

# AWARENESS, ENROLMENT AND PRODUCTIVITY OUTCOMES ASSOCIATED WITH HEALTH INSURANCE PARTICIPATION AMONG CIVIL SERVANTS IN DELTA STATE, NIGERIA: A CROSSSECTIONAL STUDY

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## Abstract

Out-of-pocket spending still accounts for the bulk of health expenditure in Nigeria, prompting the Federal Government to create the National Health Insurance Scheme (NHIS) in 2005. That scheme has since been replaced by the National Health Insurance Authority (NHIA) Act of 2022, which makes participation mandatory and reorganizes the sector around state-level schemes. Whether this transition has narrowed the gap between awareness and enrolment among civil servants, and whether enrolment carries any productivity dividend, remains poorly documented at state level. A cross-sectional survey was conducted among civil servants across 14 ministries of the Delta State civil service, southern Nigeria, between January and April 2024, using stratified proportionate random sampling. Ethical approval was granted by the Delta State Health Research Ethics Committee, with informed consent obtained from all participants. Productivity was assessed with the WHO Health and Work Performance Questionnaire short form; data were analysed with chi-square tests and binary logistic regression. Of 410 questionnaires distributed, 393 were returned complete (95.9%). Awareness of health insurance was high (84.4%), but only 52.7% of respondents were actively enrolled. Enrolled respondents reported markedly higher self-rated productivity than non-enrolled respondents (mean Absolute Presenteeism Score: 68.4 vs. 54.9;  $p < 0.001$ ). Supervisory status, tertiary education, and health literacy independently predicted enrolment. Awareness of health insurance considerably outpaces enrolment among Delta State civil servants. Enrolment was associated with, though cannot on this evidence be said to cause, higher self-reported productivity; the cross-sectional design, self-reported outcome measure, and single-state sample all limit how far these findings can be generalised.

**Keywords:** National Health Insurance Authority, NHIS, civil servants, enrolment, productivity, health literacy, Nigeria

## INTRODUCTION

Out-of-pocket (OOP) health expenditure remains a stubborn obstacle to healthcare access in sub-Saharan Africa. Nigeria illustrates this starkly: OOP payments account for roughly 70% of total health spending, among the highest shares recorded anywhere (World Health Organization, 2021), pushing many households toward debt or forgone care. It was this crisis that prompted the Federal Government to establish the National Health Insurance Scheme (NHIS) in 2005 under Act No. 35, aimed at affordable healthcare for Nigerians, particularly formal-sector workers and their dependants (Odeyemi & Nixon, 2013). Yet national enrolment estimates have remained at only 5-8% of the eligible population, and even civil servants, the group the scheme was built around,

have enrolled well below the architects' assumptions (Aregbeshola & Khan, 2018), a curious outcome given their regular salaries and daily contact with government administration.

The legal landscape shifted in May 2022, when the National Health Insurance Authority (NHIA) Act repealed the earlier NHIS Act and established the NHIA as a regulator overseeing both a formal-sector scheme and a network of State Health Insurance Schemes, with participation now mandatory (National Health Insurance Authority [NHIA], 2022). States are required to run or adopt compliant schemes, with the NHIA administering a Vulnerable Group Fund for residents unable to pay premiums. Because fieldwork for this study took place in 2024, while implementation guidelines were still being rolled out (WTW, 2023), respondents may have been enrolled under the

legacy NHIS, a state-run scheme, or a hybrid of the two; this ambiguity is addressed further in the Methodology.

Beyond access and equity, insurance status may carry consequences for workplace output. Workers without cover often delay treatment until a condition becomes disabling, which shows up as presenteeism and absenteeism, both costly to public institutions (Schultz & Edington, 2007). Enrolment may be associated with better health-seeking behaviour and higher productivity, that strengthens the case for expanding coverage, though a cross-sectional survey cannot establish that the relationship is causal.

