Methodological Evaluation of District Hospitals Systems in Ghana Using Time-Series Forecasting Models for Reliability Measurement

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Abstract

Ghana's healthcare system faces challenges in managing district hospitals' operations efficiently. Time-series forecasting models were applied to historical data from Ghanaian district hospitals. The Box-Jenkins ARIMA model was used, with uncertainty quantified through robust standard errors. The forecast accuracy suggests a potential need for resource reallocation in certain wards within the system (e.g., a 15% variance between actual and predicted patient admissions). Time-series forecasting models can be effective tools for assessing district hospital system reliability, with specific insights into ward-level performance. Investigate targeted interventions where forecasted discrepancies are significant to improve system efficiency. forecasting, time series, ARIMA, healthcare systems, Ghana Treatment effect was estimated with $text\{logit\}(\pi)=beta\,0+\beta^{\urcorner}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *District Hospitals, Ghana, Time-Series Analysis, Forecasting Models, Health Systems Research, Reliability Measurement, Geographic Information Systems*

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