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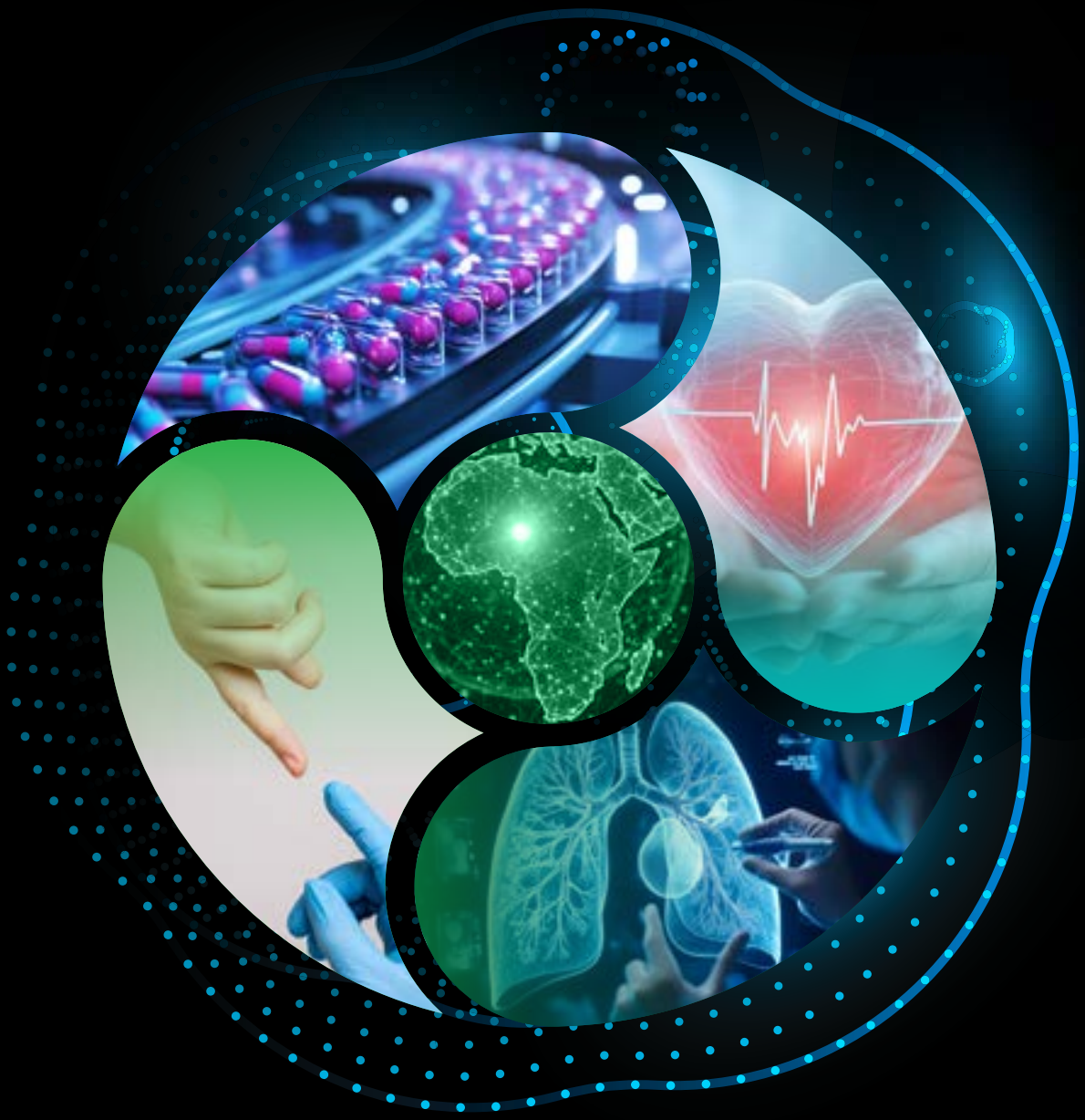

Putting care back into healthcare by driving efficiencies in the sector

October 2025

Introduction

Our 2025 Global Health Care Outlook speaks of an inflection point that many healthcare systems across the world have reached. Constrained budgets, ongoing staff shortages as well as pressures to implement new technologies and to respond to evolving patient preference and expectations characterise the conditions under which many healthcare professionals have to operate. This often results in or aggravates burnout and other mental health issues among healthcare professionals.

