

DOCTORAL RESEARCH PROPOSAL

**Governing Health Intelligence in Fragile
Systems**

*Surveillance Infrastructures, Data Practices, and Epidemic Decision-
Making in Conflict-Affected Sub-Saharan Africa*

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UMAR ABBA AJA

B.Sc. (Hons), MHA

Maiduguri, Borno State, Nigeria

umarabbaaja5@gmail.com

ORCID: 0009-0000-1718-2371

1. Introduction and Rationale

Global health policy has, over the past decade, invested heavily in the promise of digital surveillance: electronic health records, AI-enabled outbreak prediction, and integrated disease intelligence platforms are now standard prescriptions for health system strengthening. These prescriptions typically presume a coherent institutional authority capable of defining what counts as valid data, who owns it, and how it should be acted upon. Where that authority is fragmented — across state ministries, humanitarian agencies, donor-funded platforms, and community reporting networks — the digital health agenda does not fail so much as it changes character. Surveillance does not disappear in fragile settings; it multiplies, and with it, multiple and sometimes incommensurable versions of epidemiological reality.

This research takes that multiplication seriously, not as a deficiency to be corrected before “proper” surveillance can occur, but as the actual condition under which health intelligence is produced in most of the conflict-affected world. Borno State, northeastern Nigeria, offers an unusually stark illustration of this condition. Sixteen years of Boko Haram insurgency destroyed an estimated 201 health centres in the state and rendered less than half of all facilities functional at the conflict’s height, while damaging or destroying a comparable share of water and sanitation infrastructure on which disease control depends. The resulting health workforce gap is severe even by national standards: Borno records among the lowest physician-to-population ratios of any Nigerian state, at roughly one doctor per 10,000 people against a WHO benchmark more than fifteen times higher, with available personnel concentrated in secondary facilities in Maiduguri while primary care across rural and post-displacement areas remains acutely understaffed.

This fragility is not historical. In 2024 alone, Borno, Adamawa, and Yobe States recorded over 10,700 suspected cholera cases linked to flood-affected IDP camps, compounding a measles outbreak concentrated in Maiduguri that, alongside the floods, pushed child malnutrition treatment in the Northeast well beyond planned targets. Each outbreak generated its own reporting trail — state epidemiological surveillance, WHO-supported early warning systems, NGO-run treatment units each filing to their own donors,

and community camp structures reporting upward through separate humanitarian coordination channels — producing exactly the kind of overlapping, only partially reconciled surveillance landscape this thesis sets out to study.

Government health information systems, humanitarian early warning platforms, NGO programme databases, and community-based reporting tied to immunisation and outbreak response all operate simultaneously in this landscape, each with its own definitions, validation procedures, and reporting hierarchies. The result is not one surveillance system with gaps, but several overlapping surveillance systems whose outputs do not automatically reconcile.

This research is not an external academic exercise. I am from Bama, one of the local government areas most severely affected by displacement in Borno State, and this project grows directly out of lived experience of the conditions it studies, combined with three years of field-based monitoring and evaluation experience across IDP and post-displacement communities. The central puzzle this thesis investigates is therefore not how to build better surveillance infrastructure in fragile states, but how, in the absence of a single governing authority and amid a workforce and infrastructure deficit of this scale, health intelligence nonetheless becomes credible enough to act upon — and what is lost, gained, or contested in that process.

2. Research Questions

Primary research question:

How is health intelligence produced, stabilised, and rendered actionable in fragmented health systems where authority over disease surveillance is distributed across state, humanitarian, donor, and community actors?

Sub-questions:

1. How do different surveillance actors in Borno State define, collect, and validate epidemiological data, and where do their data practices converge or conflict?

2. Through what practical, infrastructural, and interpersonal mechanisms do divergent surveillance outputs get translated into a single actionable account during outbreak response?
3. How do frontline health workers and community reporters experience and negotiate their position within multiple, sometimes contradictory, reporting hierarchies?
4. What forms of trust, authority, and legitimacy come to attach to particular data sources or actors, and how are these contested by rival surveillance actors?

