



# Bayesian Hierarchical Model for Assessing Cost-Effectiveness of Community Health Centres in Tanzania 2009

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## Abstract

The effectiveness of community health centers in Tanzania has been a topic of interest for assessing their cost-effectiveness and impact on public health. A Bayesian hierarchical model was employed to analyse the financial and operational data collected from various community health centers across Tanzania. The model accounts for the variability in costs and outcomes at different levels of aggregation (e.g., individual patient visits versus centre-wide operations). The analysis revealed a significant proportion of cost savings attributed to telemedicine interventions implemented by some centers, reducing travel expenses for patients. The Bayesian hierarchical model provided robust estimates of cost-effectiveness ratios and credible intervals that support the financial sustainability of community health centre networks in Tanzania. Based on these findings, policy recommendations suggest integrating more digital healthcare tools to further enhance the efficiency and affordability of community health services. Treatment effect was estimated with  $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^{-1} p X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Tanzania, Bayesian hierarchical model, cost-effectiveness analysis, community health centers, epidemiology, methodology, public health, statistical methods*

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