



# Time-Series Forecasting Model for Measuring Adoption Rates in District Hospitals Systems: A Methodological Evaluation of South African Context,

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## Abstract

The adoption rates of new healthcare technologies in South African district hospitals are critical for improving patient outcomes and resource management. The study employed a time-series analysis using an ARIMA (AutoRegressive Integrated Moving Average) model. Data were collected through surveys and official records. Adoption rates of electronic health record systems showed a consistent upward trend, increasing by approximately 15% over the two-year period. The ARIMA model provided reliable forecasts for adoption trends in district hospitals, indicating potential improvements with sustained intervention strategies. Further research should explore longer-term projections and incorporate additional variables such as financial incentives to enhance technology uptake. ARIMA model, time-series forecasting, healthcare technology, South Africa, district hospitals Treatment effect was estimated with  $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** African healthcare systems, Geographic Information Systems (GIS), Methodological evaluation, Time-series analysis, District hospitals, Forecasting models, Resource management

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