Analysing the Determinants of Healthcare Insurance Uptake in Nigeria

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List of abbreviations

CHWs	Community Health Workers
ERISC	“Enquête Rapide sur l'Impact Socio-Economique du Covid-19 à Madagascar” or Rapid Survey on the Socio-Economic Impact of Covid-19 in Madagascar
HC	Health Centre
INSTAT	National Institute of Statistics
MICS	Multiple Indicator Cluster Survey
SDG	Sustainable Development Goal

Abstract

The challenge of low health insurance coverage in Nigeria has persisted for decades, hindering access to healthcare, and impacting human capital development negatively. This is despite the diverse types of health insurance schemes co-existing in the country. The current study, therefore, sought to identify the potential factors driving the uptake of health insurance and its types (private and public health insurance) in Nigeria. To achieve the objective, the study assessed cross-sectional data across the 36 States in Nigeria (including the Federal Capital Territory -FCT) obtained from the 2018 Nigeria Demographic and Health Survey (DHS). Accordingly, this study highlighted stylised facts about health insurance and key socio-economic factors, while regression analysis was explored to determine the crucial factors motivating health insurance uptake in Nigeria. The analysis showed that the positive drivers of health insurance uptake (mainly private) include the financial inclusion rate and employment level. The study also observed that due to financial constraints, low-income groups might be less likely to enrol on health insurance than the middle-income and high-income groups. Education is found to have a statistically significant and negative effect on health insurance uptake in the country. On the other hand, health access problems and age of the household head did not have statistically significant effects on health insurance uptake. With the National Health Insurance Authority (NHIA) Act 2021 making health insurance mandatory, it is imperative for the Nigerian government to strengthen the identified positive drivers of health insurance uptake across the country.

Keywords: *Healthcare, Insurance uptake, Socio-economic factors, NHIS, NHIA*

1. Introduction

Health insurance is essential for increasing access to healthcare and improving human capital development. However, health insurance coverage in Nigeria has historically been low, with less than 5% of Nigeria's 208 million people being covered by any form of health insurance (PwC, 2019). In addition, between 2010 and 2020, health insurance was the lowest contributor to healthcare financing in Nigeria, contributing an average of 1.9% and peaking at 2.3% in 2020. Consequently, many Nigerians have had to rely on Out-Of-Pocket (OOP) health payments, accounting for 75% of current health spending in Nigeria, to access healthcare (WHO, 2022a). The high reliance on OOP spending has resulted in limited access to quality healthcare, increased poverty risks, and raised concerns about Nigeria's ability to achieve Sustainable Development Goal (SDG) target 3.8 - Achieving Universal Health Coverage - (Chuma and Maina, 2012; Mchenga et al., 2017; Aregbesolaand Khan, 2018).

In 2005, the Federal Government of Nigeria introduced the National Health Insurance Scheme (NHIS). The Scheme aimed to protect households from the financial burden of OOP health payments, and it was made compulsory for formal workers in both public and private sectors. By 2022, almost two decades after implementation, the NHIS has only covered about 5% of Nigerians (Obikeze et al., 2022). Alongside several other health insurance schemes in Nigeria that have failed to succeed, the low uptake among the people has been a major headwind (Nnamuchi et al., 2019). Health insurance uptake is especially low in the informal sector, where 70% of the labour force is employed (Adewole et al., 2017). The factors such as inadequate legal framework for a successful scheme, optional enrolment policy, poor funding, and lack of political will have contributed to the failure of most health insurance schemes in the country (Azeez et al., 2021). Consequently, Nigeria ranked 170th out of 194 countries on the World Health Organization's global universal health service coverage index in 2019 (WHO, 2022a).

To accelerate health insurance coverage in Nigeria, the implementation of the NHIS was decentralized to sub-nationals in 2014. More recently, in 2021, the National Health Insurance Authority (NHIA) Act was signed (repealing the National Health Act 2004), making health insurance mandatory for all citizens and legal residents. While the NHIS largely focuses on the formal sector, the NHIA law seeks to expand health insurance coverage beyond a few formal workers and allows all residents to enrol in community-based health insurance, commercial private health insurance plans, or the NHIS as operated by both federal and State governments in Nigeria (Shobiye et al., 2021).

However, using compulsion alone may not guarantee improved healthcare insurance coverage. Further clarity is required on the factors driving the low uptake of health insurance in Nigeria. Several issues, ranging from system-wide to socio-cultural and socio-economic factors have been linked to Nigeria's inadequate health insurance uptake. At a broader level, Apeleko (2017), Shobiye et al. (2021), and Adepoju (2022) reported that corruption allegations, accusations of misappropriation of funds, and complaints had disincentivized health insurance uptake. Likewise, the poor quality of healthcare delivery and poor social infrastructure have motivated the low health insurance demand (Akokuwebe and Idemudia, 2022). Meanwhile, other factors such as income level, poverty, education level, premium paid for health insurance, employment status, and awareness play a crucial role in people's decision to enrol for health insurance (Dror et al., 2016; Aregbeshola and Khan, 2018; Akinyemi et al., 2021; Akokuwebe and Idemudia, 2022).

Moreover, understanding the sources of low health insurance uptake could support strategies towards enhancing coverage. The available empirical literature shows that most studies on the demand for health insurance in Nigeria have focused on household surveys and primary data collection through interviews and questionnaires, which might not be universal. Also, past studies have been narrowed to assessing NHIS. This study innovates by conducting a cross-sectional analysis to shed light on the uptake of healthcare insurance using Nigeria's Demographic and Health Survey (DHS) data for the 36 States (including the FCT). To this end, this study seeks to review the prevailing conditions that could influence health insurance uptake across Nigerian states. Also, this study seeks to identify the key and significant determinants of healthcare insurance uptake in Nigeria. This is expected to support policy design towards improving health insurance uptake, achieving universal health coverage, and improving human capital outcomes in Nigeria.

Following the introduction section, the rest of the paper is structured as follows. Section Two details the stylized facts about health insurance and socio-economic conditions across 36 Nigerian States (FCT inclusive). Section Three reviews the theoretical and empirical literature on the determinants and drivers of health insurance uptake. Section Four contains the study's theoretical framework and methodology. Section Five presents and discusses empirical results, while Section Six concludes the study.

2. Stylized facts about health insurance and Socio-economic conditions across Nigerian States

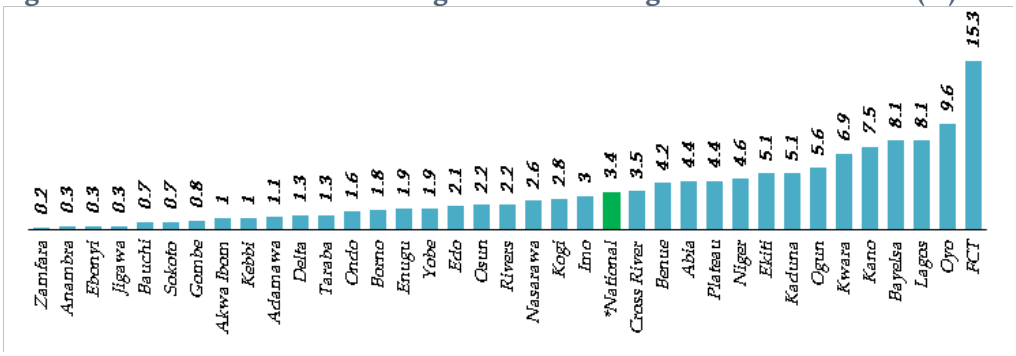
Introduction

This section relies on insights from the 2018 Nigeria Demographic and Health Survey (DHS). The DHS is a national sample survey that provides information about demographic and health indicators. The DHS covered 36 States (FCT inclusive). It is important to note that Katsina State was omitted from this study's consideration due to the absence of data on health insurance uptake. The survey was based on a representative sample of about 42,000 households.[1]

Health insurance uptake and coverage rate across Nigerian States

Health insurance coverage in Nigeria and health insurance uptake is low, with variations among states. The rate of health insurance coverage used in this study is the proportion of respondents (Nigerian residents) enrolled in either private or public health insurance or both. In 2018, the national average health insurance coverage rate was 3.4%%. Remarkably, only 14 States (including the FCT) had health insurance coverage rates above the national average (Figure 1). Twenty-two (22) States underperformed the national average, led by Zamfara at 0.2%.

