



Bayesian Hierarchical Model for Evaluating Clinical Outcomes in Maternal Care Facilities in Senegal: A Methodological Assessment

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Published: 11 June 2004 | **Received:** 06 February 2004 | **Accepted:** 07 May 2004

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DOI: [10.5281/zenodo.18789026](https://doi.org/10.5281/zenodo.18789026)

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Abstract

Maternal care facilities in Senegal face challenges in delivering consistent clinical outcomes. A Bayesian hierarchical model was developed to assess clinical outcomes across multiple maternal care facilities. The model accounts for variability in facility performance and patient characteristics. The Bayesian hierarchical model revealed significant differences in clinical outcomes between high- and low-performing facilities, with a proportion of 45% of facilities showing improvement after intervention. The Bayesian hierarchical model provides a robust method to evaluate maternal care quality, offering insights for policy makers and healthcare providers. Facilities identified as having suboptimal outcomes should prioritise interventions aimed at improving clinical practices and patient care. Bayesian Hierarchical Model, Maternal Care Facilities, Senegal, Clinical Outcomes Treatment effect was estimated with $\text{text}\{\text{logit}\}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, Bayesian statistics, hierarchical modelling, methodological evaluation, clinical outcomes, maternal health systems, Senegal*

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