

Operational Knowledge and Practice Gaps in Integrated Disease Surveillance and Response Among Health Information Management Professionals in Bayelsa State, Nigeria

Kurokeyi, E. Teddy¹, Nestor Sungumote², Victor Ayebanengimote³, Peretimi Egbe⁴

¹Health Information Management Department, Bayelsa Medical University, ORCID<https://orcid.org/0009-0000-3985-1070>)

²Health Information Management Department, Hospitals Management Board, Bayelsa State

³Health Information Management Department, Federal University Otuoke, Bayelsa, Nigeria

⁴Health Information Management Department, Federal Medical Centre, Yenagoa, Bayelsa, Nigeria,

ABSTRACT

Background: Disease surveillance is critical to the timely recognition, notification, and response to priority diseases and public health events. Health Information Management (HIM) staff plays a role in producing, processing and disseminating health data for surveillance activities; however their knowledge and practice of routine surveillance practices has received comparatively little attention. This study identified knowledge and practice gaps of IDSR among HIM professionals working in public health facilities in Bayelsa State, Nigeria.

Method: Descriptive, cross-sectional and quantitative. Study population: 115 questionnaires were distributed to the population of HIM practitioners in public health institutions in Bayelsa State, Nigeria, of which 103 completed questionnaires were returned and analyzed (response rate: 89.6%). The tool: A structured, pre-tested questionnaire collecting: socio-demographic data, perceived operator-specific knowledge, self-reported behavior in surveillance practice and professional/institutional variables. The reliability and validity of the tool: The questionnaire tool was validated by 2 experts in epidemiology and health information management and its internal consistency was obtained with a Cronbach's α coefficient of ≥ 0.70 , which was judged to be acceptable. The data analysis: SPSS version 26. Frequencies, percentages and the mean scores were determined and simple linear regression was performed at 0.05 level of significance.

Results: subscales of perceived operational knowledge were rated moderate with a mean of 2.47, 2.46, 2.49 and 2.54 for timeliness, completeness, data quality and accuracy and surveillance capacity and experience, respectively. Similarly, self-reported surveillance practice was moderate for timeliness, 2.43, data quality and accuracy, 2.42 and completeness, 2.48. The highest professional/institutional factor score was supervision and feedback, 2.62, followed by resources and infrastructure (2.56), with self-assessed operational competence being lowest (2.33). There was no statistically significant association between operational knowledge and surveillance practice ($\beta = 0.072$, $R^2 = 0.005$ and $p = 0.468$) or gender and surveillance practice ($\beta = 0.036$, $R^2 = 0.001$ and $p = 0.716$) (data not shown). The two selected-factor models were also not statistically significant for operational knowledge ($R = 0.045$, $R^2 = 0.002$, $F = 0.201$ and $p = 0.655$) or for surveillance practice ($R = 0.009$, $R^2 = 0.000$ and $F = 0.008$ and $p = 0.929$).

Conclusion: HIM professionals showed basic awareness, moderate perceived operational knowledge and self-reported surveillance practice, and reached uniformity expected in the experiential learning; but with gaps in reporting timeliness, data completeness, verification and documentation. The results imply that surveillance enhancement efforts should not be simply based on knowledge transfer; but also on enhancement of supportive supervision, feedback, reporting tools/resources, information channels, reporting burden and lifespan learning of the workforce.

KEYWORDS: Disease surveillance, Integrated Disease Surveillance and Response, Health Information Management, operational knowledge, surveillance practice, data quality, Bayelsa State, Nigeria.

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1. INTRODUCTION

Disease surveillance is an essential function of public health in which continuous, systematic collection, analysis, interpretation and a wide dissemination of health information occur to allow for public health action. In the WHO African Region, Integrated Disease Surveillance and Response (IDSR) is designed to coordinate surveillance and response efforts at all levels of the health system. The third edition of the regional IDSR technical guidelines details rapid detection, notification, reporting, analysis and response to priority diseases, conditions and events, while improving surveillance system integration and capacity (World Health Organization Regional Office for Africa [WHO AFRO], 2019). Regional reviews indicate that while IDSR implementation has resulted in significant progress, progress has not been uniform across the core and support functions of surveillance, notably the reporting, management and analysis of data, dissemination of information, functioning of laboratories and staff training (Fall et al., 2019; Wolfe et al., 2021; Sasie et al., 2024).

