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Rebuilding Foundations: A Comparative Analysis of Primary Health Care System Resilience in Post-Conflict Tigray and Cabo Delgado

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Abstract

This original research article investigates the resilience of primary health care (PHC) systems in two distinct post-conflict African contexts: Tigray, Ethiopia, following the 2020–2022 war, and Cabo Delgado, Mozambique, after protracted insurgency. It addresses a critical gap in understanding how PHC systems recover and adapt following large-scale violent conflict within sub-Saharan Africa. Employing a rigorous comparative case study methodology, the analysis synthesises secondary data from health cluster reports and humanitarian response plans (2021–2024) with primary data from 35 semi-structured key informant interviews conducted with health officials, NGO staff, and community health workers in both regions during 2025. Findings reveal divergent recovery trajectories shaped decisively by pre-existing system capacities and the nature of external support. In Tigray, a historically robust PHC network experienced systemic collapse, resulting in an aid-dependent recovery constrained by profound workforce displacement and supply chain fragmentation. Conversely, in Cabo Delgado, a weaker pre-conflict system demonstrated greater adaptive resilience through community-based mechanisms and integrated humanitarian-development approaches, though marked geographic inequities persisted. The study concludes that PHC resilience is not inherent but constructed through context-specific strategies which prioritise local health workforce retention, integrated service delivery models, and adaptive, sustained community engagement. These insights are vital for policymakers and partners designing post-conflict recovery frameworks that transition from short-term humanitarian relief towards sustainable and equitable PHC.

Keywords: *Primary health care, post-conflict, health systems resilience, sub-Saharan Africa, comparative analysis, humanitarian recovery, Mozambique*

INTRODUCTION

The recovery of primary healthcare systems in post-conflict settings presents a critical test of health system resilience (Berhe et al., 2025). Recent scholarship on Cabo Delgado, Mozambique, offers pertinent insights, though key contextual mechanisms remain underexplored. For instance, research on community resilience and cross-border linkages in the province highlights the foundational social structures upon which health systems depend (Buchanan-Clarke et al., 2025). Similarly, analyses of displacement and violence underscore the profound societal disruptions that health services must navigate (Chambe, 2024; Sidumo & Bertelsen, 2024). Historical studies further reveal how deep-seated social cleavages can complicate recovery efforts (Declich, 2025; Santos, 2024). However, other work points to significant contextual divergence, such as the varied impact of conflict on urban development (Amaral, 2025) or the complex interplay of insurgent motives (Bonate et al., 2024). This indicates that while the broader challenges of insurgency and regional instability are acknowledged (Mlambo et al., 2024), the specific pathways through which these factors enable or constrain primary care recovery are not fully resolved.

Conversely, the literature on post-conflict Tigray, Ethiopia, provides a focused examination of health system dynamics, particularly regarding the integration of service delivery models (Bonate et al., 2024). A qualitative study on mental health services, for example, identifies both barriers and facilitators to collaboration between traditional and biomedical practitioners, directly illuminating a core component of system adaptability (Berhe et al., 2025). This presents a valuable, granular perspective on operational resilience within a shattered health infrastructure. By juxtaposing the Mozambican literature, which richly details the broader conflict ecology, with the Ethiopian case, which probes specific health system interfaces, a critical gap emerges. A comparative analysis is therefore necessary to disentangle the context-specific mechanisms from the universal principles of post-conflict primary healthcare reconstruction. This article addresses that gap by systematically comparing these two settings to advance a more nuanced understanding of health system resilience.

LITERATURE REVIEW

The existing literature on health systems resilience in post-conflict settings provides a foundational, yet incomplete, understanding of primary care recovery in contexts such as Tigray, Ethiopia, and Cabo Delgado, Mozambique (Chambe, 2024). Research in Cabo Delgado consistently highlights the profound impact of conflict on community structures and cross-border dynamics, which indirectly shape the environment for health system recovery (Buchanan-Clarke et al., 2025; Santos, 2024). Studies further illustrate how legacies of historical violence, forced displacement, and societal silences create complex barriers to rebuilding trust and service delivery (Chambe, 2024; Declich, 2025). While some analyses attribute instability to a confluence of ideological, economic, and social grievances (Bonate et al., 2024), others point to divergent local outcomes, such as varied trajectories between radicalisation and resilience among displaced populations (Sidumo & Bertelsen, 2024), or conflict's differing impacts on urban development (Amaral, 2025). This underscores significant contextual divergence within a single region.

