

# Evaluating Health Systems in Ghana

A Multilevel Regression Analysis of Yield Improvement in Community Health Centres

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## ABSTRACT

**Background:** Community health centres are pivotal for primary care delivery in sub-Saharan Africa, yet systematic evaluations of their operational systems for improving agricultural health outcomes are limited. Existing assessments often lack the methodological rigour to disentangle centre-level system effects from individual patient-level factors.

**Purpose and objectives:** This intervention study aimed to methodologically evaluate the impact of a structured health systems strengthening intervention on maize yield improvement—a key nutritional determinant—among farming households registered with community health centres. The primary objective was to quantify the intervention's effect while accounting for the hierarchical data structure.

**Keywords:** *Community Health Centres, Sub-Saharan Africa, Health Systems Evaluation, Multilevel Regression Analysis, Primary Healthcare, Ghana*

### Article Highlights

- Multilevel regression isolates system-level effects from individual factors.
- Intervention integrated agricultural health training and patient tracking.
- Findings link primary healthcare delivery to food production outcomes.
- Methodology accounts for hierarchical data structure across districts.

### Methodological Insight

The analysis used a three-level mixed-effects model to partition variance between household, health centre, and district levels, quantifying the specific contribution of centre systems.

*This study presents a novel interdisciplinary evaluation framework.*

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