future health index 2023

Saudi Arabia

Taking healthcare everywhere

Addressing staff shortages and patient needs with new care delivery models

The Future Health Index is commissioned by Philips

Contents

Research premise

This is the largest global survey of its kind, analyzing the priorities and perspectives of healthcare leaders and younger healthcare professionals.

The Future Health Index – now in its eighth year – is based on proprietary research conducted in 14 countries.

In 2023, the Future Health Index explores how healthcare leaders and younger healthcare professionals view the role of new care delivery models, which integrate physical and virtual care within and beyond hospital walls.
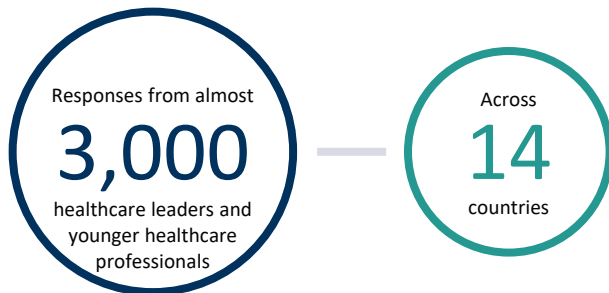
Countries included in the research

Saudi Arabia
Australia
Brazil
China
Germany
India
Indonesia
Italy
Japan
Netherlands
Poland
Saudi Arabia
Singapore
South Africa
United States

Responses from almost

3,000

healthcare leaders and younger healthcare professionals

Across

14

countries

Foreword

Saudi Arabian Healthcare leaders and younger healthcare professionals are aligned in their vision to innovate new models of care delivery that meet patients where they are.

In the ever-evolving landscape of global healthcare, the Saudi Arabian healthcare sector stands at the forefront of transformative change. It is with great anticipation that we present the 2023 Future Health Index Report for Saudi Arabia, shedding light on the unique perspectives and strides made by Saudi Arabian healthcare leaders and younger healthcare professionals in the Kingdom.

The synergy between Saudi Arabian healthcare leaders and younger healthcare professionals is evident in their aligned vision for innovative new models of care delivery. This alignment signifies a commitment to meeting patients where they are—whether in a virtual or in-person setting. It is a testament to a forward-thinking approach that caters to the evolving needs and expectations of patients in a post-pandemic era.

Saudi Arabian healthcare leaders are tackling the challenge of attracting and retaining talent. In a landscape where the demand for healthcare professionals outpaces the supply, technology emerges as a critical ally.

Saudi Arabian healthcare leaders are turning to technology, aiming to increase productivity and satisfaction among healthcare practitioners, as well as external partnerships. Alongside enhancing care delivery and increasing efficiencies, such investments play a crucial role in attracting and retaining talent. Saudi Arabian healthcare leaders are leaning on technology to manage workforce shortages and alleviate pressure on staff.

Over the past two FHI surveys, Saudi Arabia has witnessed notable progress in investments in artificial intelligence (AI). As a nation at the forefront of technological adoption, these investments underscore a strategic commitment to leveraging AI for enhanced efficiency and improved healthcare outcomes. The journey depicted in the FHI surveys mirrors Saudi Arabia's dedication to embracing digital transformation in healthcare.

In a world increasingly shaped by eco-conscious values, the Saudi Arabian healthcare leaders of today—guided by a sustainable mindset—are crafting the future of care delivery. This commitment reflects a profound understanding of the impact healthcare has on the environment and the responsibility to align with a greener, more sustainable future. Saudi

Arabian healthcare leaders and younger healthcare professionals signal an opportunity for wider ecosystem collaboration to overcome barriers in protecting the health of our planet.

Our eco-conscious generation of Saudi Arabian healthcare leaders are taking steps to address environmental sustainability. However, they know they cannot do it alone. Partnerships emerged as a key theme this year. Both healthcare leaders and younger healthcare professionals say that closer collaboration between providers is needed to deliver integrated, and sustainable, patient care across settings.

