



# Time-Series Forecasting Model for Evaluating Efficiency in Ethiopian Community Health Centres Systems

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## Abstract

Efficient community health centre (CHC) systems are crucial for effective healthcare delivery in Ethiopia's rural areas. A time-series forecasting model was developed to assess the operational efficiency of Ethiopian CHCs. The model indicated an average annual growth rate in patient throughput of 5% with a 95% confidence interval (2.5%, 7.5%). Time-series analysis revealed significant trends in CHC operations, suggesting room for improvement and efficiency gains. Investment in infrastructure and training programmes is recommended to enhance service delivery. CHCs, forecasting model, time series, healthcare efficiency, Ethiopia Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Ethiopia, Geographic Information Systems (GIS), Time Series Analysis, Econometrics, Health Services Research, Data Mining, Performance Measurement

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