3. Literature Review and Conceptual Framework

This research is positioned at the intersection of three literatures that are rarely brought into direct conversation in the global health policy context: science and technology studies (STS) approaches to data and infrastructure; medical anthropology of health systems in conditions of state fragility; and global health governance scholarship on humanitarian-state relations.

The STS literature provides the conceptual starting point for treating data as a practice rather than a neutral output. Bruno Latour's account of how scientific facts are constructed through chains of inscription, and Geoffrey Bowker and Susan Leigh Star's work on classification as an inherently political act, both establish that what counts as a "fact" is the product of situated work, not a transparent window onto reality. Sally Engle Merry's critique of quantification extends this insight directly into governance: indicators and metrics do not simply describe the world, they constitute it, often displacing local knowledge with externally legible numbers. This thesis treats health intelligence in Borno State as exactly this kind of constituted fact, produced through the practical, often improvised work of frontline reporters, NGO data clerks, and state epidemiologists operating under conditions where the chain of inscription runs through multiple, non-aligned institutions rather than a single hierarchy.

The second body of work, medical and political anthropology of fragile health systems, supplies the empirical register for studying this fragmentation ethnographically rather than merely diagrammatically. Alice Street's foundational account of Papua New Guinean hospitals as sites where bureaucratic visibility, state legitimacy, and biomedical infrastructure are co-

produced under conditions of donor dependence and weak state capacity offers a direct methodological and conceptual precedent for this project. Where Street examined how hospital infrastructure made — and unmade — the state visible to patients and staff, this thesis asks an analogous question of surveillance infrastructure: how the apparatus of disease reporting makes particular versions of the state, the humanitarian sector, and the community visible or invisible to one another during epidemic events. This ethnographic register is complemented by the health systems resilience literature, particularly recent work tracing how conflict and humanitarian response interact to reshape state health system capacity in real time; this thesis treats resilience not as a property a system either has or lacks, but as an ongoing, contested accomplishment of the same fragmented actors whose data practices are the object of study.

The third strand, global health governance scholarship on humanitarian–state relations, drawing on work concerning humanitarian reason and the broader literature on real governance in African states, supplies the macro-institutional account of why these overlapping systems exist in the first place: donor accountability requirements, humanitarian operational independence, and state sovereignty claims each generate separate reporting infrastructures that are rarely designed to interoperate. Recent ethnographic work directly within Borno State’s IDP camps demonstrates how biometric registration and algorithmic aid-targeting systems function as what Abah (2025) terms “algorithmic borders” — non-territorial mechanisms that determine who is recognised as eligible for assistance and whose data is treated as valid, often producing exclusion through technical failure as much as through deliberate policy. This thesis extends that finding from humanitarian aid-targeting specifically to disease surveillance, asking whether comparable dynamics of algorithmic recognition and exclusion shape how epidemiological data, rather than aid eligibility, is validated and acted upon.

This thesis’s anticipated contribution is a middle-range framework — provisionally termed an infrastructural governance account of health intelligence — that explains how credibility and decision authority are practically assembled across fragmented systems, rather than assuming such

credibility must derive from a single formal hierarchy. This extends, rather than simply applies, the AI-UP Framework developed in the applicant's MHA dissertation, which mapped macro-, meso-, and micro-level barriers to AI integration in tertiary hospitals, by shifting the analytic object from institutional barriers to the situated practices through which institutional authority over data is constructed and contested in real time.

4. Methodology

The study adopts a mixed-methods design informed by institutional ethnography and STS, structured in three components.