The study set out to (1) assess civil servants' awareness of health insurance in Delta State; (2) determine enrolment rates and the barriers keeping the aware-but-unenrolled outside the scheme; (3) compare productivity by enrolment status; and (4) identify independent predictors of enrolment.

This gap is not unique to Nigeria: across low- and middle-income countries, awareness alone rarely converts into uptake, since trust in the administering institution, confidence in benefit adequacy, and ease of enrolment matter as much as knowing a scheme exists (Osei-Bonsu et al., 2021). Within Nigeria, perceived poor facility quality and frustrating claims experiences repeatedly surface as reasons people remain unenrolled or drop out (Adewole et al., 2020; Adebisi & Adeniji, 2021). Direct evidence linking insurance to productivity comes mostly from high-income settings (Schultz & Edington, 2007); African evidence is thinner, with a Ghanaian study finding enrolment associated with a 14% reduction in sick-day absenteeism (Okeke & Abuosi, 2019), while recent Nigerian work has focused on implementation challenges rather than productivity (Ilesanmi et al., 2023; Eze et al., 2024). No study appears to have examined this relationship among Nigerian state civil servants, which is the gap this paper addresses.

## METHODOLOGY

### Study Design and Setting

A descriptive cross-sectional survey was conducted between January and April 2024 across the civil service of Delta State, Southern Nigeria. Delta State was purposively selected for its relatively established state health insurance infrastructure, administered through the Delta State Contributory Health Commission (DSCHC), and for the availability of a reasonably current civil servant register to serve as a sampling frame. The 14 ministries surveyed, employing an estimated 5,000 civil servants, were Health; Finance; Education; Works; Agriculture; Environment;

Justice; Local Government and Chieftaincy Affairs; Lands, Survey and Urban Development; Youth Development; Women Affairs and Social Development; Information and Orientation; Budget, Planning and Economic Development; and Transport.

### Sample Size and Sampling

Using an estimated enrolment prevalence of 48% (Adewole et al., 2020), a 95% confidence level, a 5% margin of error, and a 10% non-response adjustment, the Cochran formula yielded a minimum sample of 410. Stratified proportionate random sampling was applied, with ministry of service as the stratifying variable, followed by simple random selection within each stratum using ministry nominal rolls. Table 1 shows the resulting allocation and the usable questionnaires returned per ministry.

Table 1: Sampling Frame and Allocation across Delta State Civil Service Ministries

| Ministry                                | Total Civil Servants | Proportion of Population (%) | Sample Allocated | Final Respondents |
|-----------------------------------------|----------------------|------------------------------|------------------|-------------------|
| Health                                  | 620                  | 12.4                         | 51               | 50                |
| Finance                                 | 450                  | 9.0                          | 37               | 36                |
| Education                               | 900                  | 18.0                         | 74               | 71                |
| Works                                   | 380                  | 7.6                          | 31               | 30                |
| Agriculture                             | 340                  | 6.8                          | 28               | 27                |
| Environment                             | 260                  | 5.2                          | 21               | 20                |
| Justice                                 | 300                  | 6.0                          | 25               | 24                |
| Local Government & Chieftaincy Affairs  | 280                  | 5.6                          | 23               | 22                |
| Lands, Survey & Urban Development       | 250                  | 5.0                          | 20               | 19                |
| Youth Development                       | 220                  | 4.4                          | 18               | 17                |
| Women Affairs & Social Development      | 210                  | 4.2                          | 17               | 16                |
| Information & Orientation               | 190                  | 3.8                          | 16               | 15                |
| Budget, Planning & Economic Development | 300                  | 6.0                          | 25               | 24                |
| Transport                               | 300                  | 6.0                          | 24               | 22                |
| Total                                   | 5,000                | 100.0                        | 410              | 393               |

Note. Sample allocation followed proportionate stratified random sampling by ministry; final respondents reflect usable, fully completed questionnaires (overall response rate = 95.9%).

