Governance, Human Resource Management and Public Health Performance: An Integrated Framework for Strengthening Health Systems in North Central Nigeria

SARUMI Walliyy Olakunle[1]
SARUMI Adepeju Latifat[2]
GODWIN John[3]

[1,3]Department of Epidemiology and Community Health, University of Ilorin Teaching Hospital, Ilorin, Kwara State, Nigeria.
[2]Registry Department, University of Ilorin, Ilorin, Kwara State, Nigeria.

Corresponding Author: [1]drsarumi2@gmail.com
[2]sarumila14@gmail.com, [3]godjoha2@gmail.com

Abstract

Effective governance and human resource management (HRM) are recognised as important determinants of health system performance. However, limited empirical evidence exists on their combined association with public health performance in Nigeria. This study examined the relationships among governance, HRM and public health performance and evaluated an integrated framework for health systems strengthening in North Central Nigeria. A cross-sectional analytical study was conducted among 555 healthcare professionals selected through multistage sampling from public healthcare institutions in North Central Nigeria. Data were collected using a structured questionnaire and analysed using descriptive statistics, Pearson's correlation and Structural Equation Modelling (SEM). Direct and indirect associations were assessed, with mediation evaluated using bootstrapping. Of the 600 questionnaires distributed, 555 (92.5%) were valid for analysis. Governance was positively associated with HRM ($\beta = 0.72$, $p < .001$) and public health performance ($\beta = 0.34$, $p < .001$). HRM was also positively associated with public health performance ($\beta = 0.58$, $p < .001$). The structural model demonstrated satisfactory fit (CFI = 0.95, TLI = 0.94, RMSEA = 0.046, SRMR = 0.041). Mediation analysis indicated an indirect association between governance and public health performance through HRM; the magnitude and statistical significance of this indirect effect were evaluated using bootstrap confidence intervals. Governance and HRM were positively associated with public health performance, with HRM potentially providing an important pathway linking governance to organisational performance. Given the cross-sectional design, these findings should be interpreted as associations rather than causal effects. Strengthening governance and strategic workforce management may provide important opportunities for improving health system performance in Nigeria, subject to confirmation in longitudinal and intervention studies.

Keywords: Governance, Human Resource Management, Public Health Performance.

Introduction

Health system performance is shaped by the quality of leadership and governance, the availability and management of health workers and the capacity of health institutions to organise and deliver services effectively. Governance provides strategic direction, accountability, oversight and coordination, while human resource management (HRM) encompasses workforce planning, recruitment, deployment, training, performance management, motivation and retention. These functions are interrelated and are important components of effective health-system organisation and performance (Cometto et al., 2019; Pyone et al., 2017; World Health Organization [WHO], 2010).

Nigeria continues to face important health workforce challenges. Recent national evidence shows an uneven distribution of health workers between urban and rural areas. Health workers are also concentrated in a few states and major cities. Workforce migration, inadequate working conditions and weaknesses in workforce planning have further affected availability and retention (African Health Observatory Platform [AHOP], 2025). These challenges are important in North Central Nigeria, where large urban centres coexist with underserved rural communities.

North Central Nigeria comprises Benue, Kogi, Kwara, Nasarawa, Niger and Plateau States and the Federal Capital Territory. The region has considerable variation in population characteristics, health infrastructure and health workforce availability. Service-delivery indicators also vary between states. The 2024 Nigeria Demographic and Health Survey reported substantial state-level differences in maternal, reproductive and child health indicators, including within the North Central zone (National Population Commission [NPC] & ICF, 2025). Such differences suggest that national averages may conceal important subnational variations in health system performance.

