Bayesian Hierarchical Model for Evaluating Efficiency Gains in District Hospitals Systems in Kenya: A Methodological Study

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Abstract

Efficiency gains in district hospitals are crucial for improving healthcare outcomes in resource-limited settings such as Kenya. A Bayesian hierarchical model was employed to analyse data collected from district hospitals across Kenya. The model accounts for both within-hospital and hospital variability. The analysis revealed that incorporating patient volume into the efficiency calculation significantly improved the accuracy of efficiency estimates, with a proportional increase in efficiency gains ranging from 20% to 35%. This study demonstrates the effectiveness of Bayesian hierarchical modelling in enhancing the precision and applicability of efficiency assessments in district hospital systems. The findings suggest that incorporating patient volume into efficiency measures could lead to more targeted interventions aimed at improving healthcare delivery in Kenya. Bayesian Hierarchical Model, District Hospitals, Efficiency Gains, Healthcare Systems Treatment effect was estimated with $text\{logit\}(\pi)=beta\,0+\beta^{\cdot}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

ABSTRACT-ONLY PUBLICATION

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