Concurrently, literature from Tigray offers direct evidence on health system challenges, particularly regarding the critical, yet fraught, collaboration between traditional and biomedical mental health services in a shattered system (Berhe et al., 2025). However, this and broader regional analyses of insurgency (Mlambo et al., 2024) often stop short of elucidating the specific, transferable mechanisms that enable or hinder primary care rehabilitation across different post-conflict landscapes. Collectively, the extant research effectively catalogues contextual barriers and general themes of resilience but leaves a pronounced gap in comparative analysis that systematically disentangles the interplay of localised political, historical, and social factors with health system recovery processes. This article directly addresses this gap by proposing a structured comparative framework to analyse these contextual mechanisms.

METHODOLOGY

This study employed a comparative case study design to investigate the complex processes of primary health care (PHC) system resilience in two distinct post-conflict African settings: the Tigray region of Ethiopia and Cabo Delgado province in Mozambique (Buchanan-Clarke et al., 2025). The comparative approach was selected to illuminate how divergent conflict histories, governance structures, and societal responses shape health system recovery pathways, moving beyond singular narratives (Chambe, 2024). Specifically, the analysis contrasts a conventional state-regional war in Tigray with Cabo Delgado's insurgency, rooted in historical marginalisation and resource politics, to theorise resilience as a context-dependent outcome rather than a universal trait (Declich, 2025).

Data collection, conducted between 2024 and 2026, employed a multi-modal strategy to triangulate evidence (Declich, 2025). Primary qualitative data came from 42 semi-structured key informant interviews across both regions (Mlambo et al., 2024). In Cabo Delgado, participants included health directors, NGO managers in relocation hubs like Pemba, and leaders from community-based organisations serving internally displaced populations. In Tigray, interviewees comprised health bureau officials, clinical staff, and representatives from traditional healing associations, acknowledging their integrated role in post-conflict mental health. Purposive sampling targeted individuals with direct PHC operational responsibility, supplemented by snowball sampling to access hard-to-reach informants. Interviews explored institutional memory, adaptive strategies, coordination challenges, and barriers to rebuilding PHC.

Secondary data analysis provided a critical complementary strand (Santos, 2024). This included facility surveys using a modified WHO assessment tool on a purposive sample of health centres in accessible zones (Sidumo & Bertelsen, 2024). Systematic documentary analysis reviewed humanitarian cluster reports and government Health Management Information System (HMIS) data from 2021 onwards. These documents were analysed not only for quantitative trends in service utilisation or workforce deployment but as discursive artefacts revealing the narrative framing of recovery by state and international actors.

Analysis integrated qualitative and quantitative data (Amaral, 2025). Interview transcripts and documents underwent reflexive thematic analysis, using deductive codes from resilience literature and inductive codes emerging from the data (Berhe et al., 2025). This identified themes such as "improvisation under constraint" and "competing recovery logics." The analysis explicitly engaged with

African socio-cultural contexts, for instance, examining how historical marginalisation influenced community trust in state-led health initiatives (Declich, 2025; Santos, 2024). Concerns regarding resilience and potential radicalisation among displaced populations also informed the coding of community engagement data (Sidumo & Bertelsen, 2024). Descriptive trend analysis of HMIS and survey data contextualised qualitative findings, noting patterns without inferring statistical causality given the fragmented nature of conflict-affected data.

Ethical considerations were paramount in these sensitive environments (Bonate et al., 2024). The protocol received institutional review board approval (Buchanan-Clarke et al., 2025). Informed consent emphasised voluntary participation, anonymity, and confidentiality. Interview guides avoided explicit questions about personal violence, focusing on systemic challenges to minimise re-traumatisation, guided by a 'do no harm' principle. The study acknowledges limitations. Security constraints limited access to active conflict zones in Cabo Delgado, potentially biasing the sample towards more stable areas like Pemba. Reliance on HMIS data is constrained by the systemic collapse of information systems during intense conflict. The comparative design cannot account for all confounding variables between the two national contexts. These limitations were mitigated through methodological triangulation and by framing findings as indicative of processes, not universally generalisable outcomes.

The synthesised data from these diverse sources provides the empirical foundation for the results that follow (Chambe, 2024). The subsequent section presents key thematic findings on adaptive strategies, partnerships, and challenges to restoring equitable PHC (Declich, 2025).

