

Challenges in Accessing NHIA Services among Formal and Informal Sector Workers in Kano, Nigeria

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Abstract

Nigeria's National Health Insurance Authority (NHIA) aims to achieve universal health coverage (UHC), yet persistent inequities in access between formal and informal sector workers who constitute over 80% of the workforce remain poorly understood. The aim of this study is to compare challenges faced by formal and informal sector enrollees in accessing NHIA services in Kano, Nigeria, and identify systemic gaps to inform policy reforms. A cross-sectional comparative study of 440 NHIA enrollees (205 formal, 235 informal) across all 44 Local Government Areas in Kano State was conducted. Eligible participants were adults (≥ 18 years) enrolled for ≥ 6 months who had accessed care within the past 3 months. Data were collected via structured questionnaires and in-depth interviews. Primary outcomes included self-reported challenges in accessing NHIA services, analyzed by sector (formal/informal). Secondary outcomes included specific barriers (e.g., service codes, coverage limitations) and qualitative themes (e.g., operational delays). Chi-square tests assessed associations. Among 440 enrollees, 71.6% reported challenges, with informal sector workers disproportionately affected (87.7% vs 53.2%; $\chi^2=64.03$, $P<0.001$). Key barriers included difficulty obtaining service codes (38.0% informal, 41.4% formal), inadequate service coverage (9.6% vs 28.4%), poor customer service (12.2% vs 7.9%), and low awareness of benefits (14.6% vs 7.0%). Qualitative data highlighted operational inefficiencies (e.g., long wait times, unclear communication) as compounding factors. This study reveals significant disparities in NHIA access, with informal sector enrollees facing systemic barriers. Policy priorities should address administrative bottlenecks, expand service coverage, and strengthen community-based awareness campaigns to advance equitable UHC in Nigeria.

Keywords: Health Insurance, Informal Sector, NHIA, Nigeria, Universal Health Coverage.

Introduction

Persistent inequities in financial protection remain a central challenge to achieving universal health coverage (UHC) in Nigeria [1]. Despite repeated global commitments most notably the 1978 Alma-Ata Declaration and the Sustainable Development Goals, access to affordable, quality healthcare continues to elude large segments of Nigeria's population, particularly those outside the formal employment sector [2]. Although UHC aims to ensure that all individuals receive essential

health services without incurring financial hardship, out-of-pocket (OOP) payments still account for over 70% of total health expenditure in Nigeria, one of the highest proportions in sub-Saharan Africa [2, 3]. This over-reliance on OOP spending has contributed to delayed care-seeking, unmet health needs [4], and catastrophic health expenditures (CHE), often pushing households into poverty [5, 6].

The Nigerian healthcare system reflects broader global patterns of inequality, wherein

access to care is shaped by income level, geographic location, and employment status [7, 8]. Wealthier urban residents are more likely to access adequately staffed facilities with essential supplies, whereas rural and low-income populations often contend with under-resourced public clinics or resort to self-medication and informal care [2, 5, 8]. To address these disparities, Nigeria introduced the National Health Insurance Scheme (NHIS) in 2005 to improve health financing, reduce OOP payments, and promote risk pooling. However, structural limitations such as its voluntary nature, narrow risk pool, and focus on federal employees hampered the scheme's reach and sustainability [7, 9].

Recognizing these shortcomings, the Federal Government enacted the National Health Insurance Authority (NHIA) Act in 2022, which replaced the NHIS and mandated coverage for all Nigerians [10]. Key innovations under the NHIA include decentralization of scheme implementation to subnational levels, greater emphasis on strategic purchasing, and an expanded role for states and private actors in enrolling the informal sector. These reforms were intended to align Nigeria's health financing architecture more closely with the WHO UHC cube, which emphasizes coverage across three dimensions: population inclusion, service availability, and financial protection [11, 12].

Yet, more than a year after the NHIA Act's passage, fewer than 10% of Nigerians are enrolled in any health insurance scheme, with formal sector workers particularly federal employees accounting for most beneficiaries through automatic payroll deductions [12, 13]. In contrast, Nigeria's large informal workforce, which constitutes over 80% of total employment, remain largely uninsured [14-16]. Barriers to enrollment among informal workers include income instability, limited awareness, mistrust of scheme benefits, and difficulties navigating registration procedures [17-19]. Moreover, even among those enrolled,

satisfaction with NHIA services varies considerably, influenced by factors such as long wait times, limited provider choice, drug stockouts, and perceptions of poor service quality [20-22].

