



Time-Series Forecasting Model for Evaluating Maternal Care Facilities in Kenya: A Methodological Study

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Abstract

Maternal care facilities in Kenya face challenges in ensuring optimal clinical outcomes for mothers and newborns. There is a need to evaluate these systems over time and forecast their performance. A time-series forecasting model was developed using historical data from multiple maternal care facilities. The model considers key indicators such as pre-pregnancy weight, gestational age at delivery, and newborn birth weights. Robust standard errors were used to account for uncertainty in the model's predictions. The forecasted outcomes showed a significant decrease ($p < 0.05$) in neonatal mortality rates by 12% over the next five years, indicating potential improvements if implemented. This study provides evidence that time-series forecasting can be effectively used to evaluate and improve maternal care facilities in Kenya, offering a tool for policymakers and healthcare providers. Policymakers should consider implementing this model as a regular monitoring mechanism to enhance the quality of maternal health services in Kenya. Maternal Care Facilities, Time-Series Forecasting, Clinical Outcomes, Robust Standard Errors Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^{-1} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Kenya, Geographic Information Systems, Maternal Health Services, Time-Series Analysis, Forecasting Models, Spatial Data, Evaluation Methods

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