

Evaluating the Competency and Readiness of Frontline Community Health Extension Workers in Managing Emergency Public Health Crisis Situations

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Abstract

Background: Community Health Extension Workers (CHEWs) constitute the primary frontline infrastructure for delivery within peripheral networks, serving as the first line of defense during acute public health emergencies. **Objective:** This investigation executed an empirical assessment of the professional clinical competencies, logistical readiness parameters, and institutional challenges experienced by practicing CHEWs when managing emergent epidemiological crises within Rivers State, Nigeria. **Methodology:** Utilizing a descriptive cross-sectional survey design, the study sampled 120 practicing CHEWs across randomly selected primary health facilities. Data collection was implemented via a validated, high-density multi-stage Clinical Safety and Crisis Competency Matrix Questionnaire, and analytical results were processed through descriptive and inferential statistical algorithms. **Results:** Quantified metrics revealed that while baseline routine maternal and preventative care proficiencies were high (84.2%), critical competency gaps manifested in acute infection triage execution (41.7%) and rapid epidemiological data reporting tracking (31.5%). Operational readiness was heavily hindered by systemic resource gaps, including deficient supplies of personal protective equipment (87.5%) and an absence of in-service simulation laboratory training (93.3%). **Conclusion:** Health science training institutions and ministry management boards must urgently integrate advanced crisis pedagogy, formalized objective structured clinical evaluations (OSCEs), and structured supply loops to preserve primary health security.

Keywords: community health extension workers, competency assessment, public health crises, primary healthcare, operational readiness, clinical pedagogy, Rivers State.

INTRODUCTION

The structural layout of a nation's primary healthcare delivery framework acts as its fundamental defense network against localized and widespread epidemiological threats (World Health Organization [WHO], 2023). Within the unique administrative layout of Nigeria's healthcare ecosystem, mid-level health professionals, specifically Community Health Extension Workers (CHEWs), serve as the vital bridge linking remote, rural, and peri-urban populations to the formal tiers of secondary and tertiary clinical medicine. Deployed within primary health centers, comprehensive health posts, and mobile community outreach units, CHEWs are structurally

mandated to implement an extensive array of preventative interventions, basic maternal-child clinical procedures, health education sessions, and direct disease surveillance tracking.

However, the contemporary global landscape, characterized by frequent and highly volatile outbreaks of infectious diseases, has drastically altered the field expectations placed upon these frontline operators. Frontline healthcare workers are no longer responsible solely for static, routine preventative care; they are now forced to operate as rapid crisis responders during outbreaks of viral hemorrhagic fevers, cholera epidemic waves, respiratory contagions, and environmental toxicological disasters. When an epidemic strikes a population, the speed and clinical precision demonstrated during initial patient contact directly determine whether the outbreak is successfully contained at the periphery or escalates into a wider national crisis. (UNICEF, 2022). Consequently, systematic verification of the practical psychomotor and cognitive competencies of CHEWs is an urgent prerequisite for health security forecasting.

Despite this clear clinical reality, a significant gap persists within health science instructional design. Historically, standard curricular structures have prioritized chronic healthcare parameters and peaceful, routine community actions, leaving the specific training architectures required for acute crisis triage unaddressed (Frank et al., 2020). This mismatch leaves a critical empirical blind spot regarding how effectively field practitioners can execute advanced infection control, isolate index cases, and manage digital disease tracking tools under stress. This study addresses this gap by presenting a detailed, data-driven analysis of current clinical competency profiles and institutional operational barriers across primary care settings in Rivers State, Nigeria, providing a clear blueprint for urgent curriculum and structural upgrades.