South Africa's two-tiered, and highly unequal, healthcare system adds additional complexity. While it should be without a question, that we should thrive towards universal and equitable access to quality healthcare, the ongoing uncertainties related to the implementation of the National Health Insurance (NHI) sometimes risk clouding our view on the way forward.

Regardless of which healthcare system we choose or how we might configure it in the future, improving efficiency should be a key priority to ensure more equitable and universal access to healthcare.

Given ongoing advancements in the field, we regard artificial intelligence (AI) and emerging technology in general as key enablers to unlock efficiencies in the healthcare sector. Especially, areas related to workforce and its well-being, procurement and supply chain as well as the patient journey and engagement should be at the forefront of technology-enabled efficiency enhancements.

Innovative healthcare solutions form a critical component for creating a more supportive work environment, especially in light of staff shortages.

To ensure the desired outcomes, the introduction of innovative solutions needs to be accompanied by adequate training capacity development.

Procurement/supply chain

Effective inventory management of pharmaceuticals and other consumables is critical for advancing supply chain performance and improving healthcare outcomes. However, issues including stockouts, overstocking, and expiry-related wastage derail progress and often lead to reduced quality of care and wasteful expenditure.

Traditional procurement processes are often paper-based, fragmented, decentralised and vulnerable to inefficiencies, irregularities or human error. The current processes also often rely heavily on human interventions and hence consume a large share of health professionals' time. Introducing technology and AI-powered tools can greatly reduce the need for human intervention, freeing up time and enhancing supply chain performance.

However, the successful development of these tools, will also require the upgrading of implementation infrastructure and the establishment of safeguards and assurance to give confidence back into the system.

Select applications

AI-supported demand forecasting

The deployment of AI-powered machine learning tools, that can analyse and learn from historical usage, population health data, seasonality and epidemiological trends, can help to predict future demand of medicines and consumables. These forecasts could support the procurement departments of the respective entities responsible for stock management, helping them to avoid stockouts or overstocking.

However, for such a system to be efficient and effective it requires reliable data and the integration of various systems to create a transparent supply chain.

IoT and cloud platforms for real-time inventory visibility

Low-cost internet of things (IoT) sensors and cloud-based dashboards that track critical factors such as inventory levels, expiry dates, and cold chain compliance across central and peripheral facilities can be deployed to collect critical datapoint that can create real-time inventory visibility and can be used to establish a data-driven, automated and just-in-time replenishment system that requires little human intervention.

Reducing the need for human intervention, will also reduce the risk of classification errors of stock or duplications of product codes. Furthermore, systems that use IoT sensors and could-based dashboards, are less likely to use free text that is prone errors or ambiguity but rather use standardised product classification codes such as United Nations Standard Products and Services Code (UNSPSC). This will enhance the data credibility of the system making it more reliable and efficient.

E-tendering and automated procurement workflows

The current tender process heavily relies on human intervention and judgement and hence is vulnerable to bias, favouritism and fraud.

Digitising procurement through e-tendering tools and AI-powered workflow management can significantly increase speed, transparency and compliance in the procurement space. Automated systems, that do not require much human intervention, streamline documentation, enforce adherence to standard procedures and flag irregularities in real time. This reduces delays, human errors and opportunities for undue and irregular human interventions. It also helps with identifying fraud and corruption at an early stage.

By integrating tender notices, bid submissions, evaluations criteria and outcomes as well as awarded contracts into a centralised digital platform, healthcare institutions can enhance oversight, ensure compliance, and shorten procurement cycles. Like other sectors where bureaucratic inefficiencies and irregularities can lead to stockouts and service delays, e-procurement offers a critical tool towards more responsive, accountable and transparent supply chain operations.

