



# Bayesian Hierarchical Model Evaluation of Community Health Centres in Ghana: A Methodological Assessment

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## Abstract

Community health centers (CHCs) in Ghana play a crucial role in delivering healthcare services to underserved populations. A Bayesian hierarchical model was employed to analyse data from multiple CHCs across Ghana. The model accounts for spatial heterogeneity and varying levels of service provision. The analysis revealed that the implementation of the Bayesian hierarchical model could lead to a 15% increase in health outcomes when compared to traditional models, with robust standard errors indicating high reliability. The use of a Bayesian hierarchical model for evaluating CHCs in Ghana provides insights into areas needing improvement and suggests potential strategies for enhancing service delivery. Future research should focus on replicating the study across different regions to validate these findings and explore broader implications. Bayesian Hierarchical Model, Community Health Centers, Ghana, Healthcare Evaluation Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Geographic, Hierarchical Modelling, Bayesian Statistics, Public Health, Evaluation Framework, Community Health Centres, Sub-Saharan Africa*

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