African Oncology Nursing

Bayesian Hierarchical Model Evaluation of Community Health Centre Adoption Rates in Rwanda

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Abstract

Rwanda has implemented a national strategy to enhance community health centers (CHCs), aiming to improve access and utilization of healthcare services. However, there is limited understanding of how CHC adoption rates vary across different regions within Rwanda. We employed a Bayesian hierarchical linear mixed-effects model to analyse data from multiple CHCs in Rwanda. The model accounts for spatial heterogeneity and potential clustering effects within regions. The analysis revealed significant variation in CHC adoption rates across districts, with some areas showing adoption levels as high as 80% while others were below 50%. This indicates substantial disparities in service uptake. Our model provides insights into the factors driving CHC adoption and highlights regions requiring targeted interventions to enhance coverage. Policy-makers should prioritise investments in CHCs with lower adoption rates, considering contextual factors such as socioeconomic status and infrastructure availability. Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic Terms: Rwanda*

Methodological Terms: Bayesian hierarchical models Monte Carlo methods Random effects models Markov chain Monte Carlo (MCMC) Epidemiological data analysis

ABSTRACT-ONLY PUBLICATION

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