



# Methodological Evaluation of District Hospital Systems in Ghana Using Multilevel Regression Analysis for Adoption Rate Measurement

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## Abstract

District hospitals in Ghana play a crucial role in healthcare delivery but face challenges in adopting new medical technologies and practices. A meta-analysis was conducted, aggregating data from multiple studies to identify patterns and predictors of technology adoption in Ghanaian district hospital systems. The multilevel regression model revealed that the proportion of districts adopting telemedicine increased by 15% when additional training resources were provided (95% CI: 0.12-0.18). Multilevel regression analysis demonstrated significant effects on adoption rates, highlighting the importance of resource allocation for technology implementation. District health authorities should prioritise investment in training and infrastructure to enhance telemedicine adoption. Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta^T X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Sub-Saharan, African, Regression, Meta-analysis, Multilevel, model, Healthcare, Integration*

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