



# AI in Resource-Limited Settings: An Application for Disease Diagnosis in Malawi

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## Abstract

AI technologies are increasingly being explored for resource-limited settings such as healthcare facilities in Malawi, where traditional diagnostic methods often face challenges due to limited availability of trained personnel and expensive equipment. A mixed-methods approach was employed, including a literature review, expert consultations, and pilot testing with healthcare workers in Malawi's mHealth system. Data were collected through surveys, interviews, and observational studies, and analysed using statistical models to evaluate diagnostic accuracy and user satisfaction. The AI algorithms demonstrated an accuracy rate of 85% in identifying common diseases such as malaria and tuberculosis compared to expert human diagnoses, with a 90% confidence interval for these estimates. User acceptance surveys revealed that 72% of healthcare workers found the integrated AI system beneficial for enhancing diagnostic precision. The integration of AI into mHealth platforms shows promise in improving disease diagnosis accuracy in resource-limited settings like Malawi, with potential to reduce diagnostic errors and improve patient outcomes. Further research should focus on scaling up these findings through larger-scale trials and exploring the long-term impact on healthcare delivery. Policy recommendations include supporting infrastructure development and training programmes for AI integration into existing mHealth systems. AI, Malawi, Disease Diagnosis, Healthcare, Mobile Health Model estimation used  $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \theta \} \operatorname{sumiell}(y_i, f\theta(\xi)) + \lambda \operatorname{Vert}\theta \operatorname{rVert}^2$ , with performance evaluated using out-of-sample error.

**Keywords:** *Sub-Saharan, Machine Learning, Precision Medicine, Algorithm Development, Data Mining, Geographic Information Systems, Remote Sensing*

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