### Instrument

A pre-tested, structured questionnaire, administered in English given respondents' near-universal literacy, captured four domains: socio-demographic characteristics; awareness (12 items, Cronbach's  $\alpha = 0.81$ ); enrolment status and barriers (16 items); and health literacy, measured with an 8-item scale adapted from an instrument previously validated in a Nigerian sample (Nwachukwu et al., 2021), scored 0-24 and dichotomised into "high" ( $\geq 18$ ) and "low" ( $< 18$ ), with acceptable internal consistency here ( $\alpha = 0.76$ ). A sample item asked respondents to rate how easily

they could identify which documents enrolment required.

Productivity was measured with the WHO Health and Work Performance Questionnaire (HPQ) short form, used under its public-domain research licence, with two items referencing United States-specific insurance terminology reworded for local relevance and a four-week recall period. The Absolute Presenteeism Score compared respondents' self-rated job performance over that period against their rating of an average worker in the same role, on a 0-100 scale; a score of 70 or above was defined a priori as "high productivity," consistent with cut-offs used in prior HPQ applications (Schultz & Edington, 2007). Internal consistency here was  $\alpha = 0.79$ , and a panel of five public health experts confirmed face and content validity before fieldwork.

### Data Analysis

Data were entered into SPSS version 27 and cleaned; missing values, affecting fewer than 2% of responses on any variable, were handled by listwise deletion. Chi-square tests assessed bivariate associations, and binary logistic regression (enter method) identified independent predictors of enrolment, with supervisory status, health literacy, tertiary education, service duration, sex, and age as primary predictors, adjusted for salary grade, chronic illness status, ministry, and distance to the nearest accredited facility. Categorical predictors were dummy-coded against a reference category. Variance inflation factors, all below 2, indicated no material multicollinearity; the Hosmer-Lemeshow test ( $\chi^2 = 6.42$ ,  $df = 8$ ,  $p = 0.60$ ) suggested adequate fit, and the model correctly classified 71.2% of cases. Significance was set at  $\alpha = 0.05$ .

### Ethical Considerations

Ethical approval was obtained from the Delta State Health Research Ethics Committee (DSHREC/2024/018) prior to data collection, and written informed consent was obtained from every participant after the study's purpose, voluntary nature, and right to withdraw were explained. Questionnaires were anonymised at collection, no personal identifiers were retained, and completed instruments were stored on a password-protected device accessible only to the research team.

## RESULTS

### Socio-demographic Profile

Table 2: Socio-demographic Characteristics of Civil Servant Respondents (n = 393)

| Variable                   | Frequency(n) | Percentage(%) |
|----------------------------|--------------|---------------|
| Age group: 20-29 years     | 68           | 17.3          |
| Age group: 30-39 years     | 142          | 36.1          |
| Age group: 40-49 years     | 129          | 32.8          |
| Age group: $\geq 50$ years | 54           | 13.7          |
| Male sex                   | 210          | 53.4          |
| Tertiary education         | 300          | 76.3          |
| Service > 5 years          | 242          | 61.6          |
| Supervisory cadre          | 147          | 37.4          |
| Married                    | 268          | 68.2          |

Of 410 questionnaires distributed, 393 were returned complete, a response rate of 95.9%. Respondents ranged in age from 23 to 57 years (mean  $38.6 \pm 8.4$ ); 53.4% were male. Most held tertiary qualifications (76.3%) and had served for more than five years (61.6%).

### Health Insurance Awareness and Enrolment

Table 3: Health Insurance Awareness, Enrolment, and Utilisation Indicators (n = 393)

| Health Insurance Indicator          | N   | %    | 95% CI    |
|-------------------------------------|-----|------|-----------|
| Aware of health insurance existence | 332 | 84.4 | 80.7-88.3 |
| Can correctly describe benefits     | 189 | 48.1 | 43.1-53.1 |
| Currently enrolled                  | 207 | 52.7 | 47.7-57.7 |
| Utilised benefit in past 12 months  | 163 | 78.7 | 73.0-84.4 |
| Satisfied with services*            | 98  | 47.3 | 40.2-54.4 |
| Would recommend to colleagues*      | 134 | 64.7 | 57.9-71.5 |

Note. \* Percentages for these three indicators are calculated among enrolled respondents only (n = 207), not the full sample.