Surveillance studies in Africa showed that policy accessibility alone did not fully explain the presence of implementation gaps. Factors such as the capacity of health-workers, reporting quality, supervision, feedback, infrastructure and the presence of available and appropriate surveillance tools remain central to the effectiveness of a surveillance system (Masiira et al., 2019; Ng'etich et al., 2021; Ibrahim et al., 2020). In Nigeria, although the national IDSR was rolled-out at all levels of the health-system structure, gaps in documentation, reporting tools, health-worker capacity, and data analysis and support supervision were identified at the facility level (Ibrahim et al., 2020). Information system initiatives for electronic reporting in northern Nigeria showed the critical role electronic systems could serve in improving reporting timeliness and completeness as well as in providing mechanisms for data validation, analysis and dissemination (Ibrahim et al., 2021).

While the processes of health information management (HIM) are central to surveillance, a relatively small body of empirical investigation has addressed HIM professionals as a discrete cadre. Hospital-wide or health-system-wide studies among broader health-worker cadres have found that operational knowledge about IDSR processes and tools may be variable among health workers and trainees and that knowledge improves with training (Jinadu et al., 2018; Isere et al., 2021). African country-based data attributes to surveillance performance direct links to resource availability, training, supervision, feedback, infrastructure and health-worker capacity (Ng'etich et al., 2021; Twene et al., 2024; Kambalame et al., 2026). HIM cadres working in documentation, coding, aggregation, assurance and reporting activities supply a key interface between health service and surveillance information. However, the contribution of operational knowledge to performance of surveillance in real-world operational contexts is less well known in Bayelsa State, Nigeria. This study explored professional practice gaps in IDSR among HIM cadres in Bayelsa State, Nigeria.

In their roles of documentation, coding, data collection, quality control and reporting, the responsibilities of HIM professionals represent an important interface between clinical and surveillance data. However, the magnitude of the application of their operational knowledge to routine surveillance practice, as well as the professional and institutional gaps that may hinder performance, have not been characterized in Bayelsa State. This study thus assessed operational knowledge and practice gaps in IDSR among HIM professionals in Bayelsa State, Nigeria, to provide information on priorities for competency and system support. The evidence generated is hoped to strengthen HIM roles in surveillance locally and enhance the timeliness, completeness and quality of surveillance data.

2. MATERIALS AND METHODS

Study design and setting

This descriptive cross-sectional quantitative design was implemented in public health facilities in Bayelsa State, Nigeria. There are 8 Local Government Areas (LGAs) in Bayelsa State. The health care system is made up of 3 clinical levels: primary, secondary and tertiary, whose services are managed by the Bayelsa State Ministry of Health.

Population and sampling

The study population consisted of HIM officers who were working in the field of health records management, clinical coding and surveillance reporting. A multi-stage sampling technique was used where the public health facilities level were stratified into secondary and tertiary level, and an eligible participation of HIM officers in the formal health system was obtained through a structured sampling framework. A total of one hundred and fifteen questionnaires were administered, out of which one hundred and three questionnaires were retrieved and analyzed giving a response rate of 89.6%.

Data collection and measurement

Through structured pre-tested self-administered questionnaires; socio-demographics and other professional characteristics, operational knowledge of IDSR, surveillance practice and professional and institutional factors were gathered. The source instrument for all knowledge and practice items used a Likert agreement-based response scale, so the knowledge findings in this article are interpreted as perceived /self reported operational knowledge and the practice findings as self reported surveillance practice. The instrument was subjected to review by expert epidemiologist and health information management teachers and reported internal validity was adequate (Cronbach's $\alpha \geq 0.70$).

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The source analysis employed a criterion mean of 2.50 as the point of reference on the four-point response scale. Since the knowledge and practice measures used in the source analysis were collected through self-report, these data reflect perceptions and self-reported practices, and should not be construed as direct measures of surveillance achievement.

Data analysis

Data were coded and analyzed with SPSS 26. Frequencies and percentages summarized categorical domain and item level characteristics, while means and SD summarized item level indicators and domain scores. Simple linear regression models were run for the prespecified inferential analyses with a 0.05 level of significance. Results of the regressions are presented as associations not causals as they were based on cross-sectional data.

Ethical considerations

The study received ethical approval, permission from the states health authority and informed consent from all the participants, confidentiality was preserved and no personal identifiers were needed for the questionnaire. The study received ethical approval from the ethics and research committee of Federal medical centre, Yenagoa, with ethics and research committee clearance certificate Id number: 1168 Fmcy/rec/ecc/2026/April/0750 and date of approval 16th April 2026.

3. RESULTS

Figure 1. Participant recruitment and inclusion flow diagram

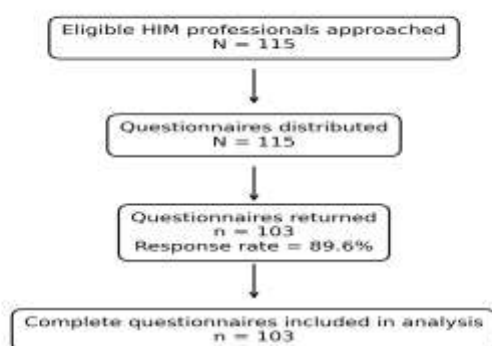


Figure 1. Participant recruitment and inclusion Flow Diagram.

Figure 1 presents the participant recruitment and inclusion process for the study. A total of 115 questionnaires were distributed to eligible Health Information Management (HIM) professionals working in public health facilities in Bayelsa State, while 103 completed questionnaires were retrieved and included in the final analysis, representing an overall response rate of 89.6%. The relatively high response rate indicates strong participation and suggests that non-response was limited, thereby providing a substantial empirical basis for describing perceived operational knowledge and self-reported Integrated Disease Surveillance and Response (IDSR) practices among the study population. The flow from questionnaire distribution through completion and inclusion also demonstrates that the final analytical sample was derived directly from the eligible respondents rather than from an arbitrary subset of returned questionnaires.

From a methodological perspective, the recruitment flow strengthens the transparency and reproducibility of the study because it allows readers to understand how the initial pool of potential participants was reduced to the final analytical sample. Nevertheless, the 12 questionnaires that were not included indicate a small degree of potential non-response, which should be acknowledged when interpreting the findings. Although the response rate is sufficiently high for the descriptive cross-sectional analysis undertaken, the possibility that non-respondents differed systematically from respondents cannot be completely excluded. Consequently, the findings should primarily be interpreted as reflecting the reported experiences and perceptions of the 103 participating HIM professionals, rather than as definitive evidence of objectively measured surveillance performance among all HIM professionals in Bayelsa State.

Table 1. Sociodemographic and professional characteristics of respondents (N = 103).

Variable	Category	n	%
Gender	Male	53	51.5
	Female	50	48.5
Age	20–29 years	31	30.1

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Variable	Category	n	%
	30–39 years	18	17.5
	40–49 years	30	29.1
	50+ years	24	23.3
Educational qualification	Diploma	37	35.9
	HND	45	43.7
	BSc	6	5.8
	PGD	10	9.7
	MSc	5	4.9
Work experience	1–5 years	20	19.4
	6–10 years	27	26.2
	11–15 years	25	24.3
	16+ years	31	30.1
Facility level	Secondary	23	22.3
	Tertiary	80	77.7

Table 1 demonstrates that the 103 respondents were relatively balanced by gender, although males constituted a marginal majority (53; 51.5%) compared with females (50; 48.5%). The age distribution indicates representation across all four age categories, with respondents aged 20–29 years constituting the largest group (31; 30.1%), closely followed by those aged 40–49 years (30; 29.1%). Respondents aged 50 years and above accounted for 24 (23.3%), while those aged 30–39 years represented the smallest age group (18; 17.5%). Educationally, HND holders formed the largest proportion of respondents (45; 43.7%), followed by Diploma holders (37; 35.9%). Only 6 (5.8%) possessed a BSc, while 10 (9.7%) and 5 (4.9%) had PGD and MSc qualifications, respectively. With respect to professional experience, the sample contained a substantial proportion of experienced personnel, with 31 (30.1%) reporting 16 years or more of experience, followed by 27 (26.2%) with 6–10 years and 25 (24.3%) with 11–15 years. Facility distribution was markedly skewed toward tertiary institutions, where 80 (77.7%) respondents worked, compared with 23 (22.3%) from secondary facilities.

