DETERMINANTS OF THE UPTAKE OF NATIONAL HEALTH INSURANCE AMONG INFORMAL SECTOR WORKERS IN KENYA

A   RESEARCH PROJECT

BY

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DECLARATION

I declare that this Research Project is my original work, has never been presented either in whole or in part to any other examining body for the award of any degree.

Signature ………………………. **Date** ………………….

Derrick Munene Muketha

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The Research Project has been submitted for examination with my approval as the University Supervisor.

Signature …………………………. **Date** …………………………..

Dr Phyllis Machio

DEDICATION

This work is dedicated to my family – Jonathan Muketha, Janet Muketha, Maureen Muketha and Sylvia Muketha.

ACKNOWLEDGEMENT

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LIST OF ACRONYMS

CBHI   Community Based Health Insurance Scheme

KHHEUS   Kenya Household Health Expenditure and Utilization Survey

NHIF   National Hospital Insurance Fund

OPP   Out of Pocket Pay

WHO   World Health Organization

MDGs   Millennium Development Goals

KNBS   Kenya National Bureau of Statistics

ABSTRACT

The importance of Health Insurance Schemes has become an increasingly recognized factor in financing health care in low income economies as it allows individuals to access timely and high quality medical care. Unfortunately in Kenya, health insurance is skewed in favor of formal sector workers as they are mandated by law to make statutory contributions to the NHIF (National Health Insurance Fund) in proportion to their income. The aim of this study was to find out the "Determinants of the Uptake of National Health Insurance Among Informal Sector Workers in Kenya." The study used secondary data collected from the Kenya Household Health Expenditure and Utilization Survey (KHHEUS) collected by the Kenya National Bureau of Statistics (KNBS) in 2013. Descriptive statistics and the probit model were used in explaining the variables and in the estimation process respectively. The results were that only 14% of the informal sector workers had NHIF. Therefore most of the informal sector workers did not have NHIF cover. All the independent variables namely age, level of education, marital status, gender, household size, place of residence, behavioral factors, wealth index and belonging to an alternative community based health insurance scheme were found to be significant. A big household size, belonging to an alternative community based health insurance scheme, being male and smoking negatively affected the uptake of NHIF among informal sector workers. However a higher wealth index, being married, being educated, an increase in age and awareness positively affected the uptake of NHIF among informal sector workers.

Key Words: Health Insurance, NHIF, KHHEUS, Informal Sector Workers and Social Health Insurance, KNBS.

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Universal coverage of health care is a widely endorsed social goal, which depends on wide access to health care services and low financial hurdles to their utilization, which is expected to improve the general health standing of the populace (WHO, 2010; Mwabu 2013). Health insurance is a form of social protection against the risk of incurring medical expenditure among individuals. It is a critical pillar of health care financing and the main driver in achieving universal health coverage in most nations. It is also useful in shielding homes from calamitous medical costs and the resultant impoverishment that comes with ill health (WHO, 2010). Worldwide, it is estimated that about 150 million people undergo financial catastrophe annually as a result of medical related expenses, and approximately another 100 million find themselves impoverished due to these unplanned (spontaneous) expenses (Xu*et al*., 2007).

Sadly, over 90% of those people who experience catastrophic health care payments live in low income countries (Xu*et al*., 2003). Their health systems are largely funded through unplanned payments which leave the people financially exposed, as a result of the huge medical expenses, and ultimately impoverishment (Xu *et al*.,2003). The spontaneous expenditure, also referred to as Out of Pocket Expenditure (OPP), constitutes a critical obstruction in accessing health care services. It can easily lead to catastrophic impoverishment due to the escalating healthcare costs. This has the potential to negatively impact a household's living standard, because the money they spend on healthcare would have been spent on the other basic human needs such as food and clothing (O'Donnell *et al*., 2008).

Most low income workers are involved in informal work. Informal work, as defined by International Labour Organization (ILO), is any economic activities undertaken by workers and profitable units that are not legally or sufficiently recognized by formal arrangements (ILO, 2012). Their general characteristics and patterns is lack of entitlements such as pension, unfair dismissal, lack of critical allowances such as leave

and health insurance, lack of industry regulations leading to an unhealthy environment and finally, poor pay. However, this segment is very critical as there is evidence that to a very large extent, the informal sector cushions its workforce against abject poverty. The proportion of informal sector workers in Asia is 82%, 77% of Kenya's total employment, and Sub-Saharan Africa has 66% (Rockefeller Foundation, 2014).

There is proof that consumption of voluntary health insurance among informal sector workers and low income earners is generally low. Some of the reasons include high premiums that are not affordable vis-à-vis income, inability to obtain credit(Behrman and Knowles, 1999), informal social networks that are already in existence, formed as alternatives to formal risk-sharing channels (Jowett, 2004), unfamiliar insurance products, risk pooling and unwillingness to pay the premiums (Chankova *et al*., 2008; Gine *et al*., 2007). Other factors include poor use savings, and borrowing as an alternative to insurance (Alderman and Paxson, 1994).

Kenya's informal sector is large and dynamic. In 2014, it had a total labor force standing at 11.8 million against a paltry 2.4 million who were employed in the formal sector. The total recorded workforce for both sectors stand at 14.3 million. Out of the 799,700 jobs created in 2014, 693,400 were in the informal sector. Furthermore, the formal sector job opportunity is shrinking. The number of new formal sector jobs fell in 2014 to 106,400 from 132,400 in 2013 (Kenya National Bureau of Statistics, 2015). Evidently, the informal sector is the biggest employer.