Despite increasing attention to health financing reforms in Nigeria, few empirical studies have systematically compared health insurance enrollment, utilization, and satisfaction across formal and informal sector workers. These groups differ not only in terms of income and job security but also in how they engage with and experience the health system. Without disaggregated analysis, equity gaps may remain obscured, undermining policy responses.

Access to care remains uneven, particularly for informal sector workers, due to affordability, location, and awareness constraints. The NHIA, formerly the National Health Insurance Scheme (NHIS), was established to promote universal health coverage in Nigeria. However, participation remains skewed toward formal sector workers due to payroll-based registration and structural barriers that limit informal sector enrollment, including the irregularity of income and limited awareness [4, 19, 23] of the Group, Individual and Family Social Health Insurance Programme (GIFSHIP) platform for self-enrolment or group enrolment [22].

To address this gap, the present study examines differences in NHIA enrollment, healthcare access, and satisfaction between formal and informal sector workers in Kano State, a populous and socioeconomically diverse region in Northern Nigeria that reflects the broader challenges of UHC implementation. Grounded in equity-focused frameworks such as the WHO UHC cube and Andersen's Behavioral Model of Health Services Use [24, 25], the study identifies sector-specific barriers and facilitators of NHIA participation. The findings are intended to inform adaptive strategies for equitable expansion of NHIA coverage, particularly among informal workers,

and contribute to evidence-based policymaking in Nigeria and comparable low- and middle-income countries [11, 26].

Methods

Study Design and Setting

This was a cross-sectional comparative study conducted among National Health Insurance Authority (NHIA) enrollees who had accessed outpatient care in Kano State, Nigeria. Kano is Nigeria's most populous state, with an estimated population of over 15 million in 2024 based on extrapolations from the most recent national census conducted in 2006. Located in the northwest geopolitical zone, the state shares borders with Katsina, Jigawa, Bauchi, and Kaduna states. Kano City, the state capital, is Nigeria's largest urban centre and an important commercial and cultural hub.

Administratively, Kano comprises 44 Local Government Areas (LGAs), including 8 urban and 36 rural LGAs. The economy is largely driven by informal sector activity, including small-scale trade, repair services, and agriculture. Formal sector employment, though limited, consists primarily of civil service and private-sector jobs.

The health infrastructure in Kano State includes two federal tertiary hospitals, three state-owned teaching hospitals, 35 secondary facilities (33 state-run, 2 federal), 22 primary health care centres, seven military health institutions, and 72 NHIA-accredited private hospitals.

Participants and Eligibility Criteria

Participants were stratified into two categories: (1) formal sector enrollees-government and private-sector employees enrolled via employer payroll contributions; and (2) informal sector enrollees-self-employed individuals registered through the NHIA's Group, Individual and Family Social Health Insurance Programme (GIFSHIP).

Eligibility criteria included adults aged 18 years or older, enrolled in the NHIA scheme for

at least six months, and who had accessed outpatient care at a NHIA-accredited facility within the three months preceding data collection. The three-month criterion was used to minimise recall bias regarding service utilisation. Only one respondent per household was enrolled to avoid duplicate data from intra-household clustering.

This study adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cross-sectional studies [27].

Sample Size Determination

The minimum required sample size was calculated using the formula for comparing two proportions [28, 29]:

$$n = \frac{(Z_{\alpha/2}^2 + Z_{\beta}^2) \cdot (p_1(1 - p_1) + p_2(1 - p_2))}{(p_1 - p_2)^2}$$

Where:

- $Z_{\alpha/2}$ =1.96 for 95% confidence
- Z_{β} =0.84 for 80% power
- p_1 and p_2 were the estimated proportions of NHIA utilisation among formal and informal sector enrollees, based on existing literature and pilot data.

With a 10% adjustment for non-response, a final sample of 440 was determined to be adequate.

Sampling and Data Collection

Participants were selected using a multistage sampling strategy. First, all 44 LGAs in Kano State were included to ensure geographic representation. Within each LGA, NHIA-accredited facilities were randomly selected using a sampling frame provided by the Kano NHIA office. At the facility level, systematic sampling was used to recruit eligible enrollees proportionately across formal and informal sector registries.

Data were collected using a pretested, structured interviewer-administered questionnaire adapted from the NHIA evaluation toolkit. Information captured included socio-demographic characteristics,

NHIA enrolment history, recent service utilisation, satisfaction indicators, and perceived barriers to care. Data were collected by trained enumerators using tablets loaded with Open Data Kit (ODK) software.

