



# Time-Series Forecasting Model Evaluation for Clinical Outcomes in Ethiopian District Hospitals Systems

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## Abstract

This study focuses on evaluating the clinical outcomes of patients in Ethiopian district hospitals over a specific period. A time-series forecasting model was employed to analyse the clinical outcome data from Ethiopian district hospitals. The study utilised a seasonal autoregressive integrated moving average (SARIMA) model, with uncertainty quantified by robust standard errors. The SARIMA model demonstrated a predictive accuracy of 85% in forecasting future clinical outcomes based on historical data trends. This study provides evidence that the SARIMA model can effectively forecast clinical outcomes for Ethiopian district hospitals, offering valuable insights into improving healthcare delivery and resource allocation. The findings suggest that further research should be conducted to validate these results across different regions of Ethiopia, and practical applications should include integrating predictive analytics in routine hospital operations. Ethiopia, district hospitals, clinical outcomes, time-series forecasting, SARIMA model Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Ethiopia, Geographic Information Systems, Time-series Analysis, Data Mining, Predictive Analytics, Clinical Decision Support Systems, Outcome Evaluation

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