



Forecasting Adoption Rates in Ghana's Community Health Centers Using Time-Series Analysis Techniques

Kwesi Dankai^{1,2}, Abena Mensah^{2,3}, Ameyaw Agyei⁴, Yinka Kwasi^{5,6}

¹ Department of Epidemiology, University of Ghana, Legon

² Council for Scientific and Industrial Research (CSIR-Ghana)

³ Accra Technical University

⁴ Department of Epidemiology, Accra Technical University

⁵ Department of Clinical Research, University of Ghana, Legon

⁶ Ghana Institute of Management and Public Administration (GIMPA)

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Correspondence: kdankai@outlook.com

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Author notes

Kwesi Dankai is affiliated with Department of Epidemiology, University of Ghana, Legon and focuses on Medicine research in Africa.

Abena Mensah is affiliated with Council for Scientific and Industrial Research (CSIR-Ghana) and focuses on Medicine research in Africa.

Ameyaw Agyei is affiliated with Department of Epidemiology, Accra Technical University and focuses on Medicine research in Africa.

Yinka Kwasi is affiliated with Department of Clinical Research, University of Ghana, Legon and focuses on Medicine research in Africa.

Abstract

Community health centers in Ghana play a crucial role in providing healthcare services to underserved populations. A comprehensive time-series forecasting model was employed to analyse adoption data from Ghana's community health centers. The ARIMA (AutoRegressive Integrated Moving Average) model was used for its robustness in handling temporal data and uncertainty estimates were provided using a 95% confidence interval. The initial analysis showed an average adoption rate of 72%, with significant variation observed across different regions, indicating the need for targeted interventions to improve coverage. Time-series forecasting models offer valuable insights into understanding and predicting adoption rates in Ghana's community health centers. Further research is recommended to refine these models and inform policy decisions. Implementing tailored strategies based on regional data could enhance service uptake, particularly focusing on regions with lower-than-average adoption rates. 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: *Sub-Saharan, health systems, forecasting, econometrics, intervention effectiveness, longitudinal analysis, community engagement*

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