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The future of healthcare has arrived

How Middle East healthcare players can respond

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EXECUTIVE SUMMARY

Artificial intelligence (AI), mobile apps, telemedicine, and other advances are creating a world in which care is based on data, and is accessible anywhere, anytime.

Technological innovation and broader societal changes are shifting the balance of power in healthcare from providers to patients, creating forces that industry stakeholders cannot ignore. Providers under pressure to manage costs are looking for ways to become more agile, and provide care more effectively. The same wave of personalization and consumerization that ushered in analytics-based recommendation engines for entertainment has programmed people to want healthcare that is customized, personalized, and delivered in a way that works with their lives. The COVID-19 pandemic has intensified these developments.

To make the most of the opportunities that these forces represent, Middle East governments, regulators, and healthcare providers need to work together in four areas: strategy, policy, and regulation; governance and partnerships; funding and financing; and information and communication technology (ICT).
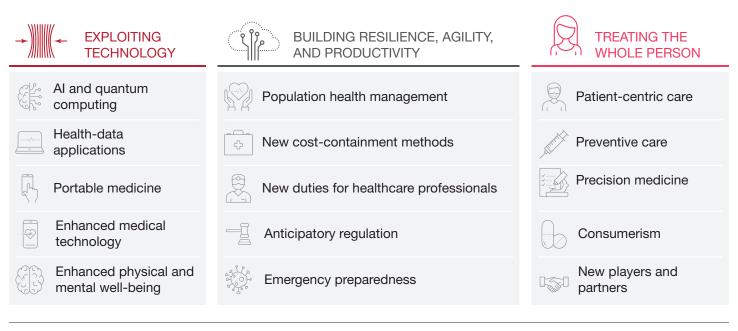
In particular, governments should join with public-sector agencies and other entities to create frameworks that accelerate healthcare transformation, and that provide the necessary funding and data resources. Regulators should revise policies and standards to put new healthcare regulations into effect faster. They must develop a national strategy for healthcare innovation that incorporates specific policies, regulations, and standards. Healthcare providers should continue putting patients at the center of all they do while simultaneously cultivating partnerships, and improving their financial and digital acumen.

THE THREE FORCES RESHAPING HEALTHCARE

The response to the COVID-19 pandemic unleashed a wave of healthcare advances unparalleled in recent history. Consumer products companies retooled manufacturing lines to produce personal protective equipment. Healthcare providers switched to video calls to treat patients when lockdowns canceled in-person appointments. Pharmaceutical companies rushed vaccines through the development process in record time, with a similarly swift response from regulators.

The pandemic accelerated three forces that had already been reshaping healthcare: the increased use of technology; a need for healthcare delivery to be more resilient, agile, and productive; and consumerization, personalization, and the imperative to treat the whole person (*see Exhibit 1*).

EXHIBIT 1
Three forces are reshaping healthcare

EXPLOITING TECHNOLOGY	BUILDING RESILIENCE, AGILITY, AND PRODUCTIVITY	TREATING THE WHOLE PERSON
AI and quantum computing	Population health management	Patient-centric care
Health-data applications	New cost-containment methods	Preventive care
Portable medicine	New duties for healthcare professionals	Precision medicine
Enhanced medical technology	Anticipatory regulation	Consumerism
Enhanced physical and mental well-being	Emergency preparedness	New players and partners

Source: Strategy&

Exploiting technology

New technologies are creating a world in which care is based on data, and is accessible anywhere, anytime. Healthcare is taking advantage of technology to move beyond the hospital, clinic, and pharmacy, and into the virtual world.

AI and quantum computing
AI and quantum computing are among the technologies that hold the most promise for healthcare. AI helps providers come up with faster, more accurate, less invasive diagnoses, in many cases based on less information from an individual patient, and less invasive procedures. An algorithm codeveloped by Google's AI unit DeepMind, for example, is more accurate than doctors at diagnosing breast cancer from scanning mammograms.[1]

AI was used extensively during the COVID-19 pandemic for screenings, contact tracing, and predicting people's risk of developing the virus.[2] Medical providers also have used AI to help with diagnosis of the virus, repurpose existing drugs to treat it, and manage healthcare supplies.[3]

Quantum computing will be able to process information more accurately and efficiently than most traditional computers. This allows healthcare providers to speed up calculations used in drug discovery and hospital logistics, run virtual clinical trials, and perform genetic sequencing, among other things.[4] Quantum computing could one day run clinical-decision support systems, allowing clinicians to analyze petabytes of historical data to make better patient care decisions.