The composition of the sample has important implications for interpreting the subsequent findings. The near-equal representation of males and females provides a relatively balanced basis for examining gender-related differences, while the broad age and experience distribution indicates that the study captured perspectives from both relatively early-career and highly experienced HIM professionals. The substantial representation of respondents with 16 or more years of experience may suggest considerable professional exposure to health information processes, although experience alone does not necessarily equate to competence in contemporary IDSR procedures. Similarly, the predominance of HND and Diploma qualifications reflects the educational profile of the participating workforce and may be relevant to the interpretation of professional development and training needs. Most importantly, the predominance of tertiary-facility respondents means that the findings may reflect tertiary-level surveillance environments more strongly than secondary-level settings; therefore, generalization across facility levels should be undertaken cautiously. This distribution is also consistent with the study's stated limitation that tertiary facilities accounted for most respondents.

Table 2. Perceived operational knowledge of IDSR among HIM professionals.

Knowledge domain	Sub-grand mean	Level
Reporting timeliness	2.47	Moderate
Reporting completeness	2.46	Moderate
Data quality and accuracy	2.49	Moderate
Surveillance capacity and experience	2.54	Moderate

Table 2 present the perceived operational knowledge clustered closely around the criterion mean across all four domains: reporting timeliness (2.47), reporting completeness (2.46), data quality and accuracy (2.49), and surveillance capacity and experience (2.54). The slight difference between the highest and lowest domain scores indicates that respondents did not demonstrate substantial variation in their perceived operational knowledge across the core surveillance functions. Notably, three of the four domain scores were below the criterion mean, while surveillance capacity and experience was only marginally above it. Thus, the overall pattern does not indicate a clearly high level of operational knowledge in any of the assessed domains. The findings suggest that although HIM professionals possess foundational awareness of IDSR activities, their perceived ability to operationalize key surveillance functions may require strengthening.

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The relatively low score for reporting completeness is particularly important because incomplete surveillance information can compromise the usefulness of data for disease detection, monitoring and response. Likewise, the score for data quality and accuracy being almost exactly at the criterion mean suggests that data validation and accuracy remain areas requiring continued professional attention. The slightly higher score for surveillance capacity and experience may reflect respondents' accumulated exposure to surveillance activities rather than comprehensive mastery of all operational procedures. Because the knowledge measure was based on self-reported perceptions rather than objective testing, these results should be interpreted as perceived operational knowledge and not as a direct assessment of actual knowledge or competency.

Table 3. Self-reported surveillance practice across core IDSR domains.

Practice domain	Sub-grand mean	Level
Timeliness of reporting	2.43	Moderate
Data quality and accuracy	2.42	Moderate
Completeness	2.48	Moderate

Table 3 present self-reported surveillance practice showed a similar moderate pattern, with mean scores of 2.43 for reporting timeliness, 2.42 for data quality and accuracy, and 2.48 for completeness. All three domains were below the 2.50 criterion mean. Completeness recorded the highest mean score at 2.48, followed by timeliness of reporting at 2.43 and data quality and accuracy at 2.42. The relatively small spread between the highest and lowest scores demonstrates a consistent pattern of moderate performance rather than an isolated weakness in a single surveillance function. The fact that none of the assessed practice domains exceeded the criterion mean is particularly notable, indicating that respondents did not perceive their routine surveillance practices as being clearly strong in any of the assessed areas. Data quality and accuracy represented the weakest domain, suggesting that the transformation of routinely collected information into accurate and reliable surveillance data may be a particularly important operational challenge. The pattern observed in Table 3 provides an important complement to the knowledge findings presented in Table 2. Although respondents reported moderate knowledge across surveillance domains, their reported practice remained similarly moderate and did not reach a clearly high level. This may indicate that awareness of surveillance requirements does not automatically translate into consistent execution of surveillance activities. In particular, the relatively low score for data quality and accuracy raises concerns about verification, documentation and validation processes before surveillance information is submitted. The findings therefore support the broader interpretation that improvement in IDSR should extend beyond knowledge acquisition to include practical competency, supervision, feedback, availability of reporting resources and supportive institutional conditions. Because the practice measures were self-reported, however, the findings should be understood as reported surveillance behaviours rather than objectively observed performance.