Ethical Considerations

Ethical approval was obtained from the Kano State Ministry of Health Ethics Committee. Additional permissions were granted by the NHIA Kano Office, Aminu Kano Teaching Hospital, Kano State Hospital Management Board, and Texila American University. All participants provided written informed consent prior to enrolment. The study was conducted in accordance with the principles outlined in the Declaration of Helsinki.

Statistical Analysis

Data were analysed using IBM SPSS version 25. Descriptive statistics (means, medians, proportions) were used to summarise variables. Differences between formal and informal sector groups were assessed using chi-square tests for categorical variables and t-tests or Mann-Whitney U tests for continuous variables.

Multivariate logistic regression was used to identify predictors of satisfaction and health care utilisation, adjusting for potential confounders. Statistical significance was set at a 2-sided alpha level of 0.05.

Results

Sociodemographic Characteristics

A total of 440 NHIA enrollees participated in the study, comprising 205 from the formal sector and 235 from the informal sector. Males predominated in both groups (64.4% formal; 59.1% informal). The mean age of informal enrollees (43.4 ± 8.7 years) was significantly higher than that of formal sector participants (39.5 ± 10.5 years; $p < 0.05$), with most respondents aged 30–49 years.

The Hausa ethnic group was the largest in both cohorts (64.9% formal; 51.4% informal; $p < 0.001$), and Islam was the predominant religion (90.2% formal; 85.5% informal). Marital status varied slightly, with 79.0% of formal and 72.0% of informal respondents being married ($p < 0.001$) as seen in “Table 1”.

Table 1. Socio-Demographic Characteristics of Respondents

Variable		Formal n(%)	Informal n(%)	χ^2	p-value
Type of facility	Federal Tertiary	61(29.8)	61(25.9)	5.87	0.21
	State Tertiary	61(29.8)	61(25.9)		
	State Secondary	10(4.9)	10(4.3)		
	Private	71(34.6)	103(43.8)		
	PHC	2(0.9)	0(0.0)		
	Total	205(100.0)	235(100.0)		
Gender	Male	132(64.4)	139(59.1)	1.27	0.28†
	Female	73(35.6)	96(40.9)		
	Total	205(100.0)	235(100.0)		
Age group(years)	18-24	14(6.8)	5(2.1)	37.52	<0.001*
	25-34	66(32.2)	31(13.2)		
	35-44	70(34.1)	104(44.3)		
	45-54	35(17.1)	77(32.8)		
	≥55	20(9.8)	18(7.7)		
	Total	205(100.0)	235(100.0)		

Ethnic group	Hausa	133(64.9)	130(51.4)	20.64	<0.001*
	Fulani	30(14.6)	61(36.0)		
	Yoruba	27(13.2)	31(13.2)		
	Igbo	3(1.5)	11(4.7)		
	Others	12(5.8)	2(0.9)		
	Total	205(100.0)	235(100.0)		
Religion	Islam	185(90.2)	201(85.5)	2.26	0.15†
	Christianity	20(9.8)	34(14.5)		
	Total	205(100.0)	235(100.0)		
	Single	28(13.7)	26(11.1)	11.10	<0.001*
	Married	162(79.0)	169(72.0)		
	Divorced	11(4.4)	34(10.2)		
	Widow	4(2.0)	5(2.1)		
	Separated	0(0.0)	1(0.4)		
	Total	205(100.0)	235(100.0)		
No. of Children	None	36(17.6)	39(16.6)	23.30	<0.001*
	≤2	45(22.0)	33(14.0)		
	3	48(23.4)	79(33.6)		
	4	32(15.6)	60(25.5)		
	5	19(9.3)	14(6.0)		
	≥6	25(12.2)	10(4.3)		
	Total	205(100.0)	235(100.0)		

*= Significant at $p < 0.05$

†=Fisher exact test

Household and Employment Characteristics

Polygamous households were significantly more common among informal enrollees (43.5%) than formal enrollees (14.7%; $p < 0.001$). The majority of formal sector respondents resided in urban areas (95.1%), compared to 82.1% in the informal group ($p < 0.001$).

Educational attainment was generally higher among formal participants, with 51.2% holding

a diploma or bachelor's degree and 8.9% reporting postgraduate education. Although 69.8% of informal workers had some form of tertiary education, only 3.4% had postgraduate degrees ($p = 0.002$). Income disparities were evident: 71.9% of informal enrollees earned ₦51,000–₦200,000 monthly, whereas 19.0% of formal workers earned less than ₦10,000 ($p < 0.001$). These data is displayed in “Table 2”.

