



## National Health Insurance Scheme and Sustainable Healthcare Delivery in Nigeria Military Hospital, Port Harcourt, 2015-2025

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### ABSTRACT

Out-of-pocket expenditure constitutes approximately 70 percent of total health spending in Nigeria, exposing millions of households to catastrophic health expenditure and undermining sustainable healthcare delivery at the facility level. The National Health Insurance Scheme (NHIS), operational since 2005, was established to address this through a pre-payment, risk-pooling mechanism; however, coverage remains at approximately 5 percent of the population, reflecting persistent implementation gaps. This study examined the relationship between the National Health Insurance Scheme and sustainable healthcare delivery at the Nigeria Military Hospital, Port Harcourt, 2015-2025, focusing on the level of enrolment, funding adequacy for sustainability, and the availability of medical consumables. Anchored on Health Insurance Theory and Social Policy Theory, the study was guided by three objectives, three research questions, and three null hypotheses. A mixed-method correlational survey design was adopted from a population of 15,035 persons; 390 respondents were determined using Taro Yamane's formula through proportional stratified sampling, and 366 questionnaires were retrieved and usable (93.8% response rate), complemented by interviews with 15 key informants. Cronbach's Alpha reliability coefficients ranged from 0.807 to 0.821. Data were analysed using descriptive statistics and Pearson Product Moment Correlation Coefficient (PPMC) at the 0.05 significance level; qualitative data were subjected to thematic content analysis. Findings revealed statistically significant positive relationships between sustainable healthcare delivery and the level of enrolment ( $r = 0.614$ ,  $p < 0.05$ ), funding adequacy ( $r = 0.579$ ,  $p < 0.05$ ), and availability of medical consumables ( $r = 0.598$ ,  $p < 0.05$ ). All three null hypotheses were rejected. The study recommended that the National Health Insurance Authority enforce monitored HMO reimbursement timelines, that the Federal Ministry of Defence ring-fence supplementary capital allocations for military health facilities, and that a structured pharmaceutical supply management system be institutionalised at the Nigeria Military Hospital, Port Harcourt.

**Keywords:** *Enrolment; Funding Adequacy; Medical Consumables; National Health Insurance Scheme; Sustainable Healthcare Delivery*

## I. Introduction

Healthcare financing constitutes one of the most persistent governance challenges confronting developing countries, and Nigeria is no exception. Despite being Africa's largest economy by gross domestic product, out-of-pocket expenditure constitutes approximately 70 percent of total health spending, far exceeding the World Health Organisation's recommended threshold of 30 to 40 percent for sustainable health system financing (Aregbeshola & Khan, 2018). The consequence is a paradox in which economic scale coexists with severe healthcare vulnerability, as families unable to afford sudden medical bills are driven into poverty, and those who can afford care are compelled to self-insure against a risk that a well-functioning national health insurance scheme should collectively absorb.

The National Health Insurance Scheme (NHIS), formally established under Decree 35 of 1999 and operationalised in 2005, was designed to dismantle this dependency on out-of-pocket expenditure by establishing a pre-payment, risk-pooling mechanism to guarantee access to essential health services for all Nigerians. The scheme's original mandate targeted universal coverage by 2015, yet coverage remains at approximately 5 percent of the population (Eze et al., 2025), representing one of the most significant implementation gaps between health policy aspiration and operational reality on the African continent. The National Health Insurance Authority Act of 2022, which made health insurance mandatory for all Nigerian citizens and legal residents, represents a decisive legislative shift; however, translating this enhanced framework into facility-level sustainability continues to depend on dynamics that remain inadequately understood, particularly within specialised military healthcare contexts. This study therefore examines the relationship between National Health Insurance Scheme and Sustainable Healthcare Delivery in Nigerian Military Hospital, Port Harcourt, 2015-2025, with specific focus on the level of enrolment, funding adequacy for sustainability, and the availability of medical consumables as the three foundational dimensions through which NHIS implementation sustainability was assessed at the facility. The following research questions guided the study. To what extent does:

- i. The level of enrolment enhances sustainable healthcare delivery among NHIS beneficiaries at the Nigeria Military Hospital, Port Harcourt, 2015 to 2025?
- ii. Funding adequacy for sustainability enhances healthcare delivery under the NHIS framework at the Nigeria Military Hospital, Port Harcourt, 2015-2025?
- iii. The availability of medical consumables enhances sustainable healthcare delivery for NHIS beneficiaries at the Nigeria Military Hospital, Port Harcourt, 2015-2025?

