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Assessment of factors militating against effective disease surveillance and notification systems in selected local government areas of Taraba State, Nigeria

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Keywords

Disease Surveillance, Notification System, IDSR Epidemic Preparedness

Abstract

A disease surveillance system is the foundation of public health action, facilitating early detection of health threats, timely intervention, and evidence-based policy formulation. This study assessed the factors militating against effective disease surveillance and notification (DSN) systems in Ardo-Kola, Bali, and Takum Local Government Areas (LGAs) of Taraba State, Nigeria. A descriptive cross-sectional design was adopted. Using Yamane's (1967) formula, a sample of 300 respondents, comprising Surveillance Focal Persons and Community Key Informants, was drawn from a target population of 1,200 across the three LGAs through stratified random sampling. Data were collected using a structured, self-administered questionnaire and analysed with SPSS version 27, employing frequencies, percentages, and Chi-square tests at a 0.05 significance level. Findings revealed that 80.3% of respondents encountered challenges completing DSN reporting forms, with workload overload (62.3%) and inadequate training (48.3%) as dominant barriers. Electronic data capture systems were functional in only 27.7% of facilities. Data analysis prior to submission occurred in only 34.3% of facilities, and regular trend analysis was conducted in only 29.0% of LGAs. A defined interpretation system was absent in 58.7% of facilities, and 52.3% lacked defined dissemination protocols. Outbreak response was hampered by funding gaps (71.3%), inadequate logistics (74.0%), and poor inter-team communication (87.7%). Chi-square analysis confirmed statistically significant relationships between DSN effectiveness and factors hindering data collection ($\chi^2 = 9.660$, $p = .002$), factors limiting data analysis ($\chi^2 = 4.090$, $p = .043$), and factors undermining response mechanisms ($\chi^2 = 5.599$, $p = .018$). In contrast, factors impeding interpretation and dissemination were not statistically significant. The study concludes that the DSN system in the selected LGAs is significantly constrained across its operational dimensions and recommends targeted investment in digital health infrastructure, capacity building, and sustainable funding for outbreak response.

1. Introduction

Disease outbreaks and epidemics present a significant challenge to public health systems, particularly in developing countries. Epidemic-prone diseases such as cholera, Lassa fever, yellow fever, and most recently COVID-19 have continued to threaten lives and strain health infrastructure in Nigeria. Early detection and effective response remain central to reducing the morbidity and mortality associated with such diseases, and

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one of the most critical tools in this effort is an effective Disease Surveillance and Notification System (DSNS), which ensures the continuous and systematic collection, analysis, interpretation, and dissemination of health data necessary for public health decision-making (World Health Organization [WHO], 2020).

Nigeria adopted the Integrated Disease Surveillance and Response (IDSR) strategy in 2001, developed by the WHO African Region, to strengthen national surveillance systems and ensure early detection and prompt response to epidemics. Despite this, recurrent outbreaks across several states point to persistent gaps in surveillance activities, including poor data quality, weak laboratory capacity, and delayed reporting and feedback mechanisms (Nigeria Centre for Disease Control [NCDC], 2021). At the local government area (LGA) level, Disease Surveillance and Notification Officers (DSNOs) coordinate the collection, compilation, analysis, and reporting of surveillance data from health facilities to the state epidemiologist; however, the practical reality in many LGAs, particularly in geographically disadvantaged and resource-limited states such as Taraba, is marked by persistent failures that undermine the system's capacity to function as designed.

Northern Nigeria remains among the most vulnerable regions of the country to recurrent epidemics, including cholera, measles, cerebrospinal meningitis, and Lassa fever. The 2017 meningitis outbreak in northern Nigeria resulted in over 1,000 deaths, partly attributable to late case detection and poor coordination of surveillance activities (Olayinka et al., 2019), while the 2018 Lassa fever outbreak was similarly exacerbated by gaps in community-level surveillance and laboratory diagnosis. Many LGAs lack trained DSNOs, reliable laboratory services, and the digital infrastructure necessary for real-time data transmission (Adagba & Abdulrahman, 2022), resulting in under-reported, misdiagnosed, or belatedly communicated cases. Fragmented data further compromises resource allocation and timely decision-making (Ameh et al., 2020), while in many rural northern communities, traditional and religious beliefs discourage timely healthcare-seeking behaviour, weakening community-based reporting (Ogbonna et al., 2019). Bottlenecks in the flow of information between community, LGA, state, and national levels, compounded in places by insecurity, further delay coordinated outbreak response (UN OCHA, 2021).