Figure 1: Health insurance coverage rate across Nigerian States in 2018 (%)



Note: Katsina State was omitted as it has no data on healthcare insurance
Data: 2018 DHS; Chart: NESG Research

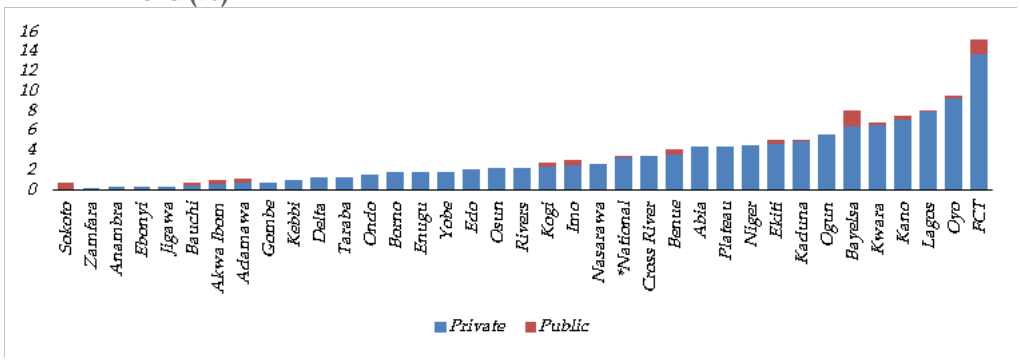
Unlike other socio-economic indicators, the uptake of health insurance has no

regional concentration. Socio-economic data in Nigeria – such as poverty, income inequality, unemployment, and literacy – often exhibit vast regional differences. However, the variation in health insurance uptake is divergent across the country, with no region substantially outperforming the other. In Figure 1 above, among the top ten (10), there is a mix of States from the South-West, South-South, North-Central, and North-West regions. The highest coverage rate at 15.3% was in the FCT. Being the seat of the Federal Government of Nigeria, there is an increased presence of Federal Government agencies, consulates, embassies, high commissions, and country offices of many multinational and multilateral organizations.

Health insurance uptake, however, is skewed towards the major business hubs in the country. Except for Bayelsa, the country's top four States with the highest health insurance coverage in Nigeria – FCT, Lagos, Oyo, and Kano – are major economic hubs (Figure 1). As such, this emphasises the role of employment in the decision to enrol for health insurance, as the payment for the policy is directly deducted from employees' salaries from the source or is made by the employer on behalf of the employees.

Private health insurance, particularly employer-based insurance, is the most prominent type of health insurance among Nigerians. Nigeria's overall health insurance uptake pattern mirrors the private health insurance uptake across States. Employer-based insurance accounted for 94% of private health insurance uptake across Nigerian States as of 2018. Specifically, in Abia, Borno, Cross River, Delta, Ebonyi, Edo, Nasarawa, Niger, Ogun, Ondo, and Osun, all uptake of health insurance was private (Figure 2). Meanwhile, enrolment into public health insurance is high in FCT, Bayelsa, Benue, Kogi, Imo, and Adamawa, albeit private insurance uptake remains predominant in the States (Figure 2). Furthermore, the uptake of public health insurance schemes is most prominent in Sokoto State. Overall, there was an uptake of private health insurance in 35 States (FCT inclusive), while the uptake of public health insurance was recorded in 16 States (including FCT).

Figure 2: Private and public health insurance coverage across Nigerian States in 2018 (%)

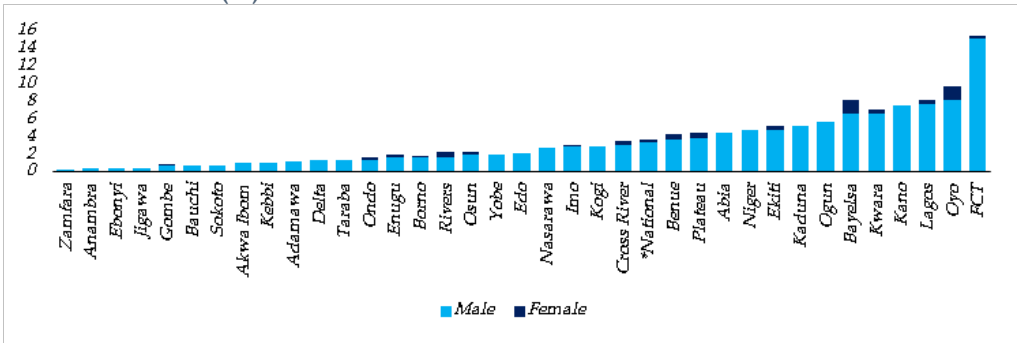


Data Source: 2018 DHS; Chart: NESG Research

Gender-wise, health insurance uptake among Nigerians is unfavourably skewed against women. According to the DHS (2018), at the national level, health insurance

coverage for men stood at 3.4%, higher than the coverage rate of 2.6% among women. In terms of health insurance uptake, there is a considerable gender gap in insurance uptake across States and worse in 20 States (mainly in the Northern part of the country), where no woman reported being enrolled for a health insurance policy (Figure 3). This could be traced to the predominantly informal economic activities women engage in.

Figure 3: Gender distribution of health insurance uptake across Nigerian States in 2018 (%)



Data Source: 2018 DHS; Chart: NESG Research

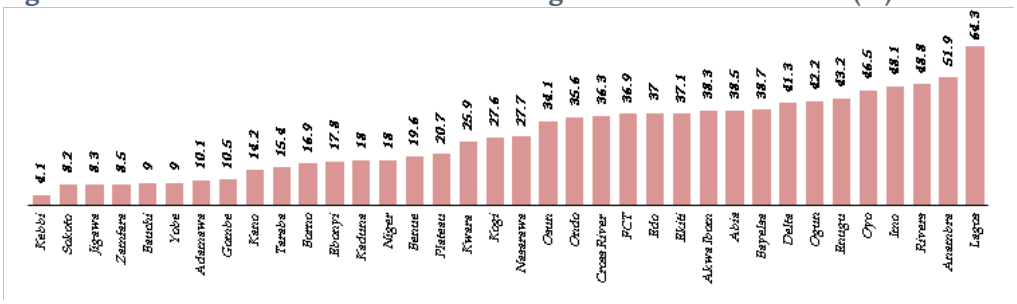
Health insurance uptake and selected socio-economic socio-economic indicators

Socio-economic conditions are critical determinants of health outcomes. There is a consensus that there are many connections between socio-economic status and health insurance uptake. Having access to material and social resources is vital for maintaining good health. Generally, persons with poor socio-economic conditions are at greater risk of ill health than those with improved socio-economic conditions with the wherewithal to enrol for health insurance (van Lenthe and Mackenbach, 2021). Also, the higher a person's socio-economic position, the healthier they tend to be – a situation called the ''social gradient of health'' (WHO, 2022b). Across all income levels, health and illness follow a social gradient such that the lower the socio-economic position, the worse the health (WHO, 2022b). In this study, the socio-economic indicators of interest include financial inclusion, employment opportunities, income distribution, problems accessing healthcare, education status and age of the household head. Meanwhile, unlike other socio-economic factors, the average age of the household head has no marked variation across Nigerian States; hence it was dropped from the stylized facts section.

Financial inclusion is more entrenched in Southern Nigeria. Financial inclusion, as used here, is the proportion of respondents (Nigerian residents) that have and use bank accounts across the 36 States (including FCT). According to the DHS data, the national average financial inclusion rate was 28% as of 2018. A total of 16 Southern States, led by Lagos (64.3%), significantly outperformed the national average (Figure

4). Conversely, States with the lowest financial inclusion rates are found in Northern Nigeria, with Kebbi State having the lowest financial inclusion rate at 4.1%.

Figure 4: Financial inclusion rate across Nigerian States as of 2018 (%)

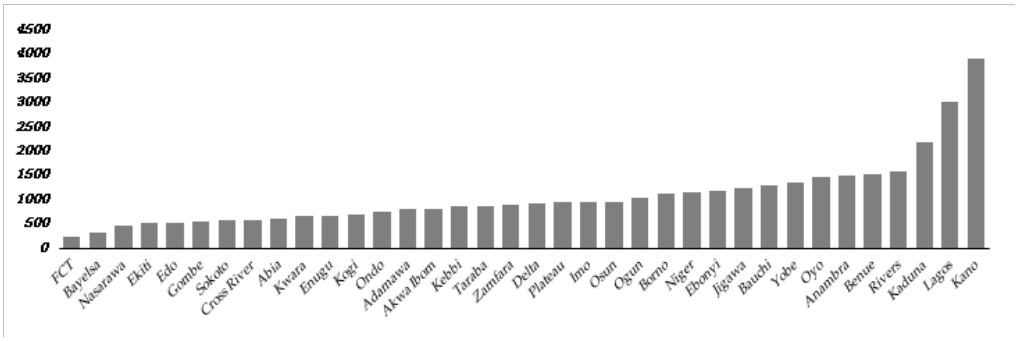


Data: 2018 DHS; Chart: NESG Research

Remarkably, all the Southwestern States – with higher health insurance uptake and coverage rates - also recorded high financial inclusion. Also, almost all the Northern states - with low health insurance coverage rates and uptake - similarly lagged in terms of financial inclusion. This suggests that variation in financial inclusion rates across states could influence the uptake of health insurance in Nigeria, which is explored in the later part of this study.

The three commercial seats of the nation - Kano, Lagos, and Kaduna states - had the highest number of employed respondents. In Figure 5, these states, respectively, accounted for 3,914 (10.1%), 3,006 (7.7%), and 2,194 (5.6%) of the total number of employed respondents (38,856 people) selected across the 36 States (including FCT). The wide variation in employment distribution of respondents across the States could also inform the differences in health insurance uptake and the high enrollment into employer-based health insurance. This suggests that the varied employment conditions across States could influence health insurance uptake in Nigeria, which is explored in the later part of this study.