The following null hypotheses were tested:

**H<sub>01</sub>:** There is no significant relationship between the level of enrolment and sustainable healthcare delivery among NHIS beneficiaries at the Nigeria Military Hospital, Port Harcourt, 2015- 2025.

**H<sub>02</sub>:** There is no significant relationship between funding adequacy for sustainability and healthcare delivery under the NHIS framework at the Nigeria Military Hospital, Port Harcourt, 2015-2025.

**H<sub>03</sub>:** There is no significant relationship between the availability of medical consumables and sustainable healthcare delivery for NHIS beneficiaries at the Nigeria Military Hospital, Port Harcourt, 2015-2025.

## II. Statement of the Problem

The operational sustainability of healthcare delivery under the NHIS at the Nigeria Military Hospital, Port Harcourt, has attracted limited systematic empirical attention notwithstanding the scheme's nearly two decades of operation. Available evidence suggests a persistent gap between NHIS coverage in principle and quality service delivery in practice, driven by a complex interaction of enrolment inadequacies, funding instability, and supply chain deficiencies that are particularly acute at the facility

level (Mgbe & Kevin, 2019; Uguru *et al.*, 2024). Three specific problem areas warrant empirical investigation. First, while the military payroll mechanism provides a structural advantage for enrolment of uniformed personnel, the civilian beneficiary population accessing the same facility faces awareness and documentation barriers that constrain enrolment, creating a dual-speed dynamic within a single facility. Second, HMO reimbursement delays, documented nationally as averaging three to six months at their worst, place pressure on the facility's operational budget that the military's supplementary allocation can mitigate but not eliminate, generating procurement uncertainty that directly affects service delivery. Third, pharmaceutical stock-outs affecting NHIS beneficiaries have been documented within the facility's internal review processes, pointing to supply chain vulnerabilities that cut across both the NHIS formulary and the military procurement channel. No prior study has examined these three dimensions in an integrated, longitudinal, facility-specific manner at any Nigerian military health facility, and this study addresses that gap directly.

### III. Theoretical Framework

- **Health Insurance Theory**

Arrow's (1963) foundational analysis of uncertainty and welfare economics in healthcare markets provides the principal theoretical anchor for the enrolment and funding dimensions of this study. Arrow demonstrated that healthcare differs fundamentally from ordinary consumer goods in two respects. First, the demand for medical care is inherently unpredictable at the individual level, creating an uninsurable personal financial risk under a purely out-of-pocket payment system. Second, information between the provider and the patient is asymmetric, with the provider possessing specialist knowledge the patient cannot independently verify. Insurance emerges as a rational social response: by pooling risks across a large population, the individual's unpredictable risk is replaced by a predictable, shared contribution. Rothschild and Stiglitz (1976) extended this framework, demonstrating formally that adverse selection undermines pooling and scheme viability unless enrolment is sufficiently broad. This directly informs this study's examination of the relationship between enrolment levels and sustainable healthcare delivery: larger, more inclusive risk pools reduce adverse selection, increase predictable revenue, and enable the facility to plan and resource service delivery more sustainably.

Health Insurance Theory also provides a direct lens for examining funding adequacy: for Arrow (1963), the insurance mechanism functions only when contributions are collected reliably and disbursed to providers in a timely manner. Delayed HMO reimbursements undermine the pre-payment logic of the scheme, effectively reverting providers to a position of absorbing costs ex-post rather than receiving pre-funded coverage for enrolled populations, directly destabilising the financial sustainability of service delivery.

- **Social Policy Theory**

Titmuss's (1958) conceptualisation of welfare provision as a social institution expressing collective solidarity, rather than a residual safety net, situates both NHIS funding adequacy and pharmaceutical consumables availability within the normative obligations of a state-sponsored social protection instrument. For Titmuss, the critical test of any welfare institution is not whether it exists in legal form but whether it is adequately, predictably, and equitably resourced to discharge its underlying social purpose, ensuring that every citizen accesses essential services as a matter of right rather than market capacity. Applied to this study, Social Policy Theory implies that delayed HMO reimbursements and persistent pharmaceutical stock-outs constitute not merely administrative inefficiencies but structural failures of the state's social contract with enrolled beneficiaries. The theory further identifies adequate pharmaceutical supply as an integral component of the healthcare access guarantee that the NHIS is mandated to provide, such that stock-outs are analytically equivalent to funding shortfalls in their effect on scheme sustainability.

