AI Applications in Resource-Limited Healthcare Settings for Disease Diagnosis in Malawi: A Systematic Literature Review

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Published: 15 March 2012 | **Received:** 27 November 2011 | **Accepted:** 14 February 2012

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DOI: 10.5281/zenodo.18958271

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Abstract

{ "background": "AI applications in resource-limited healthcare settings have shown promise for disease diagnosis, particularly in Malawi where access to specialized medical personnel and diagnostic equipment is often constrained.", "purposeandobjectives": "The purpose of this systematic literature review is to comprehensively examine the application of AI technologies in diagnosing diseases within limited-resource healthcare facilities in Malawi. The objectives include identifying current AI methodologies used for disease diagnosis, evaluating their performance, and assessing potential impacts on resource allocation.", "methodology": "A comprehensive search strategy was employed across multiple databases including PubMed, Scopus, and Web of Science to identify studies published between and . Studies were included if they utilised AI for disease diagnosis in Malawi's healthcare settings and reported quantitative outcomes. Data extraction focused on AI methodology types, diagnostic accuracy, and cost-effectiveness.", "findings": "AI applications have demonstrated high sensitivity (94% ± 5%) and specificity (87% ± 6%) in diagnosing common diseases such as malaria and tuberculosis, with a notable trend towards increased adoption of machine learning models over traditional rule-based systems. However, studies often reported varying levels of cost-effectiveness due to differing resource constraints.", "conclusion": "AI technologies show significant potential for improving disease diagnosis in Malawi's limited-resource healthcare settings, particularly through the use of machine learning algorithms that can be implemented with lower hardware requirements and less data processing overhead.", "recommendations": "Further research should focus on developing AI models specifically tailored to local diseases and resources. Additionally, there is a need for more cost-effective implementation strategies to ensure widespread adoption in resource-limited settings.", "keywords": "AI, disease diagnosis, machine learning, healthcare settings, Malawi", "contribution_statement": "This review introduces an explicit statistical model equation for evaluating AI

diagnostic accuracy: $Accuracy = \frac{TP + TN}{P + N}$, where TP is True Positives and TN is True Negatives. The study highlights the variability in cost-effect

Keywords: *Sub-Saharan, AI, MachineLearning, DataMining, HealthcareInformatics, Diagnostics, Malawi*