

**DETERMINANTS OF NATIONAL HOSPITAL INSURANCE FUND UPTAKE BY  
HOUSEHOLDS IN KENYA**

**BY**


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**A PROJECT SUBMITTED TO THE SCHOOL OF ECONOMICS, UNIVERSITY OF  
NAIROBI IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD  
OF THE DEGREE OF MASTER OF SCIENCE IN HEALTH ECONOMICS AND  
POLICY**

**2022**

## DECLARATION

This is my original work and has not been presented for an award to any other institution of higher learning.

Signed: .....  ..... Date 30/01/2023

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**X53/13524/2018**

This project is submitted for examination with my approval as the University supervisor.

Signed: .....  ..... Date 8/9/2023

**Dr. Phyllis Machio**

## **DEDICATION**

This work is dedicated to my children – Sonia Mawira and Giacomo Mawira that they may be studious.

## **ACKNOLDGEMENT**

I first acknowledge God almighty for this far I have come. I would like to acknowledge my supervisor Dr. Phyllis Machio for the guidance throughout the project. I also acknowledge my parents Gilbert Mugambi and Mercy Mugambi for their tireless effort, support and encouragement. I also acknowledge my wife Christine Gachigi for her support and understanding without which this work would not have been possible. Lastly, I acknowledge my sisters Christine Makena and Maureen Mwende for their moral support and inspiration.

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## **LIST OF ACRONYSMS**

**HIV:** Human Immunodeficiency Virus

**IMF:** International Monetary Fund

**MOH:** Ministry of Health

**NHIF:** National Hospital Insurance Fund

**OOP:** Out of Pocket Expenditure

**VIF:** Variance Inflation Factor

**WHO:** World Health Organization

## **ABSTRACT**

Out of pocket expenditure is a major source of health spending for households in Kenya with negligible payments coming from insurance placing them at peril of incurring medical expenditure exceeding 10% of the total household expenditure. National Health Insurance Fund (NHIF) is the main provider of health insurance coverage in Kenya, yet, only 26% of the Kenyan population is covered under NHIF. This study examined the socio- economic determinants related to uptake of NHIF by households in Kenya. The independent variables were education, religion, household size, marital status, chronic illness, access to information, employment and wealth status (quintile). The dependent variable was uptake of NHIF. Social exchange theory and Expected Utility Theory informed the study. The study used Probit model which is appropriate when analyzing dichotomous responses. Data for the study was mined from the 2018 survey by Ministry of Health on Kenya Household Health Expenditure. Findings from the study verify that socio-demographic factors contribute significantly to uptake of NHIF insurance among households. Among these are wealth status, marital status, employment status and level of education. The study recommends for inclusion of basic health insurance concepts in school curricula. The government should come up with viable means for subsidizing health insurance for households to stir uptake and continuation as well as creating an enabling business environment to enhance households wealth status which will translate to increased enrollment to NHIF.

## **CHAPTER ONE**

### **INTRODUCTION**

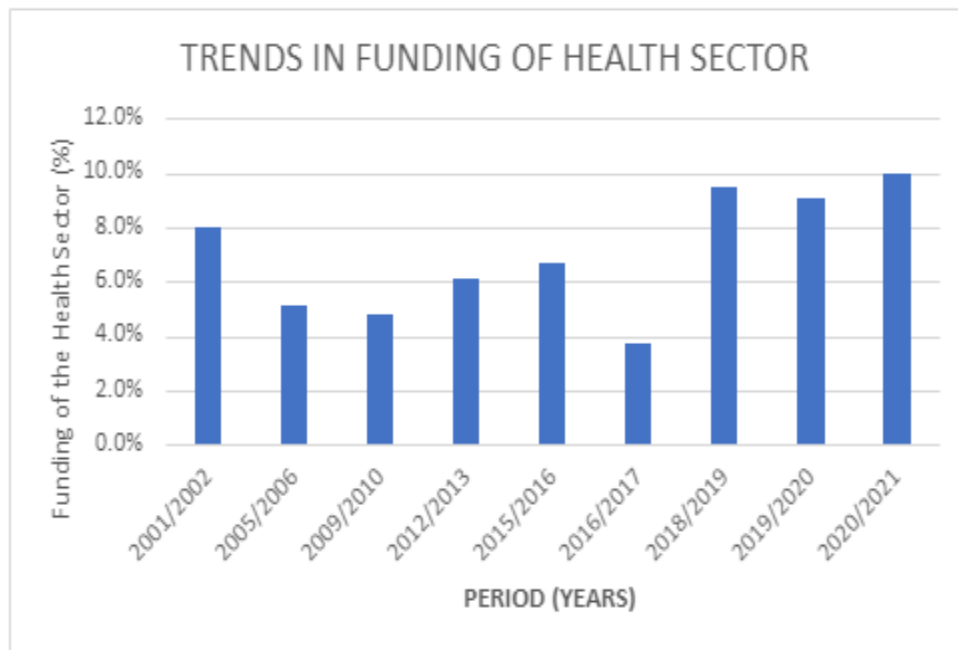
#### **1.1 Background to the study**

The emphasis on universal health is enshrined in the WHO Constitution which declared health a basic human right and is also expressed in Alma-Ata declaration of 1978 on Health for All agenda. It also aligns with sustainable development goals number one and three which focus on guaranteeing sound state of health for all and bringing an end to extreme poverty in all forms by 2030 respectively. With unanimous adoption of United Nations General Assembly resolution emphasizing health as an essential aspect in international development, universal health coverage is gaining support globally. The 12<sup>th</sup> December resolution on Global Health and Foreign Policy of the year 2012, called upon governments to press on towards delivering affordable and accessible healthcare to all people. On this basis, governments should focus on developing a financing system which ensures accessible health services to all persons in terms of prevention, treatment, promotion of health, palliative and rehabilitation care when needed while at the same time minimizing the risk of financial hardship from health care expenses (United Nations General Assembly, 2015). Further, the African Charter on Human and Peoples' Rights ((Banjul Charter 1981) Article 16 gave emphasis on the right of every person to attain perfect physical and mental health with a call on governments to adopt strategies which protect the health of their people by providing medical attention when required.

Universal health coverage is a critical component in reducing poverty and social inequities and a major element in promoting sustainable development. Statistics from World Bank and WHO (2017) indicate that, globally half of the population cannot receive vital health care with 800 million spending about 10 percent of their income to cater for family health expenses and another 100 million pushed by high medical spending to survive barely on less than one dollar per day. Due to expenses involved, no country in the world can accomplish universal health coverage in a day. Despite this, strategies should be put in place to hasten the move and also sustain what countries have so far reaped. Requirements to achieve Health for all in any country include; designing a sound health financing mechanism that cushions all persons from being impoverished, well equipped medical outlets, and qualified staff at all levels (WHO, 2010).

At the national level, governments are working towards a functional health system, by ensuring adequate collection of earnings in a sustainable manner while at the same time ensuring efficiency and equitable distribution. In logical terms, this implies that governments will need to finance or subsidize all those health facilities that qualify as basic public and merit goods. In addition, they should also, finance services for the needy and, ideally, provide their entire population with financial security as a matter of financial justice (IMF, 2006). In the year 2001 African Union member states met in Abuja, Nigeria and signed the Abuja Declaration which called on governments to give priority to the health by allocating sufficient resources. The meeting sought to address persistent challenges in the sector and also ensure governments readiness in mitigating and managing disease outbreaks such as tuberculosis, malaria, and HIV and AIDs. To accomplish this, governments made a political pledge of having fifteen percent of their total budget allocated to health care each year. Additionally, the declaration called on donor countries to increase their funding for the sector (Federal Republic of Nigeria, 2001).

