



Methodological Evaluation of District Hospitals Systems in Rwanda Using Multilevel Regression Analysis for Cost-Effectiveness Assessment

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Published: 01 November 2012 | **Received:** 05 September 2012 | **Accepted:** 08 October 2012

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DOI: [10.5281/zenodo.18947320](https://doi.org/10.5281/zenodo.18947320)

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Abstract

District hospitals in Rwanda play a crucial role in healthcare delivery, particularly for primary care services. However, their operational efficiency and cost-effectiveness are not well understood. The review employs a comprehensive search strategy across multiple databases and journals. Studies are critically appraised based on methodological rigor and applicability to Rwandan settings. Multilevel regression models are used to analyse the data from selected studies, accounting for hierarchical structures in healthcare systems. Multilevel regression analysis revealed significant variation in cost-effectiveness across different district hospitals, with some showing substantial savings compared to national averages. While multilevel regression proved effective in assessing cost-effectiveness, the heterogeneity of findings suggests further research is needed to identify common best practices and address methodological challenges. Future studies should consider standardised data collection methods and longitudinal designs to enhance comparability and robustness of results. Policy recommendations could focus on optimising resource allocation based on identified efficiencies. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, district hospitals, multilevel analysis, cost-effectiveness, regression, health economics, resource allocation*

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