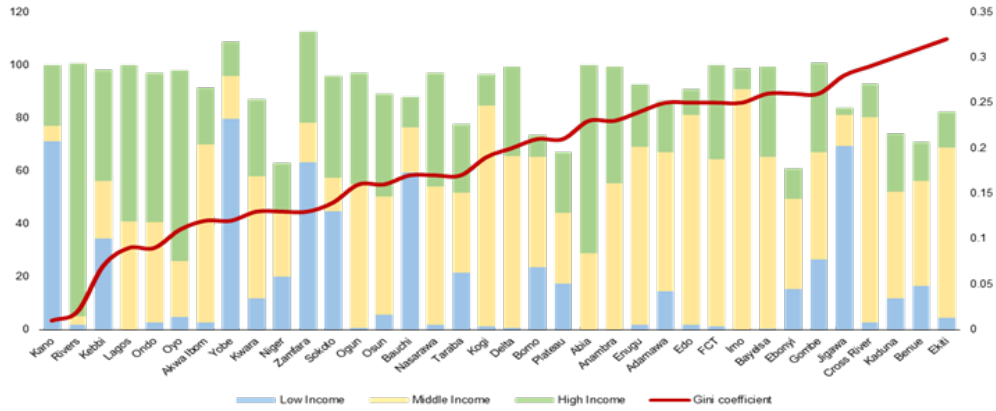
Figure 5: Number of employed respondents across Nigerian States and the FCT as of 2018



Data Source: 2018 Nigeria DHS

Moreover, as shown in Figure 6, income distribution is more skewed to the middle class at the subnational level, whereas many states underperform the national average in terms of income inequality. In about 22 out of 36 States (including the FCT), many respondents belong to the middle-income group. This suggests that average-income Nigerians domicile in the majority of the States, as against low-income and high-income individuals. Meanwhile, six out of 35 states and the FCT have higher income inequality rates relative to the national average of 0.25 points. In summary, the variation in the income distribution pattern across States could influence the uptake of health insurance in Nigeria, which is explored in the later part of this study.

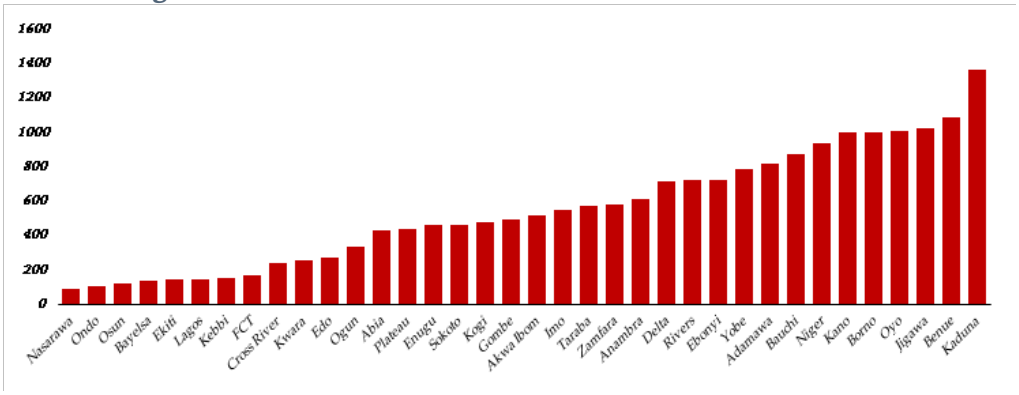
Figure 6: Respondents by income class (%) and income inequality (points) across Nigerian states and the FCT as of 2018



Data Source: 2018 Nigeria DHS

The intensity of healthcare access challenges is more pronounced in the Northern region. Two-thirds of the respondents with challenges accessing healthcare (19,849 affected people) lived in Northern Nigeria as of 2018 (Figure 7). This has predisposed Northern residents to higher multidimensional poverty than their Southern counterparts (NBS, 2022). To this end, the variation in the intensity of healthcare access problems – due to disabilities, lack of funds to seek healthcare, and long distances of health centres from the residences of health service seekers across Nigerian states could influence the enrollment for health insurance, which is explored in this study.

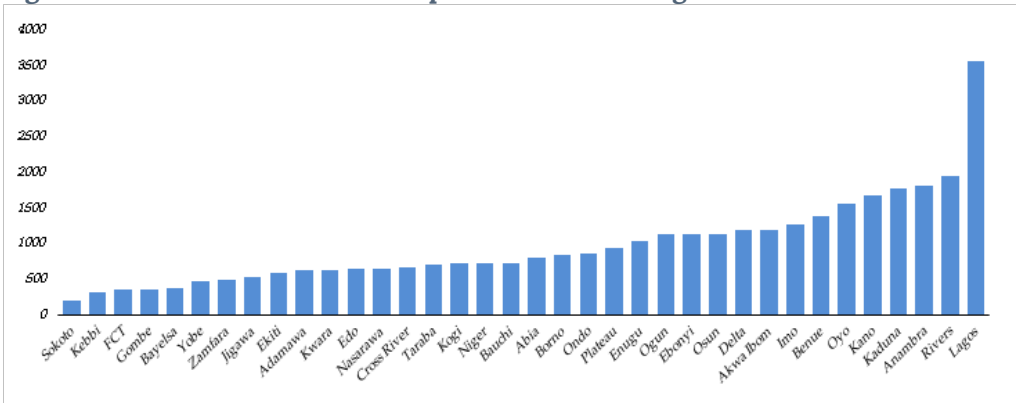
Figure 7: Number of respondents facing healthcare access challenges across Nigerian States as of 2018



Data Source: 2018 DHS; Chart: NESG Research

In addition, the stock of educated respondents is more skewed to Southern Nigeria. 7 out of the top 10 states - with the highest number of respondents having at least primary education and accounting for about half of the educated respondents - emanated from the Southern part of the country (Table 8). Northern states ranked among the bottom 30% of states regarding the headcount of educated respondents. This suggests that the variation in the headcount of educated respondents across States could influence the uptake of health insurance in Nigeria, explored in the later part of this study.

Figure 8: Number of educated respondents across Nigerian States as of 2018



Data Source: 2018 DHS; Chart: NESG Research

3. Literature review

The determinants of health insurance are inconclusive. Over time, theories have evolved around the demand for healthcare insurance and several empirical findings in support or rebuttal of the theories have emerged. In this section, the study reviews major theories of the demand for health insurance and existing empirical studies on the drivers of healthcare insurance enrolment.

Theories of demand for health insurance

The theories explaining the demand for health insurance rest on the various theories of demand in economics. This review covers theories of consumer behaviour, expected utility theory, prospect theory, state-dependent utility theory, cumulative prospect theory, and endowment effect theory, among others.

The **consumer behaviour theory** assumes that individuals maximize utility subject to their preferences and budget constraints. It views health insurance as a normal good (Schneider, 2004). This implies that demand for health insurance is expected to be positively related to income. Some empirical studies support this assertion. For instance, Phelps (1973) found that insurance demand is negatively related to the insurance premium paid and positively related to the user fees. It also implies that the poor are less likely to purchase insurance.

Meanwhile, the theories of decision making under uncertainty are more prominent in explaining individuals' attitudes towards health insurance enrolment. The first in the row is the **expected utility theory**, concerned with decision-making under uncertainty and widely used to model the demand for health insurance. This theory assumes a preference for some losses over others with the same expected magnitude (Arrow, 1963). Insurance demand is conceptualized as a choice between certain losses from paying an insurance premium, for example, and uncertain losses in the event of illness in the future (Manning and Marquis, 1996). The model assumes that economic agents are risk-averse. Individuals face uncertainty about their future state of health and what impact the state of ill-health will have on their wealth holdings.

The individual compares the utility obtained when insurance is purchased to a state where insurance is not purchased in determining whether or not to buy it. Therefore, the demand for health insurance stems from the desire to avoid the risk of larger losses if the individual falls ill. Risk-averse individuals prefer the certain loss

associated with a health insurance premium to the uncertain loss associated with ill-health. As Nyman (2003) explained, health insurance is purchased due to the certainty it affords an individual. In contrast to the consumer behaviour theory, the expected utility theory makes no predictions about the effect of an individual's income on the demand for health insurance. Meanwhile, little evidence exists to support the expected utility theory, which has birthed other theories of decision-making under uncertainty.

Nyman (2001) re-evaluated the conventional expected utility theory and its usefulness in explaining the demand for health insurance, leading to the **prospect theory.** In contrast to the expected utility theory, which assumes that decision-making is based on uncertainty about the future, the prospect theory assumes that individuals use their current state as the reference point for intertemporal decisions (O'Donoghue and Rabin, 1999; Ananth et al., 2021). The prospect theory suggests that individuals act as though losses are more unpleasant than gains gratifying; hence, people are risk-loving when it comes to losses but risk-averse when it comes to gains (Ashraf and Nambiar, 2021).

