



## Uptake of health insurance by the informal sector workers at Kenyatta market, Kibra sub-county, Nairobi County, Kenya

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### Abstract

The uptake rate of health insurance in many countries is quite low, particularly in Africa and East Asia. In Kenya, the National Health Insurance has been lowly taken up by employees involved in the informal economy, this has been credited to a host of factors. This paper assessed the influence of education level, income level, marital status, and religious affiliations on the rate at which the National Health Insurance is taken up by informal sector employees in Kenyatta market. The theories of Maslow hierarchy of needs and Planned behaviour were anchors for the study. Descriptive research design was used. A sample of 241 respondents was chosen from the different strata identified based on a simple random sampling technique. Instruments validity was checked by experts in the field while Cronbach alpha coefficient was used in checking reliability. The findings show that only 64.4% of the sampled respondents had enrolled in NHIF scheme despite government policy that every Kenyan 18 years and above must enroll for NHIF. In addition, based on the binary logistic regression, it was found that education and income were positive significant predictors of NHIF uptake, religious affiliations have a negative influence on uptake of NHIF, and marital status was not a significant predictor of uptake of NHIF. The study findings will be significant to researchers in the area of project management in particular health projects financing.

**Keywords:** Education level, Health insurance uptake, Income level, Informal sector, Marital status and Religious affiliations.

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### **Contribution of this paper to the literature**

The paper contributes to knowledge by showing the existence of a significant relationship between level of education, level of income, religious affiliation, and NHIF uptake, but marital status had no significant association with NHIF uptake.

## **1. Introduction**

The uptake of healthcare insurance in USA in 2020 stood at those having private healthcare insurance were 66.5 percent and 34.8 percent were dependent on healthcare insurance offered by the government, while those who had not taken up any insurance were 8.6 percent (Keisler-Starkey & Bunch, 2020). Germany uses a multi-player healthcare system that integrates a subsidized health care system available for the low-income citizens as well as a private system that takes care of the healthcare needs of the higher income citizens (Unger & De Paepe, 2019). In Asia, Laksono, Rukmini, Tumaji, Ipa, and Wulandari (2022) carried out research with a view of determining the antecedents to health care insurance subscription, and established that employment status had the highest influence on enrolment while age had the least influence.

Several countries in the African continent such as Tanzania, Ghana, Senegal, Rwanda, Nigeria, and Kenya finance their healthcare in remote parts of the country by mobilizing the members of the community to subscribe to a community-based or social insurance scheme which mobilize resources from public and the private sector (Adebayo et al., 2015). The most common factors that have been posited to influence an individual's choice of whether to take or not to take a health insurance policy include; sociocultural factors such as age, religion, culture, and household size, (Fenny, Kusi, Arhinful, & Asante, 2016). In Nigeria, Ogundeji, Akomolafe, Ohiri, and Butawa (2019) found that the out-of-pocket payment (OOP) account to almost 70% of health expenditure financing, which is greater than the recommended maximum level of 30%.

In Kenya, despite the efforts made by the government in making sure that universal health coverage is attained by the year 2030 through encouraging all citizens above the age of eighteen (18) years to voluntarily enroll as members in the National Health Insurance Fund, there is still some reluctance by self-employed individuals to do so. This study aimed at examining the influence of hypothesized determinants of health insurance uptake on the decision to enrolment in the national health insurance fund, which is a state health insurance scheme, among the informal sector workers domiciled at Kenyatta market, Kibra sub-county.

### *1.1. Statement of the Problem*

To achieve universal health coverage (UHC), the Kenya government has been pushing for maximum enrolment into the national health insurance fund by all adults. However, this has not been fully complied with, especially in the informal sector where contribution is voluntary. In Kenya, close to 83% of the country's workforce are employed in the informal sector, out of which youth make up 60% while women are 50% (Murunga, Muriithi, & Wawire, 2021). Despite the high number of employees in the informal sector, a paltry 39% are covered by NHIF (Muketha, 2016). Notwithstanding the inadequate contribution to the NHIF scheme, the informal sector members consume 33% of the benefits paid out (Okungu, Chuma, Mulupi, & McIntyre, 2018). According to the KNBS (2019) census report, the population of Kibra sub-county was 181,509 with 102,688 being above the age of 18 years. Out of these, 74, 411 which represents 72.5% of the adult population are employed in the informal sector. In general, 21.3% of the residents of Kibra have enrolled in a health insurance scheme (Wanjiku Ng'ang'a & Odhiambo, 2023) this includes employees working in both the informal and formal economy sectors. A health survey conducted in 2021 by the Department of Health Services of the Nairobi County Government showed that only 13.6% of the informal sector employees had enrolled in the NHIF scheme (www.nairobi.go.ke). In Kibra sub-county the report specifically indicated that a paltry 4.7% of the informal sector employees had enrolled in the NHIF scheme. This study sought to assess the influence of religious affiliation, education level, marital status, and level of income, on the uptake of the National Health Insurance Fund (NHIF) in Kenyatta market, Kibra sub-county, Kenya.

### *1.2. Objectives of the Study*

- i. To assess the influence of level of education on the uptake of National Health Insurance in Kenyatta Market, Kibra sub-county, Kenya.
- ii. To assess the influence of level of income on the uptake of National Health Insurance in Kenyatta Market, Kibra sub-county, Kenya.
- iii. To examine the influence of religious affiliation on the uptake of National Health Insurance in Kenyatta Market, Kibra sub-county, Kenya.
- iv. To assess the influence of marital status on the uptake of National Health Insurance in Kenyatta Market, Kibra sub-county, Kenya.

## **2. Literature Review**

### *2.1. Uptake of Health Insurance*

According to Kuwawenaruwa, Makawia, Binyaruka, and Manzi (2022) and Maurya and Mintrom (2020) the best bet to attainment of universal health coverage (UHC) which guarantees improvement in healthcare utilization and financial protection is by use of health insurance. Universal health coverage grew out of the need for quality improvement in health services in addition to making it easily accessible (Ji & Chen, 2016). The uptake of health insurance in countries that are considered to have low-and-middle income (LMICs) is generally low with low-income countries having an average uptake of 7.9%, middle-income countries in the lower level having an average uptake of 27.3%, and lastly, middle-income countries in the upper level having an uptake average of 52.5% (Hooley, Afriyie, Fink, & Tediosi, 2022). Israel has 95% coverage by the national health insurance which is obligatory for all except foreigners, army, and prison service officers who are supposed to take up private insurance (Tikkanen, Osborn, Mossialos, Djordjevic, & Wharton, 2020). A study done by Barasa, Kazungu, Nguhiu, and Ravishankar (2021) to examine the level of take up of health insurance across various Sub-Sahara Africa countries painted a bleak picture of a paltry 10% or less of the adult populace had taken up health insurance.

With limited income majority of the informal workers do not usually take up health insurance, they opt for out-of-pocket payment which put them at risk when they need health services but do not have money. This sought to add onto the research by establishing the influence of selected hypothesized determinants on the rate at which National health insurance Fund scheme is being taken up by informal sector employees in Kenyatta Market in Kibra sub-county.

### *2.2. Level of Education and Uptake of Health Insurance*

The highest education level attained by an individual has been found to be key in decision making. [Ngetich, Aruasa, Too, and Newa \(2021\)](#) conducted a study at a referral hospital in Eldoret town, Kenya to try and establish the antecedents to enrolment to a health insurance scheme by the patients visiting the Moi Teaching and Referral Hospital, and they established that education positively influenced the decision made by an individual on whether to or not to take up a health insurance policy.

In Ghana, [Seddoh and Sataru \(2018\)](#) carried out a household survey and found that education was positively correlated with NHIS enrolment. [Dror \(2020\)](#) conducted descriptive research in LMICs and established that the registration into the national/community/social-based health insurance was positively associated with education level of the household head, they conceptualized education level in terms of the years of education.

