

# Socio-economic and Healthcare Determinants of Health Insurance Awareness and Enrollment in Ilorin, Nigeria

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# Abstract

## Introduction

Health insurance, intended to reduce financial burdens and enhance affordability of healthcare services, remains a relatively new concept in Nigeria. Despite efforts to expand its coverage, approximately 90% of Nigerians lacked health insurance as of 2024. This study assessed the awareness, utilization, and the socioeconomic and healthcare factors influencing health insurance uptake in Ilorin, Kwara State.

## Method

The study employed a cross-sectional design conducted among adults from the ages of 18 years and 70 years within Ilorin, Kwara State, Nigeria. Data was collected within the period of 3 months (July to September 2024) using semi-structured questionnaires covering the awareness, utilization and associated factor to health insurance uptake. Descriptive statistics, chi-square and logistic regression were conducted using SPSS version 25.0 whilst setting statistical significance with p-values at  $\leq 0.05$ .

## Result

Of the 415 participants, 243 (59.3%) were aware of health insurance, but only 121 (29.9%) are enrolled, with healthcare providers (37.4%) being the main source. The National Health Insurance Authority (NHIA) has the highest enrollment rate (51.2%). Among the insured, the most reported challenge was limited coverage for certain conditions (22.5%), while the uninsured mostly reported lack of awareness of available plans (33.3%). However, being a healthcare worker significantly increased awareness of health insurance (AOR = 2.368, 95% CI: 1.446–3.878,  $p = 0.001$ ); single individuals showed (AOR = 0.366, 95% CI: 0.190–0.704,  $p = 0.003$ ) lesser awareness. Additionally, those who were aware of health insurance were more likely to enroll (AOR = 13.893, 95% CI: 6.637–29.080,  $p = 0.000$ ) and being a healthcare worker was not significantly linked to enrollment (AOR = 0.913, 95% CI: 0.538–1.549,  $p = 0.737$ ).

## Conclusion

Despite moderate awareness of health insurance, actual enrollment remained low, driven more by perceived healthcare access and system confidence than by knowledge or affordability. Limited coverage and low enrollment further hinder uptake. Targeted interventions addressing socio-economic and healthcare system barriers are essential to improve health insurance utilization and advance progress toward Universal Health Coverage (UHC).

## Background

Every health system has recognized universal health coverage (UHC) as a top priority [1]. The World Health Organization (WHO) has repeatedly called on many countries to establish a prepaid healthcare financing systems facilitating access to high-quality healthcare and give family the necessary safeguard against the disastrous effects of healthcare-associated out-of-pocket (OOP) expenses, demonstrating the significance of the objective [1].

Prepayment mechanisms, including health insurance, are widely regarded as the most reliable approach to achieving universal health coverage [2, 3]. However, prepayment systems are well-established in developed countries, but many developing countries, especially in Africa, still rely on out-of-pocket payments, which negatively affects people's health, hinders efforts to achieve universal health coverage, and continues to financially burden over 200 million people, including more than 150 million people in the WHO Africa Region [4].

Nigeria's healthcare system is financed through multiple sources, including private sector contributions such as external donor backings, government-based public-driven funding, out-of-pocket payments, social health insurance, and community-based health funding [5]. However, Nigeria health insurance are covered as either the Social (National) Health Insurance and the Private Health Insurance. The establishment of National Health Insurance Authority (NHIA) under the National Health Insurance Scheme (NHIS) Act 35 of 1999, overarching goal is to ensure widespread access to cost-effective, high-quality healthcare services for insured individuals and their beneficiaries. The NHIS aims to prevent excessive medical expenses while regulating the rising cost of healthcare services in

Nigeria. It ensures a steady flow of funds for the scheme's efficient operation and promotes fairness in distributing healthcare costs across different income groups. Furthermore, the scheme seeks to encourage private sector involvement in healthcare service delivery, contributing to a more sustainable and inclusive healthcare system [6–8].

Following the establishment of health insurance, it still remains a new concept in Nigeria and several other African nations. Despite efforts to expand NHIS coverage, registering clients into the scheme remains suboptimal. As of 2024, fewer than 10% of Nigerians were enrolled, with most beneficiaries drawn primarily from a small segment of federal workers. Consequently, most of the population still lacks access to health insurance [9]. Even though fewer than 10% of Nigerians are engaged in the NHIS program at the moment, coverage varies by location [10]. Also, awareness of health insurance is particularly poor in the informal sector, where many individuals either lack knowledge of the scheme or do not fully understand its benefits. In contrast, awareness is higher among those in the formal sector, yet enrollment remains suboptimal despite a demonstrated willingness to participate. A major challenge affecting uptake is the voluntary nature of enrollment, especially for informal sector workers, who must actively subscribe and make annual premium payments making health insurance inaccessible to many, particularly the poor and vulnerable [11].

However, the Nigerian government authorized the establishment and operation of state-supported health insurance schemes (SSHIS) in 2015 in order to expand coverage of the informal and formal sectors. The NHIA provided financial and technical assistance for these schemes [10, 12]. The goal of this decentralizing reform was to increase stakeholders' commitment to and sense of ownership over the health insurance system, which would help the states move closer to attaining universal health coverage [10]. Therefore, SSHIS plans have been implemented in roughly 20 states to varying degrees since its start [13].

Nevertheless, several factors contribute to the low uptake of health insurance, including weak legal frameworks, poor policy implementation, inadequate government funding, and a lack of political commitment to making health insurance mandatory for all citizens. The informal sector, which makes up a major portion of Nigeria's workforce, struggles with financial constraints that make regular insurance contributions difficult. Moreover, inefficiencies within the NHIS's regulatory and administrative structures discourage enrollment. Among women, especially those in the informal sector, the situation is even more concerning [11]. A study in Nigeria establish that majority (97.9%) of women of reproductive age were not captured by health insurance, highlighting a critical gap in healthcare access for this demographic group. Given that women play a central role in family health and well-being, their exclusion from health insurance coverage poses a serious public health challenge [14]. Healthcare delivery in Nigeria also faces broader issues, such as inadequate funding, low motivation among health workers, and unequal access to medical services. The government allocates only a small percentage of the national gross domestic product (GDP) to public healthcare, far below international recommendations. As a result, rural areas, where the majority of the population resides, often experience constricted access to healthcare, which is typically of lower quality than in urban centers [15].

A study conducted in Ilorin, Kwara State, revealed that awareness of the NHIS was significantly higher among workers within the formal sector compared to those in the informal sector, where knowledge of the scheme remains low. Awareness was notably greater among federal government employees, individuals with post-secondary education, and younger, single individuals, suggesting that educational level and employment type influence knowledge and utilization of health insurance [3]. The study also highlighted that awareness plays a crucial role in health insurance enrollment, as individuals with better knowledge about the scheme were more likely to participate. Despite this, coverage remains low, particularly among those in informal employment and non-working group, underscoring the need for targeted awareness campaigns [3]. This work sought to examine the awareness, and enrollment in health insurance among Ilorin residents, with a focus on identifying the key socioeconomic and healthcare factors that influence participation in the scheme.

