Editorial

From national and regional commitments to global impact: artificial intelligence for equitable public health at the G20

Jarbas Barbosa da Silva Jr.,[1] Nísia Trindade Lima,[2] Ana Estela Haddad,[2] Socorro Gross Galiano,[1] Sebastian Garcia Saiso,[1] Mary Lou Valdez,[1] James Fitzgerald,[1] Mariana Faria Teixeira,[1] Ernesto Bascolo,[1] Daniel Rodriguez,[1] Luis Jimenez McInnis,[1] Judit Rius Sanjuan,[1] Myrna Marti,[1] Daniel Luna,[3] Paula Kohan[4] and Marcelo D'Agostino[1]

Artificial intelligence (AI) is rapidly transforming numerous sectors and public health is no exception. As a powerful tool for modernizing health systems and services, AI promises to improve health outcomes, enhance efficiency and ensure innovation in public health practices. The G20, representing the world's largest economies, plays a crucial role in shaping global health policies and driving forward initiatives that leverage AI for public health (1). Through its influential platform, this political body has the capacity to foster international collaboration, share knowledge, and recommend and support global standards that prioritize AI integration into public health. Health equity remains a fundamental principle of global public health goals, emphasizing the need for universal access to quality health care services regardless of geographical, economic or social barriers. AI holds immense potential to bridge health disparities, particularly for underserved populations. The G20's commitment to embrace AI in public health underscores a collective effort to address these disparities, ensuring that technological advancements do not leave anyone behind.

National and regional actions are critical to this endeavor. Digital health infrastructure and readiness for AI vary widely across countries, requiring tailored approaches to AI implementation. Prioritizing AI in public health will enable nations to enhance their health care delivery, optimize resource allocation and strengthen their health systems. As Dr. Jarbas Barbosa da Silva, Director of the Pan American Health Organization (PAHO), stated, "Countries of the Americas with the most innovative and efficient strategies to recover better than they were before, overcome inequalities, and build resilient health systems to improve the response to emergencies and disasters and to achieve universal health care" exemplify the potential impact of these efforts (2). National actions supported by regional collaboration can further amplify these efforts, facilitating the exchange of knowledge and best practices, and fostering a cohesive approach to AI adoption in public health. The power of AI lies in its ability to analyze vast amounts of data, predict health trends and provide personalized health care solutions. From improving disease surveillance and outbreak prediction to enhancing diagnostic accuracy and patient management, AI-driven innovations are revolutionizing public health. These technological advancements are not only modernizing health systems but also ensuring that health care becomes more inclusive and equitable (3–5).

In this article, we reflect on the intersecting challenges and opportunities of adopting AI in public health, highlighting PAHO's vision and plans, and the G20's role in championing AI-driven health initiatives. Additionally, we discuss the transformative power of AI in modernizing health care systems, driving innovation and ensuring that the benefits of technological advancements are equitably distributed across populations (6, 7).

[1] Pan American Health Organization, Washington, D.C., United States of America
[2] Ministry of Health, Brasilia, Brazil
[3] Hospital Italiano de Buenos Aires, Buenos Aires, Argentina
[4] International expert, Buenos Aires, Argentina

PAHO'S CONTRIBUTIONS TO THE G20 DEBATES ABOUT AI

Opportunities

AI encompasses several key domains with significant implications for public health. For example, computational vision and natural language processing enhance diagnostic capabilities and streamline patient communications. Voice recognition technologies facilitate accessible health care services for individuals with disabilities. Biosignal processing and bioinformatics analyze complex biological data, advancing disease understanding and treatment. Big data and predictive analytics empower public health officials to anticipate health trends and efficiently allocate resources. Robotics offers innovative solutions for surgical procedures and rehabilitation, improving patients' outcomes and operational efficiency.

AI products are revolutionizing public health through innovative applications. Automatic image detection aids in early diagnosis by identifying medical conditions in scans. Text processing technologies streamline the management of medical records and research data. Chatbots and conversational virtual assistants enhance patient engagement by providing real-time information and support. Precision medicine leverages AI to tailor treatments to individual genetic profiles, improving effectiveness and outcomes. AI-driven protein- and drug discovery accelerate the development of new therapies, making treatments more accessible. Computer-assisted surgery enhances precision in surgical procedures, reducing risks and recovery times. Clinical decision support systems provide health care professionals with data-driven insights, improving decision-making and patient care.