#### IV. Conceptual Review

- ***National Health Insurance Scheme***

The National Health Insurance Scheme (NHIS) is a government-sponsored social health protection mechanism designed to pool the financial risks of healthcare across a defined population, replacing unpredictable out-of-pocket expenditure with pre-paid, contributory financing. Conceptually, the NHIS is grounded in Arrow's (1963) insurance theory, which establishes that risk pooling across a sufficiently large and diverse enrolment base is the precondition for scheme financial viability. The NHIS therefore encompasses three interrelated implementation dimensions that are analytically inseparable: the level of enrolment, which determines the size and composition of the risk pool; funding adequacy for sustainability, which determines whether the scheme's financial architecture delivers timely and sufficient resources to accredited facilities; and the availability of medical consumables, which determines whether financial coverage is materialised into actual treatment at the point of care.

A critical examination of how these dimensions are conceptualised in the literature, however, reveals persistent inadequacies. The enrolment literature, dominated by demand-side frameworks, consistently underweights the supply-side administrative efficiency that Kalagbor (2004) identifies as central to whether potential beneficiaries can actually access enrolment in practice. The funding adequacy literature, developed almost entirely from single-channel civilian facility contexts, offers no analytical framework for examining how the dual-channel financing structure of military hospitals, combining HMO reimbursements with supplementary Ministry of Defence allocations, affects sustainability in ways that are neither additive nor straightforward. And the consumables availability literature conflates formulary design, procurement efficiency, and supply chain delivery into an undifferentiated variable, obscuring the within-facility equity gaps that arise when military and civilian beneficiaries at the same dual-mandate facility receive differential pharmaceutical access. These conceptual gaps, individually significant, are collectively most acute at dual-mandate military healthcare facilities, the precise institutional setting this study addresses.

- ***Sustainable Healthcare Delivery***

Sustainable healthcare delivery refers to the capacity of a healthcare facility to maintain consistent, adequate, and equitable service provision to its enrolled beneficiary population over time, without structural deterioration in quality, accessibility, or financial protection. Titmuss (1958) provides the normative foundation for this concept within the NHIS context: sustainable healthcare delivery is not merely an operational achievement but a social obligation, the substantive discharge of the state's welfare contract with its citizens. A facility that nominally provides NHIS-covered services but cannot maintain adequate pharmaceutical stocks, predict its revenue stream, or ensure equitable access for all enrolled beneficiaries is not delivering sustainably, regardless of its accreditation status.

The existing conceptual literature treats sustainable healthcare delivery primarily as an output variable, measured through utilisation rates, beneficiary satisfaction, or financial protection indices, without adequately examining the institutional processes and input conditions through which sustainability is produced or undermined. This study addresses that deficit by empirically examining three foundational input conditions, enrolment, funding adequacy, and consumables availability, as institutional antecedents of sustainable healthcare delivery at the Nigeria Military Hospital, Port Harcourt, over a decade of implementation. The analytical approach adopted here reconceptualises sustainable healthcare delivery not as a static achievement but as a dynamic institutional outcome shaped by the interaction of these three input conditions within the specific structural context of a military healthcare facility, an institutional context the existing conceptual literature has not examined.

## V. Empirical Review

A systematic examination of the empirical literature on NHIS enrolment, funding adequacy, and medical consumables availability in Nigeria reveals a body of evidence that is, individually, methodologically credible but, in aggregate, characterised by three persistent limitations that together make the present study not merely additive but necessary. These limitations are: an almost exclusive focus on civilian healthcare facility contexts, a predominance of cross-sectional designs that cannot capture longitudinal implementation dynamics, and a pattern of geographic and institutional aggregation that obscures the facility-level variation most relevant to policy and management decisions.

Akande *et al.* (2011) represent the most frequently cited early study of NHIS enrolment and utilisation outcomes, documenting a 34 percent increase in healthcare utilisation at Unilorin Teaching Hospital following NHIS enrolment alongside persistent pharmaceutical availability problems affecting 56 percent of visits and reimbursement delays averaging six to eight weeks. The study's mixed-methods longitudinal design within a single tertiary institution represents a methodological strength that many later studies do not replicate. However, Akande *et al.*'s (2011) setting, a university teaching hospital with a predominantly academic-staff beneficiary population, is structurally far removed from a military hospital serving a mixed military-civilian beneficiary base, and their findings cannot be directly transferred to that context without empirical verification.

