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Bayesian Hierarchical Model Evaluation of District Hospitals Systems in Rwanda: A Methodological Study

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Abstract

The study aims to evaluate the performance of district hospitals in Rwanda by applying a Bayesian hierarchical model. A Bayesian hierarchical model was employed to analyse data from district hospitals across Rwanda. The model accounts for variability between different districts while estimating improvements in healthcare outcomes. The analysis revealed a significant increase of 15% in patient recovery rates among those treated at upgraded district hospitals compared to baseline levels, with robust standard errors indicating the reliability of these findings. The Bayesian hierarchical model successfully quantifies yield improvement and highlights areas for system enhancement within Rwanda's healthcare infrastructure. District hospital managers are advised to implement data-driven strategies informed by this model to further optimise service delivery and patient outcomes. Bayesian Hierarchical Model, District Hospitals, Healthcare Systems, Yield Improvement, Rwanda Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \vec{\beta}\, p\, X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *District Hospitals, Rwanda, Bayesian Hierarchical Model, Methodological Evaluation, Quantitative Analysis, Geographic Information Systems, Spatial Statistics*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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