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Forecasting Adoption Rates in Nigerian District Hospitals Using Time-Series Models: A Longitudinal Study

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Abstract

Adoption rates of new medical technologies in Nigerian district hospitals have been slow, necessitating a better understanding of factors influencing their uptake. A longitudinal study employing ARIMA (AutoRegressive Integrated Moving Average) model to analyse monthly data from - across 50 randomly selected hospitals. Data includes patient demographics and hospital resources. The forecasted adoption rate for a new ultrasound machine is projected at an increase of 48% over the next two years, with significant variations observed among different regions. ARIMA models effectively predict adoption rates in district hospitals; however, resource allocation and public health policies remain critical for successful implementation. District hospital managers should prioritise resources towards new technology training and infrastructure improvements to enhance adoption rates of diagnostic tools. Treatment effect was estimated with $text\{logit\}(\pi)=beta0+\vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, longitudinal study, time-series analysis, ARIMA models, diffusion of innovations, predictive analytics, healthcare systems assessment*

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