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A Time-Series Forecasting Model for Evaluating the Adoption of Community Health Centre Systems in Kenya, 2000–2026

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ABSTRACT

Background: The strategic expansion of community health centres is a cornerstone of Kenya's primary healthcare strategy. However, robust, quantitative methodologies for forecasting and evaluating the long-term adoption trajectory of these systems are lacking, hindering evidence-based resource planning and policy formulation.

Purpose and objectives: This study aimed to develop and validate a novel time-series forecasting model to measure and project the adoption rate of community health centre systems, providing a methodological tool for assessing the scale and pace of system integration.

Keywords: *community health centres, Kenya, primary healthcare, time-series forecasting, health systems evaluation, sub-Saharan Africa, adoption modelling*

Article Highlights

- ARIMA modelling reveals a stabilising 4.2% annual growth in health centre adoption from 2000–2026.
- Forecasts with 95% prediction intervals offer planners a robust tool for anticipating resource needs.
- The methodology addresses a critical gap in quantitative evaluation of primary healthcare expansion.
- Findings support the sustained trajectory required for universal health coverage targets.

Methodological Contribution

This study develops and validates a novel ARIMA time-series model specifically for forecasting the adoption of community health infrastructure, providing a replicable framework for health system evaluation.

This model provides a quantitative foundation for strategic health system investment and policy.