## Methods

### Study Design and Setting

We adopted a cross-sectional research approach carried out in Ilorin the capital of Kwara State, located in western Nigeria. Despite being in the North-Central geopolitical zone, Ilorin is classified as a Yoruba city on all historical and sociological grounds. According to the 2006 census, it has 777,667 inhabitants, making it the seventh-largest city in Nigeria [16]. The contemporary city serves as a hub for commerce, industry, and education. A nursing home for the aged and other public, private, and religious hospitals are also encompassed health services [17].

## Sample size, Study population and Sampling

The initial study population was calculated using a 50% assumed proportion at a 95% confidence interval, yielding a 384-sample size. After alteration with a 10% attrition rate, the sample size increased to 422 and was further expanded to 480 to allow quota allocation across worker categories in Ilorin, where occupational data are limited. Participants were recruited using a stratified probability sampling technique, with strata defined as non-working groups, formal/official sector workers, and informal sector workers to ensure adequate representation. A 3:2:1 ratio was applied, allocating 240 respondents to the non-working highest group, 160 to the formal/official sector, and 80 to the informal lowest sector.

## Inclusion and Exclusion Criteria

Individuals between the ages of 18 and 70 who agreed to take part in the study were included. This study eliminated those who felt like they belonged to this age range but had not lived in Ilorin for more than a year, as well as people who had mental health issues and had trouble communicating.

## Data Collection

This study employed a refined semi-structured questionnaire adapted from previous studies conducted in Nigeria [3, 18, 19], tailored to capture existing knowledge on preventive care access and health insurance utilization. The data collection team then collected the relevant information from the participants between the month of July-September 2024

## Measurement and study variables

The questionnaire covered comprehensive details about the demographic and socio-economic independent variables, health-related information on universal health coverage, healthcare access and financial constraint, awareness, and enrollment in health insurance (outcome/dependent variables) among people living in Ilorin, Kwara State. The demographic and socio-economic variables assessed were age, sex, religion, occupation, educational status, health-related information such as status of healthcare in Ilorin, awareness about UHC, financial hardship, confidence in accessing healthcare services in Ilorin (Supplementary file 1).

## Data storage/management

To ensure confidentiality, the questionnaire data were stored in a password-protected folder accessible only by the research principal investigator. Prior to analysis, the data were checked for accuracy, consistency, and completeness, then entered into Excel and securely stored with restricted access.

## Data analysis

The stored data was imported to SPSS version 26 for analysis. Descriptive statistics including frequency, percentage, and bar charts were used for presenting data on demographic and socio-economic variables, health-related variables, awareness, utilization of health insurance and barriers associated with health insurance. Inferential statistics such as chi-square was employed to check the connection between health-associated factors, awareness and utilization of health insurance among the study respondents. Additionally, univariate and multivariate logistic regression analysis was utilized to assess the association between independent variables and outcome variables (awareness and utilization of health insurance) and to establish the true predictors of the dependent factors using adjusted odd ratios. The significance of the inferential statistics was considered at  $\leq 0.05$  p-values.

## Ethical Approval

The Kwara State Ministry of Health's Ethical Review Committee in Ilorin, was consulted and gave the study's ethical approval under reference number ERC/MOH/2024/06/312. Prior to being recruited for the study, each participant had to provide their informed consent. To protect participant responses, their data was anonymized and kept private.

## Results

**Socio-demographic characteristics of the study participants**

A total of 415 participants completed the survey. The majority 236 (56.9%) were aged 18–27 years and female 218 (52.5%). Religion was nearly evenly distributed, with 210 (50.6%) identifying as Christian and 205 (49.4%) as Muslim. Most respondents were single 264 (63.6%), students 180 (43.4%), and had tertiary education 295 (71.1%). Additionally, 287 (69.2%) were non-healthcare workers, while 128 (30.8%) were healthcare workers. (Table 1).

**Table 1:** *Demographics and socio-economic features of the participants sampled in Ilorin, 2024 (n=415)*

| <b>Variables</b>         | <b>Frequency</b> | <b>Percent (%)</b> |
|--------------------------|------------------|--------------------|
| <b>Age Range</b>         |                  |                    |
| 18-27 Years              | 236              | 56.9               |
| 28-37 Years              | 95               | 22.9               |
| 38-47 Years              | 47               | 11.3               |
| 48-57 Years              | 24               | 5.8                |
| 58-67 Years              | 9                | 2.2                |
| 68 and Above             | 4                | 1.0                |
| <b>Gender</b>            |                  |                    |
| Male                     | 197              | 47.5               |
| Female                   | 218              | 52.5               |
| <b>Religion</b>          |                  |                    |
| Christianity             | 210              | 50.6               |
| Islam                    | 205              | 49.4               |
| <b>Marital Status</b>    |                  |                    |
| Single                   | 264              | 63.6               |
| Married                  | 142              | 34.2               |
| Widowed                  | 6                | 1.4                |
| Divorced                 | 3                | 0.7                |
| <b>Occupation</b>        |                  |                    |
| Government Worker        | 88               | 21.2               |
| Private Worker           | 51               | 12.3               |
| Self Employed            | 69               | 16.6               |
| Unemployed               | 22               | 5.3                |
| Student                  | 180              | 43.4               |
| Retired                  | 5                | 1.2                |
| <b>Educational Level</b> |                  |                    |
| Primary School           | 6                | 1.4                |
| Secondary School         | 26               | 6.3                |
| Tertiary                 | 295              | 71.1               |
| Postgraduate             | 86               | 20.7               |
| No Formal Education      | 2                | 0.5                |
| <b>Healthcare Worker</b> |                  |                    |
| Yes                      | 128              | 30.8               |
| No                       | 287              | 69.2               |

#### Participants General Health Information Awareness

The largest proportion of 182 (43.9%) participants in the study rated healthcare in Ilorin as Good. Regarding knowledge of Universal Health Coverage (UHC), 259 (62.4%) reported being informed about it, while 388 (93.5%) agreed that healthcare access is a fundamental human right. 239 (57.6%) of the participants reported they did not experience financial hardship in accessing healthcare. Additionally, 151 (30.4%) were somewhat confident in accessing healthcare services (Table 2).

