



AI in Resource-Limited Settings: An Analysis of Disease Diagnostics in Malawi

Chilufya Mulenga¹, Kachika Konde², Mazwi Chaka³, Zulu Simu^{4,5}

¹ Department of Artificial Intelligence, Lilongwe University of Agriculture and Natural Resources (LUANAR)

² Department of Cybersecurity, Lilongwe University of Agriculture and Natural Resources (LUANAR)

³ Lilongwe University of Agriculture and Natural Resources (LUANAR)

⁴ Mzuzu University

⁵ Malawi University of Science and Technology (MUST)

Published: 11 October 2008 | **Received:** 27 May 2008 | **Accepted:** 19 September 2008

Correspondence: cmulenga@aol.com

DOI: [10.5281/zenodo.18880943](https://doi.org/10.5281/zenodo.18880943)

Author notes

Chilufya Mulenga is affiliated with Department of Artificial Intelligence, Lilongwe University of Agriculture and Natural Resources (LUANAR) and focuses on Computer Science research in Africa.

Kachika Konde is affiliated with Department of Cybersecurity, Lilongwe University of Agriculture and Natural Resources (LUANAR) and focuses on Computer Science research in Africa.

Mazwi Chaka is affiliated with Lilongwe University of Agriculture and Natural Resources (LUANAR) and focuses on Computer Science research in Africa.

Zulu Simu is affiliated with Mzuzu University and focuses on Computer Science research in Africa.

Abstract

AI applications in resource-limited settings are increasingly being explored to improve healthcare outcomes, particularly for disease diagnostics. A comparative analysis was conducted using machine learning algorithms on a dataset of clinical records from two hospitals in Malawi. The study employed cross-validation techniques with uncertainty intervals provided by bootstrapping methods. AI models were able to diagnose malaria with an accuracy rate of 85%, indicating high potential for resource optimization. The findings suggest that AI can significantly enhance disease diagnostics in Malawi, particularly for malaria and tuberculosis, reducing the need for local expertise and resources. Further research should be conducted to validate these models across a broader spectrum of diseases and healthcare settings. AI, machine learning, resource-limited settings, disease diagnosis, Malawi Model estimation used $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sumiell}(y_i, f\theta(\xi)) + \lambda l \operatorname{Vert}\theta r \operatorname{Vert} 2^2$, with performance evaluated using out-of-sample error.

Keywords: African geography, machine learning, predictive analytics, resource scarcity, telemedicine, data mining, algorithmic fairness

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ **REQUEST FULL PAPER**

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa



Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge