

Randomised Field Trial of a Diagnostic Framework for District Hospital System Reliability in Senegal

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ABSTRACT

Background: District hospitals in sub-Saharan Africa face persistent challenges in system reliability, affecting service delivery and patient outcomes. Existing assessment tools are often fragmented or lack a holistic operational focus, limiting their utility for guiding targeted interventions.

Purpose and objectives: This study aimed to evaluate a novel diagnostic framework for assessing and improving hospital system reliability through a randomised field trial. The primary objective was to determine the framework's effect on a composite reliability score.

Keywords: *Randomised controlled trial, Health systems research, Sub-Saharan Africa, District hospitals, System reliability, Diagnostic framework, Senegal*

Article Highlights

- Cluster-randomised trial in 24 Senegalese district hospitals shows measurable system improvement.
- Structured checklists and root-cause analysis across five operational domains.
- Most substantial gains observed in medical supply logistics and maintenance systems.
- Framework provides actionable guidance for targeted health system interventions.

Methodological Note

Linear mixed-effects model with cluster random effects was used to estimate the adjusted mean difference in composite reliability scores (0-100 scale) after 12 months.

This trial demonstrates a practical tool for strengthening core hospital operations in resource-constrained settings.

ABSTRACT-ONLY PUBLICATION

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