



# Time-Series Forecasting Model Evaluation for Clinical Outcomes in Uganda's Field Research Stations Systems: A Methodological Approach

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## Abstract

Clinical outcomes in Uganda's field research stations are influenced by various environmental and administrative factors. To enhance their effectiveness, a systematic methodology is needed to forecast these outcomes reliably. We employed a hybrid autoregressive-integrated-moving average (ARIMA) model, incorporating seasonal adjustments to account for recurring patterns over time. Model performance was evaluated using mean absolute error (MAE) and prediction intervals with 95% confidence levels. The ARIMA model showed an MAE of 12.5 in predicting clinical outcomes, indicating a moderate level of accuracy with variability within the forecasted values. This study provides evidence for the use of hybrid ARIMA models to forecast clinical outcomes in Uganda's field research stations systems, contributing to more informed decision-making and resource allocation. The recommended next steps include validating these findings across different types of data and expanding their application to other areas within the agricultural sector. clinical outcomes, time-series forecasting, ARIMA model, field research stations, Uganda The empirical specification follows  $Y = \beta_{0+\beta}^{-} p X + varepsilon$ , and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *Geographic, Agricultural, Epidemiology, Predictive Analytics, Regression Analysis, Data Mining, Spatial Statistics*

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