The creation of the Community Health Extension Worker cadre in Nigeria was a strategic policy initiative designed to correct the severe rural-urban imbalances in health practitioner distribution (Awofeso, 2014). Following the adoption of the landmark Alma-Ata Declaration on Primary Healthcare, the Federal Ministry of Health, in coordination with the National Board for Technical Education (NBTE) and the Community Health Practitioners Registration Board of Nigeria (CHPRBN), established a formal academic pathway within colleges of health science and technology. This training was uniquely structured to produce a practitioner proficient in both clinical procedures and community mobilization, capable of working independently in resource-constrained environments (Oleribe et al., 2019).

Historical evidence confirms that when supported by clear, structured guidelines and adequate logistics, the CHEW cadre achieves exceptional public health results. Their central involvement in the worldwide eradication of wild poliovirus types, the execution of national infant immunization campaigns, and the local deployment of oral rehydration therapies demonstrated their capacity to manage large-scale healthcare initiatives. These successes established CHEWs as the structural baseline of the primary health defense framework. However, critics point out that while historical achievements in managing predictable, routine health tracking are well documented, there remains a lack of empirical research evaluating their readiness to face unpredictable, fast-moving infectious threats (Aregbeshola & Khan, 2021).

This research is theoretically grounded in the *Competency-Based Education Model (CBEM)* and the *Health Defense In-Depth Paradigm*. The CBEM argues that academic progression and professional qualification must not be measured simply by classroom attendance or the passive memorization of textbooks. Instead, it asserts that professional readiness is defined by verified, observable psychomotor capability and critical clinical reasoning executed under realistic field conditions. When applied to primary health education, this model requires that a

student's transition from the classroom to field placement must be preceded by rigorous, objective practical testing within an active clinical simulation environment (Frenk et al., 2020).

Complementing this approach, the Health Defense In-Depth Paradigm outlines that national health security relies on a series of overlapping defensive layers. Within this model, the primary healthcare worker represents the critical initial layer. If the frontline clinician fails to correctly recognize early warning indicators, applies incorrect triage sorting, or lacks the skills to use proper personal protective gear, the initial defensive layer fails immediately. This failure forces the secondary and tertiary hospital sectors to absorb high volumes of advanced cross-infections, often overwhelming institutional capacities. Therefore, verifying frontline competency is not merely an educational requirement, but a core component of national health defense strategy.

The unique environmental and demographic layout of the Niger Delta region, particularly within Rivers State, creates distinct public health vulnerabilities. Dense urban concentrations in centers like Port Harcourt, combined with geographically isolated riverine and oil-producing communities, create complex pathways for disease transmission. Empirical data tracking recent localized outbreaks of cholera, Lassa fever, and yellow fever between 2021 and 2026 show that delayed identification at primary points of care remains a major cause of preventable mortality and institutional spread (Aregbeshola & Khan, 2021).

Furthermore, contemporary researchers consistently highlight a significant drop in operational confidence when primary practitioners are forced to move away from paper-based registries and navigate digital disease surveillance reporting platforms. When epidemiological reporting interfaces are poorly managed, the transmission of vital outbreak data to central response centers is delayed, weakening the community's early warning systems (Oleribe et al., 2019). These field findings suggest that the practical clinical labs inside training colleges may rely on outdated training equipment, indicating an urgent need to update baseline curricula to reflect modern, data-driven health realities.

METHODOLOGY

This study utilized an empirical descriptive cross-sectional survey design. This design allowed for the concurrent collection of quantitative performance metrics and descriptive barrier evaluations from a wide sample of active practitioners. The study was conducted within Rivers State, Nigeria, intentionally targeting primary health centers, comprehensive health outposts, and local health units situated across three distinct zones: urban center hubs, peri-urban growth communities, and remote riverine communities. This broad selection guaranteed that the resulting dataset reflected the full range of institutional resources and field challenges present in the region.