**Table 2:** *Distribution of participant’s health-related information in Ilorin, 2024 (n=415)*

| Variables                                                      | Frequency | Percent (%) |
|----------------------------------------------------------------|-----------|-------------|
| <b>Perception Of Quality of Healthcare Services in Ilorin</b>  |           |             |
| Excellent                                                      | 38        | 9.2         |
| Good                                                           | 182       | 43.9        |
| Fair                                                           | 162       | 39.0        |
| Poor                                                           | 33        | 8.0         |
| <b>How well are you Informed with UHC</b>                      |           |             |
| Well Informed                                                  | 77        | 18.6        |
| Informed                                                       | 259       | 62.4        |
| Not Informed                                                   | 79        | 19.0        |
| <b>Is access to healthcare a Fundamental Right?</b>            |           |             |
| Yes                                                            | 388       | 93.5        |
| No                                                             | 13        | 3.1         |
| Undecided                                                      | 14        | 3.4         |
| <b>You Experience Financial Hardship Accessing Healthcare?</b> |           |             |
| Yes                                                            | 176       | 42.4        |
| No                                                             | 239       | 57.6        |
| <b>Confidence in Accessing Healthcare Service</b>              |           |             |
| Very Confident                                                 | 104       | 25.1        |
| Somewhat Confidence                                            | 151       | 36.4        |
| Not Very Confident                                             | 126       | 30.4        |
| Not At All Confident                                           | 34        | 8.2         |

### Information on the Enrollment and Utilization of Health Insurance Among Insured participants

NHIS was the most utilized health insurance program, with 62 (51.2%) participants enrolled. The most commonly used healthcare service was doctor visits, reported by 64 (37.0%) of the participants. Healthcare access was mostly occasional, as indicated by 59 (48.8%) participants, while only 36 (29.8%) were satisfied with their access (Table 3).

**Table 3:** *Information on the utilization of Health Insurance among insured participants (n=121)*

| Variables                           | Frequency | Percent (%) |
|-------------------------------------|-----------|-------------|
| <b>Health Insurance Enrolled in</b> |           |             |
| NHIS                                | 62        | 51.2        |
| Kwara Care                          | 33        | 27.3        |
| Private Health Insurance            | 26        | 21.5        |
| <b>Health Insurance Utilization</b> |           |             |
| Doctor's Visit                      | 64        | 37.0        |
| Hospital Stays/Admission            | 34        | 19.7        |
| Prescription Medication             | 43        | 24.9        |
| Preventive Care                     | 32        | 18.5        |
| <b>Health Insurance Usage Rate</b>  |           |             |
| Regularly                           | 27        | 22.3        |
| Occasionally                        | 59        | 48.8        |
| Hardly ever                         | 35        | 28.9        |
| <b>Satisfactory Level</b>           |           |             |
| Very Satisfied                      | 36        | 29.8        |
| Somewhat Satisfied                  | 43        | 35.5        |
| Neutral                             | 37        | 30.6        |
| Somewhat dissatisfied               | 1         | 0.8         |
| Very Dissatisfied                   | 4         | 3.3         |

### **Awareness, and Enrollment in Health Insurance, and Perceptions of UHC Among Participants**

A total of 246 (59.3%) of participants were aware of health insurance, but only 121 (29.2%) are enrolled, leaving 294 (70.8%) unenrolled (Figure 1). Regarding UHC objectives, 40.5% prioritized quality healthcare, 36.3% emphasized health equity, and 23.3% focused on financial risk protection (Figure 2). The main sources of health insurance information were healthcare providers (37.4%), family and friends (24.4%), and social media (19.5%) (Figure 3).

### **Health Insurance Utilization Barriers Among Insured and Enrollment Barriers Among Uninsured Participants**

Based on identified health insurance utilization barriers among insured and enrollment barriers among uninsured participants, the major challenge among the insured were limited coverage for certain conditions (22.5%), distance to healthcare facilities accounted for 16.4%, cost (12.7%) and long wait times was (12.7%). Other barriers were healthcare worker behavior (12.7%), difficulty in enrollment and renewal (9.9%), lack of transparency (7.0%), and limited access to healthcare (6.1%) (Figure 4a). For the uninsured, barriers included lack of awareness of available plans (33.3%), difficulty in enrollment (23.7%), cost (21.7%), lack of transparency and cost concerns (15.1%), and cultural or religious beliefs (6.2%) (Figure 4b).

### **Healthcare-Related Factors Associated with Health Insurance Awareness and enrollment among Ilorin Respondents.**

This study examined how healthcare-related factors influence awareness and enrollment in health insurance amongst 415 participants in Ilorin. Awareness was generally higher among those who rated healthcare as excellent (63.2%) or good (64.3%), though the association was not significant ( $p = 0.084$ ). A significant association was observed between awareness and knowledge of Universal Health Coverage (UHC) ( $p = 0.000$ ); 64.9% of well-informed and 64.1% of moderately informed participants were aware of health insurance, compared to only 38.0% for the uninformed. Confidence in healthcare access was also significantly linked to awareness ( $p = 0.001$ ), with the highest awareness (74.0%) among those very confident in accessing care.

In contrast, health insurance enrollment was significantly associated with healthcare rating ( $p = 0.049$ ) and confidence in access ( $p = 0.000$ ). Enrollment was highest (50.0%) among participants who were very confident in accessing quality healthcare services, and lowest (18.3%) among those with little confidence. No significant associations were found between enrollment and UHC knowledge, financial hardship, or viewing healthcare as a right. Generally, confidence in healthcare access showed significant association with both awareness and enrollment, while UHC knowledge notably influenced awareness (Table 4).

**Table 4:** Healthcare-Related factors associated with health insurance awareness and enrollment among respondents in Ilorin, 2024. (n=415)

| Variables                                                  | Awareness |           |         | Enrollment |           |         |
|------------------------------------------------------------|-----------|-----------|---------|------------|-----------|---------|
|                                                            | Yes       | No        | p-value | Yes        | No        | p-value |
| Rating of Healthcare in Ilorin                             |           |           |         |            |           |         |
| Excellent                                                  | 24(63.2)  | 14(36.8)  | 0.084   | 14(36.8)   | 24(63.2)  | 0.049*  |
| Good                                                       | 117(64.3) | 65(35.7)  |         | 63(34.6)   | 119(65.4) |         |
| Fair                                                       | 91(56.2)  | 71(43.8)  |         | 37(22.8)   | 125(77.2) |         |
| Poor                                                       | 14(42.4)  | 19(57.6)  |         | 7(21.2)    | 26(78.8)  |         |
| Knowledge About UHC                                        |           |           |         |            |           |         |
| Well Informed                                              | 50(64.9)  | 27(35.1)  | 0.000*  | 23(29.9)   | 54(70.1)  | 0.147   |
| Informed                                                   | 166(64.1) | 93(35.9)  |         | 82(31.7)   | 177(68.3) |         |
| Not Informed                                               | 30(38.0)  | 49(62.0)  |         | 16(20.3)   | 63(79.7)  |         |
| Is access to healthcare a Fundamental Right?               |           |           |         |            |           |         |
| Yes                                                        | 232(59.8) | 156(40.2) | 0.704   | 115(29.6)  | 273(70.4) | 0.459   |
| No                                                         | 7(53.8)   | 6(46.2)   |         | 4(30.8)    | 9(69.2)   |         |
| Undecided                                                  | 7(50.0)   | 7(50.0)   |         | 2(14.3)    | 12(85.7)  |         |
| You have Financial Hardship accessing healthcare services? |           |           |         |            |           |         |
| Yes                                                        | 104(59.1) | 72(40.9)  | 0.947   | 49(27.8)   | 127(72.2) | 0.613   |
| No                                                         | 142(59.4) | 97(40.6)  |         | 72(30.1)   | 167(69.9) |         |
| Confidence in Healthcare Access                            |           |           |         |            |           |         |
| Very Confident                                             | 77(74.0)  | 27(26.0)  | 0.001*  | 52(50.0)   | 52(50.0)  | 0.000*  |
| Somewhat Confident                                         | 90(59.6)  | 61(40.4)  |         | 38(25.2)   | 113(74.8) |         |
| Not Very Confident                                         | 61(48.4)  | 65(51.6)  |         | 23(18.3)   | 103(81.7) |         |
| Not At All Confident                                       | 18(52.9)  | 16(47.1)  |         | 8(23.5)    | 26(76.5)  |         |

\* =Significant p-value ( $\leq 0.05$ )

Health Insurance Program Access and Satisfaction Among Study Respondents

The association between health insurance program access and satisfaction revealed a significant relationship ( $P \leq 0.05$ ). Among NHIA users, 25(40.3%) were somewhat satisfied, while 13(39.4%) of Kwara Care users were very satisfied. In addition, 10(38.5%) of those with private health insurance were neutral toward their program (Table 5).