Another study was carried out by [Nguru, Kodhiambo, and Yitambe \(2018\)](#) in Embu town among patients attending private and public health facilities and found that acceptance of health insurance was greatest amongst the research respondents who had attained university/college education and least among the respondents with no education. A similar study was conducted by [Sundays, Ngaira, and Mutai \(2015\)](#) among workers involved in the informal sector of Kakamega town in Kakamega County and found that education level was significantly linked with subscription to the NHIF scheme.

### *2.3. Level of Income and Uptake of National Health Insurance*

[Mukhwana, Ngaira, and Mutai \(2015\)](#) did a study in Kakamega among the employees in the informal sector and found that individuals in the informal segment who had superior income monthly (more Kshs. 10,000) had a higher likelihood of registering in a health insurance scheme and in particular NHIF as compared to those with a lower income. [Basaza et al. \(2019\)](#) conducted a survey among taxi drivers in Kampala to ascertain the influence of income on their eagerness to subscribe to a community health insurance (CHI) and concluded that respondents who were wealthy, in particular those belonging to the fourth and fifth quantiles, were more ready to pay for CHI as compared to those who were not wealthy. [Muiya \(2017\)](#) using a randomly selected sample of four hundred and fifty-six respondents gotten from the Nairobi and Machakos counties informal areas carried out research to determine the antecedents to social-based health insurance enrolment and established that the income level of a household determines the choice of whether not to join or to join a health insurance scheme. Similarly, [Negera and Abdisa \(2022\)](#) in their study on the factors linked with eagerness to subscribe to community-based health insurance by payment of monthly premiums found that among the 400 sampled respondents located in the South West Shoa Zone of Ethiopia, the greatest impediment to enrolment was low household income followed by high premiums.

[Nurhasana et al. \(2022\)](#) studied the association between financial hardship and health insurance enrolment in the rural areas of Indonesia and established the presence of a direct correspondence between the two variables. [Njogu \(2019\)](#) analysed the link that subsists between income and uptake of health insurance in Nyeri County using the probit model and established that income positively influenced subscription to a health insurance scheme.

To determine the connection between household income and registration to a health insurance plan, [Kagaigai, Anaali, Mori, and Grepperud \(2021\)](#) carried out a study of cross-sectional nature in Dodoma region that involved 722 households. Income was found to be statistically significant but having a very low influence on enrolment, this was based on the strength of association (odds ratio). [Iyalomhe, Adekola, and Cirella \(2021\)](#) also found a significant positive link exists between keenness to pay for health insurance that is community-based and the income level of an individual among dwellers of Awka slums, Nigeria.

### *2.4. Marital Status and Uptake of National Health Insurance*

[Mukhwana et al. \(2015\)](#) found that among the informal sector employees in Kakamega County, people who are married and have families were more likely to join the NHIF scheme followed by single individuals, widowed, and divorced respectively. In Ghana, a study by [Badu, Agyei-Baffour, Ofori Acheampong, Preprah Opoku, and Addai-Donkor \(2018\)](#) applying a cross-sectional methodology to ascertain the effect of sociodemographic factors on the utilization and the rate of take up of health insurance established that marital status influence the choice of whether to register or not to register in a health insurance scheme. [Njogu \(2019\)](#) did research whose objective was to establish the link that exists between the status of marriage of an individual and enrolment into a health insurance scheme in Nyeri County, and established that a change in marital status from single to married or divorced to married led to a 0.02% increase in the likelihood of an individual procuring a health insurance. Marriage has generally been shown to increase enrolment in a health insurance scheme ([Ying, Wang, Bai, & Li, 2020](#)).

[Owusu-Sekyere and Chiaraah \(2014\)](#) looked at how marital status among Ghanaians influenced their registration into a health insurance programme, and the findings indicated that the status of marriage of an individual was a strong indicator for enrolment. [Kong \(2010\)](#) also studied the nexus between subscription into a health insurance and marital status in USA, found that married adults had a higher chance of registering in a health insurance scheme as compared to the widowed, divorced, and single adults.

