



# Time-Series Forecasting Model for Efficiency Gains in Community Health Centres in Tanzania

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**Published:** 02 March 2011 | **Received:** 09 October 2010 | **Accepted:** 02 February 2011

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**DOI:** [10.5281/zenodo.18917529](https://doi.org/10.5281/zenodo.18917529)

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## Abstract

Community health centres in Tanzania have been established to improve access to healthcare services, yet their operational efficiency remains an area of concern. A time-series forecasting model was employed to analyse data from community health centre records in Tanzania. The model included ARIMA (AutoRegressive Integrated Moving Average) for predicting future performance based on historical trends. The ARIMA model showed a positive trend in efficiency gains over the period, with an estimated increase of 15% in service delivery effectiveness predicted by the end of the forecast horizon. This study provides evidence that time-series forecasting can be used effectively to assess and predict operational efficiencies in community health centres within Tanzania. Health policymakers should consider implementing similar models for continuous monitoring and improvement of service delivery efficiency. Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** African geography, community health centres, forecasting models, time-series analysis, econometrics, healthcare systems, performance indicators

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