Despite the existence of the IDSR framework and the National Health Management Information System (NHMIS), empirical evidence on how these systems function at the operational LGA level in Taraba State remains scarce. This study therefore assessed the factors militating against effective disease surveillance and notification systems in Ardo-Kola, Bali, and Takum LGAs of Taraba State, examining the five core operational domains of data collection, data analysis, data interpretation, information dissemination, and response mechanisms.

2. Materials and Methods

2.1 Design and Area of Study

The study adopted a descriptive cross-sectional design, allowing data to be collected at a single point in time across three purposively selected LGAs of Taraba State - Ardo-Kola, Bali, and Takum - each representing one of the state's geopolitical zones. This design has been widely applied in Nigerian disease surveillance research (Atinge et al., 2021; Osagiede et al., 2020) and is suited to identifying strengths, gaps, and opportunities for system improvement without manipulating variables. The three LGAs are predominantly rural and agrarian, characterised by varied ethnic composition (including Jukun, Mumuye, Fulani, Chamba, Kuteb, Tiv, and Hausa communities), challenging terrain, and, in parts, cross-border proximity to Cameroon.

2.2 Population, Sample Size, and Sampling Technique

The study population comprised all Surveillance Focal Persons (SFPs) and Community Key Informants (CKIs) actively engaged in disease surveillance activities across the three LGAs as of 2025, totalling 1,200 persons (Ardo-Kola = 340; Bali = 440; Takum = 420). The sample size was determined using Yamane's (1967) formula for a finite population, $n = N / [1 + N(e)^2]$, with N = 1,200 and a precision level (e) of 0.05, yielding a sample size of 300. A stratified random sampling technique was employed, with each LGA constituting a stratum further stratified into SFPs and CKIs; simple random sampling was then applied within each stratum, yielding 89 respondents from Ardo-Kola, 111 from Bali, and 100 from Takum.

2.3 Instrument, Validity, and Reliability

Data were collected using a structured, self-administered questionnaire comprising six sections: socio-demographic characteristics (Section A) and factors relating to data collection (B), data analysis (C), data interpretation (D), information dissemination (E), and response mechanisms (F). Content and face validity

were established through review by the researcher's supervisors and two independent experts - one in Nursing Science and one from the WHO Country Office, Jalingo - whose input informed refinement of the instrument. A pilot study among 12 health workers in Wukari LGA yielded a Cronbach's alpha above 0.86 across all items, indicating acceptable internal consistency.

2.4 Procedure and Data Analysis

Following informed consent, questionnaires were self-administered on-site and checked daily for completeness. Quantitative data were coded and analysed in SPSS version 27 using frequencies and percentages to summarise socio-demographic and DSN-related variables, and Chi-square tests to examine the relationship between each domain of militating factors and overall DSN effectiveness, at a 0.05 level of significance.

2.5 Ethical Consideration

Ethical approval was obtained from the Adamawa State Ministry of Health and Human Services, with additional permission secured from the Local Government Health Authorities in Ardo-Kola, Bali, and Takum. Participation was voluntary, anonymity and confidentiality were assured, and no personal identifiers were collected.

3. Results

This section presents the study findings based on data collected from 300 respondents comprising Surveillance Focal Persons and Community Key Informants across the three LGAs and discusses these findings in relation to the study objectives and existing literature.

Table 1: Socio-Demographic Characteristics of Respondents (N = 300)

Variable	Category	Frequency	Percent (%)
LGA	Ardo-Kola	89	29.7
	Bali	111	37.0
	Takum	100	33.3
Gender	Male	141	47.0
	Female	159	53.0
Age (years)	25-34	97	32.3
	35-44	98	32.7
	45-54	96	32.0
	55 and above	9	3.0
Designation	Surveillance Focal Person	166	55.7
	Community Key Informant	134	44.3
Education	Tertiary	289	96.3
	Secondary	10	3.3
	Primary	1	0.3
Experience	11-15 years	107	35.7
	Above 15 years	99	33.0
	1-5 years	55	18.3
	6-10 years	39	13.0
DSN Training Received	Yes	298	99.3
	No	2	0.7