Table 2. Socio-Demographic Characteristics of Respondents

Variable		Formal n(%)	Informal n(%)	χ^2	p-value
Type of family	Polygamy	26(14.7)	91(43.5)	37.77	<0.001†
	Monogamy	151 (85.3)	118(56.5)		
	Total	177(100.0)	209(100.0)		
	Urban	195(95.1)	193(82.1)	17.74	<0.001†

Place of Residence	Rural	10(4.9)	42(17.9)		
	Total	205(100.0)	235(100.0)		
Level of Education	No formal	2(9.8)	2(0.9)	19.29	0.002*
	Primary	4(2.0)	2(0.9)		
	Secondary	52(25.4)	34(14.5)		
	Voc/Technical	24(11.7)	25(10.6)		
	Diploma/Bachelor	105(51.2)	164(69.8)		
	Postgraduate	18(8.9)	8(3.4)		
	Total	205(100.0)	235 (100.0)		
Income (Naira)	<10,000	39(19.0)	11(4.7)	38.82	<0.001*
	10,000-50,000	53(25.9)	37(15.7)		
	51,000-100,000	59(28.8)	88(37.4)		
	101,000-200,000	37(18.0)	81(34.5)		
	≥201,000	17(8.3)	18(7.7)		
	Total	205(100.0)	235(100.0)		
Duration employed (years)	<1	28(13.7)	12(5.1)	21.36	<0.001*
	1-5	65(31.7)	64(27.2)		
	6-10	52(25.4)	97(41.3)		
	11-15	31(15.1)	42(17.9)		
	≥16	29(14.1)	20(8.5)		
	Total	205(100.0)	235(100.0)		

*= Significant at $p < 0.05$

†=Fisher exact test

Employment Type and Occupation

As expected, most formal sector participants were government employees in either junior or senior roles as seen in “Figure 1”.

Informal sector respondents were primarily small-scale traders (53.6%) and artisans, based on self-reported occupation. These are shown in “Figure 2”.

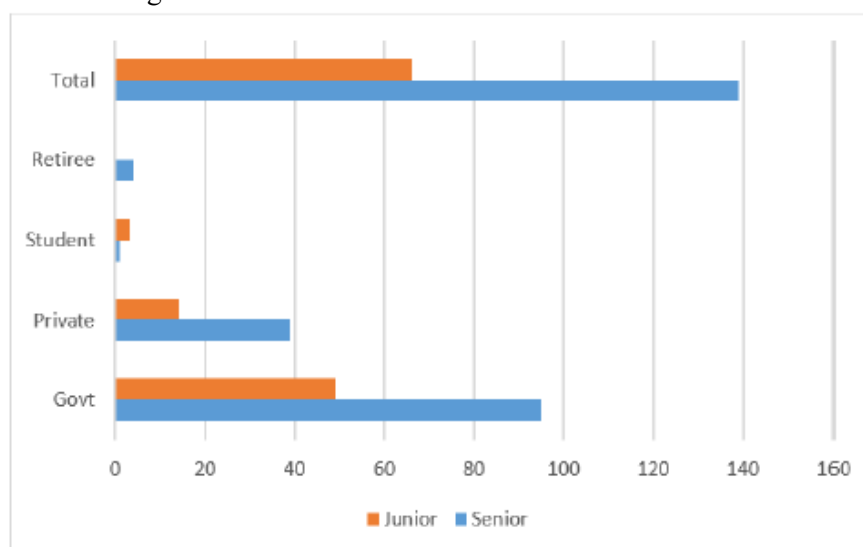


Figure 1. Level and Type of Employment of Formal sector Enrollees

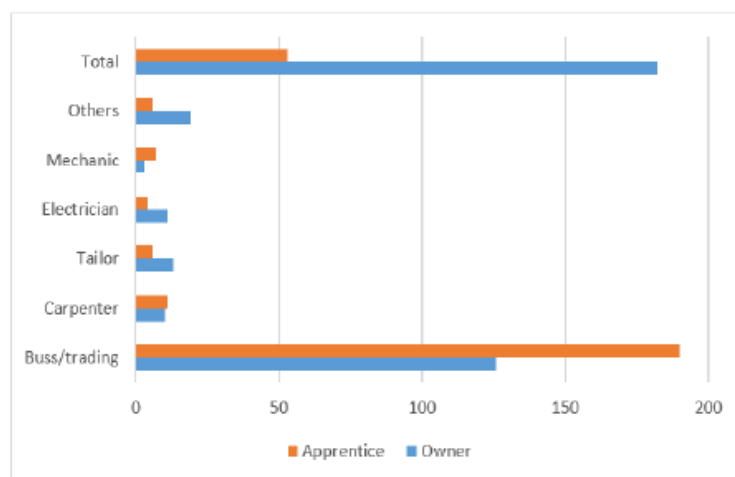


Figure 2. Occupation of the Informal Sector Enrollees

NHIA Awareness and Enrollment Patterns

Awareness of NHIA was high in both groups (87.3% formal; 83.0% informal). Formal enrollees primarily learned about NHIA through their employers (52.2%), whereas informal enrollees relied more on friends and colleagues (50.6%; $p < 0.001$).

