African Creative Writing Research (Humanities)

Methodological Evaluation of District Hospitals Systems in South Africa Using Time-Series Forecasting Models for Adoption Rate Measurement

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Abstract

District hospitals in South Africa play a crucial role in healthcare delivery, but their adoption rates of new medical technologies and practices vary. The review methodology involves a comprehensive search strategy using databases such as PubMed and Web of Science. Studies are selected based on predefined inclusion criteria focusing on methodologies used to measure adoption rates and their validity and reliability within the context of district hospitals in South Africa. A key finding is the predominance of time-series forecasting models, particularly autoregressive integrated moving average (ARIMA) models, which showed a moderate success rate in accurately predicting hospital system adoption rates over different periods. The review concludes that while ARIMA models are effective for short-term predictions, their reliability diminishes with longer forecast horizons due to model complexity and data limitations. Future research should consider incorporating more robust statistical methods and longitudinal data to enhance the accuracy of adoption rate measurements in district hospitals. Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, healthcare systems, forecasting models, diffusion of innovations, systematic review, quantitative methods, geographic information systems*

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