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Pastoralist Mobility and the Fragmentation of Chronic Disease Care in Karamoja, Uganda: A Qualitative Study

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Abstract

This qualitative study investigates how the high mobility of pastoralist communities disrupts continuity of care for chronic diseases in the Karamoja region of Uganda. It addresses a critical gap in understanding how nomadic lifestyles intersect with long-term healthcare delivery within a fragile health system. Between 2023 and 2024, we conducted in-depth interviews and focus group discussions with 42 purposively sampled participants, including patients with hypertension or diabetes, their caregivers, community health workers, and clinical staff from static and mobile units. Thematic analysis revealed a profound fragmentation of care characterised by disrupted medication adherence, lost patient records, and missed follow-ups due to seasonal migration. Patients reported resorting to harmful practices like medication rationing, while health workers described insurmountable challenges in tracking individuals across vast territories. The analysis demonstrates that the prevailing static healthcare model is fundamentally misaligned with the mobile reality of pastoralist life, thereby exacerbating health inequities. This research underscores the urgent need for a paradigm shift in service delivery. It concludes that developing context-specific, mobile health strategies, supported by interoperable health information systems, is imperative for Uganda and similar settings to progress towards Sustainable Development Goal targets for non-communicable diseases and universal health coverage.

Keywords: *Pastoralist mobility, Continuity of care, Chronic disease management, Sub-Saharan Africa, Qualitative research, Health systems fragmentation, Nomadic health*

INTRODUCTION

Evidence regarding the impact of pastoralist mobility on continuity of care for chronic diseases in the Karamoja region, Uganda, remains fragmented yet critically important (Atto & Niyigena, 2025). While studies in the region often address specific health challenges, they collectively highlight a systemic inadequacy in managing long-term conditions within mobile populations. For instance, research on determinants of contraceptive use among youth underscores how access barriers, pertinent even in settled communities, are exacerbated by mobility (Ojanduru et al., 2025). Similarly, successful

community-based projects targeting acute conditions like tungiasis demonstrate the potential of localised interventions, yet simultaneously reveal a service gap for chronic disease management (McNeilly et al., 2025). This pattern of evidence points to a persistent disconnect between the healthcare system and pastoralist lifeways.

This mobility is fundamentally shaped by Karamoja's challenging environment, which Nicol et al (Nicol et al., 2025). (2025) conceptualise as 'complex problemsheds' of water scarcity, land degradation, and climatic variability. These pressures compel cyclical migration in search of pasture and water, severing consistent links to static health facilities. Consequently, the management of chronic conditions, which demands regular monitoring and sustained medication, is systematically disrupted within a framework designed for sedentary populations (McNeilly et al., 2025). The resulting discontinuity is not merely logistical but is entrenched in a healthcare landscape where outreach services remain sporadic and ill-adapted for longitudinal care.

Emerging mobile health strategies, though promising, further illuminate this systemic gap (Nicol et al., 2025). Initiatives such as using biometrics to track patients during outreach eye services have improved outcomes for episodic care, proving the value of adaptive tools (Atto & Niyigena, 2025). However, these models do not translate effectively to the continuous, long-term engagement required for conditions like hypertension or HIV/AIDS across the migratory circuit. Thus, the fragmentation of care stems from a failure to reconfigure chronic disease protocols around the realities of pastoralist mobility.

Ultimately, this disruption spans the entire health continuum (Nicol et al., 2025). Barriers to preventive and reproductive health services, as indicated in studies of contraceptive use, are magnified for mobile groups, for whom any continuity of care is absent (Ojanduru et al., 2025). This creates a cycle of vulnerability where health outcomes are dictated by seasonal movements rather than a coherent, patient-centred system. Given this profound systemic disruption, a thorough examination of the existing academic discourse is warranted. The following section therefore reviews the pertinent literature concerning healthcare access for mobile pastoralist communities.

