Artificial Intelligence in healthcare: Benefits and challenges

The South African Medical Journal (SAMJ) team is delighted to present to our readers the first issue of SAMJ Specialties, themed Artificial Intelligence (AI) in Healthcare. The articles published in this issue are adapted from the first AI Roundtable convened by the South African Medical Association (SAMA) in December 2024.

Recognising that AI has disrupted various sectors globally—with healthcare among the most significantly affected—SAMA's roundtable brought together key stakeholders, including healthcare professionals, AI experts, policymakers, and academics, to explore the potential, challenges, and ethical considerations of implementing AI in the South African healthcare system. Discussions focused on identifying actionable steps to leverage AI to improve healthcare outcomes while ensuring equity and accessibility. The current state of AI and technology was explored, along with opportunities for AI to address healthcare challenges, ethical, legal, and social issues, capacity building and infrastructure, strategic partnerships, and funding. Although many presentations were delivered at the roundtable, we have selected six articles—both local and international—for publication in this issue.

South Africa National Artificial Intelligence Policy Framework

Shortly before the roundtable, the South Africa National Artificial Intelligence Policy Framework was released in August 2024. [1] While several of the articles in this issue refer to the framework, we provide a synopsis here, highlighting its key points.

This framework marks a first step in the development of a comprehensive national AI policy. It aims to promote the integration of AI technologies to drive economic growth and enhance societal well-being. Since 2020, AI has advanced rapidly and is now recognised as a general-purpose technology (GPT) due to its wide-ranging impacts across sectors and its potential to transform economies and societies.

The framework emphasises that AI's transformative potential must be embraced, and opportunities across all sectors must be leveraged. At the same time, critical national challenges must be addressed. Its primary objective is to strategically advance a robust AI ecosystem through coordinated efforts in research and development, talent cultivation, and infrastructure enhancement. Through this holistic approach, AI is envisaged as a catalyst for a digital society, digital economy, and digital inclusion—ensuring benefits for all South Africans.

To fully realise the potential of AI, careful consideration of ethical, social, and economic implications is required, ensuring that AI benefits are broadly shared, and risks effectively managed.. The framework underscores a commitment to ethical AI development and use. AI systems must be transparent, accountable, and designed to promote fairness while mitigating biases. Strong data governance frameworks are essential to protect privacy and enhance data security, alongside the establishment of standards for AI transparency and explainability to foster trust among users and stakeholders.

The importance of human-centred AI is a key theme, with AI applications expected to augment, not replace, human decision-making. Safeguarding professional responsibility and promoting human values are essential to aligning AI development with societal and ethical considerations. Capacity building and economic development are supported through AI education and training programmes, support for AI startups, and facilitation of public–private partnerships. The framework also calls for the development of measures to enhance cybersecurity and protect AI systems from malicious threats.

The "push of the present" regarding AI revolve around quantitative factors and patterns that shape the future. With AI technologies evolving rapidly worldwide, South Africa must adopt innovations to remain competitive and avoid lagging behind in technological capabilities. AI offers significant potential for economic growth by enhancing productivity, creating new industries, and fostering innovation. Embracing AI can stimulate South Africa's economic development, generate employment opportunities, and strengthen overall economic resilience. Additionally, there is increasing social demand for AI-driven solutions in key sectors such as healthcare, agriculture, education, and public safety.

AI can offer innovative solutions to societal challenges, enhancing service delivery and improving quality of life. Global trends in AI governance, along with the need to harmonise with international standards, are placing pressure on South Africa to develop its own AI policies that align with these norms to ensure ethical and effective AI deployment.

However, several obstacles and entrenched structures continue to impede progress and resist change. It has been noted that South Africa has struggled to address its historical challenges, which include:

Digital divide: Persistent inequalities in access to technology and education pose a major challenge. Bridging this divide is essential to ensure equitable AI adoption and benefits.

Historical inequities: Socioeconomic disparities rooted in historical injustice may impede AI adoption. Inclusive policies are needed to ensure broad access to AI's benefits.

Institutional inertia: Resistance to change within established institutions and bureaucratic structures can delay the adoption of new technologies. Strong leadership and policy direction are needed to overcome this.

Regulatory frameworks: Existing legislation may be ill-equipped to deal with the fast pace of technological change. Reforms are essential to support a conducive environment for AI development.

The framework further stresses the importance of fairness and bias mitigation to enable equitable deployment of AI. This includes developing methods to identify and minimise bias in AI systems and ensuring the use of inclusive data sets that represent all demographics.

A human-centred approach is required—AI must remain under human control. Critical decisions, especially in generative AI systems, must involve human oversight, aligning with the concept of Human-in-the-Loop systems. AI decision-making frameworks must prioritise human judgement.

In conclusion, the framework advocates for human-centric AI solutions that prioritise the needs and well-being of all South Africans, ensuring that AI advances lead to tangible improvements in quality of life and societal development.

About SAMJ Specialties

The SAMJ is South Africa's premier general medical journal, publishing high-quality research across a wide range of medical disciplines. However, some submissions—while valuable—fall outside the scope of the SAMJ's core focus and are declined for publication. Additionally, the rapid evolution of healthcare technologies, particularly AI, calls for a dedicated platform to showcase innovations and best practices in this area.

In response, SAMJ Specialties has been launched—a quarterly publication designed to feature specialised medical research and innovation in healthcare. We hope you find this publication valuable, and we look forward to your future contributions to SAMJ Specialties.

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1. Department of Communications and Digital Technologies, South Africa. South Africa National Artificial Intelligence Policy Framework. Pretoria: DCDT, 2024. https://www.michalsons.com/wp-content/uploads/2024/09/South-Africa-National-AI-Policy-Framework.pdf (accessed 20 May 2025).