

Leveraging AI for Claims Processing and Fraud Detection in African Health Insurance Systems

Author
Lilian Damisa

Affiliations
Ahmadu Bello University

1 Introduction

Healthcare financing in Africa is often undermined by inefficiencies in claims processing and widespread fraud. Manual verification processes delay reimbursements, strain patient-provider relationships, and increase operational costs for Health Maintenance Organizations (HMOs). Fraudulent claims, including inflated billing, ghost patients, and inaccurate coding, further threaten the sustainability of health insurance schemes. Integrating Artificial Intelligence (AI) into claims management offers a pathway to improve efficiency, transparency, and trust within African health systems.

2 Objective

To design and pilot an AI-powered claims verification system that enhances fraud detection and streamlines claim processing within African Health Maintenance Organisations.

3 Methodology

This study explored the design and pilot testing of an AI-powered claims verification system tailored for HMO workflows. Using supervised machine learning models and anomaly detection algorithms, the system analysed structured and unstructured claim data to identify irregular patterns. Natural language processing was applied to digitised clinical notes, while predictive analytics flagged high-risk claims for human review. The system was tested on de-identified claims datasets, with iterative feedback from healthcare administrators to ensure contextual relevance.

4 Results

Preliminary findings indicate that AI integration reduced claim processing time by up to 40% compared to manual workflows. Fraud detection accuracy improved significantly, with the system successfully identifying common patterns such as duplicate billing and mismatched clinical codes. Early adoption also highlighted improved accountability among providers, as the transparent audit trail discouraged fraudulent submissions. Importantly, the tool demonstrated interoperability with existing electronic medical records and insurance platforms, supporting scalability.

5 Conclusion

AI-enabled claims processing and fraud detection can play a critical role in strengthening healthcare financing systems in Africa. By improving efficiency, reducing fraud, and fostering transparency, such solutions enhance the sustainability of HMOs and expand access to care. Scaling requires collaborative partnerships, regulatory alignment, and continuous adaptation to local health financing contexts.

Related literature

References available on request