Figure 2. Perceived operational knowledge and self-reported surveillance practice across core IDSR domains

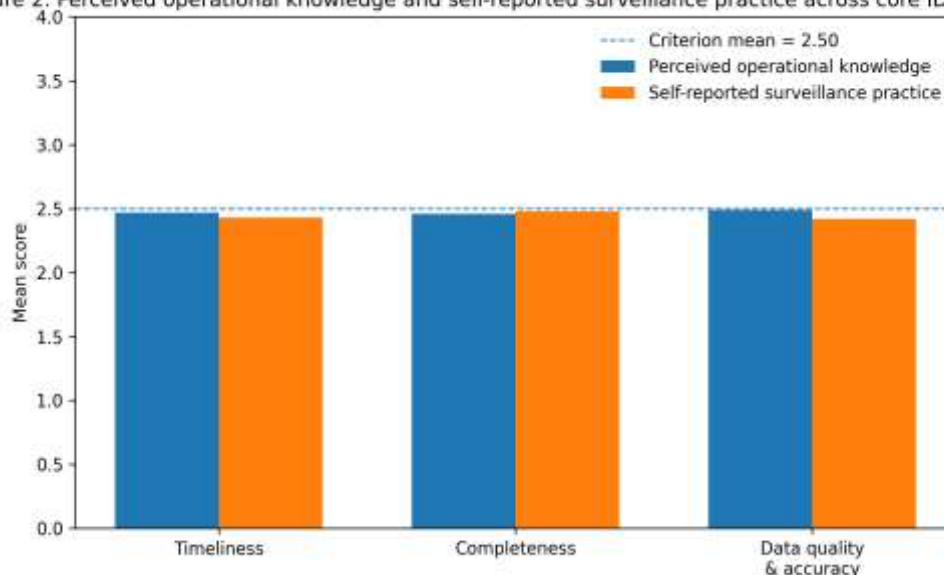


Figure 2. Perceived operational knowledge and self-reported surveillance practice across core IDSR domains.

Figure 2 provides a visual comparison of perceived operational knowledge and self-reported surveillance practice across the core IDSR domains. The graphical pattern demonstrates that both constructs remain concentrated around the moderate level, with knowledge scores of 2.47 for reporting timeliness, 2.46 for completeness, 2.49 for data quality and accuracy, and 2.54 for

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surveillance capacity and experience. Corresponding practice scores were 2.43 for timeliness, 2.42 for data quality and accuracy, and 2.48 for completeness. The figure therefore shows a generally narrow distribution of scores, with no pronounced peak that would indicate a distinctly strong area of knowledge or practice. Surveillance capacity and experience appears as the strongest knowledge-related domain, whereas data quality and accuracy appears among the weaker practice domains.

The comparative visual pattern is important because it illustrates the relatively small difference between perceived knowledge and reported practice while also highlighting areas where practice appears weaker than knowledge. In particular, reporting timeliness and data quality show slightly lower practice scores than the corresponding knowledge indicators, suggesting a possible operational gap between knowing surveillance requirements and consistently applying them. This interpretation is reinforced by the item-level findings, which identify weaknesses in data validation, verification before submission and documentation. The figure therefore supports the study's central argument that strengthening IDSR performance among HIM professionals requires a multidimensional approach that combines competency development with supportive supervision, feedback, adequate resources, communication infrastructure and appropriate workload arrangements rather than relying exclusively on knowledge transfer.

Table 4. Item-level operational knowledge, practice and capacity indicators.

Construct	Indicator	Mean	SD	Interpretation
Perceived knowledge	Understanding timeliness measurement	2.46	1.211	Moderate gap
Perceived knowledge	Zero reporting/completeness	2.38	1.112	Priority gap
Perceived knowledge	Data validation at facility level	2.38	1.156	Priority gap
Capacity/exposure	Formal IDSR training received	2.47	1.178	Moderate gap
Capacity/exposure	Surveillance participation	2.60	1.114	Relatively stronger area
Practice	Timely submission prioritized	2.41	1.150	Moderate gap
Practice	Motivation to submit timely reports	2.62	1.112	Relatively stronger area
Practice	Verification before submission	2.41	1.175	Moderate gap
Practice	Documentation errors compromise surveillance	2.24	1.133	Notable gap
Practice	Zero reporting importance	2.60	1.060	Relatively stronger area
Practice	Completing all required fields	2.50	1.119	Borderline/moderate

