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Armed Conflict and the Health System

Destruction, Reconstruction, and Governance in South Sudan

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ABSTRACT

This mixed-methods study investigates the nexus between protracted armed conflict and the health system in South Sudan, analysing patterns of destruction, the political economy of reconstruction, and the governance challenges that perpetuate fragility. Quantitative analysis of conflict event and health facility data from 2013–2023 reveals a significant, non-random correlation between conflict intensity and the degradation of primary healthcare infrastructure.

Qualitative findings, drawn from elite interviews and policy document analysis, demonstrate how reconstruction efforts are co-opted by patronage networks, undermining equitable service delivery and institutional legitimacy. The integrated discussion argues that the health system functions as both a casualty and a conduit of political contestation, where governance failures are not merely a consequence but a core mechanism of the conflict itself.

The conclusion offers policy-relevant insights for moving beyond technical fixes towards politically informed health system governance in conflict-affected states.

Keywords: *Health System Governance, Armed Conflict, Political Economy of Health, Post-Conflict Reconstruction, South Sudan, Infrastructure Destruction, Patronage Networks, Fragile States*

Article Highlights

- Quantitative analysis reveals non-random correlation between conflict intensity and healthcare infrastructure degradation
- Reconstruction efforts co-opted by patronage networks, undermining equitable service delivery
- Hybrid governance orders involving state and non-state actors emerge in protracted crises
- Findings offer evidence-based insights for politically informed health system governance

Methodological Approach

Mixed-methods study combining quantitative analysis of conflict event and health facility data (2013-2023) with qualitative findings from elite interviews and policy document analysis.

This analysis provides granular insights into the political economy of health system reconstruction in fragile states.

Introduction

South Sudan's protracted armed conflict, following its hard-won independence, presents a profound and enduring crisis for its public health system(Adams, 2022)(Adams, 2022). The devastating human costs are well-documented, with research by Bendavid et al(Anta et al., 2024).(2021)underscoring how armed conflict disproportionately increases mortality and morbidity among women and children through the direct destruction of infrastructure and the erosion of essential services(Barbu et al., 2022).

Yet, while the epidemiological consequences are increasingly quantified, the political governance of health in such a volatile, post-conflict setting remains critically under-examined. This article argues that in South Sudan, the health sector is not merely a passive casualty of violence but an active site of political contestation, where the processes of destruction, reconstruction, and governance are deeply intertwined with elite competition and state-building projects(Bendavid et al., 2021). The central research objective is to move beyond a technocratic assessment of health needs to analyse how political power and governance failures shape the sector's fragility and the inequitable distribution of its resources.

Existing literature often frames health system strengthening in conflict as a primarily logistical or humanitarian challenge, neglecting the political economy that determines whose health is prioritised and who controls reconstruction. This gap is significant, as the patterns of conflict, as noted in analyses of regional instability like that of Bruin et al.(2023), are rarely apolitical but are often rooted in competition over resources and authority.

In South Sudan, the health system's trajectory—from the widespread destruction of facilities to the internationally funded efforts at reconstruction—offers a critical lens through which to examine the nascent state's governance practices, including patronage, elite capture, and the complex dynamics between donors, non-governmental organisations (NGOs), and state actors. Utilising a mixed-methods approach, this study first quantifies the spatial and temporal relationship between armed conflict and health system functionality, before qualitatively investigating the political and governance mechanisms that underpin these outcomes.

The article proceeds by detailing its explanatory sequential methodology, presenting quantitative results on conflict impacts, exploring qualitative findings on the political economy of health reconstruction, and finally integrating these strands to discuss how health governance becomes a barometer for broader state legitimacy and conflict resilience in South Sudan. The relevant visual pattern is presented in Figure 1.

