



Early Warning Systems for Malaria Epidemics in Northern Ethiopia: A Community-Driven Assessment of Health Centre Performance

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Published: 07 February 2012 | **Received:** 05 September 2011 | **Accepted:** 24 December 2011

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DOI: [10.5281/zenodo.18951712](https://doi.org/10.5281/zenodo.18951712)

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Abstract

Malaria remains a significant health challenge in northern Ethiopia, necessitating effective early warning systems (EWS). Community participation is crucial for identifying and responding to outbreaks promptly. The research employed a mixed-methods approach with quantitative surveys ($n=200$) \wedge *qualitative interviews* ($n=30$). Data were analysed using descriptive statistics for survey responses and thematic analysis for interview transcripts. A multivariate logistic regression model was used to identify factors influencing EWS performance. Community feedback highlighted a need for improved diagnostic tools, particularly in rural areas where sensitivity testing was often unreliable. Health centre staff reported challenges with timely medication supply and communication infrastructure. The study underscores the importance of integrating community input into health services to enhance malaria EWS effectiveness. Recommendations include upgrading diagnostic facilities and strengthening logistics management systems. Develop a comprehensive training programme for health workers on advanced diagnostic techniques, including sensitivity testing. Establish partnerships with local suppliers to ensure consistent medication supply.

Keywords: *Sub-Saharan, African, Malaria, Epidemiology, CommunityHealth, SystemsAnalysis, GeographicMapping*

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