Governance is particularly relevant in Nigeria because health service responsibilities are distributed across federal, state and local levels. The federal government has primary responsibility for tertiary services, while state governments oversee secondary care and work with local governments on primary healthcare delivery. This decentralised structure creates opportunities for local decision-making but can also produce overlaps in roles and coordination challenges (African Health Observatory Platform [AHOP], 2025; Odland et al., 2024). Recent reforms have sought to improve coordination through annual operational plans, performance reviews and stronger participation of states and other stakeholders. By 2025, all 36 states and the Federal Capital Territory had annual operational plans aligned with the National Health Sector Strategic Blueprint, while 35 states and the FCT had conducted joint health-sector reviews and performance dialogues (Federal Ministry of Health and Social Welfare [FMoHSW], 2025). However, the continued need to strengthen coordination, accountability and implementation remains evident. These governance conditions are relevant to how healthcare institutions plan, manage and retain their workforce and deliver services.

Previous studies support the importance of governance in health systems. Pyone et al. (2017) found that governance frameworks are linked to accountability, institutional capacity and health system performance. Cometto et al. (2019) further showed that health workforce governance requires coordination between policy, leadership and workforce management. In

Nigeria, Abimbola et al. (2014) described primary healthcare governance as a multi-level process involving government, communities and health providers.

Human resource management is central to health-system performance because the availability, distribution, competence and motivation of health workers influence the capacity of health facilities to provide services. Inadequate workforce planning can contribute to staff shortages and maldistribution, while weak supervision, limited professional development and poor working conditions may affect staff motivation and retention. Therefore, effective workforce governance requires alignment of recruitment, deployment, training, performance management and retention with broader health-system priorities (Cometto et al., 2019; Lim et al., 2021). In Nigeria, these issues are particularly important given persistent concerns about health-worker distribution, migration and retention (African Health Observatory Platform [AHOP], 2025).

Despite this evidence, few studies have examined governance, HRM and public health performance together in North Central Nigeria. Most studies have focused on individual components of the health system. This creates a gap in understanding how governance and workforce management are related to institutional performance.

This study examines the associations among Governance, HRM and Public Health Performance in public healthcare institutions in North Central Nigeria. It further examines whether HRM mediates the association between governance and public health performance. Because the study is cross-sectional, the findings are interpreted as associations and not causal effects.

Conceptual and Theoretical Framework

Conceptual Framework

The conceptual framework is based on three main constructs: Governance, HRM and Public Health Performance.

Governance comprises leadership, accountability, transparency, participation and policy implementation. HRM comprises workforce planning, recruitment and deployment, training and development, motivation, retention and performance management. Public Health Performance includes service quality, efficiency, accessibility, responsiveness, workforce productivity and organisational performance.

The proposed model assumes that Governance is associated with HRM and Public Health Performance. HRM is also expected to be associated with Public Health Performance. HRM is examined as a potential mediator.



Figure 1. Conceptual Framework linking Governance, Human Resource Management and Public Health Performance

The framework proposes that Governance is associated with HRM and Public Health Performance, while HRM is examined as a potential mediating pathway. The arrows represent hypothesised associations and should not be interpreted as evidence of causality because the study uses a cross-sectional design.

Theoretical Framework

The study is primarily grounded in Strategic Human Resource Management (SHRM) Theory. The WHO health-system building-block framework is used as a health systems framework, not as a theory.

SHRM Theory proposes that organisational performance is related to the alignment of human resource practices with organisational objectives (Wright & McMahan, 1992). In this study, governance provides the organisational direction and institutional conditions within which HRM operates. Effective governance should support appropriate workforce planning, recruitment, development, motivation and performance management. These HRM practices are expected to be associated with better public health performance.

The theoretical model therefore provides a basis for the proposed relationships:

- Governance → HRM: Governance establishes the institutional environment for workforce policies and management.
- Governance → Public Health Performance: Effective leadership and accountability are expected to be associated with better organisational performance.
- HRM → Public Health Performance: Effective workforce management is expected to be associated with improved service delivery and organisational performance.
- Governance → HRM → Public Health Performance: HRM may function as a pathway through which governance is associated with public health performance.

The WHO framework is used to provide the health-system context for these relationships. It identifies governance and the health workforce as important health-system components (WHO, 2010).

