

Methodological Evaluation and Multilevel Regression Analysis of Clinical Outcomes in Ethiopia's Rural Clinic Systems

Mekdes Tsegaye¹

Ethiopian Institute of Agricultural Research (EIAR)

Correspondence: mtsegaye@hotmail.com

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ABSTRACT

Background: Rural clinic systems in Ethiopia are critical for healthcare delivery, yet robust methodologies for evaluating their clinical performance are underdeveloped. Existing assessments often fail to account for the hierarchical structure of patient data nested within clinics and regions, potentially leading to biased inferences.

Purpose and objectives: This study aimed to methodologically evaluate the application of multilevel modelling for analysing clinical outcomes within these systems and to identify key facility-level factors influencing patient recovery rates.

Keywords: *Sub-Saharan Africa, health systems research, multilevel modelling, primary healthcare, clinical audit, rural health services, Ethiopia*

Article Highlights

- Multilevel modelling quantifies clinic-level variance in patient recovery rates.
- Drug availability score increase raises odds of recovery by 1.8 times.
- Methodology addresses hierarchical data structure to prevent biased inference.
- 22% of outcome variance attributable to clinic-level readiness.

Methodological Insight

The study employs a three-level random intercept logistic regression model to partition variance across patient, clinic, and regional levels, providing a statistically robust framework for health systems evaluation.

This analysis demonstrates how advanced statistical techniques can inform equitable health resource allocation.

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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