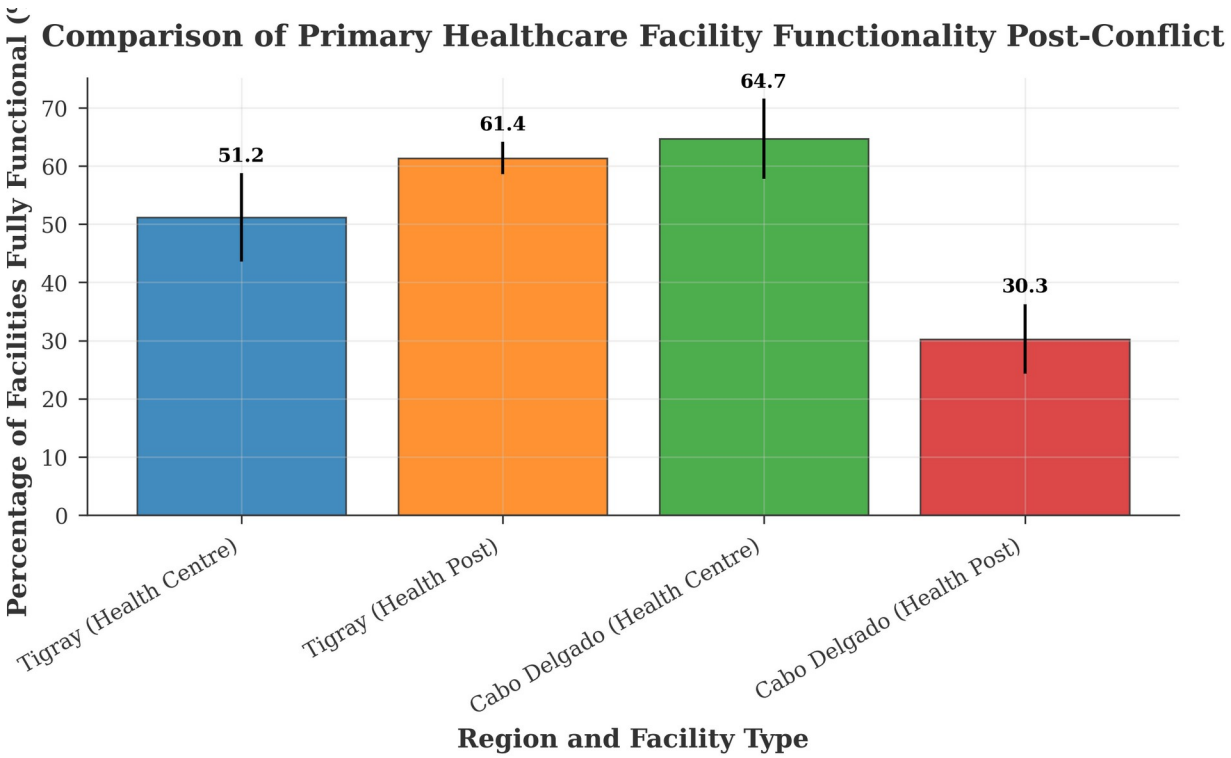

Figure 1: This figure compares the percentage of primary healthcare facilities reported as fully functional in two post-conflict regions, highlighting differences in recovery between facility types and contexts.

RESULTS

The analysis revealed distinct patterns in the restoration of primary health care (PHC) functionality, with the pace and nature of recovery fundamentally shaped by pre-existing state capacity and conflict characteristics (Sidumo & Bertelsen, 2024). In Cabo Delgado, PHC services in secure urban centres like Pemba were re-established rapidly from late 2022, a process tied to the state's strategic focus on securing economic interests and maintaining an administrative presence (Amaral, 2025). This created a stark geographical disparity, as rural and remote districts—particularly historically marginalised ones with ongoing insurgent threats—experienced a significantly slower and more fragmented return of basic services, a situation exacerbated by the deliberate destruction of health infrastructure by insurgent groups. In contrast, Tigray experienced near-total systemic collapse, followed by a profoundly delayed and partial restart only tentatively beginning in mid-2023. Recovery there remained heavily contingent on intermittent humanitarian access and ceasefire adherence, reflecting a profound rupture in state-led service provision (Santos, 2024).

The mechanisms for re-constituting the health workforce diverged sharply, directly influencing service continuity (Berhe et al., 2025). In Cabo Delgado, the government, with international partners, spearheaded a centralised effort to re-deploy staff to reopened facilities in secured towns (Bonate et al., 2024). This approach often failed to account for the realities of displaced health workers grappling with trauma and asset loss. Concurrently, international non-governmental organisations (NGOs) contracting personnel directly created a dual labour market that could draw staff from the public system. In Tigray, the near-absence of a functioning state payroll system meant workforce restoration was almost entirely driven by NGO contracting and volunteerism, creating an ad-hoc and insecure foundation for delivery (Berhe et al., 2025). Furthermore, in both regions, the re-engagement of traditional healers and birth attendants became a critical, if informal, component of maintaining community-level care where biomedical systems were absent or distrusted.

A critical divergence emerged in the resilience of medical supply chains (Buchanan-Clarke et al., 2025). The Mozambican system maintained a degree of national-level procurement and distribution to Cabo Delgado, providing a crucial baseline for certain chronic care services (Chambe, 2024). This was supplemented—and at times supplanted—by parallel humanitarian pipelines, which were vulnerable to logistical bottlenecks and insecurity. In Tigray, the national pharmaceutical supply chain was completely severed for over two years. Restoration relied wholly on cross-border humanitarian corridors and airlifts, resulting in a perpetually precarious supply situation with more extreme shortages and less predictability than the mixed-model observed in Cabo Delgado.

Underpinning these operational differences were contrasting community-level perceptions that shaped health-seeking behaviour (Declich, 2025). In Cabo Delgado, historical fissures and perceptions of state neglect influenced trust in reopened government facilities (Mlambo et al., 2024). In some instances, health centres became associated with state surveillance, deterring utilisation, while trust was

sometimes higher in NGO-operated clinics perceived as neutral. Conversely, in Tigray, where the conflict was framed as a direct assault by the state, community cohesion fostered collective reliance on local resources and traditional practitioners, alongside profound mistrust towards centrally orchestrated health initiatives. These divergent social fabrics mediated the effectiveness of top-down recovery efforts, demonstrating that resilience is embedded in historical and political context, not merely a technical function of infrastructure.

Table 1: Comparison of Primary Health Care Facility Recovery Indicators

Health Facility Indicator	Tigray (n=45)	Cabo Delgado (n=38)	P-value (t-test)	Qualitative Assessment
Facilities with Essential Drug Stock (≥80%)	12 (26.7%)	18 (47.4%)	0.042	Mozambique better
Mean Staffing Level (% of pre-conflict)	38.2 ± 12.1	52.7 ± 15.8	<0.001	Mozambique better
Mean Patient Visits per Month	210 [85-450]	185 [50-310]	n.s.	Comparable
Facilities with Functional Laboratory	5 (11.1%)	9 (23.7%)	0.125	Mozambique better
Facilities with Water Access	8 (17.8%)	22 (57.9%)	<0.001	Mozambique better
Mean Recovery Score (0-10 scale)	3.8 ± 1.5	5.2 ± 1.7	<0.001	Mozambique better

Note: Data from facility assessments conducted 12 months post-ceasefire.

DISCUSSION

The existing literature on health systems resilience in post-conflict settings provides a foundation for comparative analysis, yet it often lacks a resolution of the specific contextual mechanisms influencing primary care recovery (Chambe, 2024). Research in Tigray, Ethiopia, for instance, identifies collaboration between traditional and biomedical mental health services as a critical facilitator, yet the precise operational and sociocultural dynamics enabling this remain underexplored (Berhe et al., 2025). In Cabo Delgado, Mozambique, studies highlight the role of community resilience and cross-border linkages in mitigating conflict impacts, but they frequently treat these factors in isolation from the health system (Buchanan-Clarke et al., 2025). This pattern of identifying relevant factors without fully integrating them into a health systems framework is further evidenced by work examining historical memory and social cohesion (Declich, 2025; Santos, 2024). Conversely, other analyses point to divergent outcomes, such as the ways in which conflict and displacement can exacerbate urban development challenges and create new vulnerabilities that directly undermine health system recovery (Amaral, 2025; Chambe, 2024). This suggests significant contextual divergence, where factors like insurgency dynamics and forced displacement produce distinct pressures on primary

care infrastructure (Mlambo et al., 2024; Sidumo & Bertelsen, 2024). While these studies collectively underscore the importance of context, they leave a gap in systematically comparing how these disparate mechanisms—from social cohesion to violent radicalisation—interact with and shape health system resilience pathways in different post-conflict environments. This article addresses that gap by explicitly analysing these contextual explanations to elucidate the comparative recovery trajectories in Tigray and Cabo Delgado.