Even with commitment to the 15% budget allocation by Kenya government, funding of the health sector is still far below as shown through various financial years: 2001/2002 (8.0%), 2005/2006(5.1%), 2009/2010(4.8%), 2012/2013(6.1%), 2015/2016(6.7%), 2016/2017(3.7%), 2018/2019 (9.5%), 2019/2020(9.1%), 2020/2021(10%)(Republic of Kenya, 2020). This is summarized in figure 1: Trends in funding of health sector.



**Figure 1: Trends in funding of health sector.**

In tandem with the declaration, the government has developed partnerships in the sector to support funding which culminated in 2018-2030 Kenya Health Sector Partnership and Coordination Framework to coordinate and align efforts of the different partners in improving the health of all Kenyans (Ministry of Health, 2020).

### **1.1.1 Households health spending**

In Kenya, the focus on universal health is embedded in a number of legal instruments: the 2010 constitution Article 43 entitles the citizens to right to health which encompass high quality healthcare services with special focus on sexual and reproductive healthcare. The government is mandated to offer support to those who are not financially able to support themselves and their dependents as a means to attaining social security. To further support the need for universal health, the Kenya National Patients’ Rights Charter was developed in 2013 with three aims: to provide highest quality of health to all Kenyans, empower those seeking for service to press for better services and to ensure equitable service for every individual. Act No. 21 of 2017 on “The right to health” calls for sufficient facilities which are financially non-discriminatory in access (Republic of Kenya, 2017a). To improve the image of the sector, and to align with the 2010 Constitution, Vision 2030, global commitments and the strategic plan for national development,

the Health Policy, 2014–2030 was enacted to give direction to the planned improvements (Republic of Kenya, 2014).

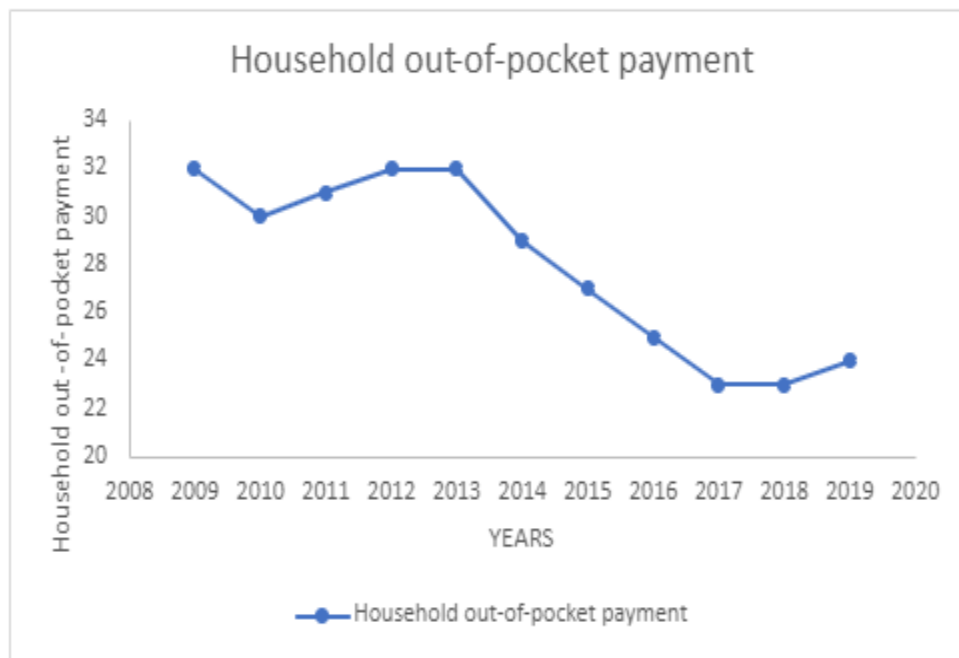
In spite of this, OOP forms the major source of health spending for households with negligible payments coming from insurance thus placing them at peril of incurring medical expenditure exceeding 10% of the total household expenditure (Chuma & Maina 2012). This creates financial barriers to health care and further exposes households to financial insecurity. In the financial year 2015/16, insurances paid off only 6% which marked a decline from 15 percent in the financial year 2009/10 (MOH, 2017). Households' with prepayment reap benefits in that they are safeguarded from financial healthcare burden and they also have a predictable plan to pay for their health. Low subscription exposes individuals to danger of Catastrophic Health Expenditure. To reduce barriers to financial health care, the Government has implemented programs like the free primary healthcare, Linda Mama programs, and also increased registration through NHIF. Despite these policy efforts, direct spending by households has persistently contributed to about 30 % of medical financing. To align with the vision of Social Health Insurance Fund (SHIF), there are plans to increase enrollment of more people to NHIF as a means of making payment in advance thus, address the major challenge of equity in health care (Barasa, 2017).

From 2007 KHHEU Survey data, reports levels of CHE ranging between 9.8% and 14.8% for the households. In the 2013 survey, OOP expenditures on outpatient visits amounted to about 78% (KShs 48.4 billion) of entire household expending in health. At the same time inpatient services amounted to about 22% (KShs 13.7 billion). For the year 2013 the average spending per person for entire inpatient and outpatient visits was approximately Kshs 355 and KShs 1,254 respectively. Diverse annual per capita spending were noted for outpatient expenditure among counties with Turkana and Siaya both spending about KShs 500 compared to a spending of above KSh 2000 for Mombasa, Kirinyaga, Nairobi, and Kajiado. The year 2018 report indicated a figure of KSh 2,470 as the per capita expenditure covering an average of KSh 529 and KSh 1,941 for inpatient and outpatient respectively thus, presenting 53% increase to the estimated per capita spending of KSh 1,609 from the 2013 survey. The low inpatient expenditure in comparison to that of outpatient was attributed to lower cases of admissions against high outpatient visits. These differences were linked to variations in the socioeconomic factors which affected utilization of healthcare services. Poverty-stricken counties, among them Lamu,

Turkana, and Makueni, had lower spending in health when compared to wealthy counties like Nairobi, Kirinyaga and Kajiado. On the overall, the percentage of households that were reported to have incurred catastrophic health expenditures in the year 2013 was 4.5 %.

The mean unweighted OOP expenditure in 2018 was KSh 21,851 and KSh 1,227 for inpatient and outpatient services respectively. Kiambu and Nyeri Counties attracted highest per capita expenditure rising above KSh 4,000. On the contrary, West Pokot, Bomet, Turkana and Bungoma recorded low per capita expenditures of less than KSh 1,400. The estimated CHE during the 2018 survey period was 4.9% (using 40% threshold) and 8% (using 10% threshold) which was an improvement compared to the 2013 figure of 6.21% and 12.7% respectively and also an improvement from 2003 5.2 % (using 40% threshold) and 6.7% (using the 10% threshold) (MOH, 2018).

