



Bayesian Hierarchical Model for Measuring Clinical Outcomes in Public Health Surveillance Systems in Tanzania

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Abstract

Public health surveillance systems are essential for monitoring clinical outcomes in Tanzania. However, their effectiveness can be improved through advanced analytical methods. A longitudinal study employing a Bayesian hierarchical model to analyse data from multiple surveillance sites across Tanzania. The model demonstrated high predictive accuracy, with an estimated mean prediction error of 10% and a 95% credible interval around the true value. The Bayesian hierarchical model provided robust estimates for clinical outcomes, enabling more precise monitoring and intervention planning in public health surveillance systems. Public health authorities should consider implementing this method to enhance the reliability of their surveillance data. Bayesian Hierarchical Model, Clinical Outcomes, Public Health Surveillance, Tanzania Treatment effect was estimated with $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: Tanzania, Geographic, Hierarchical, Bayesian, Model, Clinical, Outcomes

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