Methodological Evaluation of District Hospitals Systems Using Time-Series Forecasting Models for Efficiency Gains in Nigeria

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Abstract

District hospitals in Nigeria face significant operational challenges, particularly in terms of resource allocation and service delivery efficiency. A mixed-method approach was employed, integrating quantitative data from time-series analysis with qualitative insights to assess model accuracy and practical utility. The time-series forecasting model demonstrated an average prediction error of ±5% over a period of three years, indicating moderate precision in system efficiency metrics. While the model showed promise for improving resource utilization and service delivery, further validation is required to ensure its reliability across different hospital environments. Future research should focus on validating these models in diverse settings and exploring potential cost savings from optimised resource allocation. district hospitals, time-series forecasting, efficiency gains, Nigeria Treatment effect was estimated with $\text{logit}(\pi) = beta\,0 + \vec{\beta}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African, District Hospitals, Efficiency, Forecasting, Time-Series, Intervention, Methodology*

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This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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