Bayesian Hierarchical Model for Evaluating Efficiency Gains in Ghanaian Community Health Centres Systems

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Abstract

Efficiency gains in community health centers (CHCs) are crucial for improving healthcare delivery in Ghana's underserved regions. A Bayesian hierarchical model was applied to assess the performance of CHCs, considering both local and central health systems data. The analysis revealed significant improvements (25%) in service delivery times across CHCs, with clear variations between urban and rural settings. Bayesian hierarchical modelling offers a robust approach for measuring efficiency gains in Ghana's CHC system, highlighting the need for targeted interventions in underserved areas. Investment should focus on upgrading infrastructure and training staff to achieve sustained efficiency improvements. community health centers, Bayesian hierarchical model, efficiency gains, Ghanaian healthcare systems Treatment effect was estimated with $text\{logit\}(\pi) = beta\, 0 + \beta^{-}\, p\, X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Ghanaian, Bayesian, Hierarchical, Model, Evaluation, Efficiency*

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