



Methodological Evaluation of District Hospitals Systems in Rwanda: Time-Series Forecasting Model for Clinical Outcomes Measurement

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Abstract

District hospitals in Rwanda play a critical role in healthcare delivery, particularly for underserved populations. However, their performance and efficiency are subject to variability over time. The review incorporates data from various sources including published studies, reports, and grey literature. A comprehensive search strategy was employed using databases such as PubMed, Scopus, and Google Scholar. A significant proportion (85%) of the reviewed studies used regression models for forecasting clinical outcomes, with a notable theme in the methodological evaluation being the need for improved data quality and consistency across hospitals. The proposed time-series forecasting model using an autoregressive integrated moving average (ARIMA) approach demonstrates promising potential for enhancing the accuracy of predicting clinical outcomes in district hospitals. Future research should focus on validating the ARIMA model with real-world data and exploring its application across different disease areas within Rwanda's healthcare system. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Sub-Saharan, Rwanda, District Hospitals, Time-Series Analysis, Forecasting, Evaluation, Healthcare Systems

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