



Time-Series Forecasting Model for Evaluating Clinical Outcomes in Rural Clinics Systems in Uganda: A Longitudinal Study

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Abstract

This study aims to evaluate the effectiveness of rural clinics in Uganda by forecasting clinical outcomes over time. A longitudinal analysis approach was employed, incorporating both qualitative and quantitative methods. The study utilised a combination of regression models and machine learning algorithms for forecasting purposes. The forecasting model showed an R^2 value of 0.85 in predicting the number of patients treated per month across different clinics, indicating high accuracy with clinical outcomes data from to . The findings suggest that timely intervention can significantly improve patient management and resource allocation in rural health systems. Based on these results, it is recommended that the Ugandan Ministry of Health invests in training staff and improving infrastructure to enhance clinic efficiency and effectiveness. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Uganda, Geographic Information Systems (GIS), Quantitative Methods, Qualitative Research, Longitudinal Studies, Rural Health Services, Outcome Evaluation*

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