**Table 5:** Association between health insurance program access and level of satisfaction among insured participants sampled in Ilorin, 2024 (n=121)

| Variables                       | Very satisfied | Somewhat Satisfied | Neutral     | Somewhat Dissatisfied | Very Dissatisfied | p-value       |
|---------------------------------|----------------|--------------------|-------------|-----------------------|-------------------|---------------|
| NHIA                            | 17(27.4)       | 25(40.3)           | 17(27.4)    | 0(0.0)                | 3(4.8)            |               |
| Kwara Care                      | 13(39.4)       | 9(27.3)            | 10(30.3)    | 1(3.0)                | 0(0.0)            | <b>0.000*</b> |
| Private Health Insurance Agency | 6(23.1)        | 9(34.6)            | 10(38.5)    | 0(0.0)                | 1(3.8)            |               |
| <b>Total</b>                    | 36 (29.75%)    | 43(35.54%)         | 37 (30.58%) | 1 (0.83%)             | 4 (3.31%)         |               |

### Predictor of Health Insurance Awareness Among the Study Respondents

The univariate logistic regression analysis from this study shows that marital status is a significant predictor of the awareness of health Insurance with Single individuals (adjusted OR = 0.416, 95% CI: 0.270-0.639,  $p = 0.000$ ) having lesser chances of been aware of health insurance than those previously or presently married. Age-group was also a significant predictor of health insurance awareness with 18-27 years age-bracket presenting AOR = 0.613, 95% CI: 0.410-0.915,  $p = 0.017$  and having lesser chance of been aware than those within 28 years and above. However, Formal sector members (AOR = 2.338, 95% CI: 1.469-3.723,  $p = 0.000$ ) were more likely to be aware of health insurance than those working in informal sector and non-working group. Similarly, Healthcare workers (AOR = 2.740, 95% CI: 1.726-4.350,  $p = 0.000$ ) were more likely to be awareness of health insurance as compared to those who are not healthcare workers. Education, gender and religion did not present as significant predictors of health insurance awareness (Table 6).

In the Multivariate analysis, being an healthcare worker still remains a strong predictor of being aware of health insurance (AOR = 2.368, 95% CI: 1.446–3.878,  $p = 0.001$ ) compared to being a non-healthcare worker. Marital status was also a significant predictor, with single individuals (AOR = 0.366, 95% CI: 0.190–0.704,  $p = 0.003$ ) showing lesser chance of awareness than those married or previously married. Gender and religion, particularly Christianity (AOR = 0.915, 95% CI: 0.601–1.392,  $p = 0.678$ ) showed no significant association. Other factors such as Educational level and occupation were similarly also non-significant (Table 6).

**Table 6.** Influence of Socio-demographics on Awareness of health insurance among study Resampled in Ilorin, 2024 ( $n=415$ )

| Variable         |                                     | Univariate         | Multivariate  |                    |               |
|------------------|-------------------------------------|--------------------|---------------|--------------------|---------------|
|                  |                                     | Crude OR (CI)      | p-value       | Adjusted OR (CI)   | p-value       |
| Gender           | Male                                | 1.284(0.866-1.903) | 0.213         | 1.248(0.811-1.919) | 0.314         |
|                  | Female                              | Reference          |               |                    |               |
| Age              | 18-27                               | 0.613(0.410-0.915) | <b>0.017*</b> | 1.032(0.563-1.891) | 0.920         |
|                  | 28 and above                        | Reference          |               |                    |               |
| Marital status   | Single                              | 0.416(0.270-0.639) | <b>0.000*</b> | 0.366(0.190-0.704) | <b>0.003*</b> |
|                  | Married/Formerly (Divorced/Widowed) | Reference          |               |                    |               |
| Religion         | Christian                           | 0.836(0.565-1.237) | 0.371         | 0.915(0.601-1.392) | 0.678         |
|                  | Islam                               | Reference          |               |                    |               |
| Education        | Basic/No formal                     | 0.216(0.043-1.087) | 0.063         | 0.273(0.050-1.481) | 0.132         |
|                  | Secondary                           | 0.649(0.293-1.439) | 0.288         | 0.841(0.367-1.929) | 0.683         |
|                  | Higher Institution                  | Reference          |               |                    |               |
| Occupation       | Formal Sector                       | 2.338(1.469-3.723) | <b>0.000*</b> | 1.081(0.584-1.999) | 0.805         |
|                  | Informal Sector                     | 0.734(0.425-1.267) | 0.266         | 0.541(0.279-1.052) | 0.070         |
|                  | Non-Working Group                   | Reference          |               |                    |               |
| Healthcareworker | Yes                                 | 2.740(1.726-4.350) | <b>0.000*</b> | 2.368(1.446-3.878) | <b>0.001*</b> |
|                  | No                                  | Reference          |               |                    |               |

\* =Significant  $p\text{-value} \leq 0.05$ ; OR= Odd ratios

#### Predictors of Health Insurance Utilization Among the Study Participants

In the Univariate analysis, age was a significant predictor of the enrollment in health insurance with age group 18-27 (aOR = 0.415, 95% CI: 0.293-0.693,  $p = 0.000$ ) being less likely to enroll in health insurance than individuals who are 28 years and above. Also, individuals who are single (aOR = 0.434, 95% CI: 0.281-0.670,  $p = 0.000$ ) less likely to enroll in health insurance than individuals that are ever married. More so, Individuals working in formal sector (aOR = 2.655, 95% CI: 1.657-4.254,  $p = 0.000$ ) more likely of health insurance enrollment than those in informal sector or non-working group. Additionally, Healthcare workers were more likely to enroll in health insurance (aOR =1.586, 95% CI: 1.014-2.479,  $p = 0.043$ ). Also, health insurance awareness is a strong predictor of health insurance enrollment (aOR = 14.859, 95% CI: 7.256-30.429,  $p = 0.000$ ). However, Education, gender and religion are not a significant predictor of health insurance utilization (Table 7).