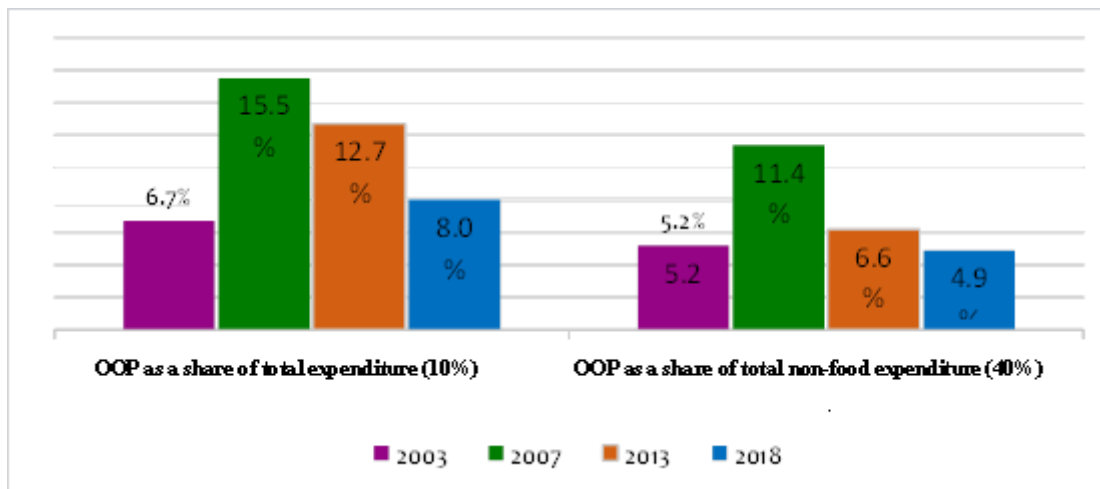
World Health Organization Global Health Expenditure Database indicate a decrease of OOP in Kenya over the years as presented in figure 2.



**Figure 2: Household out of pocket payment in Kenya**

Incidences of catastrophic health expenditure have also been reported from four KHHEU surveys





**Figure 3: Trends in incidence of catastrophic health expenditure in Kenya**

### 1.2.2 Health Insurance in Kenya

In 1966, Cap 255 of the Laws of Kenya established NHIF to insure only individuals in specified occupations. Over time, amendment was made on expanded coverage by adopting a social model with the intention of insuring every Kenyan with timeline set as the year 2022. As the main provider of health cover, the insurance is commissioned to offer affordable, accessible, and quality cover to every Kenyan. Despite having a good foundation to expand its enrollment, NHIF coverage is still less than one fifth of the population. For financial year 2019/20, the fund enrolled 557,559 new members raising the total membership to 8.9 million Kenyans with active membership of 3.2M. This means that, about 12.7 million Kenyans, that is, 26% of the population are under the NHIF cover (MOH, 2020). What this means is that majority of Kenyans directly make payments when they seek for health care services. To achieve universal insurance coverage, it will be imperative for the government to consider; a) strengthening the NHIF system b) intensifying enrollment of informal workers and the poor in particular c) improving the purchasing mechanisms (WHO, 2010). Statistics from KNBS (2018) indicate that close to 30 % of the urban had a cover with 14% registered in the rural areas. This evidently shows existence of Geographic variations in membership to insurance cover among Kenyans.

The survey by MOH (2018b) revealed that insurance up take in all categories of insurance schemes was notable among the wealthy attracting a cover of 42 percent compared to a cover of 2.9 percent for the lowest quintile. Majority of those covered had enrolled with NHIF, with the

larger portion of those insured by NHIF being among the poor. Cover by private providers increased among the wealthy attracting a cover of 7% with no registration among the poorest members of the population. Enrollment by the poor to community-based health insurance coverage was highest.

## **1.2 Statement of the problem**

In Kenya, the population covered by health insurance is 29 percent. Of these, 89 percent are insured by NHIF, private insurance covers 5.1 percent, 3.9 percent are covered by employer/institution, 0.7 percent are with community-based health insurance, county schemes cover 0.7 percent with other forms of insurance covering 0.1 percent. While NHIF covers most of the insured, it only covers 26% of the population (Republic of Kenya, 2018). Levels of enrollment differ notably within socioeconomic status and geographical regions. Insurance coverage is much higher among the wealthy with 42 % reported to have a cover compared to 2.9% among poor. The aforementioned findings evidently reveal a discrepancy in accessing healthcare. From figure 3, in the study period, the incidence of CHE was estimated as 8% (using a threshold of 10%) and 4.9% (using a threshold of 40%).

Out of Pocket spending is thus a major burden on both the poor and vulnerable households and a major obstacle to usage of healthcare. A survey by MOH (2018) found that 19.4 % of households were not able to access care in the facilities they visited due to high costing, a figure which matches the 2013 figure. Being a public institution, the government prefers NHIF as a means to scaling up health coverage among the population. The government has made clarion calls to Kenyans especially the vulnerable groups to register with the fund as part of the government's Big 4 Agenda (Kenya news agency, 2022). Yet only 26 percent of the population is covered by NHIF (NHIF Performance Report (2018)). Studies have identified several reasons contributing to this low uptake as; Lack of education and illiteracy which makes it difficult for individuals to understand health information messages, low economic status and lack of money to afford monthly premiums, low levels of awareness on (registration procedures , benefits of NHIF membership, who benefits from the cover, premium payment procedures), lack trust on the insurance, lack of accessible registration centers and long distance to registration centers, inadequacy of health facilities. Others were spousal refusal particularly for large families and

where children were over 18 years which required verification of their economic dependency relevant documents among them enrollment is school or university. Those with lower risk of chronic illnesses and those over 69 years of age for go insurance covers (Ndung'u, 2015; Kipaseyia, 2016; Mwaura et al, 2022).

Previous studies focused on insurance uptake of NHIF by Sacco members (Nyorera and Okibo (2015); informal sector workers (Mukhwana & Mutai, 2015 and Muketha 2016) and the public transport industry workers (Muli, (2013). The study by Kamau (2013) focused on insurance penetration in Kenya. A study by Wanjiru et al (2019) in Uasin Gishu County focused on National Hospital Insurance Fund enrolment while Nkatha (2019) focused on Micro economic determinants of health insurance demand. There is thus a research gap on determinants of NHIF uptake by households in Kenya at the national level.

### **1.3 Research Questions**

- (i) Which are the social- economic determinants of uptake of NHIF by households?
- (ii) What are the policy implications form the study?

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

The study aims to:

- (i) To examine the socio- economic determinants of uptake of National Hospital Insurance Fund by households in Kenya.
- (ii) To document implications for policy decisions.

### **1.5 Significance of the Study**

Findings on determinants of health insurance uptake and how they influence decisions of households to take insurance cover or not will help policy makers to develop health insurance packages that promote more uptake of medical covers. This will also provide information that can help in strategic reforms in NHIF and in redesigning of medical insurance products to suit specific household needs equitably. Other stakeholders in the insurance industry (private and community) may also benefit from the study to scale up uptake of medical insurance covers. Increased uptake of health insurance eventually leads to achievement of universal health coverage. Lastly, the research findings may add important information to existing body of

knowledge on determinants of uptake of medical cover by households which future researchers can use to inform their research.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

Covered in the chapter is theoretical review with focus on theory that explains decision to uptake medical insurance; empirical literature review highlight studies that have been undertaken previously; and overview of the literature to highlight key lessons and to unveil knowledge gaps.

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

Two theories are considered to guide the study; Social exchange theory by George Homans (1961) and Nyman's (2001) Expected Utility Theory.

