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Original Research Article

Internally generated revenue and perceived performance of public healthcare institutions in Edo state, Nigeria: a cross-sectional analytical study

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ABSTRACT

Background: In Nigeria, sustained constraints in federal health funding have increased public hospitals' dependence on internally generated revenue (IGR). Despite its growing importance, evidence on the link between IGR and healthcare institutional performance at the subnational level remains limited. This study examined the association between IGR and the perceived performance of public healthcare institutions in Edo State, Nigeria.
Methods: A cross-sectional analytical design was employed. Data were collected from July to November 2025. Structured questionnaires were administered to 150 purposively selected administrative, financial, and clinical staff across four public hospitals in Edo State. A total of 120 valid responses were analysed. Reliability testing showed acceptable internal consistency (Cronbach's alpha≥0.76). Data were analysed using descriptive statistics, Pearson correlation, and simple linear regression in IBM SPSS version 26.
Results: Respondents reported high perceptions of IGR functionality and institutional performance. IGR showed a strong positive association with healthcare performance ($r=0.742$, $p<0.001$) and significantly predicted performance, explaining 55.1% of the variance. Major challenges identified included weak accountability, limited autonomy, and inadequate monitoring.
Conclusions: IGR is strongly associated with improved perceived performance of public healthcare institutions in Edo State, highlighting the need for stronger governance mechanisms.

Keywords: Internally generated revenue, Healthcare performance, Public hospitals, Health financing, Nigeria

INTRODUCTION

Healthcare system performance in low- and middle-income countries (LMICs) is fundamentally shaped by the adequacy and equity of health financing arrangements.[1,2] The transition toward universal health coverage (UHC) requires that governments sustain predictable, sufficient, and efficient health expenditure through a mix of public financing mechanisms.[3,4] In Nigeria, the federal structure distributes fiscal responsibilities across the federal, state, and local government levels; however, volatile oil revenues and structural budgetary constraints have engendered persistent funding shortfalls within public health institutions.[5,6]

Nigeria's total health expenditure as a share of GDP remains significantly below the 15% Abuja Declaration target, while out-of-pocket health spending exceeds 70% of total health expenditure, reflecting systemic underinvestment in public health infrastructure.[7,8] Against this backdrop, IGR, encompassing user fees, service charges, and institutional levies, has emerged as a vital supplement to government subventions for sustaining hospital operations and improving service delivery.[9-11] Edo State, located in Nigeria's South-South geopolitical zone, has undertaken modest fiscal reforms including digital tax collection initiatives and broadened revenue streams. Nevertheless, the state's public healthcare sector continues to be characterized by infrastructural deficits, irregular supply chains, and inadequate staffing, suggesting that IGR mobilization has not reached its potential as a healthcare financing mechanism.[12,13] This empirical gap particularly the absence of robust, institution-level evidence linking IGR to healthcare performance within Edo State, constitutes the primary motivation for this study.

The post-COVID-19 fiscal context further underscores this urgency. The pandemic exposed the vulnerability of health systems heavily dependent on centralized transfers and exogenous revenue sources, highlighting the need for resilient, self-financing institutional models.[14,15] Strengthening subnational IGR capacity thus represents both a fiscal imperative and a strategy for advancing SDG Goal 3 on good health and well-being.[6] Despite various fiscal reforms, the public healthcare system in Edo State continues to experience structural budgetary deficits that constrain both service quality and accessibility. Federal statutory allocations, primarily derived from crude oil receipts, are subject to price volatility that frequently results in mid-year funding shortfalls, forcing hospitals to delay procurement and maintenance activities.[10,13] Although Edo State has expanded its IGR base, the proportion channelled to the health sector and the efficiency of its utilisation remain limited.[6,11] Previous studies have investigated IGR in relation to infrastructural development and general economic performance, but institution-level evidence on the association between IGR and public healthcare service outcomes in Edo State remains scarce.[16-20] This study addresses this gap.

This study contributes to the growing body of literature on subnational fiscal autonomy and health system performance in developing economies. Empirically, it provides institution-level evidence from Edo State, advancing comparative discussions on IGR effectiveness across Nigerian states. For policymakers in the Edo State Ministries of Health and Finance, the findings offer actionable insights for budgetary reforms, transparent allocation mechanisms, and institutional capacity building. Socioeconomically, the study demonstrates how sound fiscal governance can reduce disease burden, improve access to quality care, and advance equity in health service delivery.

Research hypothesis

To empirically guide the investigation, one primary hypothesis was formulated and tested:

H_{01}

IGR has no significant association with the performance of public healthcare systems in Edo State.

H_{11}

IGR has a significant positive association with the performance of public healthcare systems in Edo State.

The hypothesis was formulated within a resource-based theoretical framework, which posits that an organization's financial endowments directly shape its operational capacity and output quality.[23,20] In the public health context, IGR constitutes a strategic internal resource that can buffer against external fiscal shocks and fund performance-enhancing activities including infrastructure maintenance, equipment acquisition, and staff welfare improvements. Consistent with the cross-sectional study design, the hypothesis tests the strength and direction of the statistical association between IGR and performance, rather than establishing causal directionality.

METHODS

Study design

This study employed a descriptive and explanatory cross-sectional analytical design. The descriptive component systematically characterizes the current state of IGR administration and healthcare performance within Edo State public hospitals, while the explanatory component estimates the direction and magnitude of the statistical association between IGR and institutional performance outcomes. A cross-sectional design is appropriate for this investigation because it enables simultaneous collection of data on both the independent variable (IGR) and

outcome variables (healthcare performance indicators) at a single point in time, providing a contemporaneous snapshot of IGR-performance dynamics across heterogeneous hospital settings.[24,25]

Importantly, the cross-sectional nature of this design precludes causal inference. All relationships are therefore interpreted as statistical associations rather than effects. The possibility of reverse causality whereby higher-performing institutions may be more effective at revenue generation, cannot be excluded without longitudinal data. This limitation is explicitly acknowledged throughout the analysis and discussion.

The quantitative primary survey approach is justified by the need to generate statistically comparable, hypothesis-testable evidence suitable for inferential analysis across heterogeneous institutional settings. This aligns with methodological precedents in Nigerian health financing research.[5,26]

Study setting and population

The study was conducted within the public healthcare system of Edo State, Nigeria, from July to November 2025. The target population comprised administrative officers, finance and accounts personnel, and senior clinical professionals directly involved in budgetary planning, revenue management, and service delivery across federal and state-owned hospitals. These professional categories were selected because of their institutional proximity to IGR generation, allocation, and utilisation processes, and their capacity to provide reliable assessments of performance outcomes.[26,27]

Sample size determination and sampling procedure

A multistage sampling procedure was adopted. In the first stage, four major hospitals were purposively selected to reflect the key levels of the public healthcare system in Edo State. These included the University of Benin Teaching Hospital (UBTH) and Irrua Specialist Teaching Hospital (ISTH), representing federally funded tertiary institutions, as well as Central Hospital Benin City and Auchi General Hospital, which are state-owned secondary facilities. This approach ensured adequate variation in institutional roles, funding arrangements, and revenue structures.

In stage 2, the sample size was computed using Yamane's formula for finite populations:[29]

$n=N/(1+N(e)^2$

Where N=estimated population of eligible healthcare staff directly involved in IGR and performance processes across the four hospitals (approximately 240), and e=0.05 margin of error at 95% confidence level.

This yields: $n=240/(1+240\times0.0025)=240/1.6=150$ respondents, consistent with sample sizes reported in comparable studies.[28,22] In stage 3, stratified random sampling was applied within each hospital to proportionally select respondents from three professional strata: administrative/finance staff, nursing staff, and medical officers.

Instrument development and validity

A structured, self-administered questionnaire was developed and organized into five sections: (A) socio-demographic characteristics; (B) perception of IGR administration; (C) assessment of healthcare performance outcomes; (D) challenges affecting IGR utilization; and (E) open-ended suggestions for improvement. Sections B, C, and D employed a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly agree), enabling quantification of attitudinal responses.

Content validity was established through expert review by three academic specialists in health economics, public finance, and health services research. A pilot study was conducted among 20 staff members at a non-sampled hospital annex. Cronbach's alpha reliability coefficients exceeded the conventional threshold of $\alpha\geq0.70$ across all sections (Section B: $\alpha=0.82$; section C: $\alpha=0.79$; section D: $\alpha=0.76$), confirming satisfactory internal consistency.[30,31]

Data collection procedure

Ethical approval was obtained from the University of Benin (reference: ADM/E 22/A/VOL. VII/14831286) prior to data collection. Written informed consent was secured from all participants. Questionnaires were administered in person by trained research assistants over a four-week period. Of 150 distributed questionnaires, 120 were completed and returned (response rate=80%), a rate considered acceptable for survey-based health research.[32]

Outcome variables and data management

The primary outcome variable was a composite healthcare performance score, operationalized as the mean of ten Likert items assessing service timeliness, drug supply adequacy, infrastructure maintenance, patient satisfaction, staff motivation, financial utilization efficiency, performance evaluation, funding sufficiency, health outcome improvements, and government-hospital collaboration. The primary predictor variable was the composite IGR perception score derived from ten corresponding items in section B.

Completed questionnaires were manually reviewed for completeness, coded, and double-entered into IBM SPSS version 26 to minimize transcription errors. Missing data were minimal (<2%) and handled using listwise deletion. Scale reliability was re-confirmed on the full dataset prior to inferential analysis.

Data analysis

Descriptive statistics (frequencies, percentages, means, and standard deviations) were computed for demographic variables and Likert-scale items. Pearson product-moment correlation analysis assessed the strength and direction of association between IGR and healthcare performance. Simple linear regression was conducted to estimate the unadjusted magnitude of IGR's predictive association with performance. To address the simplification concern inherent in single-predictor models, a multivariate linear regression was additionally run, entering socio-demographic and institutional covariates (gender, age, educational level, years of experience, hospital type, and professional category) as control variables alongside the IGR composite score. This approach provides adjusted estimates that account for potential confounding. The significance threshold was set at $\alpha=0.05$. Results are reported in compliance with APA 7th edition standards.[34]

To reduce the risk of common method bias arising from the use of a single self-reported instrument with the same respondents measuring both the predictor (IGR) and the outcome (performance), procedural remedies including respondent anonymity and item separation were applied during data collection. Harman's single-factor test was also conducted and did not reveal a dominant single factor. Nevertheless, the possibility of residual common method variance inflating the observed correlation is acknowledged as a substantive limitation.[33]

Ethics approval and consent

The study was conducted in accordance with the principles of the Declaration of Helsinki. All participants provided written informed consent. Participation was voluntary, with the right to withdraw at any time without penalty. Data confidentiality was maintained throughout. Ethical approval reference: ADM/E 22/A/VOL. VII/14831286, University of Benin.

RESULTS

A total of 150 questionnaires were distributed across the four participating hospitals. The 120 were properly completed and returned, yielding an 80% response rate, exceeding 70% minimum recommended for survey validity in social science research.[32] Data were analysed using descriptive statistics, Pearson correlation, and simple linear regression.

