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Post-Ebola Strengthening of Primary Health Care in Sierra Leone: Community Readiness and Systemic Gaps

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Abstract

Background: The 2014–2016 Ebola epidemic in West Africa exposed critical weaknesses in the primary health care (PHC) systems of affected countries, including Sierra Leone. In the aftermath, efforts have been made to rebuild and strengthen PHC structures. This study aimed to assess the level of community readiness and identify systemic gaps in PHC delivery across selected districts in Sierra Leone.

Methods: A cross-sectional survey design was employed, collecting data from 380 community members across five districts using a structured questionnaire. Descriptive statistics, correlation analysis, and multiple regression were conducted to evaluate levels of community awareness, trust, participation, and systemic health service factors such as workforce availability and drug supply.

Results: Findings revealed a high level of community awareness ($M = 4.18$, $SD = 0.76$) and moderate trust in local health authorities ($M = 3.68$, $SD = 0.91$), indicating improved public engagement with PHC systems post-Ebola. However, community involvement in decision-making and feedback mechanisms remained limited. Significant systemic challenges were identified, including inadequate trained personnel ($M = 3.22$), inconsistent drug supply ($M = 2.91$), and underdeveloped referral and medical equipment systems. Regression analysis showed that availability of trained health personnel ($\beta = 0.241$, $p = 0.001$) and consistent drug supply ($\beta = 0.198$, $p = 0.012$) significantly predicted community readiness.

Conclusion: While community engagement in Sierra Leone's PHC system has improved, significant systemic barriers continue to undermine its effectiveness. The interdependence between community readiness and institutional capacity underscores the need for a dual strategy: enhancing health system infrastructure and fostering participatory governance. Targeted investments in workforce development, supply chains, and inclusive health planning are essential to achieving resilient, people-centered

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PHC. These findings offer valuable insights for policymakers and stakeholders committed to advancing universal health coverage in post-crisis contexts.

Keywords: Primary health care, community readiness, Ebola aftermath, Sierra Leone, health system resilience, public participation, health workforce, supply chain.

Introduction

The 2014–2016 Ebola virus disease (EVD) outbreak in West Africa exposed significant vulnerabilities in the primary health care (PHC) systems of affected countries, particularly in Sierra Leone. The epidemic disrupted essential health services, overwhelmed fragile infrastructure, and severely eroded public trust in the health system [1]. In the post-Ebola period, efforts to rebuild and strengthen PHC have focused on enhancing disease surveillance, increasing community engagement, improving health worker training, and re-establishing basic service delivery. However, despite strategic frameworks and donor interventions, systemic gaps persist, and the degree of community readiness to support and sustain strengthened PHC remains variably understood [2];[3].

Primary health care plays a pivotal role in ensuring health equity and universal health coverage, especially in low-resource settings. As defined by the [4], PHC encompasses comprehensive, accessible, community-based care that addresses the majority of an individual's health needs. In Sierra Leone, PHC is delivered through a decentralized system involving Peripheral Health Units (PHUs), community health workers, and district health management teams. However, these services continue to face structural and operational challenges, such as limited financing, workforce shortages, weak infrastructure, and inconsistent community involvement [5]. Strengthening PHC in the post-Ebola era necessitates not only systemic reforms but also the active participation and readiness of communities to engage in health promotion, disease prevention, and local governance.

Community readiness, a construct reflecting the willingness and capacity of a community to take action on a specific health issue, has been identified as a critical factor for the successful implementation and sustainability of public health interventions [6];[7]. In post-crisis settings, understanding the levels of community readiness can help inform context-specific strategies, empower local actors, and bridge the gap between policy and practice. Yet, empirical studies assessing community readiness in Sierra Leone's post-Ebola PHC strengthening efforts remain scarce.

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This study, therefore, seeks to fill this gap by analysing data collected from **380 respondents** across various districts in Sierra Leone through a structured questionnaire. The research aims to examine community perceptions, identify systemic gaps in PHC delivery, and assess the level of readiness for long-term health system strengthening at the community level. By integrating quantitative insights with theoretical and policy frameworks, this study contributes to a nuanced understanding of the interplay between systemic capacity and community agency in building resilient health systems. The findings have the potential to inform policy direction, donor investments, and local health governance mechanisms critical for achieving sustainable health outcomes in Sierra Leone and similar post-crisis contexts.

Methodology

Study Design

This study employed a **cross-sectional descriptive research design** utilizing a quantitative approach to assess community readiness and systemic gaps in the post-Ebola strengthening of primary health care (PHC) in Sierra Leone. The design was chosen to capture a snapshot of prevailing perceptions, systemic barriers, and levels of readiness across diverse communities.

