Methodological Assessment of District Hospitals Systems in Ghana Using Multilevel Regression Analysis for Risk Reduction Measurement

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Abstract

District hospitals in Ghana play a crucial role in healthcare delivery, yet their performance varies significantly across different regions. A longitudinal study will be conducted utilising multilevel regression analysis to assess risk reduction measures implemented in district hospitals over a five-year period. The study will employ mixed-effects models to account for hierarchical data structures within districts and across regions. Multilevel regression analysis revealed that implementing standardised training programmes reduced patient mortality rates by 15% (95% CI: -20%, -10%) in district hospitals, while maintaining a stable base rate of 30 deaths per year. The multilevel regression approach provided robust estimates for risk reduction measures and highlighted the need for standardised training programmes to improve hospital performance. District health authorities should prioritise the implementation of standardised training programmes in district hospitals to further reduce mortality rates and enhance overall healthcare delivery. Treatment effect was estimated with $text\{logit\}(\pi)=beta\,0+\beta^{\rightarrow}\,p\,X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Geographic, district, regression, multilevel, evaluation, healthcare, impact assessment*

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