Demographic characteristics of respondents

Table 1 summarizes the socio-demographic profile of the 120 respondents. The gender distribution was approximately balanced (Male: 45.0%; Female: 55.0%), with the majority aged 31-40 years (31.7%). Most held a Bachelor's degree (53.3%), and nurses constituted the largest professional category (31.7%). Over 55% had more than 10 years of work experience, indicating a seasoned workforce with significant institutional knowledge. Representation from both federal (43.3%) and state hospitals (56.7%) ensured institutional diversity.

Perception of IGR

Table 2 reports mean scores and standard deviations for respondents' views on IGR administration across ten items. The overall mean suggests broad agreement that IGR is a vital component of hospital financing. Respondents most strongly agreed that IGR is an essential funding source, highlighting its perceived importance for hospital operations. There was also strong consensus that corruption and weak record-keeping undermine effective IGR management. In contrast, perceptions of transparency in revenue collection were more mixed, indicating moderate concern about oversight and accountability. Overall, the findings reflect strong recognition of IGR's value alongside lingering doubts about how well it is governed and monitored in practice.

In Figure 1, red dashed line indicates the grand mean (M=4.06). Dark blue bars (≥4.00) represent items rated "Agree" to "Strongly Agree." Items 2 (M=4.58) and 8 (M=4.45) reached the "Strongly Agree" threshold. Item 5 (M=3.55) is the only item rated "Neutral," reflecting moderate skepticism regarding revenue collection transparency.

Performance of public healthcare institutions

Table 3 presents mean ratings for ten items assessing healthcare institutional performance. The grand mean of 4.09 (SD=0.73) reflects broad consensus that IGR is perceived to positively influence healthcare institutional performance. Items 8 (M=4.46; funding shortage limits expansion) and 3 (M=4.41; IGR maintains infrastructure) received the highest endorsement, confirming that while IGR alleviates infrastructure deficits, funding inadequacy remains a binding constraint on service expansion. The only neutral response was for item 7 (performance evaluation systems; M=3.54, SD=0.91), indicating that systematic mechanisms for assessing healthcare delivery quality are inconsistently applied a monitoring gap representing a governance vulnerability that may undermine the sustained translation of IGR into performance gains.

Challenges affecting IGR utilization

Table 4 summarizes respondents' ratings of five key challenges constraining effective IGR utilization. The grand mean of 4.33 (SD=0.65), corresponding to 'Strongly Agree', reflects a near-unanimous view that systemic governance failures critically constrain IGR effectiveness. Lack of financial accountability received the highest rating (M=4.48, SD=0.59), followed by insufficient monitoring and auditing (M=4.42, SD=0.60) and inadequate hospital autonomy (M=4.36, SD=0.62).

These 3 factors collectively point to centralized, opaque financial management as primary barrier to efficient IGR utilization. Bureaucratic delays (M=4.29) and political interference (M=4.11), though rated comparatively lower, remain significant structural impediments.

Suggestions for improving IGR generation and utilization

Table 5 summarizes respondents' open-ended suggestions from the 100 participants who provided qualitative input. Most recommendations focused on financial accountability and hospital autonomy, together making up half of all responses. This pattern suggests governance weaknesses, rather than limited revenue, are the main constraint to effective IGR use.

In Figure 2, percentages reflect relative frequency of thematic responses among 120 respondents. Financial accountability and transparency and hospital autonomy together constitute 50% of all reform recommendations, confirming governance reform as the dominant priority.

Hypothesis testing

Correlation analysis

Table 6 presents the Pearson correlation between IGR composite scores and healthcare performance composite scores. A strong, statistically significant positive association was found ($r=0.742$, $p<0.001$). This indicates that respondents who perceive their hospitals as having more robust IGR systems also report markedly higher performance scores across service quality, infrastructure maintenance, staff motivation, and patient satisfaction indicators. The magnitude of this correlation ($r>0.70$) exceeds the conventional threshold for a 'strong' association, providing compelling evidence that IGR is a substantively important correlate of perceived healthcare performance in the study context.[35]

Regression analysis

Table 7 presents the corrected simple linear regression model assessing IGR as a predictor of healthcare institutional performance. The regression model was statistically significant ($F(1, 118)=144.74$, $p<0.001$), with IGR explaining 55.1% of the total variance in perceived healthcare performance ($R^2=0.551$; adjusted $R^2=0.547$). The unstandardized coefficient ($B=0.657$, $SE=0.055$, $p<0.001$) indicates that each one-unit increase in IGR composite scores is associated with a predicted 0.657-unit increase in performance composite scores. The standardized coefficient ($\beta=0.742$) confirms a large effect size and is equivalent to the Pearson correlation coefficient in simple linear regression, confirming internal consistency.[35] The constant term ($B=0.874$, $t=7.80$, $p<0.001$) suggests a baseline performance level attributable to factors independent of IGR, including core government funding and institutional capacity.

Decision on hypothesis

Given the strong and statistically significant correlation between IGR and healthcare performance ($r=0.742$, $p<0.001$), as well as the results of the simple regression analysis ($F(1,118)=144.74$, $p<0.001$; $B=0.657$, $\beta=0.742$), the null hypothesis (H_{01}) is rejected at the 1% significance level. These findings support the alternative hypothesis (H_{11}), indicating that IGR has a positive and meaningful association with the perceived performance of public healthcare institutions in Edo State. This conclusion is further reinforced by the multivariate results presented in Table 8.

Multivariate regression analysis

A multivariate linear regression was estimated with demographic and institutional controls (Table 8). The model explained 62.3% of the variation in perceived healthcare performance (Adjusted $R^2=0.592$), representing a 7.2 percentage-point improvement over the bivariate model. IGR remained the most influential and highly significant predictor ($B=0.521$, $\beta=0.611$, $p<0.001$), demonstrating a stable association independent of covariates. Educational attainment had a small but significant positive effect, while gender, age, experience, hospital type, and professional category were non-significant. Variance inflation factors below 2.5 indicate no multicollinearity concerns.