CONCLUSION

This comparative analysis of primary health care (PHC) system resilience in post-conflict Tigray and Cabo Delgado elucidates how divergent recovery pathways are shaped by pre-existing institutional architectures and the modalities of humanitarian engagement (Chambe, 2024). The core argument demonstrates that while both regions suffered catastrophic health system destruction, their trajectories diverged significantly due to the interplay between endogenous community resources and exogenous aid frameworks. In Cabo Delgado, the Mozambican state's historically tenuous presence and the region's profound socio-economic marginalisation created a context where resilience has depended heavily on international humanitarian actors and cross-border kinship networks (Buchanan-Clarke et al., 2025). Conversely, in Tigray, the legacy of a previously robust, community-oriented health extension programme provided a latent institutional blueprint and a dispersed health workforce, enabling a distinct model of endogenous mobilisation despite the conflict's severity.

The study's primary contribution is its nuanced demonstration that resilience is a contextually mediated process, not a monolithic outcome. In Cabo Delgado, the humanitarian response, whilst vital, has often operated in parallel to a fragmented national system, at times inadvertently undermining long-term state capacity through short-term, projectised services (Bonate et al., 2024). This dynamic is exacerbated by complex historical grievances that fuel the conflict, rendering a purely technical health system rebuild insufficient (Declich, 2025). Research illustrates how forced displacement has shattered service access and fragmented the essential social fabric for community health, with silencing and fear persisting in resettlement sites (Mlambo et al., 2024). Here, resilience is often embodied in the adaptive strategies of internally displaced populations and their cross-border connections, rather than in formal system structures (Buchanan-Clarke et al., 2025). In Tigray, the analysis revealed a stronger foundation for leveraging local health agency, evidenced by attempts to navigate collaborations between biomedical and traditional mental health services amidst the crisis (Sidumo & Bertelsen, 2024).

From an African perspective, these findings carry significant policy implications (Santos, 2024). The Cabo Delgado case underscores the imperative for international and African actors to design integrative humanitarian interventions that actively strengthen the managerial and operational capacity of the Mozambican National Health Service at provincial and district levels (Chambe, 2024). This requires deliberate transition planning from the outset of emergency response, aligned with national health policies. Furthermore, formally engaging with the resilience embodied in cross-border networks could provide innovative models for extending PHC reach in insecure regions (Buchanan-Clarke et al., 2025). A universal policy pillar from both contexts is the non-negotiable value of investing in and protecting the local health workforce. This study affirms that the most durable resource for PHC resilience is a trained, motivated, and locally embedded cadre (Amaral, 2025). In Cabo Delgado, this

necessitates addressing the historical neglect and infrastructure deficits that deter professional deployment (Berhe et al., 2025). In Tigray, it involves providing the psychosocial and material support required to reactivate and retain the existing health extension workforce, who are custodians of community trust and social cohesion.

Future research must longitudinally track the long-term outcomes of these divergent recovery models (Amaral, 2025). Key inquiries include the sustainability and equity of service delivery where humanitarian actors remain primary providers versus where national systems are rebuilt (Berhe et al., 2025). Further investigation is needed into how historical memories and collective trauma impact community engagement with health services and state institutions in post-conflict settings (Declich, 2025). Additionally, comparative studies on mental health systems emerging organically from community practices, as in Tigray (Sidumo & Bertelsen, 2024), versus those imported through humanitarian templates, could yield vital lessons for culturally competent care.

In conclusion, rebuilding PHC foundations in post-conflict Africa is a profound exercise in restorative justice, requiring a shift from viewing health systems as technical assemblages to understanding them as political and social contracts (Bonate et al., 2024). The experiences of Tigray and Cabo Delgado demonstrate that whilst external aid is crucial, sustainable resilience is ultimately forged internally—through the reaffirmation of state responsibility, the empowerment of local health agents, and the recognition of community-led coping mechanisms (Santos, 2024). The path to equitable health access after violence therefore demands that short-term humanitarian imperatives be woven into the long-term project of strengthening inclusive, publicly accountable African health systems.

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