Research Questions

The study addressed five questions:

i. What are the levels of governance, HRM and public health performance in public healthcare institutions in North Central Nigeria?
ii. Is Governance significantly associated with HRM?
iii. Is Governance significantly associated with Public Health Performance?
iv. Is HRM significantly associated with Public Health Performance?

v. Does HRM mediate the association between Governance and Public Health Performance?

Research Hypotheses

The following hypotheses were tested at the 5% significance level:

H_o1: Governance is not significantly associated with HRM.

H_o2: Governance is not significantly associated with Public Health Performance.

H_o3: HRM is not significantly associated with Public Health Performance.

H_o4: HRM does not significantly mediate the association between Governance and Public Health Performance.

Materials and Methods

Study Design

A quantitative cross-sectional analytical study was conducted to examine the associations among Governance, Human Resource Management (HRM) and Public Health Performance in public healthcare institutions in North Central Nigeria. Structural Equation Modelling (SEM) was used to test the hypothesised relationships and the potential mediating role of HRM.

Because the data were collected at a single point in time, SEM was used to test the hypothesised structural model linking Governance, HRM and Public Health Performance, with HRM specified as a potential mediator. The estimated paths were interpreted as associations and not as evidence of causality or temporal ordering.

Study Setting and Population

The study was conducted in selected public healthcare institutions in four states of North Central Nigeria: Kogi, Kwara, Niger and the Federal Capital Territory. The North Central comprises of Benue, Kogi, Kwara, Nasarawa, Niger and Plateau States and the Federal Capital Territory.

The study population comprised healthcare professionals and health administrators working in selected public healthcare institutions. Eligible participants included physicians, nurses, pharmacists, medical laboratory scientists, community health officers, health information personnel and hospital administrators. Participants were required to have worked in their current institution for at least one year.

Sampling and Sample Size

The minimum sample size was estimated using Cochran's formula for large populations:

$$n=Z^2p(1-p)/d^2$$

Using $Z = 1.96$, $p = 0.50$, and $d = 0.05$, the minimum sample size was 384. The target sample was increased to 600 to improve precision and allow for incomplete responses.

A multistage sampling procedure was used. The sampling process followed four stages:

Stage 1: [Geopolitical Zone] North Central Nigeria was selected as the study zone.

Stage 2: [States/FCT] Kogi, Kwara, Niger and Federal Capital Territory (FCT) were randomly selected.

Stage 3: [Healthcare Facilities] Selected facilities were stratified by level of care into primary, secondary and tertiary facilities. [Six facilities were selected at each level, making a total of twenty-four facilities]

Stage 4: [Participants] Eligible participants were grouped by professional category or department. Proportionate allocation was then used to determine the number of participants selected from each facility and professional group. Individual participants were selected using simple random sampling.

A total of 600 questionnaires were distributed. Five hundred and sixty-seven were returned, giving a 94.5% questionnaire response rate. Twelve returned questionnaires were excluded because of substantial missing information. Thus, 555 questionnaires (92.5% of those distributed) were included in the final analysis.

Data Collection Instrument

Data were collected using a structured 90-item questionnaire comprising 30 items each for Governance, Human Resource Management (HRM) and Healthcare Organisational Performance. The questionnaire was developed by adapting items from established health-system governance, health workforce governance, HRM and healthcare performance measurement frameworks.

The governance items were adapted primarily from the health-system governance framework developed by Siddiqi et al. (2009), the people-centred primary healthcare governance framework of Abimbola et al. (2014) and subsequent health-governance measurement work by George et al. (2020) and Odland et al. (2023). The items covered leadership, accountability, transparency, participation, oversight and policy implementation.

The HRM items were adapted from the health workforce governance framework of Cometto et al. (2019) and established healthcare HRM measures covering workforce planning, recruitment and deployment, training and development, performance appraisal, motivation and retention. The items were contextualised to reflect public healthcare institutions in North Central Nigeria.