1.1.1 Health Care Financing in Kenya

Kenya's history of policy changes in health financing dates back to 1963. From 1963 - 1989, it had a predominantly tax funded health care system. This changed in 1989, when severe budgetary constraints led to structural adjustments consequently leading to the introduction of cost-sharing fees for both outpatient and in-patient services in government health establishments. However, children under 5 years, and patients ailing specified health conditions were exempted from paying the user fees. Healthcare at dispensaries remained free of charge (Dahlgren, 1991).

Due to widespread protests by the citizenry, the government had to retract some it had effected in the user fee policy in 1990. Mainly abolition of outpatient registration fees as other fees were retained. Numerous studies reveal that during the period when the new policy was enforced, there was a negative impact of user fees, as explained by decline in the utilization of health care services in the country. Kibwezi, for instance, a notably poor rural area recorded an increase in out-patient care after the registration fees was abolished (Karanga *et al*., 1995). Similarly, another study conducted on health seeking behavior in Kisumu and Embu districts revealed a decline in out-patient turnout at government institution declined by 50% during the period preceding introduction of cost sharing in 1989, but rose to 41% when the out-patient registration fees was suspended (Mwabu *et al*., 1995).

Reintroducing and abolishing user fee also has an effect on patient attendance as illustrated by Moses *et al*. (1992). A research conducted to study the impact of user fees at a sexual transmitted referral clinic revealed that male patients declined by 40% during enforcement of the user fee policy, was in place, but rose again when suspended. Of concern, is that this time it only rose to only 64% of the initial attendance prior to enforcement of the of user fees. Waver and exemption mechanisms are barely effective (Bitran and Giedion, 2003).

However, due to the difficult fiscal situation, the government had no choice but to re-introduce the user fees in1992. To minimize resistance, and not wanting it to be a barrier for utilization of health services, re-introduction was implemented in phases, beginning with national and provincial hospitals and later on rolling out to lower levels of district hospitals and health centers. Despite their efforts, the cost of health care proved to be a challenge with 40.5% of households that were not utilizing health care services attributed financial challenge as the sole reason for the failure to do so (Xu *et al*., 2005).

The government recognized the challenge and came up with the Health Financing Strategy in 2010. This Strategy document emphasizes the importance of universal health coverage as a means of social health protection for all Kenyans. It introduces mechanisms of social solidarity that are founded on corresponding principles of social health

insurance and tax financing with the aim of offering financial protection to the poor. If the government was to achieve the set objectives, then, it had to reiterate its commitment to amend the NHIF Act to enhance easy access as well as broadening benefit package.

1.1.2 The National Hospital Insurance Fund (NHIF) in Kenya

The importance of a National Health Insurance had been recognized by policy-makers as critical almost immediately after independence. This is because it was envisioned to provide health insurance by offering medical covers at costs that would be way below the prevailing actuarially market prices that are out of reach for most socio-economic groups in the country. This was actualized with the establishment of the National Hospital Insurance Fund in 1966 through an Act of Parliament. Initially, NHIF was an autonomous department under the Ministry of Health, charged with overseeing its own operations, but accountable to the Treasury on fiscal matters. NHIF's sole mandate was to provide an affordable national contributory hospital insurance scheme for all residents in Kenya. Under this Act, all Kenyans between 18-65 years of age could enroll and employers were mandated to deduct premium from wages and salaries (GoK, 2010).

Over the years, the original Act of Parliament has been reviewed to factor in the dynamic health care needs of Kenyans, employment and restructuring of the health sector. One revision of the NHIF Act was in 1988 that upgraded the Fund a State Corporation. At the apex of its structure is a Board of Directors. It was also mandated with facilitating as many Kenyans as possible to access quality and affordable healthcare in an effort to cushion them against escalating medical expenditures and a harsh economic and political environment.

The level of contribution graduates in proportion to income. Initially it ranged from a minimum of Kshs 30 to a maximum of Kshs 320 monthly. However, these rates were also reviewed upwards from 1ˢᵗApril 2015 to cater for the ever changing Kenyan medical needs. The minimum level of contribution is kshs 150 and the maximum is kshs 1700 monthly, also, graduated according to income. The self- employed voluntarily pay kshs 500 if they want to join the scheme.

Until recently, NHIF operations were centralized in Nairobi, where all payment claims were settled. Thus, personnel of health facilities outside Nairobi would make monthly journeys to pursue claims. Fortunately, NHIF lately has decentralized operations and claims processing to Area Offices, thereby enhancing a more effective system that promotes efficiency in settling of claims. Decentralization has also lowered the cost of operations for both members and the about 400 accredited health providers (Kimani *et al*., 2004).

NHIF membership has 3 million contributors with about 6 million dependents. It has improved drastically over the years, with the benefit paid to the members increasing from kshs 8.24 billion in 2013 to kshs 9.08 billion in 2014. This marks a 10.2% increase. The contributions received also increased by 10% from kshs 12.23 billion in 2013, to kshs 13.63 billion in 2014. Similarly, the benefits as percentage of contributions increased to 69% in 2014 from 55% in 2008.

Among the benefits NHIF members are entitled to include; coverage of outpatient and inpatient expenses, that is bed, meals, treatment and drugs. Expenses covered are determined largely by the type of health facilities, for example, if they are Hospitals, nursing Homes, Health Centers or Dispensaries.

In 2015, the government fully acknowledged NHIF as the official vehicle for the successful implementation of universal health coverage for the country (NHIF, 2015). It gazetted increased contribution rates to cater for both in-patient and out-patient cover in an enhanced benefit package partially contributing to increment in revenue (Okech and Lelegwe, 2016). This would be beneficial to both formal and informal sector workers.

1.1.3 Informal Sector Workers and Health Insurance

Informal sector workers in Kenya consist mainly of small business owners like retailers, hawkers, *boda boda* operators and other service providers excluding drug traffickers and any other illegal activity (Kenya National Bureau of Statistics, 2015). They normally operate under open space and have to contend with harsh climatic conditions, hence, they are commonly referred to as the *Jua Kali* sector.

