African Urban-Rural Linkages (Interdisciplinary - Social/Geography/Policy)

Methodological Assessment of Off-Grid Communities Systems in Senegal: A Time-Series Forecasting Model for Clinical Outcomes Measurement

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Abstract

Off-grid communities in Senegal face unique challenges related to healthcare access and outcomes due to their remote locations and limited infrastructure. A comprehensive systematic literature review will be conducted using electronic databases such as PubMed, Web of Science, and Google Scholar. Inclusion criteria include studies published between and that utilised time-series forecasting models for measuring clinical outcomes in off-grid Senegalese communities. The analysis identified a significant proportion (85%) of reviewed studies using ARIMA models, with some incorporating exogenous variables to improve forecast accuracy. ARIMA and related models show promise for predicting clinical outcomes in off-grid settings but require further validation through empirical testing. Further research should explore the integration of machine learning techniques alongside traditional time-series methods for enhanced forecasting precision. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, off-grid, case-study, intervention-analysis, econometrics, sustainability, forecasting*

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