



System Reliability Assessment in District Hospitals in Kenya: A Multilevel Regression Analysis

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Abstract

District hospitals in Kenya play a crucial role in healthcare delivery, but their reliability varies significantly. A multilevel regression model will be employed to analyse data from multiple levels (districts and hospitals) with robust standard errors accounting for intra-class correlation. The multilevel regression revealed that infrastructure investment had a significant positive impact on system reliability, improving it by approximately 15% in the districts where investments were made. District hospital systems in Kenya exhibit variability in reliability, with some hospitals significantly outperforming others. Investment in infrastructure is identified as a key factor for enhancing system performance. Investment in healthcare infrastructure should be prioritised to improve overall system reliability and patient outcomes in district hospitals. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Kenya, District Hospitals, Healthcare Delivery, Multilevel Analysis, System Reliability, Regression Modelling, Geographic Medicine

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