



# Methodological Evaluation of District Hospitals Systems in Ghana: Multilevel Regression Analysis for Efficiency Gains

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## Abstract

The performance of district hospitals in Ghana is a critical aspect of healthcare delivery, with significant implications for patient outcomes and resource allocation. A comprehensive meta-analysis approach was employed, synthesizing data from multiple studies on district hospitals in Ghana. Multilevel regression models were used to account for the hierarchical structure of the healthcare system and varying levels of patient care outcomes. The multilevel regression analysis revealed that investment in infrastructure had a significant positive effect on hospital efficiency ( $\beta = 0.82, p < 0.05$ ), with hospitals receiving higher investments seeing an average improvement of 10% in operational efficiency. This study underscores the importance of targeted investments in district hospital infrastructure for enhancing overall healthcare efficiency. Health policymakers should prioritise funding and resource allocation towards improving infrastructure at district hospitals to achieve better patient care outcomes. Treatment effect was estimated with  $\text{text}\{logit\}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Geographic, Sub-Saharan, Hierarchical, Multilevel, Regression, Evaluation, Efficiency*

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