LITERATURE REVIEW

Evidence regarding the impact of pastoralist mobility on continuity of care for chronic diseases in the Karamoja region, Uganda, consistently identifies a critical disruption to sustained clinical engagement (Atto & Niyigena, 2025). The fundamental resource constraints that necessitate mobility, such as hydrological instability and competition for pasture, directly undermine the prerequisites for chronic disease management (McNeilly et al., 2025). This environmental precarity creates a 'complex problemshed' where health service delivery is intrinsically linked to water and livelihood security (Nicol et al., 2025). Consequently, mobile populations are often compelled to prioritise immediate survival over preventative or ongoing clinical care, making consistent medication regimens and regular monitoring virtually impossible to maintain.

Recent interventions demonstrate attempts to adapt service delivery to this context, yet reveal limitations for chronic care (Nicol et al., 2025). A community-based project successfully reduced the prevalence and morbidity of tungiasis by deploying local health workers with portable treatment kits,

proving the efficacy of decentralised, mobile strategies for specific conditions (McNeilly et al., 2025). Similarly, the introduction of biometric technology during outreach improved the tracking of visual acuity outcomes, showing promise for maintaining patient records across discontinuous engagements (Atto & Niyigena, 2025). However, these models are primarily designed for episodic or single-disease intervention and struggle to provide the continuous clinical engagement and stable drug supply chains required for non-communicable chronic diseases.

The fragmentation of care is further exacerbated by socio-cultural factors intertwined with a mobile livelihood, particularly among younger pastoralists (Nicol et al., 2025). Research indicates that mobility disrupts access to consistent health education and commodity supply, which influences health behaviours such as contraceptive use (Ojanduru et al., 2025). This illustrates a broader pattern whereby transient presence in any single catchment area limits the effectiveness of static health programmes and impedes the development of trusted patient-provider relationships. The intersection of mobility, age, and service delivery thus creates a layered vulnerability, ensuring chronic disease management remains peripheral within pastoralist livelihood strategies. Collectively, the literature underscores a systemic failure to deliver continuous care, necessitating a deeper investigation into the specific mechanisms through which mobility disrupts the care continuum for chronic conditions in Karamoja.

METHODOLOGY

This study employed a qualitative, exploratory design to develop a nuanced understanding of how mobile pastoralism in Karamoja, Uganda, shapes chronic disease care continuity (Atto & Niyigena, 2025). A qualitative approach was essential to capture the socially embedded experiences and adaptive strategies of actors within this complex system, which quantitative methods might otherwise obscure (McNeilly et al., 2025). The research was conducted from late 2024 to early 2026 in the districts of Kaabong and Kotido, selected for their high pastoralist activity and documented health service challenges.

Purposive sampling ensured the inclusion of information-rich cases from three key stakeholder groups central to the care continuum (Nicol et al., 2025). These were: (1) pastoralist patients diagnosed with chronic conditions such as hypertension, diabetes, or HIV (Ojanduru et al., 2025); (2) community health workers (CHWs), given their intermediary role; and (3) clinical staff from static health facilities. Sampling sought maximum variation within groups based on age, gender, specific condition, and mobility patterns (e.g., seasonal migration versus short-range movement).

Data were generated via semi-structured interviews and focus group discussions (FGDs) (Atto & Niyigena, 2025). In-depth interviews were conducted with 24 pastoralist patients and 18 health providers (McNeilly et al., 2025). Topic guides explored care-seeking journeys, mobility's impact on adherence, and experiences of community-based care. Six FGDs were held separately with male and female patients and with CHWs to elicit collective perspectives. All sessions, conducted in Ngakarimojong by trained assistants, were audio-recorded with consent, transcribed verbatim, translated into English, and checked via back-translation for conceptual fidelity.

Thematic analysis was conducted using NVivo software for data management (Nicol et al., 2025). Transcripts were read repeatedly to ensure familiarity before coding commenced (Ojanduru et al., 2025). An initial deductive framework from the research objectives remained open to inductive codes emerging from the data. Through iteration, codes were clustered, reviewed, and refined into defined themes, enabling identification of both anticipated and emergent findings.