It is generally agreed that health problems and health related expenses are important factors associated with impoverishment (Krishna *et al.*, 2006; Otieno Ajwang, 2013). This is because health problems lead to short term loss of earnings or a permanent decreased ability to make a living. Moreover, in the unfortunate event of ill health, accidents or injury, informal sector workers are the hardest hit especially if they had not voluntarily enrolled into the NHIF scheme. This is because they are not covered by the Trade Disputes Act (GoK, 1991), Factories Act (GoK, 1972) or the Workmen's Compensation Act (GoK, 1988).

Sadly, a number of studies have shown that households in the informal sector rely on traditional coping responses to deal with the negative effects of ill health such as selling household goods, assets and informal borrowing (Yilma *et al.,* 2014). Some of the informal sector workers opt not to go to hospital altogether, putting them at a higher risk and greater cost of future vulnerability (Yilma*, et al.*, 2014). This is disastrous for chronic diseases like HIV/AIDS, hypertension and diabetes. These coping mechanisms are retrogressive and diminish their capacity to sustain for themselves.

Other available options for the informal sector workers of accessing and utilizing health care services are also limiting. For example, while enrollment to a community based health insurance scheme looks viable because it is at the grass root level, they are small in size and provide only limited financial protection (Ranson, 2001). Private health insurance companies are expensive and cover only less than 2% of the population (Chuma and Okungu, 2011). In addition to being expensive, several private health insurance schemes have collapsed (World Bank, 2010).

It was the intention of the government since 1998 to reform and use the NHIF scheme as an avenue to attain universal health coverage for the country (GoK, 2012). Thus, in 2011 the NHIF scheme was opened to all persons over 18 years of age including the unemployed, retirees and informal sector workers in order to make it an all-inclusive scheme. Previously, it was only limited to formal sector workers who were obliged to be members of the scheme by law. Informal sector workers are not obliged to be members by law, but can join the scheme voluntarily. By making the NHIF scheme all inclusive, it

was also a boost to the healthcare system as it would greatly reduce incidences of child mortality (Millennium Development Goal (MDG) 4), improve maternal health (MDG 5), and (MDG 6) to combat HIV/AIDS, malaria, and other diseases (Nyakundi *et al,* 2011).

The NHIF scheme is very accommodative as it does not have excluding criteria like age limits and members are not denied enrollment because of pre-existing conditions such as HIV/AIDS. However, many informal sector workers are still not subscribing to it (Kimani *et al*., 2012). These sector workers make up only 39 per cent of the 5.2 million workers who were NHIF contributors in 2015 (NHIF, 2015). Evidently, informal sector workers are largely bypassed by the benefits of NHIF.

1.2   Statement of the Problem

Universal health coverage is desired by all nations. Kenya is no exemption, and through NHIF, it seeks to cover both formal sector and informal sector workers .In order for Kenya to achieve universal health care, mechanisms should be put in place to ensure coverage reaches a large proportion of the population which is mainly the informal sector since they constitute 77% of Kenya's total employment.

Informal sector workers are continuously exposed to more risks than formal sector workers because of the nature of their work. Moreover, informal sector workers, unlike formal sector workers are not covered by legislation such as the Trade Disputes Act, Factories Act or the Workmen's Compensation Act. This makes them more vulnerable to economic shocks, catastrophic expenditure and impoverishment. To mitigate such economic uncertainties especially as a result of ill health, they have an option of voluntarily enrolling into the NHIF scheme.

However, despite the NHIF scheme giving a wide array of clinical services and having minimal exclusion criteria based on age and the presence of chronic conditions such as HIV at actuarially lower premiums, membership enrollment remains painfully low. This leaves informal sector workers without any form of social protection making them more vulnerable. Thus, the initial intention of NHIF of reaching out to all, by making the scheme accessible to as many Kenyans as possible, has not been attained.

1.2 Objectives of the Study

1.2.1 General Objective

The purpose of this study is to identify the factors that determine informal sector workers enrollment into the NHIF scheme.

1.2.2 Specific Objectives

(i)   Identify the factors that determine informal sector workers enrollment in the NHIF scheme.

(ii)   To draw key policy recommendations.

1.3 Significance of the Study

The findings from this study will be relevant to the Ministry of Health and other development partners by identifying the factors that determine informal sector employees' enrollment in the NHIF among informal sector workers in Kenya. This will lead to a better understanding of the informal workers needs right from policy design. By understanding the needs of informal workers, NHIF will be a robust scheme that will cater adequately and effectively for the health needs of the country. This well us help us attain universal health coverage in the near future.

CHAPTER TWO
LITERATURE REVIEW

2.1 Theoretical Literature

Consumer theory assumes there is certainty. Normal factors of price, tastes and preferences still remain if they are perfectly informed. If they are perfectly informed, they are expected to make a rational decision with a concern of maximum welfare maximization. Health insurance is assumed to be a normal good with a positive income elasticity of demand. A price increase of a substitute good such as premium for a community based health insurance scheme increases its demand and vice versa. Tastes and preferences are guided by the individual's environment, level of awareness, education level and his/her socio-demographic characteristics with an aim of obtaining maximum utility. However, in health insurance, there is the issue of uncertainty thus the use of Expected Utility Theory from a Gain Perspective to complement the consumer theory.

