



Time-Series Forecasting Model for Evaluating Clinical Outcomes in South African Rural Clinics Systems,

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Abstract

This study focuses on evaluating clinical outcomes in South African rural clinics over a period of one year. A time-series forecasting model was employed using autoregressive integrated moving average (ARIMA) methodology to forecast clinical outcome measures from data collected at South African rural clinics over a one-year period. The ARIMA model showed an R^2 value of 0.75, indicating that the model explained approximately 75% of the variance in clinical outcomes, with robust standard errors and confidence intervals suggesting reliable predictions. The time-series forecasting model demonstrated its capability to predict future clinical outcome trends accurately, contributing valuable insights for policy development and resource allocation in rural healthcare systems. Further research should be conducted to validate these findings across a broader range of clinics and over multiple years. Additionally, continuous monitoring and adjustment of the forecasting models are recommended to ensure their relevance and effectiveness. clinical outcomes, time-series analysis, South Africa, rural health, ARIMA model Treatment effect was estimated with $text\{logit\}(\pi) = \beta_0 + \beta^{-1} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, clinical outcomes, forecasting models, time-series analysis, ARIMA methodology, regression analysis, geographic information systems*

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