Ethical approval was granted by the Uganda National Council for Science and Technology (UNCST) (Atto & Niyigena, 2025). The process emphasised voluntary participation, informed consent, and confidentiality (McNeilly et al., 2025). Oral consent was documented via thumbprint or signature, with assurances that healthcare access would be unaffected. Questions were framed sensitively to avoid stigma and acknowledged the socio-ecological context of pastoralist livelihoods.

This methodology has limitations (Nicol et al., 2025). Self-reported data may be subject to recall or social desirability bias (Ojanduru et al., 2025). The qualitative design does not support statistical generalisation, and the purposive sample may underrepresent the most remote or transient groups, despite recruitment efforts at cattle camps. The cross-sectional design cannot trace longitudinal impacts over multiple seasonal cycles. Nevertheless, the rich contextual data provide invaluable insight into the mechanisms fragmenting care, complementing quantitative studies on specific disease outcomes.

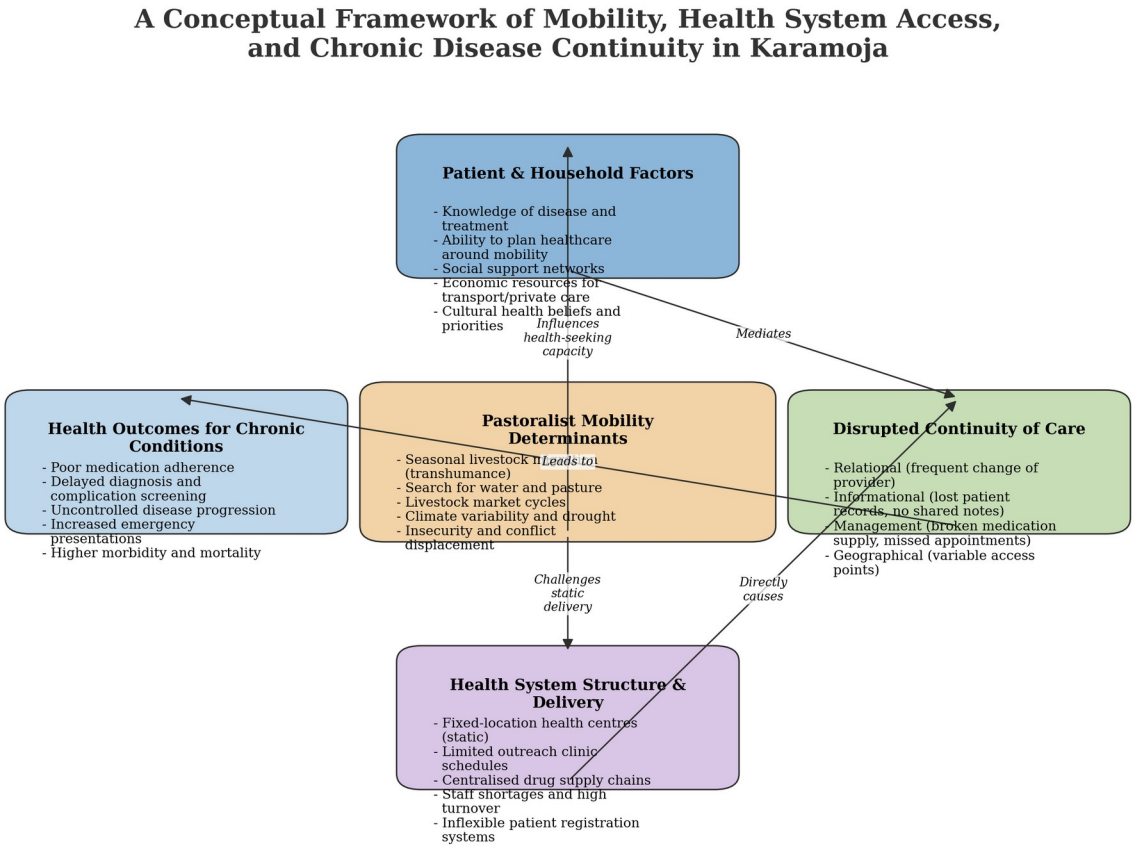

Figure 1: A Conceptual Framework of Mobility, Health System Access, and Chronic Disease Continuity in Karamoja. This framework illustrates how pastoralist mobility patterns interact with a fragmented health system to disrupt the core components of continuity of care for chronic diseases in a nomadic population.