Accordingly, individuals may opt for the risk of future loss to a certain premium payment (Kahneman and Tversky, 1979; Schneider, 2004; Benartzi and Thaler, 1995). Individuals assess their risk of future loss based on their current state. In the case of insurance demand, a healthy individual may expect their future health status to not deviate (deteriorate) greatly from its present state, leading the individual not to demand health insurance. Hwang (2016), using the American Life Panel dataset, found that less-averse individuals have low demand for private health insurance due to using their wealth to access healthcare without a health insurance plan as their reference point.

Moreover, **state-dependent utility theory** assumes that utility and tastes depend on the individual's current state, which could be health or socio-economic status. An individual's current state influences their risk aversion and expected pay-out level for buying a health insurance plan, which determines the decision to take out an insurance policy (Schneider, 2004). It is believed that as individuals grow older, their health stock depreciates. This generally incites the purchase of health insurance to forestall catastrophic health expenditures if individuals should fall ill in the future (Grossman, 1972). Manning and Marquis (1996) found supporting evidence for this theory in their study. The authors found that the expected payoffs when sick are a key determining factor in health enrolment decisions, whereas insurance premiums and household incomes played no role in insurance enrolment.

The **cumulative prospect theory (CPT)** combines the features of the **prospect and state-dependent utility** theories. A key feature of the CPT is that individuals tend to under-weight large probabilities and over-weight small ones. In the case of the demand for healthcare insurance, people will tend to over-weight the probability of falling ill, leading to insurance uptake. However, according to the CPT, poor people may not insure (Schneider, 2004). Instead, they are likely to underweight the probability of illness because they cannot afford to become sick. In addition, Kairies-Schwarz et al. (2017), in an experiment to determine the validity of the prospect theory in the choice

of health insurance, established that the CPT is a superior predictor of consumer behaviour under uncertain circumstances.

The **endowment effect theory** assumes that individuals assign greater value to something new. The theory holds that individuals would instead hold on to something currently owned than replace it with something new with unknown benefits. This has been documented empirically by Kahneman, Knetsch, and Thaler (1991). They found that people's willingness to accept compensation for items owned was higher than their willingness to pay for the same.

In addition, theories **of demand for health insurance by the poor** suggest that the behaviour of poor individuals may diverge from the predictions of the expected utility theory. According to Schneider (2004), the poverty literature sheds additional insights on decision-making using concepts such as time preferences and risk aversion against risky investments by poor households. While the expected utility theory makes assertions about individual behaviour under uncertainty, it makes no assertions about the effect of socio-economic status on demand for healthcare insurance. The extant literature suggests that poor people become more risk averse as they approach the poverty line. For instance, Dror and Firth (2014) found that poorer population sub-groups were more willing to pay than their richer counterparts for the same insurance package.

Finally, the **role of trust in health insurance demand** cannot be overemphasized. Mechanic (1998) describes trust as the belief that practitioners and institutions will act in people's best interests. Dimensions of trust exist between the individual and healthcare providers, insurers, and institutions that enforce contracts. In contrast to the expected utility theory, which is silent about trust, Dercon et al. (2019) opined that a negative relationship can exist between risk aversion and insurance demand when trust is considered. The authors found that, in Kenya, a lack of trust was more likely the determinant of health insurance demand due to service delivery challenges than a lack of financial literacy. Schneider (2004) argues that trust is particularly important with community-based health insurance, usually based on informal agreements and functions within weak political and legal structures.

Empirical literature

Apeleko (2017) examined the administration of the National Health Insurance Scheme (NHIS) using the Obafemi Awolowo University Health Centre (OAUHC) as a case study. The results showed that NHIS reduces the cost burden of healthcare services (78.7% of respondents), reduces extortion by private health service providers (67%), provides affordable healthcare delivery (77%), and cuts across all levels of healthcare, including preventive, curative and consultative (70%). However, the findings revealed that the challenges facing the proper implementation of the scheme in OAUHC include: poor funding (70.6% of the respondents), the scheme being non-mandatory (71.9%), under-equipped health centres (78.7%), lack of adequate medical personnel (83.7%), and lack of publicity among students and staff (73.3%).

Similarly, Shobiye et al. (2021) surveyed sixty (60) healthcare facilities drawn from six (6) Local Government Areas in Lagos State. The findings showed that private health facilities participated significantly in health insurance than public facilities. Also, secondary and tertiary healthcare facilities had a higher participation rate than primary health facilities. Increased patient volume and higher revenues were motivating factors in health providers' participation in health insurance. In contrast, low tariffs, delay and denial of payments, and patients' unrealistic expectations were identified as inhibiting the factors to health providers' participation in healthcare insurance schemes.

Nwoko and Abubakar (2021) examined how the NHIS has impacted the health system by promoting accessible, affordable, and quality healthcare in Nigeria. The study revealed that NHIS has significantly impacted the health needs of the populace by enabling access to healthcare, making it easy for healthcare seekers by financing health needs and promoting good Health in Nigeria. However, the study found that most of the populace in the informal sector is not adequately captured in the health insurance scheme, which is one of the reasons for low healthcare coverage in the country. A focus on accessibility, affordability, and availability for the scheme means that on account of either of the three, all facility categories and their interests must be considered in further planning of the NHIS for effective and efficient operations (Uguru et al., 2020).

Moreover, Akinyemi et al. (2021) examined the perception of about 273 Federal Civil Servants regarding the NHIS in Ibadan between October and November 2015. Awareness of the scheme was very high (95.2% of the respondents), with 83.5% enrolled under the scheme. About 50% of the respondents joined the scheme because it is cheap and affordable. The study established a significant association between awareness, level of education, knowledge of NHIS, and respondents' enrolment into the scheme. Most respondents (87.3%) claimed that NHIS is a better way of settling healthcare costs than out-of-pocket payments.

Akokuwebe and Idemudia (2022) estimated the extent of health insurance coverage and explored the social and demographic factors associated with health insurance in South Africa and Nigeria using the country-specific DHS as of 2016 and 2018, respectively. Using the multivariate logistic regression, the study showed that higher levels of education were significantly more likely to be associated with health insurance uptake. The study revealed that health insurance coverage is low in South Africa and Nigeria and is independently associated with socio-demographic factors such as education, wealth, and employment. Using 2013 Nigeria's DHS, Aregbeshola and Khan (2018) examined the predictors of enrolment in the NHIS among women of reproductive age in Nigeria. The findings showed that 97.9% of women of reproductive age were not covered by health insurance. Further analysis showed that age, education, geo-political zone, socio-economic status, and employment status significantly drove enrolment into the NHIS.

Dror et al. (2016) showed that household income, education, age of household head, gender of the household head, and marital status were significantly associated with enrolment in community-based health insurance schemes in low and middle-income countries. Moreover, in their study on Kenya, Kazungu and Barasa (2017) found that employment in the formal sector, marital status, gender, age, exposure

to media, and household welfare were significant factors associated with the uptake of healthcare insurance in the country.

At the macro level, Nkatha et al. (2020) observed that income levels, education level, inflation rate, and unemployment affected the demand for health insurance in Kenya. While higher income and education levels positively impacted the demand for health insurance, inflation and unemployment negatively affected the demand for health insurance in Kenya. Using the 2008-09 Kenya DHS, Kimani et al. (2014) established that being employed in the formal sector, being married, exposure to the mass media, having secondary education or higher, residing in households in the middle or rich wealth index categories and residing in a female-headed household were significantly associated with having health insurance in Kenya.

Furthermore, employing a logistic regression, Mhlanga and Dunga (2020) showed that health insurance coverage is low in South Africa and identified gender, marital status, race, and education level as significant determinants of the demand for healthcare insurance in the country. In South Africa, men had a higher probability of demanding health insurance than women, suggesting a huge gender disparity in the uptake of health insurance. In the case of Ghana, Salari et al. (2019) revealed that education, age, wealth, occupation, and marital status are significant determinants of health insurance enrolment in the country.

A similar study by Duku (2018) identified age, sex, education level, marital status, and health status as significant predictors of health insurance enrolment among working-age adults in Ghana. Adjei-Mantey and Horioka (2022) showed that risk preferences significantly impact health insurance enrolment, with risk-averse individuals being substantially more likely than other households to enrol into health insurance schemes. The findings also showed that indigent households are significantly more likely to enrol in health insurance than high-income households because they are exempt from paying insurance premiums.

In addition, using the probit regression, Takudzwa et al. (2020) established that premium, employment type, place of residence, education level, and access to information were significant predictors of participation in health insurance schemes in Zimbabwe. Leveraging on 2016 Uganda's DHS data and logistic regression, Medard et al. (2022) indicated that wealth, education, age, marital status, residence type, and access to information were significant factors affecting the uptake of healthcare insurance in Uganda. Individuals from wealthy households and those with access to information through listening to the radio, reading newspapers, and watching television had a greater participation in healthcare insurance in the country.