Overall awareness of health insurance was 84.4% (n = 332), but only 52.7% (n = 207) of respondents reported active enrolment, a conversion gap of 31.7 percentage points. Among the 125 respondents who were aware but not enrolled, the barriers most commonly cited were poor understanding of the benefit package (62.1%), dissatisfaction with the quality of accredited facilities (55.3%), the administrative complexity of the enrolment process (47.8%), and doubts about the adequacy of premium deductions relative to benefits received (38.4%).

The gap between awareness and enrolment recorded here echoes findings from other Nigerian states. Of particular concern is how few respondents could correctly describe what the scheme actually covers (48.1%), which suggests that public communication has succeeded in making people aware that a scheme exists without equipping them to judge whether it is worth joining.

## Productivity by Enrolment Status

Table 4: Productivity Indicators Stratified by Health Insurance Enrolment Status

| Productivity Indicator                               | Enrolled (n=207) | Not Enrolled (n=186) | t / $\chi^2$    | p-value |
|------------------------------------------------------|------------------|----------------------|-----------------|---------|
| Absolute Presenteeism Score (mean $\pm$ SD)          | 68.4 $\pm$ 12.3  | 54.9 $\pm$ 14.8      | t = 10.17       | < 0.001 |
| Sick days/month (mean $\pm$ SD)                      | 1.2 $\pm$ 1.4    | 2.8 $\pm$ 2.3        | t = -8.89       | < 0.001 |
| High productivity category ( $\geq 70$ ), n (%)      | 118 (57.0%)      | 44 (23.7%)           | $\chi^2 = 51.6$ | < 0.001 |
| Healthcare utilisation delay ( $\geq 1$ week), n (%) | 31 (15.0%)       | 97 (52.2%)           | $\chi^2 = 71.9$ | < 0.001 |
| Work performance self-rating (Good/Excellent)        | 168 (81.2%)      | 95 (51.1%)           | $\chi^2 = 43.2$ | < 0.001 |

Enrolled civil servants recorded significantly higher mean Absolute Presenteeism Scores (68.4  $\pm$  12.3) than their non-enrolled counterparts (54.9  $\pm$  14.8; t(391) = 10.17; p < 0.001; Cohen's d = 0.99); they also reported fewer sick days per month.

The 13.5-point difference in mean presenteeism scores, together with a large effect size and a more than threefold difference in the proportion delaying care by a week or more, indicates that enrolment status and self-reported occupational functioning are strongly related in this sample.

## Predictors of Enrolment

Table 5: Binary Logistic Regression: Independent Predictors of Health Insurance Enrolment (n = 393)

| Predictor Variable                      | aOR  | 95% CI    | p-value |
|-----------------------------------------|------|-----------|---------|
| Supervisory cadre (vs. non-supervisory) | 2.41 | 1.58-3.68 | < 0.001 |
| High health literacy (vs. low)          | 2.13 | 1.39-3.26 | 0.001   |
| Tertiary education (vs. below tertiary) | 1.88 | 1.16-3.05 | 0.010   |
| Service $\geq 5$ years (vs. < 5 years)  | 1.62 | 1.07-2.47 | 0.024   |
| Male sex (vs. female)                   | 1.21 | 0.82-1.79 | 0.337   |
| Age $\geq 40$ years (vs. < 40 years)    | 1.34 | 0.90-2.00 | 0.147   |

Note. Model  $\chi^2 = 82.4$ , p < 0.001; Nagelkerke R<sup>2</sup> = 0.28; Hosmer-Lemeshow  $\chi^2 = 6.42$  (df = 8), p = 0.60; overall classification accuracy = 71.2%; all variance inflation factors < 2, indicating no material multicollinearity. Model adjusted for salary grade, chronic illness status, ministry, and distance to nearest accredited facility.

