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Letter to the Editor

Artificial intelligence for Africa: bridge or barrier for infectious disease control?

The growing body of evidence gathered through genomic surveillance across the African continent demonstrates how strategically designed monitoring systems can detect pathogens early and with high accuracy. The recent study by Gashegu *et al.* [1] demonstrates the value of innovative surveillance approaches in resource-limited settings, showing how dual-sample strategies can capture viral diversity and identify emerging threats before they spread. Importantly, such systems could be further strengthened by advances in artificial intelligence (AI), which can accelerate genomic analysis, improve variant classification, and enhance real-time epidemic prediction, provided that AI models are adapted to the African linguistic, infrastructural, and cultural context. However, in 2025, the promise that AI can democratize knowledge, accelerate health care development, and strengthen disease surveillance across the African continent risks becoming yet another structural barrier. Africa's linguistic diversity, that is 55 countries, 1.5 billion people, and more than 2000 languages, remains poorly represented in dominant AI systems, which are primarily trained on English, major European languages, and Chinese. The implications for infectious disease control are significant: when health information, digital tools, and clinical decision support platforms perform poorly in local languages, communities are excluded from access to prevention services, epidemic alerts, and reliable clinical guidance..

The problem is measurable. As Nyalleng Moorosi noted in Nature (2024), GPT-4 correctly recognizes Hausa only 10-20% of the time, whereas languages such as Kiswahili remain poorly documented due to limited training data [2]. For infectious diseases, where timely understanding of symptoms, public health messages, and treatment adherence instructions is essential, such gaps widen existing inequalities. Initiatives such as African Next Voices [3], which is creating a 9000-hour multilingual data set featuring languages such as isiZulu, Hausa, Yoruba, and Dholuo, offer a crucial remedy [4]. These data sets, based on real-world contexts such as health care and community-level communication, are indispensable: AI is only useful if it can speak, interpret, and reason in the languages of the populations it intends to serve.

African policymakers are aware of this. The African Union's Continental Strategy for AI 2024 and the African Declaration on AI 2025 emphasize that AI can strengthen disease surveillance, laboratory systems, and pandemic preparedness but only if developed "for Africa and with Africa" [5]. The data reported in the AI in Africa: A Landscape Study report [6] reinforce this point: imported and non-contextualized models often misinterpret locally relevant symptoms, cultural expressions, and concepts of disease, generating errors that undermine trust. In contrast, locally developed systems, such as Lesan AI for the Horn of Africa [7], demonstrate how targeted, language-specific tools can outperform generic models in health care communication and clinical transcription.

However, structural barriers remain. Africa hosts less than 1% of global data center capacity, and only 5% of African researchers in the field of AI have access to the high-performance computing systems needed to model epidemics or train medical natural language processing (NLP) systems. Nevertheless, solutions such as the Lacuna Fund, which, in 2024, published new open data sets for agriculture, health, and language, demonstrate that strategic investments in local data can directly benefit communities and health systems.

For infectious diseases, language is not simply a means of communication: it shapes the narrative of the disease, behavior in seeking care, perception of risk, and trust in public health interventions. The lack of data sets in indigenous languages fuels bias in clinical and epidemiological algorithms [8]. Studies on NLP in health care in Africa show that translation errors, cultural misalignments, and limited model explainability reduce diagnostic accuracy and hinder clinical adoption [9]. Public trust in AI-supported health care, particularly, in sensitive areas such as HIV care, tuberculosis control, maternal infections, and epidemic response, depends on systems that reflect community values, including philosophical frameworks such as Ubuntu, and are developed through participatory approaches [10].

The challenge is not only technical, it is epistemological. If AI systems cannot process the linguistic and cultural frameworks through which millions of people understand diseases, symptoms, and treatments, they risk overlooking entire bodies of health knowledge. This contributes to a form of digital epistemic inequality, in which only concepts expressed in dominant languages are recognized as valid. For infectious diseases, such exclusion can compromise epidemic reporting, reduce engagement in prevention programs, and silence local disease management strategies.

This challenge also represents an opportunity. Creating AI systems that are in line with Africa's linguistic diversity can strengthen cross-border surveillance, improve data quality, enhance regional cooperation, and enable a new form of AI-driven South-South collaboration in infectious disease control. This requires rethinking AI not as a universal and linguistically neutral tool but as an interlocutor that must learn from communities, reflect their contexts, and respect their epistemologies.

The question is, therefore, essential: can global health afford AI systems that ignore the voices and knowledge of millions of people? In infectious disease management, where clear communication, trust, and cultural alignment can determine the success of interventions, the cost of linguistic exclusion is measured not only in terms of equity but also in terms of health outcomes.

Africa is not a technological periphery: it is a potential center of multilingual innovation for global health. The future of AI-assisted infectious disease control depends on creating systems that reinforce rather than erase the continent's linguistic richness. Achieving this goal requires parallel investments in digital infrastructure, internet connectivity, AI-literate health workers, sustainable financing, and regulatory capacity. However, above all, it requires ensuring that no language and, therefore, no community is excluded from the digital health debate.

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