



Forecasting Adoption Rates in Uganda's District Hospitals Using Time-Series Models: A Methodological Evaluation

Chewulime Omoding¹

¹ Uganda National Council for Science and Technology (UNCST)

Published: 08 July 2008 | Received: 28 February 2008 | Accepted: 08 June 2008

Correspondence: comoding@aol.com

DOI: [10.5281/zenodo.18869559](https://doi.org/10.5281/zenodo.18869559)

Author notes

Chewulime Omoding is affiliated with Uganda National Council for Science and Technology (UNCST) and focuses on Medicine research in Africa.

Abstract

Uganda's district hospitals face challenges in adopting new medical technologies, affecting patient care and operational efficiency. A systematic literature review was conducted to identify suitable time-series models. The study used historical data from five randomly selected district hospitals over two years. The Holt-Winters Exponential Smoothing model predicted an average adoption rate increase of 15% in the next year, with uncertainty bounds indicating a 95% confidence interval of $\pm 3\%$. Time-series models can effectively forecast adoption rates for new medical technologies in Ugandan district hospitals. Implementing these forecasting tools could inform policy-makers and hospital administrators on resource allocation and training needs. Holt-Winters Exponential Smoothing, time series analysis, medical technology adoption, Ugandan district hospitals Treatment effect was estimated with $\text{text}\{logit\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Sub-Saharan, district hospitals, forecasting, time-series, econometric modelling, healthcare systems, adoption rates

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