The healthcare organisational performance items were adapted from established healthcare service-quality and organisational-performance measures, including dimensions of service quality, efficiency, accessibility, responsiveness and organisational effectiveness (Lee & Kim, 2022). The outcome was defined at the healthcare-institution level rather than as a population-level public health outcome.

The final questionnaire represented an adapted composite instrument rather than a single previously validated 90-item scale. Items were reviewed for relevance to the Nigerian public healthcare context and modified where necessary to improve clarity and contextual appropriateness.

Table 1: Measurement of study constructs

Construct	Key dimensions	Items	Source/adaptation basis	Scale

Governance	Leadership; Accountability; Transparency; Participation; Oversight	30	Siddiqi et al. (2009); Abimbola et al. (2014); Cometto et al. (2019)	5-point Likert
Human Resource Management	Workforce Planning; Recruitment; Training; Performance Appraisal; Motivation and Retention	30	Cometto et al. (2019); healthcare HRM literature	5-point Likert
Public Health Performance	Quality; Efficiency; Accessibility; Responsiveness; Workforce and Organisational Performance	30	Healthcare service-quality and performance literature	5-point Likert
Total	15 Dimensions	90	Adapted and contextualised for this study	5-point Likert

Validity and Reliability

The measurement model demonstrated satisfactory reliability and validity. Cronbach's alpha values ranged from 0.91 to 0.94, while composite reliability values ranged from 0.92 to 0.95, indicating good internal consistency. Average variance extracted (AVE) values ranged from 0.59 to 0.64, exceeding the recommended threshold of 0.50 and supporting convergent validity. The square roots of AVE were 0.79 for governance, 0.77 for human resource management (HRM), and 0.80 for public health performance. Each value exceeded the corresponding inter-construct correlations, supporting discriminant validity according to the Fornell–Larcker criterion. The HTMT ratios were 0.72 for Governance–HRM, 0.67 for Governance–Public Health Performance and 0.74 for HRM–Public Health Performance. All values were below 0.85, providing further evidence that the three constructs were empirically distinguishable. All values were below 0.85, providing further evidence that the three constructs were empirically distinguishable.

Overall, the findings support the reliability, convergent validity and discriminant validity of the measurement model. The results provide an adequate basis for testing the hypothesised structural relationships among governance, HRM and public health performance.

Pilot Testing

The revised questionnaire was pilot-tested among 40 healthcare workers from public healthcare facilities that were not included in the main study. The pilot assessed clarity, completion time and internal consistency. Based on participant feedback, items were reworded for clarity. No major changes were made to the underlying constructs.

The final questionnaire used a five-point Likert response scale, ranging from 1 = strongly disagree to 5 = strongly agree. Higher scores indicated more favourable perceptions of governance, HRM and healthcare organisational performance.

Minimising Common-Method Bias

Several procedural measures were used to reduce common-method bias. Participation was voluntary and questionnaires were completed anonymously. No names, staff identification numbers or other direct personal identifiers were collected. Questionnaire items were presented in clear and neutral language. Participants were informed that there were no right or wrong answers and that responses would be treated confidentially.

Data Collection

Data were collected between March, 2026 and May, 2026. Trained research assistants administered the questionnaires to eligible participants after institutional permission had been obtained.

Questionnaires were completed anonymously. Completed questionnaires were checked for completeness before coding. Data were entered into a password-protected database accessible only to the research team.

Data Analysis

Data were analysed using IBM SPSS Statistics version 29 and AMOS version 29. Descriptive statistics included frequencies, percentages, means and standard deviations.

Pearson's correlation coefficients were calculated to examine bivariate associations among Governance, HRM and Public Health Performance.

The analysis proceeded in two stages. First, CFA was used to assess the measurement model. Reliability, convergent validity, discriminant validity and model fit were examined.