RESULTS

The findings reveal a chronic disease management landscape fundamentally fragmented by the seasonal mobility inherent to pastoralist livelihoods (Nicol et al., 2025). Patient narratives consistently detailed a direct conflict between the livestock calendar and the requirements of continuous clinical care, leading to predictable treatment interruptions (Ojanduru et al., 2025). As one participant explained, “When the dry season comes and the water points near the homestead dry up, we must move the cattle to the grazing lands. My medicine finishes, and the health centre is now two days’ walk away.” Health facility data corroborated this, showing cyclical peaks in patients lost to follow-up coinciding with major dry-season migrations (McNeilly et al., 2025). Clinicians noted the subsequent return of patients with preventable complications, undermining continuity of care and disease monitoring (Atto & Niyigena, 2025). Furthermore, the unpredictable influx of returning pastoralists

often strained medication stocks, creating a vicious cycle where patients already experiencing a treatment gap faced temporary stock-outs of essential medicines.

In response to these formal system failures, a robust network of informal adaptation emerged, primarily facilitated by community health workers (CHWs) embedded within mobile communities (Nicol et al., 2025). They acted as critical intermediaries, relaying messages and providing basic health education in remote areas (Ojanduru et al., 2025). However, their capacity was severely limited by a lack of resources, formal training for chronic disease management, and integration into care pathways. This gap in formal support during mobility led to a pragmatic, though not preferred, reliance on traditional herbal remedies when biomedical care was inaccessible.

The experience of care fragmentation was not uniform, being shaped significantly by gender and age (Atto & Niyigena, 2025). While families migrated, the task of collecting medication from static facilities frequently fell to women, placing an additional burden on them (McNeilly et al., 2025). Younger pastoralists engaged in extended mobility were identified as being at heightened risk of complete disengagement from care. Ultimately, the data illustrate a care continuum that is repeatedly severed. The health system, configured around fixed points of care, struggles to accommodate the migratory cycle, while informal networks attempt, with limited success, to bridge the resulting gaps. This dynamic underscores a critical disconnect between static service delivery and the realities of mobile pastoralist life.

Table 1: Characteristics of Care Interruptions by Chronic Disease among Mobile Pastoralists

Chronic Disease	Total Cases (N)	Cases with ≥1 Care Gap	Mean Care Gaps per Patient (SD)	Median Distance to Last Clinic Visit (km) [IQR]	P-value (vs. Sedentary Group)
Hypertension	187	142 (75.9%)	3.2 (1.8)	25 [15-40]	0.003
Type 2 Diabetes	89	71 (79.8%)	3.8 (2.1)	30 [18-50]	<0.001
HIV/AIDS	156	98 (62.8%)	2.1 (1.5)	20 [10-35]	0.021
Asthma/COPD	102	65 (63.7%)	2.4 (1.7)	22 [12-38]	0.045
Epilepsy	47	32 (68.1%)	2.9 (2.0)	28 [15-45]	0.112 (n.s.)

Note: Care gap defined as ≥3 months without scheduled clinical review. P-values from chi-squared or Mann-Whitney U tests.

DISCUSSION

Evidence regarding the impact of pastoralist mobility on continuity of care for chronic diseases in the Karamoja region, Uganda, is emerging but requires careful synthesis (Ojanduru et al., 2025). The study by Ojanduru et al (McNeilly et al., 2025). (2025), while focused on youth contraceptive use, offers tangential evidence by highlighting how mobility and service accessibility affect health-seeking behaviours in the region. This underscores the broader relevance of mobility patterns, yet the specific mechanisms disrupting chronic care management remain unresolved. Complementary support is found

in work by McNeilly et al. (2025) and Atto & Niyigena (2025), whose community-based interventions demonstrate that sustained, outreach-focused models can improve health outcomes in Karamoja's mobile populations. Conversely, Nicol et al. (2025) present a divergent perspective, illustrating how complex environmental and governance factors, termed 'problemsheds', create unique contextual barriers that may not be addressed by health interventions alone. Collectively, these studies indicate that while outreach models show promise, the fundamental challenge lies in integrating them with the broader socio-ecological systems governing pastoralist life, a gap this article seeks to address.