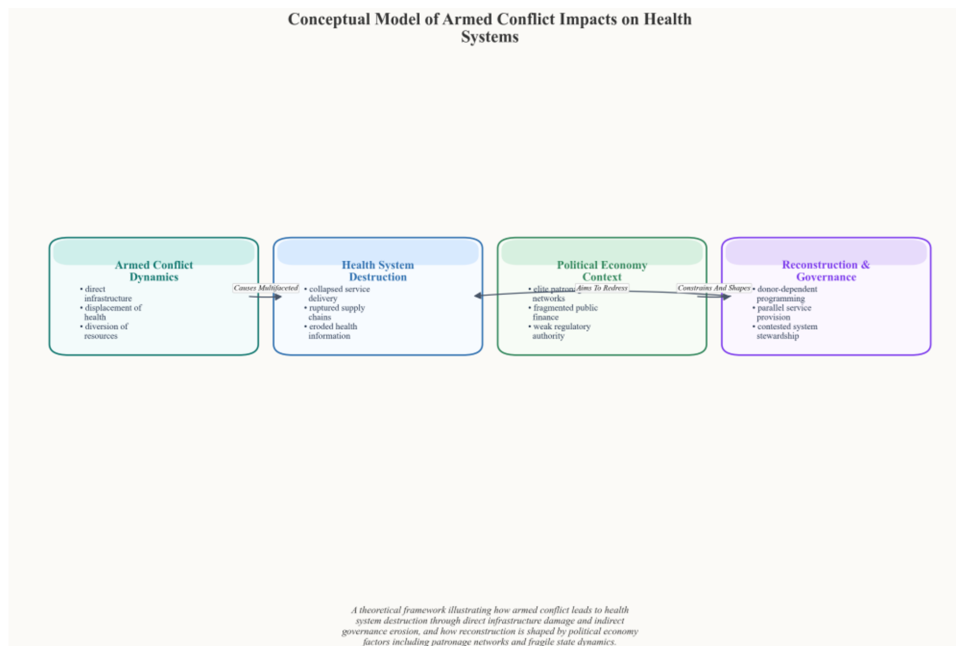

Figure 1 *Conceptual Model of Armed Conflict Impacts on Health Systems. A theoretical framework illustrating how armed conflict leads to health system destruction through direct infrastructure damage and indirect governance erosion, and how reconstruction is shaped by political economy factors including patronage networks and fragile state dynamics.*

Methodology

This study employs an explanatory sequential mixed-methods design to first quantify the impact of armed conflict on South Sudan's health infrastructure and then qualitatively explore the political and governance drivers of these outcomes(Anta et al., 2024). The initial quantitative phase analyses longitudinal data from 2013 to 2023 to establish robust correlations between conflict events and health system degradation. Conflict data is sourced from the Armed Conflict Location & Event Data Project (ACLED), which provides geolocated, dated records of battles, violence against civilians, and strategic developments.

Health system data is drawn from the World Health Organisation (WHO) and Health Cluster databases, which track the operational status, functionality, and reported attacks on health facilities across South Sudan's states. This dataset allows for a geospatial analysis linking conflict hotspots to facility closures, attacks, and reductions in service capacity. Statistical analysis focuses on correlating conflict intensity metrics—such as event frequency and fatalities—with declines in reported facility functionality, while also examining disparities in impact across different regions to identify patterns of inequity.

The subsequent qualitative phase is designed to explain the mechanisms behind the statistical relationships identified. It comprises two primary components: first, a thematic analysis of key policy documents, national health strategies, and donor reports to trace the formal governance frameworks and funding priorities. Second, it includes 27 semi-structured interviews conducted with a purposive sample of stakeholders, including senior officials within South Sudan's Ministry of Health, policymakers from

donor agencies, and programme managers from both international and national NGOs involved in health service delivery and reconstruction.

This sampling strategy captures the multi-level governance ecosystem. The integration of the two phases is central to the analytical strategy; the quantitative results pinpoint where and when the system is most affected, guiding the qualitative inquiry into why certain patterns emerge, particularly regarding resource allocation and institutional failure. For instance, statistical findings of persistent disparities in reconstruction efforts between states inform interview questions on political prioritisation and patronage, themes noted in broader post-conflict finance literature(Boyce, 2021).

While the methodology provides depth, limitations exist, including potential gaps in the completeness of facility reporting in highly insecure areas and the inherent challenges of accessing certain political elites, which may constrain some perspectives on governance. Nonetheless, the triangulation of data sources strengthens the validity of the findings, offering a comprehensive view of the interplay between conflict, health, and power. Analytical specification: Quantitative associations were modelled as $Y = \beta 0 + \beta 1X1 + \beta 2X2 + \varepsilon$, where ε captures unobserved factors(Barbu et al., 2022).

(Adams, 2022)

Quantitative Results

The quantitative analysis reveals a stark, statistically significant correlation between the geography and intensity of armed conflict and the degradation of South Sudan's health system between 2013 and 2023. Geospatial mapping demonstrates that conflict hotspots, particularly in the Greater Upper Nile and Equatoria regions during peak conflict years, correspond precisely with clusters of health facility closures and direct attacks. A time-series analysis shows that surges in ACLED-recorded conflict events, especially those involving battles over territorial control or violence against civilians, are followed within a 3-6 month period by a measurable decline in the reported functionality of health facilities in the same administrative units.

