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Time-Series Forecasting Model for Clinical Outcomes in South African Field Research Stations: A Methodological Evaluation

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Abstract

Clinical outcomes data from South African field research stations have been collected over several years but lack a consistent method for forecasting these outcomes. A time-series analysis model was developed to forecast future clinical outcome trends based on past data from South African field research stations. Robust standard errors were used to assess the uncertainty in these forecasts. The model demonstrated a moderate predictive accuracy, forecasting outcomes with an average error of ±10% over a five-year period. The time-series forecasting model provided reliable estimates for clinical outcomes but acknowledged significant variability and limitations due to data heterogeneity. Further research should focus on enhancing the model's robustness through larger datasets and more comprehensive methodological validation. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African savanna, spatio-temporal analysis, longitudinal data, predictive modelling, ecological forecasting, biostatistics, geographic information systems*

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