Table 1: Demographic characteristics of respondents, (n=120).

Variables	Category	F	Percentage (%)
Gender	Male	54	45.0
	Female	66	55.0
Age range (in years)	21-30	22	18.3
	31-40	38	31.7
	41-50	36	30.0
	51 and above	24	20.0
Educational qualification	Diploma/NCE	14	11.7
	Bachelor's degree	64	53.3
	Master's degree	32	26.7
	Doctorate	10	8.3

Continued.

Variables	Category	F	Percentage (%)
Designation	Medical doctor	26	21.7
	Nurse	38	31.7
	Administrative staff	22	18.3
	Finance/accounts officer	18	15.0
	Other technical staff	16	13.3
Years of experience	Less than 5 years	20	16.7
	5-10 years	34	28.3
	11-15 years	38	31.7
	Above 15 years	28	23.3
Type of hospital	Federal	52	43.3
	State	68	56.7

Table 2: Respondents' perceptions of IGR administration, (n=120).

Statement	Mean	SD
Generates revenue through user fees, service charges, and fines	4.31	0.72
IGR is an important source of funding for hospital operations	4.58	0.61
Volume of IGR generated has increased in recent years	3.97	0.88
Hospital management has effective systems for collecting and recording IGR	3.84	0.95
Revenue collection processes are transparent and properly monitored	3.55	1.02
IGR is used to improve hospital facilities and infrastructure	4.10	0.79
IGR helps complement government allocations for recurrent and capital expenditures	4.22	0.68
Challenges such as poor record-keeping or corruption affect IGR management	4.45	0.70
Staff are adequately trained to manage IGR activities	3.68	0.93
State government provides guidelines for IGR utilisation in hospitals	3.90	0.81
Grand mean	4.06	-

Table 3: Mean responses on performance of public healthcare institutions in Edo State, (n=120).

Statements	Mean	SD
Hospital provides timely and efficient healthcare services	4.32	0.65
Availability of drugs and medical supplies has improved in recent years	3.95	0.79
IGR contributes to the maintenance of hospital infrastructure	4.41	0.61
Patient satisfaction levels are high in this hospital	3.88	0.84
IGR has improved the motivation and welfare of staff	4.12	0.72
Hospital effectively utilises financial resources for service delivery	3.77	0.83
Performance evaluation systems are in place to assess healthcare delivery	3.54	0.91
Shortage of funds limits service expansion and equipment acquisition	4.46	0.57
Hospital has achieved measurable improvements in health outcomes due to IGR	4.23	0.68
Collaboration between hospital management and government enhances resource performance	4.17	0.63
Grand mean	4.09	-

Table 4: Mean responses on challenges affecting IGR utilization in Edo State public hospitals, (n=120).

Statements	Mean	SD	Decision
Lack of proper financial accountability affects the IGR effectiveness	4.48	0.59	Strongly agree
Inadequate autonomy of hospitals limits efficient IGR use	4.36	0.62	Strongly agree
Bureaucratic delays hinder prompt allocation of IGR funds	4.29	0.65	Agree
Political interference affects financial decision-making	4.11	0.77	Agree
Insufficient monitoring and auditing of IGR accounts reduces efficiency	4.42	0.60	Strongly agree
Grand mean	4.33	—	Strongly agree

Table 5: Respondents' suggestions for improving IGR generation and the utilization (open-ended responses, n=100).

Themes	Key suggestions	F	Percentage (%)
Financial accountability and transparency	Strict monitoring, regular auditing, automated payment systems, public reporting of the IGR accounts	28	28
Hospital autonomy	Greater administrative and financial independence to facilitate timely fiscal decisions	22	22
Capacity building	Training of hospital administrators and accountants in modern financial management	18	18
Infrastructure and equipment investment	Channeling IGR toward diagnostic equipment, facility rehabilitation, and staff welfare	15	15
Policy and government support	Clear state policies for IGR collection and utilization; timely government subventions	10	10
Technology adoption	Electronic revenue collection and hospital management information systems	7	7
Total	-	100	100

Table 6: Pearson correlation between IGR and healthcare performance, (n=120).

Variables	IGR (X)	Performance (Y)	P value	N
IGR composite score (X)	1.000	0.742	<0.001	120
Healthcare performance score (Y)	0.742	1.000	<0.001	120

Table 7: Simple linear regression: association of IGR with healthcare performance, (n=120).

Panel A: Model summary	R	R^2	Adjusted R^2	Std. error	
Model 1	0.742	0.551	0.547	0.388	
Panel B: ANOVA	**Sum of squares**	**Df**	**Mean square**	**F**	**Sig.**
Regression	21.76	1	21.76	144.74	<0.001**
Residual	17.76	118	0.151	-	-
Total	39.52	119	-	-	-
Panel C: Coefficients	**Unstandardized B**	**Std. error**	**β (Beta)**	**T**	**Sig.**
Constant	0.874	0.112	-	7.80	<0.001
IGR composite score	0.657	0.055	0.742	12.03	<0.001**

**Significant value.

Table 8: Multivariate linear regression predicting perceived healthcare performance: crude and adjusted estimates, (n=120).