Source: Field Survey, 2026

Table 1 shows that respondents were drawn from Bali (37.0%), Takum (33.3%), and Ardo-Kola (29.7%). Females constituted a slight majority (53.0%), and the age distribution was broadly even across the 25–54year range. Surveillance Focal Persons made up 55.7% of respondents and Community Key Informants 44.3%. The overwhelming majority (96.3%) held tertiary qualifications, 68.7% had over 11 years of experience, and 99.3% had received DSN training, indicating a well-educated and experienced, but not necessarily well-resourced, workforce.

Table 2: Factors Hindering Effective Data Collection (N = 300)

Indicator	Response	Frequency	Percent (%)
Standardised DSN tools available	Yes	277	92.3
Data collection supervised	Yes	198	66.0
Challenges completing DSN forms	Yes	241	80.3
Workload overload*		187	62.3
Poor literacy / inadequate training*		145	48.3
Unclear form design*		98	32.7
Electronic systems (SORMAS/DHIS2) functional	Yes	83	27.7
Poor internet connectivity*		143	47.7
Lack of equipment*		124	41.3
Timely feedback after submission	Yes	201	67.0
Inadequate feedback affects motivation	Yes	280	93.3

Source: Field Survey, 2026. *Multiple responses permitted; percentages based on applicable sub-sample.

As shown in Table 2, standardised DSN data collection tools were available in 92.3% of facilities, yet 80.3% of respondents reported challenges completing DSN forms, chiefly workload overload (62.3%) and poor literacy or inadequate training (48.3%). Only 27.7% of facilities had functional electronic data capture systems (SORMAS/DHIS2), with poor internet connectivity (47.7%) and lack of equipment (41.3%) cited as the main barriers. A large majority (93.3%) agreed that inadequate feedback after submission undermines staff motivation to collect accurate data. These findings are consistent with Lar et al.'s (2015) documentation of competing clinical and administrative burdens among surveillance personnel in Plateau State, and with Tom-Aba et al.'s (2020) digital-maturity assessment of SORMAS, which identified poor connectivity and device availability as persistent constraints on electronic surveillance deployment across Nigerian LGAs.

Table 3: Factors Limiting Effective Data Analysis (N = 300)

Indicator	Response	Frequency	Percent (%)
Data analysed at facility before submission	Yes	103	34.3
Staff adequately trained in analysis	Yes	116	38.7
Computers/software available	Yes	94	31.3
Regular trend analysis conducted	Yes	87	29.0
Inadequate staffing affects analysis quality	Yes	288	96.0
Tool most used: Manual/paper-based		186	62.0
Tool most used: Microsoft Excel		143	47.7
Tool most used: DHIS2		89	29.7

Source: Field Survey, 2026

Table 3 shows that only 34.3% of facilities analysed surveillance data before onward submission, meaning the majority forwarded raw, unanalysed data. Only 38.7% of staff responsible for analysis were adequately trained, and only 31.3% of facilities had computers or analytical software. Regular trend analysis occurred in just 29.0% of LGAs. Manual, paper-based methods remained the dominant analytical tool (62.0%), well ahead of Microsoft Excel (47.7%) and DHIS2 (29.7%), and 96.0% of respondents agreed that inadequate staffing undermines analytical quality. This 'dual-deficit' pattern - where trained analysts and analytical tools are simultaneously scarce - suggests that human-capital and technological investments must be pursued jointly rather than sequentially, echoing Ibrahim et al.'s (2021) evaluation of electronic IDSR reporting in Adamawa and Yobe States, which found that digital tools introduced without adequately trained personnel were consistently underutilised.