Enrollment rates were similarly high (98.5% formal; 97.4% informal). Informal enrollees were more likely to be principal policyholders (83.8% vs. 70.8%; $p = 0.002$), while formal enrollees enrolled a greater number of dependents, with 19.5% enrolling six or more, compared to only 6.0% of informal enrollees ($p < 0.001$). Additionally, 27.6% of formal participants had been enrolled for at least seven years, compared to 5.6% of informal participants ($p < 0.001$).

Challenges in Accessing NHIA Services

Overall, 125 participants reported no challenges with NHIA services, while 315 experienced at least one. Difficulties obtaining service codes were the most common complaint (38.0% informal; 41.4% formal). A significantly higher proportion of informal enrollees reported challenges (87.7%) compared to formal enrollees (53.2%; $\chi^2 = 64.03$, $p < 0.001$).

Formal participants were more likely to cite inadequate coverage (28.4% vs. 9.6%), whereas informal enrollees more often reported poor customer service (12.2% vs. 7.9%) and lack of awareness (14.6% vs. 7.0%). Informal enrollees also reported more frequent issues: 34.9% experienced challenges often, versus 20.5% of formal participants ($\chi^2 = 60.42$, $p < 0.001$). “Table 3”, displays this data.

Table 3. Frequency and types of Challenges faced by Respondents

Variable		Formal (n%)	Informal n(%)	χ^2	p-value
Faced challenges	Yes	109(53.2)	206(87.7)	64.03	0.00†
	No	96(46.8)	29(12.3)		
	Total	205(100.0)	235(100.0)		
Challenges encountered	Long waiting time	13(6.0)	15(7.3)	183.07	0.00*
	Limited HCF	10(4.7)	18(8.8)		
	Poor customer service	17(7.9)	25(12.2)		

	Inadequate coverage	61(28.4)	20(9.6)		
	Difficulty getting code	89(41.4)	78(38.0)		
	Lack of awareness	15(7.0)	30(14.6)		
	Others	10(4.7)	19(9.3)		
	Total	215(100.0)	205(100.0)		
Frequency of challenges	Always	9(4.4)	20(8.5)	60.42	0.00*
	Frequently	42(20.5)	82(34.9)		
	Occasionally	48(23.4)	101(43.0)		
	Rarely	10(4.9)	3(1.3)		
	Never	96(46.8)	29(12.3)		
	Total	205(100.0)	235(100.0)		

*Statistically significant

†=Fisher exact test

Qualitative Insights: Barriers and User Experience

Thematic analysis of open-ended responses reinforced these quantitative findings. Informal enrollees described greater structural and operational barriers, including time delays, facility shortages, and lack of clarity on benefits. A recurring theme was frustration with inefficiencies:

“It’s time-consuming—you end up wasting the whole day.”

“You don’t get full service, even when you do everything right.”

Formal sector respondents more frequently cited administrative hurdles and operational inefficiencies.

“Network problem... sometimes drugs are not available, so care is incomplete.”

“Hard to change dependents, I wanted to remove one of my child and put another child instead. They referred me somewhere far and it took time before it was ready.”

Both groups reported high awareness and saw the enrollment process as fundamentally straightforward, although many noted bureaucratic delays when updating policy details.

Cultural or religious barriers to NHIA use were minimal. Respondents consistently

indicated that religious beliefs supported healthcare access, and none reported stigma attached to using NHIA services.

Affordability was cited as a strength of the scheme, with both groups describing NHIA contributions as “*very affordable*.” However, experiences with service quality and grievance redress were mixed. While some formal participants reported rapid resolution of complaints, informal enrollees noted that complaints were often acknowledged but not addressed.

Discussion

This study explored differences in National Health Insurance Authority (NHIA) awareness, enrolment patterns, and service access challenges between formal and informal sector enrollees in Kano, Nigeria. The findings highlighted important disparities in sociodemographic characteristics, enrolment dynamics, user experience, and perceptions of NHIA service delivery.

