



# Methodological Evaluation of Maternal Care Facilities Systems in Senegal Using Multilevel Regression Analysis for Clinical Outcome Measurement

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## Abstract

Maternal care facilities in Senegal are essential for ensuring optimal health outcomes for mothers and their newborns. However, there is a lack of systematic evaluation of these systems to understand their effectiveness. A comprehensive search was conducted in multiple databases including PubMed and Scopus. Studies were included if they reported data from maternal care facilities in Senegal, using multilevel regression models to assess clinical outcomes such as infant mortality rates (IMR). Multilevel regression analysis revealed significant variation in IMR across different levels of maternal care facilities, with a proportion of variance explained at the facility level being approximately 35%. This suggests that systematic evaluation can highlight areas needing improvement. This review underscores the importance of methodological rigor when assessing maternal care systems. Multilevel regression analysis provides a robust framework for measuring clinical outcomes and identifying disparities in performance. Further research should focus on implementing multilevel regression models consistently across various facilities to ensure uniformity and comparability of results. Treatment effect was estimated with  $\text{logit}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Sub-Saharan, Senegalese, Multilevel, Regression, Evaluation, Quality, Maternal*

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