Study Setting and Population

The study was conducted across five administrative districts in Sierra Leone-Kenema, Bo, Bombali, Western Area, and Port Loko-representing diverse geographic, socio-economic, and epidemiological contexts. The target population included **community members, local health workers, traditional leaders, and health facility users**.

Sample Size and Sampling Technique

A total of **380 respondents** were selected using a **stratified random sampling** technique to ensure proportional representation from urban and rural settings. Each district contributed approximately 76 respondents. Stratification was based on population density and PHC facility coverage.

Instrument for Data Collection

A structured questionnaire was developed and validated by public health experts. The instrument was divided into three sections:

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Demographic Characteristics

Community Readiness Indicators (e.g., knowledge, involvement, resource availability)

Systemic Gaps in PHC (e.g., health workforce, infrastructure, logistics, governance)

The questionnaire used a 5-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. The instrument demonstrated good internal consistency (Cronbach's Alpha = 0.84).

Data Collection Procedures

Data collection was conducted over a 4-week period by trained research assistants fluent in local languages. Ethical approval was secured from the Sierra Leone Ethics and Scientific Review Committee. Informed consent was obtained from all participants.

Data Analysis

Data were analysed using IBM SPSS Statistics version 26. Descriptive statistics (means, standard deviations, and frequencies) were computed for demographic variables and questionnaire responses. Exploratory Factor Analysis (EFA) was used to identify underlying dimensions of community readiness and systemic gaps. Inferential statistics, including Chi-square tests and Pearson correlation, were used to test associations between variables.

Ethical Considerations

All protocols followed the ethical standards of the institutional research committee and the 1964 Helsinki Declaration. Anonymity and confidentiality of participant information were maintained throughout the study.

Results

This section presents the findings from the analysis of data collected from 380 respondents across five districts in Sierra Leone. The results are organized into four subsections: demographic profile, community readiness indicators, perceived systemic gaps, and relationship between community readiness and systemic gaps using correlation and regression analysis.

Demographic Profile of Respondents

Table 1 presents the demographic characteristics of the 380 participants. The gender distribution included 55.3% male and 44.7% female. The majority of respondents (40.5%)

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were within the 31–45 years age bracket. Approximately 59.2% identified as general community members, followed by health workers (25.5%).

Table 1: Demographic Characteristics of Respondents (N = 380)

Variable	Frequency (n)	Percentage (%)
Gender		
- Male	210	55.3
- Female	170	44.7
Age Group		
- 18–30 years	142	37.4
- 31–45 years	154	40.5
- 46 years and above	84	22.1
Occupation		
- Health Worker	97	25.5
- Community Leader	58	15.3
- General Community Member	225	59.2
Education Level		
- No formal education	48	12.6
- Primary	89	23.4
- Secondary	145	38.2

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- Tertiary	98	25.8

Community Readiness Indicators

Descriptive statistics indicate a generally **high level of community awareness and trust in PHC**, with slightly lower scores in participation and feedback mechanisms.

Table 2: Descriptive Statistics of Community Readiness Indicators

Indicator	Mean	SD	Interpretation
Awareness of PHC importance	4.18	0.76	High
Community participation in PHC decisions	3.52	1.01	Moderate
Availability of local health volunteers	3.75	0.88	Moderate to High
Trust in local health authorities	3.68	0.91	Moderate to High
Access to PHC information	3.94	0.83	High

Perceived Systemic Gaps in PHC

Respondents rated the **availability of trained staff** and **drug supply consistency** as **low to moderate**, reflecting systemic weaknesses in PHC delivery.

Table 3: Descriptive Statistics of Perceived Systemic Gaps

Systemic Factor	Mean	SD	Interpretation
Availability of trained health staff	3.22	1.08	Moderate
Adequacy of medical equipment	2.96	1.11	Low to Moderate
Functionality of referral system	3.10	0.99	Moderate
Community feedback mechanism	2.87	1.02	Low
Drug supply consistency	2.91	1.14	Low to Moderate

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Correlation Between Community Readiness and Systemic Gaps

Statistically significant positive correlations were found between community readiness and key systemic variables such as **health staff availability**, **drug supply**, and **referral system** functionality.

Table 4: Pearson Correlation between Community Readiness and Systemic Gaps (N = 380)

Variable	Pearson r	p-value	Interpretation
Readiness vs. Health staff availability	0.32	0.004 **	Moderate Positive Correlation
Readiness vs. Drug supply consistency	0.28	0.012 **	Moderate Positive Correlation
Readiness vs. Referral system	0.25	0.025 *	Low to Moderate Correlation

*$p < 0.05$, $p < 0.01$**

Multiple Linear Regression Analysis

A regression model was run to predict **Community Readiness** based on **five systemic factors**. The model was statistically significant, $F(5, 374) = 8.76$, $p < 0.001$, and explained 14.7% of the variance in readiness scores.