Health data applications
Devices and applications that collect health data have become ubiquitous. Apps for smartphones and smartwatches can measure blood oxygen level, take a pulse, and if needed, dial emergency services. A phone's location history can measure the outcome of a treatment regime or identify potential health risks. Payors have begun to offer people incentives to use mobile devices to track and share health data to provide better care.

The pandemic kicked off widespread development of contact tracing mobile apps. It also led to increased demand for data and connectivity infrastructure worldwide, and an increase in collaborations between health workers, app developers, and data scientists.

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Healthcare is taking advantage of technology to move beyond the hospital, clinic, and pharmacy, and into the virtual world.

Portable medicine

If mobile devices are a new way to collect healthcare data, portable medicine is a new way to deliver it. Telemedicine, in which providers treat patients over phone or video, is one such delivery method. Healthcare providers switched to telemedicine and remote patient monitoring when pandemic-related lockdowns curtailed face-to-face appointments. With infrastructure in place, and demonstrated advantages including convenience and accessibility, providers are likely to continue to deploy telemedicine as part of a hybrid delivery model.[5]

In the future, portable medicine may also include devices with algorithms that help patients manage chronic conditions. For example, these devices could show people with diabetes what food to eat to stabilize their blood sugar based on their current insulin levels.
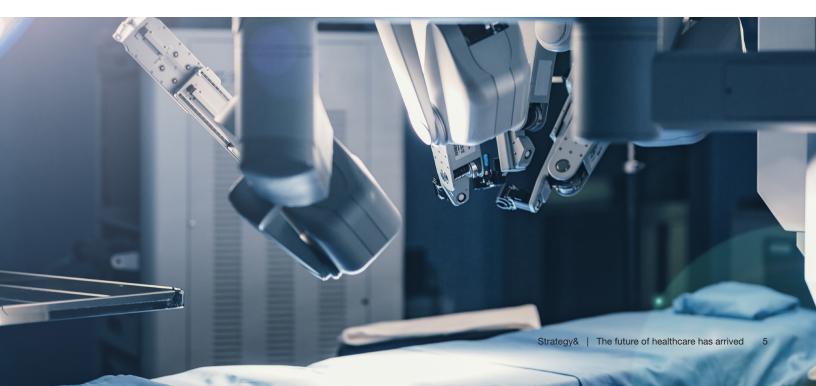
Enhanced medical technology

Healthcare facilities are using sophisticated medical technology (medtech) such as 3D printing to create prosthetic limbs and 4D artificial organs printed from living tissue to replace organs that no longer function. Other medtech, such as nanotechnology and proton therapy, serve as alternatives to traditional surgery, making treatments safer and less invasive.

Treating COVID-19 patients and protecting healthcare staff accelerated the development of a range of enhanced medtech, including 3D-printed respirators and personal protective equipment. Hospitals in Egypt deployed robots to take COVID-19 patients' temperatures. The Taiwanese medtech startup Brain Navi developed an autonomous robot that can take nasal swabs for COVID-19 testing.[7]

Enhanced physical and mental well-being

New technologies can improve the physical and mental well-being of patients, and assist providers. Developments include neural interfaces that let prosthetic devices interact directly with the wearer's brainwaves to move in reaction to their thoughts. Robots are being adapted from other fields to assist in surgical procedures. Augmented and virtual reality can help surgeons practice operations, and are being used to improve communications between providers and patients.

Building resilience, agility, and productivity

A second force driving change is providers' need to operate more efficiently and effectively to counteract the effect of healthcare payors tightening their purse strings. This is causing providers to look for new ways to manage costs. Along with encouraging them to be more agile and productive, it is pushing them to improve planning and processes.