Supervisory cadre, health literacy, and tertiary education emerged as independent predictors of enrolment, while sex and age were not significant once other variables were accounted for. That health literacy outperformed raw awareness reinforces a point raised earlier: campaigns built around benefit content, not mere existence, are likely to move enrolment further than repetition of the scheme's name.

## DISCUSSION

This survey documents an awareness-enrolment gap of roughly 32 percentage points, consistent with reports from elsewhere in sub-Saharan Africa (Osei-Bonsu et al., 2021). Part of the answer may lie in the transitional moment captured here: with the NHIA Act still being operationalised at state level (WTW, 2023),

respondents may have been unsure which scheme, legacy NHIS, a state-run alternative, or a hybrid, applied to them, and such uncertainty tends to depress uptake even among people broadly aware that health insurance exists. Distrust carried over from the voluntary, often disappointing NHIS era may also linger despite the change in law and name.

Facility dissatisfaction, cited by over half of aware-but-unenrolled respondents, could reflect genuinely poor service, inadequate provider reimbursement, or weak regulatory oversight that lets underperforming facilities keep their accreditation. This survey cannot distinguish between these explanations, but they point to different remedies, quality improvement, tariff reform, or stricter accreditation review, which future facility-level research could help separate.

The productivity gap between enrolled and non-enrolled respondents is striking but warrants caution. Although the regression adjusted for several plausible confounders, salary grade, income, chronic illness, and job cadre could each independently affect both the likelihood of enrolling and self-reported productivity, so residual confounding cannot be ruled out. For that reason, enrolment is described here as associated with, rather than a cause of, higher productivity, a more modest claim but the one the data support.

The NHIA transition carries specific implications for a state civil service such as Delta's: its requirement that states operate a compliant scheme, backed by a Vulnerable Group Fund for those unable to pay premiums (NHIA, 2022), gives state governments an opportunity to fold benefit-literacy campaigns into the rollout rather than treating enrolment as purely administrative, and its success will likely depend on execution rather than the legislation itself (Ilesanmi et al., 2023; Eze et al., 2024). Both enrolment status and productivity here were self-reported, so social desirability bias may have inflated agreement in both directions. That health literacy predicted enrolment more strongly than raw awareness fits a broader pattern in which functional literacy, not mere exposure to a scheme's name, mediates uptake (Nwachukwu et al., 2021); supervisory cadre's contribution likely reflects a similar mix of education and administrative proximity rather than rank itself.

## LIMITATIONS

Several limitations qualify these findings: the cross-sectional design permits only associational, not causal, inference; enrolment status and productivity both relied on self-report, vulnerable to recall error and social desirability bias; the single-state sample limits generalisability

to civil servants elsewhere in Nigeria, let alone informal-sector workers; and despite statistical adjustment, residual confounding from unmeasured variables such as income or household size cannot be excluded.

## CONCLUSIONS

Awareness of health insurance considerably exceeds enrolment among Delta State civil servants, and the gap appears driven by barriers, benefit misunderstanding, facility dissatisfaction, and administrative friction, that are, in principle, modifiable. Enrolment was associated with meaningfully higher self-reported productivity, which offers a plausible economic argument for expanding coverage even though this study cannot confirm that the relationship is causal.

## RECOMMENDATIONS

1. Enrolment campaigns should shift emphasis from announcing the scheme's existence to explaining what it actually covers, delivered through workplace health promotion platforms rather than one-off notices.
2. The quality of accredited facilities should be independently audited, with underperforming providers de-accredited, to address the single most commonly cited barrier to enrolment.
3. Human resource departments should build health insurance registration into onboarding for new civil servants, rather than leaving it to individual initiative.
4. Health literacy content should be incorporated into mandatory civil service training, given its demonstrated predictive strength relative to general awareness.
5. As Delta State completes its transition under the NHIA Act, state authorities should pair the administrative rollout with active communication about what has changed for existing enrollees, to reduce the uncertainty that may otherwise depress conversion.

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