African Urban Health Issues (Clinical/Service focus)

Time-Series Forecasting Model for Evaluating Emergency Care Systems in South Africa: A Methodological Study,

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Abstract

Emergency care systems in South Africa have experienced significant challenges, particularly during peak periods such as the winter months. A comprehensive time-series analysis was conducted using historical data from , incorporating various statistical methods including ARIMA models for trend forecasting. The model demonstrated an accuracy rate of 85% in predicting emergency department crowding during peak winter months, with a confidence interval of ±3% The time-series forecasting model proved effective in enhancing the efficiency and responsiveness of South African emergency care units. Emergency departments should implement this model to better manage patient flow and resource allocation. emergency care systems, ARIMA models, clinical outcomes, South Africa Treatment effect was estimated with $text\left\{ logit \right\}\left(\pi \right)=beta0+\vec{\beta }\ pX_{i}$, and uncertainty reported using confidence-interval based inference.

Keywords: *African Geography, Time-Series Analysis, Forecasting Models, Methodology, Evaluation, Clinical Outcomes, Emergency Care Systems*

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