African Power Engineering

Community Health Worker Programmes' Impact on Malaria Case Incidence in Gambian Rural Areas: A Two-Year Evaluation

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Abstract

This study addresses a current research gap in Engineering concerning Community Health Worker Programs for Malaria Prevention and Control in Gambian Rural Communities: Impact on Case Incidence Rates Over Two Years in Gambia. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A mixed-methods design was used, combining survey and interview data collected over the study period. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Community Health Worker Programs for Malaria Prevention and Control in Gambian Rural Communities: Impact on Case Incidence Rates Over Two Years, Gambia, Africa, Engineering, original research This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African Geography, Community Health Workers, Epidemiology, Geographic Information Systems, Malaria Control, Public Health Engineering, Vector-Borne Diseases*

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