



# 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 play a critical role in improving health outcomes for newborns and mothers in Ethiopia. A multilevel regression model was employed to analyse data from Ethiopian hospitals covering a period of one year. The model accounts for both individual patient-level variables (e.g., gestational age) and hospital-level characteristics (e.g., staffing levels). The analysis revealed that adequate prenatal care was significantly associated with improved neonatal survival rates, with a 20% reduction in mortality rate. Maternal care systems in Ethiopia need to enhance prenatal care protocols to improve clinical outcomes for mothers and their newborns. Investment should be directed towards training healthcare providers on best practices in maternal care and improving access to prenatal services. Treatment effect was estimated with  $\text{text}\{logit\}(\pi) = \beta_0 + \beta^T p X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** Ethiopia, maternal health, multilevel modelling, regression analysis, clinical outcomes, sub-Saharan Africa, geographic information systems

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