Finally, an overview of past empirical studies shows that the bulk of the literature on the demand for health insurance in Nigeria primarily focused on household surveys and primary data collection through the instrumentality of interviews and questionnaires. The current study innovates by conducting a cross-sectional analysis of the demand for healthcare insurance, particularly to suggest ways of improving the uptake of health insurance at the sub-national level using Nigeria's most recent DHS data. Also, studies in Nigeria evaluated the determinants of the enrolment of one type of health insurance in Nigeria, namely, the NHIS. However, the current study covers all forms of health insurance, including public and private health insurance.

4. Theoretical framework and methodology

Introduction

This study is conducted to identify the critical determinants of health insurance uptake using Nigerian States' cross-sectional data. To this end, the sub-sections include theoretical framework, model specification, data description and sources, estimation technique, and expected results.

Theoretical framework

As reviewed earlier, the traditional demand for health insurance rests on the expected utility theory. The theoretical framework underlying this study is built on one of the strands of the expected utility theory called the **"theory of second-best coverage".** The second-best insurance policy involves two steps: The first step is that the consumer maximises utility by choice of healthcare, taking the premium as fixed. By disregarding the cost of healthcare paid for through the premium, the consumer demands too much healthcare (called **moral hazard**). This becomes the constraint in the second step, which is finding the policy (coinsurance) that maximizes the expected utility given that the consumer, when sick, pays attention only to coinsurance, and not the premium when demanding healthcare (McGuire, 2012).[2] The theoretical model of second-best insurance coverage proceeds as follows:

Key assumptions

1. When the individual is sick, he maximizes,

$$U^s(h, W - \pi - ch) \tag{1}$$

Equation 4 implies that the individual's utility when sick is a function of his demand for healthcare (h) and net income when sick $W - \pi - ch = \gamma^s$ after deducting insurance premium (π) and the coinsurance payment (ch) from income (W); where c is the rate of coinsurance (the share of counterpart funding for healthcare provided by an individual), $\pi = p(1 - c)h$ (where p is the probability of falling sick), and $\gamma^H = W - \pi$ (where γ^H is the net income less premium payment when healthy).

2. Disregarding any effect of h on π, the demand for healthcare (first-order condition) suggests that:

$$U_h^s - cU_\gamma^s = 0 \quad (2)$$

Differentiating the demand condition (Equation 2) with respect to *h* gives:

$$(U_{hh}^s)dh - U_\gamma^s(dc) = 0 \;\; (U_{hx}^s = 0)$$ 1

$$\frac{dh}{dc} = \frac{U_\gamma^s}{U_{hh}^s}$$

Dividing both sides by *h*, we have the healthcare demand elasticity as:

$$\varepsilon = \frac{dh/h}{dc} = \frac{U_\gamma^s}{U_{hh}^s h} \quad (3)$$

3. Proceeding to the second-best (SB) health insurance policy, we find the value of coinsurance rate (c) that maximises the expected utility function subject to a constraint describing demand, that is:

$$Max\ EU_{x,c} = pU^s(h, W - p(1-c)h - ch) + (1-p)U^H(W - p(1-c)h) - \quad (4)$$

$$\mu(U_h^s - cU_\gamma^s)$$

Where μ is a multiplier on the demand behaviour constraint.

4. The three first-order conditions associated with differentiating Equation 4 with respect to healthcare (*h*), coinsurance rate (*c*) and the multiplier (μ) are, respectively:

$$SB_h = p(U_h^s + \left(U_\gamma^s(-p(1-c) - c\right) + (1-p)U_\gamma^H\left(-p(1-c)\right) - \mu(U_{hh}^s) = 0 \quad (5)$$

$$SB_c = pU_\gamma^s h(p-1) + (1-p)U_\gamma^H ph + \mu U_\gamma^s = 0 \quad (6)$$

$$SB_\mu = U_h^s - cU_\gamma^s = 0 \quad (7)$$

Solving for μ in equation 6, we have:

$$\mu = \frac{-ph(1-p)(U_\gamma^H - U_\gamma^s)}{U_\gamma^s}$$

Substituting for μ and using equation 7 to substitute for U_γ^s , SB_h is re-written as:

$$SB_h = p(cU_\gamma^s + U_\gamma^s(-p(1-c)-c) + (1-p)U_\gamma^H\big(-p(1-c)\big) = \quad (8)$$

$$U_{hh}^s\,(\frac{-ph(1-p)(U_\gamma^H - U_\gamma^s)}{U_\gamma^s})$$

Re-arranging Equation 8, we have:

The first term on the left-hand side of Equation 8 can be re-written as:

$$p\left(cU_\gamma^s + U_\gamma^s(-p(1-c)-c)\right) = p\big(cU_\gamma^s - pU_\gamma^s + pcU_\gamma^s - cU_\gamma^s\big) = p(-p(1-c)U_\gamma^s$$

The second term on the left-hand side of Equation 8 can be re-written as:

$$(1-p)U_\gamma^H\big(-p(1-c)\big) = -p(1-p)(1-c)U_\gamma^H$$

Therefore, the left-hand side of Equation 8 reduces to:

$$p(-p(1-c)U_\gamma^s - p(1-p)(1-c)U_\gamma^H = -(1-c)p[pU_\gamma^s + (1-p)U_\gamma^H$$

Substituting for the definition of healthcare demand elasticity $(\frac{U_{hh}^s}{U_\gamma^s}h = \frac{1}{\varepsilon})$, the right-hand side of Equation 8 reduces to:

$$\frac{U_{hh}^s}{U_\gamma^s}h\left(-p(1-p)\big(U_\gamma^H - U_\gamma^s\big)\right) = \frac{1}{\varepsilon}\left(-p(1-p)\big(U_\gamma^H - U_\gamma^s\big)\right)$$

Finally, Equation 8 is simplified as:

$$= -(1-c)p[pU_\gamma^s + (1-p)U_\gamma^H] = \frac{1}{\varepsilon}\left(-p(1-p)\big(U_\gamma^H - U_\gamma^s\big)\right) \quad (9)$$

$$-(1-c)\big[pU_\gamma^s + (1-p)U_\gamma^H\big] = \tfrac{1}{\varepsilon}\left(-(1-p)\big(U_\gamma^H - U_\gamma^s\big)\right)$$

Dividing both sides of Equation 9 by $-[pU_\gamma^s + (1-p)U_\gamma^H]$ gives:

$$(1-c) = \frac{(1-p)\big(U_\gamma^H - U_\gamma^s\big)}{\varepsilon[pU_\gamma^s + (1-p)U_\gamma^H]} \quad (10)$$

5. From Equation 10, the left-hand side term (1 - *c*) is the degree of health insurance coverage. As noted earlier, $\gamma^s < \gamma^H$ Hat any positive values of *c*. In a typical case where the marginal utility of income when sick U_γ^s is greater than the marginal utility of income when healthy U_γ^s, Equation 10 is positive (given that the elasticity of demand for healthcare is negative). This suggests that *c* must be less than unity and that some degree of health insurance coverage is optimal. To this end, the key factors influencing the second-best coverage are healthcare demand elasticity (ε) and the discrepancy in the marginal utility of income between healthy and sick states $(U_\gamma^H - U_\gamma^s)$.

Meanwhile, this study extends this theoretical framework by considering socio-economic factors - some of which have been noted in the empirical literature – that could influence healthcare insurance uptake in Nigeria. This leads to the following sub-section on model specification.

Model specification

Underlying the uptake of health insurance in any country, as posited by the theoretical literature, include the high level of risk aversion, higher income levels, insurance premiums, and trust in providers' quality of care level and health insurance management (Schneider, 2004). The empirical literature has also confirmed these factors in different country contexts. It also expanded the list of determinants of healthcare insurance uptake to include: awareness, level of literacy, wealth, employment, age of the household head, gender of the household head, marital status, exposure to mass media, health status (or initial health conditions), occupation type, constraints in accessing healthcare, and resident type (Shobiye et al., 2021; Akinyemi et al., 2021; Akokuwebe and Idemudia, 2022; Aregbeshola and Khan, 2018; Dror et al., 2016; Kazungu and Barasa, 2017; Nkatha et al., 2020; Mhlanga and Dunga, 2020; Adjei-Mantey and Horioka, 2022; Takudzwa et al., 2020, and Medard et al., 2022).