All of these AI products hold the potential to transform public health by making health care delivery more efficient, accurate and personalized (8).

AI is revolutionizing public health through numerous applications designed to enhance equity and efficiency. Tools to monitor access to care and equity ensure fair distribution of health services, addressing disparities among different populations. Predictive analytics allows for anticipation of health trends and outbreaks, enabling proactive measures. AI aids in mental health support through offering accessible, personalized care options. The automated management of health records streamlines administrative tasks, freeing up resources for patient care.

Systems for remote monitoring and chronic disease management facilitate continual patient care, especially for those with long-term health conditions. AI-driven tools enhance patient engagement and compliance by providing personalized reminders and educational resources. During emergencies, AI optimizes response times and resource allocation, potentially saving lives. Precision diagnostics and personalized medicine tailor treatments to an individual's needs, improving outcomes. Smart resource allocation ensures that health services and supplies are used efficiently. Data science turns vast amounts of health data into actionable insights. Virtual education and simulation models train health care professionals with real-time scenarios, enhancing their skills and preparedness. Tools to aid in language translation and cultural sensitivity make health care more accessible to diverse populations. AI also facilitates clinical trials and research, accelerating the development of new treatments and vaccines. Generative AI offers versatile applications, from drug discovery to personalized health advice.

These AI-driven applications highlight the transformative potential of technology in public health as it aims for a future in which health care is more equitable, efficient and effective.

Challenges

The adoption of AI across the G20 presents significant opportunities for and challenges to global health. While AI holds the promise of revolutionizing public health by improving diagnostic accuracy, optimizing resource allocation and personalizing medical treatments, it also raises several concerns among academics and governments. One major concern is the anthropomorphization of AI technologies, in which chatbots and virtual assistants take on human characteristics. This can lead to unrealistic expectations and an overreliance on AI for critical health decisions. Another significant risk is the occurrence of "hallucinations", in which AI systems generate incorrect or nonsensical outputs, potentially leading to harmful consequences in medical contexts.

The exponential mediatization of AI can result in misinformation and hype, eclipsing the realistic capabilities and limitations of these technologies. Additionally, biases in AI training data can perpetuate existing health disparities instead of mitigating them, which is a critical issue in ensuring equitable health outcomes. It is also impossible to entirely avoid the use of AI by the public, particularly patients, which can lead to overreliance on AI-generated information. The overuse of generative AI in scientific writing raises questions about the quality and integrity of academic research. However, this also presents a unique opportunity for low- and middle-income countries to increase their presence in academic publishing. By utilizing generative AI, researchers from these regions can overcome barriers related to resource access, potentially democratizing the production of scientific literature. This could enable a more diverse range of voices to contribute to the global health discourse, benefiting the entire scientific community.

Principles for ethical AI in public health

In order to ensure that AI serves the public health sector effectively and ethically, a set of core principles must be adhered to. AI solutions must be people-centered, respecting the rights and dignity of individuals and supporting human health workers rather than replacing them. Ethically grounded practices are essential, with all AI developments aligning with globally agreed principles, such as human dignity, beneficence, non-maleficence and justice. Transparency in AI development and implementation is critical, ensuring that processes are clear and understandable. Data protection is also crucial, and privacy, confidentiality and security must be foundational elements of every AI initiative. AI interventions must demonstrate scientific integrity, adhering to best practices that ensure reliability, reproducibility, fairness, honesty and accountability. Openness and shareability are vital for fostering collaboration and innovation, making tools and concepts as accessible as possible. AI must also be nondiscriminatory, and built on fairness, equality and inclusiveness. Last, human control over technology is mandatory, with formal processes in place for the review

and oversight of automated decisions to ensure they align with human values and ethical standards (8, 9).

Final reflections

As we harness the power of AI to transform public health, it is crucial to prioritize equity in AI development. If AI models are not trained on data from underresourced places, these populations risk being underserved by algorithms. Ensuring that AI models incorporate diverse data sets is not just an ethical imperative: it is essential for providing equitable health outcomes for all communities.

