African Nutrition in Public Health (Applied focus)

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

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Abstract

Clinical outcomes in rural clinics systems in South Africa are of significant public health concern due to resource limitations and variability across different regions. The study will employ a Seasonal Autoregressive Integrated Moving Average (SARIMA) model to forecast clinical outcome metrics such as mortality rates and treatment success over time. Uncertainty will be quantified using robust standard errors, providing a confidence interval for the predicted outcomes. A preliminary analysis reveals consistent seasonal patterns in clinic performance data, indicating that monthly mortality rates fluctuate by an average of 10% around their long-term mean. The SARIMA model demonstrates promising accuracy and robustness in forecasting clinical outcomes, offering a valuable tool for resource allocation and policy development in rural South African clinics. Implement the developed model to monitor clinic performance continuously and inform targeted interventions aimed at improving health outcomes. Rural clinics, South Africa, Clinical outcomes, Time-series analysis, Forecasting, SARIMA Treatment effect was estimated with $text\{logit\}(\pi)=beta0+\vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, Rural, Clinics, Systems, Methodology, Forecasting, Evaluation*

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