

A Randomised Field Trial Protocol for Evaluating District Hospital Systems and Yield Optimisation in Kenya.

Wanjiku Mwangi¹

Department of Epidemiology, Egerton University

Correspondence: wmwangi@hotmail.com

Received: 27 February 2019 | Accepted: 24 May 2019 | Published: 24 June 2019 | DOI:

[10.5281/zenodo.18949474](https://doi.org/10.5281/zenodo.18949474)

ABSTRACT

District hospitals in sub-Saharan Africa face systemic inefficiencies that constrain service delivery and agricultural yield outcomes linked to community nutrition. Current evaluations often lack rigorous causal designs to isolate the effect of specific systemic interventions on measurable outputs. This protocol details a randomised field trial to evaluate the impact of a structured systems optimisation bundle on operational yield—defined as the composite of patient throughput and agricultural-nutritional programme efficiency—within the Kenyan district hospital context. We will conduct a cluster-randomised controlled trial across 24 facilities, stratified by region and baseline capacity. Intervention facilities will implement a co-designed bundle comprising logistics management, clinical pathway streamlining, and integrated agricultural extension linkage. The primary outcome is the yield improvement score (YIS). Analysis will use a mixed-effects model: $Y\{it\} = \beta_0 + \beta_1 T_i + \gamma X\{it\} + u_i + \varepsilon\{it\}$, where T_i is treatment assignment, with inference based on cluster-robust standard errors. As a protocol, no empirical results are presented. The anticipated primary analysis will test the hypothesis that the intervention increases the mean yield improvement score by a minimum of 15 percentage points relative to control facilities. This protocol provides a methodological framework for robustly quantifying how targeted systems engineering impacts multifactorial yield in resource-constrained hospital settings, with potential applicability across similar food system interfaces. Future research should adopt similar experimental designs to disaggregate the effects of individual system components. Policy mechanisms should integrate routine yield metrics into hospital performance assessments. health systems research, operational research, randomised controlled trial, health-agriculture linkage, service delivery, sub-Saharan Africa This protocol introduces a novel composite yield metric and a causal experimental design to evaluate hospital system interventions, directly generating evidence for optimising the health-agriculture nexus.

Keywords: *Randomised controlled trial, Health systems evaluation, Sub-Saharan Africa, Agricultural yield, Implementation science, District hospitals, Kenya*

Article Highlights

- Cluster-randomised trial across 24 Kenyan district hospitals.
- Evaluates a co-designed bundle of logistics, clinical, and agricultural interventions.
- Primary outcome is a novel composite Yield Improvement Score (YIS).
- Aims to causally isolate the effect of systemic optimisation on operational outputs.

Methodological Note

The analysis will employ a mixed-effects model with cluster-robust standard errors to test for a minimum 15-percentage-point improvement in the mean Yield Improvement Score.

This article details a study protocol; empirical results are forthcoming.

ABSTRACT-ONLY PUBLICATION

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

REQUEST FULL PAPER

 **Email:** info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

 **Submit at:** app.parj.africa



Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge