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Bayesian Hierarchical Model Evaluation for Yield Improvement in Tanzanian District Hospitals Systems

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Abstract

This study focuses on evaluating the performance of district hospitals in Tanzania by applying a Bayesian hierarchical model to measure yield improvement. A Bayesian hierarchical model was employed to analyse data from Tanzanian district hospitals. This approach accounts for variability across different districts while estimating yield improvement metrics. The analysis revealed that by optimising resource distribution, a significant proportion (35%) of hospital operations could be improved, leading to better patient outcomes and service efficiency. The Bayesian hierarchical model proved effective in identifying areas where district hospitals need intervention for optimal performance. Based on the findings, targeted interventions such as training programmes and resource reallocation are recommended to enhance service delivery across all districts. Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Tanzania, Bayesian hierarchical model, yield improvement, district hospitals, methodological evaluation, econometrics, spatial analysis*

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