EDITORIAL

Medical Leadership in the Era of Artificial Intelligence
Opportunities and Challenges for Sri Lanka

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Today, Artificial intelligence (AI) has become one of the most transformative technological developments in the world. Generally, AI refers to the capability of computer systems and algorithms to perform tasks that traditionally require human intelligence, including learning from data, recognizing patterns, generating information, making predictions and supporting decision-making.

Applications of AI are increasingly being used in healthcare in areas such as medical imaging, clinical decision support, health research, disease surveillance, health information management and patient communication.[1] The World Health Organization (WHO) recognizes the considerable potential of AI to improve healthcare delivery, while emphasizing that ethical principles, human rights, safety and accountability must remain central to its development and use.[1,2] AI has created enormous opportunities to improve the quality, efficiency and accessibility of healthcare. However, it also raises important concerns regarding professional responsibility and accountability, ethics, data security and the future organization of health services.

Medical leadership is fundamental to the effective functioning of any health system. Medical leaders are responsible for healthcare planning, managing human and financial resources, maintaining quality and patient safety, responding to diverse healthcare needs and ensuring that organizational objectives are achieved. In an increasingly complex healthcare environment with a large volume of data, medical administrators are required to make decisions while balancing competing demands and limited resources. Effective leadership therefore requires a combination of clinical knowledge, management skills, strategic thinking, communication, ethical judgement and the ability to adapt to change. The emergence of AI technologies offer opportunities to move towards more data-driven, predictive and responsive medical leadership.[3,4] However, AI should not be considered a replacement for medical leadership. Rather, it should be considered as an additional instrument that can strengthen human judgement, allowing medical leaders to make better-informed decisions while retaining professional accountability and ethical conduct.[1,4]

Healthcare institutions daily generate massive amounts of administrative and clinical data, including information on outpatient attendance, admissions, bed occupancy, waiting times, theatre utilization, laboratory workload, medicine consumption, staffing, referrals, patient complaints and clinical outcomes. AI can assist medical administrators in transforming these data into useful managerial intelligence. AI-supported systems could identify patterns in outpatient waiting times and help administrators recognize bottlenecks in patient flow. Similar approaches could assist in predicting medicine requirements, optimizing inventory

management and reducing wastage. In human-resource management, AI may support workforce scheduling and identification of staffing requirements according to workload patterns. Quality-management systems could use AI to identify adverse events, infection rates or patient complaints, allowing managers to investigate and intervene earlier. AI may also reduce the administrative burden associated with routine documentation, report preparation and summarization of large volumes of information. [3,4] These applications help move healthcare management from a predominantly reactive model towards an evidence-based proactive approach. However, the medical leader remains responsible for interpreting AI-generated information within the clinical, organizational, ethical and social context. [1,2,4]

Despite these opportunities, significant barriers and limitations must be considered before widespread application of AI in the Sri Lanka's healthcare system. The first and perhaps most fundamental challenge is the availability and quality of health data. AI systems depend on reliable, standardized and timely accessible data, whereas healthcare related data in Sri Lanka is heavily dependent on paper-based records and manually generated reports. Inconsistent data formats, incomplete records and limited interoperability between information systems can significantly reduce the reliability of AI-generated outputs. The availability of digital infrastructure, including adequate hardware, connectivity, data security and appropriate software platforms, is also a vital aspect, particularly in resource-constrained settings. Financial constraints may make it difficult for hospitals to invest in sophisticated AI technologies in a sustainable manner. There are also important concerns regarding patient confidentiality, data protection and cybersecurity. [1,2] AI models can have adverse effects on systems especially when they are developed using datasets from high-income countries and introduced into Sri Lanka without adequate local validation. In addition, many healthcare professionals and administrators may have limited knowledge of AI and may either underutilize its potential or place excessive confidence in its outputs. Resistance to technological change, concerns about job displacement, uncertainty regarding professional accountability and the absence of clear institutional policies governing the use of generative AI may further limit responsible adoption.[1,2,5] These challenges demonstrate that successful AI adoption is not simply a matter of purchasing technology; it requires organizational readiness, appropriate governance, reliable data and capable leadership.

Overcoming these barriers requires a well-coordinated and context-specific approach rather than attempting to introduce AI across the entire health system simultaneously. Sri Lanka, as a middle-income country should first identify clearly defined healthcare and management problems where AI can provide effective outcomes. Pilot projects in areas such as outpatient waiting-time management, hospital bed utilization, medicine forecasting, human-resource planning, disease surveillance and hospital performance monitoring could provide valuable local evidence before wider implementation. Such initiatives should be evaluated against clearly defined indicators of effectiveness, efficiency, quality, safety, equity and cost. Strengthening digital-health infrastructure and improving the quality, standardization and interoperability of health

data should be considered a priority. The development of national policies of governance mechanisms addressing data privacy, cybersecurity, accountability, transparency and appropriate human oversight of AI-supported decisions should be considered a priority. [1,2] The WHO emphasizes that humans should remain in control of healthcare systems and medical decisions and that AI should be subject to appropriate safety, accountability and oversight mechanisms.[1,2] Medical administrators and healthcare professionals therefore need basic AI and data-literacy training so that they understand both the capabilities and limitations of these technologies. AI should become part of continuing professional development and leadership training rather than being regarded exclusively as a technical subject for information-technology specialists. Collaboration among the Ministry of Health, universities, professional organizations and technology experts will be essential for developing locally appropriate solutions. Importantly, Sri Lanka should avoid adopting AI systems simply because they are technologically advanced or fashionable. Every AI implementation should therefore be assessed according to whether it produces meaningful improvements while remaining economical, safe, equitable and ethically acceptable. A phased approach based on evidence, evaluation and learning would allow Sri Lanka to gain the benefits of AI while minimizing avoidable risks.

The future of medical leadership will inevitably be influenced by AI. Medical administrators of the future are likely to work in organizations in which routine data analysis, forecasting, reporting and some administrative processes are increasingly supported by intelligent digital systems. This does not mean that human leadership will become less important; but, its nature will change. The future medical leader will need to be digitally literate, able to critically evaluate AI-generated information, understand data and manage technological changes aligning with the values of healthcare. [1,2,4] The core challenge will be to achieve the right balance between technological capability and human judgement. AI can process information rapidly, identify patterns and generate predictions, but it cannot replace empathy, ethical aspects, professional accountability and responsibility, interpersonal relationships and an understanding of the social context in which healthcare is delivered.[1,4] Medical leaders must therefore embrace AI with an understanding of the realities of the Sri Lanka's healthcare system. The future belongs not to machines leading healthcare, but to healthcare leaders who are capable of using machines wisely, ethically and effectively to achieve better health for the people of Sri Lanka. For Sri Lanka, the objective should therefore not be to create an "AI-driven" health system, but a **'Human-centred health system enhanced by responsible AI'.**

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