##### **2.2.1 Social exchange theory**

The theory by George Homans (1961) posits that social behavior results from an exchange process with the aim of maximizing benefits while minimizing costs at the same time. According to this theory, people assess potential benefits and risks of any undertaking or of a social relationship. Where risks exceed gains, people will end or relinquish that relationship and *visé versa*. To determine the worth of a relationship or an undertaking, people naturally consider the benefits and then subtract the costs. Where benefits exceed cost, a positive relationship is said to occur while negative relationships occurs when the costs are higher than the benefits. The theory is applicable in this study since uptake of a medical cover will be judged in relation to maximizing health services received while at the same time minimizing healthcare costs, that is, reducing on Out Of Pocket (OOP) expenditure. Moreover the social exchange process involves examining existing alternatives, analyzing the benefits and costs then comparing to make a

decision on the best option. In life practice, households will do a survey of available medical cover alternatives and make a choice based on perceived benefits.

### **2.2.2 Expected Utility Theory from a Gain Perspective**

The theory by Nyman's (2001) posits that when a person is faced with comparable alternatives to choose from, an individual will pick on one which will fully satisfy the specified purpose. In this respect, the purpose of health cover is the anticipated payment to be made when services are sought. It is the uncertainty that triggers the need for financial security. The cover will help in eliminating financial uncertainties linked with future illnesses. In life a person may not know when he/she may need health care and may not fully understand the impact sickness may have on their finances. The theory unveils financial gain from health insurance as well as likely loss by the insurer, accruing from increased need for health care overtime.

When households take up health insurance cover, the expectation is that the profit garnered surpass benefits bygone from other substitutes that could have been secured. From this perspective the cover serves as extra earning to mitigate any eventualities when in sick state. There are two dimensions in understanding the application of the theory; first, in the event of sickness, the insurance will cater for treatment cost which in some cases is higher than the premiums paid thus representing a gain. Secondly a person who does not pay for premiums may have more personal income. Such a person has no cover to fall back to when health care is required and will eventually shoulder the cost of treatment of which might be very high and thus deplete all the accrued finances through non-payment of insurance premiums hence a loss.

The theory applies to this study due to the fact that it views health insurance as encompassing aspects of uncertainty and risk profiles where consumers weigh outcomes (gains or losses) of enrolling to a health insurance and then selecting the alternative with maximum utility.

### **2.3 Empirical literature**

Muranda et al (2021) studied the role of personal characteristics on membership into NHIF among employees in the informal sector in Vihiga County. Target population was from the 4 wards in the Sub County where a sample of 384 participants was drawn using probability sampling methods. Semi-structured questionnaires were employed to gather data which was then analyzed through descriptive statistics. To test for associations, both bivariate and multivariate

regressions were used at a significance level of 0.05. Findings showed a significant association between persons aged over fifty years, income, level of education, , and formal employment with purchase of the cover. The study concluded that enrollment was highly dependent on gender of the household head, a person's age, level of education of an individual, form of employment status and monthly earnings.

Asindua et al. (2021) study on establishing uptake of health cover in Matuu Ward of Machakos County used a sample of 202 respondents to provide data. Frequencies and percentages were used for descriptive data analysis while standard deviations were computed for items in the likert scale to check on how far the individual responses to the items varied from the mean. Themes and sub-themes were used to group qualitative data from key informants. From the study, 97% of the workers were generally informed about the health insurance but only 31% were aware of the UHC pilot that was being carried out in the county and information on health insurance schemes originated from friends. Forty one point seven percent indicated that one of the reason for dropping payment of insurance premiums was loss of livelihood and that age, gender, education level and amount of income were of no consequence on uptake; on the contrary, marital status was found to influence uptake of insurance. The study concluded that most of workers in the informal sector were registered with NHIF with majority of them acknowledging the importance of insuring and expressed their willingness to enroll in the long run. This was linked to government's effort in diffusing information on the benefits of enrolling with NHIF. At the same time, low enrollment with private firms was occasioned by high premiums and low and irregular incomes among majority of the workers in the sector.

A study by Cheruiyot (2020) using cross sectional data examined factors that contributed to uptake of medical insurance by informally employed people in Narok County. Data was drawn from KHHUES, 2018. To carry out estimations, probit model was used which revealed that: a) wealth quintile/income and level of education were influential in determining health insurance uptake in the county, and b) households with fewer members and with higher income returns were better placed to insure themselves. The study also found that there was no correlation between locality of residence, gender, marital status and age with the uptake of insurance cover which was inconsistent with what some studies had established. The study concluded that many

people and households had no financial capacity to pay for insurance which placed them in danger of making direct payments when seeking for health care.

Nkatha (2019) conducted a study to investigate on macroeconomic determinants for demand of health insurance in Kenya using the Auto-regressive Distributed Lag (ARDL) Model. Different sources of data were used; insurance Regulatory Authority provided data related to the Health insurance demand; World Economic Outlook provided data on income level; central bank provided information on financial development and inflation rate. The final source of data was World Development Index which focused on the inflation rate. Result of analysis indicated that in the long term, both income and level of education were positively correlated with demand for insurance showed a negative effect in the short run.

Wanjiru et al (2019) conducted a cross-sectional study using questionnaires and interview guides and a sample of 334 participants, to identify the determinants of uptake of NHIF among residents of Kapyemit, in Uasin Gishu County, Kenya. Pearson's Chi-square test at 0.05 confidence interval was used to ascertain association between the study variables and multivariate regression was used to find out the variables linked with membership to NHIF. Findings were that: people that were never married had a lower likelihood to register compared to the married ones; possibility of enrolling increased with education level; those with more information on the cover and associated benefits stood a higher chance of enroll. Persons in the professional and technical fields were more attracted to scheme membership compared to blue-collar workers; those with a weekly or monthly income were better placed to enroll than those with daily earnings and that households with higher income were more attracted to enrollment compared to those with low income. Households with more than one livelihood source were more likely to take an insurance cover. Finally the study revealed people with inclination to using private facilities were more likely to seek membership.

A survey by Kariuki et al (2018) in Nyeri Central Sub-County using a sample of 306 self-employed residents and questionnaires to collect data established that those associated with social groups and those with higher earnings were better placed to insure themselves. Analysis of findings used means and standard deviations then displayed diagrammatically in form of graphs and tables. Limited information on procedure for registration, available payment options, scanty information on benefit of the cover, long distance to NHIF offices, low number of

available facilities, payment mode, and number of contributions, premium, and cost of transactions were found to mar the registration process. It was concluded that the decision by self-employed residents to enroll to NHIF was influenced by awareness of benefits, registration and accessibility.

Using cross sectional survey design Lukhale et al (2017) studied scheme-based factors that influenced patients to enroll for health covers at Bungoma referral hospital. A sample of 300 patients and 4 heads of department took part in the study to respond to questionnaire items and to participate in the interview to generate data for the study. Findings established that; awareness of insurance benefits and concepts was crucial in making choice to register for an insurance cover; individual factors among them age, household income, education levels, and marital status were significant in uptake of insurance covers.

