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Time-Series Forecasting Model Evaluation of Community Health Centre Systems in Rwanda

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Abstract

This report evaluates the effectiveness of community health centre (CHC) systems in Rwanda's public healthcare sector through a time-series forecasting model. A time-series forecasting model was employed using ARIMA (AutoRegressive Integrated Moving Average) methodology to predict future healthcare needs based on historical data from to . Confidence intervals were used to quantify the uncertainty around these predictions. The analysis revealed consistent monthly fluctuations in patient visits, with a significant upward trend identified over the study period ($p<0.05$). The time-series forecasting model demonstrated potential for predicting CHC performance and resource requirements more accurately than previous static assessments. Further research should explore the impact of these predictions on policy-making and service delivery improvements in Rwanda's healthcare system. Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Rwanda, Geographic Information Systems (GIS), Spatial Analysis, Regression Analysis, Time-Series Analysis, Epidemiology, Public Health Systems*

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