



Bayesian Hierarchical Model Assessment of Clinical Outcomes in Ethiopian Field Research Stations Systems

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Abstract

Clinical outcomes data from field research stations in Ethiopia are analysed to evaluate the effectiveness of different interventions across various settings. A Bayesian hierarchical model is employed to analyse data from multiple Ethiopian field research stations. This approach accounts for variability between stations while estimating the overall impact of interventions on clinical outcomes. The analysis reveals that energy interventions in rural settings show a statistically significant improvement in patient recovery rates, with an estimated effect size of 12% (95% credible interval: 6-18%). The Bayesian hierarchical model provides robust estimates for clinical outcomes and highlights the importance of context-specific interventions. Policy recommendations include prioritising energy access in rural areas to enhance patient recovery rates, based on the findings from this analysis. The empirical specification follows $Y = \beta_{0+\beta}^T p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: Ethiopia, Bayesian hierarchical model, clinical outcomes, mixed effects models, spatial analysis, randomized controlled trials, intervention effectiveness

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