In multivariate analysis, enrollment in health insurance was significantly associated with awareness, with those aware more likely to enroll (aOR = 13.893, 95% CI: 6.637–29.080,  $p = 0.000$ ). Surprisingly, after adjusting for cofounders, occupation, age group, marital status are significant predictors in the univariate analysis, became non-significant predictor of health insurance utilization. Also, gender, religion and been a healthcare worker does not stand as a significant predictor of health insurance utilization (Table 7).

**Table 7.** Influence of respondents' socio-demographics on enrollment of health insurance (n=415)

| Variable          |                                             | Univariate           | Multivariate  |                      |               |
|-------------------|---------------------------------------------|----------------------|---------------|----------------------|---------------|
|                   |                                             | Crude OR (CI)        | p-value       | Adjusted OR (CI)     | p-value       |
| Gender            | Male                                        | 1.493(0.976-2.285)   | 0.065         | 1.225(0.744-2.015)   | 0.425         |
|                   | Female                                      | Reference            |               |                      |               |
| Age               | 18-27                                       | 0.415(0.293-0.693)   | <b>0.000*</b> | 0.583(0.295-1.155)   | 0.122         |
|                   | 28 and above                                | Reference            |               |                      |               |
| Marital status    | Single                                      | 0.434(0.281-0.670)   | <b>0.000*</b> | 1.062(0.507-2.225)   | 0.872         |
|                   | Married/formerly Married (Divorced/Widowed) | Reference            |               |                      |               |
| Religion          | Christian                                   | 0.860(0.563-1.314)   | 0.486         | 0.895(0.549-1.458)   | 0.655         |
|                   | Islam                                       | Reference            |               |                      |               |
| Education         | Basic/No formal                             | 0.343(0.042-2.821)   | 0.320         | 0.616(0.053-7.175)   | 0.699         |
|                   | Secondary                                   | 1.067(0.451-2.526)   | 0.882         | 1.884(0.672-5.279)   | 0.228         |
|                   | Higher Institution                          | Reference            |               |                      | \             |
| Occupation        | Formal Sector                               | 2.655(1.657-4.254)   | <b>0.000*</b> | 1.696(0.847-3.397)   | 0.136         |
|                   | Informal Sector                             | 1.177(0.621-2.231)   | 0.618         | 1.144(0.503-2.601)   | 0.749         |
|                   | Non-Working Group                           | Reference            |               |                      |               |
| Healthcare worker | Yes                                         | 1.586(1.014-2.479)   | <b>0.043*</b> | 0.913(0.538-1.549)   | 0.737         |
|                   | No                                          | Reference            |               |                      |               |
| Awareness         | Yes                                         | 14.859(7.256-30.429) | <b>0.000*</b> | 13.893(6.637-29.080) | <b>0.000*</b> |
|                   | No                                          | Reference            |               |                      |               |

\* =Significant  $p\text{-value} \leq 0.05$ ; OR= Odd ratio

## Discussion

The combined findings from this research provide a comprehensive and nuanced understanding of health insurance awareness and enrollment among residents of Ilorin, Nigeria, and highlight both progress and persistent challenges on the path toward universal health coverage (UHC).

A central finding of this study revealed 59.3% of participants reported being aware of health insurance, yet only 29.9% actually enrolled in it, leaving a significant 70.8% of the surveyed population uninsured. This is akin to some studies in Nigeria that reported low enrollment rates between 0.3% and 13.5% [3,20-22]. However, Effiong et al. [10] reported an increase in health insurance enrollee in Kwara State of about 37.3% which focus only on Kwara care enrollment as compared this study assessing both NHIS, Kwara care and private health insurance. Although a study conducted among federal civil servant in Rivers State reported higher enrollment rate of 83.8% [23]. These findings reflect the regional variation in health insurance uptake, and low acceptance and reluctance to pay premiums, especially in the informal sector, which harbors over 70% of Nigeria's workers and non-working group [24]. However, our work reported a low coverage rate possibly because it was conducted among people working in formal sector, informal and those who are in non-working groups. This could imply that the health insurance has difficulties breaking into the unorganized sector. Additionally, although making up half of all respondents, students (non-working group) and younger adults were primarily uninsured in the majority of our study states, indicating unique obstacles to young adults' coverage under the program [10].

The gap between awareness and enrollment is not only peculiar to Ilorin, but it mirrors national trends across many Nigerian states, where fewer than 10% of the populace are enrolled in the NHIS despite its introduction over two decades ago [3]. The relatively high awareness rate in Ilorin may be attributed to its urban setting and the predominance of young, educated participants who had tertiary education and also an effect of the previous community based health insurance in Kwara state that's has been running in 2006 and the subsequent state health insurance which runs in 2018 has contributed to raising significant level of awareness about health insurance with community mobilization and engagement tactics [3,7, 25]. Previous research has consistently shown that higher education levels and formal employment are associated with greater awareness and uptake of health insurance [3].

In this study, of the 29.2% enrollment rate, NHIA (51.2%) was the most accessed insurance package. Despite this relatively high awareness, actual enrollment in health insurance remains low, especially among informal sector workers and non-working groups, as buttressed by similar studies conducted in Nigeria which reported enrollment rate between 6.7 and 21.1% [13,26] and a study conducted by Mwinuka et al. [27] among informal sector in Tanzania reporting enrollment rate of 9.1%. The voluntary nature of health insurance enrollment in Nigeria, particularly for those in the informal sector, continues to be a significant barrier. Many informal workers lack stable incomes, making regular premium payments difficult [7,26]. This study and several other study also reported that cost and difficulty in enrollment were among the most frequently cited barriers for the uninsured, alongside lack of awareness of available plans [7,26]. These challenges are compounded by weak legal frameworks, inadequate government funding, and inefficiencies in the scheme's administration, as noted in broader literature [13,26].

In this study, awareness and utilization were significantly higher among formal sector workers, individuals with tertiary education, younger and single individuals. This is in line with findings from Adewole et al. [3], who reported that education and employment type are strong predictors of health insurance awareness and utilization.

The barriers to health insurance utilization observed in this work are multifaceted affecting both the insured and uninsured. This study reported lack of awareness of available plans, difficulty in enrollment, and cost as the major barrier to enrollment of health insurance among uninsured participants. However, those who are insured expressed dissatisfaction which stemmed from limited coverage for certain conditions, distance to healthcare facilities, cost, long waiting times, negative healthcare worker behavior, and difficulty with enrollment and renewal. These findings are consistent with previous research showing that administrative complexity, limited benefit packages, and negative experiences with healthcare providers can discourage both enrollment and continued participation [3,7,26,28]. Additionally, the study highlights other factors such as low level of trust in government social policies, poverty, and lack of trust in managing health insurance scheme funds, while disagreements from cultural and pious beliefs are also frequent barriers in Nigeria and other similar settings [28-30]. The complexity of the enrollment process and the lack of tailored information for informal sector workers further exacerbate these challenges [31]

Surprisingly, this study reported that, only 29.8% of insured participants expressed satisfaction with their healthcare access, though most of them (35.5%) were just partially satisfied with their insurance services. A large proportion reported only occasional access to healthcare services. This suggests that even for those who are insured, the perceived value and quality of insurance programs may be limited, potentially undermining trust and willingness to recommend or renew coverage [3,7]. The limited coverage for certain conditions and the distance to healthcare facilities were notable sources of dissatisfaction among the insured [3,7].

