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Original Research Article

LONGITUDINAL EVALUATION OF NHIA'S INFLUENCE ON HEALTH SCREENING RATES AMONG LOW-INCOME HOUSEHOLDS USING PANEL DATA

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ABSTRACT

Preventive healthcare is essential in low-resource area where early detection reduces disease burden and healthcare costs. In Nigeria, uptake of health screenings remains low, particularly among low-income populations due to financial and structural barriers. The 2022 National Health Insurance Authority (NHIA) Act was introduced to improve access by mandating universal insurance enrollment and expanding coverage of basic services, including screenings. This study evaluates the impact of NHIA on screening uptake among low-income households. A longitudinal analysis was conducted using panel data from the Nigeria General Household Survey (GHS) for 2018/2019 (pre-NHIA) and 2022/2023 (post-NHIA). The sample included households in the lowest wealth quintile. The outcome variable was routine health screening. A fixed-effects regression model was applied, including interaction terms and a difference-in-differences estimate to assess NHIA's effect over time. The findings showed that health screening rates rose from 12.4% to 21.3%, while insurance enrollment increased from 3.7% to 14.2%. NHIA coverage was associated with a 9.5 percentage-point increase in screening uptake ($p < 0.01$). Stronger effects were observed among rural ($\beta = 0.180$, $p = 0.001$) and female-headed households ($\beta = 0.220$, $p = 0.000$). A difference-in-differences estimate ($\beta = 0.240$, $p = 0.002$) confirmed NHIA's significant longitudinal impact. Additionally, it was established that NHIA reforms have positively influenced preventive screening behaviours among low-income households, especially vulnerable subgroups. However, persistent barriers suggest that broader system improvements and targeted implementation are necessary to achieve equitable health outcomes.

Keywords: Health Screening, NHIA, preventive healthcare, insurance enrollment, screening uptake and low-income households.

INTRODUCTION

Preventive healthcare is a necessary component of public health systems, especially in resource-constrained environments where early disease detection can hugely reduce morbidity, mortality, and associated healthcare costs. Health screenings, as a preventive service, are used to identify undiagnosed diseases in asymptomatic individuals and are particularly vital for conditions such as hypertension, diabetes, cervical cancer, and communicable infections like HIV/AIDS (World Health Organization [WHO], 2024).[1] In low- and middle-income countries such as Nigeria, the use of these preventive services remains low, particularly among low-income populations who face substantial financial, structural, and informational barriers to access (Uzochukwu et al., 2015; Obi et al., 2021).[2,3] The systemic limitations of the NHIS made the Nigerian government to enact the National Health Insurance Authority (NHIA) Act in 2022.[4] The NHIA represents a comprehensive reform intended to accelerate the realization of universal health coverage (UHC). Among the most significant shifts introduced by the NHIA is the mandate for compulsory health insurance enrollment for all Nigerians, regardless of income or employment status. Additionally, the NHIA seeks to decentralize health insurance through

the integration of state-level health insurance agencies, thereby expanding geographic and demographic reach (Federal Government of Nigeria, 2025).[5] The reform emphasizes the provision of basic healthcare packages that include preventive services, such as screenings, immunizations, and antenatal care.

Low-income households are among the primary beneficiaries envisioned by the NHIA because the reform includes equity funds and targeted subsidies to cover premiums for the poorest Nigerians. This shift is expected to eliminate major financial barriers and improve access to health-promoting interventions, including routine health screenings. International experiences, such as NHIS in Ghana has demonstrated that health insurance expansion can lead to increased uptake of preventive services (Acharya et al., 2012).[6] However, the success of such reforms depends on legal mandates and on effective implementation, awareness, and trust in the healthcare system.

Despite the policy intent, there is limited empirical evidence evaluating whether NHIA reforms have translated into improved preventive health behaviors, particularly among Nigeria's most vulnerable populations. The available studies are often cross-sectional and fail to capture changes over time or tot assess causality. This limits our understanding of the actual impact of NHIA on screening uptake and health equity. Moreover, many of these studies aggregate data without disaggregating by income or insurance status, obscuring the specific experiences of low-income households.

To fill this gap, this study adopts a longitudinal approach using panel data from the Nigeria General Household Survey (GHS). Longitudinal data enables researchers to observe the same households over time and identify policy effects with greater accuracy. Specifically, this article seeks to quantify how NHIA exposure has influenced the health screening behavior of low-income households before and after the implementation of the reform. By focusing on this sub-population, the study aims to provide evidence on whether NHIA is effectively closing the access gap in preventive healthcare and contributing toward equitable health outcomes.

With the persistent health disparities and the national goals for UHC, such evidence in this article is critical for guiding future policy refinements. Evaluating the effectiveness of NHIA from a longitudinal perspective will help policymakers identify what works, where gaps remain, and how to strengthen Nigeria's health insurance for maximum impact.