Muketha (2016) carried out a study on determinants of the uptake of national health insurance among informal sector workers in Kenya using data from the KHHEU survey of 2013. Analysis of data was undertaken using descriptive statistics (means and standard deviations) and probit regression. The study found a strong association between level of education, marital status, level of awareness of the NHIF, wealth index and age with uptake of NHIF. Other findings were that: members of the Sacco who lived in the rural were less attracted to membership than those in the urban areas, being male decreased probability of taking a cover, households with a female head stood a higher chance to enroll compared to those headed by a male. Findings also showed that a person with risky behavior like smoking was less likely to enroll with NHIF when compared with a nonsmoker and that a large household had low attraction to uptake of insurance cover. Possession of alternative community based health insurance scheme reduced probability of having a NHIF cover.

Kituku et al (2016) study in Murang'a County targeted UNAITAS SACCO members using descriptive survey design with 150 members selected using stratified random sampling technique to take part in the study. For analysis, both inferential and descriptive statistics were used. Chi-square analysis validated the interdependence of the study variables and finally to check on relationship between study variables, correlation analysis was done. Percentages, means and standard deviations were used for the likert items. Findings indicate that income, knowledge of NHIF benefits, nearness to NHIF facilities had a significant positive influence on uptake of



NHIF cover while premiums payable had a negative relationship with uptake of NHIF. The amount of payable premiums was found to be an influential factor for uptake of NHIF among SACCO members. It was concluded that the major influential factors for uptake of NHIF were; presence of children, income level, education level, access to NHIF outlet, awareness of NHIF benefits, and the cost of the premiums.

Kimani et al. (2012) carried out a study in the slums of Nairobi to find out factors that led residents to purchase health insurance. To understand association of factors with registration into the NHIF program and establish the characteristics of the sample, multivariate logistic regression analysis and descriptive statistics and were carried out using STATA version 10. To check association between NHIF enrollment and the predictor variables, Chi-square test (X<sup>2</sup>) was used while Multivariate logistic regression was used to examine factors linked to uptake of public insurance program. Findings revealed that those in the low income category were significantly unlikely to register with NHIF compared to those in the category of higher income; employment status influenced membership to NHIF program, and that those in the informal sector with higher monthly income were better placed to enroll compared to their counterparts with unstable income. The study also found that women were unlikely to enroll in the NHIF program compared to men and there existed no relationship between ethnicity and uptake of the health insurance program. An evaluation study by Zollmann and Ravishankar (2016) on insurance choices by Kenyans found that those with stable employment enrolled with public health insurance as opposed to enrolling with the private ones. It was concluded that high cost of the health cover was the main hurdle to uptake of health cover. These findings collate to those of Akach and Adobea (2016) which associated low uptake of health insurance with low income and limited finances.

A study by Yaari (2009) on factors determining demand for insurance industry notes that cultural factors posed significant opposition to enrollment in insurance schemes which immensely led to low levels of uptake premised on the belief that, life insurance was as a result of not trusting that God's protective care was sufficient. On these grounds countries in Europe denounced life insurance and prohibited people from enrolling till the nineteenth century. Further, Yaari notes that in many Islamic countries, religious hostility to life insurance still limits the willingness of people to register.

Hassan et al (2017) conducted a survey involving 389 Muslims in Nairobi County to explore the role played by religion in their uptake of health insurance and also to determine the level of uptake among them. Analysis used SPSS Version 20 to perform the test of independence (Chi square) and descriptive statistics. The study found that 22% of the Muslims had subscribed to a health cover. Among those covered, 70.6% had registered under NHIF with the remaining 29.4% having registered with private providers. Majority (94.1%) of those who participated in the study choose to enroll with Takaful insurance to comply with code of living (Shariah) for Muslims. Findings also indicate that Religion was a major factor that influenced decisions of Muslims to enroll to health schemes. The study confirmed a positive relationship between religious beliefs, Shariah teachings and uptake of Takaful which is a type of Islamic health insurance. The study concluded that Muslims laws of life and tough religious beliefs restrained them from enrolling to health insurance schemes that were not Islamic oriented.

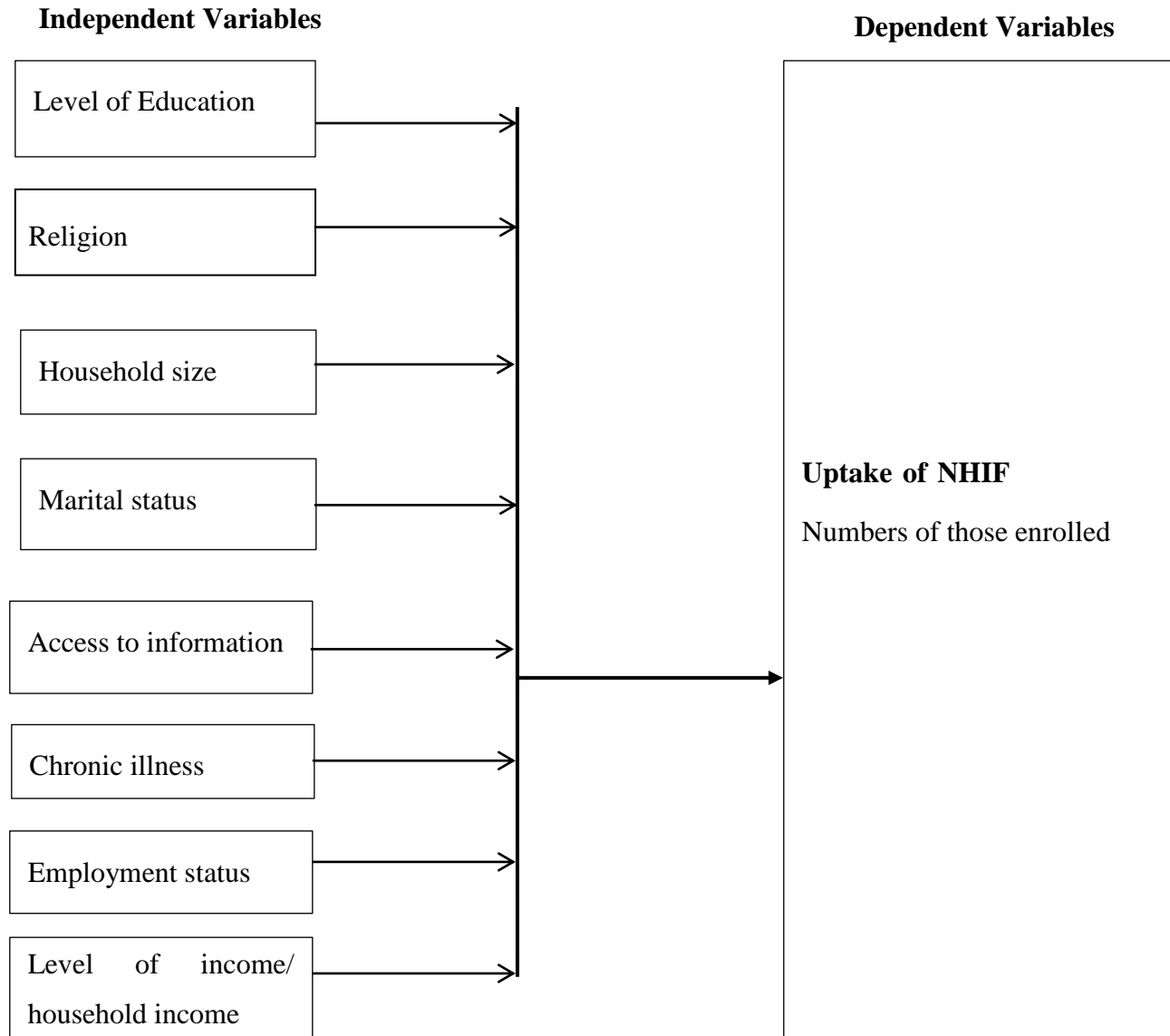
#### **2.4 Overview of literature review**