[Maina, Kithuka, and Tororei \(2016\)](#) did research in Kenya to establish the nexus between health insurance subscription and marital status of women, and found that married women had higher chances of enrolling in a health insurance scheme in comparison to those not in marriage. In Bungoma, [Masengeli, Mwaura-Tenambergen, Mutai, and Simiyu \(2017\)](#) established that married respondents were 10 times more probable to take up a health insurance plan in comparison to unmarried respondents.

### 2.5. Religious Affiliation and Uptake of National Health Insurance

With regard to uptake of a health insurance scheme, [Badu et al. \(2018\)](#) conducted a comprehensive study in Ghana and found that in Central and Eastern Ghana, affiliation of a household with a certain religious outfit, whether Islam, Christianity, or Traditional increased the chances of that household enrolling in a health insurance scheme. In Nepal, [Bhusal and Sapkota \(2021\)](#) found that respondents who were Hindus had higher chances of registering in a health insurance scheme in comparison to the ones who were not Hindus. Similarly, [Hassan, Mwaura-Tenambergen, and Eunice \(2017\)](#) conducted a study in Nairobi County, Kenya, and established that shariah teachings and religious beliefs were the main reason as to why a good proportion of the sampled respondents did not choose to register in a healthcare insurance scheme of any kind. [Musonda and Chowa \(2022\)](#) did a study in Kalumbili Mining Community in Zambia and established religion combined with culture had no influence on uptake of life insurance. [Ewulum et al. \(2022\)](#) established that among the formal sector employees, one of the significant and common barriers to health insurance uptake was found to be the religious belief of the respondent. In contrast to the findings of the study done by [Ewulum et al. \(2022\)](#) and [Nguru et al. \(2018\)](#) [2827 in her master thesis established that religion did not in any way influence registration of the respondents into a health insurance scheme.

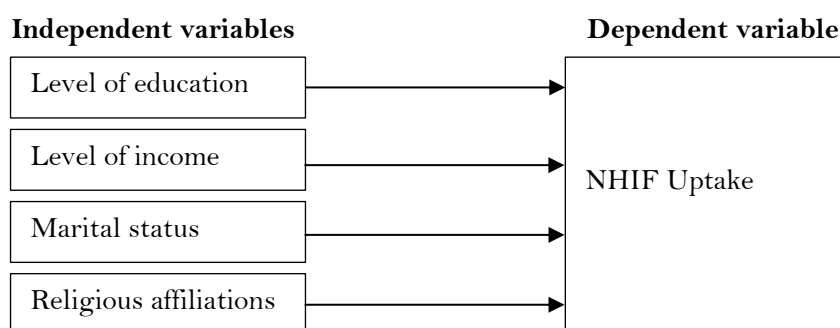
[Gitau and Sile \(2016\)](#) using a sample of 100 respondents selected randomly from a population of 160 in the Nairobi Central Business established that religion significantly influenced the rate of health insurance uptake among the sample respondents. [Ng'ang'a \(2021\)](#) while using the probit model with uptake of health insurance being taken as the response variable and religion being one of the six independent variables established that religion was significant influencer of the rate of enrolment into NHIF in Kibera, Nairobi among the low-income populations.

### 2.6. Theoretical Framework

This study was anchored upon the theories of Maslow's Hierarchy of Needs, Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB). Maslow's theory underpins the fact that the seeking behaviour for health insurance being a safety need is motivated by attainment of physiological needs, which in this case are food, water, clean air, and shelter. The TRA refers to behaviors which are voluntary because they involve conscious decision on the part of an individual, ([Hale, Householder, & Greene, 2003](#)). They argue that an individual may fail to perform behaviour because of insufficient skills, lack of opportunity, and lack of support from others but not because of voluntary decisions. The theory of planned behaviour states that the actual execution of a behaviour is proportional to the magnitude of domination that the person has over the given behaviour and the strength of his intention towards performing that particular behaviour ([Ajzen, 2011](#)). The TPB comprises of three components that direct the intention of a person performing a certain behaviour and they include, subjective norm, attitude, and perceived behavioral control ([Orbell, Hodgkins, & Sheeran, 1997](#)). [Randall and Wolff \(1994\)](#) reviewed Fishbein and Ajzen theory and established that the behaviour type that an individual adapts is usually linked to the strength of the connection that exists between the behaviour and intentions. According to [Ajzen \(2011\)](#) the behaviour of an individual is normally guided by the beliefs they have of the likely repercussions of his/her behaviour and the assessments of the repercussions.

