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Guest Editorial

Artificial Intelligence in Low- and Middle-Income Countries: Reducing the Gaps in Health Care, Research, and Education

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INTRODUCTION

Artificial intelligence (AI) has emerged as a transformative force across various disciplines, with health care being a prominent area of interest (Khera et al, 2023). This interest has emerged due to the potential for AI to revolutionize health care . AI is predominantly developed and deployed in high-income countries (HIC). These countries have more resources, better health care outcomes, and better staffing than the low- and middle-income countries (LMIC)(Paprotny, 2021). Given these disparities, one can argue that LMIC have a greater need to deploy AI technology not only in health care delivery but also in health education and research. The gap in health care outcomes between HIC and LMIC is largely due to disparities in resources related to health care , health education, and research (Demaidi,2023). Artificial intelligence technology presents a valuable opportunity to help bridge this gap. While the potential of AI in LMIC is promising, the lack of a universal strategic plan guiding its use could widen the disparity between HIC and LMIC.

Reducing Disparity in Practice, Education, and Research

Fostering collaborative efforts and international partnerships can facilitate the transfer of AI knowledge and resources to developing nations. Such endeavors can transform health care delivery in LMIC and help to achieve a more equitable and technologically empowered global health care landscape.

In LMIC, where access to specialized health care services is limited, AI can provide remote diagnostics and telemedicine,

enabling patients to receive expert consultations regardless of their location. AI technology can also help in medical diagnosis. For example, deep learning and computer vision algorithms can aid in analyzing patients' imaging. (Jiang,2023), which can expedite proper diagnosis and care for various conditions with radiological findings. Artificial intelligence driven predictive analytics can help identify high-risk populations for diseases, allowing for proactive interventions and resource allocation. For example, a recent study developed AI technology to diagnose occlusion myocardial infarction that was superior in sensitivity and precision compared to expert clinicians (Al-Zait, 2023). Such technology can enhance diagnostic accuracy in the LMIC where expertise may be limited. Additionally, AI-powered decision support systems can assist health care providers in low-resource settings by offering personalized treatment recommendations based on individual patient data and global best practices.

In addition to its transformative impact on health care practices, AI technology also plays a pivotal role in facilitating contributions from non-English speaking populations to the global scientific discourse. In LMIC, where linguistic barriers often impede the dissemination of valuable research findings, AI-driven language and editing tools can serve to assist authors in refining their manuscripts. AI technology can also guide researchers in designing clinical trials (Davenport & Kalakota, 2019), and can also aid in budgeting. This not only facilitates the inclusion of diverse perspectives in global academic discussions but also empowers researchers in LMIC to share their findings with a broader audience.

In health care education, AI-powered educational platforms can provide accessible and tailored learning experiences, accommodating diverse learning styles and language barriers. AI technology can be used in developing lesson plans, rubrics and clinical scenarios. Furthermore, the use of virtual reality simulations and augmented reality tools can optimize training experiences (Mir, et al, 2023), particularly beneficial in areas where hands-on training opportunities are limited. Moreover, AI-driven adaptive learning systems can personalize educational content to address the specific needs and skill levels of learners, ensuring effective knowledge retention and competency development.

While the widespread use of AI technology may require many years, developing strategies to optimize access to AI technology in LMIC can facilitate its deployment. This can narrow the gap in health care practices, research, and education between LMIC and HIC.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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