Most studies focused on informal sector in Kenya using cross-section survey. The small sample sizes and reliance on case studies limit generalization of findings. The current study will focus on data that is from a national level with a bigger sample size which will help to understand the determinants of uptake of NHIF on a wider scale. Moreover, this study will make use of probit to understand the determinants of uptake of NHIF unlike majority of previous studies which were mainly descriptive. From the analysis of literature, findings by Asindua et al. (2021) and Cheruiyot (2020) deviate from what other researchers have found concerning gender, age, education and income level and influence on uptake of insurance. The current study will further investigate on these parameters for further confirmation. Studies have identified several reasons contributing to this low uptake as; Lack of education and illiteracy which makes it difficult for individuals to understand health information messages, low economic status and in ability to afford monthly premiums, lack of awareness on (registration procedures , benefits of NHIF membership, who benefits from the cover, premium payment procedures), lack of trust on the insurance, lack of accessible registration centers and long distance to registration centers, inadequacy of health facilities. Others were spousal refusal particularly for large families and where children were above the age of 18 years which required confirmation of their economic dependency through appropriate documents such as enrollment in education or training

institutions. Those with lower risk of chronic illnesses and those over 69 years of age for go insurance covers (Ndung'u, 2015; Kipaseyia, 2016; Mwaura et al, 2022).

## 2.5 Conceptual Framework

The framework presents the relationship between variables. The dependent variable is uptake of NHIF. The independent variables are level of education, religion, household size, marital status, access to information, chronic illness, employment status, and wealth status.



**Figure 4: Conceptual Framework**

## CHAPTER THREE

### METHODOLOGY

#### 3.1 Introduction

The chapter presents theoretical, empirical models as well as definition and measurement of variables.

#### 3.2 Theoretical model

This study is anchored on utility maximization theory which asserts that in a situation where a person is faced with a number of options to choose from, the choice was made by assessing to identify that option which gives highest value in terms of maximizing satisfaction as the expected utility function. Expected value is the total of the various benefits and their linked chances (Von Newmann and Morgenstern in 1944). Faced with many alternatives therefore, the person will need to use some criteria to rank available options with the choice being determined by their occurrence. Decision of an individual will depend on the option that attracts highest benefits to avoid risk. The benefits are thus used to weigh behavior in choice making. In life, people are likely to be faced with certain risks among them, those related to health. It is for this reason that people take up insurance covers to shield themselves against possible high medical costs thus removing financial burdens.

In normal life there are two states, a person is healthy or sick. To achieve a healthy output, a sick person will be compelled to spend on food, medical care and exercises (the so called health inputs) to sustain a healthy life. Health inputs can be paid for through individual's earnings or by a health cover. In this case, the cover will be of use only in case of sickness. On this basis, applicants of health insurance will consider the magnitude of difference between the level of expected utility with insurance ( $EU_1$ ) and expected utility without health insurance ( $EU_2$ ), that is  $EU_1$  minus  $EU_2$ . If the value is higher than 0 then, the person will opt to insure and if negative, the person will hesitate to buy the health cover. The assumption is that any person would prefer to join a national health insurance scheme when  $EU_{i1} > EU_{i2}$ , but will opt not to enroll if  $EU_{i1} < EU_{i2}$ .

### 3.3 The Econometric Model and Model Specification

Based on the theoretical model, the study used Probit model also known as probit regression which is appropriate when analyzing dichotomous responses. The concern of this study was to explain the dependent variable as the probability of either making a choice to buy NHIF or not to given other explanatory variables. The study assumed that the relationship between the latent variable  $Y^*$  and explanatory variables ( $x_i$ ) is a linear one. This is presented as;

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

$Y^*$  represents the unobserved latent variable ranging from  $-\infty$  to  $\infty$

$x_i$  is a vector of explanatory variables

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

$\varepsilon$  is error term.

How the latent variable  $Y^*$  and the observed binary variable  $Y$  relate can be explained using the measurement equation:

$$Y = \begin{cases} 1 & \text{if } Y^* > K \\ 0 & \text{if } Y^* \leq K \end{cases}$$

$y_i$  is the probability of having an NHIF (1 if enrolled with NHIF and 0 if otherwise).

$K$  is the critical level/ cut off/ threshold point of the index  $Y^*$  beyond which an individual enrolled with NHIF.

To establish extent to which each variable influences households' choice of either taking a cover or not, the attribute of  $X$  are averaged and then regressed against  $Y$ . In this study, uptake of NHIF is presented as a function of socio- economic factors (Education level, religion, household size, and marital status, availability of information, chronic illness, employment status, and wealth quintile / level of income). The model for the study thus translates to:

$$\text{NHIF} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \varepsilon$$

NHIF- Health insurance

$\beta_0$  – coefficient constant

$\beta_1$  –  $\beta_8$  – coefficient to be estimated

X1- level of education

X2- religion

X3- household size

X4- marital status

X5- Access of information

X6- chronic illness

X7- employment status

X8- wealth quintile

$\varepsilon$  – error term.

### 3.4 Definition and measurement of variables

**Table 1: Definition and measurement of variables**

<b>Variable</b>	<b>Variable Definition</b>	<b>Measurement</b>	<b>Variable sign</b>
-----------------	----------------------------	--------------------	----------------------

<b>Dependent variable</b>			
<b>Uptake of NHIF</b>	Registering in a health insurance scheme	1 for yes ,0 otherwise	
<b>Independent variables</b>			
Level of Education	The highest successfully completed level of formal learning which include: post-secondary (tertiary) level; secondary level; primary level; No formal education	1 if an Individual has tertiary education and 0 if otherwise. 1 if Individual has secondary education and 0 if otherwise; 1 if Individual has primary education and 0 if otherwise; 1 if Individual has no formal education and 0 if otherwise,	Positive
Religion	Religion measured as dummy variables	1 if protestant, and 0 otherwise 1 if Catholic and 0 otherwise 1 if a Muslim and 0 otherwise 1 if other religions and 0 otherwise 1 if no religion and 0 otherwise	Positive
Size of household	Number of members in a household	1 if size is 1-3 members and 0 otherwise 1 if size is 4-7 members and 0 otherwise 1 if size is 7+ members and 0 otherwise	Positive/ Negative
Marital Status	Marital status measured as a dummy variable	1 if never married and 0 otherwise 1 if married and 0 otherwise 1 if separated/ divorced and 0 otherwise 1 if widowed and 0 otherwise	Positive
Access of information	Ownership of TV or Radio	1 if has TV/Radio 0 if otherwise	Positive

Chronic illness	Health condition that last 1 year or more and require ongoing medical attention	1 if has chronic illness and 0 if otherwise	Positive
Employment status	Whether one is employed or not	1 if employed and 0 otherwise	Positive
Wealth status	Wealth status measured in quintiles	1 if household belongs to the higher wealth quintile and 0 otherwise 1 if household belongs to middle quintile and 0 otherwise 1 if household belongs to low quintile and 0 otherwise	Positive

### 3.5 Data sources

Secondary data from the 2018 Kenya Household Health Expenditure Survey by Ministry of Health (MOH) 2018b was used for this study. 37,500 households drawn from 1,500 clusters among them 577 in urban and 923 in the rural were targeted. Stratified sampling was done in two-stages: In stage one, clusters were selected; in stage two systematic sampling was used to sample 25 households from each of the selected cluster. The sampling framework used was that developed and managed by KNBS. The Complex Module of SPSS software was used for sampling. Equal Probability Selection Method (EPSEM) was used to select the 1,500 clusters within each stratum from NASSEP V frame. The clusters were then organized in different strata: county, urban versus rural and finally by geographic locations.