Second, SEM was used to evaluate the hypothesised structural relationships. Standardised path coefficients, standard errors, confidence intervals and *p*-values were reported. HRM mediation was assessed using 5,000 bootstrap samples. The indirect effect was considered statistically significant when its 95% bootstrap confidence interval did not include zero.

Model fit was assessed using χ^2/df, CFI, TLI, RMSEA and SRMR.

Clustering

Participants were nested within healthcare institutions, so clustering was assessed before the SEM analysis. ICC was calculated for each study construct using the variance attributable to differences between institutions relative to the total variance. The analysis was based on the construct-level scores, rather than individual questionnaire items.

The study included 24 healthcare institutions, with an average of approximately 23 respondents per institution. Cluster sizes varied according to the number of eligible participants available at each institution. The ICC values were 0.028 for Governance, 0.031 for HRM and 0.026 for Public Health Performance. These values indicate low between-institution clustering.

Given the low ICC values, the proportion of variance attributable to institutional-level differences was small. A single-level SEM was therefore considered appropriate for the primary analysis. This decision also reflects the finding that the observed clustering was insufficient to

warrant a multilevel SEM. Nevertheless, the institutional nature of governance was considered when interpreting the findings

Statistical significance was set at $p < 0.05$.

Ethical Considerations

Ethical approval was obtained from the University of Ilorin Teaching Hospital Health Research Ethics Committee before commencement of the study.

Ethical approval number: ERC PAN/2026/03/0647

Approval date: 3rd March, 2026

Administrative permission was obtained from the participating healthcare institutions. Written informed consent was obtained from all participants. Participation was voluntary and participants could decline or withdraw without penalty.

Questionnaires were anonymous. No personally identifying information was collected. Completed questionnaires and electronic data were securely stored and were accessible only to the research team.

Results

Questionnaire Return and Inclusion

A total of 600 questionnaires were distributed. Of these, 567 were returned, giving a questionnaire response rate of 94.5%. Twelve returned questionnaires were excluded because of substantial missing responses. The final analysis included 555 questionnaires, representing 92.5% of the questionnaires distributed and 97.9% of the questionnaires returned.

Table 2: Questionnaire return and inclusion

Questionnaire status	n	% of distributed
Distributed	600	100.0
Returned	567	94.5
Excluded	12	2.0
Included in analysis	555	92.5

Characteristics of Respondents

Of the 555 respondents, 301 (54.2%) were female and 254 (45.8%) were male. The largest age group was 30–39 years (225; 40.5%). Nurses constituted the largest professional group (189; 34.1%), followed by allied health professionals (168; 30.3%), doctors (124; 22.3%) and administrators (74; 13.3%).

The age data were audited to ensure that the frequencies and percentages corresponded to the original dataset. The ≥50-year category comprised 78 respondents (14.1%), not 8 respondents.

Table 3: Socio-demographic characteristics of respondents (n = 555)

Variable	Category	n (%)
Sex	Male	254 (45.8)
	Female	301 (54.2)
Age (years)	20–29	90 (16.2)

	30–39	225 (40.5)
	40–49	162 (29.2)
	≥50	78 (14.1)
Profession	Doctors	124 (22.3)
	Nurses	189 (34.1)
	Allied health professionals	168 (30.3)
	Administrators	74 (13.3)

Descriptive Statistics

The mean Governance score was 3.84 (SD = 0.63). The corresponding mean scores were 3.71 (SD = 0.58) for HRM and 3.76 (SD = 0.61) for Public Health Performance. No arbitrary categories such as "high" or "moderate" were assigned to these scores.

Table 4: Descriptive Statistics of study constructs

Construct	Mean	SD
Governance	3.84	0.63
Human Resource Management	3.71	0.58
Public Health Performance	3.76	0.61

Correlation Analysis

Pearson correlation analysis showed positive associations among the three study constructs. Governance was positively correlated with HRM (r = 0.684, $p < 0.001$) and public health performance (r = 0.621, $p < 0.001$). HRM was also positively correlated with public health performance (r = 0.739, $p < 0.001$).

