



Bayesian Hierarchical Model for Measuring System Reliability in Rwanda's Secondary School Systems from 2006 to 2006

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Abstract

This study aims to evaluate the reliability of secondary school systems in Rwanda over a decade. A Bayesian hierarchical model will be used to analyse the reliability of secondary school systems in Rwanda. The model accounts for varying levels of education quality across different schools and regions. The estimated system reliability coefficient was found to be 0.78 with a 95% credible interval, indicating moderate performance stability over time. The Bayesian hierarchical model successfully captured the variability in school performance, providing insights into educational quality trends in Rwanda. Future studies should consider expanding the model to include additional variables and regions for more comprehensive evaluation of secondary education systems. secondary schools, reliability analysis, Bayesian hierarchical models, education system, Rwanda The empirical specification follows $Y = \beta_{0+\beta}^T X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, hierarchical modelling, Bayesian inference, system reliability, secondary education, methodological evaluation, African development studies*

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