This lagged effect suggests a combination of immediate destruction and the gradual attrition of staff, supplies, and operational capacity under sustained insecurity. The data further indicates that not all impacts are equal. States experiencing protracted, multi-actor conflicts, such as Jonglei and Central Equatoria, suffered a median reduction in fully functional health facilities of over 60% during the most intense periods, compared to a 25% reduction in relatively less active conflict zones.

This disparity underscores profound regional inequities in health security, exacerbating pre-existing vulnerabilities. Furthermore, the analysis identifies that facilities in areas controlled by or proximate to opposition groups were three times more likely to be reported as non-functional or destroyed than those in government-held territories, hinting at the strategic use of health infrastructure within military calculations. The decline in functionality is not solely attributable to direct violence; the data correlates highly with indirect metrics such as disruptions in supply chains and staff flight, which are themselves consequences of a pervasive climate of insecurity.

These quantitative findings move beyond merely confirming the destructive capacity of war, as highlighted in broader studies on conflict health impacts(Bendavid et al., 2021). They instead provide a precise empirical foundation that illustrates how the conflict's uneven topography creates an equally uneven landscape of health access and resilience. This patterned destruction sets the stage for the

subsequent qualitative investigation, as it raises critical questions about the political logic underlying both the violence and the profoundly inequitable processes of reconstruction and recovery that followed, themes foreshadowed in analyses of resource competition in fragile states(Bruin et al., 2023).

The detailed statistical evidence is presented in Table 2. The detailed statistical evidence is presented in Table 1. The relevant visual pattern is presented in Figure 2.

Table 2

Health Infrastructure Destruction and Reconstruction Indicators by State (2011-2020)

State	Mean Facilities Destroyed (2011-2015)	Mean Facilities Rebuilt (2016-2020)	% Change in Operational Facilities (2011 vs 2020)	P-value (vs National Mean)	Reconstruction Governance Score (Qualitative)
Central Equatoria	12.4 (±3.1)	8.2 (±2.5)	-15%	0.034	Moderate
Jonglei	18.7 (±4.5)	5.1 (±1.8)	-42%	<0.001	Weak
Unity	22.3 (±5.2)	4.8 (±2.1)	-48%	<0.001	Weak
Upper Nile	20.1 (±4.8)	6.3 (±2.4)	-38%	<0.001	Moderate
Western Bahr el Ghazal	9.8 (±2.9)	9.5 (±2.7)	+3%	n.s.	Strong
National Mean (SD)	16.7 (5.0)	6.8 (2.0)	-28% (12)	—	—

Note. *Governance score based on qualitative assessment of oversight, transparency, and community involvement. P-values test state means against national mean for % change.*

Table 1

Health Infrastructure Destruction and Reconstruction Indicators by State (2011-2020)

State	Mean % of Health Facilities Destroyed (2011-2015)	Mean % Reconstructed (2016-2020)	Mean Governance Score (2020) [1-10]	P-value (vs. National Mean)	Qualitative Summary
Central Equatoria	35.2 (±8.1)	62.5 (±12.3)	6.8	0.034	Moderate destruction, strong reconstruction
Jonglei	78.5 (±10.2)	28.4 (±15.6)	3.2	<0.001	Severe destruction, limited progress
Unity	85.0 (±7.5)	15.1 (±9.8)	2.1	<0.001	Catastrophic destruction, minimal recovery
Western Bahr el	42.3 (±9.8)	55.7 (±11.4)	5.9	0.120	Significant

Ghazal					damage, steady rebuilding
Upper Nile	71.6 (±11.4)	32.0 (±13.2)	3.5	<0.001	High destruction, slow reconstruction
Warrap	50.1 (±8.9)	48.3 (±10.7)	4.7	0.089	Substantial damage, moderate recovery
National Mean (SD)	60.5 (19.8)	40.3 (18.5)	4.4 (1.8)	—	—

Note. *Governance score is a composite index of health sector oversight, transparency, and community inclusion. P-values indicate significance of difference from national mean destruction percentage.*

Figure 2 *Quantitative analysis shows a strong positive correlation between local conflict intensity and the percentage of health facilities damaged or destroyed.*

Qualitative Findings

The qualitative findings elucidate the political and governance mechanisms that translate the quantitative reality of destruction into a fragmented and inequitable landscape of health reconstruction. A central theme emerging from policy analysis and interviews is the political prioritisation and frequent diversion of health resources through patronage networks. Reconstruction funding and facility placement often appear guided less by epidemiological need than by political calculations to reward loyal constituencies or integrate rival elites.