The target population for this study encompassed all community health practitioners currently registered and actively employed within the public primary health service of Rivers State. To ensure that the sample was highly representative and statistically sound, a rigorous multi-stage stratified random sampling procedure was implemented. The state was first stratified into its three formal senatorial districts. From each district, specific Local Government Areas (LGAs) were randomly selected, and individual health facilities were isolated based on patient volume categories. Finally, a random selection matrix was applied to the personnel registers, yielding a final analytical sample size of 120 practicing CHEWs. This sample size was checked against standard statistical power parameters to ensure sufficient accuracy for regional generalization.

The primary tool used for data collection was a newly designed, highly structured Clinical Safety and Crisis Competency Matrix Questionnaire. This instrument was intentionally built to go beyond simple self-reported opinions and test objective knowledge through situational clinical

scenarios. Section A focused on socio-demographic indicators and professional training history; Section B used a 5-point Likert scale to gauge practitioners' self-reported confidence across routine tasks; Section C used clinical case scenarios to measure objective competence in managing acute infections and data reporting; and Section D documented physical and administrative operational barriers.

To ensure high structural and content validity, the initial draft was reviewed by an expert evaluation panel consisting of senior epidemiologists, ministry officials, and chief lecturers specializing in community health education. The panel assessed each item for clarity, cultural appropriateness, and alignment with modern clinical standards. Following these adjustments, a pilot test was conducted with 15 active practitioners working in adjacent, non-sampled facilities. The pilot data yielded a strong Cronbach's alpha reliability coefficient of $\alpha = 0.84$, confirming the instrument's high internal consistency and readiness for full field deployment.

RESULTS

The raw field data was systematically cleaned, organized, and input into automated statistical software packages. Quantitative processing utilized both descriptive frequency counts and mean score breakdowns to evaluate performance variations across key clinical tasks.

Table 1

Socio-Demographic and Professional Background Characteristics of Respondents (N = 120)

Professional Parameter	Classification Category	Frequency (n)	Sample Percentage (%)
Gender Profiles	Male	38	31.7%
	Female	82	68.3%
Years of Active Practice	1 – 5 Years	45	37.5%
	6 – 10 Years	51	42.5%
	11+ Years	24	20.0%
Highest Professional Credential	Certificate in Community Health (JCHEW)	29	24.2%
	Diploma in Community Health (CHEW)	73	60.8%
	Higher National Diploma / Degree	18	15.0%

The demographic analysis in Table 1 shows a stable, highly experienced workforce, with 62.5% of the sampled practitioners having more than five years of active field practice. Furthermore, 75.8% hold a professional diploma or higher qualification. This distribution indicates that observed skill gaps during emergencies cannot be attributed simply to a lack of basic clinical experience or insufficient length of service, suggesting instead a need to look closely at specific educational and institutional factors.

Table 2

Objective Competency Performance and Mean Domain Distributions (N = 120)

Evaluated Competency Domain	Proficient (n)	Proficient (%)	Mean Score (M)	Standard Deviation (SD)
Routine Immunization Logistics	101	84.2%	4.21 / 5.00	0.45
Basic Curative & Wound Care	92	76.7%	3.84 / 5.00	0.58
Infectious Triage & Patient Isolation	50	41.7%	2.08 / 5.00	1.12
Epidemiological Digital Reporting	38	31.5%	1.57 / 5.00	0.94

The objective testing results in Table 2 reveal a distinct gap between routine and emergency capabilities. While proficiency scores for routine immunization logistics and baseline curative care were solid, reaching 84.2% and 76.7% respectively, performance dropped sharply in emergency categories. Only 41.7% of practitioners successfully demonstrated correct patient triage and isolation procedures for infectious scenarios. Most notably, digital data reporting tasks scored lowest, with an average mean of just 1.57 out of 5.00, identifying a major vulnerability in early outbreak reporting capacities.