The survey covered all the 47 Counties with the study period spreading from 9th of April to 19th of May, 2018 using Questionnaires to collect data. Computer Aided Personal Interview (CAPI) technique were used for collecting data. For ease of use, questionnaires were converted into a form that was compatible with mobile phones using ICT software. For data entry, the CS entry programme was used. To test the program for data errors quality controls and validation checks were provided. A total of 31,655 (95%) of households responded to the questionnaire.



### **3.6 Potential estimation issues**

To ensure accurate inferences two tests was conducted:

#### **3.6.1 Heteroscedasticity Test**

Econometrically, heteroscedasticity denotes a situation which emerges when the difference of the error term is inconsistent resulting to violation of Ordinary Least Square (OLS) which calls for the error term to have a constant variance, and thus possibly lead to unreliable statistical determinations. This can be caused by; incorrect model specification with omitted variable, existence of visible differences in the subgroup, errors of measurement, presence of outliers in relation to observations, skewed distribution of one or more regressors, and incorrect data transformation. Detection of heteroscedasticity was by use of Breusch-Pagan / Cook-Weisberg test. Remedial measures for heteroscedasticity were by robust standard errors.

#### **3.6.2 Test for Multicollinearity**

Multicollinearity is a situation where a perfect linear relationship exists among some or all explanatory variables of a regression model. It also includes cases where the independent variables are intercorrelated but without a perfect association. Where multicollinearity is perfect, Regression coefficients of independent variables are indeterminate and their standard errors are infinite. On the other hand, if it is below perfect, the coefficients pose substantial standard errors meaning that they cannot be accurately estimated. To determine the presence of multicollinearity, Variance Inflation Factor (VIF) for each predictor was carried out by doing a linear regression of that predictor on all the other predictors, and then obtaining the  $R^2$  from that regression. If present; multicollinearity was dealt with by dropping one of the highly correlated variables.

**CHAPTER FOUR**  
**RESULTS AND FINDINGS**

**4.1 Introduction**

This chapter presents the descriptive statistics and the regression results and discussion of the same.

**4.2 Descriptive statistics**

**Table 2: Table Showing the Descriptive Statistics**

Variable	Minimum	Maximum	Mean	Std. Deviation
<b>Uptake of Health Insurance</b>				
No	0	1	0.7766	0.41654
Yes	0	1	0.2234	0.41654
<b>Wealth Status (Quintiles)</b>				
Low	0	1	0.4085	0.49162
Middle	0	1	0.2103	0.40755
Highest	0	1	0.3812	0.48572
<b>Religion</b>				
Christian (Catholic)	0	1	0.1993	0.39951
Christian (Protestant)	0	1	0.5910	0.49169
Islam	0	1	0.1663	0.37241
Other Religion	0	1	0.0228	0.14932
No Religion	0	1	0.0205	0.14182
<b>Marital Status</b>				
Never Married	0	1	0.39	0.487
Married / Living Together	0	1	0.48	0.500
Divorced / Separated	0	1	0.05	0.208
Widowed	0	1	0.09	0.286

<b>Employment Status</b>				
Unemployed	0	1	0.6462	0.47820
Employed	0	1	0.3538	0.47820
<b>Education</b>				
Primary	0	1	0.3990	0.48974
Secondary	0	1	0.2061	0.40457
Tertiary	0	1	0.0915	0.28829
Never Went to School	0	1	0.3034	0.45977
<b>Chronic Illness</b>				
No Chronic Illness	0	1	0.8424	0.36441
Has Chronic Illness	0	1	0.1576	0.36441
<b>Household Size</b>				
1 – 3 members	0	1	0.4117	0.49229
4 – 6 members	0	1	0.3980	0.48964
7+ members	0	1	0.1903	0.39266
<b>Access to Information</b>				
Access	0	1	0.9990	0.03219
No access	0	1	0.0010	0.03219

The descriptive statistics indicate that 22.3% of the respondents were covered by NHIF. Majority of the respondents belonged to the low quintile at 40.9%, followed by high quintile at 38.1%, while the least were in the middle quintile at 21%. For chronic illness 15.76% had a chronic illness whilst 84.24% didn't have a chronic illness. Christian (Protestant) was the most dominant religion at 59.1%. This is followed by Christian (Catholic) at 19.9%, Islam at 16.6%, other religion at 2.3% and no religion at 2.1%. Under marital status 47.7% were married/living together, 38.8% were never married, widowed were at 9% and the least was separated/divorced at 4.5%. The results indicated that 64.6% were unemployed and only 35.4% were employed.

Majority of the respondents had attended primary at 39.9%, 30.3% never went to school while secondary were at 20.6%. Those who attended tertiary level were at 9.1%.

## 4.2 Diagnostic tests

The study conducted Heteroscedasticity Test and Multicollinearity tests to ensure accurate inferences.

### 4.2.1 Heteroscedasticity Test

Within cross-sectional units, the error process may be homoscedastic; however its variance may differ across units: a condition referred to as group wise heteroscedasticity. From table 3, the null hypothesis of homoscedastic error terms is rejected as evidenced by a p-value of 0.0008 and thus heteroscedasticity error terms. Through estimating the models with robust standard errors, the problem was corrected.

**Table 3: Heteroscedasticity Results**

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	
Ho: Constant variance	
Variables: fitted values of health insurance	
chi2(1)	= 77.61
Prob > chi2	= 0.0008

### 4.2.2 Test for Multicollinearity

To determine the presence of multicollinearity, Variance Inflation Factor (VIF) for each predictor was executed through a linear regression each predictor on all the other predictors, and then obtaining the  $R^2$ .

**Table 4: Multicollinearity Results**

Variable	VIF	1/VIF
Quantile	1.140	0.877
Employment	1.120	0.896
Marital status	1.100	0.908

Household size	1.080	0.927
Education	1.030	0.970
Access to information	1.010	0.993
Religion	1.010	0.994
Chronic illness	1.000	0.995

From the table, VIF values <10 for the variables indicating nonexistence of multicollinearity among the investigated variables (wealth status, marital status, education, household size, employment, religion, chronic illness and access to information).

