



# Bayesian Hierarchical Model Evaluation of Community Health Centre Systems in Ghana,

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## Abstract

Community health centers in Ghana have been established to improve access to healthcare services among underserved populations. A systematic literature review was conducted using Bayesian hierarchical models to analyse data from various sources. The models were designed to account for spatial and temporal variations in adoption rates within different regions of Ghana. Bayesian hierarchical models demonstrated significant variability in adoption rates across districts, with a median adoption rate of 52% (95% credible interval: 48-56%). The Bayesian approach provided nuanced insights into the factors influencing adoption rates and highlighted the need for targeted interventions to boost coverage. Public health policymakers should prioritise implementation strategies based on local context, leveraging spatially informed models to enhance service delivery effectiveness. Treatment effect was estimated with  $\text{text}\{logit\}(\pi) = \beta_0 + \beta^T X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Geographic, Bayesian, Hierarchical, Model, Adoption, Evaluation, Ghana*

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