African Perioperative Nursing

Time-Series Forecasting Model for Evaluating Efficiency in Senegalese Community Health Centers

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Abstract

The Senegalese healthcare system faces challenges in maintaining efficiency within community health centers (CHCs). These facilities are pivotal for delivering primary care services but often struggle with resource allocation and performance measurement. We employed a Box-Jenkins ARIMA (AutoRegressive Integrated Moving Average) model for forecasting service utilization rates at CHCs. Robust standard errors were used to account for the uncertainty in our predictions. The forecast revealed an upward trend in patient consultations over time, suggesting potential improvements with strategic resource management and training programmes. Our findings indicate that timely interventions could enhance service delivery efficiency at CHCs, contributing to better health outcomes in Senegal's underserved regions. Policy makers should prioritise investment in human resources development and infrastructure upgrades for CHCs to support sustainable service expansion and improvement. Senegal, Community Health Centers, Efficiency, Time-Series Forecasting, ARIMA Model 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, econometrics, forecasting, regression, time-series, intervention, performance*

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