This study found financial hardship not to be significantly associated with either awareness or utilization of health insurance. Enrollment rates were similar among those experiencing financial hardship and those who were not. However, confidence in healthcare access was significantly associated with both awareness and enrollment compared to much lower rates among those with low or no confidence. This finding aligns with broader evidence that trust in health systems is a critical driver of insurance [32].

Healthcare providers were the main source of information about health insurance, followed by family/friends and social media. This highlights the influential role of trusted intermediaries and the potential for leveraging these channels in future awareness and enrollment campaigns. The role of healthcare providers as the primary source of information suggests that interventions aimed at increasing awareness and uptake can benefit by involving healthcare workers as advocates and educators [3,7]. Also, all insured participants reported satisfaction to the program they were enrolled in with just few being dissatisfied, reflecting feelings of adequacy in the services they were getting from the program.

In this study, the major access to information about health insurance was reported to be from healthcare workers which makes an healthcare provider to be more aware of health insurance awareness. Although awareness and information access by healthcare workers related to health insurance, does not translate to its enrollment. This could probably be attributed to perceived feelings of self

confidence in catering for their health services when they needed it. Also, the study highlighted that awareness plays a crucial role in health insurance enrollment, as individuals with better knowledge about the scheme were more likely to participate. This suggests that to improve the enrollment rate, the state needs to strengthen the awareness level and community engagement in every sector, most especially the informal sector and non-working group.

### **Policy Implications and Recommendations**

In summary, while awareness of health insurance in Ilorin is higher than national averages, enrollment remains low due to a complex interplay of socioeconomic, structural, and perceptual barriers. Addressing these challenges will require multifaceted interventions, including:

- **Targeted Awareness Campaigns:** Leveraging healthcare providers, social media, and community leaders to disseminate information, especially to less-educated and informal sector populations.
- **Simplification of Enrollment Processes:** Reducing administrative complexity and making enrollment more accessible for informal workers and vulnerable groups.
- **Expansion of Coverage Options:** Broadening the benefit packages to cover more conditions and services and ensuring that coverage meets the needs of diverse populations.
- **Building Trust and Satisfaction:** Improving the quality of healthcare services, addressing negative provider behaviors, and ensuring transparency in fund management to foster trust in the health insurance system.
- **Innovative Communication Strategies:** Developing culturally appropriate, easy-to-understand educational materials and community-based outreach programs, as demonstrated by successful models in other Nigerian states.

### **Strengths of the Study**

The strength of this study lies in the findings generated from this study which unveils gaps in awareness and enrollment in health insurance and the barriers associated with enrollment and utilization of health insurance which are relevant to achieving UHC goals in Nigeria.

### **Limitations of the Study**

The limitations of this study lie on the cross-sectional study design used, which limits the ability to observe changes in awareness or enrollment over time or to track the impact of interventions. Also, the absence of qualitative data (e.g., focus group discussions, in-depth interviews) might limit a deeper understanding of the "why" behind some of the observed behaviors and perceptions, particularly concerning trust, cultural beliefs, or specific administrative frustrations.

## **Conclusion**

This study on health insurance in Ilorin, Nigeria, reveals a significant gap between awareness and enrollment. While most residents are aware of health insurance, only few individuals are enrolled, leaving majority uninsured. This trend mirrors national challenges, particularly affecting informal sector workers and vulnerable groups. Despite progress in awareness, significant effort is needed to boost health insurance enrollment and effective utilization in Ilorin. This requires targeted interventions, policy reforms, and increased stakeholder engagement to make health insurance accessible, affordable, and trustworthy for everyone.

## **Declarations**

### **Acknowledgement**

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### **Ethical Approval**

The Kwara State Ministry of Health's ethical review committee based in Ilorin gave the ethical approval with reference number: ERC/MOH/2024/06/312 for the study. The research was carried out in accordance with the Helsinki declaration act.

## Consent to Participate

All participants gave their consents to participate in the research work.

## Consent for Publication

Not Applicable

## Conflict of Interest

Authors declare no conflict of Interest

## Source of Funding

There was no external source of funding for this research work

## Data Availability

All data generated are embedded in this manuscript

## Authors Contribution

TJO: Conceptualized the study idea, took part in data collection, data analysis, writing the study's first draft, proofreading and editing of the manuscript. SSY & OAO: Conceptualization of the study, data collection, and writing of the manuscript. MOA & OPO: Conceptualization of the study, design of data collection materials, data collection and writing of the second Manuscript. MZP: Review, Proofreading and editing of the final manuscript. ARE: Writing of the Manuscript. RDD: Headed the study discussion, Supervision, Proofreading and editing of the manuscript. FBE: Supervised, review, Proofreading and editing of the manuscript.