Sociodemographic and Occupational Differences

As expected, formal sector respondents were younger, more urban-based, and more likely to hold government positions. Their higher proportion of postgraduate education aligns

with public service employment patterns in Nigeria. Informal sector participants, despite a relatively high level of tertiary education, showed less postgraduate attainment and greater occupational diversity, reflecting the non-standardized and heterogeneous nature of the informal economy. The significant prevalence of polygamous households among informal enrollees (43.5%) may reflect broader cultural and socioeconomic patterns that affect health service access, household health needs, and NHIA utilization [30-32].

NHIA Awareness and Enrolment Patterns

High awareness of NHIA in both groups (>80%) is encouraging and reflects the scheme's reach since its inception. However, information sources differed markedly: formal enrollees predominantly learned about the scheme through institutional channels (e.g., employers), whereas informal workers relied heavily on peer networks. This underscores the need for tailored awareness strategies to reach informal workers, including community-based campaigns, market associations, and local influencers [33-35].

Despite broadly similar enrolment rates, significant disparities emerged in coverage scope. Informal enrollees were more often principal subscribers, but they enrolled fewer dependents and had shorter enrolment duration likely reflecting weaker financial capacity and less exposure to scheme benefits over time. These findings align with previous studies that have found lower NHIS uptake and continuity among informal sector groups due to limited awareness of benefits and affordability constraints [4, 7, 13].

Challenges in Accessing NHIA Services

More than 80% of informal enrollees reported experiencing challenges in accessing NHIA services substantially higher than among their formal counterparts. The most frequently cited issue in both groups was difficulty

obtaining service codes, reflecting persistent bottlenecks in authorization and claims processing systems. However, the nature and frequency of challenges differed. Informal enrollees reported significantly more structural and service-related problems, including poor customer care, long waiting times, and poor communication about entitlements. These challenges were corroborated by qualitative data, where informal sector users voiced frustration with long wait times, unclear benefit packages, and lack of staff responsiveness. Their narratives reflect broader structural issues affecting access and equity within the NHIA scheme. Similar findings were found in other studies [36-38].

Formal sector respondents, on the other hand, more often highlighted administrative inefficiencies such as referral delays and challenges with updating dependent information. Despite these, they reported greater satisfaction with complaint resolution a reflection of stronger institutional ties and perhaps more robust grievance redress mechanisms within the formal system.

Implications for Health Equity and Policy

The findings underscore a critical health equity concern: while the NHIA aims to provide universal coverage, the informal sector comprising the majority of Nigeria's workforce continues to face disproportionate barriers. This discrepancy threatens to entrench healthcare access inequities, especially as informal workers often lack financial protections and employer support.

Policy reforms must prioritize equity-focused strategies. These include: (1) decentralized, user-friendly enrolment and grievance redress platforms; (2) community-based sensitization campaigns leveraging peer networks; and (3) increased investment in primary care infrastructure serving informal workers. The success of the NHIA's expansion

depends on addressing these structural deficits. [39, 40].

Strengths and Limitations

A key strength of this study lies in its comparative design and integration of both quantitative and qualitative data, which enhanced explanatory power. However, the study was conducted in a single state, limiting generalizability. Moreover, self-reported responses may be subject to recall or social desirability bias.

Conclusion

While awareness and enrolment in NHIA are high in both sectors, informal enrollees face

greater challenges in accessing services, navigating processes, and securing redress. Without structural improvements and equity-sensitive reforms, the NHIA risks reinforcing the very disparities it seeks to eliminate.

Conflict of Interest

There is no conflict of interest.

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References

- [1]. Okpani, A. I., Abimbola, S., 2015, Operationalizing universal health coverage in Nigeria through social health insurance. *Nigerian Medical Journal*, 56 (5), 305–310.
- [2]. Flannery, D., Garvey, J., Inyang, U., 2020, The financial protection of national health insurance: Evidence from a cross section of State and Federal workers in Akwa Ibom, Nigeria, 10(3).
- [3]. Okunogbe, A., Hähnle, J., Rotimi, B. F., Akande, M., T., Wendy, J., 2022, Short and longer-term impacts of health insurance on catastrophic health expenditures in Kwara State, Nigeria. *BMC Health Services Research*, 22 (1), 1-18.
- [4]. Adewole, D. A., Adebayo, A. M., Udeh, E. I., Shaahu, V. N., Dairo, M. D., 2015, Payment for health care and perception of the national health insurance scheme in a rural area in Southwest Nigeria *American Journal of Tropical Medicine and Hygiene*, 93(3), 648-654.
- [5]. Aregbeshola, B. S., Khan, S. M., 2018, Out-of-pocket payments, catastrophic health expenditure and poverty among households in Nigeria 2010. *Int J Health Policy Manag*, 7(9), 798–806.
- [6]. Amakom, U., Ezenekwe, U., 2012, Implications of households catastrophic out of pocket (OOP) healthcare spending in Nigeria. *Journal of Research*

in Economics and International Finance (JREIF), 1(5), 136-140.