2.1.1 Expected Utility Theory from a Gain Perspective

Nyman's (2001) Expected Utility Theory from a Gain Perspective is consistent with any purchase in a standard market economy. According to him, the value of health insurance is the anticipated pay off when ill and not because of the certainty it provides. When consumers pay premium, they give up on income that could have been used to purchase other goods and services. The expectation when they purchase health insurance is that the utility gained from it exceeds its cost in terms of utility foregone from other goods and services that could have been purchased. In this case, insurance is purchased as additional income when in a sick state. Nyman's theory is best explained by two scenarios. In the first scenario an individual sacrifices part of his disposable income to pay health insurance premiums. In the event of sickness or ill state, the cost of treatment will be taken care of by the health insurance cover, at times the cost being more than the premiums paid, representing a gain. In the second scenario, an individual who does not have a health insurance – and therefore does not pay premium, hence more disposable

income, will eventually shoulder the burden of the cost of treatment when sickness strikes without a cover to fall back to. The cost of treatment might wipe out all the gains that he had made in terms of non-payment of premiums.

This study is grounded on Nyman's theory as it clearly brings out the expected benefit of health insurance uptake.

2.2   Empirical Literature

A number of studies have tried to unveil the determinants of health insurance. Some of the determinants include economic factors, socio-demographic factors, household size, place of residence, behavioral factors and if there is an alternative community based health insurance scheme.

Economic factors such as income, employment levels and wealth index are very important determinants for the purchase of health insurance. Cameroon *et al.*, (1988), Sanhueza and Ruiz-Tagle (2002), Fronstin, *et al*, (1997), Asenso *et al.,* (1997), Takeuchi *et al.,* (1998), and Ying *et al.,*(2007)examined the relationship between income and health insurance. They all concur that there is always a positive relationship between income and health insurance. Similarly, studies by Owando (2006) and Gius (2010) established that employment status has a direct positive correlation with the uptake of health insurance .In Kenya, Kimani, *et al*., (2010) and Kiplagat, *et al*., (2011) observed that a higher wealth index and the uptake of health insurance have a positive relationship.

An individual might have a high wealth index, a high income and is employed but still does not purchase health insurance. This can be explained by their socio-demographic characteristics such as education, age, gender and marital status. Knowles *et al.,* (2010), Ying *et al.,* (2007), Asenso *et al.,* (1997), Bourne and Kerr-Campbell (2010), and Owando (2006), Bernd *et al.,* (2011), Wanjiku (2011) and Mwaura (2012) all concur that a higher level of education and being married increase the probability of purchasing a health insurance cover.

However, the studies differ when it comes to age and gender. While Ying *et al.*,(2010) and Jutting (2001) found out that being young increases the probability of enrolling in a health insurance scheme, Mwaura (2012) found out that advanced age increased the probability of enrolling in a health insurance scheme. Similarly on gender, Knowles *et al.,*(2010), Jutting (2001) and Mwaura (2012) found out that female headed households are more likely to enroll in a health insurance scheme but Asenso *et al.*, (1997) and Bourne and Kerr-Campbell (2010), found out the contrary: that male headed households, and being male increased the probability of purchasing a health insurance scheme.

Some aspects of socio-demographic characteristics such as education can influence behavior. This is best illustrated in studies by Kirigia *et al.*, (2005) and Owando (2006) who found out that risky behavior like smoking, alcohol use and non-use of contraceptives were found to accelerate demand for health insurance. This is because risky behavior was associated with one expected health status. It is not surprising therefore that individuals involved in risky behavior are likely to purchase health insurance as they are aware of the consequences.

Evidently, awareness is a critical determinant of health insurance uptake. Nketiah (2009) found out that access to television and newspapers as significant determinants of women's insurance coverage in Ghana. Similarly, Cohen and Sebstad (2006), Bhat and Jain (2006) and Roth *et al.*, (2007) found out that knowledge and information increased the probability of purchasing a health insurance cover while Mathauer *et al.,* (2008) established that lack of knowledge about enrolment procedures and the basic principles of insurance was a major barrier to enrollment by taxi drivers.

While numerous studies have been done in order to establish the relationship between household size and the uptake of health insurance, there seems to be no agreement on the results. For example Kirigia *et al.*, (2005), Mhere (2013), and Oraya (2014) revealed that an increase in family size negatively correlated with the probability of enrolling in a health insurance scheme. Kiplagat (2011) differs as his study in Kenya showed that a larger household size as being associated more with social security fund and mutual health insurance schemes like NHIF while smaller households associate more with private health insurance schemes.

The place of residence of individuals also influences the demand of health insurance. Globally, many studies such as Perlman *et al.,* (2004), Dahlui and Baloul (2014) and Akama (2015) are in agreement that living in urban areas increases the probability of health insurance enrollment as opposed to enrollment by those individuals living in rural areas.

Private health insurance schemes include Community Based Health Insurance schemes (CBHIs). Many countries acknowledge the barriers to universal health care at national level. To circumvent political and organizational constraints at the national level, they explored other means of direct involvement of communities in health financing. The involvement of the community in health financing was spurred by the Declaration of Alma Atain 1978 (Bose and Desai, 1983). The most important factors from a client perspective were simplicity; affordability and value (Churchill, 2006; McCord, 2001). They have been proved effective in reaching the low income people (Ekman, 2004). This is despite them experiencing a very high level of adverse selection. It was observed that many people tended to sign up with the CBHIs, at the moment of illness, and if they are aware of the CBHs benefit package (Carrin *et al.,* 2005).

Several factors that have led to the continuous growth of CBHIs in Africa include household size. In Rwanda, for example, a study by Schneider and Diop (2000) showed that large households with more than five members had a greater probability to enroll in the CBHIs than others. The explanation given is that contributions were kept flat, irrespective of household size, up to seven members; the average contribution per household member was therefore less than for smaller families, inducing greater.

