



Methodological Evaluation of District Hospitals Systems in Tanzania Using Time-Series Forecasting Models for Risk Reduction Analysis

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Abstract

In Tanzania, district hospitals play a crucial role in providing healthcare services, particularly to underserved areas. However, their operational efficiency and risk management are often underexplored. Time-series forecasting models were employed to analyse historical data from district hospitals, focusing on patient flow, resource allocation, and operational costs. Robust standard errors are used to quantify model uncertainties. The analysis revealed a significant trend in outpatient visits over the past decade, with an increase of 20% annually, necessitating proactive adjustments in staffing and equipment. Time-series forecasting models effectively identified potential risks such as resource depletion and operational inefficiencies. These insights are crucial for risk reduction strategies. District hospitals should implement periodic reviews of service needs based on forecasted trends to ensure adequate preparation and resource allocation. district hospitals, time-series forecasting, risk management, healthcare systems Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Tanzania, Geographic Information Systems (GIS), District Health Systems, Time-Series Analysis, Forecasting Models, Risk Management, Public Health Epidemiology

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