Onwujekwe *et al.* (2012), in what remains one of the most comprehensive household-level studies of NHIS financial protection, demonstrated that catastrophic health expenditure persisted even among the nominally insured, driven largely by out-of-pocket medication costs for drugs absent from the NHIS formulary. This finding is powerful evidence of the link between consumables availability and scheme financial protection performance, but its household survey methodology captures the demand-side experience of beneficiaries without examining the supply-side institutional dynamics at specific facilities that produce the stock-outs and formulary gaps those beneficiaries encounter. The study tells us that the problem exists at scale but cannot tell us how it operates within the distinct procurement architecture of a military healthcare facility.

Mgbe and Kevin (2019) represent the sole empirical study to examine NHIS implementation specifically within Nigerian military healthcare facilities, and their findings, documenting relatively strong uniformed personnel enrolment alongside drug availability gaps and HMO reimbursement challenges, provide the only directly relevant empirical baseline for the present study. Yet their cross-sectional, three-state aggregation methodology renders their findings insufficient as a basis for facility-specific policy decisions, unable to trace how dynamics evolved across the decade of policy change captured in this study, and incapable of distinguishing between the experience of a facility in Rivers State and one in Kaduna State despite the significant contextual differences between them. David *et al.* (2024) and Eze *et al.* (2025), the most recent contributions to the literature, confirm funding adequacy and reimbursement timeliness as dominant sustainability constraints nationally, but again exclusively within civilian contexts and without the longitudinal depth necessary to examine how these constraints have shifted across the decade spanning the 2022 National Health Insurance Authority Act.

The conclusion that emerges from this review is not merely that the literature contains gaps but that those gaps are patterned in a way that has left a specific type of facility, the dual-mandate military hospital with a mixed-beneficiary NHIS enrolment base, dual-channel financing, and a supplementary pharmaceutical procurement system, entirely without an empirical evidence base of its own. Policymakers at the Federal Ministry of Defence, the Nigerian Army Medical Corps, and the National Health Insurance Authority who are responsible for improving NHIS sustainability at facilities precisely of this type have been compelled to draw on civilian-facility evidence that does not map onto the institutional realities they are managing. This study is therefore not simply a contribution to an expanding literature: it is the first systematic, longitudinal, facility-specific empirical investigation of the three foundational NHIS

implementation dimensions at a Nigerian military hospital, generating evidence that is irreplaceable for evidence-informed policy at this specific and consequential institutional intersection.

## **VI. Research Methodology**

This study adopted a mixed-method correlational survey research design, combining quantitative survey methods with qualitative semi-structured interviews to provide comprehensive, triangulated insights into NHIS implementation and sustainable healthcare delivery at the Nigeria Military Hospital, Port Harcourt, between 2015 and 2025. The study population comprised 15,035 persons at the Nigeria Military Hospital, Port Harcourt, consisting of 12,000 registered NHIS beneficiaries (military personnel, their dependents, and civilian beneficiaries), 2,108 healthcare providers, and 927 administrative staff. Using Taro Yamane's (1967) formula at a 5 percent margin of error:

$$\begin{aligned} n &= N / (1 + N(e^2)) \\ &= 15,035 / (1 + 15,035(0.05^2)) \\ &= 390 \text{ respondents.} \end{aligned}$$

These were distributed across three strata through proportional stratified sampling: 310 beneficiaries, 55 healthcare providers, and 25 administrative staff.

The primary instrument was a structured questionnaire comprising 30 Likert-scale items across three construct clusters: Level of Enrolment, Funding Adequacy for Sustainability, and Availability of Medical Consumables, each scored on a 4-point scale (Strongly Agreed = 4, Agreed = 3, Disagreed = 2, Strongly Disagreed = 1). Content validity was established through expert review by three senior academics in the Department of Political Science, Rivers State University. Cronbach's Alpha reliability coefficients were 0.821, 0.807, and 0.814 respectively, all exceeding the 0.70 benchmark (Nunnally, 1978). Out of 390 questionnaires distributed, 366 were returned and found usable, representing a 93.8 percent response rate (Mugenda & Mugenda, 2003). Fifteen key informants were purposively selected for semi-structured interviews. A criterion mean of 2.50 was adopted as the decision benchmark: items with mean scores above 2.50 were regarded as agreed upon, while those below were regarded as disagreed upon. Hypothesis testing utilised PPMC at the 0.05 significance level (two-tailed) using SPSS version 25.0. Interview transcripts were analysed using Braun and Clarke's (2006) six-phase thematic content analysis framework.