Therefore, the current study focuses on the determinants of healthcare insurance uptake and considering the limited number of observations (which in this case is 36 Nigerian States, including the FCT), only a few factors are considered. These include rate of financial inclusion, level of employment, income class (low, middle and high-income groups), challenges accessing health care (such as failure to attend hospitals alone, possibly due to disabilities, lack of funds to access healthcare, and long distances of residence from healthcare centres), education and the average age of the household head. Hence, the model for health insurance uptake is specified below:

$$insured_i = \beta_1 + \beta_2 employed_i + \beta_3 inclusion_i + \beta_4 income\_class_i + \beta_5 prob\_access_i + \beta_6 educ_i + \beta_7 age\_hh_i + \varepsilon_i \quad (11)$$

$$income\_class_i = \{income\_low_i, income\_mid_i, income\_high_i\} \quad (12)$$

Where: *employed* stands for the number of employed respondents over the 12 months before the survey period; *inclusion* stands for financial inclusion rate (measured in terms of the percentage of respondents having bank accounts); *insured* stands for health insurance uptake; *prob_access* stands for the%age of respondents facing health access problems; *educ* stands for the number of respondents with at least primary education; *age_hh* represents the average age of the household head; *income_low* means the number of low-income respondents; *income_mid* means the number of middle-income respondents; *income_high* means the number of high-income respondents; *i* represents a Nigerian State; $\beta_1 - \beta_7$ are regression parameters; ε is the non-stochastic error term capturing all other random factors driving the health insurance uptake but are not explicitly captured in equation 11).

Moreover, it is also expedient to investigate the potential drivers of enrolment across health insurance types in Nigeria. This study classified health insurance services into public and private health insurance, for ease of analysis; hence, the models for private and public healthcare insurance uptake are, respectively, specified below:

$$insure\_pr_i = \beta_9 + \beta_7 employed_i + \beta_{10} inclusion_i + \beta_{11} income\_class_i + \beta_{12} prob\_access_i + \beta_{13} educ_i + \beta_{14} age\_hh_i + \in_i \quad (13)$$

$$insure\_pub_i = \beta_{15} + \beta_{16} employed_i + \beta_{17} inclusion_i + \beta_{18} income\_class_i + \beta_{19} prob\_access_i + \beta_{20} educ_i + \beta_{21} age\_hh_i + \mu_i \quad (14)$$

Where: *insure_pr* means the uptake of private health insurance; *insure_pub* stands for public health insurance uptake; all other variables in equations 12 and 13 remain as defined previously; represents a Nigerian State; $\beta_9 - \beta_{21}$ in equations 12 and 13 are regression parameters; ϵ,μ in both equations are the non-stochastic error terms.

Data description and sources

The data on all variables were sourced and compiled from the 2018 Demographic and Health Survey (DHS) for Nigeria. The 2018 DHS for Nigeria is a national sample survey providing demographic and health indicators information. A representative sample of 42,000 households across Nigeria was selected. The DHS targets men and women respondents aged 15-49 years.[3]

Estimation technique

This study uses the Ordinary Least Squares (OLS) technique in estimating equations 11, 12 and 13. This estimation technique is preferred to alternative estimation techniques, such as the Maximum Likelihood (ML) method and Generalized Method of Moment (GMM), because the OLS estimators are considered the Best Linear Unbiased Estimator (BLUE), having satisfied the assumptions underlying the Classical Linear Regression Models (CLRMs). The assumptions include linearity, zero mean for error term, normality, no serial correlation, no heteroscedasticity, variability in values taken by the explanatory variables, and the number of observations (36 states, including the FCT in this study's case), among others. Given that these assumptions are satisfied, OLS, in the class of unbiased linear estimators, have minimum variance and are regarded as BLUE (Gujarati and Porter, 2009).

Expected results

Having gainful employment enhances health insurance uptake, particularly in the case of employer-based and purchased health insurance plans. Therefore, the a priori expectation is a positive impact, so that: $(\beta_2; \beta_7; \text{ and } \beta_{16}) > 0$. Similarly, being financially included gives an individual the leverage to make payments on private or public health insurance upfront out of the individual's gross income. In contrast, the employee's net/take-home income is paid through the bank account by the employer or deposited by the income earner himself. Therefore, the a priori expectation is a positive impact, so that: $(\beta_3; \beta_{10}; \text{ and } \beta_{17}) > 0$.

Furthermore, having a source of livelihood (income) allows the wealth owner to seek quality healthcare delivery, even if it entails making payments out-of-pocket or purchasing a health insurance plan. However, the uptake of health insurance could differ across different income groups, with low-income groups having low uptake of health insurance, while middle- and high-income groups have higher uptake. Accordingly, the a priori expectation is inconclusive, so that: $\beta_4 < 0$ (for a low-income group) and $\beta_4 > 0$ (for middle- and high-income groups); $\beta_{11} < 0$ (for a low-income group) and $\beta_{11} > 0$ (for middle- and high-income groups), and $\beta_{18} < 0$ (for a low-income group) and $\beta_{18} > 0$ (for middle- and high-income groups). Moreover, many prospective health insurance plan buyers face many challenges accessing healthcare, such as disabilities, lack of funds to seek health services and long distances of individuals' residences from the health centres. Hence, the a priori expectation is a negative impact such that: $(\beta_5; \beta_{12}; \text{ and } \beta_{19}) < 0$.

In addition, the more educated an individual is, the more the individual is better informed to enrol for health insurance. Therefore, the a priori expectation is a positive impact such that: $(\beta_6; \beta_{13}; \text{ and } \beta_{20}) > 0$. Lastly, the older an individual becomes, the more the likelihood of the individual enrolling into health insurance to be relieved from health-related financial burdens, particularly in the post-retirement period. Therefore, the a priori expectation is a positive impact such that: $(\beta_7; \beta_{14}; \text{ and } \beta_{21}) > 0$.

5. Empirical analysis and discussion of results

This section presents the descriptive statistics on all the variables, results of pairwise correlation coefficients, and the regression estimates of the six possible determinants of health insurance uptake in Nigeria.

Descriptive statistics

Table 1 shows the summary statistics for the variables employed in this study. The mean value of employed respondents being greater than the average enrolment in health insurance (private and public) suggests the low health insurance coverage rate, particularly amongst the employed respondents. The average age of the household head is 44 years, suggesting that the household heads fall within the working age group. Meanwhile, there is a great number of unbanked adults, as reflected in a low average financial inclusion rate of 28%.

Furthermore, the mean distribution of respondents is skewed towards the low and middle-income groups, almost doubling the average headcount of high-income respondents (Table 1). The high average number of respondents with health access problems and the low average number of respondents with a minimum of primary education indicates Nigeria's poor human capital development. Regarding the spread of series around their mean values (based on the coefficient of variation), the most volatile variable is the headcount of enrollees in private and public health insurance (Table 1). Conversely, the least volatile variables are the age of the household head and the headcount of respondents with health access problems.

Table 1: Summary statistics

	Obs.	Mean	Standard Deviation	Coefficient of Variation (CoV)	Minimum	Maximum
employed	36	1,079	720.239	66.751	244	3914
inclusion	36	28.008	15.492	55.313	4.1	64.3
insure_pr	36	11.722	12.555	107.106	0	54
insure_pub	36	0.778	1.355	174.165	0	6
insured	36	12.5	13.413	107.304	1	60
prob_access	36	551.367	13.413	2.433	89.4	1,363.7
educ	36	974	635.203	65.216	196	3,567
age_hh	36	44	2.098	4.768	40	49
income_low	36	978.573	1,292.037	132.033	0	4,393.664
income_mid	36	976.931	563.237	57.654	220.932	3,175.227
income_high	36	1,033.633	1,459.096	141.162	79.005	8,454

Source: Authors' Computation

Correlation analysis

Table 2 shows the pairwise correlation matrix for all variables used in this study. Much emphasis is laid on the pairwise correlation between the uptake of health insurance (aggregative, private and public variants) and the socio-economic characteristics of Nigeria. The results showed a positive and significant association between gainful employment and the uptake of health insurance, particularly private health insurance. This result suggests that gainful employment allows employees to personally enrol for private health insurance or through their employers (the so-called HMO plans).

Moreover, being financially included enhances the enrolment into health insurance – particularly private health insurance. For low-income groups, income is negatively correlated with health insurance uptake. However, for middle-income and high-income groups, income has a positive and, in some cases, significant correlation with health insurance uptake. In addition, prevalent health access problems are negatively and insignificantly correlated with health insurance uptake among Nigerian states. Enrolment in health insurance (private health insurance) is positively and significantly correlated with educational qualification. In contrast, there is no correlation between the age of the household head and enrolment into health insurance.