### 2.7. Conceptual Framework

A conceptual framework is given that shows the hypothesized relationship among the variables in the research. The independent variables; level of education, level of income, marital status, and religious affiliations, are assumed to influence the uptake of the National Health Insurance Fund (NHIF).



## 3. Research Methodology

### 3.1. Research Design

This study utilized a descriptive research design because it enabled the study to compute a correlation coefficient that was used to determine how strong the relationship between two variables is and also the direction of relationship if it exists ([Huntington-Klein, 2021](#)).

### 3.2. Sample Size and Sampling Procedure

The target population for the research study was 608 members of Kenyatta Market located in Kibra Sub – County, Nairobi County, Kenya, and who are registered by the County Government of Nairobi.

**Table 1. Target population.**

Business	Number of members
Food vendors	132
Retail and wholesale shops	191
Saloons and Kinyozi	221
Motor vehicle mechanics	64
Total	608

Source: <https://nairobi.go.ke/downloads/>.

Table 1 presents the target population of a research study focused on members of the Kenyatta Market located in Kibra Sub-County, Nairobi County, Kenya. These individuals are registered by the County Government of Nairobi. The total target population is 608 members, distributed across various business sectors.

A sample of 241 individuals from a population of 608 was used as determined by using the formula due to Yamane (1967). This sample of 241 was distributed proportionately as shown in Table 2.

Table 2. Sample size.

Business	Number of members
Food vendors	52
Retail and wholesale shops	76
Saloons and Kinyozi	88
Motor vehicle mechanics	25
Total	241

This study adopted simple random sampling technique to select study respondents in each stratum, where the stratum represents the different informal businesses that are involved in economic activities in Kenyatta Market.

### 3.3. Research Instruments

The instrument utilized in the collection of data was semi-structured questionnaires. The semi-structured questionnaires were used for gathering of both quantitative and qualitative data of primary nature.

### 3.4. Pilot Testing of the Research Instruments

The research instruments were piloted in Toi Market located in Kibra sub-county with a sample of 24 respondents, which represents 10% of the study sample.

### 3.5. Validity of the Research Instruments

The Delphi method was used in measuring content validity where the expert looked at the content of the research instruments individually, then compared their rating before making a final decision on the constructs and advised on their appropriateness in achieving the desired research objectives.

### 3.6. Reliability of the Research Instruments

Stability reliability also known as test – retest reliability was checked by administering the research instrument (semi – structured questionnaire) a sample from the study population twice within a period of seven days, then a correlation coefficient was generated based on the Pearson's product moment correlation technique.

### 3.7. Data Collection Procedure

The questionnaires were self-administered and collected by the researcher; and this enhanced the response rate of the questionnaires.

### 3.8. Data Analysis Technique

Quantitative data was analyzed for descriptive statistics as well as for inferential statistics, where a logistic regression technique of binary nature was applied to help determine the input and significance of each of the independent variables.

Qualitative data that was collected from the open – ended questions was thematically analyzed and the findings corroborated with those of the quantitative data analysis for presentation.

## 4. Data Analysis, Presentation, and Interpretation of Findings

### 4.1. Questionnaire Response Rate

A total of 241 semi-structured questionnaires were issued by the researcher to the research participants. Out of which, 216 (89.6%) were duly filled and useable for research.

### 4.2. Gender of the Respondents

The results indicated in Table 3 shows that 58.8% of the sampled research respondents belonged to the female gender while the remaining 41.2% indicated that they belonged to the male gender.

Table 3. Gender of respondents.

Gender	Frequency	Percent
Female	127	58.8
Male	89	41.2
Total	216	100.0

### 4.3. Age of Respondents

The results of the age analysis is as shown in Table 4. Cumulatively, it was found that 77.3% of the research respondents were mature adults aged over 30 years.

Table 4. Age of respondents.