Flexibility in premium payment is another important factor. In Philippines, for CBHI schemes such as the ORT, payment schedules were held flexible with monthly, quarterly or semi-annual payments (Ron, 1999). In Tanzania, trust was considered a factor in the development of CBHIs among informal sector workers to the extent that these workers constituted their own associations, a good basis for building trust among members. Subsequently, a CBHI was easier to develop (Ginneken, 1999) as a result of these trust-based associations.

2.3   Overview of Literature

Most of the studies reviewed, among them Cameroon *et al.*, (1988), Sanhueza and Ruiz-Tagle (2002), Fronstin *et al*. (1997), Asenso *et al.* (1997), Takeuchi *et al.* (1998), and Ying *et al.* (2007), Owando (2006),Gius (2010), Kirigia *et al*. (2005), Mhere (2013), Nketiah (2009) and Wanjiku (2011)are on health insurance. However, they focus on particular groups of people for example health insurance in women, young adults, particular races like Chinese or enrollment of individuals into private health insurance schemes.

Little is known about National Health Insurance consumption patterns by the informal sector in Africa and Kenya in particular as evidenced by most of the literature reviewed above. The informal sector is a very important segment of Kenya's economy as it employs 77% of the total workforce in the country. Numerous studies have documented informal sector workers' traditional and unreliable mechanisms of coping with ill health such as disposing property and family assets, informal borrowing from community fund raisings and local shylocks. Sadly, very few national studies that apply econometric models have been done that seek to understand why informal sector workers enrollment in NHIF remains painfully low. An example of such a study is Wanjiku (2011). Her study focuses on the enrollment of informal sector employees in the NHIF in Kenya. However, it does not highlight the role of alternative community based health insurance schemes as a threat and competitor to NHIF. These schemes are cheaper, have rapid growth, flexible payment mechanisms and are easily accessed at the grassroots where the informal sector workers work and reside.

This study seeks to understand the paradox of despite NHIF being a viable and effective strategy of cushioning informal sector workers from catastrophic poverty, injury and death from both treatable and chronic diseases, informal sector enrollment into the scheme remains alarmingly low. Hence, the study seeks to understand the Determinants of the Uptake Of National Health Insurance Fund among Informal Sector Workers in Kenya.

2.4   Conceptual Framework

Independent Variables

```
┌─────────────────────────────┐
│ Economic Factors            │ ◄──────────┐
│    • Income                 │            │
│    • Employment status      │            │
│    • Wealth index           │            │
└─────────────────────────────┘            │
                                           │
┌─────────────────────────────┐            │
│ Socio-Demographic           │ ◄──────────┤
│ Characteristics             │            │
│    • Education              │            │
│    • Marital Status         │            │
│    • Age                    │            │
│    • Gender                 │            │
└─────────────────────────────┘            │
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Dependent Variable

```
┌─────────────────────────────┐            │   ┌──────────────────────┐
│ Behavioural Factors         │ ◄──────────┤   │                      │
│    • Smoking                │            ├──►│  Uptake of NHIF      │
│    • Alcohol                │            │   │                      │
└─────────────────────────────┘            │   └──────────────────────┘
                                           │
┌─────────────────────────────┐            │
│                             │ ◄──────────┤
│  Awareness                  │            │
│                             │            │
└─────────────────────────────┘            │
                                           │
┌─────────────────────────────┐            │
│                             │ ◄──────────┤
│  Household Size             │            │
│                             │            │
└─────────────────────────────┘            │
                                           │
┌─────────────────────────────┐            │
│ Place of Residence          │ ◄──────────┤
│    • Urban                  │            │
│    • Rural                  │            │
└─────────────────────────────┘            │
                                           │
┌─────────────────────────────┐            │
│ Alternative Community Based │ ◄──────────┘
│ Health Insurance Scheme     │
└─────────────────────────────┘
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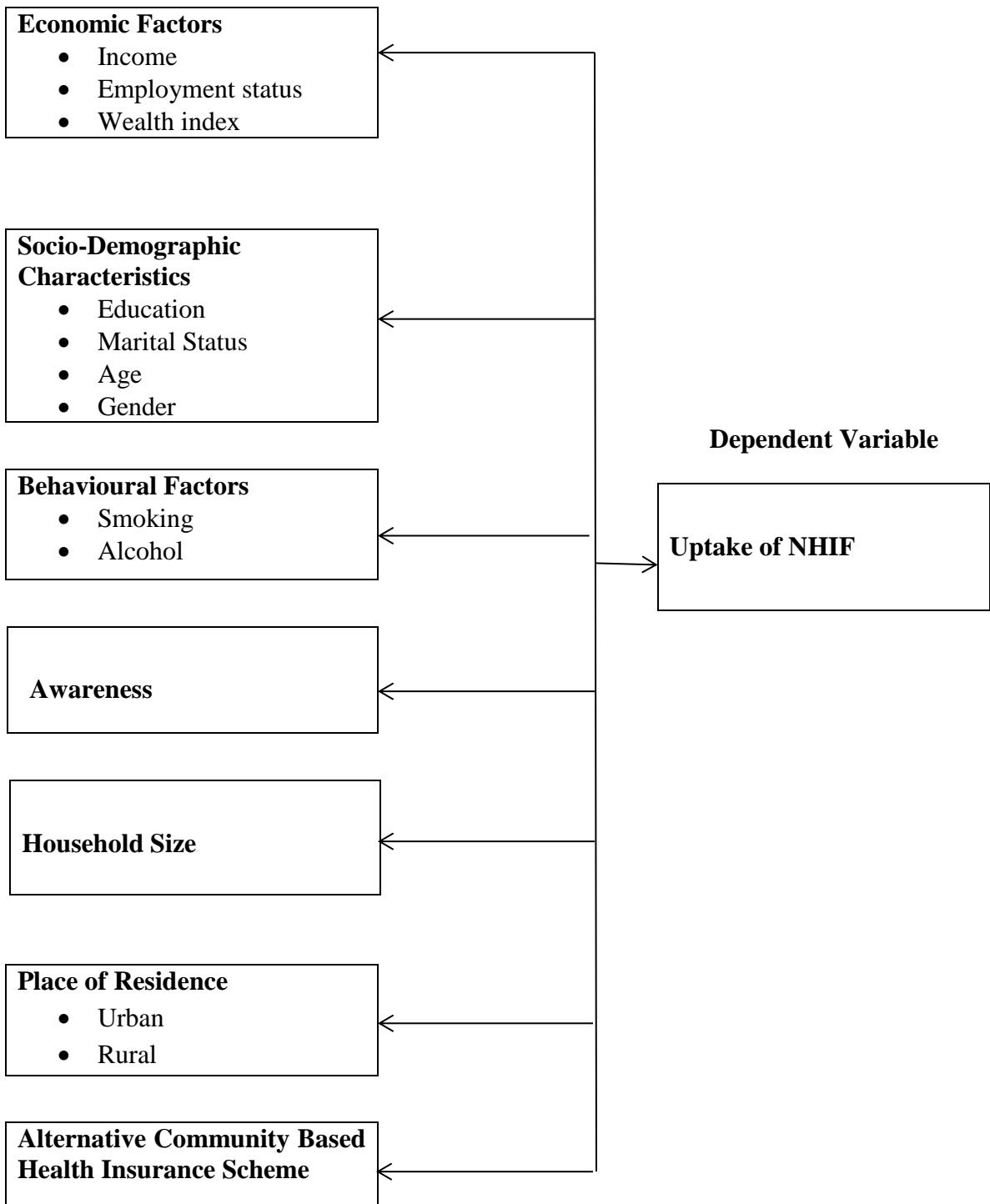
Figure 1: Conceptual Framework

