



Methodological Evaluation of District Hospitals Systems in Rwanda Using Bayesian Hierarchical Models for Yield Improvement Assessment

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Abstract

The evaluation of district hospitals in Rwanda aims to enhance service delivery and patient outcomes through methodological improvements. A Bayesian hierarchical model was employed to analyse data from multiple districts, accounting for both variability within and across districts. The models were calibrated using historical patient records and resource allocation data. The analysis revealed a significant improvement in diagnostic yield (up to 20%) with the implementation of targeted interventions, indicating a positive impact on healthcare delivery. Bayesian hierarchical modelling provided a robust framework for evaluating district hospital systems, enabling tailored recommendations for system enhancement. District hospitals should prioritise resource allocation based on patient need and implement continuous quality improvement programmes to sustain yield improvements. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: District Hospitals, Rwanda, Bayesian Hierarchical Models, Methodology, Epidemiology, Evidence-Based Medicine, Quantitative Analysis

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