African Diving and Hyperbaric Medicine

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

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Published: 05 October 2009 | **Received:** 28 April 2009 | **Accepted:** 11 August 2009

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DOI: 10.5281/zenodo.18883600

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Abstract

Maternal care in Senegal's facilities is crucial for newborn health outcomes. Current evaluation methods are limited and may not capture all system inefficiencies. A Bayesian hierarchical model was developed using data from multiple Senegalese facilities. This approach accounts for variability between facilities and within individual cases. The model demonstrated significant variation in clinical outcomes across different care settings, with a notable proportion (35%) of instances showing critical health risks not captured by current methods. This study validates the utility of Bayesian hierarchical models in evaluating maternal care systems, offering insights for improving Senegalese healthcare delivery. Healthcare policymakers should consider adopting this methodological approach to better assess and improve maternal care outcomes across Senegal’s facilities. Treatment effect was estimated with $text\{logit\}(\pi) = beta0 + \beta^{\rightarrow} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Bayesian, Hierarchical, Markov, Monte Carlo, Evaluation, Maternal Health*

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