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Forecasting Risk Reduction in Senegalese District Hospitals Using Time-Series Models: A Methodological Assessment

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Abstract

This study focuses on evaluating the effectiveness of time-series forecasting models in predicting healthcare resource utilization at district hospitals in Senegal. A comprehensive analysis was conducted, employing ARIMA (AutoRegressive Integrated Moving Average) models to analyse time-series data from district hospital records. Robust standard errors were used in the model estimation process. The forecasts indicate an expected reduction of 15% in healthcare resource utilization over the next five years, with a confidence interval of ±3% ARIMA models have demonstrated their efficacy in forecasting risk reduction strategies for Senegalese district hospitals, contributing to improved healthcare resource management. Further research should explore the scalability and generalizability of these findings across other regions with similar healthcare systems. Healthcare Forecasting, Time-Series Analysis, ARIMA Models, District Hospitals, Risk Reduction Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, forecasting, econometrics, intervention studies, healthcare systems, time-series, regression analysis*

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