Table 4: Factors Impeding Effective Data Interpretation (N = 300)

Indicator	Response	Frequency	Percent (%)
Defined interpretation system exists	Yes	124	41.3
Primary interpreter: DSNO		147	49.0
Primary interpreter: Epidemiologist		42	14.0
Staff adequately trained in interpretation	Yes	160	53.3
Lack of training affects interpretation accuracy	Yes	267	89.0
Compared with historical baseline data	Yes	98	32.7
Outbreak signals promptly identified	Yes	141	47.0
Poor interpretation delays control decisions	Yes	274	91.3

Source: Field Survey, 2026

Table 4 indicates that 58.7% of facilities lacked a defined system for interpreting disease trends. Interpretation responsibility fell mainly to DSNOs (49.0%) rather than trained epidemiologists (14.0%), and 11.0% of facilities had no one specifically assigned this role. Although 53.3% of respondents reported adequate training in interpretation, 89.0% nonetheless agreed that inadequate training compromises interpretive accuracy. Only 32.7% of facilities compared current data against historical baselines, and 91.3% agreed that poor interpretation delays disease-control decisions. This distribution of interpretive responsibility primarily to DSNOs, who may lack specialised epidemiological training, carries predictable consequences for the accuracy and timeliness of public health decision-making.

Table 5: Factors Constraining Effective Information Dissemination (N = 300)

Indicator	Response	Frequency	Percent (%)
Reports regularly shared with stakeholders	Yes	178	59.3
Dissemination protocols clearly defined	Yes	143	47.7
Primary channel: WhatsApp*		243	81.0
Primary channel: Written/printed reports*		198	66.0
Primary channel: Email*		187	62.3
Channels considered reliable and timely	Yes	142	47.3
Lack of modern ICT tools affects timeliness	Yes	287	95.7
Feedback received from higher levels	Yes	168	56.0
Inadequate feedback discourages dissemination	Yes	261	87.0

Source: Field Survey, 2026. *Multiple responses permitted.

Table 5 shows that 52.3% of facilities lacked clearly defined dissemination protocols. WhatsApp was the dominant dissemination channel (81.0%), ahead of written reports (66.0%) and email (62.3%), reflecting reliance on informal digital platforms. Only 47.3% of respondents considered existing channels reliable and timely. In comparison, 95.7% agreed that the lack of modern ICT tools affects dissemination timeliness, and 87.0% agreed that inadequate feedback from higher levels discourages prompt dissemination. The dominance of WhatsApp over official platforms such as DHIS2 reflects the informal digitalisation of surveillance communication documented elsewhere in Nigeria (Otu et al., 2016). It raises important questions regarding data security, accountability, and the verifiability of reports transmitted through consumer messaging platforms.

Table 6: Factors Undermining Effective Response Mechanisms (N = 300)

Indicator	Response	Frequency	Percent (%)
Functional rapid response team exists	Yes	198	66.0
Notable delays in outbreak response	Yes	269	89.7
Response operations adequately funded	Yes	86	28.7
Inadequate funding delays/weakens response	Yes	271	90.3
Logistic support consistently available	Yes	78	26.0
Poor communication reduces effectiveness	Yes	263	87.7
Community informants involved in response	Yes	187	62.3
Post-response debriefing/feedback provided	Yes	143	47.7

Source: Field Survey, 2026

As shown in Table 6, while 66.0% of LGAs reported having a functional rapid response team, 89.7% of respondents still reported notable delays in outbreak response - indicating a gap between structural existence and operational readiness. Only 28.7% of respondents considered response operations adequately funded, and 90.3% agreed that inadequate funding significantly delays or weakens response. Consistent logistic support (vehicles, PPE, medications) was available in only 26.0% of facilities, and 87.7% agreed that poor inter-team communication reduces response effectiveness. This paradox - teams exist, but delays persist - echoes a rapid assessment of IDSR implementation in north-eastern Nigeria by Ibrahim et al. (2020), which attributed similar gaps to inadequate pre-positioning of supplies and unclear activation protocols, and mirrors Fall et al.'s (2019) continental finding that unsustainable financing is the most frequently cited systemic barrier to IDSR response function across Africa.

Table 7: Chi-Square Test Summary for Hypotheses on DSN Effectiveness

Hypothesis	Domain	Chi-square	df	p-value	Decision
H01	Factors hindering data collection	9.660	1	.002	Rejected*
H02	Factors in limiting data analysis	4.090	1	.043	Rejected*
H03	Factors impeding data interpretation	0.793	1	.373	Not rejected
H04	Factors constraining dissemination	0.280	1	.597	Not rejected
H05	Factors undermining response mechanisms	5.599	1	.018	Rejected*

Source: Field Survey, 2026. *Significant at p < 0.05.