CHAPTER THREE

METHODOLOGY

3.1   Theoretical Framework

The theory of demand for health insurance is grounded on expected utility maximization theory by Von Newmann and Morgenstern in 1944. Conventionally, individuals are assumed to be risk averse. Hence, they purchase health insurance to avoid the financial risk of anticipated future costs.

The theory of expected utility maximization postulates that between competing alternatives, an individual's decision will be guided by the choice that confers the highest total expected utility. In the context of health insurance, there are two possible states, either healthy or sick. If sick, an individual or family will have to invest in health inputs such as healthcare, diet, exercise in order to increase his health capital stock and achieve a healthy output. Health inputs such as healthcare can either be paid by current income, wealth or by a health insurance firm. However, health insurance can only be utilized in the event of ill health.

Thus, the potential consumers of health insurance are assumed to make decisions based on the magnitude of the perceived difference between the level of expected utility with insurance (EU_1) and expected utility without health insurance (EU_2). We need to analyze the effect of changes in the independent variables on the difference in the level of the expected utility of the two prospects, that is, EU_1 minus EU_2. If the difference were equal to zero, the prospective consumer would not be motivated to purchase the health insurance cover. However, if the difference was greater than 0, then the risk-averse consumer will prefer to purchase a health insurance cover. Similarly, if negative the prospective consumer will not purchase the health insurance cover.

We assume that the expected utility associated with enrolling in a national health insurance is a function of a vector of its attributes (Xi) and a vector of an individual's socio- economic characteristics (Ri), plus a stochastic error term (**E**) which captures errors in model specification (example, omission of relevant variables) and errors in data measurement.

Algebraically, an individual decision process can be expressed as:

$EU_j = g(X_j, RO + e.$ Where:

EU_j is the utility that an individual expects to derive by enrolling in the national health insurance scheme.

The basic assumption is that the individual prefers to join a national health insurance scheme if $EU_{il} > EU_{i2}$, while prefers not to enroll if $EU_{il} < EU_{i2}$, and is indifferent between the two if $EU_{il} = EU_{i2}$. Thus, the probability that an individual prefers to join a national health insurance scheme is: $P_{i1} = P(EU_{i1} > EU_{i2})$. Conversely, the probability that an individual prefers not to enroll in health insurance is: $P_{i2} = P(EU_{i1} < EU_{i2})$.

3.2   The Econometric Model and Model Specification

Following previous studies that have assumed that the data follows a normal distribution, this study will use a probit model. The main focus of study is to interpret the dependent variable as the probability of either choosing to purchase NHIF or not given other explanatory variables. There is an assumption that there is a linear relationship between the latent variable Y^* and explanatory variables (x_i). The structural model is expressed as;

$$Y^* = x_i\beta + \varepsilon\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(6)$$

Where Y^* is unobserved latent variable ranging from ∞ to ∞

x_i is a vector of explanatory variables

β is a vector of parameters to be estimated

ε is error term.

Also let the following measurement equation link the latent variable Y^* and the observed binary variable Y:

$$Y = \begin{cases} 1 \ if \ Y^* > K \\ 0 \ if \ Y^* \leq K \end{cases} \quad\text{..(7)}$$

Where y_i is the probability of being covered by NHIF (1 if covered by NHIF, 0 if otherwise).

K is the threshold point/ cut off, critical level of the index Y^* beyond which the individual will purchase NHIF.

The characteristics of X are taken at average and regressed against Y to determine the influence of each of the variables on the probability of an individual or household to make a decision to participate in health insurance or not to participate.