Population health management

It has become more challenging to rate risks or assess the services that a community is likely to use and set premium rates accordingly.[8] This is because populations and healthcare delivery have become more complex and populations more heterogeneous. Payors are increasingly using data to assess risk factors and provide preventive care that reduces the need for more costly treatments. This type of population health management also ensures that resources are allocated efficiently and people with severe illnesses receive the necessary care.[9]

During the pandemic, governments used population data to stratify infection risks and control the virus' spread, a practice that is likely to continue in the future. Authorities in Mumbai, India, took proactive population health-management measures to contain COVID-19 in the city's Dharavi slums, considered one of the most densely populated areas in the world.[10]

New cost-containment methods

After decades of basing payments on quality or performance, healthcare systems and payors are containing costs. They are moving beyond value-based payments to more outcome-focused models. Although specifics vary, new models reduce low-value or value-decreasing services while maintaining or improving service quality. An example of new cost-containment models are providers that are integrated with payors, such as Kaiser Permanente and Geisinger Health System that operate clinics and hospitals in the United States.[11]

New duties for healthcare professionals

Healthcare systems are ceding more care management to medical professionals other than doctors as a means of curbing costs. Between physician assistants, nurse practitioners, and nurses picking up more responsibilities, and the increased use of AI, doctors can concentrate on the tasks that only they are qualified to perform. The demand for healthcare workers to treat COVID-19 patients pushed health systems to deploy more non-physician medical professionals to provide services.

In addition, as healthcare incorporates technology in more of its operations, administrators need stronger data science and technology skills. They also must coordinate care across multiple providers, locations, and systems, for example, for cancer care that could span several specialties. Some providers have addressed this by creating jobs for care navigators, who support complex or high-risk cases.

Anticipatory regulation

New technologies are only effective if laws and regulations enable them and protect people from their potential misuse. One way to streamline this is through anticipatory regulation, laws, and policies that regulators and healthcare innovators work out together to ensure that they empower emerging technologies rather than hinder them. The U.K. has passed regulations paving the way for genomic medicine even though related treatments are not yet broadly commercialized.[12]

Emergency preparedness
Climate disasters, the increasing incidence of drug-resistant bacteria, pandemics, and other major events underscore the need for providers, systems, and payors to improve how they respond to emergencies. Governments and healthcare systems are stockpiling emergency supplies and localizing production, creating pandemic emergency plans, and improving disease tracking.

Countries across the globe responded to the pandemic by developing emergency management infrastructure that is increasingly resilient for changing circumstances. For example, many of the facilities run by the Abu Dhabi Health Services Company (SEHA), which operates all public hospitals and clinics in the emirate, are modular with the entire bedcount being adaptable between acute and intensive care. In other regions, governments have updated healthcare policies to allow for telemedicine and other alternative delivery methods while protecting patient data. Dubai's Health Authority and Electronic Security Center created a security standard for electronic biomedical devices to ensure healthcare providers can collect accurate information while also protecting patients' privacy.[13]

Treating the whole person

Personalization and consumerization have shifted power from providers to patients. As in other parts of their lives, people want healthcare to be tailored to their needs, and delivered in a way that works for them.

Patient-centric care
Historically, healthcare systems were designed to meet the priorities of organizations. Patient-centric care turns healthcare on its head, from how buildings are configured to how care is administered. Patients participate in decisions about their own care to make sure it meets their needs. Patient-centric care looks beyond medicine to understand how social determinants such as socioeconomic circumstances or work stress affect a person's health. Countries such as Australia and the U.S. have adopted collaborative, cross-functional models that consider the whole person when devising a care plan, and reward providers that take this approach.

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Personalization and consumerization have shifted power from providers to patients.

Preventive care

Countries are recognizing the importance of preventing illnesses from happening in the first place, and adopting early screenings to keep populations healthier. Preventive care is particularly potent as populations age and average life expectancies increase, since the best way to care for the elderly is to lower their risk of developing chronic ailments.

The most obvious preventive-care measure that came out of the pandemic is the development of a COVID-19 vaccine. Work on the vaccine accelerated development of nanotechnology, and cell and gene therapies, and ultimately has led to the release of mRNA-based vaccines from Moderna and Pfizer-BioNTech.[14]

Precision medicine

Precision medicine goes hand in hand with patient-centric and preventive care. Precision medicine uses data analytics and new technologies to tailor care to the individual, taking into account everything from a patients' genetic makeup to their socioeconomic status. The emergence of next-generation sequencing, which speeds up the process of extracting a genetic sequence from a sample, makes it easier to include genetic considerations in decisions about care.

The seemingly irregular nature of how COVID-19 spreads increased interest in precision medicine and personalized treatment.[15] As part of this use of precision medicine, researchers in the U.S. are growing "mini-brains," essentially organs on a chip, to understand how the infection spreads in order to develop better treatments.[16]

Consumerism

People are more likely to regard themselves as consumers, not patients, and treat healthcare like any other good or service. Providers and systems must compete for their patronage, using image or brand to differentiate themselves from competitors. A provider's image may come from being an early adopter of new technologies, or from patient ratings for convenience or quality of service.