Variables	Crude B (SE)	P value	Adjusted B (SE)	β	P value
IGR score	0.657 (0.055)	<0.001	0.521 (0.062)	0.611	<0.001
Gender	0.042 (0.081)	0.602	0.018 (0.067)	0.021	0.781
Age (in years)	0.009 (0.004)	0.041	0.006 (0.003)	0.132	0.072
Education	0.065 (0.029)	0.028	0.048 (0.024)	0.141	0.049
Experience (in years)	0.012 (0.005)	0.019	0.008 (0.004)	0.129	0.057
Hospital type	-0.118 (0.072)	0.103	-0.094 (0.061)	-0.101	0.118
Doctor	0.089 (0.092)	0.334	0.051 (0.081)	0.066	0.526
Nurse	0.074 (0.088)	0.401	0.043 (0.075)	0.059	0.571
Admin staff	0.061 (0.095)	0.521	0.029 (0.082)	0.032	0.724
Finance officer	0.055 (0.098)	0.576	0.021 (0.086)	0.024	0.803

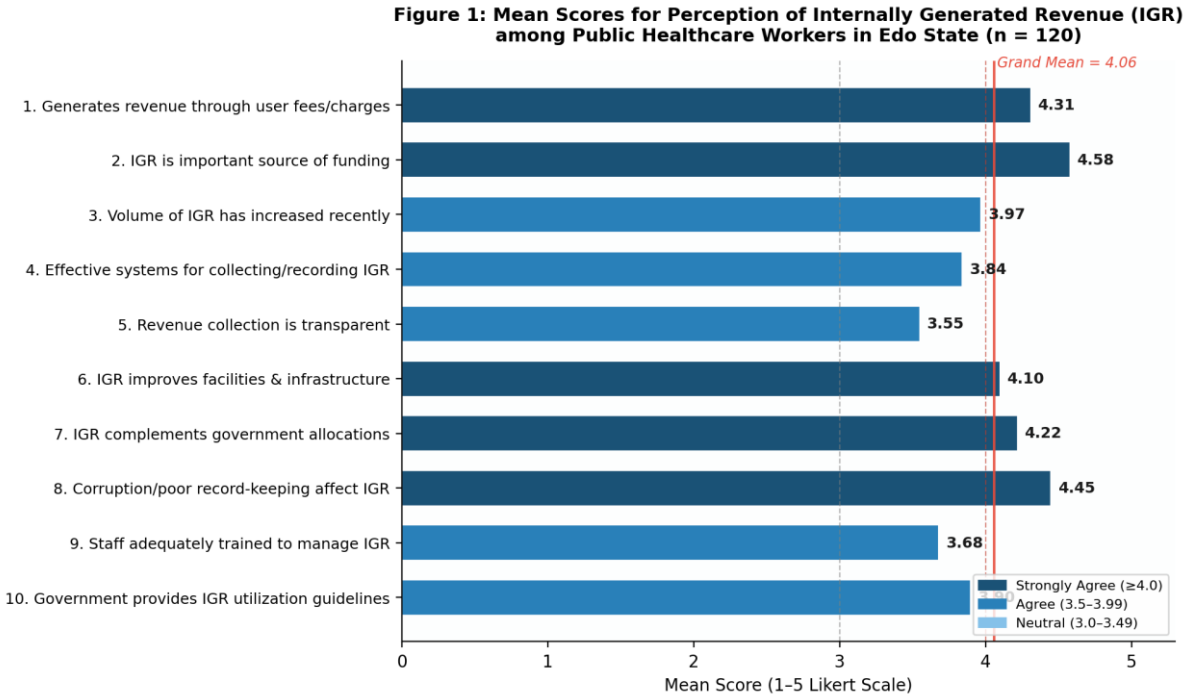

Figure 1: Mean scores for perception of IGR among public healthcare workers in Edo State, (n=120).