Age (Years)	Frequency	Percent
18 - 30	49	22.7
31 - 40	107	49.5
Over 40	60	27.8
Total	216	100.0

#### 4.4. Nature of Business

Summary of nature of business undertaken by respondents is shown in Table 5.

**Table 5.** Nature of business.

Nature of Business	Frequency	Percent
Food vendors	33	15.3
Retail and wholesale shops	52	24.1
Saloon and Kinyozi	113	52.3
Motor vehicle and motor bike mechanics	18	8.3
Total	216	100.0

#### 4.5. Duration of Business Operation

Table 6 results indicate the period which vendors have been operating the businesses.

**Table 6.** Duration in business.

Duration (Years)	Frequency	Percent
Under 1	102	47.2
1 less than 3	61	28.2
3 less than 5	33	15.3
Over 5	20	9.3
Total	216	100.0

#### 4.6. Enrolment in National Health Insurance Fund (NHIF)

Table 7 results show that majority of the sampled respondents 139 (64.4%) had enrolled in NHIF while the remaining 77 (35.6%) had not enrolled into NHIF.

**Table 7.** Enrolment in NHIF.

Response	Number	Percent
Yes	139	64.4
No	77	35.6
Total	216	100.0

#### 4.7. Level of Education and Uptake of National Health Insurance Fund (NHIF)

The first objective of the study was to assess the influence of education level on enrolment into a health insurance scheme, in particular, the uptake of National Health Insurance Fund (NHIF). This was done in two parts, first establishing the extent of influence of level of education, on uptake of NHIF, and results are as shown in Table 8.

**Table 8.** Extent of influence of level of education on the uptake of national health insurance fund (NHIF).

Extent	Frequency	Percent
Not at all	3	1.4
Little extent	19	8.8
Moderate extent	33	15.3
Great extent	157	72.7
Very great extent	4	1.8
Total	216	100.0

Secondly, the study aimed at assessing the influence of constructs of level of education on uptake of national health insurance fund and findings are as shown in Table 9.

**Table 9.** Level of education indicators.

No	Statement	Mean	Std. dev.
1	I have never attended school	1.04	0.13
2	I dropped out of primary school	1.98	0.79
3	I finished primary level education	2.91	0.87
4	I dropped out of secondary school	3.14	0.89
5	I finished secondary school	4.29	0.33
6	I have never attained any post-secondary education	3.99	1.17
7	I have post-secondary school training	2.06	0.24
8	Composite	2.77	0.87

#### 4.8. Level of Income and Uptake of National Health Insurance Fund (NHIF)

The study aimed at assessing the role that the income level of an individual plays in their decision to take up health insurance, in particular, the national health insurance fund (NHIF). This was done in two parts, first establishing the extent of influence and next establishing the influence of constructs of level of income. Results are as shown in Tables 10 and 11.

**Table 10.** Extent of influence of level of income on uptake of national health insurance fund (NHIF).

Extent	Frequency	Percent
Not at all	2	0.9
Little extent	11	5.1
Moderate extent	16	7.4
Great extent	169	78.2
Very great extent	18	8.3
Total	216	100.0

**Table 11.** Level of income indicators.

No	Statement	Mean	Std. dev.
1	I earn less than Kshs. 10,000 a month	3.67	0.30
2	I earn between Kshs. 10,000 – Kshs. 20,000 a month	3.71	0.18
3	I earn between Kshs. 20,000 – Kshs. 30,000 a month	2.79	0.86
4	I earn more than Kshs. 30,000 a month	2.64	0.71
5	Combined	3.20	0.53

**4.9. Marital Status and Uptake of National Health Insurance Fund (NHIF)**

The third research objective was assessment of the influence of marital status on the uptake of the national health insurance fund (NHIF). This was done in two parts, first establishing the extent of influence and next establishing the influence of constructs of marital status as shown in Table 12.