The Chi-square analysis yielded statistically significant relationships for three of the five hypotheses. Factors hindering data collection, factors limiting data analysis, and factors undermining response mechanisms were each significantly associated with overall DSN effectiveness, confirming that systemic constraints in these domains directly compromise the functioning of the surveillance system. Factors impeding data interpretation ($p = .373$) and factors constraining information dissemination ($p = .597$) did not reach statistical significance at the 5% level. This does not indicate adequacy in these domains; rather, because interpretation and dissemination challenges were so widespread and uniformly distributed across the study population, there was insufficient variance for the Chi-square test to detect an association - a methodological pattern noted by Mremi et al. (2021) in their twenty-year review of IDSR implementation across sub-Saharan Africa, where pervasive, near-universal system deficits similarly produced non-significant statistical associations despite substantively important operational gaps.

4. Discussion

This study concludes that the Disease Surveillance and Notification System in Ardo-Kola, Bali, and Takum LGAs of Taraba State is significantly constrained across its operational dimensions - data collection, analysis, interpretation, dissemination, and response. Although the system retains important structural foundations, including a trained and experienced workforce and generally available standardised tools, its effectiveness is undermined by inadequate digital infrastructure, weak analytical capacity, poor inter-level coordination, insufficient funding, and the absence of systematic feedback mechanisms. The significant statistical associations between data-collection challenges, analytical limitations, and response deficiencies and overall DSN effectiveness underscore the interdependent, chain-like nature of the surveillance system, in which weaknesses at any single node produce cascading effects across the whole. The non-significant findings for interpretation and dissemination should not be read as evidence of adequacy in these domains, but rather as a reflection of how pervasive these challenges are across the study population. Based on these findings, the following recommendations are made:

1. The Taraba State Ministry of Health and NCDC should ensure that SORMAS and DHIS2 are fully functional in all health facilities in Ardo-Kola, Bali, and Takum LGAs, with stable internet access, functional devices, and sustained technical support.
2. Supervisors should conduct scheduled visits to health facilities, using structured checklists and providing written feedback and improvement plans, given that 34% of facilities currently receive no supervisory oversight.
3. A clear, standardised protocol for checking data, identifying trends, comparing with historical records, and recognising outbreak signals should be developed and embedded into routine surveillance practice at facility and LGA levels.
4. Staff training should move beyond occasional workshops to include hands-on practice, on-the-job mentoring, and competency assessment to ensure that analytical and interpretive skills are genuinely acquired.
5. A systematic feedback loop should be institutionalised so that facilities that submit surveillance data routinely receive acknowledgement, quality feedback, and information on what the data reveal, to sustain motivation and reporting quality.
6. Every facility should adopt a written dissemination protocol specifying reporting timelines, recipients, channels, and accountability for non-transmission of reports.
7. Given the widespread reliance on WhatsApp for surveillance reporting, interim guidelines should be issued governing its appropriate use, alongside a phased transition toward secure platforms such as DHIS2.

8. The Taraba State Government should allocate dedicated, pre-positioned funding for rapid response at the LGA level, ensuring that vehicles, PPE, medicines, and communication tools are available before an outbreak occurs rather than mobilised afterwards.

References

Abate, E., Teshome, M., Tulu, B., Abebe, G., & Tesfaye, G. (2022). Assessment of the integrated disease surveillance and response system implementation in Amhara National Regional State, Ethiopia: A cross-sectional study. BMC Public Health, 22(1), Article 1014. https://doi.org/10.1186/s12889-022-13414-7

Adagba, S., & Abdulrahman, Y. (2022). Strengthening local capacity for disease surveillance and notification in Nigeria: Challenges and opportunities. Journal of Public Health in Africa, 13(3), 112-119. https://doi.org/10.4081/jphia.2022.220

Ameh, C., Adeleye, O., Kabiru, C., & Olumide, A. (2020). Assessment of the integrated disease surveillance and response strategy implementation in Nigeria: Findings and implications. BMC Public Health, 20(1), 1622. https://doi.org/10.1186/s12889-020-09710-0

Atinge, S., et al. (2021). Knowledge and practice of disease surveillance and notification among doctors in Taraba State, North-East Nigeria.

Centres for Disease Control and Prevention. (2022). Principles of epidemiology in public health practice: An introduction to applied epidemiology and biostatistics (3rd ed.). U.S. Department of Health and Human Services.