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Figures

Chart showing Awareness and Enrollment in Health Insurance

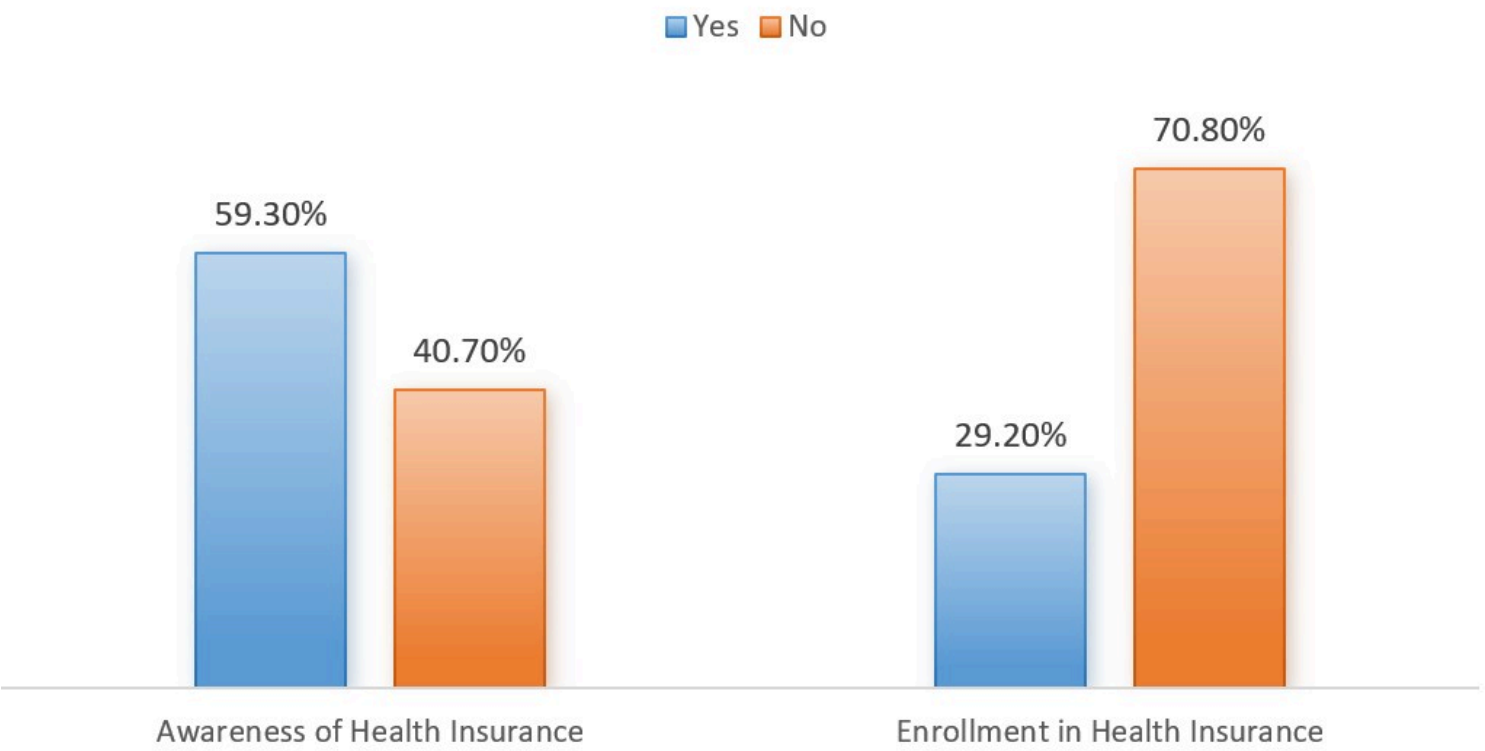


Figure 1

Distribution of awareness and enrollment in health insurance among participants (n=415)

**Chart Showing the Distribution of UHC Perceived Objective**

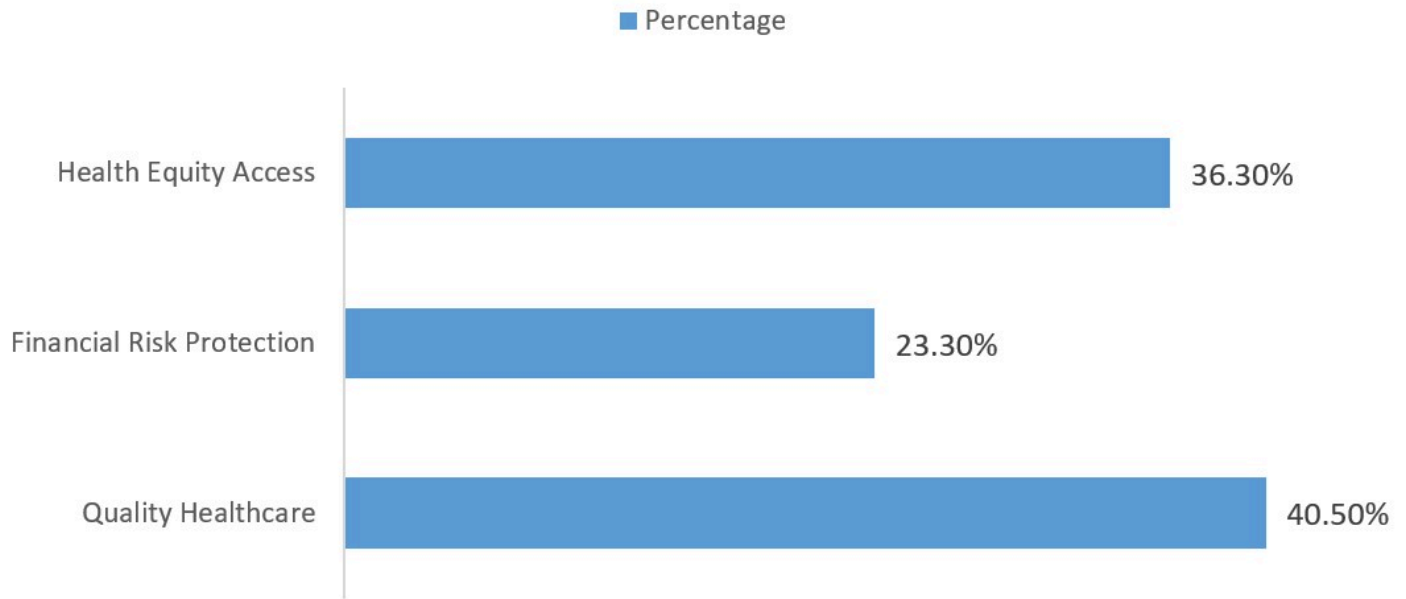


**Figure 2**

*Distribution of the perceived objective of UHC among participants (n=415)*

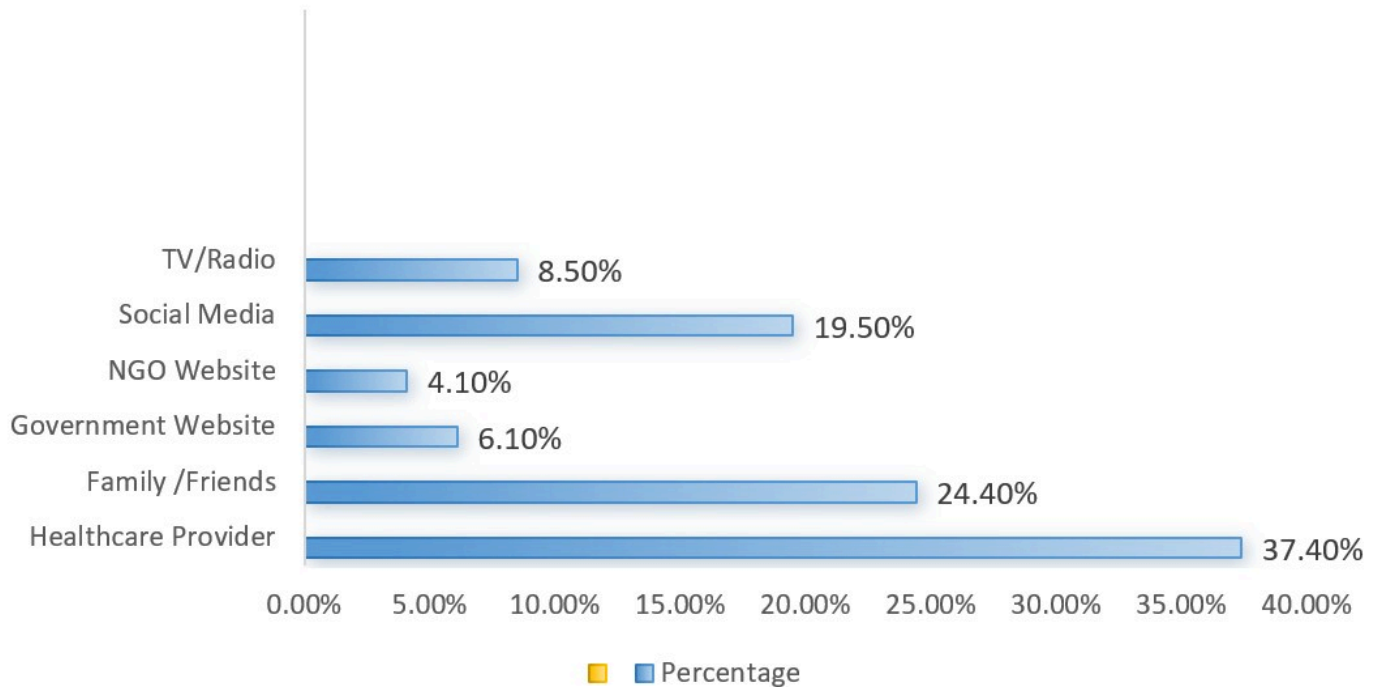


**Figure 3**

*Distribution of sources of health insurance information among participants aware of the scheme (n=246)*