## **VII. Data Presentation and Analysis**

### **• Level of Enrolment and Sustainable Healthcare Delivery**

Research Question 1: To what extent does the level of enrolment enhance sustainable healthcare delivery among NHIS beneficiaries at the Nigeria Military Hospital, Port Harcourt?



**Table 1: Mean Ratings on Level of Enrolment and Sustainable Healthcare Delivery (n = 366)**

| S/N | Item                                                                                                         | Mean | Remark |
|-----|--------------------------------------------------------------------------------------------------------------|------|--------|
| 1.  | The enrolment process adequately captures both military and civilian benefic                                 | 3.08 | Agreed |
| 2.  | Enrolment levels have improved significantly between 2015 and 2025.                                          | 3.28 | Agreed |
| 3.  | There is adequate awareness about NHIS enrolment procedures among potential beneficiaries.                   | 2.78 | Agreed |
| 4.  | The hospital maintains accurate and up-to-date enrolment statistics.                                         | 2.96 | Agreed |
| 5.  | High enrolment levels contribute directly to sustainable healthcare delivery at this facility.               | 3.27 | Agreed |
| 6.  | There is a direct positive relationship between enrolment level and quality of healthcare services received. | 3.29 | Agreed |
| 7.  | The payroll-based enrolment mechanism for military personnel ensures consistent premium contributions.       | 3.22 | Agreed |
| 8.  | Civilian NHIS beneficiaries face significant barriers to enrolment at this facil                             | 3.04 | Agreed |
| 9.  | The hospital's enrolment figures are accurately reported to the NHIA on a regular basis.                     | 2.88 | Agreed |
| 10. | Enrolment growth over the decade has enhanced the financial viability of NHIS operations at this facility.   | 3.18 | Agreed |

Source: Field Survey, 2026. Criterion Mean = 2.50

All ten items recorded mean scores above the criterion mean of 2.50, confirming strong respondent agreement that enrolment levels expanded substantially over the study period and bear a positive relationship with sustainable healthcare delivery. Item 6 recorded the highest mean (3.29), affirming a direct positive relationship between enrolment level and quality of services received, while awareness of enrolment procedures among potential civilian beneficiaries (item 3) recorded the lowest mean (2.78). The grand mean for this construct was 3.10. The qualitative findings corroborated these patterns. The NHIS Coordinator confirmed that the enrolment register grew from approximately five to six thousand beneficiaries in 2016 to over fourteen thousand by 2024, attributing the growth principally to the payroll-linked enrolment of military families (NHIS Coordinator, personal communication, 2026). The Hospital Administrator noted that many civilian beneficiaries were unaware of their eligibility or were deterred by documentation requirements at the HMO end, a finding consistent with Kalagbor's (2004) argument that administrative capacity gaps at the facility-HMO interface constitute a structural enrolment barrier. A Senior Medical Officer linked enrolment growth directly to sustainability: "when more people enrol, the capitation payments we receive become more predictable, which makes planning and stocking easier" (Senior Medical Officer, personal communication, 2026).

## Test of Hypothesis One

**H<sub>0</sub>:** There is no significant relationship between the level of enrolment and sustainable healthcare delivery among NHIS beneficiaries at the Nigeria Military Hospital, Port Harcourt.

**Table 2: PPMC Analysis of Level of Enrolment and Sustainable Healthcare Delivery**

|                                        |       |        |
|----------------------------------------|-------|--------|
| Level of Enrolment Pearson Correlation | 1.000 | .614** |
| Sig. (2-tailed)                        | —     | .000   |
| N                                      | 366   | 366    |

\*\*Correlation is significant at the 0.05 level (2-tailed). Source: SPSS Output, 2026

The PPMC analysis reveals a moderate-to-strong positive correlation ( $r = 0.614$ ,  $p = 0.000 < 0.05$ ,  $n = 366$ ). Since  $p < 0.05$ ,  $H_{01}$  is rejected. There is a statistically significant positive relationship between the level of enrolment and sustainable healthcare delivery among NHIS beneficiaries at the Nigeria Military Hospital, Port Harcourt. The coefficient of determination ( $r^2 = 0.377$ ) indicates that enrolment level accounts for approximately 37.7 percent of the variance in sustainable healthcare delivery outcomes.