As we delve into the Saudi Arabia-specific insights of the FHI 2023, it is clear that the Kingdom is not merely adapting to change but actively shaping the future of healthcare. The integration of AI, the emphasis on sustainability, and the collaborative spirit underscore the Kingdom's progressive stance.

I invite you to explore the detailed survey findings, drawing inspiration from the narratives of both current and future healthcare leaders. Together, let us embark on a journey that redefines healthcare delivery and ensures a healthier, more connected future for Saudi Arabia.

"

Prioritisation of artificial intelligence and sustainability is key for the future of healthcare

Mohammad Mostafa,
General Manager, Health Systems, Philips Middle East, Türkiye, and Africa

Key findings at a glance

Three main themes emerge from the 2023 Future Health Index, showing how healthcare systems are innovating care delivery to meet evolving patient needs with increasingly strained resources. Each of these themes is explored in more detail in the following chapters.

Chapter 1

Tackling workforce challenges through digital innovation

Like their peers around the world, healthcare leaders in Saudi Arabia are facing significant challenges, including recruitment and financial pressures. They are turning to technology, aiming to increase productivity and satisfaction among healthcare practitioners, as well as external partnerships. Alongside enhancing care delivery and increasing efficiencies, such investments play a crucial role in attracting and retaining talent.

Chapter 2

Bringing healthcare closer to the patient

Saudi Arabia's healthcare leaders are aware of the role of technology and innovation in delivering care and want to use both to offer a range of in-person and virtual services. The country's Health Sector Transformation Program includes a focus on digital technologies such as AI, an area already invested in and used by the country's healthcare leaders.

Chapter 3

Partnering across the healthcare ecosystem

Partnerships with private organizations are a key area of focus for the government's healthcare strategy, and Saudi Arabia's healthcare leaders are increasingly collaborating with a broad range of partners to deliver new models of care, more so than their global counterparts in many areas. Saudi Arabian healthcare leaders are also taking steps to address environmental sustainability, however, most face some challenges in this area.

Like their peers around the world, healthcare leaders in Saudi Arabia are facing significant challenges, including recruitment, retention and employee satisfaction.

For solutions, they are turning to technology, as well as external partnerships. Alongside enhancing care delivery and increasing efficiencies within their facilities, such investments play a crucial role in attracting and retaining talent, with younger healthcare professionals seeking such technologies in the workplace.

1

Tackling workforce challenges through digital innovation

Healthcare leaders turn to technology to manage workforce pressures

Alleviating the strain on staff with digital technologies

The rapid development of smart medical cities and hospitals in the Kingdom, coupled with a growing and aging population, has created unprecedented demand for healthcare workers[1]. It is estimated that Saudi Arabia will need around 20,000 additional hospital beds by 2030[2].

As they navigate these challenges, 63% of Saudi Arabia's healthcare leaders are using or planning to use digital health technologies to help reduce the impact of workforce shortages (see Figure 1). This is in line with the global average of 56%.

## Technology supports staff by broadening care settings

Among those using or planning to use digital technology to alleviate staffing pressures, half (51%) are opting for solutions that connect with out-of-hospital settings (see Figure 2). This is followed by cloud-based technology to support access to information from any location (44%).

Figure 1

63% of Saudi Arabian healthcare leaders whose hospital/facility is using or planning to use digital health technologies to help reduce the impact of workforce shortages

Figure 2: Most selected solutions among healthcare leaders using or planning to use technology to reduce the impact of workforce shortages

Technology solutions that connect with out-of-hospital settings **51%**

Cloud-based technology to support access to information from any location **44%**

Critical decision support technology **43%**
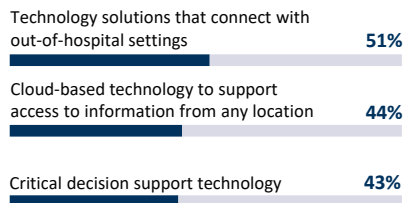
Technology reduces administration overload and improving job satisfaction

By 2030, up to 40% of work in the country's health sector could be automated[3]. The Saudi Arabian Ministry of Health's E-Health Initiative, involving a combination of electronic communication and information technology, aims to increase productivity and satisfaction among healthcare practitioners[4].

