



# Bayesian Hierarchical Model for Measuring Risk Reduction in Community Health Centre Systems, Uganda

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## Abstract

This study examines the risk reduction strategies implemented in community health centres within Uganda's healthcare system. A Bayesian hierarchical model was applied to analyse data from community health centres in Uganda. The model accounts for variability within different regions and across time periods. The analysis revealed a significant reduction ( $p < 0.05$ ) in the incidence of childhood diarrhoea by 20% when integrated preventive measures were implemented compared to baseline conditions. The Bayesian hierarchical model provided robust estimates for risk reduction and highlighted areas where further interventions are needed. Communities should prioritise training healthcare workers on new prevention methods, especially in remote areas with lower implementation rates. Treatment effect was estimated with  $\text{text}\{logit\}(\pi) = \beta_0 + \beta^{-1} p X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** African, Bayesian, Hierarchical, Modelling, Risk, Evaluation, Community

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