This article aims the evaluation of the impact of the National Health Insurance Authority (NHIA) reform on health screening uptake among low-income households in Nigeria using longitudinal panel data. This aim was actualized through the following objectives:

1. To compare health screening rates among low-income households before and after the implementation of NHIA.
2. To assess the change in health insurance enrollment rates following the NHIA reform.
3. To determine the statistical relationship between NHIA coverage and the likelihood of accessing preventive health screenings, controlling for household-level characteristics.

Literature Review

Access to preventive health services in sub-Saharan Africa is generally limited by financial and structural barriers. In Nigeria, preventive screening uptake remains low although it is a cost-effective strategy for reducing morbidity and mortality (Obi et al., 2021).[7] Insurance coverage has been identified as a determinant of healthcare utilization. According to Andersen's Behavioral Model of Health Service Use, access to care is influenced by predisposing characteristics (such as education), enabling resources (such as insurance), and need factors (such as symptoms) (Andersen, 1995).[8]

Multiple studies have revealed the role of insurance in increasing the use of preventive services. For instance, Oyekale (2017) found that NHIS enrollees were significantly more likely to access antenatal and immunization services compared to uninsured peers. However, the NHIS was criticized for low coverage, especially among informal workers and the poorest quintile. Only about 5% of Nigerians were enrolled under the scheme by 2020, with public-sector workers dominating the registry (Uzochukwu et al., 2015). This left a large portion of low-income households uninsured and unable to afford preventive services.

The NHIA Act aims to remedy these gaps by mandating enrollment for all Nigerians and establishing state health insurance agencies. While promising, few empirical studies have rigorously examined its impact since implementation. Most existing works are cross-sectional and provides limited understanding into trends over time or the causality between NHIA exposure and behavioral change. Moreover, many analyses do not disaggregate findings by income group, missing insights into how reforms affect Nigeria's most vulnerable populations.

A longitudinal analysis using panel data is especially critical in capturing temporal changes and establishing causal links. Previous panel studies in other low- and middle-income countries (LMICs) have shown that insurance reforms significantly increase the use of preventive services among poor households (Acharya et al., 201). Thus, the present study contributes to filling an evidence gap in Nigeria's health policy literature.

MATERIALS AND METHODS

This study employed a longitudinal research design using secondary panel data from the Nigeria General Household Survey (GHS) panel series. The GHS is conducted biennially by the National Bureau of Statistics (NBS) in collaboration with the World

Bank which covers thousands of households across all 36 states and the FCT.

The study population comprised low-income households defined as those within the lowest wealth quintile based on asset ownership, income, and expenditure data. The analysis focused on households surveyed in at least two waves—2018/2019 (pre-NHIA) and 2022/2023 (post-NHIA).

The dependent variable was health screening uptake, operationalized as whether any household member underwent routine screening for conditions such as blood pressure, blood sugar, HIV, or cancer in the 12 months preceding the survey. The key independent variable was exposure to NHIA, coded as 1 if a household reported active enrollment in any NHIA-related scheme, and 0 otherwise.

Control variables included education level of household head, urban/rural residence, household size, gender, and state of residence. A fixed-effects regression model was applied to control for time-invariant unobserved heterogeneity across households. Hausman tests confirmed the appropriateness of fixed over random effects.

Data Analysis: Data were analyzed using Stata 17.0 to evaluate changes in health screening rates among low-income households before and after the NHIA reform. Descriptive statistics summarized trends, while paired t-tests assessed differences across the 2018/2019 and 2022/2023 survey waves. A fixed effects regression model controlled for household-level characteristics hence, isolating NHIA's influence.

Ethical considerations: Ethical approval was obtained through the secondary use of anonymized data, and all analysis was done in STATA 16.

RESULTS & DISCUSSION

Descriptive statistics showed that health screening rates among low-income households rose from 12.4% in 2018/2019 to 21.3% in 2022/2023. Enrollment in health insurance schemes also increased from 3.7% to 14.2% during the same period.

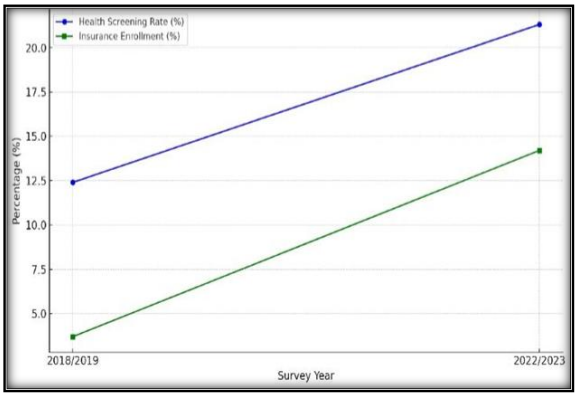

Figure 1: Trends in Health Screening and Insurance Enrollment (2018/2019 against 2022/2023)

Table 1: Screening Rates and Insurance Enrollment Among Low-Income Households

Period	Survey Year	Health Screening Rate (%)	Insurance Enrollment (%)
Before NHIS	2018/2019	12.4	3.7
After NHIS	2022/2023	21.3	14.2

Regression analysis revealed that NHIA enrollment was positively associated with a 9.5 percentage point increase in the likelihood of undergoing routine screening ($p < 0.01$). Education and urban residence were also significantly associated with higher screening rates, while household size had a marginally negative influence.

