



Methodological Evaluation of District Hospitals in Tanzania: A Time-Series Forecasting Approach to Assess System Reliability

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Abstract

The healthcare systems in district hospitals of Tanzania are under significant strain due to resource limitations and varying levels of infrastructure development. A comprehensive review of existing literature combined with an empirical study using advanced statistical techniques such as ARIMA (AutoRegressive Integrated Moving Average) model to forecast future trends and improve system reliability. The analysis revealed a moderate positive correlation between the number of health workers and patient outcomes, indicating that adequate staffing is crucial for improved service delivery. This study underscores the importance of timely resource allocation and maintenance in enhancing healthcare services within district hospitals in Tanzania. Implementing regular training programmes for staff and investing in technology upgrades are recommended to mitigate current system inefficiencies. Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, African, Socioeconomic, Healthcare, Epidemiology, Modelling, SystemsAnalysis, Geospatial*

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