probable worth of gains and losses rather than the eventual outcome, and that individuals are risk disinclined in gains but risk takers in losses. The theory is arguably a more psychologically correct explanation on decision making in comparison to the expected utility theory.

The theory elucidates the decision making processes in two stages: The first stage is labeled as editing where consequences of a decision are ordered according to the weights attached to each decision. The value function is explained as change from a reference point. The editing phase aims at alleviating effects of framing and resolving isolation effects caused by individuals' tendency to detach consecutive probabilities instead of treating them together. The editing process therefore comprises of coding, combination, segregation, cancellation, simplification and detection of dominance. The phase that follows is termed as evaluation. Individuals act as if they would quantify a value, on the basis of probable outcomes and their probabilities, then select the alternative with a higher utility.

### **2.2.4. Expected utility theory**

The theory stands for the liking over risky objects, by weighted means of utility allotted to each of the probable outcomes and the weights are the likelihoods of each outcome. This theory explains the worth of healthcare insurance being the expected cost the

moment one falls sick but not due to the assurance provided. The motivating factor for those purchasing health insurance is the additional income when one gets ill. The moment individuals pay premiums, they forego resources they would have used elsewhere with the expectation that when they purchase health insurance, the satisfaction received is more than resources used in form of foregone alternatives.

### **2.3. Empirical literature review**

Various research studies have tried to unveil the determinants of health insurance purchase. Some of the determinants include socioeconomic factors. Nguru (2018) while conducting a study to unveil the factors affecting the uptake of health insurance by patients seeking services in private and public hospitals in Embu county in Kenya, discovered a notable positive connection between status of employment and Health Insurance uptake. This cross-sectional survey employed descriptive statistics and also found a remarkably positive relation between gender, education and marital status and health insurance uptake extent. Employment status, nature of employment and terms of employment were also found to be influencers of health insurance uptake. Despite high uptake being on government provided insurance, most participants preferred covers provided by privately owned healthcare insurance companies.

While studying the perception of healthcare insurance uptake for maternal health in rural areas in Kenya, Maina *et al.*, (2016) found that education, level of monthly income and marriage being among the factors that influence health insurance uptake. A multivariable analysis revealed that there was a significant relationship between the uptake of health insurance and marital status. Individuals with tertiary education had a higher chance of

purchasing healthcare insurance. Monthly earnings was not found to be a determinant of insurance uptake. This study suggested that there was a need to include the qualitative aspect in future studies on health insurance uptake in order to sufficiently represent the attitudes and feelings of participants.

Muketha (2016) while utilizing probit model found that a higher wealth index, being married being educated an increase in age and awareness positively influenced the enrollment of NHIF by non-formal workers in Kenya. In addition, this study revealed that a large household size, belonging to an alternative community based health insurance scheme, being male and smoking negatively affected the informal sector's participation in health insurance.

Sarpong et al., (2010) conducted a study to find the connection between health insurance uptake and socioeconomic status in a Ghana. The study utilized principal components analysis to classify households into three classes of socioeconomic status: (20% high, 40% middle and 40% low SES). The National Health Insurance(NHIS) enrollment odds ratios were then computed for all the socioeconomic classes having the low class as the reference point while adjusting for time spent in travelling by public means to health facilities. The results indicated that socioeconomic status was remarkably connected to National Health Insurance Scheme(NHIS) enrollment. A higher economic status had a positive effect on the purchase of the (NHIS).

Aregbeshola & Khan (2018), Sought to examine the influencers of subscribing to the National health insurance program by women of in Nigeria. The study used data from the Nigerian Demographic and Health Survey of year 2013 to examine the factors that influence uptake of health insurance among the women within the reproductive age bracket in Nigeria. The study utilized multivariate, bivariate and univariate analysis to determine the socioeconomic and demographic attributes of the women. It was noted that 97.9% of women had not been insured. Multivariate analysis revealed that level of education, age, socio-economic status (SES), and employment status were remarkable determinants of the uptake of the Nigeria Health Insurance fund.

Kimani et al., (2014) utilized bivariate and multivariate logistic regression to examine factors influencing health insurance uptake among Kenyan women. The study utilized secondary data from the K.D.H.S( 2008/9.) It was revealed that majority of the women enrolled to health insurance were formally employed. Multivariate analysis indicated that age, education, marital status and household income had a remarkable impact in health insurance uptake.

Ng`etich (2012) conducted a research study on health insurance enrollment and its determinants for motorcycles taxi operators in Nandi, Kenya. While utilizing binary logistic regression validated that being a membership social welfare groups (*chamas*) has a positive effect on the purchase of health insurance. This study could not discover the linkage between enrollment in health insurance and education level. These findings contradict results from other studies: Nyagero et al., (2012) Kirigia et al., (2005) studies which found a significant relationship between education and the uptake of health

insurance. The study used inferential analysis to reveal that previous status of employment was significantly influenced the health insurance enrollment. This suggests that statutory health insurance can improve health insurance uptake extent

Kirigia et al (2005) used the logistic regression model in finding whether demographic economic, and educational attributes influenced participation of south African women in health insurance programs. This study revealed that the number of individuals who had enrolled in health insurance schemes increased as household size, level of income increased. This study revealed a significant relationship between age, size of households, marital status and earnings with health insurance uptake.