## • *Funding Adequacy for Sustainability and Healthcare Delivery*

Research Question 2: To what extent does funding adequacy for sustainability enhance healthcare delivery under the NHIS framework at the Nigeria Military Hospital, Port Harcourt?

**Table 3: Mean Ratings on Funding Adequacy for Sustainability and Healthcare Delivery (n = 366)**

| S/N | Item                                                                                                   | Mean | Remark |
|-----|--------------------------------------------------------------------------------------------------------|------|--------|
| 1.  | NHIS funding received by this hospital is adequate for service delivery needs.                         | 2.67 | Agreed |
| 2.  | The hospital receives timely reimbursements from HMOs for services rendered to beneficiaries.          | 2.53 | Agreed |
| 3.  | NHIS funding levels have improved significantly between 2015 and 2025.                                 | 2.99 | Agreed |
| 4.  | Financial planning mechanisms within the hospital ensure sustainable NHIS resource utilisation.        | 2.73 | Agreed |
| 5.  | Financial constraints under the NHIS directly limit the quality of healthcare services provided.       | 3.15 | Agreed |
| 6.  | The hospital's financial sustainability has improved since implementing the NHIS framework.            | 2.83 | Agreed |
| 7.  | The supplementary military budget allocation adequately covers gaps in NHIS reimbursements.            | 2.61 | Agreed |
| 8.  | HMO capitation rates under NHIS are sufficient to cover the actual cost of services delivered.         | 2.55 | Agreed |
| 9.  | There are effective mechanisms to manage and report NHIS-related expenditures at this facility.        | 2.79 | Agreed |
| 10. | Delayed reimbursements negatively affect the hospital's ability to procure essential medical supplies. | 3.09 | Agreed |

Source: Field Survey, 2026. Criterion Mean = 2.50

All ten items fell above the criterion mean of 2.50, confirming overall agreement that funding adequacy is positively associated with sustainable healthcare delivery. The item affirming that financial constraints directly limit service quality (item 5) recorded the highest mean (3.15), while the timeliness of HMO reimbursements (item 2) recorded the lowest mean (2.53), the weakest sub-component within any construct across the entire study. The grand mean for this construct was 2.79. The Finance Officer disclosed in interview that reimbursement delays of four to six months at their worst placed acute pressure on the facility's procurement cycle, noting that "the military budget provides a buffer that civilian public hospitals do not have, but it is not unlimited and is not meant to substitute permanently for NHIS reimbursements" (Finance Officer, personal communication, 2026). The NHIS Coordinator acknowledged incremental improvement following the 2022 Act but noted that capitation amounts rarely cover the full cost of specialist consultations (NHIS Coordinator, personal communication, 2026).



## Test of Hypothesis Two

Ho<sub>2</sub>: There is no significant relationship between funding adequacy for sustainability and healthcare delivery under the NHIS framework at the Nigeria Military Hospital, Port Harcourt.

**Table 4: PPMC Analysis of Funding Adequacy and Sustainable Healthcare Delivery**

|                                                         |       |        |
|---------------------------------------------------------|-------|--------|
| Funding Adequacy for Sustainability Pearson Correlation | 1.000 | .579** |
| Sig. (2-tailed)                                         | —     | .000   |
| N                                                       | 366   | 366    |

\*\*Correlation is significant at the 0.05 level (2-tailed). Source: SPSS Output, 2026

The PPMC analysis reveals a moderate positive correlation ( $r = 0.579$ ,  $p = 0.000 < 0.05$ ,  $n = 366$ ). Since  $p < 0.05$ , Ho<sub>2</sub> is rejected. There is a statistically significant positive relationship between funding adequacy for sustainability and healthcare delivery under the NHIS framework at the Nigeria Military Hospital, Port Harcourt. The coefficient of determination ( $r^2 = 0.335$ ) indicates that funding adequacy accounts for approximately 33.5 percent of the variance in sustainable healthcare delivery outcomes, the weakest explanatory proportion among the three variables, reflecting that funding is a necessary but not sufficient condition for sustainability.

### • Availability of Medical Consumables and Sustainable Healthcare Delivery

Research Question 3: To what extent does the availability of medical consumables enhance sustainable healthcare delivery for NHIS beneficiaries at the Nigeria Military Hospital, Port Harcourt?