Table 2: Pairwise correlation matrix

	employed	inclusion	insure_pr	insure_pub	insured	prob_access	educ	age_hh	income_low	income_mid	income_high
employed	1.0										
inclusion	0.04	1.0									
insure_pr	0.42***	0.32*	1.0								
insure_pub	-0.05	0.12	0.6***	1.0							
insured	0.39**	0.31*	0.99***	0.66***	1.0						
prob_access	0.49***	-0.37**	-0.02	-0.12	-0.04	1.0					
educ	0.74***	0.59***	0.38**	-0.09	0.35**	0.19	1.0				
age_hh	0.02	0.06	-0.09	-0.09	-0.09	-0.07	-0.02	1.0			
income_low	0.33*	-0.76***	-0.13	-0.26	-0.13	0.42**	-0.27	0.09	1.0		
income_mid	-0.4**	0.14	0.26	0.24	0.29*	-0.3*	-0.32*	-0.18	-0.17	1.0	
income_high	0.14	0.00006	0.09	0.55***	0.08	0.004	0.21	0.05	0.01	-0.02	1.0

Note: ***, **, and * represents the rejection of the null hypothesis of no significant correlation between any pair of variables at 1%, 5%, and 10% levels of significance, respectively; employed stands for the number of employed respondents over the 12 months before the survey period; inclusion stands for financial inclusion rate (measured in terms of the%age of respondents having bank accounts); insure_pr means private health insurance uptake; insure_pub stands for public health insurance uptake; insured stands for health insurance uptake; prob_access stands for the%age of respondents facing health access problems; educ stands for the number of respondents with at least primary education; age_hh represents the average age of the household head; income_low means the number of low-income respondents; income_mid means the number of middle-income respondents; income_high means the number of high-income respondents.
Source: Authors' Computation

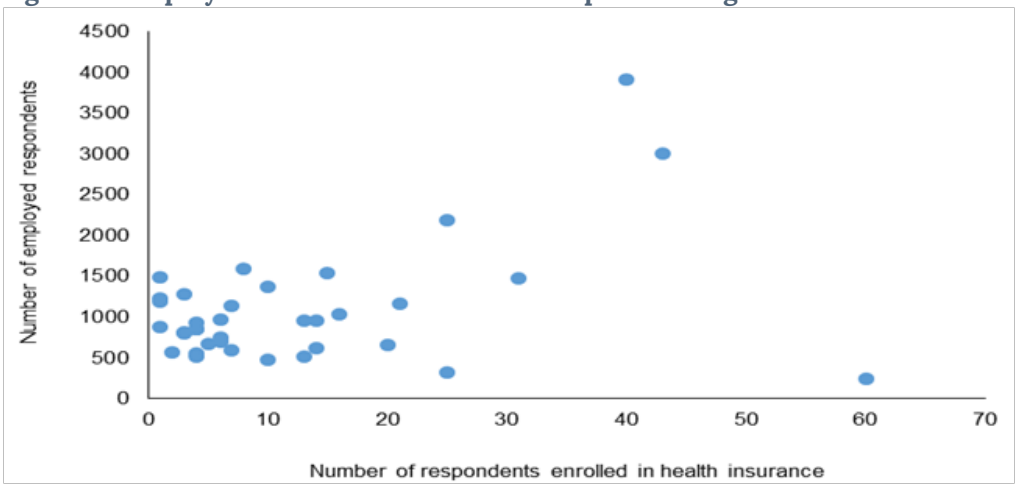
Regression analysis and discussion of results

This study used six drivers of health insurance uptake in Nigeria, as already established in the empirical literature. The regression results for the uptake of health insurance and its types – private and public – are presented in tables 3, 4 and 5. Models I, II, and III control for different income levels – low-income, middle-income and high-income, respectively. The impacts of the potential drivers of health insurance uptake are explained in detail below.

Employment and health insurance uptake

In line with the findings of Salari et al. (2019); Takudzwa et al. (2020), and Akokuwebe and Idemudia (2022), the result shows that employment opportunities stimulate health insurance uptake (Figure 9). As in the correlation results, a positive and significant relationship exists between gainful employment and the uptake of health insurance and types – private and public insurance (models I-III; models IV-VI and models VII-IX in table 3, 4 and 5, respectively). This suggests that employment opportunities strongly enhance the uptake of health insurance in Nigeria.

Figure 9: Employment and health insurance uptake in Nigeria as of 2018



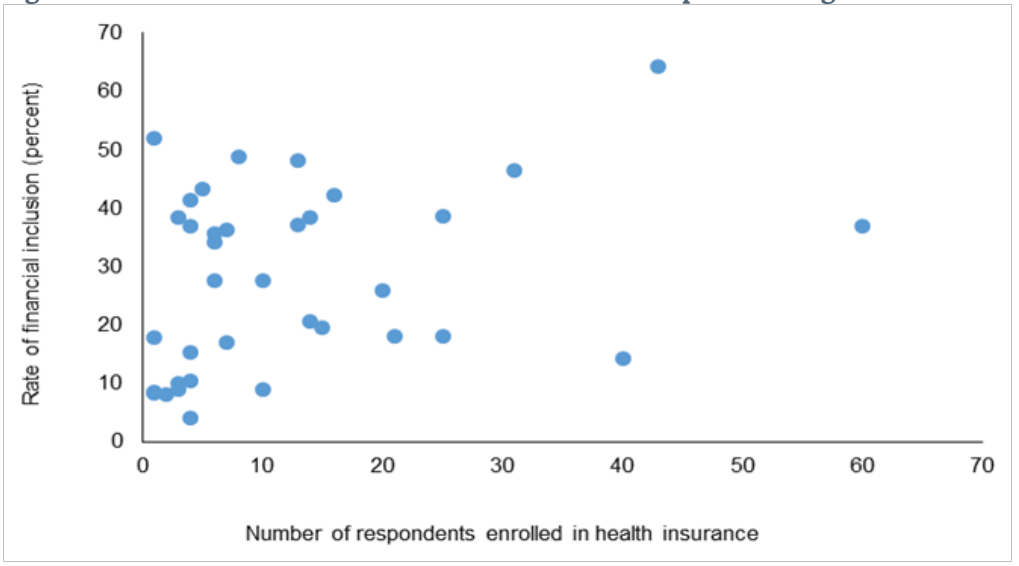
Data Source: 2018 DHS; Chart: NESG Research

Financial inclusion and health insurance uptake

Financial inclusion in terms of the ownership and use of bank accounts enhances the uptake of health insurance (Figure 10). This result aligns with the general observations of Raj (2019) that insurers predominantly use mobile applications, which in turn enhances financial inclusion. It also affirms the findings of Jasintha et al. (2022) that financial inclusion and insurance work complementarily to promote people's well-

being. Similarly, in Nigeria, financial inclusion positively and significantly impacted enrollment into health insurance and types – private and public health insurance (models II and III; models V and VI, and model VIII in tables 3, 4 and 5, respectively). This result also corroborates the strong correlation between financial inclusion and health insurance uptake among Nigerians.

Figure 10: Financial inclusion and health insurance uptake in Nigeria as of 2018

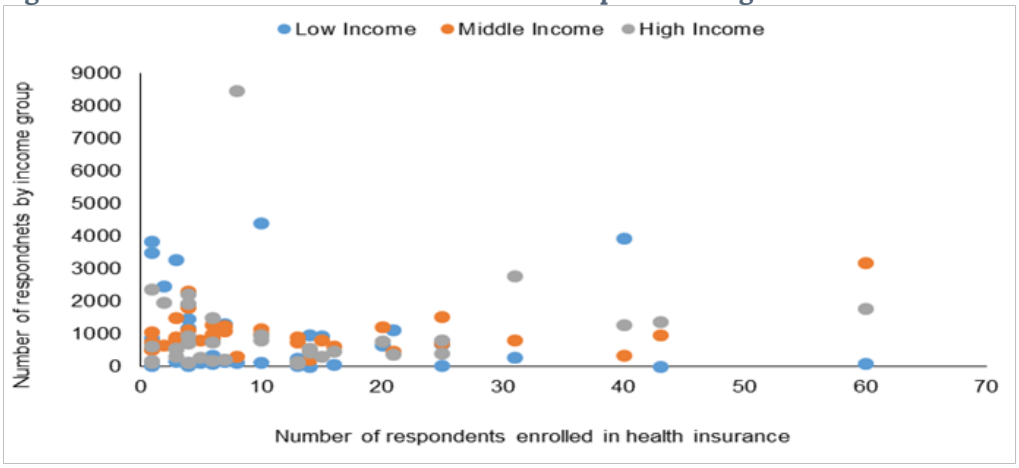


Data Source: 2018 DHS; Chart: NESG Research

Income and health insurance uptake

Income class matters in the uptake of health insurance in Nigeria. While low-income groups have little probability of enrolling for health insurance due to financial constraints, middle and high-income groups do not face such constraints and are more likely to enroll for health insurance (Figure 11). This result aligns with the previous findings of Salari et al. (2019) and Medard et al. (2022). The current study found a negative and significant relationship between income and health insurance uptake in the case of low-income groups (models I and IV in Tables 3 and 4, respectively). Conversely, the study established a positive and significant relationship between income and health insurance uptake in the case of middle-income groups (models II, V and VIII in Tables 3, 4 and 5, respectively).

Figure 11: Income class and health insurance uptake in Nigeria as of 2018



Data Source: 2018 DHS; Chart: NESG Research

Health access problems and health insurance uptake

The problems potential health seekers face in accessing health services in terms of lack of funds, disabilities, and longer distances to health centres disincentivise the enrollment for healthcare insurance. This was the case in this study, where it is established that elevated health access challenges reduce the uptake of health insurance and its types, both private and public insurance (models I-III; models IV-VI and models VII & IX in tables 3, 4 and 5, respectively). This result resonates with the findings of Apeleko (2017) and Uguru et al. (2020) that the health access problems would deter health insurance uptake and impede the progress of public insurance schemes such as the NHIS and State Health Insurance Scheme (SHIS).

