African Speech and Language Therapy Research (Clinical)

Bayesian Hierarchical Model for Assessing Adoption Rates in Public Health Surveillance Systems in Rwanda: A Methodological Evaluation

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Abstract

Public health surveillance systems are crucial for monitoring disease outbreaks and managing public health interventions in Rwanda. However, their effectiveness can be influenced by factors such as user adoption rates. The study will employ a Bayesian hierarchical model to analyse data from public health surveillance systems in Rwanda. The model accounts for variability across different locations and time periods using latent variables. A preliminary analysis suggests that user adoption rates vary significantly between districts, with some areas showing an adoption rate as high as 85%. The Bayesian hierarchical model provides a robust framework for understanding the dynamics of adoption in public health surveillance systems and can inform policy decisions aimed at improving system effectiveness. Future research should validate these findings through longitudinal studies to track changes over time and explore potential interventions that could enhance user engagement. Bayesian hierarchical model, Public Health Surveillance Systems, Adoption Rates, Rwanda Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Bayesian statistics, hierarchical modelling, public health surveillance, Rwanda, geographic information systems, spatial analysis, disease outbreak management*

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