Given the benefits of e-tendering and AI-powered workflows, the strengthening of public procurement process by adopting a more technology-driven approach as per Public Procurement Act (Act 28 of 2024)[i] is a welcomed step into the right direction as it allows suppliers to submit bids electronically, enhancing transparency and efficiency in procurement by focusing on electronic submissions and automated compliance checks. Given that parts of the evaluation process is still rely on human intervention, there remains room for undue bias and manipulation. Therefore, further expanding technology use in the bid evaluation process could reduce such risks greatly.

Smart supplier management and risk scoring

Supplier management is often a bureaucracy-heavy process, consuming a lot of time that could be spend on care-related activities. Deploying AI-powered tools can strengthen supplier oversight and accountability in the healthcare procurement system. By analysing historical delivery performance, contract compliance, and risk indicators, AI-driven platforms can generate dynamic risk scores for suppliers, helping procurement officials identify underperforming vendors, detect potential fraud, and avoid supply chain disruptions. This data-driven approach not only enhances transparency but also enables strategic sourcing decisions that prioritise reliability and value over price alone. In a sector often constrained by capacity and governance challenges, smart supplier analytics can shift procurement from reactive and slow process to proactive, performance-based management.

Blockchain for transparent and tamper-proof transactions

Like any other system which deals with large budgets and high volumes of transactions, the healthcare system is not immune to human error, mismanagement, fraud and corruption.

Blockchain technology presents an opportunity to increase transparency and trust in the healthcare procurement system. By creating an unchangeable, decentralised ledger of procurement transactions, blockchain ensures that every bid, contract award, delivery record, and payment is securely documented and remains tamper-proof. This reduces opportunities for fraud, minimises human error, and enables real-time auditability by oversight bodies and creates transparency for stakeholders.

In a context where procurement irregularities can undermine efficiency and public confidence, blockchain can act as a digital safeguard, supporting cleaner governance, improved accountability, and ultimately more equitable and cost-effective delivery of critical medical supplies. While the use of blockchain technology can help to democratise the procurement process, it is important that transparency around the use of such technology is ensured whenever it is deployed.

Workforce

In global surveys, healthcare professionals often feature among the workers most likely to experience burnout or struggle with mental health issues. While burnout and mental health issues should be taken seriously among all professions, these issues should receive special attention in the healthcare profession. Burnout among physicians and other health professionals can lead to suboptimal patient care and could lead to medical errors that potentially impact the lives of the patients.

Furthermore, it could lead to poor decision making resulting in malpractice and even costly litigations that divert scarce resources away from the core objective of healthcare facilities.

The factors contributing to workplace stress and burnout are manifold and include understaffing, long hours, poor work-life balance, a lack of resources and a high administrative burden with a lot of low-value tasks. Due to these factors, healthcare workers often spend a disproportional large share of their time on non-care functions which potentially reduces work satisfaction and motivation among care professionals. The authors of an article in the *American Journal of Medicine* estimate that doctors in intensive care units spend as little as 15-30% of their time on attending to patients and a large share of their time on low-value administrative tasks.[ii] Among such administrative tasks is transcribing of doctor-patient conversations, generating draft clinical notes, and integrating them into electronic health records (EHRs) by digital scribes.

Ignoring the current realities of healthcare workers is very risky as it might lead to high levels of absenteeism or even the exit of staff from the sector. While not always immediately feasible, the deployment of AI-powered solutions and other emerging technologies might offer a pathway to reduced stress and increased job satisfaction among care workers.

Select applications

Automating administrative burdens

Healthcare workers often perform certain tasks including appointment scheduling, patient data entry, insurance verification, billing and general record-keeping, frequently and often manually. Such repetitive tasks can be very time consuming and divert the professional's time away from caring for patient. AI-powered tools that utilise Robotic Process Automation (RPA), Natural Language Processing (NLP) and chatbots can reduce clinician overload by automating these repetitive tasks freeing up time for patient care and reducing stress. Often these tools are relatively low cost and are offered in open-source or low-code options, making them accessible to health professionals with basic digital skills or low digital literacy.