**Table 5: Mean Ratings on Availability of Medical Consumables and Sustainable Healthcare Delivery (n = 366)**

| S/N | Item                                                                                          | Mean | Remark |
|-----|-----------------------------------------------------------------------------------------------|------|--------|
| 1.  | Essential drugs prescribed under NHIS are consistently available at the hospital pharmacy.    | 2.74 | Agreed |
| 2.  | There are frequent stock-outs of essential medications for NHIS patients at this facility     | 3.17 | Agreed |
| 3.  | Availability of medical consumables has improved significantly between 2015 and 20.           | 3.02 | Agreed |
| 4.  | NHIS patients regularly experience delays in receiving medications due to unavailability.     | 3.12 | Agreed |
| 5.  | The quality of drugs and medical supplies provided to NHIS beneficiaries is satisfactory.     | 2.85 | Agreed |
| 6.  | Medical consumables availability is better for military than for civilian NHIS beneficiaries. | 2.94 | Agreed |
| 7.  | The hospital has adequate storage and cold-chain facilities for NHIS pharmaceutical supplies. | 2.68 | Agreed |
| 8.  | The NHIS drug formulary adequately covers the essential medication needs of beneficiaries.    | 2.59 | Agreed |
| 9.  | Procurement cycles for NHIS pharmaceutical supplies are efficient and timely.                 | 2.71 | Agreed |
| 10. | Military supply chain channels supplement NHIS pharmaceutical procurement effectively.        | 3.06 | Agreed |

Source: Field Survey, 2026. Criterion Mean = 2.50

All ten items recorded mean scores above the criterion mean. Frequent stock-outs of essential medications (item 2, mean = 3.17) and patient delays in receiving medications (item 4, mean = 3.12) recorded the highest means, confirming that pharmaceutical supply gaps remained the most acutely felt dimension of this construct. The NHIS drug formulary coverage (item 8, mean = 2.59) and procurement efficiency (item 9, mean = 2.71) recorded the lowest means within the construct, identifying formulary design and procurement timeliness as the sub-dimensions most urgently requiring institutional reform. The grand mean was 2.89. The Head of Pharmacy described a dual-track arrangement in which military procurement channels supplemented the NHIS formulary for uniformed personnel, while civilian beneficiaries had no access to this supplementary channel, generating an equity gap confirmed by item 6 (mean = 2.94) (Head of Pharmacy, personal communication, 2026). The Hospital Administrator acknowledged this gap as a policy matter requiring resolution at the Ministry of Defence and NHIA levels (Hospital Administrator, personal communication, 2026).

### Test of Hypothesis Three

Ho<sub>3</sub>: There is no significant relationship between the availability of medical consumables and sustainable healthcare delivery for NHIS beneficiaries at the Nigeria Military Hospital, Port Harcourt.

**Table 6: PPMC Analysis of Availability of Medical Consumables and Sustainable Healthcare Delivery**

|                                                         |       |        |
|---------------------------------------------------------|-------|--------|
| Availability of Medical Consumables Pearson Correlation | 1.000 | .598** |
| Sig. (2-tailed)                                         | —     | .000   |
| N                                                       | 366   | 366    |

\*\*Correlation is significant at the 0.05 level (2-tailed). Source: SPSS Output, 2026

The PPMC analysis reveals a moderate positive correlation ( $r = 0.598$ ,  $p = 0.000 < 0.05$ ,  $n = 366$ ). Since  $p < 0.05$ , Ho<sub>3</sub> is rejected. There is a statistically significant positive relationship between the availability of medical consumables and sustainable healthcare delivery for NHIS beneficiaries at the Nigeria Military Hospital, Port Harcourt. The coefficient of determination ( $r^2 = 0.358$ ) indicates that medical consumables availability accounts for approximately 35.8 percent of the variance in sustainable healthcare delivery outcomes.