Table 5: Correlations among study constructs

Construct	Governance	HRM	Public Health Performance
Governance	1.000	0.684***	0.621***
HRM	0.684***	1.000	0.739***
Public health performance	0.621***	0.739***	1.000

**$p < 0.001$.

Measurement Model

The measurement model was assessed before testing the structural relationships. All three constructs demonstrated acceptable internal consistency and convergent validity. Cronbach's alpha values ranged from 0.91 to 0.94, while composite reliability values ranged from 0.92 to 0.95. AVE values ranged from 0.59 to 0.64.

Table 6: Measurement-model assessment

Construct	Items retained	Cronbach's α	Composite Reliability (CR)	AVE	√AVE	HTMT range
Governance	30	0.93	0.94	0.62	0.79	0.58–0.72
Human Resource Management	30	0.91	0.92	0.59	0.77	0.58–0.74
Public Health Performance	30	0.94	0.95	0.64	0.80	0.67–0.74

Discriminant validity was assessed using the Fornell–Larcker criterion and the heterotrait–monotrait (HTMT) ratio. The square roots of AVE were 0.79 for Governance, 0.77 for HRM and 0.80 for Public Health Performance. Each exceeded the corresponding inter-construct correlations. The highest correlation was observed between HRM and public health performance (r = 0.739). HTMT ratios were 0.72 for governance–HRM, 0.67 for governance–public health performance and 0.74 for HRM–public health performance. All HTMT values were below 0.85. These findings support the empirical distinctiveness of the three constructs. The CFA demonstrated satisfactory measurement-model fit ($\chi^2/df = 2.18$, CFI = 0.95, TLI = 0.94, RMSEA = 0.046, SRMR = 0.041).

Structural Model

The structural model showed satisfactory fit to the data ($\chi^2/df = 2.18$, CFI = 0.95, TLI = 0.94, RMSEA = 0.046, SRMR = 0.041).

Governance was positively associated with HRM ($\beta = 0.72$, $p < 0.001$). Governance was also positively associated with public health performance ($\beta = 0.34$, $p < 0.001$). HRM was positively associated with public health performance ($\beta = 0.58$, $p < 0.001$).

Because the study was cross-sectional, these coefficients are interpreted as associations within the hypothesised model and not as evidence of causal effects.

Table 7: Structural model and hypothesis testing

Hypothesis	Hypothesised association	β	p-value	Decision
$H_0$1	Governance → HRM	0.72	<0.001	Rejected
$H_0$2	Governance → Public Health Performance	0.34	<0.001	Rejected
$H_0$3	HRM → Public Health Performance	0.58	<0.001	Rejected

Mediation Analysis

The total association between governance and public health performance was β = 0.76 (95% CI: [0.64, 0.87]). After HRM was included in the model, the direct association was β = 0.34 (95% CI: [0.21, 0.47]).

The indirect association through HRM was β = 0.42. Based on 5,000 bootstrap samples, the 95% bootstrap confidence interval was [0.31, 0.53], which did not include zero. This provided evidence of a statistically significant indirect association.

Because the direct association remained statistically significant after HRM was included, the results were consistent with partial mediation.

Table 8: Direct, indirect and total associations

Effect	β	95% Bootstrap CI	p-value	Interpretation
Total: Governance → Performance	0.76	0.64–0.87	<.001	Significant
Direct: Governance → Performance	0.34	0.21–0.47	<.001	Significant
Indirect: Governance → HRM → Performance	0.42	0.31–0.53	<.001	Significant

The indirect association accounted for approximately 55% of the total association (0.42/0.76), while approximately 45% remained as the direct association.

Table 9: Structural model fit

Fit index	Value	Interpretation
χ^2/df	2.18	Acceptable
CFI	0.95	Good
TLI	0.94	Good
RMSEA	0.046	Good
SRMR	0.041	Good

Overall, the measurement and structural models showed satisfactory fit. The findings supported the hypothesised associations among Governance, HRM and Public Health Performance. HRM also showed a significant indirect association in the relationship between Governance and Public Health Performance.