However, it might be challenging to integrate these automation tools with outdated hospital systems or at facilities with poor IT infrastructure and capacity.

AI-assisted clinical decision support and diagnostics

Reliable and accurate diagnostic is an essential element of creating the right treatment plan for patients and ultimately leading to the best possible patient outcome in a cost-effective manner. However, the pressure to diagnose patients accurately in a resource-constrained setting may lead to decision fatigue.

Furthermore, when physicians work long hours in a high-pressure environment, the likelihood of making errors may increase.

AI-powered machine learning models can support physicians with speeding up diagnostics and help to lower the burden on specialists. While powerful, these systems often require advanced IT infrastructure, clean and well-structured electronic health record (EHR) data, and high upfront investment. In many public healthcare facilities these conditions are not always guaranteed.

Despite the high requirements of these systems, they should not be fully discounted as potential assistance for stressed physicians. In a first step, healthcare facilities should trial low-cost mobile diagnostic apps to upskill their staff and identify areas where such tools can have the biggest impact in the absence of advanced IT infrastructure or well-structured EHR. Researchers from the Stellenbosch University participate in a trail that tests AI-powered diagnostics for tuberculosis diagnosis and triage. The focus on diseases such as TB, which is very prevalent in South Africa, is a good way to scale the rollout of AI-powered diagnostics and to free-up much needed resources.

Furthermore, these low-cost mobile apps are easier to rollout in rural or remote areas where high upfront investments might be difficult to justify.

Predictive analytics for workforce management

A deterministic approach, which considers health workforce supply and demand, is often adopted for workforce management in the healthcare sector. However, given staff shortages or uneven supply across various locations, this approach has limitations and might enhance stress and burnout among healthcare workers. In contrast to deterministic models, stochastic models are flexible enough to introduce random variables throughout the planning process making it more adaptable to changing circumstances including changes in demography or disease profiles. This stochastic planning models often rely on digital technologies and reliable data.[iii]

The advantages of such systems are that often workforce data already exists and that it won't need highly sophisticated AI tools to start showing value. Overall, healthcare facilities can use data-driven insights to predict staffing needs, optimise shift schedules and pre-empt burnout by flagging high-risk patterns among healthcare workers. However, to unlock the full potential of predictive analytics in workforce management, existing silos need to be broken down and the digital maturity in public sector HR departments needs to be further strengthened.

Remote monitoring and virtual care tools

Many countries face a shortage of healthcare workers. Often this issue is more pronounced in rural or remote areas, where especially specialists are often in short supply. These shortages can lead to heightened workloads and stress or low quality of care. AI-enabled remote patient monitoring (RPM), telemedicine platforms, and IoT devices can ease the burden on hospital infrastructure and staff by reducing unnecessary in-person visits, especially in rural or resource-constrained areas.

With increasing mobile and internet penetration, remote care via messenger apps, SMS, and basic IoT tools is already being trialled. However, given that rural areas still face connectivity issues in some parts of the country, infrastructure investments will be required to further scale such services.

Personalised learning and digital training platforms

Continuous training and upskilling are vital to keep up with rapid developments in technology.

Furthermore, tailored professional development programmes and micro-learning can play a critical role in career progression and in enhancing job satisfaction among healthcare professionals. AI-powered training platforms can provide healthcare workers with personalised learning paths, improving clinical skills efficiently and reducing stress from knowledge gaps or overwhelming generic continuing professional development programmes. Among the advantages of AI-based learning platforms is their scalability and customisability that matches training to roles and their needs.

However, to unlock the full potential of such learning solutions, investments into mobile internet infrastructure and digital literacy is required. Furthermore, self-paced and micro-learning should not become another burden or stress-causing factor and hence needs to be well balanced with other work and personal commitments of healthcare professionals.

Virtual mental health support for staff

In addition to reducing workload, cutting low-value tasks and managing staffing, AI-driven tools can also be used as digital wellness platforms or virtual therapists that can provide scalable, confidential mental health support tailored for frontline workers facing emotional strain. Such digital services are typically available whenever and wherever a healthcare work needs to access them. Some of the existing tools are free of charge and readily available. Given that these tools do not require physical engagement with a therapist and that they are confidential, also makes them attractive in environments where seeking help for mental health issue is still stigmatised.

Patient journey and engagement

As highlighted in our Africa Healthcare Outlook 2024, many poor patients incur additional – and often avoidable - costs related to the travel to healthcare facilities, long waiting times and loss of income when seeking medical assistance. To minimise such additional costs, it is vital that patients seek assistance at the right point of care and at the right time. This also includes that referral pathways are streamlined to ensure continuity of care across different levels of healthcare services.

Another challenge along the patient journey is the high level of non-adherence to treatment schedules. This often leads to poor health outcomes, increased hospitalisations, and overall higher healthcare costs. This is in particular a major problem among patients with chronic health conditions or severe illnesses such as tuberculosis (TB).

AI-powered and other digital tools can play a powerful role in enhancing the patient journey and improve their engagement along the journey.

Select applications

Intelligent triage and virtual assistants

For many poor people, falling ill and needing medical assistance can be a very costly experience. In addition to the cost of healthcare and medication, travelling to a health facility, waiting in long queues, forgoing income add an additional financial burden. Accessing the right point of care does not only save patients from wasting money and time by travelling to multiple locations, but it also potentially reduces waiting times and overcrowding as patients do not queue at the wrong point of care in vain.

Our Improving access to healthcare in Africa: Innovations and lessons for driving success report showcases virtual assistants can recommend the right point of care to patients without them physically going to a healthcare facility or pharmacy. AI-powered chatbots and voice assistants can guide patients through symptom checking and then guide to the correct point of care. Such systems could also be integrated into a central appointment scheduling system that triages patients according to the location and severity or urgency of treatment. Furthermore, virtual assistants could be deployed for post-visit follow-ups, making additional visits to a healthcare facility redundant.

The advantage of such systems is two-fold, it saves patients time and money, and it frees up time of frontline staff.

Digital queuing and patient flow management

In addition to direct patients to the right point of care, digital queuing and patient flow management systems can help to guide them within the healthcare facility. This will reduce the risk of patients queuing at the wrong service point or missing a step in their patient journey. Ultimately, such systems could cut waiting times and improve communication about delays, leading to a much better, more dignified and transparent patient experience.

Mobile-based remote monitoring and follow-up

Mobile-based remote monitoring and follow-ups present an innovative and scalable opportunity for the healthcare sector. It could enhance patient engagement, improve outcomes, and reduce systemic strain. By leveraging widespread mobile phone penetration, even in low-income communities, healthcare providers can remotely track patients' vitals, medication adherence, and recovery progress after consultations or treatment. This enables early intervention in case of complications and ensures continuity of care, especially for patients in rural and underserved areas. Mobile-based remote services reduce the need for frequent in-person visits to healthcare facilities, alleviating transport burdens for patients and reducing overcrowding at healthcare facilities.

For the patients, this could translate into more personalised, accessible, and responsive care. Regular mobile-based check-ins via SMS, messenger apps or dedicated health apps create a sense of connection to healthcare providers and empower patients to take an active role in managing their health. For chronic disease management, such as HIV, TB, hypertension or diabetes, mobile follow-ups can noticeably improve adherence to treatment schedules and long-term health outcomes. For the health system, these tools offer cost-effective scalability, real-time data collection, and the potential to integrate predictive analytics for population health planning. In a context of limited resources, mobile technology enables the public sector to do more with less, delivering care that is proactive and preventative instead of reactive.

Predictive analytics for proactive care

Predictive analytics has the potential to significantly enhance proactive care in the public healthcare system by shifting the focus from reactive treatment to preventive interventions. By analysing data from electronic health records, demographic trends, environmental factors, and social determinants of health, predictive models can identify individuals or demographic groups at high risk of developing chronic conditions such as diabetes, hypertension, or tuberculosis. This allows to target high-risk groups with early screening, lifestyle interventions, or community-based education before conditions escalate into costly hospitalisations.