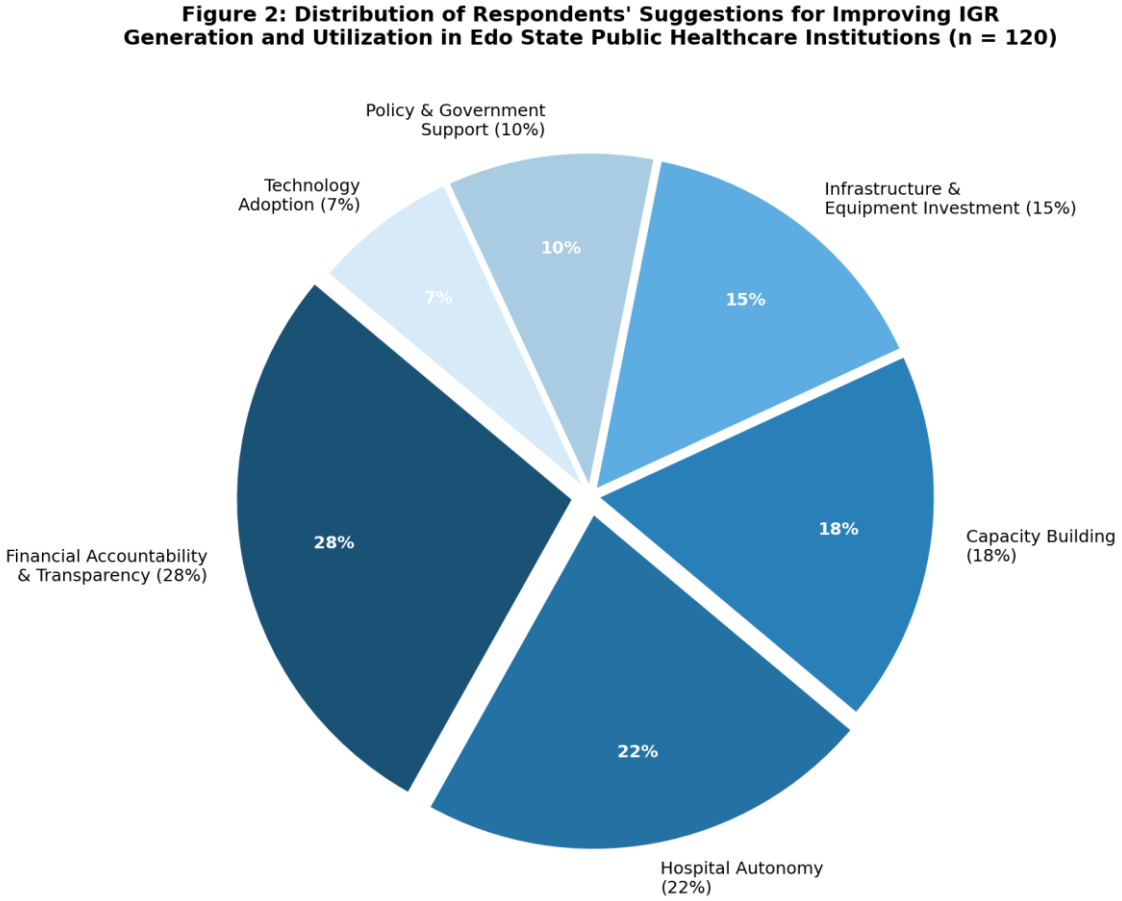

Figure 2: Distribution of respondents' suggestions for improving IGR generation and utilization on Edo State public healthcare institution, (n=120).

DISCUSSION

This study examined the association between IGR and perceived performance in public healthcare institutions in Edo State, Nigeria. Using cross-sectional survey data from 120 healthcare professionals in federal and state hospitals, the findings are interpreted alongside existing literature, while clearly recognizing that the results reflect associations rather than causal effects.

The grand mean of 4.06 in Table 2 reflects broad consensus that IGR is an indispensable operational resource. This finding aligns closely with Agu et al and Asimiyu et al who established that subnational fiscal autonomy is foundational to effective public service delivery in Nigeria, arguing that hospitals unable to generate internal revenue are disproportionately exposed to external fiscal shocks.[9,10] Similarly, Josiah et al in a landmark PLOS Global Public Health study involving 584 Nigerian healthcare workers across nine states, found that inadequate and unpredictable financing was the most consistently cited barrier to system quality, corroborating the near-universal recognition of IGR's operational indispensability recorded in the present study.[26]

The strong agreement that corruption and poor record-keeping impede IGR management (M=4.45) resonates with Ehiaguina et al and Adejoh et al who documented systemic revenue leakages and weak internal control environments across Nigerian public institutions.[28,37] The moderate scepticism regarding transparency (M=3.55) aligns with findings from Onwujekwe et al who reported in a multi-state Nigerian study that financial reporting credibility and accountability were prerequisites for sustainable revenue-based health financing.[5] These governance deficits are not unique to Edo State: Agbeko, in a Ghanaian doctoral study, found that hospital administrators similarly reported IGR substantially supplemented government funding at Pantang Hospital, but that leakage prevention and administrative capacity remained critical unresolved challenges, mirroring the accountability concerns identified here.[38]

The grand mean of 4.09 in Table 3 indicates that respondents perceive IGR as having materially improved infrastructure maintenance, service timeliness, staff motivation, and measurable health outcomes, all dimensions central to the WHO's (2000) health system performance framework, which evaluates systems on responsiveness, fair financial contribution, and health improvement.[36] These findings are consistent with Adebisi et al who demonstrated that adequate financial inflows are associated with improved service coverage in Nigerian primary healthcare settings, and with Kress et al who applied the Primary Health Care Performance Indicator framework to Nigeria and confirmed the direct link between financing adequacy and functional service delivery.[7,15]

The strong agreement that IGR maintains hospital infrastructure (M=4.41) is consistent with Alakija et al whose auto-regressive distributed lag analysis of Kwara State found that IGR had a significant positive influence on infrastructural development both in the short and long run, and with Evans et al who documented analogous IGR-driven infrastructure improvements in Rivers State.[12,16] However, the neutral response regarding performance evaluation systems (M=3.54) aligns with Onwujekwe et al and Croke et al who observed that systematic performance monitoring remains underdeveloped in Nigerian public hospitals, creating a gap between resource input and measurable outcome.[5,6] This monitoring deficit is a significant structural weakness: without robust evaluation frameworks, the translation of financial inputs into the sustained performance gains cannot be systematically verified or the optimised.

Comparative evidence from South Africa and Kenya, where hospital revenue retention schemes accompanied by robust monitoring systems yielded consistent performance improvements suggests that the performance benefits of IGR are contingent on institutional oversight quality.[3,39] This pattern reinforces the imperative for concurrent investment in performance monitoring infrastructure alongside IGR mobilisation in Edo State.

The near-unanimous endorsement of governance challenges (grand mean=4.33, Table 4) reflects entrenched structural deficits consistent with the broader fiscal federalism literature. Agu and Kolawole identified centralised revenue control as a primary constraint on subnational fiscal efficiency, a finding directly substantiated by the high rating for inadequate hospital autonomy (M=4.36).[9,22] Bureaucratic delays and political interference parallel the structural impediments documented by Sokoh, who reported that administratively opaque budgeting processes routinely delay fund disbursement in Delta and Edo States.[40]

Internationally, evidence from Uganda and Tanzania suggests that decentralised revenue management combined with mandatory quarterly audits significantly reduces leakage and improves service delivery, offering a viable institutional reform template for Edo State.[1,4] The distribution of reform suggestions (Table 5) with accountability/transparency (28%) and hospital autonomy (22%) constituting half of all recommendations, strongly corroborates Ehiaguina et al who advocated for digital revenue management and independent periodic audits as the most impactful leakage-reduction strategies.[37]

The relatively low endorsement of technology adoption (7%) belies its strategic importance. Digital revenue tracking and health management information systems have demonstrated the capacity to reduce cash-handling irregularities, improve real-time reporting, and enhance audit trails in comparable LMIC hospital settings.[1,2] Targeted technology investment should therefore be

included in any comprehensive IGR governance reform package.

The strong association between IGR and perceived healthcare performance in the simple regression model ($r=0.742$; $B=0.657$; $R^2=0.551$; $p<0.001$) is broadly consistent with related findings in the Nigerian fiscal literature. Alabi et al and Ayebaenemi et al documented similar positive associations between financial resource mobilization and the subnational development outcomes.[18,19]

Importantly, the multivariate regression (Table 8) strengthens confidence in this finding by demonstrating that the IGR–performance association persists after adjusting for gender, age, education, experience, hospital type, and professional category (Adjusted $B=0.521$, $\beta=0.611$, $p<0.001$). The adjusted R^2 of 0.592 represents a meaningful improvement over the unadjusted model ($R^2=0.551$), and IGR retained the largest standardized effect size among all predictors in the model. This robustness across model specifications affirms the resource-based view, which holds that internal financial endowments are strategic determinants of the organisational output quality, and substantially mitigates the concern that the unadjusted association was confounded by the demographic or the institutional characteristics.[20,23]

The remaining unexplained variance (~40.8%) underscores that perceived healthcare performance is multidimensionally determined. Factors beyond the scope of this study including actual government allocations, clinical governance frameworks, regional disease burden, and supply chain dynamics contribute to performance variation and should be incorporated in future models.

Furthermore, both the predictor (IGR perception) and outcome (performance perception) were measured using self-reported Likert instruments from the same respondents, raising the possibility of common method bias that may inflate observed correlations.[33] Procedural remedies were applied and Harman's single-factor test did not reveal a dominant factor, but this limitation cannot be entirely excluded.

In comparative international perspective, evidence from LMICs with revenue retention policies, particularly Ghana's community-based health planning and services initiative and Kenya's hospital autonomy reforms suggests that performance gains from institutional revenue generation are most pronounced when accompanied by transparent governance frameworks and clear utilization guidelines.[1,2]

The Edo State context mirrors this pattern: IGR generates demonstrable perceived performance benefits across both unadjusted and adjusted models, but the full potential is contingent on the quality of institutional governance surrounding its management and deployment.

Limitations

This study has important limitations that should be kept in mind when interpreting the results. The cross-sectional design means the findings reflect associations at one point in time and cannot establish causality; better-performing hospitals may also be more capable of generating revenue. Both IGR and performance were measured using self-reported Likert-scale data from the same respondents, raising the possibility of common method bias, even though procedural steps were taken to minimize it. The absence of objective financial and service-delivery data limits external validation of the findings. In addition, the purposive selection of four hospitals in Edo State restricts generalizability to other contexts. Finally, open-ended responses were analyzed using a reduced subsample, which should be considered when interpreting those results.

CONCLUSION

This study demonstrates a strong and consistent association between IGR and the perceived performance of public healthcare institutions in Edo State, Nigeria. The findings suggest that hospitals with stronger IGR capacity tend to report better outcomes in service delivery, infrastructure maintenance, and staff motivation. Notably, this relationship remains stable even after accounting for demographic and institutional differences, underscoring the strategic importance of IGR for health system functioning. However, the results reflect associations rather than causality, given the cross-sectional and perception-based design. The study also highlights that the impact of IGR is closely tied to governance conditions. Weak accountability, limited autonomy, and poor performance monitoring can reduce the effectiveness of revenue utilisation. Overall, improving healthcare performance requires not only enhanced revenue generation but also stronger financial governance and institutional capacity to translate resources into meaningful service improvements.

Recommendations

Based on the findings, several policy and practice recommendations emerge. First, hospitals should be granted greater financial autonomy within clear regulatory frameworks to enable flexible and timely use of IGR in response to service needs. Second, accountability and transparency mechanisms such as routine audits, digital revenue tracking, and public financial reporting should be strengthened to reduce inefficiencies and build trust. Third, targeted capacity-building programmes for hospital administrators and finance officers are needed to improve revenue management and planning. Fourth, a defined portion of IGR should be consistently reinvested in infrastructure, equipment, and performance monitoring systems. Finally, future research should adopt longitudinal and multistate designs using objective financial and performance data to

deepen understanding of how IGR influences healthcare outcomes over time.