**Table 12.** Extent of influence of marital status on the uptake of national health insurance fund (NHIF).

Extent	Frequency	Percent
Not at all	39	18.1
Little extent	48	22.2
Moderate extent	41	19.0
Great extent	53	24.5
Very great extent	35	16.2
Total	216	100.0

The study assessed the influence of constructs of marital status on the uptake of the national health insurance fund (NHIF) whose summary is in Table 13. It is generally concluded that marital status has some influence on the uptake of the national health insurance fund (NHIF). This is in line with studies done by other researchers such as Reshmi et al. (2021), Kituku and Amata (2016) and Dror (2020) who all concluded that marital status influences uptake of health insurance. Dror (2020) based on the relative importance index (RII) found that married individuals had the highest likelihood of taking up health insurance in comparison to the other classes of marriage, while single individuals had the least chance of taking up health insurance.

**Table 13.** Marital status aspects.

No	Statement	Mean	Std. dev.
1	I am married	3.87	0.61
2	I am single	2.39	0.65
3	I am divorced	2.88	0.38
4	I am widowed	2.24	0.42
5	Composite	2.85	0.74

**4.10. Religious Affiliation and Uptake of National Health Insurance Fund (NHIF)**

The research aimed to first establish the extent to which religious affiliation influences the uptake of National Health Insurance Fund (NHIF). This was achieved by asking respondents to indicate the extent to which they believed an individual’s education level influences their intention to take the National Health Insurance Fund. The findings are presented in Table 14.

**Table 14.** Extent of influence of religious affiliation on the uptake of national health insurance fund (NHIF).

Extent	Frequency	Percent
Not at all	10	4.7
Little extent	23	10.5
Moderate extent	17	7.9
Great extent	122	56.5
Very great extent	44	20.4
Total	216	100.0

The study was also to assess the influence of constructs of religious affiliation on uptake of national health insurance fund. Statements measuring religious affiliation of an individual were constructed and measured on a Likert scale. The respondents were required to respond to the statements by ticking just a single box. The results are shown in Table 15.

**Table 15.** Religious affiliation indicators.

No	Statement	Mean	Std. Dev.
1	I am a Christian	4.04	0.11
2	I am a Muslim	2.98	0.29
3	I am a Hindu	2.73	0.52
4	I am a Traditionalist	1.42	0.16
5	I do not subscribe to any religion	2.14	0.62
6	Composite	2.66	0.38

**4.11. Inferential Statistics**

The study employed a binary logistic regression technique since the dependent variable was of a binomial nature, where the respondents were either enrolled or not enrolled in the national health insurance fund (NHIF), while the

independent variables were; level of education, level of income, marital status, and religious affiliation. The results of the analysis are presented in Table 16.

**Table 16. Omnibus tests of model coefficients.**

		Chi-square	df	Sig.
Step 1	Step	63.127	4	0.000
	Block	63.127	4	0.000
	Model	63.127	4	0.000

The results in Table 16 show that the model is a good fit since the p-values are less than 0.05. The model summary gives a description of the percentage of variability/changes in the response variable (uptake of health insurance) that can be attributed to the predictor variables (religious affiliation, education level, marital status, income level) in the model generated. The results of the analysis are presented in Table 17.

**Table 17. Model summary.**

Step	-2 log likelihood	Cox & snell R square	Nagelkerke R square
1	43.064 <sup>a</sup>	0.351	0.617

**Note:** a. Estimation terminated on iteration number 7 because parameter estimates changed by less than .001.

The results in Table 17 show the Nagelkerke R square value of 0.617 which implies that 61.7% of the variability in enrolment in NHIF can be accounted for by the predictor variables in the model which in this case are; education level, level of income, marital status, and religious affiliation.

This section is used to determine which of the predictor variables has a statically significant influence on the decision of an individual to enroll in NHIF. The results of the data analysis are shown in Table 18.

