Forecasting Adoption Rates in Ugandan Community Health Centres: A Time-Series Model Assessment

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Abstract

Community health centres in Uganda have been established to improve access to healthcare services across rural areas where facilities are scarce. A time-series analysis was conducted on data from five Ugandan community health centres, employing an ARIMA (AutoRegressive Integrated Moving Average) model to forecast adoption rates over a six-month period. The ARIMA(1,1,0) model showed that the average monthly adoption rate fluctuated by ±2% around its mean value, indicating moderate variability in service uptake across centres. The time-series forecasting approach provided insights into the potential factors affecting community health centre utilization and can inform future policy interventions aimed at increasing their effectiveness. Further research should explore non-technical barriers to adoption such as cultural norms or financial constraints, alongside improving data collection methods for more accurate forecasting. Treatment effect was estimated with $text\{logit\}(\pi) = beta\,0 + \beta^{\rightarrow} p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Uganda, Geographic Information Systems, Geographic Analysis, Public Health, Demographic Studies, Time-Series Analysis, Forecasting Models*

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