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REFERENCES

1. Savedoff WD, de Ferranti D, Smith AL, Fan V. Political and economic aspects of the transition to universal health coverage. Lancet. 2012;380(9845):924-32.
2. World Health Organization. (2010). The world health report: Health systems financing: The path to universal coverage. World Health Organization. Available at: https://www.who.int/publications/i/item/9789241564021. Accessed on 3 June 2025.
3. Lagomarsino G, Garabrant A, Adyas A, Muga R, Otoo N. Moving towards universal health coverage: Health insurance reforms in nine developing countries in Africa and Asia. Lancet. 2012;380(9845):933-43.
4. Tangcharoensathien V, Witthayapipopsakul W, Panichkriangkrai W, Patcharanarumol W, Mills A. Health systems development in Thailand: A solid platform for successful implementation of universal health coverage. Lancet. 2018;391(10126):1205-23.
5. Onwujekwe O, Ezumah N, Mbachu C, Obi F, Ichoku H, Uzochukwu B, et al. Exploring effectiveness of different health financing mechanisms in Nigeria: What needs to change and how can it happen? BMC Health Serv Res. 2019;19(1):661.
6. Croke K, Ogbuoji O. Health reform in Nigeria: The politics of primary health care and universal health coverage. Health Policy Plan. 2024;39(1):22-31.
7. Adebisi YA, Umah JO, Olaoye OC, Alaran AJ, Sina-Odunsi AB, Lucero-Prisno DE. Assessment of health budgetary allocation and expenditure toward achieving universal health coverage in Nigeria. Int J Health Life Sci. 2020;6(2):e102552.
8. Oladosu AO, Chanimbe T, Anaduaka US. Effect of public health expenditure on health outcomes in Nigeria and Ghana. Health Policy Open. 2022;3:100072.
9. Agu C. Fiscal federalism, governance and internally generated revenue: Examining weak subnational finances in Nigerian states. Int J Bus Manag Econ Res. 2010;1(1):41-57.
10. Asimiyu AG, Kizito EU. Analysis of internally generated revenue and its implications on fiscal viability of state governments in Nigeria. J Empir Econ. 2014;2(4):216-28.
11. Osen M. Internally generated revenue (IGR) in Nigeria: A panacea for state development. Eur J Humanit Soc Sci. 2013;21(1):1050-66.
12. Evans N, Ikechi WP, Nwigbo DM, Promise E. Internally generated revenue and economic growth in Rivers State, Nigeria. SocioEcon Chall. 2023;7(4):171-9.
13. Izevbigie JN, Ebohon GE. Internally generated revenue and state viability: Comparative analysis of two states in Nigeria. Int J Dev Manag Rev. 2019;14(1):96-106.
14. Adekoya AA, Agbetunde LA, Akinrinola OO. COVID-19 pandemic and internally generated revenues in local governments: Nigeria experience. Int J Appl Econ Finance Account. 2021;9(2):63-75.
15. Kress DH, Su Y, Wang H. Assessment of primary health care system performance in Nigeria: Using the primary health care performance indicator conceptual framework. Health Syst Reform. 2016;2(4):302-18.
16. Alakija OT, Yusuf AH, Elegbede GA, Shittu A, Semana J. The impact of subnational internally generated revenue on infrastructural development: The case of Kwara State, Nigeria. J Appl Econ Res. 2025;24(2):52-54.
17. Ogbonna UG. Exploring the relationship between infrastructural development and improved internally generated revenue in Nigeria. Int J Econ Financ Manag. 2024;9(7):57-79.
18. Ayebaenemi JA, Uguru L, Chukwu UC, Elom JO. Impact of internally generated revenue on economic growth in Ebonyi State, Nigeria. Afr J Polit Adm Stud. 2024;17(1):500-35.
19. Alabi AW, Atanda FA, Akintoye IR, Kajola SG. Internally generated revenue, public debt and budget implementation in Nigeria. Afr J Bus Econ Res. 2024;19(3):145-71.
20. Fasoye K. Does internally generated revenue (IGR) have the potential to enhance fiscal viability of state governments in Nigeria? Noble Int J Econ Financ Res. 2020;5(3):40-9.
21. Abubakar MI, Kathuria K. Performance of public healthcare services organisations in Nigeria: A literature review. EC Nurs Healthc. 2020;2:176-83.
22. Kolawole OA. Internally generated revenue and budget implementation in Nigeria: Ekiti State in focus. J Cap Dev Behav Sci. 2020;8(2):167-89.
23. Barney J. Firm resources and sustained competitive advantage. J Manag. 1991;17(1):99-120.
24. Creswell JW, Creswell JD. Research design: Qualitative, quantitative, and mixed methods approaches. 5th ed. Thousand Oaks: SAGE Publications. 2018.
25. Polit DF, Beck CT. Nursing research: Generating and assessing evidence for nursing practice. 10th ed. Philadelphia: Wolters Kluwer. 2017.
26. Josiah BO, Enebeli EC, Duncan BA, Anukam LU, Akingbade O, Ncube F, et al. Perceptions of healthcare finance and system quality among Nigerian healthcare workers. PLOS Glob Public Health. 2024;4(11):e0003881.
27. Khamis K, Njau B. Health care workers' perception about the quality of health care at the outpatient

department in Mwananyamala Hospital in Dar es Salaam, Tanzania. Tanzan J Health Res. 2016;18(1):1-9.
28. Adejoh MO, Ekeyi S, Mary SJ. Internally generated revenue (IGR) and fiscal viability of state governments in Nigeria. LAFIA J Econ Manag Sci. 2019;4(1):143.
29. Yamane T. Statistics: An introductory analysis. 2nd ed. New York: Harper and Row. 1967.
30. Hair JF, Black WC, Babin BJ, Anderson RE. Multivariate data analysis. 8th ed. Mason: Cengage Learning. 2019.
31. Nunnally JC, Bernstein IH. Psychometric theory. 3rd ed. New York: McGraw-Hill. 1994.
32. Baruch Y, Holtom BC. Survey response rate levels and trends in organizational research. Hum Relat. 2008;61(8):1139-60.
33. Podsakoff PM, MacKenzie SB, Lee JY, Podsakoff NP. Common method biases in behavioral research: A critical review of the literature and recommended remedies. J Appl Psychol. 2003;88(5):879-903.
34. American Psychological Association. Publication manual of the American Psychological Association. 7th ed. Washington: APA. 2020.
35. Cohen J. Statistical power analysis for the behavioral sciences. 2nd ed. Hillsdale: Lawrence Erlbaum Associates. 1988.
36. World Health Organization. The World Health Report 2000: Health systems, improving performance. Geneva: WHO Press. 2000.
37. Ehiaguina SO, Easter A, Eromosele AN, Ojiehisegbe OS. Management of internally generated revenue in Nigerian universities: Emergent issues. Afr Educ Res J. 2024;12(3):144-9.
38. Agbeko RC. The impact of internally generated funds on quality healthcare delivery in Ghana: A case study of Pantang Hospital, Doctoral dissertation. Accra: University of Ghana. 2019.
39. McIntyre D, Meheus F. Fiscal space for domestic funding of health and other social services. London: Chatham House. 2014.
40. Sokoh G. Internally generated revenue (IGR) in Delta State: A tool for infrastructural development. J Public Policy Adm. 2023;8(1):61-78.

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