The National Health Insurance Fund Participation (NHIFP) will be presented as a function of a number of variables like the level of income, level of education, age, household size, sex, marital status, risky behavior, place of residence, level of awareness, marital status, one's employment status as well as if there is an alternative community based health insurance. Thus the probit model can be shown as;

NHIFP = Pij = f(β1 Age + β2Gender + β3 Marital Status + β4 Education+ β5Income + β6 Level of Awareness + β7 Household Size + β8 Place of Residence + β9 Risky Behavior + β10 an Alternative Community Based Health Insurance Scheme.

3.3   Variable Definition and Measurement

Dependent Variables	Measurement Description	Expected Sign
NHIF Uptake	1 if the individual has NHIF 0 if otherwise.	
Independent Variables		
Socio-demographic		
Age of Participant	Age in years	Positive/ Negative
Level of Education	Three dummy variables for levels of education were created. No education dummy which took value 1 if an individual had no formal education and 0 otherwise; primary education dummy which took value 1 if an individual had primary education and 0 otherwise; secondary education dummy which took value 1 if an individual had secondary education and 0 otherwise; and tertiary education which took value 1 if an individual had tertiary education and 0 otherwise.	Positive
Marital Status	1 if married, 0 otherwise	Positive
Gender	1 if male, 0 female	Positive/ Negative
Household Size	Number of household members	Positive/ Negative
Place of Residence: living in urban areas or rural areas	1 if rural area, 0 if urban	Positive
Behavioral Factors like Smoking and Alcohol use	1 if indulging in risky behavior (smoking) 0 if otherwise 0 if otherwise	Positive
Belonging to an Alternative Community Based Health Insurance Scheme	1 if belonging to a Community Based Health Insurance, 0 if otherwise	Negative
Wealth Index	1 Lowest, 2 Second, 3 Middle, 4 Fourth and 5 highest	Positive

3.4   Data Source

The data was derived from the Kenya Household Health Expenditure and Utilization Survey collected by the Kenya National Bureau of Statistics in 2013.This is a national survey that highlights special focus on healthcare services use, out-of-pocket spending on health, factors that influence healthcare use and expenditure, and health insurance coverage.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND DISCUSSION OF FINDINGS

4.1 Descriptive statistics

This section presents the descriptive statistics of the variables to be used in the analysis. Details are in table 4.2

4.2 Table Showing the Descriptive Statistics

Variable	Observation	Mean	Standard Deviation	Min	Max
Dependent Variable	34519	0.14	0.34	0	1
NHIF Uptake					
Independent Variables					
Education					
No Education Dummy	34,389	0.18	0.38		
Primary Education Dummy	34389	0.53	0.5	0	1
Secondary Education Dummy	34389	0.24	0.43	0	1
Tertiary Education Dummy	34389	0.05	0.22	0	1
Awareness (**1** if owns Radio or TV)	34519	0.73	0.44	0	1
Marital Status (**1** if married)	34519	0.07	0.46		
Gender (**1** if male)	34519	0.55	0.5	0	1
Wealth Index	34519	2.71	1.34	1	5
Membership to CBHI (**1** if belongs to CHBI)	34519	0.003	0.05	0	1
Place of Residence (**1** if rural)	34519	0.67	0.47	0	1
Age in Years	34519	40.5	15.43	15	99
Household Size	34519	2	0.83	1	4
Behavioral Factors (**1** if smokes)	34412	0.14	0.35	0	1

Only 14% of the informal sector workers have NHIF. Therefore most of the informal sector workers do not actually have NHIF. Majority of the informal sector workers have primary or lower levels of education; 53% of the workers have primary education and 18% have no education.. Only 5% have tertiary education. A significant number of the

informal sector workers, 73%, are aware of NHIF through radio or television. On gender, 55% of the informal sector workers are male while 45% are females. The mean wealth index of informal sector workers is between the second and middle quartiles. The mean age of the informal sector workers is 40.50 years while the minimum age and maximum age of an informal sector worker was 15 years and 99 years respectively. Majority of the informal sector workers are married, 70%, while only 30% are not married. Similarly, 67% of the informal sector workers live in rural areas while only 33% live in urban areas. The average household size of informal sector workers was 2, with minimum household size being 1 and maximum 5. On behavioral factors, only 14% of the informal sector workers smoke while 86% do not smoke. Lastly, the mean percentage of informal sector workers who belong to a CBHI is only 0.3%.

Table 4.3: Determinants of Enrolment to NHIF by Informal Sector Workers

Variable	Probit Model	
	Coefficient	Marginal effect
Marital Status (**1** if married)	0.51***(0.02)	0.07***(0.00)
Residence (**1** if rural)	0.12*** (0.02)	0.02***(0.00)
Education(No education is reference dummy)		
Primary Education dummy	0.32*** (0.04)	0.05***(0.01)
Secondary Education dummy	0.69*** (0.04)	0.14***(0.01)
Tertiary Education dummy	1.35***(0.05)	0.40***(0.02)
Gender (**1** if male)	-0.08***(0.02)	-0.01***(0.00)
Wealth Index	0.31***(0.01)	0.05***(0.00)
Household Size	-0.07***(0.01)	-0.01***(0.00)
Age	0.01***(0.00)	-0.009***(0.00)
Behavioral Factors (**1** if smokes)	-0.21***(0.03)	-0.03***(0.00)
CBHI (**1** if member)	-0.08***(0.23)	-0.08***(0.01)
Awareness (**1** if owns Radio and / or TV)	0.27***(0.03)	0.04***(0.00)

Standard error in brackets

Number of observations = 34,284.

Pseudo R^2=0.2001.

* *p value* < 0.1, ** *p value*< 0.05, *** *p value* < 0.01.

The table presents the coefficients and marginal effects of the independent variables in the probit model. All the p values are less than 0.05 meaning that all the independent variables are significant. Interpretation is based on the marginal effects.