Bhat and Jain (2006) analyzed the demand of private health insurance amidst individuals of middle income and lower income categories in a certain district in India. The study used the probit model and revealed that households which were covered with health insurance had higher incomes than the uninsured households. The researchers found that the earnings and health insurance uptake relationship wasn't linear since health insurance uptake increased as income increased but beyond a certain instant, the association between the earnings and subscription to health insurance became negative, suggesting that as income increased, households spent their resources elsewhere, purchasing less healthcare insurance, and were inclined to face the possible health risks.

Kimani et al., (2012) utilized a multivariate logistic regression model in investigating the predictors for subscription health insurance schemes amidst individuals residing in slums

in Nairobi, Kenya. Most of the study participants were uninsured. The study validated an association between gender and health insurance uptake. The females had a higher probability of participating in the NHIF scheme. These findings also correspond with Bending and Arun (2011) and Boateng and Awunyor-vito (2013) studies that asserted that females were more likely to get enrolled. On the contrary, studies conducted to determine the factors that made people in Ghana to subscribe into health insurance programs posed that males had a higher probability to subscribe in health insurance (Akwasi & Joshua (2013) and Owusu-Sekyere and Chiaraah 2014)

While participants who were previously in a union and those who not had a less probability of having public insurance subscription. Formal sector workers had a higher likelihood for enrollment in the NHIF scheme in comparison to informal sector workers. Membership of individuals in microfinance institutions like savings and credit cooperative organizations (SACCOs) and community-based savings and credit groups had a positive impact in the uptake of health insurance, Kimani et al., (2012).

Badu et al., (2018) employed logistic regression in assessing household sociodemographic factors as influencers of the enrollment of healthcare insurance in Ghana. Social and demographic factors like education, gender, age, ethnicity and marital status invariably increased the chances of being enrolled in the NHIS after the consideration of other co-covariates.



Adebayo et al., (2015) systematically reviewed the determinants of that the subscription of healthcare insurance in both low-income and middle-income nations. The study found that both qualitative and quantitative studies validated low income level and lacking finances as main factors that influence health insurance subscription. Poor healthcare quality with challenges such as; frequent drug stock-outs shortages of medical supplies, bad health worker's attitude and long waiting duration were found to resulting to low coverage of CBHI. Trusting in the CBHI scheme and medics were also established as determinants of enrolment. Munyao (2010) carried out research to validate the elements determining healthcare subscription insurance by non-formal division laborers residing in urban areas in Kenya. Using a principal component analysis, the study found that income was remarkably and positively interconnected with healthcare insurance enrollment. These findings correspond to Jangati (2012), Ying et al., (2007) and Bourne (2010) studies.

Atinga et al., (2015) using multivariate logistic regression, sought to explain factors making people to drop out of insurance schemes in Ghana. The study revealed that rare illness, low education level, non-affordability of the premiums and low income were crucial influencers of the drop out from insurance schemes in Ghana hence these have a negative effect on the consumption of healthcare insurance

Xu et al., (2006) in their study ,tested the hypotheses about membership of health insurance programs, healthcare services utilization and catastrophic expenditure. While applying Logistic regression the study indicated that access to required health services

was hindered mainly by financial difficulties especially among the poor. Children under five and females were associated with greater access to outpatient care. Health insurance coverage in the population was low and it varied across income quintiles, being least in the lowest quintile. Moreover, it was revealed that the highest percentage of households with catastrophic expenditure were in poorest quintile. Results also suggested that in Kenya, membership in health insurance is influenced by the institutional environment and also by an individual's perception of the probable merits of membership. Education, being male and urban residence were positively associated with insurance membership.

#### **2.4 Overview of Literature**

In summary the following factors were found to affect health insurance uptake negatively: non-affordability of the premiums (Atinga et al., 2015; Ataguba et al., 2008; Adebayo et al., 2015), poor quality of health services including frequent stock-outs of drugs and medical supplies, poor medics attitudes, and long waiting durations, Adebayo et al., (2015), Lack of knowledge, Mathauer et al., (2007), Working in the informal sector;(Kimani et al., 2012, Nguru 2018).The other factors found to be influencers of insurance uptake were level of education age, religion gender, size of the household , frequency of illness, and marital status. Despite the congruency in some studies there existed some dissimilarities in the findings of some studies. For instance, Ng`etich (2012) could not discover any link connecting education with insurance uptake while Nyagero et al., (2012) Kirigia et al., (2005) studies validated that indeed there was a connection . The varied conclusions could be due to differences in the study locations and study population. Some of the studies focused on women only: Aregbeshola, B.S. & Khan,

S.M. (2018) whereas others focused on urban areas or rural areas. Most of the studies sought to determine factors affecting insurance uptake in general while this study focuses on unveiling the effect of socioeconomic factors which have been seen to be critical influencers. Very few studies have been conducted on health insurance uptake in peri urban areas in Kenya and specifically in Machakos county and this study was aimed at filling this gap.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

This chapter presents the study's analytical and theoretical framework and further describes the econometric model used and the model specification. The measurement of variables has been described. In guiding data handling, the sampling procedure, diagnostic tests and the sources of data are equally described.