The initiative offers the Kingdom's health workforce the tools to enhance productivity by automating administrative tasks, supported by digital information and knowledge bases. Reducing the administrative burden of healthcare professionals could also enhance their job satisfaction and could help to both attract talent to the sector and reduce attrition from those leaving[5].
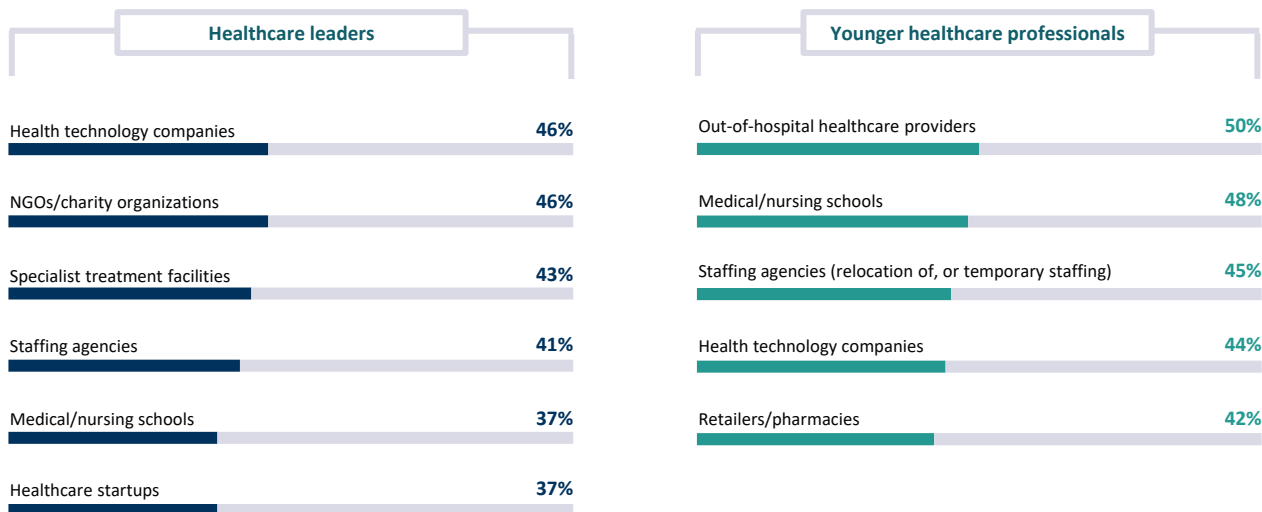
Tackling workforce shortages through collaboration

A partnership approach to staffing challenges

Alongside technology solutions, Saudi Arabia's healthcare leaders are turning to external organizations to help reduce the impact of workforce shortages. Health technology companies (46%) and NGOs/charity organizations (46%) are the top cited partners (see Figure 3), with leaders in Saudi Arabia more likely than the global average (35% and 27% globally, respectively) to be collaborating with them.

The country's younger healthcare professionals are more likely than the global average to cite out-of-hospital healthcare providers (50% versus 32% globally) and medical/nursing schools (48% versus 34% globally) as organizations their hospital or healthcare facility *should* collaborate with to tackle workforce shortages.

Figure 3: Most selected external organizations healthcare leaders say their hospital or healthcare facility is working with, and younger healthcare professionals say their hospital or healthcare facility should work with, to reduce the impact of workforce shortages
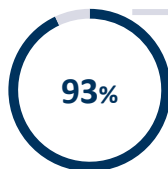
Healthcare leaders

Health technology companies	**46%**
NGOs/charity organizations	**46%**
Specialist treatment facilities	**43%**
Staffing agencies	**41%**
Medical/nursing schools	**37%**
Healthcare startups	**37%**

Younger healthcare professionals

Out-of-hospital healthcare providers	**50%**
Medical/nursing schools	**48%**
Staffing agencies (relocation of, or temporary staffing)	**45%**
Health technology companies	**44%**
Retailers/pharmacies	**42%**

Addressing financial pressures

According to information from Saudi Arabia's Health Sector Transformation Program, the cost of healthcare is outpacing national income[6], a phenomenon that many countries around the world are also experiencing.