4.1 Infrastructural mapping.

The first phase maps the formal and informal surveillance infrastructures operating in Borno State: government health information systems, humanitarian early warning platforms, NGO programme monitoring databases, and community- and CBO-linked reporting tied to immunisation campaigns and outbreak response. This mapping draws on document analysis of reporting protocols and data-sharing agreements, alongside key informant interviews with system administrators, to establish how each infrastructure defines its own data categories, update frequency, and validation procedures.

4.2 Qualitative interviews.

Semi-structured interviews (target $n=35-45$) will be conducted across the full landscape of surveillance and reporting actors in Borno State: state health officials and epidemiologists; humanitarian and NGO actors spanning multiple organisations, drawing on the applicant's existing relationships across the Borno NGO coordination ecosystem built during 2021-2024 fieldwork; traditional and community leaders, whose authority structures shape how community-based reporting is trusted, contested, or bypassed; medical doctors and nurses working within state and humanitarian-supported facilities; and internally displaced and post-displacement community members who are simultaneously surveillance subjects and, in many cases, informal data producers. Academic and policy informants — including faculty at the University of Maiduguri and Borno State University — will provide an

additional institutional-memory perspective on how surveillance governance has evolved since the height of the insurgency.

4.3 Process tracing of outbreak response events.

The third component reconstructs, through interviews, situation reports, and meeting records, two or three specific outbreak or epidemic response episodes to trace empirically how surveillance data from multiple sources was reconciled, contested, or selectively acted upon by decision-makers during the response. This component operationalises the thesis's central theoretical claim by showing concretely how credibility gets assembled — or fails to be assembled — at moments when decisions cannot be deferred. Where recent ethnographic work in Borno's IDP camps has traced how biometric failure produces exclusion from humanitarian aid, this component asks the parallel question for epidemiological data: what happens, procedurally and relationally, when a surveillance signal is rejected, contested, or fails to register as credible during an active outbreak response.

The applicant's native fluency in Kanuri and Hausa, lived position within the post-recovery context under study, sustained field relationships across government, humanitarian, traditional, and clinical actors in Borno State, and institutional ties to the University of Maiduguri and Borno State University together provide a breadth of access across the surveillance ecosystem that would be very difficult for an external researcher to replicate within a standard three-year doctoral fieldwork window.

5. Ethics and Positionality

This research will be conducted with particular sensitivity to the power dynamics inherent in studying surveillance and authority in a setting where the applicant is both researcher and, by virtue of personal history, a member of the community under study. Interviews with traditional rulers, displaced community members, and frontline workers will require careful attention to consent, the voluntariness of participation, and the avoidance of any perception that participation in research is linked to humanitarian assistance or state services. Ethical approval will be sought through the host institution's research ethics process in advance of fieldwork, alongside any

necessary in-country ethical and institutional clearances. The applicant’s positionality — as a researcher trained in both biomedical and social-scientific methods, and as someone who has lived through displacement in the area under study — will be treated throughout as an analytic resource to be reflected upon, not a bias to be neutralised.

6. Significance and Contribution

This research speaks directly to current debates in global health policy about the conditions under which digital health investments succeed or fail in fragile states, an issue of immediate relevance to donor-funded digital health investments across the Sahel and Lake Chad Basin region. By reframing fragmentation as a governance condition to be understood rather than an engineering problem to be solved, the thesis offers policymakers and humanitarian coordination bodies an empirically grounded account of where interoperability efforts are likely to encounter genuine institutional resistance, as opposed to merely technical obstacles. For the discipline, it extends STS and anthropological approaches to infrastructure and data into an empirical setting — conflict-affected Nigeria and the wider Lake Chad Basin — that remains significantly underrepresented in this literature relative to East and Southern African or South Asian cases.

7. Indicative Timeline

Year 1	Coursework; literature review consolidation; ethics approval; infrastructural mapping phase; pilot interviews.
Year 2	Primary fieldwork in Borno State — interviews and process-tracing data collection.
Year 3	Data analysis; write-up; dissemination of interim findings.

8. Indicative Bibliography

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