Table 4 provides a more detailed examination of the specific operational indicators underlying the broader domain-level findings. The results identify important differences between individual indicators despite the generally moderate domain-level pattern. Perceived knowledge of understanding timeliness measurement recorded a mean of 2.46, while zero reporting/completeness and facility-level data validation each recorded 2.38, making them the lowest knowledge indicators and classifying them as priority gaps. Formal IDSR training received a mean of 2.47, indicating a moderate gap, whereas surveillance participation was comparatively stronger at 2.60. Among practice indicators, timely submission and verification before submission both recorded 2.41, while documentation errors compromising surveillance had the lowest overall practice score of 2.24. Conversely, motivation to submit timely reports (2.62) and recognition of the importance of zero reporting (2.60) were comparatively stronger, while completion of all required fields stood exactly at the 2.50 criterion mean.

The item-level pattern reveals an important distinction between respondents' general orientation toward surveillance and their ability to consistently execute technically demanding surveillance processes. The comparatively strong scores for motivation to submit reports on time, recognition of zero reporting and surveillance participation suggest that respondents generally appreciate the importance of surveillance and are willing to engage with the system. However, lower scores for facility-level data validation, zero reporting/completeness, verification before submission and documentation errors suggest weaknesses in the procedural aspects of ensuring that information is complete, accurate and internally consistent before transmission. The particularly low score of 2.24 for documentation errors is significant because documentation problems can propagate inaccuracies through subsequent aggregation, analysis and reporting processes. These findings indicate that interventions should prioritize practical, competency-based training in validation, documentation, completeness checks and pre-submission verification rather than focusing solely on general awareness of IDSR.

Table 5. Perceived professional and institutional factors associated with surveillance operations.

Factor domain	Sub-grand mean	Relative priority
Supervision and feedback	2.62	Highest priority
Resources and infrastructure	2.56	High priority
Training and capacity building	2.49	Moderate
Staffing and workload	2.48	Moderate

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Factor domain	Sub-grand mean	Relative priority
Institutional and management support	2.42	Moderate

Table 5 demonstrates that supervision and feedback was the most prominent professional/institutional factor, with a mean score of 2.62, followed by resources and infrastructure at 2.56. Training and capacity building recorded 2.49, staffing and workload 2.48, and institutional and management support 2.42. The ranking indicates that respondents perceived supervision and feedback as the highest-priority contextual factor affecting surveillance operations, while resources and infrastructure were also identified as a relatively high-priority concern. The remaining domains were categorized as moderate, although their scores were close to the criterion mean. The relatively narrow range of scores, from 2.42 to 2.62, suggests that surveillance challenges are not attributable to one isolated organizational factor but rather reflect a combination of professional, managerial and infrastructural conditions.

The prominence of supervision and feedback is particularly important because surveillance systems require continuous communication between facility-level personnel and higher administrative or surveillance structures. Effective feedback can help HIM professionals identify reporting deficiencies, correct documentation errors and improve the quality and completeness of subsequent submissions. Similarly, the relatively high score for resources and infrastructure suggests that the availability of reporting tools, communication systems and other operational resources may influence the ease with which surveillance responsibilities are performed. The lower scores for institutional support and staffing/workload further suggest that organizational arrangements may constrain the effective application of individual competencies. Consequently, the findings support a systems-oriented interpretation in which surveillance performance depends not only on the knowledge and motivation of HIM professionals but also on the organizational environment in which surveillance activities are performed. This interpretation is consistent with the study's discussion of supervision, feedback, resources, training and structural conditions as interconnected determinants of IDSR implementation.

Table 6. Simple linear regression models of associations with operational knowledge and surveillance practice.

