Forecasting Clinical Outcomes in District Hospitals Systems: A Time-Series Analysis in Kenya's Healthcare Sector

Kinyanjui Ndege[1], **Ochieng Wamunyimi**[1,2], **Ngugi Kihoro**[1,3]

[1] Jomo Kenyatta University of Agriculture and Technology (JKUAT)

[2] Egerton University

[3] Department of Surgery, Egerton University

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Correspondence: kndege@aol.com

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Author notes

Kinyanjui Ndege is affiliated with Jomo Kenyatta University of Agriculture and Technology (JKUAT) and focuses on Medicine research in Africa.

Ochieng Wamunyimi is affiliated with Jomo Kenyatta University of Agriculture and Technology (JKUAT) and focuses on Medicine research in Africa.

Ngugi Kihoro is affiliated with Jomo Kenyatta University of Agriculture and Technology (JKUAT) and focuses on Medicine research in Africa.

Abstract

Clinical outcomes in Kenya's district hospitals are influenced by various factors including resource availability, staffing levels, and patient demographics. A time-series forecasting model was employed to analyse historical data from Kenya's district hospitals. The model included autoregressive integrated moving average (ARIMA) components for predicting clinical outcomes over the next five years. The ARIMA model forecasted a stable trend in hospital performance with slight upward adjustments, indicating potential improvements in service delivery if resources are appropriately allocated. The findings suggest that resource management and capacity building interventions can improve clinical outcomes in district hospitals. The ARIMA model provides a robust framework for future forecasting of healthcare system performance. District hospital managers should prioritise training programmes and investment in infrastructure to enhance clinical service delivery, aligning with the forecasted trends from the ARIMA model. Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, district hospitals, forecasting models, time-series analysis, resource allocation, patient demographics, clinical outcomes assessment*

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