Table 3

Perceived Structural, Logistical, and Administrative Barriers to Readiness (N = 120)

Identified Operational Barrier Element	Strongly Agree (n)	Agree (n)	Cumulative (%)
Absence of In-Service Crisis Simulation Training	88	24	93.3%
Inconsistent Supply of Basic Protective Gear (PPE)	74	31	87.5%
Outdated Physical Infrastructure in Training Labs	69	41	91.7%

The barrier data presented in Table 3 points directly to systemic institutional challenges. A dominant 93.3% of active practitioners reported that they had never participated in a structured in-service crisis simulation exercise, and 91.7% noted that the clinical demonstration labs used during

their college training relied on outdated equipment. These insights help explain why transitioning to modern, data-driven outbreak response workflows remains a persistent field challenge.

DISCUSSION OF FINDINGS

The analytical outcomes of this study confirm a clear imbalance within primary care capacity: practitioners show strong proficiency in routine, long-term health tracking but face significant difficulties when managing acute, fast-moving infectious crises. This performance gap points directly to a clear pedagogical gap in how colleges of health science and technology have historically designed their training programs. For decades, community health syllabi have focused primarily on predictable, preventative actions. While this foundation is undeniably necessary, it must be adapted to prepare workers for contemporary epidemiological realities. If a frontline worker cannot confidently establish an isolation area or navigate electronic disease tracking systems, the community's primary defense line is significantly compromised. This observation is supported by **Oleribe et al. (2019)**, who noted that Nigeria's primary healthcare system, despite structural expansion, still struggles with translating training outcomes into effective emergency response capacity at the grassroots level. In the same vein, **Aregbeshola and Khan (2021)** reported that CHEWs are often well-prepared for routine immunization and maternal health services but show reduced competence when confronted with outbreak-driven clinical demands.

This reality requires a major shift in instructional design within health science colleges. Training institutions must move away from traditional, lecture-heavy teaching models that favor passive memorization over active problem-solving. This aligns with **Frenk et al. (2020)**, who argued that global health professional education must transition from information accumulation to competency-based training systems that emphasize real-world performance and adaptive clinical reasoning. To build genuine field capability, colleges must systematically invest in modernizing their clinical demonstration halls. Introducing simulation-based learning modules allows students to practice managing high-stress triage situations safely and repeatedly before field deployment. Evidence from global health education reforms shows that simulation training improves clinical confidence, procedural accuracy, and decision-making speed during emergencies (WHO, 2023).

Furthermore, fully integrating Objective Structured Clinical Examinations (OSCEs) into final graduation assessments ensures that every student's practical skills are objectively verified before they receive a license and begin field practice. This approach is strongly supported by **Frank et al. (2020)**, who emphasized that competency-based assessment systems such as OSCEs are essential for ensuring measurable clinical competence in health professionals. Additional studies also show that OSCE implementation reduces variability in skill performance among newly qualified health workers and improves readiness for deployment in resource-constrained settings (WHO, 2023).

CONCLUSION

Community Health Extension Workers (CHEWs) constitute the primary frontline healthcare service providers during acute public health emergencies. Their professional clinical competencies and logistical readiness are key in this direction. The paper concludes that institutional challenges experienced by practicing CHEWs when managing emergent epidemiological crises within Rivers State, Nigeria should be tackled.

RECOMMENDATIONS

Building resilient primary health protection requires a coordinated, policy-driven effort that connects academic curriculum design directly with ongoing field support. Based on the empirical findings of this research, the following actions are recommended:

1. **Curriculum Integration:** The National Board for Technical Education (NBTE) and the CHPRBN should collaborate to integrate mandatory modules on field epidemiology and crisis management into the core community health syllabus.
2. **Skills Laboratory Modernization:** Institutional leadership must prioritize funding to upgrade clinical demonstration halls with modern training equipment and interactive simulation tools.
3. **Mandatory OSCE Implementation:** Colleges of health science should fully transition to Objective Structured Clinical Examinations for all practical course units to guarantee objective skill verification.
4. **Continuous Professional Development:** Local government health boards should establish institutionalized, mandatory in-service training programs focused on outbreak response protocols for active field practitioners.

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