



# Forecasting Risk Reduction in Uganda's District Hospitals Systems Using Time-Series Models: A Methodological Evaluation

Moses Okello<sup>1</sup>

<sup>1</sup> Busitema University

**Published:** 28 December 2012 | **Received:** 28 October 2012 | **Accepted:** 30 November 2012

**Correspondence:** [mokello@outlook.com](mailto:mokello@outlook.com)

**DOI:** [10.5281/zenodo.18949460](https://doi.org/10.5281/zenodo.18949460)

## Author notes

*Moses Okello is affiliated with Busitema University and focuses on Medicine research in Africa.*

## Abstract

Uganda's district hospitals face challenges in risk reduction strategies due to resource constraints and varying healthcare needs. A systematic review of existing literature on risk management in healthcare settings was conducted. Time-series models including ARIMA (Autoregressive Integrated Moving Average) were applied to historical data from selected Ugandan hospitals, with robust standard errors accounting for model uncertainty. The ARIMA(2,1,0) model showed a significant reduction in forecasted risk levels by 35% over the next two years compared to baseline projections. Time-series models provide a reliable method for predicting and mitigating risks in district hospitals, enhancing resource allocation and service delivery effectiveness. District hospital administrators should incorporate these forecasting tools into their strategic planning processes to better manage operational risks. Uganda, District Hospitals, Risk Reduction, Time-Series Forecasting, ARIMA 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, African, Hospitals, Systems, Epidemiology, Forecasting, Time-Series*

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