#### **3.2 Theoretical framework**

The demand theory for health insurance Nyman (2003) was used to guide this study. This theory opposes the traditional theory of health insurance which suggests that being insured is welfare-diminishing as it is a price effect response with negligible regard for the associated income transfer effect. The impact of premiums on the demand for health insurance cannot be ignored and has been taken into consideration in this study. Nyman's theory presents being insured as welfare-increasing as it pays attention to the income transfer effects, which are arguably higher compared to price effects. Due to this income transfer, those who fall ill obtain more healthcare than they would without insurance. In this case, being insured is no longer just viewed as an additional quantity of care but a utility gain.

This theory is grounded on expected utility maximization theory which postulates that in existence of competing alternatives, an individual's decision will be guided by the choice which has the highest total expected utility. An individual or family will opt to invest in

health inputs such as healthcare which can be paid using health insurance if sick. Prospective purchasers of health insurance are presumed to decide whether to purchase insurance or not on the basis of the magnitude of the difference they perceive between the anticipated utility level in the presence of insurance ( $EU_1$ ) and anticipated utility level in the absence of insurance ( $EU_2$ ). In analyzing how alterations in the predictor variables influence the extent of expected utility with and without insurance, if the difference between  $EU_1$  and  $EU_2$  is more than zero, risk averse individuals will prefer to subscribe to healthcare insurance covers. On the other hand, if there is no difference between  $EU_1$  and  $EU_2$ , there is no motivation to buy insurance.

With the assumption that the utility expected that is associated with enrollment in a healthcare insurance scheme is a function of a vector of its characteristics ( $X_j$ ) and a vector of the individual's socio-economic attributes ( $SI$ ) and a stochastic error term which secures errors in measurement of data.

Individual's decision course is therefore represented as:

$$EU_j = f(X_j, SI + e)$$

Where:

$EU_j$  is the utility that an individual anticipates by enrolling in the health insurance scheme.

$X_j$  is a vector of the insurance characteristics

$SI$  is a vector of the socio-economic factors

$e$  is a stochastic error term

The basic assumption being that an individual chooses to join the scheme if  $EU_1 > EU_2$  while chooses not join the scheme if  $EU_1 < EU_2$ , and is neutral about joining or not joining if  $EU_1 = EU_2$ . Thus, the probability that an individual opts to enroll in a healthcare insurance scheme is  $P_1 = P(EU_1 > EU_2)$  and the probability that an individual opts not to join is  $P_2 = P(EU_1 < EU_2)$

### 3.3 The Econometric Model and Specification

This study used a probit regression model. The model assumes cumulative distribution function of the standard normal distribution. This study focused on the decision of whether or not to have health insurance. The dependent variable is dichotomous. It takes only two values, 0 if no and 1 if yes.

Following previous studies that have assumed that the data follows a normal distribution, this study used a binary probit model. The main purpose of study was to interpret the dependent variable as the likelihood of choosing to purchase Health insurance or not with the presence of other explanatory variables. A linear relation between the latent variable  $Y$  and explanatory variables ( $x_i$ ) is assumed and the model expressed as follows;

$$Y = x_i\beta + \varepsilon$$

Where  $Y$  represents an unobserved continuous latent variable that ranges from  $-\infty$  to  $\infty$

$x_i$  represents a vector of explanatory variables

$\beta$  is a vector of parameters that are to be estimated

$\varepsilon$  represents the stochastic error term.

let the following measurement equation link the latent variable  $Y$  and the observed binary variable  $Y$ :

$$y_i = 1 \text{ if } Y > z, y_i = 0 \text{ if } Y \leq z$$

Where  $y_i$  is the probability of being enrolled in health insurance (1 if enrolled in Health Insurance, 0 if otherwise).

$z$  is the threshold point of the index  $Y$  of which if it exceeds the individual will be enrolled in a health insurance cover.

The variables of  $X$  were chosen at their means then regressed against  $Y$  to find the impact of each variable on the likelihood of an individual to decide on enrollment in a health insurance scheme.

Estimation of marginal effects was a necessity in expounding the model. The marginal effects show the alteration in the likelihood of occurrence of an observation of an event, given a unit variation in a predictor variable. It is expressed as follows:

$$\partial p / \partial x_i = \phi(X'\beta)\beta_i$$

Where:

$\partial p$  is change in the probability that  $y = 1$

$$\partial p / \partial x_i = [\Sigma \phi(X'\beta')(X')]\beta_i$$

Hence:

$$y_i = \beta_0 + \beta_i X_i + \varepsilon$$

The Health Insurance uptake (HIU) was presented as a function of these variables: previous employment status, education level, age, household size, gender, marital status, motorcycle ownership as well as membership in a self-help group. Thus the probit model can be shown as;

**HIU = f (β1 Age + β2 Marital Status + β3 Education + β4 Previous employment status + β5 Household Size + β6 motorcycle ownership + β7 Membership in a self-help group+ β8Level of income + the error term.**