**Table 18. Variables in the equation.**

Step 1 <sup>a</sup>	Variable	$\beta$	S.E	Wald	df	p	Exp( $\beta$ )
	Level of education	0.103	0.012	8.746	1	0.001	1.108
	Income level	1.950	0.537	21.173	1	0.000	7.029
	Marital status	0.006	0.038	0.065	1	0.327	1.006
	Religious affiliation	-0.071	0.025	4.266	1	0.039	0.931
	Constant	1.636	0.689	3.761	1	0.052	3.807

**Note:** a. Variable(s) entered on step 1: Level of education, income level, marital status, religious affiliation.

The results in Table 18 show the connection that exists among the outcome and predictor variables. Beta ( $\beta$ ) denotes the anticipated change in the log odds (Exp( $\beta$ )). In this case, it is observed that the probability of an individual enrolling in NHIF if they are educated or for every year of increased education is 1.108 higher than those individuals who have a low education level, given a p-value of  $0.001 < 0.05$  this implies that education level is significant forecaster of enrolment in NHIF. The probability of an individual enrolling in NHIF if they have a higher income is 7.026 times greater than those individuals who have a low level of income, since the p-value is  $0.000 < 0.05$ , this implies that income level is significant predictor of enrolment in NHIF. Marital status was found not to be a significant forecaster of enrolment in NHIF ( $0.327 > 0.05$ ). Lastly, religious affiliation was established as being a statistically significant forecaster of enrolment in NHIF ( $0.039 < 0.05$ ), the negative value of the beta coefficient however indicates that the more affiliated the people were to their religion the less they were to enroll in NHIF.

## 5. Discussion of Findings

It was established that there existed a direct association which was significant at the 5% significant level between an individual's education level and national health insurance fund (NHIF) uptake. In particular, an increase in the level of education by one unit increased the chances of an individual enrolling in NHIF by 1.108. The research findings are in tandem with those of Ngetich et al. (2021); Seddoh and Sataru (2018) and Dror (2020) who all conducted studies on the association between the two variables and found that there existed a strong statistically significant direct link between the level of education of a person and their willingness to register in a national/community/social-based health insurance in their different jurisdictions using the linear regression technique and the Pearson's correlation coefficient.

It was found that there existed a strong direct correlation which was significant statistically at the 5% significant level between level of income and uptake of national health insurance fund (NHIF). The research results concur with those of Mukhwana et al. (2015) who based on logistic regression established that a growth in the income of an individual resulted in a rise in the chances of the individual taking up health insurance of any type. The findings also in agreement with those of Basaza et al. (2019) who carried out a study in Kampala and established that taxi drivers with low income were least likely to register in a health insurance.

Based on the binary logistic regression results, it was found out that there existed a very weak direct correlation which was not significant at the 5% significant level between national health insurance fund (NHIF) uptake and marital status. The research findings contradict the verdicts of studies done by other researchers such as, Mukhwana et al. (2015); Masengeli et al. (2017); Njogu (2019) and Badu et al. (2018) who all established the existence of a positive association between marital status and uptake of health insurance based on both logistic and linear regression techniques.

The study established that an increase in religious affiliation, that is, the more religious a person is, the uptake of health insurance decreases. The research findings corroborate those of Hassan et al. (2017) and Ewulum et al. (2022) who also established a negative association between the two variables. On the flipside, the findings are in contrast with those of Badu et al. (2018) and Bhusal and Sapkota (2021) who all found a positive significant association between religious affiliation and uptake of health insurance. In addition, the findings do not agree with those of



Nguru et al. (2018) and Musonda and Chowa (2022) who carried out a study in Zambia and established the existence of no association between religious affiliation and uptake of health insurance.

## 6. Conclusion and Recommendations

The study concludes that:

- i. The level of education of an individual had a great influence on the decision of an individual to take up national health insurance fund.
- ii. The level of income of an individual had a very great influence on the uptake of national health insurance fund.
- iii. The marital status of an individual had little influence on the uptake of national health insurance fund.
- iv. The religious affiliation of an individual had little influence on the uptake of national health insurance fund.

The study recommends that the government should educate the informal sector employees on the benefits of having health insurance. In addition, adult education should be enhanced particularly in slum and rural areas where the level of education of the people in such areas is particularly low. Furthermore, the government should increase the minimum wage so that the informal sector employees can be able to take care of their basic needs as well as sparing some money for health insurance. Finally, religious leaders should be mandated to educate their followers on the importance of health insurance so as to increase the level of uptake.

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