- [7]. Onwujekwe, O., Onoka, C., Uzochukwu, B., Hanson, K., 2011, Constraints to universal coverage: Inequities in health service use and expenditures for different health conditions and providers. *International Journal for Equity in Health*, 10(50), 1-9.

- [8]. Aregbeshola, B. S., Khan, S. M., 2018, Predictors of enrolment in the National Health Insurance Scheme among women of reproductive age in Nigeria. *International Journal of Health Policy and Management*, 7(11), 1015-1023. <http://ijhpm.com> *Int J Health Policy Manag*. 2018, 7(9), 798–806.

- [9]. Eteng, F. O., Ijim-Agbor, U., 2016, Understanding the challenges and prospects of administering the national health insurance scheme in Nigeria. *International Journal of Humanities and Social Science Research*, 2 (8), 43–48.

- [10]. Federal Republic of Nigeria, National Health Insurance Authority. Federal Republic of Nigeria Official Gazette, Act of 2022, No. 95, Government Notice No. 73, Vol. 109.

- [11]. Adewole, D. A., Osungbade, K. O., 2016, Nigeria National Health Insurance Scheme: A highly subsidized health care program for a privileged few. *International Journal of Tropical Disease & Health*, 19 (3), 1–11.

- [12]. Odonkor, S. N. N. T., Koranteng, F., Appiah-Danquah, M., Dini, L., 2023, Do national health insurance schemes guarantee financial risk protection in the drive towards Universal Health Coverage in West Africa? A systematic review of observational studies. *PLOS Global Public Health*, 3 (8).
- [13]. Osunde, R. N., Olurunfemi, O., Oduyemi, R. O., 2023, Awareness, willingness, and challenges of the informal sector towards state national health insurance services in Benin City, Nigeria. *MGM J Med Sci*, 10(30) 30-37.
- [14]. Omotosho, O., Ichoku, H. E., 2016, Distributional analysis of household health expenditure in Nigeria. *Developing Country Studies*, 6 (9), 111–120.
- [15]. Omotosho, O., Ichoku, H. E., 2016, Financial protection and universal health coverage in Nigeria. *International Affairs and Global Strategy*, 51, 5–14.
- [16]. Adewole, D. A., Dairo, M. D., Bolarinwa, O. A., 2016, Awareness and coverage of the National Health Insurance Scheme among formal sector workers in Ilorin, Nigeria. *African Journal of Biomedical Research*, 19 (1), 7–16.
- [17]. Akinyemi, O. O., Owopetu, O. F., Agbejule, I. O., 2021, National Health Insurance Scheme: Perception and participation of federal civil servants in Ibadan. *Annals of Ibadan Postgraduate Medicine*, 19 (1), 49–55.
- [18]. Alawode, G., Adewole, A., 2021, Assessment of the design and implementation challenges of the National Health Insurance Scheme in Nigeria: a qualitative study among sub-national level actors, healthcare and insurance providers. *BMC Public Health*, 21 (124).
- [19]. Bolarinwa, O. A., Afolayan, M. A., Rotimi, B. F., Alatishe-Mohammad, B., 2021, Are there evidence to support the informal sector's willingness to participate and pay for statewide health insurance scheme in Nigeria? *Niger Postgrad Med J*, 28, 71-3.
- [20]. Adewale, B., Adeneye, A. K., Ezeugwu, S. M. C., Afocha, E. E., Musa, A. Z., Enwuru, C. A., et.al., 2016, A preliminary study on enrollees perception and experiences of National Health Insurance Scheme in Lagos State, Nigeria. *Int J Trop Dis Health*, 18(3), 1–14.
- [21]. Daramola, O. E., Adeniran, A., Akande, T. M., 2018, Patients' Satisfaction with the Quality of Services accessed under the National Health Insurance Scheme at a Tertiary Health Facility in FCT Abuja, Nigeria. *Journal of Community Medicine and Primary Health Care*, 30 (2), 90-97.
- [22]. Nwanaji-Enwerem, O., Bain, P., Marks, Z., Nwanaji-Enwerem, P., et.al. 2022, Patient satisfaction with the Nigerian National Health Insurance Scheme two decades since establishment: A systematic review and recommendations for improvement. *African Journal of Primary Health Care and Family Medicine*, 14, 1-10.
- [23]. Azuogu, B. N., Madubueze, U. C., Alo, C., Ogbonnaya, L. U., Ajayi, N. A., 2016, Level of awareness, and factors associated with willingness to participate in the National Health Insurance Scheme among traders in Abakaliki main market, Ebonyi State, Nigeria. *African Journal of Medical and Health Sciences*, 15(1), 18-23.
- [24]. Solanke, B. L., Yinusa, R. A., Oyeleye, O. J., Oluwatope, O. B., Ilesanmi, B. B., Oni, T. O., 2023, Using Andersen's behavioral model of health care use for intermittent preventive treatment of malaria in pregnancy in Nigeria. *BMC Pregnancy Childbirth*, 23(332).
- [25]. Kumah, E., Asana, Y., Agyei, S. K., Kokuro, C., Ankomah, S. E., Fusheini, A., 2024, Does health insurance status influence healthcare-seeking behavior in rural communities? Evidence from rural Ghana. *BMC Health Serv Rev*, 24(655).
- [26]. Ainy, A., Pujiyanto, 2022, Determinant of health insurance enrollment for the informal sector in low and middle-income countries: A systematic review. *Proceedings of the International Conference on Public Health*, 7 (2), 37-52.
- [27]. von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., Vandenbroucke, J. P., 2007, STROBE Initiative. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *PLoS Med*, 4(10).
- [28]. Lwanga, S. K., Lemeshow, S., 1991, Sample Size Determination in Health Studies: A Practical Manual. Geneva: World Health Organization.