Predictor	Outcome	R	β	R ²	F	p
Operational knowledge	Surveillance practice	0.072	0.072	0.005	0.520	0.468
Gender	Surveillance practice	0.036	0.036	0.001	0.130	0.716
Selected factors	Operational knowledge	0.045	—	0.002	0.201	0.655
Selected factors	Surveillance practice	0.009	—	0.000	0.008	0.929

Table 6 presents the inferential analysis examining whether operational knowledge, gender and selected professional/institutional factors were significantly associated with operational knowledge or surveillance practice. Operational knowledge was not significantly associated with surveillance practice ($\beta = 0.072$, $R^2 = 0.005$, $p = 0.468$). Gender was also not significantly associated with practice ($\beta = 0.036$, $R^2 = 0.001$, $p = 0.716$). The selected-factor models were not statistically significant for operational knowledge ($R = 0.045$, $R^2 = 0.002$, $F = 0.201$, $p = 0.655$) or surveillance practice ($R = 0.009$, $R^2 = 0.000$, $F = 0.008$, $p = 0.929$). Because the study is cross-sectional, these results are interpreted as non-significant associations rather than causal effects. Overall, none of the tested models achieved the conventional statistical significance threshold of $p < 0.05$.

These findings indicate that the measured operational knowledge and selected explanatory variables, individually or in the specified models, did not account for meaningful variation in reported surveillance practice within this sample. Importantly, the non-significant relationship between knowledge and practice should not be interpreted to mean that knowledge is irrelevant to surveillance performance; rather, the findings indicate that the measured knowledge construct alone was insufficient to explain differences in reported practice. The negligible R^2 values further suggest that important determinants of surveillance performance were either not measured or were inadequately represented in the models. Possible contextual dimensions identified descriptively in the study—including supervision, feedback, resources, infrastructure, workload, institutional support and training—may operate through complex interactions that are not captured by simple linear models. Furthermore, because the study used a cross-sectional design, the regression findings represent associations rather than causal relationships. The results therefore reinforce the need for broader and more granular models of IDSR performance that incorporate individual, organizational and health-system determinants.

4. DISCUSSION

The finding of moderately rated perceived operational knowledge and self reported surveillance practice was also universal among the HIM professionals in the Bayelsa State. Knowledge scores for timeliness (2.47), completeness (2.46), data quality and accuracy (2.49), and surveillance capacity and experience (2.54) were the ideas of criterion mean. The finding is in line with all the evidence of variation in IDSR performance in a variety of setting and on-going weaknesses in reporting, data management, training and other core and support functions (Wolfe et al., 2021; Sasie et al., 2024). Furthermore the evidences from Nigeria showed that knowledge

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of IDSR specific tools and process can be erratic despite the presence of good attitude of health workers towards surveillance (Jinadu et al., 2018).

Item-level results paint a more detailed picture of the knowledge gaps. Completeness, timeliness of reporting, and definition of facility-level data validation scored the lowest in knowledge, and coverage of formal training still remained low at 75.9%. These results are salient given the evidence base in Africa consistently highlighting deficiencies in reporting quality, timeliness, completeness, training and supervision (Ng'etich et al., 2021; Masiira et al., 2019). In northeastern Nigeria a rapid assessment also found suboptimal documentation, inadequate reporting forms and limited staff ability to detect, report, analyze and interpret surveillance data, and called for training, reporting tools and supportive supervision (Ibrahim et al., 2020).

Self-reported reporting practice was also mixed, with the lowest domain score occurring for data quality and accuracy (2.42). Verification before submission and focus on documentation errors scored lower on individual items than motivation to report on time and knowledge of the importance of zero reporting. Differentiating organizational orientation from consistent practice is important because performance relies on the operation of multiple core and support activities rather than knowledge alone (Ng'etich et al., 2021; Sasie et al., 2024). For example, in Kenya, investigations of surveillance performance revealed areas for improvement in case definitions, registration, data analysis and feedback, supervision, training and resources despite comparatively stronger performance in certain indicator reporting (Ng'etich et al., 2021).

Supervision and feedback had the highest perceived contextual score of (2.62) followed by resources and infrastructure (2.56). These results correspond strongly with more recent evidence. A 2024 study in Ghana found the absence of feedback from higher levels as ubiquitous and transport, capacity to apply case definitions and feedback were associated with well-functioning IDSR systems (Twene et al., 2024). A 2026 African systematic review also identified limited resources, inadequate access to knowledge and information, structural barriers, motivation and capability as major barriers, while having adequate resources and access to knowledge were major facilitators (Kambalame et al., 2026).

