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Methodological Evaluation of Regional Monitoring Networks in Ghana: Multilevel Regression Analysis for Risk Reduction Measurement

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Abstract

The prevalence of energy-related risks among children in Ghana necessitates robust monitoring systems to mitigate these threats. A mixed-method approach including surveys, interviews, and data triangulation was employed to assess network performance and risk reduction efficacy. The multilevel regression model revealed a significant $R^2 = 0.75$ (95% CI: [0.68, 0.82]) in explaining energy safety risks across regions. Regional monitoring networks effectively reduce energy-related risks among children but require further refinement for optimal performance. Continued training for network coordinators and expansion of coverage to underserved areas are recommended.

Keywords: *Sub-Saharan, African, Ghanaian, Spatial, Qualitative, Regression, Analysis, Geographic*

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