



# Time-Series Forecasting Model for Evaluating Efficiency Gains in Kenyan Community Health Centers Systems,

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### Abstract

This study focuses on evaluating the efficiency gains in Kenyan community health centers (CHCs), a crucial aspect of healthcare delivery in rural and underserved areas. A time-series forecasting model was employed using ARIMA (AutoRegressive Integrated Moving Average) methodology. The model's parameters were estimated with robust standard errors for uncertainty assessment. The forecast indicated an increasing trend in service utilization rates, suggesting potential improvements in patient access and health outcomes. The findings support the use of ARIMA models for forecasting CHC efficiency gains, providing insights that can inform policy and resource allocation decisions. Based on these results, it is recommended to implement targeted interventions aimed at enhancing service delivery and improving patient care in Kenyan CHCs. Treatment effect was estimated with  $\text{text}\{ \text{logit} \}(\pi) = \beta_0 + \beta^T X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Kenya, Community Health Centers, Time-Series Analysis, Efficiency Metrics, Forecasting Models, Epidemiology, Quantitative Methods

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