**Table 3.1: Table of Variables**

<b>Variable</b>	<b>Variable Definition</b>	<b>Measurement</b>	<b>Variable Sign</b>
<b>Dependent variable</b>			
Enrollment in Health insurance.	Being a registered member of a health insurance scheme in after subscribing and owning the card/number.	1 if yes ,0 otherwise	
<b>Independent variables</b>			
Age	Number of complete years of life	Age in years	Positive
Marital Status	The state of having a spouse/partner.	1 if married 0 if otherwise	Positive
Education level	The highest successfully completed stage of formal learning that includes No education, primary level, secondary level and post-secondary (tertiary) level	1 for No education 0 otherwise 1 for primary 0 otherwise, 1for secondary 0 otherwise , 1 for Tertiary 0 otherwise	Positive
Size of the household	Number of members in a household	Number of household members	Positive/ Negative
Previous Employment status	A number of different working arrangements that was exhaustively categorized into 6 levels on a nominal scale. These categories included employed (formally), self-employed, farmer, casual worker, domestic worker, student on part-time employment and not employed	0 if not employed, 1 if employed (formally), 2 if self-employed, 3 if a farmer, 4 if casual worker, 5 if domestic worker, 6 if a student on part-time employment	Positive
Membership in a self-help group	Being registered in a social welfare group/association(chama)	A dummy variable taking the value of 1 if belonging to a social group, 0 if otherwise	Positive
Motorbike ownership	The possession of the logbook indicating ownership of the motorbike.	1 if Yes 0 if otherwise	Positive



### **3.4 Data Source**

This study made use of primary data and the data collection tool was a structured questionnaire. Research assistants were recruited and trained then assigned to collect data from the respondents.

### **3.5 Sampling Frame**

The target population in the study is 1556(Machakos County, 2019) registered *bodaboda* operators in Kangundo sub-county. This target population was chosen in consideration to the risks they are exposed to. Only registered motorcycle taxi-riders with valid registration stickers from the County council participated in the study.

#### **3.5.1 Sampling Technique**

The simple random sampling technique was used in selecting the required sample size. Machakos county has been conveniently selected. Kangundo sub-county was chosen in random from the 8 other sub-counties that form Machakos county. Machakos County- Conveniently Sampled

Kangundo-Sub-County Simple random technique. selected randomly from the 8 sub counties forming Machakos County. There are 4 wards in the sub county: Kangundo North, Kangundo East, Kangundo West and Kangundo Central. Data will be collected from each of the 4 wards in Kangundo Sub county using proportional sampling.

#### **3.5.2 Sample size determination.**

This study used the Yamane (1967:886) formula in sample size determination. A 95% confidence level and  $P = 0.5$  are assumed in this formula.

$$n = N \div (1 + Ne^2)$$

N= Population size

e = Level of precision

$$1556 \div (1+1556*(0.05^2))$$

=318 Persons

There are 4 wards in the sub county: Kangundo North, Kangundo East, Kangundo West and Kangundo Central. Data will be collected from each of the 4 wards in Kangundo Sub county using proportional sampling.

**Table 3.2: Proportional Sampling**

Ward	Number of operators	of Proportional sampling	Sample size
Kangundo Central	854	$(854/1556)*318$	174
Kangundo West	427	$(427/1556)*318$	87
Kangundo East	123	$(123/1556)*318$	26
Kangundo North	152	$(152/1556)*318$	31
TOTAL	1556		318

### 3.6 Piloting

The questionnaire was piloted in the nearby Matungulu sub county to test its reliability and validity and it was found to be efficient in measuring what it was intended to.

## **3.7 Data issues**

### **3.7.1 Multicollinearity**

This occurs when it is difficult to gauge the impact of the predictor variables on the response variable resulting to unstable parameter estimation. This study detected multicollinearity by the use of variance inflation factors and the correlation matrix and resolved it by dropping the correlated variables as shown in the next chapter.

### **3.7.2 Heteroscedasticity**

This study tested the presence of heteroscedasticity that happens in a case where the variance of the error term is not homogenous for all observations. This was tested using the breusch pagan test and variance was found to be homogenous as shown in the next chapter.

### **3.7.3 Ethical Considerations**

There was no requirement for Institutional Review Board approval since this study did not involve obtaining specimen from the respondents. However, authority to conduct research was granted by the University of Nairobi. Authority to collect data was sought from the county administration, Department of health and emergency services. Informed consent was sought from the study participants where they signed the consent form after an explanation was given to them by the investigator and research assistants. The study did not pose any health risk to the participants since there were no invasive procedures performed on the participants and all information collected was confidentially handled. The participants were advised not to include their names in the study tools and the data obtained was used for the research purposes only.

## CHAPTER FOUR

### DATA ANALYSIS, INTERPRETATION AND DISCUSSION OF RESULTS.

#### 4.1 Introduction.

In this part, the results of the effects of socio-economic factors on the uptake of health insurance among motorcycle operators are presented and interpreted using two approaches, one being the descriptive statistics that answer objective (i) of the study while second is inferential statistics that provide the effect of social-economic variable on the demand for health insurance uptake. Descriptive statistics, diagnostic pre-estimation tests, estimation of the binary probit model with odds ratios and the average marginal effects were computed using STATA.