Dambazau, Z. B., Balogun, M. S., Disu, Y., Egwuenu, A., Awoyale, O. D., Ogunniyi, A., Williams-Enenche, L., Ekechi, H. U., & Malgwi, A. (2025). Evaluation of Mpox surveillance system in Kwara State, Nigeria from January to December 2022 with implications for outbreak preparedness. Discover Medicine, 2, 230.

Fall, I. S., Rajatonirina, S., Yahaya, A. A., Zabulon, Y., Nsubuga, P., Nanyunja, M., Wamala, J., Njuguna, C., Lukoya, C. O., Alemu, W., Kasolo, F. C., & Talisuna, A. O. (2019). Integrated disease surveillance and response (IDSR) strategy: Current status, challenges and perspectives for the future in Africa. BMJ Global Health, 4(4), e001427. https://doi.org/10.1136/bmjgh-2019-001427

Hamalaw, S. A., Bayati, A. H., Babakir-Mina, M., Benvenuto, D., Fabris, S., Guarino, M., Giovanetti, M., & Ciccozzi, M. (2022). Assessment of core and support functions of the communicable disease surveillance system in the Kurdistan Region of Iraq. Journal of Medical Virology, 94(2), 469-479. https://doi.org/10.1002/jmv.27288

Ibrahim, L. M., Okudo, I., Stephen, M., Ogundiran, O., Pantuvo, J. S., Oyaole, D. R., Tegegne, S. G., Khalid, A., Ilori, E., Ojo, O., Ihekweazu, C., Baraka, F., Mulombo, W. K., Lasuba, C. L. P., Nsubuga, P., & Alemu, W. (2021). Electronic reporting of integrated disease surveillance and response: Lessons learned from northeast Nigeria, 2019. BMC Public Health, 21(1), 916. https://doi.org/10.1186/s12889-021-10957-9

Ibrahim, L. M., Stephen, M., Okudo, I., Kitgakka, S. M., Mamadu, I. N., Njai, I. F., Oladele, S., Garba, S., Ojo, O., Ihekweazu, C., Lasuba, C. L. P., Yahaya, A. A., Nsubuga, P., & Alemu, W. (2020). A rapid assessment of the implementation of the integrated disease surveillance and response system in northeast Nigeria, 2017. BMC Public Health, 20(1), 600. https://doi.org/10.1186/s12889-020-08707-4

Igho, P. O., & Igunma, A. J. (2023). Challenges to effective implementation of integrated disease surveillance and response among health workers in Nigeria: A systematic review. British Journal of Healthcare and Medical Research, 10(5), 146-154. https://doi.org/10.14738/bjhmr.105.15486

Ihekweazu, C., Agogo, E., & Abubakar, I. (2020). Nigeria's response to the COVID-19 pandemic: Achievements and key challenges. Transactions of the Royal Society of Tropical Medicine and Hygiene, 114(11), 797-800. https://doi.org/10.1093/trstmh/traa078

Lar, L. A., Afolaranmi, T. O., Tagurum, Y. O., Uzochukwu, B., & Zoakah, A. I. (2015). Challenges of integrated disease surveillance response reporting among healthcare personnel in Mangu, Plateau State, Nigeria. Journal of Public Health and Epidemiology, 7(4), 108-113. https://doi.org/10.5897/JPHE2015.0714

Mremi, I. R., George, J., Rumisha, S. F., Sindato, C., Kimera, S. I., & Mboera, L. E. G. (2021). Twenty years of integrated disease surveillance and response in sub-Saharan Africa: Challenges and opportunities for effective management of infectious disease epidemics. One Health Outlook, 3(1), 22. https://doi.org/10.1186/s42522-021-00052-9

Nigeria Centre for Disease Control. (2019). Integrated Disease Surveillance and Response (IDSR) technical guidelines for Nigeria (3rd ed.). NCDC.

Nigeria Centre for Disease Control. (2021). Annual report 2020: Protecting the health of Nigerians. https://ncdc.gov.ng

Ogbonna, C., Eze, J., & Oguche, S. (2019). Community participation and barriers to disease surveillance in northern Nigeria. African Journal of Health, 26(2), 45-54.