Although the relevant impact coefficients are not significant at the conventional levels of significance, the health access problem is a pointer for many individuals to resort to self-medication rather than approach a health centre for proper diagnosis and treatment. This is a problem in rural communities and urban centres across Nigeria. While rural settlements suffer from a lack of health infrastructure and personnel, urban centres face huge pressures on the available health facilities and hospital attendants due to the rising urban population emanating from high rural-urban migration.

Education and health insurance uptake

Contrary to expectations, there is a negative and significant relationship between educational qualification and the uptake of health insurance and types -private and public health insurance (models I and II; models IV and V, and models VII and VIII in tables 3, 4 and 5, respectively). The more learned an individual is, the more he or she is likely to understand the importance of health insurance. Meanwhile, the unfavourable labour market conditions could undermine the role of education in enhancing health insurance uptake. In addition, many learned Nigerians are absorbed by the informal sector, providing vulnerable employment, which is about 80% of total employment in Nigeria (World Bank, 2022).

Age of household head and health insurance uptake

Contrary to expectations, there is a negative and insignificant relationship between the average age of the household head and the uptake of health insurance and types – private and public insurance (models I-III; models IV-VI and models VII-IX in tables 3, 4 and 5, respectively). This result is partly similar to the previous findings of Zheng (2022), only that the author considered a non-linear relationship between age and health insurance uptake in China. Meanwhile, the result of the current study could be attributed to the Nigerian context whereby social security, targeted mainly at the aged population, is not prioritised as much as the contributory pension is. Public sector employees are not obligated to enrol in health insurance as the NHIS is voluntary. This is, however, not the case with the contributory pension scheme, where the public sector employees' contributions to the pension fund are deducted upfront every month before the payment of workers' salaries.

Post-estimation statistics for the health insurance uptake models

In addition, the coefficient of determination (or R-squared) – which ranges between 0.16 and 0.55 - measures the degree to which the variation in the uptake of health insurance and types (private and public health insurance) is explained by the six drivers captured in a total of nine (9) models. This further informs the overall significance of the health insurance models as indicated by the F-statistics in all cases (Tables 3, 4 and 5, respectively).

Table 3: OLS estimates of the determinants of health insurance uptake in Nigeria

Specification	Model I (insured)	Model II (insured)	Model III (insured)
employed	0.025***	0.021***	0.019***
	(0.006)	(0.004)	(0.004)
inclusion	0.464	0.569**	0.609**
	(0.299)	(0.216)	(0.296)
income_low	-0.004*		
	(0.002)		
income_mid		0.011*	
		(0.006)	
income_high			0.0002
			(0.001)
prob_access	-0.006	-0.003	-0.006
	(0.0072)	(0.007)	(0.007)
educ	-0.022*	-0.015**	-0.017
	(0.012)	(0.006)	(0.011)

continued next page

Table 3 Continued

Specification	Model I (insured)	Model II (insured)	Model III (insured)
age_hh	-0.901	-0.523	-1.126
	(0.842)	(0.555)	(0.892)
constant	40.849	2.032	44.225
	(37.431)	(25.987)	(39.794)
F-statistic	7.81	11.43	16.02
	[0.000]	[0.000]	[0.000]
R-squared	0.396	0.546	0.365

Note: ***, **, and * represents the rejection of the null hypothesis of no statistical significance of impact coefficients at the 1%, 5%, and 10% significant levels, respectively; the values in parentheses ( ) are standard errors, while the values in block brackets [ ] are probabilities
Source: Authors' Computation

Table 4: OLS estimates of the determinants of private health insurance uptake in Nigeria

Specification	Model IV (insure_pr)	Model V (insure_pr)	Model VI (insure_pr)
employed	0.023***	0.019***	0.018***
	(0.005)	(0.003)	(0.004)
inclusion	0.414	0.515**	0.550*
	(0.275)	(0.200)	(0.269)
income_low	-0.004*		
	(0.002)		
income_mid		0.010*	
		(0.006)	
income_high			0.0001
			(0.001)
prob_access	-0.006	-0.003	-0.006
	(0.007)	(0.006)	(0.007)
educ	-0.019*	-0.013**	-0.015
	(0.011)	(0.006)	(0.009)
age_hh	-0.816	-0.494	-1.027
	(0.768)	(0.531)	(0.817)
constant	36.84	2.636	39.997
	(34.089)	(24.901)	(36.408)
F-statistic	7.64	11.3	14.62
	[0.000]	[0.000]	[0.000]
R-squared	0.417	0.548	0.3851

Note: ***, **, and * represents the rejection of the null hypothesis of no statistical significance of impact coefficients at the 1%, 5%, and 10% significant levels, respectively; the values in parentheses ( ) are standard errors, while the values in block brackets [ ] are probabilities
Source: Authors' Computation

Table 5: OLS estimates of the determinants of public health insurance uptake in Nigeria

Specification	Model VII (insure_pub)	Model VIII (insure_pub)	Model IX (insure_pub)
employed	0.002**	0.001***	0.001**
	(0.0006)	(0.0005)	(0.0006)
inclusion	0.050	0.055*	0.059
	(0.035)	(0.028)	(0.036)
income_low	-0.0002		
	(0.0002)		
income_mid		0.001**	
		(0.0006)	
income_high			0.00002
			(0.0001)
prob_access	-0.00009	0.0003	-0.00008
	(0.0007)	(0.0006)	(0.0007)
educ	-0.002*	-0.002**	-0.002
	(0.001)	(0.0009)	(0.001)
age_hh	-0.085	-0.029	-0.099
	(0.114)	(0.086)	(0.117)
constant	4.008	-0.604	4.229
	(5.038)	(3.692)	(5.111)
F-statistic	3.48	3.48	2.28
	[0.010]	[0.010]	[0.064]
R-squared	0.169	0.390	0.157

Note: ***, **, and * represents the rejection of the null hypothesis of no statistical significance of impact coefficients at the 1%, 5%, and 10% significant levels, respectively; the values in parentheses ( ) are standard errors, while the values in block brackets [ ] are probabilities
Source: Authors' Computation

6. Concluding remarks

This study seeks to identify potential determinants of health insurance uptake in Nigeria. The study obtained cross-sectional State data from the 2018 Nigeria DHS and employed the tools of descriptive and regression analyses. The results showed that health insurance uptake and the coverage rate are generally low across States in Nigeria. Moreover, the results suggest that an improved financial inclusion rate and high employment opportunities drive up health insurance uptake in Nigeria. The study also noted that due to financial constraints, low-income groups might have a lower chance of enrolling for health insurance than the middle-income and high-income groups. Even though the regression coefficients on education are statistically significant across specifications, education seems not to support health insurance uptake in Nigeria. However, health access problems and age of the household head did not statistically impact health insurance uptake in the country.

Based on these findings, this study suggests the following interventions:

- The evidence indicates that financial inclusion supports health insurance uptake. This suggests any strategy to increase health insurance uptake should incorporate initiatives to improve access to financial services nationwide.

- It is important that a large chunk of Nigerians is matched with decent jobs in the formal sector. The fact that a high level of informality characterises Nigeria suggests that most of the workforce face vulnerable employment and are denied enrolment into health insurance schemes. This needs to be urgently addressed as part of efforts to improve health insurance uptake, especially among educated Nigerians.

- Given that access to quality healthcare is a crucial component of the demand for healthcare, challenges faced in accessing health services can deter the demand for health insurance. Ensuring quality healthcare requires well-equipped hospitals with competent health professionals. To this end, incentivising private sector investment in the health sector would go a long way in bridging the health infrastructure gap in Nigeria, estimated at US$82 billion as of 2019[4].

- Enhanced accessibility is also crucial for using health services. To improve access to health facilities, increased availability of primary healthcare centres nationwide is essential. This is critical for rural dwellers who frequently travel long distances to access healthcare. Improved accessibility, affordability and quality of healthcare delivery would incentivize enrolment into health insurance schemes.

- An important factor that has often impeded the success of existing public insurance, such as community-based health insurance (CBHI), is the lack of funding to implement the scheme at the sub-national level, most especially. To encourage health insurance uptake at the grass-root level, the sub-national governments in Nigeria need to deploy a means to subsidise and incentivise enrolment, in addition to increased public spending on healthcare.

- As noted earlier, one of the reasons for the low coverage of the NHIS scheme is its voluntary nature. While the introduction of the NHIA that mandates every Nigerian to enrol into health insurance (private and public) is acknowledged, adequate provisions that incentivize enrolment need to be put in place, rather than resorting to compulsion. For example, the government could consider incorporating into the public health programmes ailments associated with high costs per treatment, such as chronic diseases. At the same time, public health insurance should not necessarily cover low-cost treatments and medications that could otherwise be paid for out-of-pocket.

Notes

1. For more details, see National Population Commission (NPC) [Nigeria] and ICF International (2019).

2. The Handbook chapter extensively documents other theoretical models of healthcare insurance

3. For more details, see NPC & ICF (2019).

4. see Knight Frank (2020).

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