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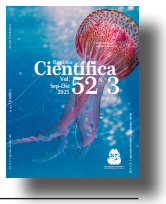

EDITORIAL

AI in Healthcare: Augmenting Care, Preserving Humanity

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Medicine is based on human expertise, experiential learning, and ethical judgment. However, in recent years, it has been supported by algorithms capable of analyzing large amounts of data with high speed and precision. While these technologies offer efficiency, accuracy, and accessibility, they also raise questions about trust, equity, and the role of healthcare professionals.

Artificial intelligence (AI) systems—specifically systems that operate on machine and deep learning platforms—are good at recognizing patterns in large datasets, but they do not possess inherent and actionable knowledge. This contrast brings a root cause of tension into the limelight: the need to incorporate algorithmic intelligence into the sphere, where human judgment cannot and will never be dispensed with. The new achievements of medical AI have been impressive. Deep networks are currently competitive or even superior to human professionals in applications like tumor detection in radiological images, the detection of diabetic retinopathy in retina scans, and the detection of cardiac abnormalities in electrocardiograms. Large language models (LLMs) can be helpful to clinicians by summarizing patient records, writing discharge notes, and offering evidence-based suggestions. These developments have resulted in an optimistic view that diagnostic errors can be reduced, the workload on clinicians can be minimized, and proper healthcare can be provided to underserved areas.

Nevertheless, the remarkable work of AI systems tends to conceal their threats. Most models are trained on filtered datasets, which might not reflect the variety of real populations. Data prejudices may perpetuate unfairness, leading to systematic underachievement among minority groups or marginalized populations. A model that has been trained mostly on urban hospital data might not work in a rural environment, and a model that has been trained on adult populations might not work with pediatric patients. Such failures are not only technical in healthcare; they can also have a direct impact on patient safety and outcomes.

Additionally, many AI models are hard to implement in clinical practice, since their nature is not transparent. Deep neural networks are often regarded as *black boxes* where predictions are not made based on reasoning. This lack of interpretability can undermine trust in the eyes of clinicians who have been conditioned to defend their actions, as well as in patients who demand to know the reason behind the decisions made. Accountability is not a choice in medicine: any diagnosis or intervention has ethical and legal consequences. When an AI system recommends a treatment that causes harm, then who is at fault: the physician, the developer, the institution, or the algorithm itself? Such considerations have contributed to the pursuit of human-oriented and human-in-the-loop concepts around medical AI. Instead of substituting clinicians, these frameworks focus on collaboration, wherein AI is used as an assistive

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resource and humans retain final judgement. Here, anomaly flagging, hypothesis generation, and/or case prioritization are performed by algorithms, and healthcare professionals assess, contextualize, and make decisions. Automation is not an end, but rather an augmentation, which implies enhancing human abilities without replacing clinical judgment.

However, AI has redefined the professional identity even in assistive roles. Clinicians might come to depend on algorithmic suggestions when systems have even greater capabilities. This dependency is dangerous in the long run, as it can lead to deskilling, meaning that practitioners will not be proficient in tasks that they do not undertake personally and with a certain regularity. Thus, the difficulty lies in finding systems that can accommodate learning and reflection, as opposed to passive acceptance. Medical workers need to know how to use AI tools, but also the assumptions, limitations, and possible modes of failure.

The discussion on the role of AI in healthcare pays significant attention to ethical aspects. The principles that steer the field of medicine include beneficence, non-maleficence, autonomy, and justice. It is significantly difficult to translate these values into algorithmic systems. To address these issues, the concept of *ethics by design* has become popular. This approach seeks to integrate ethics into the lifecycle of AI systems, which may include participatory design in healthcare, encompassing collaboration with clinicians and patients, strict bias assessment, the open description of model behaviors, and ongoing monitoring during implementation. Another crucial aspect is data privacy and security. Personal information includes genetic profiles, mental health history, intimate details of life, and healthcare data—which is among the most sensitive data types. Ensuring confidentiality and good analysis requires proper governance structures, secure moving structures, and explicit consent.

The implications of using AI in healthcare on a global scale further complicate the situation. In under-resourced scenarios, AI could help in bridging gaps by offering diagnostic assistance where experts are in short supply. Tools such as mobile-based screening can enable the early identification of diseases in the underdeveloped world. However, these advantages rely on fair access to technology, infrastructure, and training. Without proper planning, AI could further perpetuate existing disparities and focus the benefits on well-resourced areas at the expense of others.

New professional roles are bound to appear as AI systems gain a more active role in clinical processes. We might witness the emergence of the so-called *clinical AI supervisors*, who will oversee the work of models, interpret their results, and act as mediators between algorithms and professionals. Likewise, interdisciplinary teams encompassing medicine, data science, ethics, and law will also become necessary. Healthcare will cease to be the realm of clinicians to become a place of interaction between human and artificial agents.

As for the future, the goal must not be to construct completely autonomous medical systems, but to develop symbiotic intelligence. AI finds its power in the ability to work with scale and complexity, and human beings find theirs in empathy, moral judgment, and situational insight.

Consequently, AI in healthcare is not just a technological change, but a cultural and institutional shift. It compels us to think differently about how we diagnose, provide care, and make decisions.