Africa should leverage the integration of artificial intelligence in the fight against communicable diseases

Mpho Langalanga[1], Elias A. N. Fambayi[1], Fanuel Songwe[1]*

[1]Department of Applied Biosciences and Biotechnology, Faculty of Science and Technology, Midlands State University (MSU), Gweru, Zimbabwe

BACKGROUND

The African continent bears the highest burden of communicable diseases with over 30 newly emerged infectious diseases since the 1960s. Among the major contributors are malaria, tuberculosis, and HIV, which are causing a significant number of morbidities and deaths. It is known that communicable disease burden is attributable to the weak healthcare system of African countries. The suffering, long-term illnesses, social stigma, and sometimes disabilities from these diseases affect productivity and economies of the continent. The management and eradication of these diseases is often hampered by persistent challenges with diagnosis, unreliable drug supply, weak surveillance systems, and underreporting are among other complex challenges (1).

Despite all the negativities hindering the quest to reduce communicable diseases in Africa, a new vista of opportunities in the form of artificial intelligence (AI) has emerged. AI is described as "a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations, or decisions influencing real or virtual environments". These AI-based systems may be in the form of voice assistants, image analysis software, search engines, speech and face recognition systems, or hardware devices such as unmanned aerial vehicles (UAVs) (2). In this commentary, we wish to explore how AI can be integrated into healthcare systems in Africa by highlighting key opportunities, challenges, as well as offering recommendations to ensure that the technology contributes meaningfully and ethically to the public health outcomes of the continent.

Key applications

AI holds enormous potential for Africa in its quest to reduce the prevalence of communicable diseases. Since AI can process and analyze data at unprecedented levels and complexities, its integration into the public health system of Africa would herald an era of possibilities in addressing communicable diseases. With the reoccurrence of viral diseases such as Ebola, monkey pox, the COVID-19 pandemic, and other endemic infectious diseases, AI can be applied in vaccine design, diagnostics and imaging, drug discovery, genomic surveillance, and early warning systems (3,4). Although several AI systems are already in use in some countries, many more products still need to be developed so the continent can fully harness the wealth of available data. Integrating AI in the fight against communicable diseases in Africa is an issue of great interest, offering both promising opportunities and formidable challenges within the health sector.

Unique opportunities for Africa

There has been an exponential growth of AI technology companies, innovation hubs, and start-ups across Africa with estimates indicating that the technology could contribute billions of dollars to the gross domestic product (GDP) by 2030. Therefore, integrating AI in the healthcare sector of Africa should be a topic of great interest, offering both promising opportunities and challenges. Because of the youthful and tech-savvy population of Africa, growing data science ecosystems, as well as an increase in internet connectivity, there is certainly optimism that integration of AI technologies into the healthcare sector will receive wide acceptance (5).

Unique challenges and risks of Africa

While evidence is emerging that governments across the world are positioning themselves to maximize the potential benefits of integrating AI into the

health sector, full integration of AI into the public health sector of Africa will also be, without doubt, marred with challenges. AI systems are trained using large, high-quality datasets. However, health data in most African countries is often incomplete and of poor quality. The continent inherently lacks AI supporting infrastructure, such as a stable internet connection, electricity, and cloud computing services. There is also an acute trained human power shortage in areas like data science, internet of things (IoT), and AI specialists across the continent (5). This results in the continent being reliant on foreign expertise. This can never be in our best interest because it poses concerns about long-term sustainability, maintenance, and ownership. The sensitive nature of health data presents transparency, ethical, privacy concerns, and sovereignty. That makes it difficult to harmonize policies and government frameworks. The issue of algorithmic biases must also be addressed before any meaningful benefits are realized, as AI models can inadvertently perpetuate societal inequalities if not trained on diverse and representative datasets (3). For example, the underestimation of infectious disease impacts in rural populations by AI models, which are primarily trained on urban data. This might lead to a skewed allocation of resources across the continent.

CONCLUSION

Africa needs to integrate AI into its management of communicable diseases. However, many harmonized strategies need to be implemented to harness the full potential. Firstly, African governments must invest in strengthening their talent pipeline by cranking up training for data scientists, AI engineers, and public health informaticians, as well as supporting local start-ups. This should be followed by policy harmonization on data ethics, algorithmic transparency, AI governance, and public-private partnerships.

Conflict of Interest: None declared.

REFERENCES

1. Omosigho PO, Okesanya OJ, Olaleke NO, Eshun G, Lucero-Prisno DE. Multiple burden of infectious disease outbreaks: Implications for Africa healthcare system. *Journal of Taibah University Medical Sciences*. 2023.

2. Otaigbe I. Scaling up artificial intelligence to curb infectious diseases in Africa. *Frontiers in Digital Health.* 2022.

3. Hee Lee D, Yoon SN. Application of artificial intelligence-based technologies in the healthcare industry: Opportunities and challenges. *Int J Environ Res Public Health*. 2021;

4. Kaur I, Behl T, Aleya L, Rahman H, Kumar A, Arora S, et al. Artificial intelligence as a fundamental tool in management of infectious diseases and its current implementation in COVID-19 pandemic. *Environ Sci Pollut Res Int.* 2021; 28(30):40515-40532.

5. Aung YYM, Wong DCS, Ting DSW. The promise of artificial intelligence: A review of the opportunities and challenges of artificial intelligence in healthcare. *British Medical Bulletin. Br Med Bull*. 2021 Sep 10;139(1):4-15.

Citation: Langalanga M, Fambayi EAN, Songwe F. Africa should leverage the integration of artificial intelligence (AI) in the fight against communicable diseases. *HAJHBS*. 2025, 1(2): 68–69

Edited by Habteyes Hailu Tola
 Address correspondence to Songwe F et. songwef@staff.msu.ac.zw The authors declare that they have no competing interests. The views expressed in this article do not necessarily reflect the views of HAJHBS.
Submitted: May 11, 2025 | Revised: June 09, 2025 | Accepted: June 23, 2025 | Published: August 17, 2025