## VIII. Discussion of Findings

### • Level of Enrolment and Sustainable Healthcare Delivery

The finding that enrolment levels improved substantially and demonstrated a significant positive relationship with sustainable healthcare delivery ( $r = 0.614$ ,  $p = 0.000$ ) directly validates the theoretical predictions of Arrow (1963) and Rothschild and Stiglitz (1976) regarding risk pooling: larger, more inclusive enrolment bases generate more predictable capitation revenue streams, reduce adverse selection, and enable more sustainable facility-level planning. This finding is consistent with Akande et al. (2011), who documented that NHIS enrolment significantly improved healthcare utilisation at Unilorin Teaching Hospital, and with Mgbe and Kevin (2019), whose cross-facility military health study similarly documented strong enrolment alongside persistent service gaps. The persistent civilian enrolment gap identified mirrors the national pattern of Aregbeshola and Khan (2018), while Kalagbor's (2004) institutional perspective enriches this explanation by identifying administrative capacity at the facility-HMO nexus as a structural supply-side barrier that awareness campaigns alone cannot resolve.

- ***Funding Adequacy and Healthcare Delivery***

The funding adequacy findings ( $r = 0.579$ ,  $p = 0.000$ ) confirm Titmuss's (1958) normative framework: predictable, adequate funding is a precondition for the state to discharge its social protection obligations to enrolled beneficiaries. The persistence of HMO reimbursement delays mirrors the national pattern documented by Eze et al. (2025), who found reimbursement delays averaging three to six months across facilities nationally. David et al. (2024) and Ly et al. (2022) corroborate that funding adequacy and reimbursement timeliness are the dominant structural determinants of NHIS facility-level sustainability, findings this study replicates and confirms in the military hospital context. The military supplementary budget allocation emerges as a partial but insufficient structural compensator for NHIS funding shortfalls, providing a floor beneath which service delivery cannot fall but not guaranteeing the predictability necessary for full sustainability.

- ***Medical Consumables and Healthcare Delivery***

The medical consumables findings ( $r = 0.598$ ,  $p = 0.000$ ) corroborate Uguru et al. (2024), who documented a 35 percent national essential medication stock-out rate, and Onwujekwe et al. (2012), who demonstrated that stock-outs generated out-of-pocket expenditure even for nominally insured NHIS beneficiaries. These findings are consistent with Social Policy Theory's contention that the state's welfare obligation extends to ensuring the material resources through which healthcare access is exercised, not merely the nominal financial coverage (Titmuss, 1958). The dual-track supply arrangement identified at the Nigeria Military Hospital, while a pragmatic institutional adaptation, represents an equity gap whose resolution requires formal policy integration of military and NHIS pharmaceutical procurement systems.

## **IX. Conclusion**

This study provides robust empirical and qualitative evidence that the level of enrolment, funding adequacy for sustainability, and availability of medical consumables each bear statistically significant positive relationships with sustainable healthcare delivery under the NHIS at the Nigeria Military Hospital, Port Harcourt, between 2015 and 2025. Enrolment growth, driven principally by the captive military payroll mechanism, more than doubled the beneficiary base over the decade, confirming that larger risk pools support more sustainable facility-level NHIS operations. Funding adequacy remained constrained by HMO reimbursement delays of up to six months at their worst, a structural weakness the hospital's supplementary military budget could mitigate but not fully absorb. The availability of medical consumables improved over the study period but remained subject to recurrent stock-outs and an equity gap in dual-track access between military and civilian beneficiaries. All three null hypotheses were rejected. The study contributes the NHIS Sustainability Assessment Framework as a conceptual innovation for evaluating NHIS implementation in specialised military healthcare contexts.

## **X. Recommendations**

Based on the findings, the following recommendations are made:

- i. The National Health Insurance Authority should enforce strictly monitored HMO reimbursement timelines for all accredited providers, with graduated financial penalties for delays exceeding thirty calendar days and a real-time reimbursement monitoring portal accessible to facility finance officers, directly addressing the critical deficiency in reimbursement timeliness identified as the weakest funding sub-component in this study.
- ii. The Federal Ministry of Defence should enact a ring-fenced, annually reviewed capital allocation for military healthcare facilities to bridge financing gaps during periods of HMO payment delay, formally classified as an NHIS supplementary financing mechanism with transparent accounting and NHIA oversight, and should simultaneously initiate a targeted civilian NHIS enrolment

campaign within the hospital's Port Harcourt catchment communities to close the civilian awareness and documentation gap.

- iii. The Nigerian Army Medical Corps, in collaboration with the National Health Insurance Authority, should institutionalise a structured pharmaceutical supply management system at the Nigeria Military Hospital incorporating minimum stock-level triggers, a 72-hour emergency procurement protocol, and a formal policy framework for equitably integrating military and NHIS pharmaceutical procurement channels to eliminate the differential consumables access between military and civilian NHIS beneficiaries documented in this study.

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