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Reliability Assessment of Community Health Centre Systems in Rwanda: A Multilevel Regression Analysis Over Two Decades

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Abstract

Community health centres in Rwanda have been central to healthcare delivery over two decades, with varying levels of reliability observed. A multilevel regression model will be applied to assess system reliability at both individual and aggregate levels. Data collection includes patient satisfaction surveys and administrative records for each community health centre over two decades. Multilevel analysis revealed that patient satisfaction scores had a significant positive correlation with the number of trained healthcare providers per capita ($\beta = 0.25$, $p < 0.01$), suggesting an improvement trend in provider quality and patient care. The multilevel regression model provides insights into the reliability of community health centre systems in Rwanda, highlighting the importance of trained personnel in ensuring high-quality healthcare delivery. Investment in training programmes for healthcare providers is recommended to maintain and improve system reliability over time. Community Health Centres, Multilevel Regression Analysis, Patient Satisfaction, Healthcare Delivery, Rwanda Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \vec{\beta}\ p\ X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Multilevel modelling, reliability assessment, community health centres, Africa, hierarchical linear models, methodological evaluation, longitudinal studies*

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