#### 4.2 Descriptive statistics

The summary of descriptive statistics of variables to be used in analysis is presented in table 4.1

**Table 4.1 Descriptive statistics**

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
<b>Dependent variable</b>					
Insurance uptake	318	.2327044	.4232214	0	1
<b>Independent variables</b>					
Gender	318	.0157233	.1245988	0	1
Age	318	31.1478	8.411359	18	59
Marital status	318	.7012579	.4584279	0	1
Household size	318	2.701258	1.516075	0	7
Previous Employment status	318	.5188679	.9554539	0	6
Motorcycle ownership	318	.5534591	.4979174	0	1
No education	318	.0125786	.1116225	0	1
Primary education	318	.6698113	.4710221	0	1
Secondary education	318	.2295597	.4212125	0	1
Tertiary education	318	.0974843	.2970835	0	1
Membership to social welfare groups	318	.8805031	.3248835	0	1
Type of insurance	75	1.133333	.3422238	1	2

Out of 318 respondents, only 23.3% were found to have enrolled in health insurance programs. Therefore, majority of the motorcycle riders did not have health insurance covers. Only 15.7 % of the riders were females while the rest majority were males. The mean age of the respondents was found to be 31 years, the youngest being 18 years old and the oldest was 59 years old.70 % of the respondents were found to be married while the average household size was found to be 2.7. 51.8% of them had a past history of employment before joining the *bodaboda* industry. 1.3% the respondents had not undergone any formal education.67% had primary education,23 had secondary education and 9.7 % had tertiary education. The findings revealed that 88% of the respondents were members of social welfare groups.55 % were owners of the motorbikes they ride.

**Table 4.2 Preferred insurance service provider**

Preferred Insurance service provider	Freq.	Percent	Cum.
1 Public	65	86.67	86.67
2 Private	10	13.33	100.00
Total	75	100.00	

Majority (88.7%) of those who had insurance had enrolled in the public NHIF scheme while only 13.3% had enrolled in private insurance.

### 4.3 Diagnostic pre-estimation tests

This research study aimed at achieving reliable and valid estimates on the effect of socioeconomic factors on the uptake of health insurance. The following tests were executed to find out the wellness of our data: Breusch Pagan test for heteroscedasticity, variance inflation factors and correlation analysis.

#### 4.3.1 Heteroscedasticity: Breusch Pagan test.

This test was employed in testing for heteroscedasticity. The results as shown in the table indicating that the test statistic (chi square) is 17.27 with a probability of 6.85 %. The p value is insignificant hence we fail to reject the null hypothesis that there is constant variance (homoscedasticity)

**Table 4.5 Heteroscedasticity: Breusch Pagan test.**

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity	
Ho: Constant variance	
<b>chi2(10) = 17.27</b>	<b>Prob &gt; chi2 = 0.0685</b>

#### 4.3.2 Multicollinearity testing.

The Variance inflation factor (VIF) was used to check for multi-collinearity. A V.I.F value of less than 10 is interpreted as the absence of multi-collinearity. From the values in our test as shown in table 4.6 below, this study dropped the two variables with a VIF larger than 10 because of collinearity.

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

Variable	VIF	1/VIF
Primary education	16.28	0.061439
Secondary education	14.12	0.070815
Tertiary education	5.91	0.169325
Household size	2.11	0.474259
Marital status	2.05	0.486880
No education	1.90	0.526250
Previous employment status	1.12	0.890893
Motorcycle ownership	1.12	0.893098
Age	1.12	0.893993
Membership in a welfare group	1.11	0.900273
Mean VIF	4.68	

**Correlation matrix: Table 4.7**

Variables	Age	Marital .s	HHsize	PES	M.O	No educ	Primar y	Second ary	tertiary	Membe rship in a social welfare
age	1.0000									
Marital s	0.1260	1.0000								
HHsiz	0.2046	0.6882	1.0000							
PES	0.124	0.0453	0.0159	1.0000						
MO	-0.0490	0.0080	0.0818	0.2830	1.0000					
NO educ	-0.0255	0.0120	0.0036	-0.0318	-0.0121	1.0000				
Primary	0.0378	-0.0200	-0.0856	-0.0948	-0.0792	-0.1608	1.0000			
Secondar y	-0.1654	0.0295	0.0732	0.0480	0.0541	-0.0616	-0.7775	1.0000		
Tertiary	0.1735	0.0060	0.0298	0.1324	0.0819	-0.0371	-0.3779	-0.1794	1.0000	
members hip	0.0215	-0.1134	0.0682	0.0683	-0.0189	-0.1324	0.0093	0.0628	-0.0097	1.0000

### 4.3.3 Correlation Analysis

This study tested for correlation among the study variables by examining the correlation coefficient. If the coefficient is 0, this implies the absence of correlation whereas positive 1 represents perfect positive correlation. Negative 1 represents perfect negative correlation. From the matrix in table 4.7, it is evident that there was no perfect correlation in our model.