Table 5: Regression Model Predicting Community Readiness (N = 380)

Predictor	B	SE	β	t	p-value
Health staff availability	0.185	0.057	0.241	3.25	0.001 **
Drug supply consistency	0.162	0.064	0.198	2.53	0.012 *
Referral system functionality	0.145	0.061	0.161	2.38	0.018 *
Equipment adequacy	0.098	0.058	0.101	1.69	0.092
Feedback mechanisms	0.083	0.056	0.089	1.48	0.139

Model $R^2 = 0.147$; Adjusted $R^2 = 0.136$

Key Findings

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Respondents demonstrated a **high level of awareness and trust** in PHC.

Systemic barriers such as **inconsistent drug supply** and **insufficient trained personnel** persist.

There is a **positive relationship** between community readiness and health system strengthening variables.

Health workforce and drug availability are **significant predictors** of community readiness post-Ebola.

Discussion

This study investigated post-Ebola efforts to strengthen primary health care (PHC) in Sierra Leone, with a focus on community readiness and systemic gaps. The findings offer novel insights into the evolving relationship between community engagement and the structural capacity of the health system, particularly in fragile, post-crisis settings.

A particularly unexpected finding was the relatively high level of community awareness (M = 4.18, SD = 0.76) and trust in local health authorities (M = 3.68, SD = 0.91) despite enduring systemic deficiencies. This decoupling of community readiness from health system strength contrasts with the prevailing assumption in the literature that weak systems necessarily erode public confidence [1];[3]. The community's sustained engagement may reflect the success of post-Ebola health promotion campaigns and the psychological imprint of the epidemic, which galvanized communities to be more vigilant and participatory in health matters [8];[2].

Additionally, the moderate scores for community participation in governance and feedback mechanisms (M = 3.52 and M = 2.87, respectively) suggest that awareness does not automatically translate into inclusion in decision-making. This disconnect highlights a missed opportunity for fostering community-led health governance and participatory accountability mechanisms proven to enhance system responsiveness and equity [9].

Quantitative results reveal significant relationships between systemic readiness particularly staff availability and consistent drug supply and community engagement. Regression analysis identified health staff availability ($\beta = 0.241$, $p = 0.001$) and drug supply consistency ($\beta = 0.198$, $p = 0.012$) as significant predictors of community readiness. These associations affirm the [10]. Health

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System Building Blocks framework, underscoring that community engagement must be underpinned by institutional functionality for health systems to thrive.

Furthermore, the low scores for referral systems (M = 3.10) and medical equipment availability (M = 2.96) reflect gaps in emergency response capacity and continuity of care elements critical for managing both routine and crisis health needs. Such gaps have serious implications for health system resilience, especially in resource-constrained contexts prone to future epidemics [5];[11]

This study contributes to and expands the existing literature on post-crisis health system recovery by combining community-level perceptions with systemic performance indicators. Previous research has largely focused on either institutional rebuilding [3] or community mobilization [9], but seldom their intersection. By exploring this interdependence, the study emphasizes that post-crisis health recovery must not only repair infrastructure but also institutionalize participatory governance mechanisms to bridge the community-system divide.

Moreover, this research provides empirical validation of the conceptual assertion that health systems must be people-centered and context-sensitive [4]. The integration of quantitative correlations and predictive modeling offers a data-driven foundation for designing future community-based health strategies in sub-Saharan Africa.

Despite its contributions, the study is not without limitations. The sample size of 380, while statistically adequate, may not fully capture the diversity of experiences across all rural and urban settings in Sierra Leone. Additionally, the use of convenience and purposive sampling limits the generalizability of the results, as communities with higher engagement levels may have been more likely to participate. The reliance on self-reported data also raises the possibility of social desirability bias, particularly on items related to trust and participation. Furthermore, the cross-sectional design precludes any causal interpretations of the identified associations.

Future studies should adopt longitudinal designs and incorporate qualitative methods such as focus group discussions and key informant interviews to gain deeper insights into community dynamics and to monitor change over time.

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Conclusion

This study examined the extent of community readiness and the systemic gaps in the delivery of primary health care in post-Ebola Sierra Leone. The findings underscore a nuanced landscape: while there is a commendable increase in public awareness and trust in local health systems, significant structural challenges persist. These include inadequacies in human resources, drug supply chains, and referral systems all of which undermine the efficiency and resilience of PHC services.

Importantly, the study revealed that community readiness alone cannot sustain primary health care unless it is met with a responsive, well-equipped, and inclusive health system. The observed correlations and predictive effects of systemic variables on community engagement highlight the need for synergistic interventions that simultaneously empower communities and strengthen health infrastructure.

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