



Cost-Effectiveness Analysis of District Hospital Systems in Rwanda: A Multilevel Regression Study

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Abstract

Rwanda's district hospital system is a critical component of its healthcare infrastructure, aiming to provide essential medical services across various geographical regions. A multilevel regression model was employed to analyse data from district hospitals, incorporating hierarchical structures (districts as higher-level units) to assess system performance metrics such as patient flow, service utilization rates, and cost per unit of output. The analysis revealed significant differences in resource allocation effectiveness across districts, with some showing a 15% improvement in patient throughput efficiency compared to baseline levels. This study underscores the importance of tailored interventions for enhancing district hospital performance within Rwanda's healthcare system. Policy-makers should consider implementing targeted support programmes and capacity-building initiatives in underperforming districts to improve service delivery and resource utilization. Rwanda, District Hospitals, Multilevel Regression Analysis, Cost-Effectiveness, Healthcare Systems Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, Multilevel, Regression, Cost-Effectiveness, Health Systems, Infrastructure, Sub-Saharan*

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