Overall, 93% of Saudi Arabian healthcare leaders state that their hospital/facility is facing financial pressures (see Figure 4), with 80% acting to mitigate them. Healthcare leaders are primarily exploring new revenue streams as they look to reduce the impact of any financial pressures they might face (see Figure 5). This response was selected by almost half (46%) of healthcare leaders and is on par with the top answer given by healthcare leaders globally (50%), as well as those in Germany (47%), Singapore (43%) and the US (44%).

In addition, one-fifth of Saudi Arabian healthcare leaders (20%) report that their hospital or healthcare facility is cutting costs, and 14% are looking into new ways of financing.

Figure 4

93% of Saudi Arabian healthcare leaders say their hospital/facility is facing financial pressures

Figure 5: Healthcare leaders saying their hospital /facility is exploring new revenue streams to reduce the impact of financial pressures

Saudi Arabia	**46%**
Global	**50%**
Germany	**47%**
US	**44%**
Singapore	**43%**
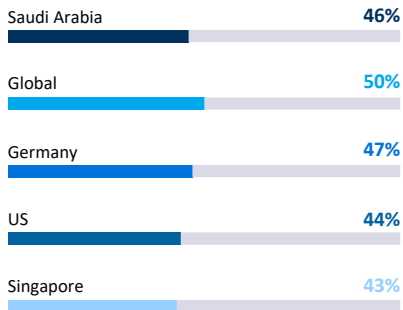
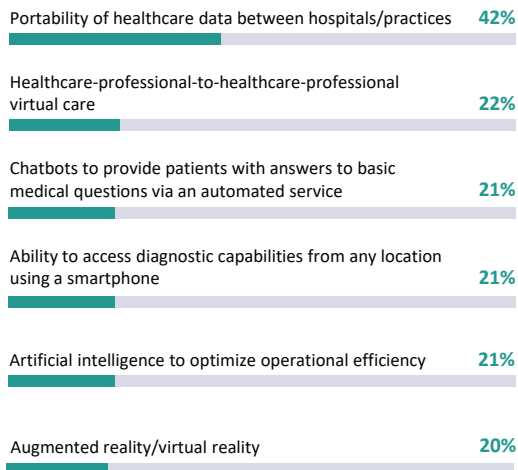# Technology tops the list for younger healthcare professionals

Technology helps make an ideal workplace

The Kingdom's government has been working hard to attract younger Saudis to train as healthcare professionals[7]. Technology appears to be an important asset for patient care: over half of younger healthcare professionals (57%) want their hospital or facility to invest in some type of virtual care today. A similar number (53%) prioritize it as a key investment within the next three years.

Portability of data key

When asked which digital technology would most improve their work satisfaction, the firm favorite was portability of healthcare data between hospitals and healthcare practices, cited by 42% of younger healthcare professionals (see Figure 6), higher than the global average (26%).

Figure 6: Digital technology that would most improve younger healthcare professionals' work satisfaction

Portability of healthcare data between hospitals/practices **42%**

Healthcare-professional-to-healthcare-professional virtual care **22%**

Chatbots to provide patients with answers to basic medical questions via an automated service **21%**

Ability to access diagnostic capabilities from any location using a smartphone **21%**

Artificial intelligence to optimize operational efficiency **21%**

Augmented reality/virtual reality **20%**

New care delivery models

When selecting a hospital or practice in which to work, 35% of Saudi Arabian younger healthcare professionals say the facility being at the forefront of connected care delivery (e.g., streamlined clinical care pathways) is an important consideration, indicating a desire for new care delivery models that connect different settings. This response aligns with the Saudi Arabian government's Vision 2030 plans, which seeks to grow the healthcare sector by driving utilization and alignment across services and products in collaboration with the private sector.

Following leadership in connected care delivery, the most important considerations Saudi Arabian younger healthcare professionals look for in a future workplace is being at the forefront of AI in healthcare and having technology available for everyday tasks (both 34%).
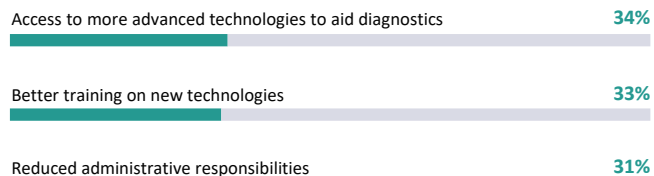
Digital technologies key to improving care

New technologies empower young professionals

When asked what would make them feel more empowered to improve patient care, access to more advanced technologies to aid diagnostics emerged as the top choice (34%) of younger healthcare professionals (see Figure 7). They also call for more opportunities for better training on new technologies (33%), illustrating the need for continual education to get the most out of digital innovation. This was followed by reduced administrative responsibilities (31%), highlighting younger healthcare professionals' perspective on the important relationship between increased efficiency and the provision of improved care.

Taken together, these findings paint a picture of a generation that is eager to embrace smart and connected technologies to help deliver better patient care. Digital innovation could be a powerful tool in attracting and retaining younger talent.

Figure 7: Factors, besides more time with patients, that would make younger healthcare professionals feel more empowered to improve patient care

Access to more advanced technologies to aid diagnostics — **34%**

Better training on new technologies — **33%**

Reduced administrative responsibilities — **31%**

2

Bringing healthcare closer to the patient

Saudi Arabia's healthcare leaders are aware of the role of technology and innovation in delivering care and want to use both to continue to offer a broad range of in-person and virtual services. They see virtual care in particular having a significant impact on patient outcomes. This is a view shared by younger healthcare professionals, with many believing virtual care technology will improve work satisfaction. AI is another key focus for healthcare technology investment area for both leaders and younger professionals in Saudi Arabia.

Improving patient care with virtual care and AI

Leaders in virtual care

The invention and adoption of mobile technologies, such as the popular SEHA health app[8], along with the successful launch of Saudi Telemedicine Network, continue to revolutionize the Saudi Arabian healthcare system[9].

This cutting-edge approach is an example of how the Saudi Arabian healthcare system facilitates virtual care in several patient services. Almost three-quarters of Saudi Arabian healthcare leaders (73%) say their hospital or healthcare facility is currently providing virtual care, higher than the global average (63%), as well as in Germany (56%) and the US (56%) (see Figure 8). Only Singapore had a higher percentage (87%).

Looking to the future, 47% of healthcare leaders say virtual care is among the technologies that will have the biggest impact on patient care over the next three years, higher than the global average (31%) and other technologically advanced nations such as Singapore (15%). Virtual care in this context includes healthcare professional-to-healthcare professional virtual care, encompassing virtual consultations or treatment plans, and healthcare professional-to-patient virtual care.

AI to enhance diagnosis

AI also ranks highly in terms of the technologies that Saudi Arabian healthcare leaders believe will have the biggest impact in improving patient care over the next three years. Forty-three percent selected AI to integrate diagnostics, including predictive analytics, such as helping to generate diagnoses from disparate clinical sources like imaging, pathology and clinical history. This is a higher result than that of the US (24%) but in line with Singapore (55%).

A future with virtual care

Younger healthcare professionals in Saudi Arabia seem aligned with their colleagues in leadership positions, when it comes to the importance of virtual care. Fifty-three percent would like to see future investments in virtual care, a higher result than the global average (32%) and Singapore (9%). Meanwhile 34% say that virtual care technology would most improve their work satisfaction. Of the specific technologies, 27% would like to see future investments in healthcare professional-to-healthcare professional virtual care, and a similar proportion (26%) desire healthcare professional-to-patient virtual care.

