



Methodological Evaluation and Time-Series Forecasting of District Hospital Systems in Ghana: An Assessment of Efficiency Gains

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Abstract

District hospital systems in Ghana are pivotal for healthcare delivery, yet their operational efficiency varies significantly across different regions and over time. The analysis employs mixed-methods including quantitative data from annual performance reports and qualitative insights through interviews with healthcare managers. A time-series forecasting model, incorporating autoregressive integrated moving average (ARIMA) methodology, is applied to predict efficiency gains over the next five years. There was a notable trend of increasing inefficiency in district hospitals, particularly in rural areas where the ARIMA model predicted an improvement rate of up to 15% by . The findings underscore the need for targeted interventions and policy reforms to enhance efficiency within Ghana's healthcare system. Immediate action is required to address identified inefficiencies, including resource allocation strategies and capacity-building programmes. Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, African, Econometrics, Healthcare, Systems, Mixed-Methods*

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