- [29]. Magnani, R., 1997, Sampling guide. IMPACT Food Security and Nutrition Monitoring Project. Arlington, VA: *International Science and Technology Institute*.
- [30]. Umar, N., Mohammed, S., 2011, Insured persons' dilemma about other family members: a perspective on the national health insurance scheme in Nigeria. *J Public Health Afr*. 22(2).
- [31]. Mohammed, S., Sambo, M. N., Dong, H., 2011, Understanding client satisfaction with a health insurance scheme in Nigeria: factors and enrollees' experiences. *Health Res Policy Syst*, 9(20).
- [32]. Mohammed, S., Aji, B., Bermejo, J. L., Souares, A., Dong, H., Sauerborn, R., 2016, User experience with a health insurance coverage and benefit-package access: implications for policy implementation towards expansion in Nigeria. *Health Policy Plan*. 31(3), 346-355.
- [33]. Lawan, U. M., Iliyasu, Z., 2012, Challenges to the scale-up of the Nigerian National Health Insurance Scheme: Public knowledge and opinions in urban Kano, Nigeria. *Ann Trop Med Public Health*. 5(1), 6-11.
- [34]. Adewole, D. A., Akanbi, S. A., Osungbade, K. O., Bello, S., 2017, Expanding health insurance scheme in the informal sector in Nigeria: awareness as a potential demand-side tool. *Pan Afr Med J*, 27(52).
- [35]. Demilade, O. I., Olusegun, E. E., Tope, M. I., Stella, A., Eytayo, E., Paul, O. A., 2012, Awareness and willingness to pay for community health scheme among rural households in Ekiti, Nigeria. *Pacific Journal of Medical Sciences*, 22(1), 37-50.
- [36]. Iliyasu, Z., Abubakar, I. S., Abubakar, S., Lawan, U. M., Gajida, A. U., 2010, Patients' satisfaction with services obtained from Aminu Kano Teaching Hospital, Kano, Northern Nigeria. *Nigerian Journal of Clinical Practice*, 13(4), 371-378.
- [37]. Onyedibe, K. I., Goyit, M. G., Nnadi, N. E., An evaluation of the National Health Insurance Scheme (NHIS) in Jos, a north-central Nigerian city. *Global Advanced Research Journal of Microbiology*, 1(1), 5-12.
- [38]. Kofoworola, A. A., Ekiye, A., Motunrayo, A. O., Adeoye, A. T., Adunni, M. R., 2020, National Health Insurance Scheme: An assessment of service quality and clients' dissatisfaction. *Ethiop J Health Sci*. 30 (5), 795-802.
- [39]. Onasanya, A. A., 2020, Increasing health insurance enrolment in the informal economic sector. *J Glob Health*, 10(1).
- [40]. Barasa, E. W., Mwaura, N., Rogo, K., Andrawes, L., 2017, Extending voluntary health insurance to the informal sector: experiences and expectations of the informal sector in Kenya. *Wellcome Open Research*, 94 (1).