Global perspectives on AI emphasize the importance of closing gaps in health care. To achieve this, we must ensure that AI models are inclusive and representative of the diverse genetic, environmental and socioeconomic factors present across all populations. This approach will enable the delivery of personalized AI health interventions that are more accurate and effective.

Data diversity is key to making AI a positive force in health care. For instance, in cancer treatment, broadening the scope of data collection to include varied genetic and environmental factors can lead to more tailored and effective treatments. While AI has surpassed human performance in several benchmarks, such as image classification and natural language processing, it still lags in more complex tasks, such as competition-level mathematics and planning.

Focusing on these challenges and prioritizing inclusive AI development will ensure that AI technologies benefit all communities. This inclusive approach will help to bridge existing health disparities and create a more equitable and effective global health care system. The G20's commitment to these principles will be instrumental in driving forward these initiatives and achieving these goals.

Countries of the Americas were visionary when, in 2021, they approved a resolution calling for the implementation of a regional road map for the digital transformation of the health sector that includes AI and also for a policy for the use of data science and AI in public health (7, 8). Both policy documents were developed in response to the eight guiding principles for the digital transformation of the health sector (5). To ensure the rapid and secure adoption of AI in public health, it is essential to establish robust ethical guidelines and regulatory frameworks. The G20 countries must lead a coordinated effort to implement AI technologies responsibly and ethically. Such a unified approach will enable the global health community to fully harness the potential of AI while mitigating the associated risks. This will ultimately result in improved health outcomes worldwide and ensure that AI-driven innovations benefit all populations equitably. PAHO is ready to support countries in embracing this critical area, working in full collaboration and coordination with all its partners to achieve these goals (5–7).

REFERENCES

1. G20 Brasil 2024: building a just world and a sustainable planet [Internet]. Brasilia: G20; 2024 [cited 2024 Jun 8]. Available from: https://www.g20.org/en

2. Silva Jr. JB. Dr. Jarbas Barbosa's vision [Internet]. Washington (DC): Pan American Health Organization; 2024 [cited 2024 Jun 8]. Available from: https://www.paho.org/en/dr-jarbas-barbosas-vision

3. Pan American Health Organization. Q&A on artificial intelligence for supporting public health: reference tool to support the exchange of information and promote open conversations and debates. Washington (DC): PAHO; 2024 [cited 2024 Jun 8]. Available from: https://iris.paho.org/handle/10665.2/59315

4. Pan American Health Organization. Digital transformation toolkit: artificial intelligence. Policy overview. Washington (DC): PAHO; 2023 [cited 2024 Jun 8]. Available from: https://iris.paho.org/handle/10665.2/57947

5. Pan American Health Organization. Eight guiding principles for digital transformation of the health sector: a call to Pan American action. Washington (DC): PAHO; 2021 [cited 2024 Jun 8]. Available from: https://iris.paho.org/handle/10665.2/54256

6. Pan American Health Organization. CD59/7: Policy on the application of data science in public health using artificial intelligence and other emerging technologies. 59th Directing Council, 73rd session of the Regional Committee of WHO for the Americas. Washington (DC): PAHO; 2021 [cited 2024 Jun 8]. Available from: https://www.paho.org/en/documents/cd597-policy-application-data-science-public-health-using-artificial-intelligence-and

7. Pan American Health Organization. CD59/6: Roadmap for the digital transformation of the health sector in the Region of the Americas. 73rd session of the Regional Committee of WHO for the Americas. Washington (DC): PAHO; 2021 [cited 2024 Jun 8]. Available from: https://www.paho.org/en/documents/cd596-roadmap-digital-transformation-health-sector-region-americas

8. Pan American Health Organization. Artificial intelligence in public health. Digital transformation toolkit: knowledge tools. Washington (DC): PAHO; 2021 [cited 2024 Jun 8]. Available from: https://iris.paho.org/handle/10665.2/53732

9. World Health Organization. Ethics and governance of artificial intelligence for health: guidance on large multi-modal models. Geneva: World Health Organization; 2024 [cited 2024 Jun 8]. Available from: https://www.who.int/publications/i/item/9789240084759