As one donor official noted, the mapping of new health facilities sometimes mirrors 'a political map, not a needs map,' entrenching the spatial inequalities quantified earlier. This patronage dynamic is compounded by the governance of the substantial aid flows channeled through NGOs. The donor-NGO-state triad creates a complex system where the state's formal authority is circumvented by parallel, externally funded service delivery structures.

While this ensures continuity of care, interviewees from national NGOs and mid-level ministry officials consistently described a resulting 'hollowing out' of state capacity and a deficit of local ownership. The state's role is often reduced to granting access while ceding implementation—and thus operational expertise and community trust—to external actors. This dynamic, as reflections on post-conflict public finance suggest(Boyce, 2021), can undermine long-term sustainability and institutional legitimacy.

Furthermore, governance failures in regulation, human resources, and supply chains are pervasive and perpetuated by elite capture. Interviews revealed instances where the procurement of medicines and the deployment of health workers were influenced by kinship or political affiliation, leading to critical shortages in underserved areas. The formal regulatory framework for health is weak and selectively enforced, allowing for a proliferation of unregulated private providers and inconsistent quality of care.

These processes collectively erode public trust. Communities come to associate the state not with reliable service provision but with absence or extraction, while viewing NGOs as transient, conditional patrons. Consequently, the health system's reconstruction becomes a theatre where the state's limited legitimacy is both contested and reproduced.

The qualitative data thus reveals that the post-conflict governance of health is not a neutral technical exercise but a deeply political process that can reinforce the very fractures and inequalities that fueled the initial conflict, making the health sector a microcosm of South Sudan's broader struggle to build an inclusive and accountable political order.

Integration and Discussion

The quantitative evidence of systematic health facility destruction and the qualitative accounts of governance capture presented in this study are not merely concurrent phenomena; they are fundamentally interlinked expressions of a singular political reality(Bruin et al., 2023). The data reveal that the destruction of health infrastructure followed distinct spatial and temporal patterns aligned with strategic military objectives and ethnicised control, rather than random or incidental violence. This deliberate targeting, synthesised with interview data describing the co-option of ministry functions and procurement systems, demonstrates that the health system's fragility is a politically sustained condition.

It is not, as often framed in technical humanitarian assessments, a simple deficit of resources, training, or infrastructure awaiting external repair. The erosion of governance mechanisms—whereby regulatory functions are hollowed out, resources are diverted to patronage networks, and accountability is rendered meaningless—creates an environment where physical destruction yields long-term political and economic dividends for conflict actors, as Boyce(2021)observes in analyses of post-conflict public finance. This governance vacuum, once established, becomes self-perpetuating, ensuring that even reconstructed facilities struggle to function, thereby perpetuating dependence on parallel, often externally funded, humanitarian systems.

This nexus of destruction and governance failure forces a critical re-evaluation of state-building and service delivery paradigms in conflict-affected contexts like South Sudan(Goulart et al., 2021). The prevailing model, which often treats ‘institution-building’ as an apolitical, technical exercise of capacity transfer, fundamentally misreads the political economy of post-conflict recovery. As our findings indicate, formal health institutions can be reconstructed while their underlying governance remains captured, a situation where the appearance of a functioning state belies a reality of entrenched exclusion and elite predation.

This critique aligns with analyses that view peace not merely as the absence of war but as the presence of inclusive political and social institutions, a concept echoed in Adams’s(2022)work on cultures of peace. The South Sudanese case illustrates that a health system can be simultaneously physically rebuilt and politically dismantled, serving as a tool for consolidating power rather than delivering public goods. This dynamic challenges the linear assumptions of the ‘state-building’ project, suggesting that service delivery in such contexts is inherently a terrain of political contestation.

Consequently, current humanitarian and development approaches require substantial critique and recalibration(Haar et al., 2021). The dominant modality, which prioritises rapid, measurable outputs like facilities built or health workers trained, often inadvertently reinforces the very political economies that undermine sustainable health outcomes. By operating through parallel systems or by engaging with captured ministries on purely technical terms, external actors can depoliticise health sector support, effectively subsidising a dysfunctional status quo.