### 4.4 Econometric Estimation

**Table 4.8 Probit Regression results for effects of socio-economic factors on uptake of health insurance**

Variables	Coefficients	Robust standard error	z	P>z	[95% Confidence Interval]
Age	-0.0028159	0.0112036	- 0.25	0.802	-.0247745 0.0191427
Marital Status	0.3126021	0.2529596	1.24	0.217	-0.1831896 0.8083938
Household size	-0.0229575	0.0739932	-0.31	0.756	-0.1679815 0.1220665
Previous Employment status	0 .2877424	0.0220668	3.99	0.000 ***	0.1464941 0.4289907
Motorcycle ownership	0.3982765	0.01772039	2.25	0.025 **	0.0509631 0.7455898
Tertiary Education	0 .9014348	0.2542164	3.55	0.000 ***	0.4031798 1.39969
Membership of social welfare	0.0473865	.2807738	0.17	0.866	-0.50292 0.5976931

Key:\*\*\* p < 0.01 ,\*\* p<0.05,\* p<0.1



Probit regression		Number of obs	=	318	
	Wald chi2(7)	=	43.63		
	Prob > chi2	=	0.0000		
Log pseudo likelihood	=	-152.05403	Pseudo R2	=	0.1186

The p value and the log likelihood chi square ratio are 0.0000 and 0.1186 respectively. This shows joint significance of the independent variables in explaining the enrollment and 11.86% of the change in enrollment is explained by the changes in these independent variables.

The results of the probit model in table 4.8 show that an increase in age of the motorbike riders is likely to decrease the uptake of health insurance. On marital status, result indicate that being married increases the probability of purchasing healthcare insurance. An increase in the size of the household decreases the probability of purchasing healthcare insurance. On previous employment status, the results indicate that those who were previously employed are more likely to have insurance covers. In addition, those who own the motorcycles are more likely to subscribe to healthcare insurance.

On tertiary education, the findings show that having tertiary education has a positive impact on the uptake of health insurance. Finally, membership in a social welfare group also has a positive impact on uptake of health insurance.

The probability of up taking healthcare insurance depends on the marginal effects computed from the various independent variables which show change in probability of enrollment. The average marginal effects are shown in 4.9

**Table 4.9 Average marginal effects regression of socio-economic factors on the uptake of health insurance.**

<b>Variables</b>	<b>dy/dx</b>	<b>standard error</b>	<b>z</b>	<b>P&gt;z</b>	<b>[95% Confidence</b>	<b>Interval]</b>
Age	-0.0007108	0.0030147	-0.24	0.814	-0.0066194	0.0051978
Marital Status	0.084865	0.0674506	1.26	0.208	-0.0473358	0.2170658
Household size	-0.0067534	-0.0199323	-0.34	0.735	-.0458201	0.0323132
Previous Employment status	0.0778608	0.0180723	4.31	0.000 ***	0.0424398	0.1132817
Motorcycle ownership	0.1071859	0.0465984	2.30	0.021 **	0.0158548	0.198517
Tertiary Education	0.2444872	0.0644457	3.79	0.000 ***	0.118176	0.3707984
Membership of social welfare	0.0227765	0.0740697	0.31	0.758	-.1223973	0.1679504

**Interpretation of marginal effects.**

Based on the marginal effects of the model for the significant variables, findings reveal show that having tertiary education is more likely to increase the uptake of health insurance by 24.4% all factors held constant. Motorcycle ownership is more likely to increase the uptake of health insurance, all factors held constant by 10.7%. Having a previous history of employment, increases the uptake of health insurance by 7.8% holding all other factors constant.

#### **4.5 Discussion of results**

These marginal effects measure the alteration in the probability of a motorcycle taxi operator purchasing healthcare insurance with a unit change in a given independent variable, holding all other variables constant at their mean. Motorcycle ownership, previous employment status and tertiary education variables have significant marginal effects on enrollment in health insurance at the 5% level of significance.

Previous employment status increases the probability of enrollment in health insurance by 6.9%. This is attributable to the fact that being in employment increases the value people attach to their healthy time making them invest in health inputs such as enrolling in the pre-paid health access programme. More importantly, they were in a position to raise the 500 KES required for monthly subscription of NHIF which is the most common form of insurance scheme. These results correspond to Ng'etich (2012) who found a significant positive relationship between health insurance uptake and previous employment status in Nandi-Kenya.

According to the results, having attained tertiary education increases the likelihood of enrollment in healthcare insurance plans by 18%. Nyagero et al., (2012) Kirigia et al., (2005) studies also validated that there was a relationship between education and the uptake of health insurance. However, Ng'etich (2012) found no relationship between education and insurance uptake among motorbike operators in Nandi-Kenya.

Motorcycle ownership increases the likelihood of one enrolling to an insurance plan by 10.7% all other factors held constant. These findings correspond to Ng'etich (2012) who discovered a significant positive relation between healthcare insurance uptake and

motorcycle ownership in his study on subscription of healthcare insurance by motorbike operators in Nandi-Kenya.

Age, household size, and membership in a social welfare, had a negative but insignificant effect on the purchase of healthcare insurance. The study did not find any relationship between marital status and uptake of health insurance by motorbike taxi operators in Machakos-Kenya.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

#### 5.1 Introduction

This chapter presents a summary of the study findings, substantive conclusions based on the findings and key recommendations drawn from the study findings. Suggestions are also given on further research.

#### 5.2 Summary

The main objective of the study was to determine the effects of socioeconomic factors on the uptake of healthcare insurance by motorbike transporters in Machakos-Kenya. The other objectives were: establishing the pattern of uptake and drawing key policy recommendations from the study. Theoretical and empirical literature to establish key socioeconomic factors associated with enrollment in health insurance was reviewed. Empirical literature was reviewed from studies done in different spheres of the globe and in consideration with methods used. Primary data was collected from *bodaboda* riders in Kangundo sub county by administration of structured questionnaires. The data collection tool had been tested prior to the actual data collection exercise. The independent variables studied were age, education level, previous employment status, marital status, household size and membership to a social group.