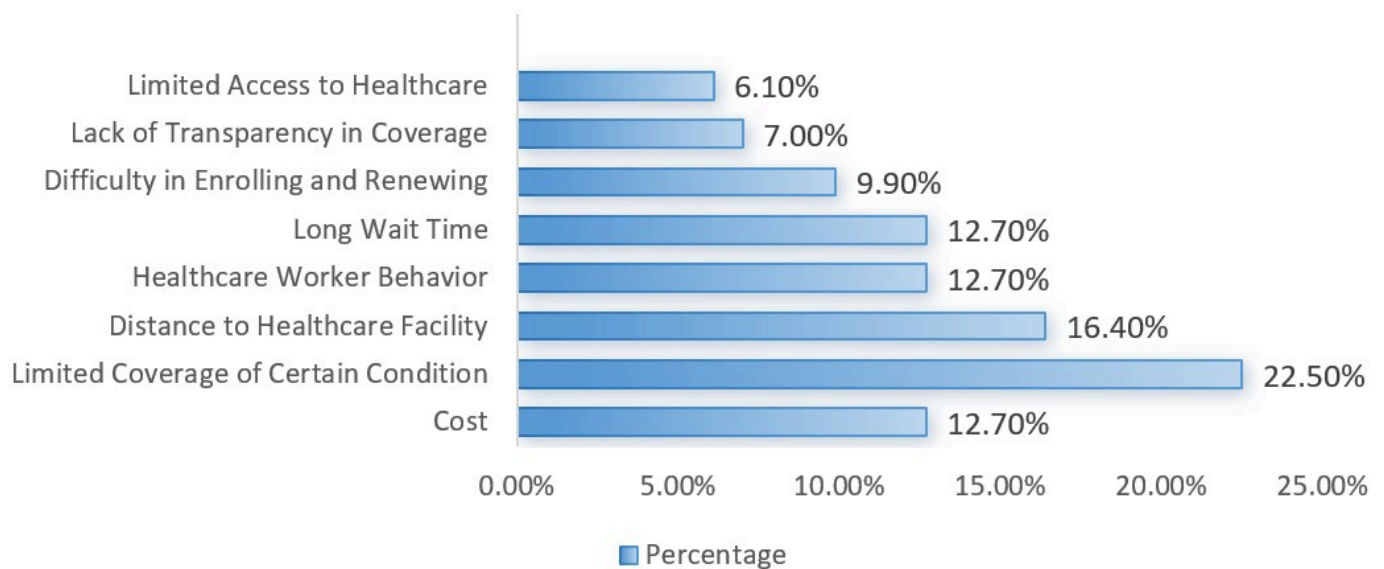


**Figure 4**

**Figure 4a:** *Perceived Barriers of health insurance utilization among participants under health insurance (n=121)*

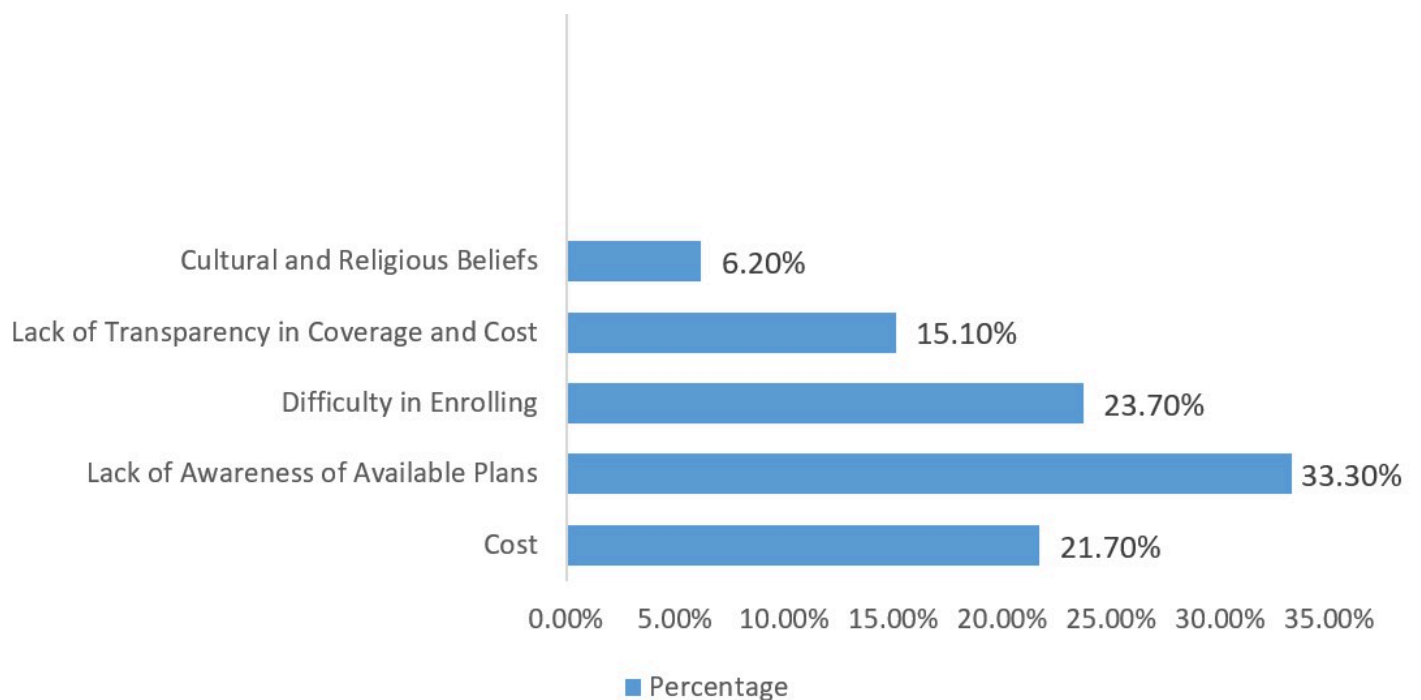


**Figure 5**

**Figure 4b:** *Perceived Barrier of health insurance enrollment among participants not under health insurance (n=294)*

## Supplementary Files

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- [HealthInsuranceSupplementaryFile.docx](#)