New players and partners

As healthcare becomes more of a consumer product, it is attracting new players with experience in consumer goods and mass customization. Notable entrants include technology giants such as Apple and Google, which possess scale and access to data.[17] The healthcare apps these tech giants have launched could serve as a gateway to develop more healthcare services.

Other newcomers have been attracted by the potential to disrupt the status quo. In the U.S., Uber and Lyft launched patient delivery services,[18] tapping into their driver networks. Food banks, social services agencies, and other community organizations are partnering with health systems to provide services that address the social determinants that can cause ill health. Also in the U.S., pharmacy companies have merged with healthcare payors, and payors have combined with healthcare providers. This type of vertical integration is seen as the way to offer low-cost care that is more cost efficient, patient-centric, and commercially attractive.

The pandemic led to other partnerships across the healthcare value chain, including collaborations to manage healthcare supplies and develop national data platforms. The Dubai Health Authority, for example, teamed up with tech startup Nybl to manage health supplies.[19]

HOW HEALTHCARE STAKEHOLDERS SHOULD RESPOND

To make the most of the opportunities that these forces represent, governments, healthcare regulators, and healthcare providers need to work together in four areas: strategy, policy, and regulation; governance and partnerships; funding and financing; and ICT (*see Exhibit 2*).

EXHIBIT 2
Healthcare stakeholders need a multi-layered response

	STRATEGY, POLICY, AND REGULATION	Develop a supporting strategic institutional framework for healthcare innovation, including national health innovation strategies, and specific policies, regulations, and standards
	GOVERNANCE AND PARTNERSHIPS	Establish mechanisms for effective decision making, collaboration, and coordination among stakeholders, and use partnerships to tap into other organizations' experience and knowledge
	FUNDING AND FINANCING	Establish required funds, channel them to the right stakeholders, and use financial instruments to incentivize the adoption of new behaviors
	INFORMATION AND COMMUNICATION TECHNOLOGY	Develop and use an infrastructure for data collection, data sharing, and data analytics

Source: Strategy&

Strategy, policy, and regulation

Governments should join with public-sector agencies and other entities to create frameworks that accelerate healthcare transformation, and to provide funding and data resources. This requires collaboration, a national healthcare innovation strategy, and a whole-person approach to care that emphasizes the patient experience.

An important aspect of strategy is for governments to integrate healthcare innovation programs into their national agenda. This ensures that the overall direction of government and the healthcare sector reinforce each other, rather than work at cross purposes. Such an approach is already occurring in Abu Dhabi, which has a government-developed digital health strategy.[20]

Governments must work in an agile way so that regulations keep pace with technology innovation. Government entities also need to collaborate with each other to accelerate the creation of frameworks that will underpin future healthcare regulation, which can encourage innovation.

To support a whole-person approach to healthcare, regulators can invite patients or patient representatives to be part of designing healthcare policy and delivery. On this point, regulators in the Middle East can draw from the experience of Western healthcare systems that have adopted more patient-inclusive decision making. Some German hospitals, for example, involve patients and the general public in decisions about service delivery.[21]

For their part, healthcare providers must develop strategies that emphasize the patient experience, personalization, and integrated and coordinated care. The Cleveland Clinic's operations in Abu Dhabi use a collaborative care model, bringing clinicians from multiple disciplines onto a single care team that takes a holistic approach to treating patients.

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Governance and partnerships

Governments should adopt a whole-system approach to healthcare to tackle issues across departments and agencies, and across borders. Their efforts should be coordinated and clearly communicated so stakeholders' interests are represented and met.

COVID-19 made it clear that healthcare issues do not stop at frontiers. Governments need to pursue partnerships to learn best practices from regional and international organizations and countries that have dealt with similar circumstances. The European Commission's international cancer genome consortium is an example of one such partnership.[22] A similar example in the Middle East is the Arab Health digital and event platform, which attracts a number of stakeholders, including government agencies.[23]

Healthcare providers have played, and will continue to play, the lead role in providing access to quality healthcare for the populations they serve. In the future, they need to make patients their focus while improving both their financial and digital acumen. This means governance should be structured around the patient, rather than administrative systems or medical specialties. An example of this is Cleveland Clinic Abu Dhabi's organization around diseases and organ systems rather than medical disciplines, ensuring smoother, more integrated patient journeys.[24] In terms of financial and digital acumen, providers need to build administrative systems that support omnichannel care delivery, seamlessly transitioning between multiple care delivery channels and disciplines.