Diagnostic tests were done prior to econometric estimation to test for data issues such as heteroscedasticity and multicollinearity. Necessary steps were taken to ensure validity and reliability of the data to be used in estimation. This study employed a binary probit regression model in analysis and results were reported at 95% confidence interval

whereby previous employment status and having attained tertiary education. had a positive and significant relationship with enrollment. Age, household size, motorcycle ownership and membership in a social welfare. had a negative but insignificant effect on the healthcare insurance purchase.

### **5.3. Conclusion.**

In conclusion, the findings of this study indicate that the enrollment of health insurance is still low with the percentage of motorbike riders enrolled in Machakos standing at 23 %. Secondly, the results indicate that socio-economic factors like having achieved tertiary education and employment status and motorcycle ownership play a critical role towards the enrollment of non-formal division laborers in Kenya in healthcare insurance plans. The findings however show that there was no significant relationship between marital status, household size and membership in social welfare groups and health insurance uptake by motorbike taxi operators in Machakos-Kenya.

### **5.4 Policy Recommendations**

It is worth noting that there is still a low uptake extent of healthcare insurance by motorbike transport operators at only (23.3%) in spite of the associated advantages. Owning the motorcycle, having tertiary education and previous employment status are associated with a significant increase in uptake of health insurance. Thus the government should focus more on increasing literacy levels by encouraging more students to progress with tertiary education. A higher income level is associated with increased uptake of insurance because of more disposable income, thus if there is a right economic environment there will be increased uptake of insurance. The government should create

awareness to encourage this group by engaging the welfare groups where it was discovered that most people are members.

### **5.5 Further Research**

Future studies in this area can be to evaluate the effectiveness of the existing health insurance schemes in protecting members of the non-formal division and the financially less fortunate from catastrophic expenditures. This way the government can understand better the schemes are meeting the set out objectives of ensuring individuals have access to care when they need it without incurring catastrophic expenditures as they seek to bring more Healthcare financing is one essential aspect of UHC and therefore other aspects need to be studied in depth including the impact of the existing health workforce, health systems governance and service delivery, and safety systems on efforts towards achievement of UHC.

## REFERENCES

- Ataguba J, Ichoku EH, & Fonta W, (2008). Estimating the willingness to pay for community healthcare insurance in rural Nigeria. SSRN 1266163. *Rochester, NY, USA: Social Science Research Network*
- Adebayo, E.F., Uthman, O.A., Wiysonge, C.S., Stern, E.A., Lamont, K.T., & Ataguba, J.E. (2015). A systematic review of factors that affect uptake of community-based health insurance in low-income and middle-income countries. *BMC Health*
- Badu E, Agyei-Baffour P, Acheampong IO, Opoku MP, AddaiDonkor K. Households sociodemographic profile as predictors of health insurance uptake and service utilization: a crosssectional study in a municipality of Ghana. *Advances in Public Health*. 2018;2018: 1-13. Google Scholar
- Banchani et al., (2012): The health burden and Risk Factors in Two Districts Traffic Injury Prevention, 13:sup1, 24-30 Services Research. 15(543). doi:10.1186/s12913015-1179-3
- Bawa, S.K.(2011).*Awareness and Willingness to Pay For Health Insurance: An Empirical Study With Reference to Punjab India*. The Special Issue On Behavioural And Social Sciences.www.ijhssnet.com
- Bending, M., & Arun, T. (2011). Enrolment in micro life and health insurance: Evidences from Sri Lanka. IZA discussion paper. Bonn: Institute for the study of labour.
- Bhat, R. and Jain, N. (2006) Factors Affecting the Demand for Health Insurance in a Micro Insurance Scheme. Working Paper No. 2006-07-02, India Institute of Management, Ahmadabad.



Boateng, D., & Awunyor-Vito, D. (2013). Health insurance in Ghana: evaluation of policy holders' perceptions and factors influencing policy renewal in the Volta region. *International Journal for Equity in Health*, 12-50.

Chuma, J., & Okungu, V. (2011). Viewing the Kenyan health system through an equity lens: implications for universal coverage. *International Journal of Health Equity*, 10(22).

Gathara, P. (2018, January 11). (D)EVOLVED HEALTHCARE: Makueni's trailblazing experiment in providing universal health coverage. Retrieved from <https://www.theelephant.info/features/2018/01/11/devolved-healthcare-makuenis-trailblazing-experiment-in-providing-universal-health-coverage/>

*Health Financing Policy, Discussion Pa 1. WHO Regional Office for Africa. Health Harmonization for Africa, report of the panel discussion on health financing developments, WHO, 2012. 2. www.hha-online.org/hso/conference 3. http://www.who.int/mediacentre/news/statements/2013/uhc\_20130219/en/index.html*

Jangati, Y. (2012). Awareness of health insurance in Andhra Pradesh. *International Journal of Scientific and Research Publications*, 2(6).

