African Quantum Computing (Theoretical - Pure Science)

Off-grid Communities Systems in Kenya: Methodological Framework for Panel Data Estimation of Clinical Outcomes

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Abstract

Off-grid communities in Kenya face unique healthcare challenges due to limited access to electricity and infrastructure. The study employs a linear regression model with robust standard errors to analyse longitudinal healthcare data from 100 randomly selected households over two years. Panel data analysis is used to account for potential endogeneity and heterogeneity across subjects. Panel data estimation revealed a statistically significant positive correlation (p-value < 0.05) between access to electricity and improved health outcomes, indicating that increased electrification leads to better clinical results. The methodological framework demonstrates the effectiveness of panel data analysis in evaluating healthcare interventions in off-grid communities, providing robust estimates for policy recommendations. Policy makers should prioritise investment in off-grid electrification programmes as a means to improve health outcomes and reduce disparities in access to essential healthcare services. Off-grid communities, Panel data estimation, Clinical outcomes, Health interventions, Robust standard errors Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *African Geography, Panel Data Analysis, Time Series, Spatial Econometrics, Random Effects Model, Cross-Sectional Study, Multilevel Modelling*

ABSTRACT-ONLY PUBLICATION

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