Discussion

This study examined the associations among Governance, Human Resource Management (HRM) and Public Health Performance in public healthcare institutions in North Central Nigeria. Governance was positively associated with HRM and Public Health Performance. HRM also showed a positive association with Public Health Performance and a significant indirect association in the governance–performance pathway. Because the study was cross-sectional, these findings indicate relationships within the proposed model and should not be interpreted as causal effects.

The association between Governance and HRM is consistent with previous health-systems research. Governance provides the institutional environment in which workforce decisions are made. Leadership, accountability, transparency and participation can shape workforce planning, recruitment, supervision and staff development. Cometto et al. (2019) similarly emphasised the importance of linking health workforce governance with wider health-system priorities. Pyone et al. (2017) also identified governance, accountability and institutional capacity as important elements of effective health-system management. The present finding

extends this evidence by showing a measurable association between governance and HRM within public healthcare institutions in North Central Nigeria.

HRM showed a stronger association with public health performance than the direct governance–performance pathway. The difference is plausible. Health workers are the immediate operational link between organisational policies and service delivery. Staffing levels, competence, motivation, supervision and performance management affect what happens at facility level on a daily basis. Governance may establish the rules and structures within which services operate, but HRM translates many of these institutional arrangements into routine workforce practices. This interpretation is consistent with Cometto et al. (2019), who identified workforce governance as a central component of health-system functioning. It also supports the strategic HRM perspective, which proposes that organisational performance is related to how effectively human resources are aligned with organisational objectives (Wright & McMahan, 1992).

The positive association between Governance and Public Health Performance was also consistent with previous evidence. Pyone et al. (2017) found that governance frameworks are linked to accountability and health-system capacity. Abimbola et al. (2014) similarly showed that healthcare governance in Nigeria involves interactions among government institutions, providers and communities. These relationships are relevant to North Central Nigeria, where healthcare institutions operate within federal, state and local administrative structures. Differences in leadership, financing, supervision and institutional capacity may therefore contribute to differences in organisational performance.

The mediation finding provides an important theoretical contribution. HRM accounted for part of the association between Governance and Public Health Performance, while a significant direct association remained after HRM was included. This pattern is consistent with partial mediation. The finding suggests that governance and workforce management should not be viewed as separate organisational functions. Rather, governance may provide the institutional conditions within which HRM operates, while HRM represents one pathway through which these conditions are reflected in organisational performance. This interpretation is consistent with Strategic HRM Theory, which emphasises alignment between organisational strategy and human resource practices (Wright & McMahan, 1992).

An alternative explanation should also be considered. Governance and HRM were measured from the perspectives of the same respondents and within the same institutions. Respondents who viewed their managers positively may also have rated workforce management more favourably. This could partly account for the observed association between governance and HRM. Common-method bias and shared perceptions of organisational climate therefore cannot be completely excluded. However, anonymity, neutral wording and separation of construct items were used to reduce this risk. The measurement analysis also showed acceptable reliability, convergent validity and discriminant validity, suggesting that the three constructs were empirically distinguishable.

Other explanations are possible. Facility size, funding, ownership within the public sector, staffing mix, leadership experience, urban–rural location and availability of infrastructure may affect both HRM and performance. These factors were not fully captured by the present cross-

sectional model. Consequently, the observed relationships should not be interpreted as evidence that governance or HRM alone determines health facility performance.

The North Central setting may also help explain the findings. The zone contains states and the Federal Capital Territory with substantial differences in population distribution, urbanisation, health infrastructure and workforce availability. Health workers are also unevenly distributed across Nigeria, with a concentration in urban areas (African Health Observatory Platform [AHOP], 2025). In this context, workforce planning and retention may have a particularly strong relationship with facility performance. Governance may matter most when it translates into practical decisions about recruitment, deployment, supervision and staff development.

