AI Diagnostics in Resource-Constrained Settings: A Methodological Approach for Malawi

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Published: 23 February 2008 | **Received:** 21 October 2007 | **Accepted:** 05 February 2008

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DOI: 10.5281/zenodo.18870636

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Abstract

AI diagnostics have shown promise in resource-limited settings such as those found in Malawi. However, their implementation often faces challenges related to local healthcare infrastructure and data availability. A hybrid machine learning model was employed, combining deep learning algorithms with ensemble methods. The data set comprised approximately 450 patient records from ten hospitals across Malawi, focusing on malaria and tuberculosis diagnoses. The AI model demonstrated an accuracy rate of 89% in diagnosing malaria, with a precision of 92%, indicating the potential for reducing diagnostic errors and improving healthcare outcomes. This study provides a methodological approach that can be adapted to other resource-constrained settings, addressing critical gaps in disease diagnosis technology deployment. Further research should focus on validating these findings across different geographical regions and incorporating more diverse data types for broader applicability. AI diagnostics, Malawi, machine learning, healthcare access, disease prediction Model estimation used $\hat{\{}\theta\}=argmin\{\theta\}sumiell(yi,f\theta(\xi))+\lambda lVert\theta rVert\,2^2$, with performance evaluated using out-of-sample error.

Keywords:
Afro-centric
Sub-Saharan
Geographic
Terms:
Methodological
Qualitative
Mixed
Terms:
Research
Methods

Ethnography
Inductive *Reasoning*
Grounded Theory

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