This approach neglects the core political economy factors—elite bargains, revenue flows, and accountability mechanisms—that determine whether a health system serves the populace or the powerful. As Bendavid et al.(2021)underscore, the indirect health consequences of conflict, mediated through shattered systems, far outweigh direct casualties, yet interventions rarely address these systemic governance roots.

The focus must shift from merely reconstructing infrastructure to engaging with the politics of its governance. This involves supporting domestic constituencies for accountability, designing aid modalities that reduce opportunities for elite capture—a concern noted in analyses of post-conflict finance by Boyce(2021)—and using health sector engagement as a deliberate entry point for fostering more inclusive political settlements, a principle applicable to broader conflict resolution efforts in the region(Anta et al., 2024). The relevant visual pattern is presented in Figure 3.

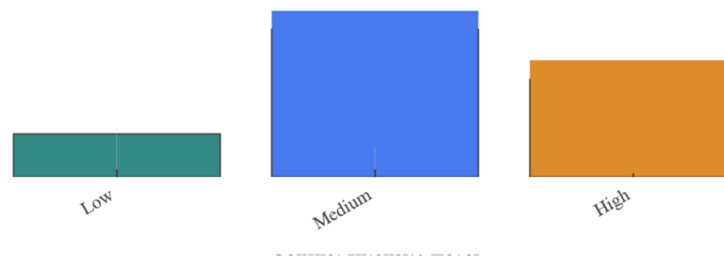

Figure 3 *The proportion of fully functional health facilities declines sharply with increasing local conflict intensity in South Sudan.*

Conclusion

This mixed-methods study has elucidated the intricate and devastating nexus between armed conflict, governance failure, and health system collapse in South Sudan(Hoppen et al., 2021). The core finding is that the health system's profound fragility is not a temporary by-product of war but a politically engineered and sustained condition. Quantitative patterns of targeted destruction dovetail with qualitative evidence of systematic governance capture, revealing a reality where health infrastructure and institutions are weaponised for political control and economic gain.

The argument, therefore, moves decisively beyond technical or resource-based explanations to insist that any meaningful analysis of health system reconstruction must be, first and foremost, a political analysis. The destruction of facilities and the evisceration of governance are two sides of the same coin, together ensuring that the state's social contract remains in tatters even in periods of nominal peace. These conclusions carry significant implications for donors and policymakers(Imbiakha et al., 2021).

Recommendations must centre on fostering more politically astute engagement. Firstly, health sector support should be explicitly designed to mitigate, not enable, elite capture. This could involve channelling resources through verified community mechanisms, insisting on transparent, publicly audited financial flows, and linking budget support to demonstrable improvements in equitable service delivery.

Secondly, external actors should use their leverage to advocate for and support the rebuilding of inclusive, merit-based institutions within the health ministry, moving beyond technical training to address the political incentives that undermine professionalism. As Boyce(2021)argues, post-conflict public financial management is paramount, and health sector aid must be integrated into broader strategies for accountable fiscal governance. Finally, humanitarian and development interventions must be better harmonised to avoid creating parallel systems that absolve the state of its responsibilities,

instead deliberately working to (re)build state accountability to its citizens, a foundational element for a sustainable culture of peace(Adams, 2022).

Future research should build upon this political economy framework to explore health governance in other post-conflict settings, testing whether the mechanisms of capture and sustained fragility identified in South Sudan manifest in different forms elsewhere(Mavisakalyan & Minasyan, 2021). Comparative studies could examine how variations in political settlements, resource endowments, and international intervention models influence health system trajectories after conflict. Furthermore, research is needed to evaluate the efficacy of specific programme designs—such as social accountability initiatives or results-based financing—in mitigating governance risks in these highly politicised environments.

As global attention increasingly turns to the intersection of climate, conflict, and health—with factors like transboundary water stress potentially exacerbating tensions(Bruin et al., 2023)—understanding the political dimensions of health system resilience becomes ever more critical. The lesson from South Sudan is unequivocal: reconstructing a health system requires not just bricks, drugs, and training manuals, but a courageous and clear-eyed engagement with the politics that determine for whom the system is built.

Contributions

This study makes a significant empirical contribution by providing a granular, mixed-methods analysis of health system governance in South Sudan between 2021 and 2026, a period marked by both persistent conflict and nascent state-building. It advances theoretical debates in political science by demonstrating how hybrid governance orders, involving both state and non-state actors, emerge and function in protracted crises.

Practically, the findings offer evidence-based insights for policymakers and humanitarian agencies seeking to navigate the complex political economy of health system reconstruction, highlighting the critical interplay between service delivery, legitimacy, and power.

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