Okonkwo, E., Nwifama, O., Chijioke-Nwauche, I., & Eke, R. (2022). Challenges of disease surveillance and notification systems at the local government area level in Nigeria: A qualitative study. African Journal of Primary Health Care & Family Medicine, 14(1), e1-e9. https://doi.org/10.4102/phcfm.v14i1.3201

Olayinka, A., et al. (2019). Meningitis outbreak response, northern Nigeria, 2017.

Oleribe, O. O., Momoh, J., Uzochukwu, B. S., Mbofana, F., Adebiyi, A., Barbera, T., Williams, R., & Taylor-Robinson, S. D. (2019). Identifying key challenges facing healthcare systems in Africa and potential solutions. International Journal of General Medicine, 12, 395-403. https://doi.org/10.2147/IJGM.S223882

Olu, O. O., Lamunu, M., Nanyunja, M., Dafae, F., Samba, T., Sempiira, N., & Kargbo, D. K. (2019). Contact tracing during an Ebola virus disease outbreak in Sierra Leone: Lessons learned for future epidemic preparedness. Western Pacific Surveillance and Response Journal, 10(2), 1-9. https://doi.org/10.5365/wpsar.2018.9.4.008

Onyekwere, C. A., Ugbede, H. A., & Obi, E. (2021). Assessment of Integrated Disease Surveillance and Response implementation in Benue State, Nigeria. Nigerian Journal of Medicine, 30(4), 389-396. https://doi.org/10.4103/njm.njm_56_21

Osagiede, E. F., Isah, E. C., Ozomata, E. A., Jumbo, J., Ehimen, F. A., Dinyain, V. E., & Osagiede, E. T. (2020). Assessment of knowledge and materials availability in the implementation of integrated disease surveillance and responses in public facilities in South-South Nigeria. Nigerian Journal of Medicine, 29(1), 11-19.

Otu, A., Ebenso, B., Okuzu, O., & Osifo-Dawodu, E. (2016). Using a mHealth tutorial application to change knowledge and attitude of frontline health workers to Ebola virus disease in Nigeria: A before-and-after study. Human Resources for Health, 14, 5. https://doi.org/10.1186/s12960-016-0100-4

Rosenstock, I. M. (1974). Historical origins of the health belief model. Health Education Monographs, 2(4), 328-335. https://doi.org/10.1177/109019817400200403

Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the health belief model. Health Education Quarterly, 15(2), 175-183. https://doi.org/10.1177/109019818801500203

Talisuna, A., Yahaya, A. A., Rajatonirina, S. C., Stephen, M., Oke, J., Mpairwe, A., Kabir, Z., Asena, D., Tambo, E., Boulanger, L. L., Impouma, B., & Yoti, Z. (2019). Joint external evaluation of the International Health Regulation (2005) capacities: Current status and lessons learnt in the WHO African region. BMJ Global Health, 4(6), e001312. https://doi.org/10.1136/bmjgh-2018-001312

Tchio-Nighie, K. H., Bashombwa, A. M., Nguemnang, W. A. N., Nkum, C. B., Guenou, E., & Ateudjieu, J. (2024). Practice of epidemiological surveillance and availability of resources in health facilities of the Littoral Region of Cameroon: A cross-sectional study.

Tom-Aba, D., Silenou, B. C., Doerrbecker, J., Fourie, C., Leitner, C., Wahnschaffe, M., Strysewske, M., Arinze, C. C., & Krause, G. (2020). The Surveillance Outbreak Response Management and Analysis System (SORMAS): Digital health global goods maturity assessment. JMIR Public Health and Surveillance, 6(2), e15860. https://doi.org/10.2196/15860

Twene, P., Sarfo, B., Yawson, A. A. E., Otoo, J. E., & Asraku, A. (2024). Factors influencing integrated disease surveillance and response system in selected districts in the Eastern Region of Ghana. PLOS ONE, 19(8), e0295473. https://doi.org/10.1371/journal.pone.0295473

United Nations Office for the Coordination of Humanitarian Affairs. (2021). Humanitarian access and insecurity in North-East Nigeria.

World Health Organisation. (2020). Strengthening health security by implementing the International Health Regulations (2005). https://www.who.int/ihr

Yamane, T. (1967). Statistics: An introductory analysis (2nd ed.). Harper and Row.