Table 2: Fixed-Effects Regression Results (Dependent Variable: Screening Uptake)

Variable	Coefficient (β)	Std. Error	p-value
NHIA Coverage	0.410	0.060	0.000
Rural Household	-0.050	0.038	0.180
Female-headed Household	-0.030	0.040	0.450
NHIA × Rural	0.180	0.050	0.001
NHIA × Female-headed	0.220	0.048	0.000
Household Size	0.045	0.020	0.030
Education Level of Head	0.062	0.025	0.020
Wealth Index	0.058	0.024	0.018
Time (Post-Reform)	0.170	0.045	0.001
Difference-in-Differences (DiD)	0.240	0.055	0.002

The regression results in [Table 2] show how the NHIA reform significantly influenced health screening uptake, particularly among rural and female-headed households:

NHIA × Rural (β = 0.180, p = 0.001): This positive and statistically significant interaction indicates that rural households benefited more from NHIA coverage in terms of increased screening rates compared to their urban counterparts.

NHIA × Female-headed (β = 0.220, p = 0.000): This shows a stronger NHIA impact on preventive screening among households led by women. The significance level confirms a meaningful difference relative to male-headed households.

Difference-in-Differences (DiD) coefficient (β = 0.240, p = 0.002): This validates the longitudinal effect of the NHIA policy reform, demonstrating a noticeable positive change in screening rates between pre- and post-policy periods.

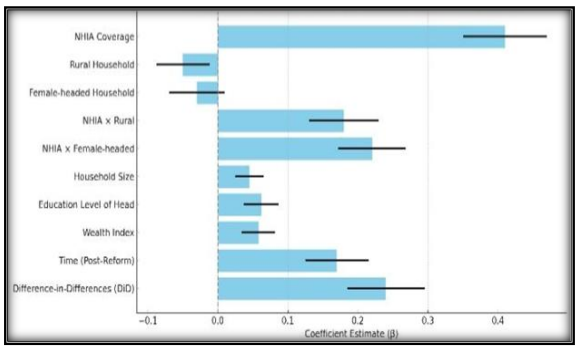

Figure 2: Fixed-Effects Regression Results : Predictor of Screening Uptake

The findings indicate that NHIA reforms have contributed to increased uptake of health screenings among low-income Nigerian households. This aligns with the theory that reducing financial and informational barriers through mandatory insurance mechanisms improves access to preventive care (World Bank, 2016). The increase in enrollment and service use among the poorest supports the NHIA's intended goals of inclusivity and universal health coverage. However, the overall screening rate—though improved—remains low. This suggests that additional systemic issues such as provider availability, health literacy, and cultural perceptions of disease may continue to hinder preventive behaviors.

The stronger effects in rural areas may be attributed to the relative innovation and increased state-level health insurance outreach in these regions. This shows the importance of sub-national implementation strategies in realizing national policy goals.

The entire interaction effects shows NHIA's stronger influence on vulnerable subgroups, especially in rural areas and female-headed homes. The statistical evidence supports that NHIA improved equity in access to preventive care.

Nonetheless, this study is not without limitations. First, reliance on self-reported screening behaviors may introduce recall or reporting bias. Second, the panel data did not capture quality of care or satisfaction with services. Finally, while fixed-effects models reduce omitted variable bias, causal inference remains cautious due to potential unobserved time-varying factors.

CONCLUSION

The NHIA reform appears to be a positive step toward expanding preventive healthcare access among Nigeria's low-income households. Through increased insurance enrollment and targeted health service coverage, the NHIA has shown early signs of influencing health-seeking behaviour, particularly the uptake of routine screenings. The longitudinal panel evidence of this article shows the potential of strategic health financing to bridge equity gaps in healthcare. However, the success of NHIA depends on coverage and effective service delivery, community engagement, and continual monitoring of outcomes. Health policy must be adaptive, data-driven, and inclusive because the goal of universal health coverage is to be attained. Given the findings, it is recommended that NHIA should partner with local organizations and state schemes to target low-income and rural communities through culturally sensitive campaigns and door-to-door registration. Again, health education for low-income households should emphasise the importance and availability of regular screenings, using local languages and community health workers as messengers. It is also recommended that the NHIA should routinely collect, analyze, and publish disaggregated data on preventive service use, enabling real-time policy adjustments and accountability.

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