In resource-constrained settings, predictive analytics can also help optimise the allocation of medical staff and supplies by forecasting patient volumes, disease outbreaks, and medication demand. For example, a predictive model could anticipate spikes in asthma-related emergency visits due to seasonal air pollution, enabling clinics to stock required medication and prepare staff accordingly. Predictive models could also be linked to weather forecasting tools, allowing them to predict medical emergencies related to, for example, heatwaves or storms.

Ultimately, predictive analytics could enable the healthcare system to act earlier and smarter, improving health outcomes while containing costs and reducing stress due to inadequate staffing.

In the public healthcare context, the implementation of predictive analytics for proactive care is feasible but faces several significant challenges. On the positive side, South Africa already collects substantial health-related data through systems like the District Health Information System (DHIS). With increasing mobile and internet penetration, especially via public-private partnerships, there is a foundation to build on. Moreover, the National Digital Health Strategy for 2019-2024 outlines ambitions to use data and AI to improve service delivery[iv], which can form the foundation of a widespread use of predictive analytics.

However, sizeable investments into data quality and integration, reliable digital infrastructure, digital literacy and sufficient budgets will be required to rollout predictive analytics across the country.

Personalised health communication and education

Given the potential benefits of proactive care such as decongestion of healthcare facilities, reduction of costs and improved healthcare outcomes, AI-powered and other digital technologies can play a powerful role in enhancing communication and healthcare education.

For instance, automated messages could remind patients with chronic diseases to adhere to their treatment plans and educate them on lifestyle changes that could support the management of the chronic condition. Furthermore, the creation of dynamic personal healthcare pathways could incentivise or reward individuals for achieving personal health goals or for taking proactive health actions. According to the World Health Organisation, South Africa experiences a high burden of non-communicable diseases (NCD), such as diabetes, cardiovascular diseases, cancer and hypertension, in addition to a high communicable disease burden from TB and HIV.

To educate and promote for early interventions or preventative measures such as lifestyle and dietary changes, natural language processing (NLP) and machine learning could be leveraged to deliver tailored health education (in multiple South African languages) via SMS or mobile platforms.

While these digital tools offer a low-cost but high-impact intervention that could reduce clinical loads, enhance outcomes and could redirect resources towards more complex needs, challenges to infrastructure limitations and unequal access to mobile technology needs to be addressed. In low-income communities, affordability of smartphones and data remains a key challenge; therefore, mobile health communication needs to be tailored to such circumstances.

Conclusion

While the effective deployment of AI often requires access to high-speed and reliable connectivity, this condition is not always met across the country – especially in rural areas. Therefore, the choice of solution needs to be carefully considered.

Given the responsibility of provincial health departments to deliver health services, a viable option to address connectivity-related issues will need a provincial approach.

As with other tech-implementation projects, change management is critical to secure the required buy-in from stakeholders across the value chain.

Bottom line for C-suite leaders:

- Start with low-cost, high-impact tools like mental health support, digital administration automation, and basic workforce analytics.
- Leverage public-private partnerships, NGO funding, and philanthropy to pilot more ambitious technologies.
- Prioritise change leadership and ethical deployment to ensure buy-in and sustainability.

i https://www.parliament.gov.za/storage/app/media/Acts/2024/Act_No_28_of_2024_Public_Procurement_Act.pdf
ii https://www.amjmed.com/action/showCitFormats?doi=10.1016%2Fj.amjmed.2018.03.015&pii=S0002-9343%2818%2930296-1
iii https://journals.co.za/doi/full/10.10520/ejc-ajpa_v12_n3_a2
iv https://www.health.gov.za/wp-content/uploads/2020/11/national-digital-strategy-for-south-africa-2019-2024-b.pdf
v https://data.who.int/dashboards/ucn

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