

# A Quasi-Experimental Longitudinal Evaluation of District Hospital System Optimisation and Yield in Kenya, 2000–2026

Kipchumba Bett<sup>1,2</sup>|Amina Hassan<sup>3</sup>|Kamau Ochieng<sup>4</sup>  
Wanjiku Mwangi<sup>4,5</sup>

*Department of Epidemiology, African Population and Health Research Center (APHRC)* • *Department of Internal Medicine, Egerton University* • *Department of Epidemiology, Kenya Medical Research Institute (KEMRI)* • *Egerton University* • *Kenya Medical Research Institute (KEMRI)*

Correspondence: [kbett@hotmail.com](mailto:kbett@hotmail.com)

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## ABSTRACT

**Background:** District hospitals are critical nodes in sub-Saharan African health systems, yet systematic longitudinal evidence on the impact of operational optimisation on their yield—defined as the composite measure of clinical output per unit resource input—remains scarce. Prior evaluations have often been cross-sectional or lacked robust counterfactuals.

**Purpose and objectives:** This study aimed to quantify the causal effect of a multi-component system optimisation intervention on hospital yield over time, using a quasi-experimental design to isolate the intervention's impact from secular trends.

**Keywords:** *Health systems research, Sub-Saharan Africa, Quasi-experimental design, Operational optimisation, Longitudinal evaluation, District hospitals, Kenya*

### Article Highlights

- Longitudinal analysis reveals causal effect of multi-component optimization on hospital yield.
- Supply chain digitization, task-shifting, and modular upgrades showed positive trajectory.
- Mid-level management engagement emerged as critical mediator of implementation success.
- Quasi-experimental design provides robust evidence for complex health system interventions.

### Methodological Note

Controlled interrupted time-series analysis of 42 hospitals over 26 years, using cluster-robust inference to isolate intervention effects from secular trends.

*This study offers causal evidence for integrated health system optimization in resource-constrained settings.*

## ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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