The findings have practical implications. Health-sector reforms should link governance reforms with workforce policies rather than treating them as separate programmes. Facility managers should strengthen workforce planning, staff development, performance appraisal and retention alongside accountability and leadership systems. State health authorities should also consider facility-level differences when planning workforce deployment and monitoring performance.

Limitations of the Study

This study has several limitations. First, its cross-sectional design prevents assessment of temporal ordering and causal relationships. Second, data were based on self-reported perceptions and may therefore be affected by social desirability or common-method bias. Third, participants were recruited from public healthcare institutions in North Central Nigeria, limiting generalisability to private facilities and other Nigerian regions. Fourth, some institutional and contextual factors that may affect both HRM and performance were not included in the model.

Several measures were used to reduce these limitations. A multistage sampling approach was used to obtain participants from different levels of public healthcare. The questionnaire was reviewed and pilot-tested before data collection. Participation was anonymous and confidentiality was assured. Reliability, convergent validity and discriminant validity were assessed before the structural model was examined. Clustering of participants within healthcare institutions was also assessed. These procedures improved the methodological rigour of the analysis but do not remove the limitations inherent in the cross-sectional design.

Conclusion

This study found positive associations among governance, human resource management (HRM), and public health performance in public healthcare institutions in North Central Nigeria. Governance was positively associated with HRM and public health performance, while HRM showed a stronger association with public health performance. HRM also showed a significant indirect association in the relationship between governance and public health performance. These findings are consistent with the proposed integrated framework and highlight the importance of considering governance and workforce management together when examining health-system performance.

The findings suggest that governance provides an important organisational context for workforce management, while HRM may represent an important pathway through which governance is associated with organisational performance. The stronger association observed between HRM and performance further indicates the importance of workforce planning, recruitment, development, motivation, retention, and performance management in public healthcare institutions.

However, the cross-sectional design does not establish temporal ordering or causality. The findings should therefore be interpreted as associations consistent with the hypothesised framework rather than evidence that governance or HRM causes changes in public health performance.

The proposed framework offers a useful context-specific model for examining the relationship between governance, HRM, and health-system performance in North Central Nigeria. Its applicability to other regions of Nigeria and other low- and middle-income settings remains an empirical question and should be assessed through studies involving different institutional and geographical contexts. Longitudinal and mixed-methods studies would also be useful for examining temporal relationships and exploring the organisational processes underlying these associations.

Recommendations

Based on the observed associations and the proposed framework, the following recommendations are made:

i. Strengthen governance and accountability: Federal and state health authorities should continue to strengthen transparent leadership, accountability, coordination and stakeholder participation within public healthcare institutions.
ii. Prioritise strategic HRM: Healthcare institutions should strengthen workforce planning, equitable recruitment and deployment, staff development, performance appraisal, motivation and retention. The stronger association between HRM and public health performance supports particular attention to these workforce functions.
iii. Link governance with workforce management: Governance policies should be translated into clear HRM practices at facility level. Health authorities should ensure that leadership and accountability mechanisms are linked to workforce planning, supervision and performance management.
iv. Strengthen health-management capacity: Regular leadership and management development should be provided for healthcare managers. Training should focus on workforce planning, accountability, staff performance, communication and evidence-informed decision-making.
v. Integrate governance and HRM indicators into monitoring: Routine health-sector monitoring should include indicators that assess governance, workforce management and organisational performance. This would allow health authorities to identify institutional weaknesses and guide targeted improvement.

vi. Strengthen institutional-level planning in North Central Nigeria: State health authorities should consider differences in workforce availability, facility capacity and local service needs when planning recruitment, deployment and retention strategies.

vii. Undertake further validation: Future studies should examine the proposed framework in other Nigerian regions and in private healthcare institutions. Longitudinal and mixed-methods studies are particularly recommended to assess temporal relationships and explore mechanisms that cannot be established through the present cross-sectional design.

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