



Methodological Evaluation of Maternal Care Facilities Systems in Ethiopia Using Multilevel Regression Analysis for Clinical Outcomes Assessment

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Abstract

Maternal care facilities in Ethiopia face challenges that impact clinical outcomes for mothers and newborns. Multilevel regression analysis was employed to examine the impact of maternal care facilities at both individual (mother) and system levels. The model included random intercepts for facility-level variation. Significant differences were observed in neonatal mortality rates across different types of maternity units, with a multilevel regression showing that proximity to specialized facilities reduced infant deaths by approximately 15% in urban areas. The study highlights the importance of integrating specialized maternal care services into existing health systems to improve clinical outcomes for mothers and newborns. Policy recommendations include prioritising the development and expansion of specialized maternity units, particularly in underserved rural regions where mortality rates remain high. Maternal Care Systems, Multilevel Regression Analysis, Neonatal Mortality, Ethiopia 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: Ethiopia, Maternal Health, Multilevel Modelling, Regression Analysis, Spatial Statistics, Public Health, Clinical Outcomes

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