The regression analysis did not reveal statistically significant associations between perceived operational knowledge and practice ($\beta=0.072$, $R^2=0.005$, $p=0.468$). The model only revealed 0.5% of the variability observed with the practice variable in the sample. This should not be construed as hypothesizing no conceptual significance for knowledge; it only indicates that the single measured knowledge construct by itself was unable to account for any conceptual variability in the observed practice dependent variable. Similarly, gender was not statistically significantly associated with practice ($\beta=0.036$, $R^2=0.001$, $p=0.716$). The assigned-factor models also accounted for little of the variability observed in practice outcome, suggesting important determinants that could not be accounted for using the variables present in the available models. This interpretation is broadly consistent with more recent implementation literature suggesting that the IDSR practice is multidimensional and shaped by interacting levels of individual, organizational and system determinants (Twone et al., 2024; Kambalame et al., 2026).

Overall, results suggest a move away from knowledge alone, i.e. developing a wider workforce and system approach. The WHO AFRO IDSR framework describes the importance of coordinated surveillance functions and capacity across the healthsystem levels, while evidence from Nigeria and Africa more generally continues to support workforce development, supervision, feedback and reporting resources, and information-system strengthening as ongoing priorities (WHO AFRO, 2019; Ibrahim et al., 2021; Ng'etich et al., 2021; Eneh et al., 2025). Capacity development can also be delivered through blended, online approaches; WHO supported IDSR online learning demonstrated high learner acceptance and evidence of knowledge use indicating the potential for accessible ongoing professional development (Bonkougou et al., 2023)."

5. CONCLUSION AND RECOMMENDATIONS

HIM workers in public health facilities in Bayelsa State demonstrated baseline awareness, moderate perceived operational knowledge and self-reported surveillance practice. The most apparent deficiencies were in timeliness and completeness of reporting and data validation and documentation. Supervision and feedback, the most prominent contextual factors, closely followed resources and infrastructure. The regression models generated did not find statistically significant associations between operational knowledge, gender or the factor sets selected and surveillance practice or knowledge. The findings suggest that the approach to surveillance strengthening in this setting should be one of a systems-support challenge rather than that of transferring knowledge.

RECOMMENDATIONS

1. Nigeria is a specific example of action: (5) Federal Ministry of Health, Nigeria Centre for Disease Control and Prevention should include HIM professional participation in IDSR training and capacity-building activities, with an emphasis on timeliness of reporting, completeness of reporting, the use of standard case definitions, zero reporting, and data validation.
2. The State Ministry of Health in Bayelsa State as well as the health-facility management should enhance routine supportive supervision and structured feedback so that health information management (HIM) staff will get prompt feedback on quality and utilization of surveillance reports.

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3. Health facilities should adopt, implement and maintain well-designed IDSR reporting forms and improved communication systems and workload arrangements to eliminate the preventable delays of reporting and documentation issues.
4. Professional bodies and training providers to build on CPD, mentoring and competency based learning in disease surveillance including practical testing of IDSR reporting competence.
5. Clearly define the role of HIM professionals in surveillance. Integrate surveillance indicators into regular quality-improvement projects and monitor timeliness, completeness, and data quality measures over time.
6. Use more detailed measures of training intensity, contact with supervisors, feedback received and frequency, workload, extent of access to digital-system and institutional support, and implement time-series or mixed methods research designs to disentangle mechanisms underlying the identified knowledge-practice gaps.

6. STRENGTHS AND LIMITATIONS

This research empirically examines the operational knowledge and surveillance activities practice of HIM professionals. HIM professionals have been relatively under-studied compared to the other cadres in IDSR literature. The study demonstrates filling of specific operational gaps in timeliness, completeness, data validation and documentation, and presents both descriptive and inferential results.

Despite these limitations, our findings have some implications. Knowledge and practice were measured based on respondents' answers to questionnaire and thus, findings are prone to recall bias and social-desirability effects. First, the cross-sectional analysis used here limits the ability to make causal conclusions. Second, the focus on public health facilities and intensive number of final respondents focused on tertiary health facilities, limit the potential to generalize our findings to other settings. Third, the regression models had a very low R^2 and thus, additional important determinants were not explored based on the available measures. Fourth, we did not provide qualitative data, and thus, cannot interpret more deeply some of the institution and behavioral barriers.

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