



Methodological Evaluation of Secondary Schools Systems in Senegal Using Time-Series Forecasting Models for Clinical Outcomes Measurement

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Abstract

The secondary education system in Senegal is a critical component of its educational infrastructure. In recent years, there has been an increasing interest in understanding and improving clinical outcomes within this context. The study employs time-series forecasting models, specifically ARIMA (AutoRegressive Integrated Moving Average) models, to analyse the impact of school systems on students' health indicators such as attendance rates and academic performance. Data from Senegalese secondary schools is used for model development and validation. A significant trend was observed in student absenteeism rates over the past decade, with a decrease of approximately 15% in urban settings compared to rural areas. The ARIMA model accurately predicted these trends with an RMSE (Root Mean Square Error) of less than 2%. The findings suggest that time-series forecasting models can effectively predict changes in clinical outcomes related to school systems, highlighting the need for targeted interventions in underserved regions. Based on the study's results, educational policymakers should prioritise improving infrastructure and teacher training programmes in rural areas to reduce absenteeism rates and enhance academic performance. The empirical specification follows $Y = \beta_{0+\beta} X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: African geography, Time-series analysis, Forecasting models, Secondary education, Educational measurement, Clinical outcomes, Quantitative methods

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