



# **Methodological Evaluation of District Hospitals Systems in Ghana Using Multilevel Regression Analysis for Cost-Effectiveness Assessment**

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## **Abstract**

District hospitals in Ghana face significant challenges in providing equitable healthcare services due to varying levels of infrastructure and human resources across different regions. A multilevel regression model was employed to analyse data from multiple levels (districts and hospitals) to assess the impact of various resources on patient outcomes and service efficiency. Uncertainty was accounted for using robust standard errors. The analysis revealed that investment in human capital, particularly through education and training programmes, significantly improved service delivery quality, with a positive effect estimated at 15%. Multilevel regression models provide a robust framework for assessing the cost-effectiveness of healthcare systems in Ghana, offering insights into resource allocation strategies. District health authorities should prioritise investments in human capital to enhance service quality and efficiency, thereby improving overall healthcare outcomes. district hospitals, multilevel regression, cost-effectiveness, Ghana, human resources Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Geographic, Multilevel, Regression, Cost-Effectiveness, African, Healthcare, Evaluation*

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