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Methodological Evaluation and Panel-Data Estimation of Risk Reduction in Nigerian District Hospital Systems

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ABSTRACT

Background: District hospital systems in Nigeria face significant operational risks, including supply chain failures and workforce shortages, which compromise service delivery. Existing evaluations often lack rigorous longitudinal analysis to quantify the impact of systemic interventions on risk mitigation.

Purpose and objectives: This study aimed to methodologically evaluate a multi-component intervention in district hospital systems and to estimate its effect on reducing composite operational risk scores using panel-data econometrics.

Keywords: *Health systems research, Panel data analysis, Risk reduction, Sub-Saharan Africa, District hospitals, Implementation science, Nigeria*

Article Highlights

- Integrated logistics management and staff training reduced composite operational risk by 17.5%.
- Study applies a two-way fixed effects panel-data model to a quasi-experimental intervention.
- Methodology provides a robust framework for evaluating complex health system interventions.
- Findings support scaling the intervention package with contextual adaptation.

Methodological Contribution

This paper demonstrates a novel application of two-way fixed effects estimation to quantify the impact of a multi-component health system intervention on a composite risk metric.

This study offers a replicable analytical framework for health systems evaluation in low-resource 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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