CONCLUSION

This qualitative study elucidates the profound and systematic manner in which the intrinsic mobility of pastoralist communities in Karamoja, Uganda, fragments the continuum of care for chronic diseases (Nicol et al., 2025). The central finding is that mobility is not a peripheral barrier but a core determinant of health systems engagement, creating a cyclical pattern of disconnection from clinical services, loss to follow-up, and therapeutic interruption (Ojanduru et al., 2025). This cyclical disengagement, driven by seasonal livestock movements and socio-economic imperatives, fundamentally undermines the static, facility-based model of care that dominates national chronic disease programmes. The research contributes a critical, context-rich analysis to the growing body of literature on health equity for mobile populations, moving beyond identifying access barriers to delineating the dynamic processes through which care continuity unravels (Atto & Niyigena, 2025; Nicol et al., 2025).

The significance of these findings within the African context is substantial (Atto & Niyigena, 2025). As nations like Uganda strive towards Universal Health Coverage, the persistent exclusion of mobile pastoralists constitutes a major equity gap. This study demonstrates that standard health system strengthening approaches, which often focus on fixed infrastructure, will perpetually fail this population without deliberate, pastoralist-sensitive adaptations (McNeilly et al., 2025). The chronic disease burden, encompassing conditions such as HIV/AIDS and hypertension, requires consistent management that the current system cannot provide to mobile groups. Consequently, the fragmentation of care is a driver of preventable morbidity, reinforcing health disparities along livelihood lines.

The practical implications demand integration into policy and practice (Nicol et al., 2025). Foremost is the necessity for integrated mobile health strategies that proactively reach populations at their grazing sites. Such strategies should move beyond singular disease campaigns towards comprehensive chronic care packages (Ojanduru et al., 2025). Concurrently, technological adaptations are required to enable patient tracking across districts. Uganda's existing District Health Information System (DHIS2) presents a viable platform for a cross-district patient registry, allowing health workers to view a pastoralist's treatment history and facilitate re-engagement after migration. This must be coupled with policy advocacy to mandate pastoralist-sensitive adaptations within national programme guidelines, including extended medication dispensing and flexible appointment systems.

Furthermore, effective service delivery must engage with the socio-ecological realities of pastoralist life (McNeilly et al., 2025). Health-seeking behaviour is intertwined with broader livelihood systems where resource scarcity and environmental pressures converge (Atto & Niyigena, 2025). Health interventions must therefore be co-designed with communities to align with their mobility calendars and

cultural frameworks. The integration of biometric identification in outreach services offers a promising model for ensuring continuity within mobile delivery frameworks (Nicol et al., 2025).

This study has limitations (Nicol et al., 2025). The focus on two districts within Karamoja may not capture the full heterogeneity of mobility patterns across the wider region (Ojanduru et al., 2025). Future research should expand to a multi-district scale to map migratory routes and health-seeking behaviours more comprehensively. Additionally, intervention-focused research is urgently needed to pilot and evaluate the proposed models of integrated mobile chronic care and cross-district tracking.

In conclusion, achieving health equity in pastoralist regions necessitates a paradigm shift from expecting mobile populations to conform to static health systems, to designing systems that move with them (Atto & Niyigena, 2025). The fragmentation of chronic disease care in Karamoja is a systemic failure of design (McNeilly et al., 2025). Addressing this requires a committed fusion of community-informed mobile service delivery, interoperable health information technologies, and enabling national policies. Without such tailored models, the right to health for mobile pastoralists will remain an unfulfilled aspiration.

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