### 4.3 Probit Results

**Table 5: Probit Regression Outputs**

<b>Uptake of NHIF</b>	<b>Coef.</b>	<b>Std. Err.</b>	<b>z</b>	<b>P&gt; z </b>
<b>Wealth status</b>				
Middle	0.535	0.093	5.730	<b>0.000</b>
Higher	0.685	0.092	7.460	<b>0.000</b>
<b>Religion</b>				
Christian (Protestant)	0.080	0.127	0.630	0.527
Islam	0.084	0.121	0.690	0.488
Other religion	-0.179	0.978	-0.180	0.855
No religion	0.123	0.216	0.570	0.569
<b>Marital status</b>				
Married/living together	0.397	0.153	2.590	<b>0.010</b>
Divorced /separated	-0.050	0.185	-0.270	0.786
Widowed	-0.331	0.165	-2.010	<b>0.045</b>
<b>Chronic illness</b>				
No	-0.001	0.070	-0.010	0.990
<b>Access to information</b>				
No ownership of Radio/tv	-0.010	0.071	-0.140	0.889
<b>Household size</b>				
4-6 members	0.099	0.082	1.200	0.229
7+ members	0.201	0.106	1.900	0.058
<b>Employment status</b>				

employed	0.648	0.120	5.380	<b>0.000</b>
<b>Education level</b>				
Secondary	-0.154	0.095	-1.620	0.104
Tertiary	0.557	0.133	4.190	<b>0.000</b>
No Formal Education	-0.397	-0.096	-4.140	<b>0.000</b>
_cons	0.484	0.235	2.060	0.039
LR chi2(16)	=	319.88		
Prob > chi2	=	0.0000		
Pseudo R2	=	0.590		

\*sig 10%; \*\*sig 5%;\*\*\*sig 1%

<b>Uptake of NHIF</b>	<b>Marginal Effects</b>	<b>Std. Err.</b>	<b>z</b>	<b>P&gt; z </b>
<b>Wealth status</b>				
Middle	0.162***	0.093	5.730	<b>0.000</b>
Higher	0.215***	0.092	7.460	<b>0.000</b>
<b>Religion</b>				
Christian (Protestant)	0.024	0.127	0.630	0.527
Islam	0.025	0.121	0.690	0.488
Other religion	0.063	0.978	-0.180	0.855
No religion	0.037	0.216	0.570	0.569
<b>Marital status</b>				
Married/living together	0.111**	0.153	2.590	<b>0.010</b>
Divorced /separated	-0.013	0.185	-0.270	0.786
Widowed	-0.091**	0.165	-2.010	<b>0.045</b>
<b>Chronic illness</b>				
No	0.000	0.070	-0.010	0.990
<b>Access to information</b>				
No ownership of Radio/tv	-0.003	0.071	-0.140	0.889
<b>Household size</b>				
4-6 members	0.030	0.082	1.200	0.229
7+ members	0.059	0.106	1.900	0.058
<b>Employment status</b>				
employed	0.218***	0.120	5.380	<b>0.000</b>
<b>Education level</b>				

Secondary		-0.051	0.095	-1.620	0.104
Tertiary		0.195***	0.133	4.190	<b>0.000</b>
No Formal Education		-0.115***	-0.096	-4.140	<b>0.000</b>
_cons	0.484		0.235	2.060	0.039
LR chi2(16)	=	319.88			
Prob > chi2	=	0.0000			
Pseudo R2	=	0.590			

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The probit results show that middle wealth quintile, high wealth quintile, being married, household size of 7 or more members, being employed, being educated to tertiary level and being Muslim / Protestant / of no religion were associated with higher likelihood of enrolment into NHIF.

Being divorced, being widowed, no access to information, having no formal education, having no chronic illness and belonging to other religion were associated with less likelihood of enrolment into NHIF.

The coefficient of being married, being widowed, being of a high wealth quintile, being of a middle wealth quintile, being employed, having no formal education and being educated to tertiary level were significant to uptake of NHIF.

#### **4.4 Discussion of result**

Individuals in the middle and high quintile were more likely to take NHIF. Individuals in the middle wealth quintile are 16.2 percentage points more likely to take NHIF cover than those in the low wealth quintile. Individuals in the high wealth quintile are 21.5 percentage points more certain to take cover than those in the low wealth quintile. The findings on wealth status concurs with findings on wealth status by Cheruiyot (2020), Nkatha (2019), Kariuki et al (2018), Likhale et al (2017), Muketha (2016), Kituku et al (2016) and Kimani et al (2012). Findings on wealth status differ with those of Asindua et al. (2021).

Being married/ living together increases likelihood of taking cover. The widowed are less likely to take NHIF. Those who are married are 11.1 percentage points more likely to take NHIF cover compared to those that were never married. Those widowed are 9.1 percentage points less likely

to take NHIF cover than those never married. The findings on marital status concur with findings on marital status by Asindua et al. (2021), Wanjiru et al (2019), Lukhale et al (2017), Muketha (2016) and Kituku et al (2016). Findings on marital status defer with those of Cheruiyot (2020).

The employed are more likely to take NHIF cover. The employed are 21.8 percentage points more likely to take NHIF cover than the unemployed. Findings on employment status concur with those of Muranda et al (2021), Asindua et al (2021), Wanjiru et al (2019) and Kimani et al. (2012)

Individuals with tertiary level education are more likely to take up NHIF while those without formal education are less likely to take up NHIF. Those educated to tertiary level are 19.5 percentage points more likely to take NHIF cover than those educated to primary level. Those with no formal education are 11.5 percentage points less likely to take NHIF cover than those educated to primary level. Findings on education concur with those of Muranda et al (2021), Nkatha 2019, Wanjiru et al (2019), Lukhale et al (2017), Muketha (2016) and Kituku et al (2016). Findings on education differ with those of Asindua et al. (2021).

On household size, those with household sizes of 7 or more are more likely to have NHIF than household sizes of 1 to 3 members. This defers with findings of Cheruiyot (2020) and Muketha (2016).



## **CHAPTER FIVE**

### **SUMMARY, POLICY RECOMMENDATIONS AND AREAS FOR FURTHER RESEARCH**

#### **5.1 Introduction**

This chapter covers summary of finding, conclusions and makes recommendations for practice and suggestions for further research based on the findings of this study.

#### **5.2 Summary of Findings**

In Kenya uptake of NHIF by households has remained low despite massive advertisement by the government to enhance participation which prompted the need for the study. Two objectives were addressed: (i) To examine the socio- economic determinants of uptake of National Hospital Insurance Fund by households in Kenya; (ii) To document implications for policy decisions. The study targeted households in Kenya using secondary data from a survey by the Ministry of Health of 2018. Probit regression model was used to make observations based on the predicted probabilities of the variables.

The probit estimate coefficients for middle wealth quintile, high wealth quintile, being married, being widowed, being employed, having no formal education and being educated to tertiary level are significant to NHIF enrolment.

The probit results show that middle wealth quintile, high wealth quintile, being married, household size of 7 or more members, being employed, being educated to tertiary level and being Muslim / Protestant / of no religion were associated with higher likelihood of enrolment into NHIF.

Being divorced, being widowed, no access to information, having no formal education, having no chronic illness and belonging to other religion were associated with less likelihood of enrolment into NHIF.

#### **5.3 Conclusion**

Socio-demographic factors played a critical role on uptake of NHIF insurance among households in Kenya. These included wealth status, marital status, employment status and level of education.

#### **5.4 Recommendations**

Based on the findings, the following recommendations were made:

- 1) The government to create an enabling environment for self-employment and more employment opportunities to make subscriptions to NHIF within reach.
- 2) To make subscriptions affordable, there is need for Government to subsidize high premiums, particularly for those in low quintiles,
- 3) The government to increase access to formal education with inclusion of basic health insurance concepts in curricula.

#### **5.5 Further Research**

Other studies can be carried out focusing on evaluating performance of NHIF in protecting households from CHE. This will enable the government to assess efficiency in ensuring access to health care by households without incurring high out of pocket expenditures

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