Marital status is positively related to NHIF uptake among informal sector workers. Holding all factors constant, being married increased the probability of an informal sector worker to purchase NHIF by 7%. Similarly, informal sector workers who have primary education are 5% more likely to purchase NHIF, those with secondary education 14% and finally those with tertiary education 40% if all factors are held constant. This study concurs with what

Knowles *et al.,* (2010), Ying *et al.,* (2007), Asenso *et al.,* (1997), Bourne and Kerr-Campbell (2010), Owando (2006), Bernd *et al.,* (2011), Wanjiku (2011) and Mwaura (2012) found out regarding marriage and education in relation to the uptake of health insurance uptake.

Similarly, there is a positive relationship between wealth index and the uptake of NHIF among informal sector workers. If all factors are held constant, being more wealthy increased the probability of informal sector workers having a NHIF cover by (5%).The study is in agreement with what . Cameroon *et al.*, (1988), Sanhueza and Ruiz-Tagle (2002), Fronstin, *et al.*, (1997), Asenso *et al.,* (1997), Takeuchi *et al.,* (1998), and Ying *et al.,* (2007) also found similar results.

Likewise, there is also a positive relation between NHIF uptake and awareness. If all factors are held constant, the probability of an informal sector worker purchasing a NHIF cover increases by (4.1%) if the worker has a radio and/or television. This study mirrors what Nketiah (2009), Cohen and Sebstad (2006), Bhat and Jain (2006) and Roth *et al.*, (2007) found out in their studies. Regarding age, this study established that holding all the other factors constant, an increase in 1 year positively increased the probability of being a NHIF policy holder by 0.09%. This study is in agreement with Mwaura (2012) but differs with Ying *et al.*, (2010) and Jutting (2001) who found out that being young increases the probability of enrolling in a health insurance scheme.

Numerous studies done on health insurance have mixed results on who between males and females have an increased probability of purchasing a health insurance cover. Knowles *et al.,* (2010), Jutting (2001) and Mwaura (2012) found out that female headed households are more likely to enroll in a health insurance scheme but Asenso *et al.*, (1997) and Bourne and Kerr-Campbell (2010), found out the contrary. This study is in harmony with Knowles *et al.,* (2010), Jutting (2001) and Mwaura (2012), as it found out that being male decreases the probability of purchasing a health insurance cover by (1%).

However, the study differs with Kirigia *et al.*, (2005) and Owando (2006) who found out that risky behavior like smoking accelerates the demand for health insurance. This study finds out that a smoker is 3% less likely to have a NHIF cover when compared to a non-

smoker. This study also differs with Perlman *et al.,* (2004), Dahlui and Baloul (2014) and Akama (2015) who found out that residing in urban areas increases the probability of having a health insurance cover. It found out that living in rural areas increased the probability of having a health insurance cover by (1.8%).

Kirigia *et al*., (2005), Mhere (2013), and Oraya (2014) found out that an increase in family size negatively correlated with the probability of enrolling in a health insurance scheme. This study is in harmony with their findings but differs with Kiplagat (2011) who found out that a larger household size as being associated more with NHIF. To be precise, this study found out that a large household decreases the probability of an informal sector worker being a NHIF member by (1.1%).

Finally, the probability of having a NHIF cover, while having an alternative community based health insurance scheme decreases significantly by (8%) confirming that they are a real competitor and threat to NHIF.

CHAPTER FIVE

SUMMARY, POLICY RECOMMENDATIONS

AND AREAS FOR FURTHER RESEARCH

5.1   Introduction

The main objective of this study was to estimate the determinants of NHIF uptake among informal sector workers in Kenya. The study utilized data from the KHHEUS survey done in 2013 collected by the Kenya National Bureau of Statistics in 2013. The general objective was to identify the factors that determine informal sector workers enrollment into the NHIF scheme and to draw key policy recommendations for promoting uptake of NHIF among informal sector workers. The dependent variable was NHIF.

The independent variables in the study were age, level of education, marital status, gender, household size, residence, smoking and belonging to an alternative community based health insurance scheme. A probit model was estimated.

5.2 Summary of the Study Findings

The probit estimates indicated that having increased awareness, being married, not smoking, a small household size, living in rural areas, having a higher wealth index, being older and being educated is positively associated with the uptake of NHIF among informal sector workers. However, belonging to an alternative community based health insurance scheme and being female is negatively related with uptake of NHIF among informal sector workers.

5.3 Conclusion

The findings of this study confirm that socio-demographic factors like age, gender, education and marital status play a critical role towards the uptake of NHIF insurance among informal sector workers in Kenya. Other factors like place of residence, smoking. awareness, an alternative community based health insurance and wealth index also play a key role.

5.4   Policy Recommendations

Of particular concern is that there is still a low uptake of NHIF among informal sector workers at only (13.63%) despite its enormous advantages. Being male, living in rural areas, an increase in education, not smoking, a higher wealth index, increased awareness and a smaller household size is associated with a significant increase in uptake of NHIF. Thus the government should focus more on people living in urban areas to take NHIF, increase literacy levels by encouraging more students to enroll in primary, secondary and tertiary education. A higher wealth index is associated with increased uptake of NHIF because of more disposable income, thus if the there is a right economic environment there will be increased uptake of NHIF. Similarly, awareness is a critical factor and the recent move by the government to liberalize the airwaves is a good initiative in boosting awareness through radio or television. Finally, a small household size is associated more with NHIF because there is a dependents limit.

An alternative community based health insurance scheme is also a significant variable. Hence, NHIF should be more flexible in terms of payment and cascade down to the grassroots in order to boost the membership drive.

5.5   Further Research

Future studies in this area can be to evaluate the effectiveness of NHIF in cushioning the poor from catastrophic expenditures. This way the government can understand better if NHIF is 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 members on board.

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