

A Multilevel Regression Analysis of Efficiency Gains in Ghanaian Community Health Centre Systems

A Methodological Evaluation

Kwame Asante^{1,2}. Ama Serwaa Mensah^{1,2}

Department of Surgery, Noguchi Memorial Institute for Medical Research | Department of Pediatrics, University of Cape Coast

Correspondence: kasante@hotmail.com

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ABSTRACT

Background: Community health centres are a cornerstone of primary healthcare delivery in many African nations, yet systematic, quantitative evaluations of their operational efficiency remain scarce. Existing assessments often fail to account for the hierarchical structure of health system data, potentially leading to biased inferences.

Purpose and objectives: This study provides a methodological evaluation of multilevel regression modelling for measuring efficiency gains within community health centre systems. Its objective is to demonstrate the application and interpretative value of this analytical approach for health systems research.

Keywords: *Community health centres, Ghana, Multilevel modelling, Operational efficiency, Primary healthcare, Sub-Saharan Africa*

Article Highlights

- 15% of variance in service output was attributable to district-level factors.
- Logistical readiness at the centre level significantly increased service output.
- Demonstrates a robust analytical framework for hierarchical health system data.

Methodological Insight

The three-level hierarchical linear model accounts for clustering at patient, centre, and district levels, providing more accurate inferences than pooled regression.

This study evaluates the application of multilevel modelling for health system efficiency analysis.

ABSTRACT-ONLY PUBLICATION

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