Healthcare providers must also seek partnerships with other healthcare stakeholders. These should include academic institutions and research centers that could support translational research, which turns basic science into medical practice, to create new therapies, along with clinical research. Likewise, they need to team up with public health authorities that could help them develop and strengthen prevention programs. While this does occur in the Middle East to some extent, providers need to move beyond a cosmetic approach and embed this ethos into their organizational DNA.

Funding and financing

To support transformation, governmental entities must provide adequate spending on healthcare research and development (R&D) and innovation, and move to new reimbursement models. Governments appear to be taking heed of that, as global health research and innovation budgets are expected to increase through 2025. The Human Genome project in the U.S. is an example of how a government-financed R&D project can act as a catalyst to drive groundbreaking innovations. The project mapped all 3.2 billion DNA base pairs in the human genome and made the information public, heralding a defining moment for the healthcare and biomedical community and society at large. Governments also must support investments in local entities conducting healthcare R&D, including in startups working on technology innovations.

Regulators should continue shifting from reimbursing healthcare spending based on volume to reimbursing providers according to the value of the care. Moreover, they should consider creating incentives for preventive care and to adopt virtual care delivery models. In the United Arab Emirates (UAE), there are Standards for Telehealth Services that require all licensed healthcare facilities to offer telehealth services and are expected to encourage adoption of similar online health services throughout the country.[25]

In light of new reimbursement models, healthcare providers must improve their understanding and management of costs and risks. This will require investments in training and improving the skills of their workforce. The Dubai Health Authority's Awtaad initiative is one such program. Begun in 2018 to help transform the region's healthcare sector, the initiative trains cohorts of doctors, nurses, pharmacists, engineers, and other healthcare industry professionals on aspects of change management and culture transformation. The expectation is that those professionals will use what they learn to become change agents within their own workplaces and ultimately improve patient care.

Information and communication technology

ICT is transforming all aspects of the healthcare value chain. Cross-governmental ICT efforts should include developing infrastructure for data integration and exchange, and infrastructure security to protect healthcare data.

Any work to further healthcare innovations should incorporate basic information technologies and safeguards. Government and regulators should work closely with healthcare providers to ensure protection of all patient information. Precautions should include protocols for sharing data across organizations, real-time electronic healthcare data collection, and proper protections for electronic healthcare records.

Information technologies could also include digital services for healthcare providers and the public, such as integrated solutions for appointment bookings and referrals, digital academies, and cybersecurity programs. In 2019, the Abu Dhabi Department of Health took a step in this direction when it launched the Abu Dhabi Healthcare Information and Cyber Security Standard, which sets out data privacy and security requirements, including protocols for handling patient data.[26] Similarly, Dubai launched the Innovation and Artificial Intelligence Strategy to accelerate adoption of AI and automation in healthcare there.

Healthcare providers can modernize their operations through the most efficient data collection and sharing. Deployment of a unified electronic medical record, which gives providers a comprehensive view of a patient's healthcare information, continues to gain traction in the region. Saudi Arabia's Ministry of Health is piloting an e-health system in several hospitals.[27] The UAE hopes to digitize all health records and unify them in a single database by 2022.[28]

Standardized data reporting is a key component of data-collection efforts, such as the standards the U.S. Department of Health and Human Services created for collecting COVID-19 data. As part of such an effort, providers should consider adopting data analytics, including predictive analytics, either by building capabilities in-house or through relevant partnerships. The Dubai Health Authority, for example, collaborated with IBM to develop a proof-of-concept AI-based predictive analytics platform that predicts the rate at which a patient's health could deteriorate based on monitoring vital signs.[29]

CONCLUSION

The future of healthcare will look very different from the way it is being provided, financed, and regulated today. The major driving forces are technological advances, greater focus on resilience, agility, and productivity, along with treating the whole person. Healthcare stakeholders have the opportunity to actively shape this ongoing transition — rather than merely responding to it. Collectively, they can better serve their constituents, by working together to craft strategies and policies, support and adopt innovation, and develop the necessary data infrastructure.

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