



Bayesian Hierarchical Model Assessment of Clinical Outcomes in Rwanda's District Hospitals System

Shingirai Karema^{1,2}, Hutu Habyarimana^{1,3}, Kabuga Mukakambira^{4,5}

¹ University of Rwanda

² African Leadership University (ALU), Kigali

³ Rwanda Environment Management Authority (REMA)

⁴ Department of Internal Medicine, University of Rwanda

⁵ Department of Public Health, African Leadership University (ALU), Kigali

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Correspondence: skarema@gmail.com

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Author notes

Shingirai Karema is affiliated with University of Rwanda and focuses on Medicine research in Africa.

Hutu Habyarimana is affiliated with Rwanda Environment Management Authority (REMA) and focuses on Medicine research in Africa.

Kabuga Mukakambira is affiliated with Department of Internal Medicine, University of Rwanda and focuses on Medicine research in Africa.

Abstract

Clinical outcomes in Rwanda's district hospitals have been assessed through various studies, but a comprehensive evaluation of these systems is lacking. A Bayesian hierarchical model will be employed to analyse data from multiple sources. This approach allows for the incorporation of both district-specific and overall system-level variability in clinical performance. The analysis reveals significant differences in infection rates between hospitals, with one district reporting a 25% lower incidence compared to others. Bayesian hierarchical modelling provides valuable insights into the effectiveness of Rwanda's district hospital systems, highlighting areas that require improvement. District health authorities should focus on implementing evidence-based interventions in high-incidence districts to improve overall patient outcomes. Treatment effect was estimated with $\text{text} \{ \text{logit} \} (\pi) = \beta_0 + \beta^T X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, Sub-Saharan, Hierarchical Models, Bayesian Methods, Quantile Regression, Spatial Analysis, Meta-Analysis*

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