



Time-Series Forecasting Model for Measuring Adoption Rates in South African District Hospitals: A Methodological Evaluation Approach

Motswana Tshabalala^{1,2}, Khathi Phala³, Sipho Motshega¹, Nkosihle Qunu²

¹ Department of Public Health, National Institute for Communicable Diseases (NICD)

² Council for Scientific and Industrial Research (CSIR)

³ Department of Surgery, Cape Peninsula University of Technology (CPUT)

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Correspondence: mtshabalala@aol.com

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Author notes

Motswana Tshabalala is affiliated with Department of Public Health, National Institute for Communicable Diseases (NICD) and focuses on Medicine research in Africa.

Khathi Phala is affiliated with Department of Surgery, Cape Peninsula University of Technology (CPUT) and focuses on Medicine research in Africa.

Sipho Motshega is affiliated with Department of Public Health, National Institute for Communicable Diseases (NICD) and focuses on Medicine research in Africa.

Nkosihle Qunu is affiliated with Council for Scientific and Industrial Research (CSIR) and focuses on Medicine research in Africa.

Abstract

District hospitals in South Africa play a crucial role in healthcare delivery across various regions. However, there is limited data on adoption rates and forecasting models to measure their effectiveness over time. A time-series forecasting model, specifically an ARIMA (Autoregressive Integrated Moving Average) model, was employed to analyse adoption rate data from South African district hospitals over the past decade. Robust standard errors were used for uncertainty assessment. The ARIMA model revealed a consistent upward trend in adoption rates with a coefficient of determination ($R^2 = 0.85$), indicating that the model explained approximately 85% of the variation in adoption data. This study provided evidence for the effectiveness of the ARIMA model in forecasting adoption rates, which can inform policy makers and healthcare administrators on resource allocation strategies. The findings suggest that continuous monitoring and periodic updates to the time-series forecasting models are essential for maintaining accuracy and relevance. Future research could explore other factors influencing adoption rates beyond historical data.

Keywords: African, District Hospitals, Methodology, Forecasting, Time-Series, Evaluation, Adoption Rates

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