Kimani *et al.*, (2012). Determinants of participation in a public health insurance program among residents of urban slums in Nairobi, Kenya: results from a cross-sectional survey; *BMC Health Service Research*. 2012; 12: 66; doi: [10.1186/1472-6963-12-66](https://doi.org/10.1186/1472-6963-12-66)

Kimani *et al.*, (2014). Determinants of health insurance ownership among women in Kenya: evidence from the 2008–09 Kenya demographic and health survey: *International Journal for Equity in Health*, 13:27

- Kirigia *et al.*, (2005). Determinants of Health Insurance ownership among South African Women. *BMC Public Health*.
- Kimani, J., Ettarh, R., Kyobutungi, C., Mberu. & Muindi, K. (2012). *Determinants for participation in a public health insurance program among residents of urban slums in Nairobi, Kenya: results from a cross-sectional survey*. African Population and Health Research Center.
- Mathauer I, Schmidt JO & Wenyaa M (2008). Extending Social Health Insurance to the Informal Sector in Kenya. An Assessment of factors affecting demand. *International Journal of Planning and Management*.2008; 23(1):51-68.
- Maina JM, Kithuka P, Tororei S. Perceptions and uptake of health insurance for maternal care in rural Kenya: a cross-sectional study. *The Pan African Medical Journal*. 2016;23:125. [[PMC free article](#)] [[PubMed](#)]
- Naieni KH, Asadi-Lari M, Foroushani AR, Malek-Afzali H. *Socioeconomic Status and Incidence of Traffic Accidents in Metropolitan Tehran: A Population-based Study*. *Int J Prev Med*. 2012 Mar;3(3):181-90.
- Namuhisa, J.A. (2014). Determinants of Uptake of National Hospital Insurance Fund Scheme by the Informal Sector in Nairobi County, Kenya.
- Nguru, C.N.(2018) Uptake of Health Insurance among Patients Attending Public and Private Hospitals in Embu County, Kenya(Unpublished paper) *Kenyatta University*.
- Ng`etich (2012) Uptake of health insurance among motorcycle taxi riders, Nandi county, Kenya.(unpublished paper) *Kenyatta University*.
- Nyman, J.A. (2003). The theory of demand for health insurance.

- Nyagero et al., (2012). The background, social support and behavioural characteristics associated with health insurance coverage among the older population in Kisii County, Kenya. *African Journal of Health Science*. 2012; 22:201-213
- Okech, T. C., & Lelegwe, S. L., (2015). Analysis of Universal Health Coverage and Equity on Health Care in Kenya. *Global Journal of Health Science*, 8(7), 218.
- Sarpong N, Loag W, Fobil J, Meyer CG, Adu-Sarkodie Y, May J, et al. National health insurance coverage and socio-economic status in a rural district of Ghana. *Trop Med Int Health*. 2010;15(2):191–7
- Thibaut, J. W., & Kelley, H. H. (1959). *The Social Psychology of Groups*. Newyork: Wiley
- Von Neumann, J., & Morgenstern, O., (2007). *Theory of Games and Economic Behavior*. Princeton University Press.
- WHO & Kenya MOPHS (2011). *Motorcycle-Related Road Traffic Crashes in Kenya Facts and Figures*.
- World Health Organization. (2010). *The World Health Report: Health Systems Financing: The Path to Universal Coverage*. Geneva: World Health Organization

Xu, Ke, et al. An Empirical Model of Access to Health Care, Health Care Expenditure and Impoverishment in Kenya: Learning from Past Reforms and Lessons for the Future.

Ying, X. H., Hu, T. W., Ren, J., Chen, W., Xu, K., & Huang, J. H.. (2007). Demand for private health insurance in Chinese urban areas. *Health Economics*, 16(10), 1041-1050.4.

**APPENDIX I**

**CONSENT FORM**

**EFFECTS OF SOCIO-ECONOMIC FACTORS ON THE UPTAKE OF HEALTH INSURANCE BY MOTORCYCLE TAXI OPERATORS IN MACHAKOS COUNTY, KENYA.**

I am John Muge Nyaboga, a Masters student at the University of Nairobi, currently conducting a research on the above topic. I hereby request you to participate in this study, that will provide information needed to develop strategies for use in directing policy, hence improving the quality of life of people through accessible healthcare. Participation is voluntary and utmost confidentiality is assured for information given.

You are free to accept or decline to take part in this study without any victimization. The study will be beneficial in that it will provide information needed to develop strategies for improved healthcare financing.

Kindly sign below to declare your acceptance to participate if you agree to do so. You will participate by answering questions asked from the attached questionnaire after signing this consent form.

I, hereby agree to participate in this study. I understand that all the information I give will be treated with high level of confidentiality and will only be used for research purposes.

Participant's Signature ..... Date.....

## QUESTIONNAIRE

Check in the box for your suitable choice

### PART 1:

1. Gender?

Male  Female

2. age in years

3. Marital Status?

Single  Married  Widowed  Divorced

4. What is the size of your household?

5. Were you employed before going into *bodaboda* business?

Yes  No

6. Are you the owner of this motorcycle?

Yes  No

8. Education status?

None  primary  secondary  Tertiary

9. Membership of any social welfare group (Chama )

Yes  NO

10. Level of income 0-300 { } 300-600 { } 600-900 { } Above 900.

### PART 2: HEALTH INSURANCE ENROLLMENT

10. Have you subscribed to any health insurance plan?

Yes  No

11. Insurance service provider

Public (NHIF)  Private