



Methodological Evaluation of District Hospitals Systems in Rwanda Using Multilevel Regression Analysis for Clinical Outcomes Assessment

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Published: 24 July 2001 | **Received:** 04 March 2001 | **Accepted:** 28 May 2001

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DOI: [10.5281/zenodo.18727128](https://doi.org/10.5281/zenodo.18727128)

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Abstract

District hospitals in Rwanda play a crucial role in healthcare delivery, yet their efficiency varies significantly across different regions. Understanding these variations is essential for improving service quality and resource allocation. Data from a sample of 50 district hospitals will be analysed, incorporating patient-level data alongside administrative records for each facility. Multilevel regression models will be employed to account for the hierarchical structure of healthcare systems (individual patient within hospital). Initial findings suggest that hospital bed availability and regional economic indicators significantly influence clinical outcomes in Rwanda. This study aims to provide a robust framework for evaluating district hospital performance, offering insights into areas needing improvement. Based on the analysis, targeted interventions should focus on enhancing resource management and infrastructure development, particularly in economically disadvantaged regions. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Rwanda, District Hospitals, Multilevel Regression, Hierarchical Analysis, Clinical Outcomes, Public Health, Epidemiology

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