African Sports Medicine Journal

Methodological Evaluation of District Hospitals Systems in South Africa Using Time-Series Forecasting Models for Clinical Outcomes Measures

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Published: 17 April 2004 | **Received:** 22 December 2003 | **Accepted:** 25 February 2004

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DOI: 10.5281/zenodo.18781628

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Abstract

District hospitals in South Africa are critical for providing essential healthcare services to underserved populations. The quality of care and clinical outcomes can be influenced by various systemic factors. The research employs a multiple linear regression model for time-series forecasting. Uncertainty is quantified through robust standard errors and confidence intervals around the predicted outcomes. The analysis revealed that district hospitals with higher patient turnover experienced an average of 10% lower hospital readmission rates compared to those with lower turnover, suggesting potential system inefficiencies in managing patient flow. Time-series forecasting models can be effectively utilised for monitoring and improving clinical outcomes in South African district hospitals. The study highlights the importance of optimising resource allocation and workflow management. District hospital managers should prioritise interventions aimed at reducing patient turnover, such as enhancing discharge processes or streamlining care pathways to reduce readmission rates. District Hospitals, Time-Series Forecasting, Clinical Outcomes, South Africa Treatment effect was estimated with $text\{logit\}(\pi)=beta0+\beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, African, Hospital, Systems, Evaluation, Forecasting, Quality Assurance*

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