Figure 8: Current provision of virtual care according to healthcare leaders

73% Saudi Arabia

63% Global average

56% Germany

56% US
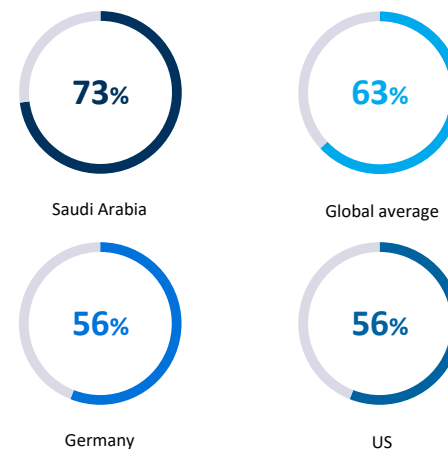
Prioritizing current and future investments in AI

Leveraging the promise of AI for improved care

Reflecting their belief in the power of AI to benefit patient care, Saudi Arabian healthcare leaders are continuously looking to enhance their AI technologies. The country's Health Sector Transformation Program includes a focus on digital technologies, including AI. Within the plan, the intent of employing AI is to help healthcare providers make better clinical decisions and to increase hospitals' access to patients' healthcare records.

Today, almost all healthcare leaders in Saudi Arabia (96%) say their hospital or healthcare facility plans to invest in AI in the next three years (see Figure 9). More than three-quarters (77%) of Saudi Arabian healthcare leaders are currently investing in AI, a significantly higher percentage than the global average (59%), Singapore (25%), and the US (59%). Only Germany has a higher percentage (98%).

Looking to future growth

Over the past three FHI surveys, investments in AI (overall) have steadily increased in Saudi Arabia, with more anticipated in the future.

And looking to the future, younger healthcare providers hope for the same: prioritized investment in AI. Most (93%) of younger healthcare professionals say they would like their hospital or healthcare facility to be investing in AI technologies three years from now.

Figure 9: How AI investments in Saudi Arabia have progressed through the past two FHI surveys

- ● hospital/facility is currently investing in AI
- ● would like their hospital/facility to invest in AI three years from now
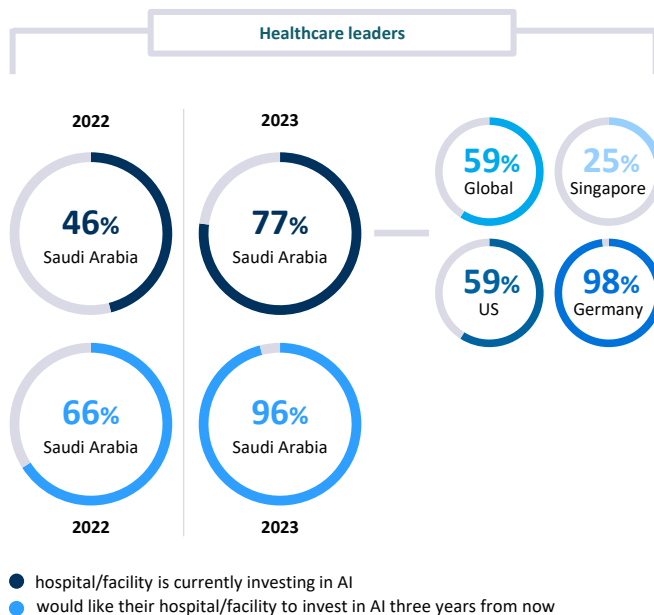
Using AI as a driving force

Saudi Arabia's healthcare leaders recognize the promise of data-based technologies, such as AI, in healthcare and are committed to furthering their adoption. But they don't have to look far to gain insights into its key benefits.

King Faisal Specialist Hospital & Research Center, the core of Saudi Arabia's healthcare system, is using AI to improve patient outcomes and ease provider burnout[10]. As a leading healthcare provider in Saudi Arabia, they are investing in the latest technologies and solutions to care for patients.

For example, the organization's AI-driven systems are optimized to improve resource management, decrease patient wait times, and promote operation room efficiency through a unified capacity command center. The center also uses AI-powered predictive analytics to identify patients at risk of developing complications, intervene early to prevent adverse outcomes, and mobilize care and solutions with agility.
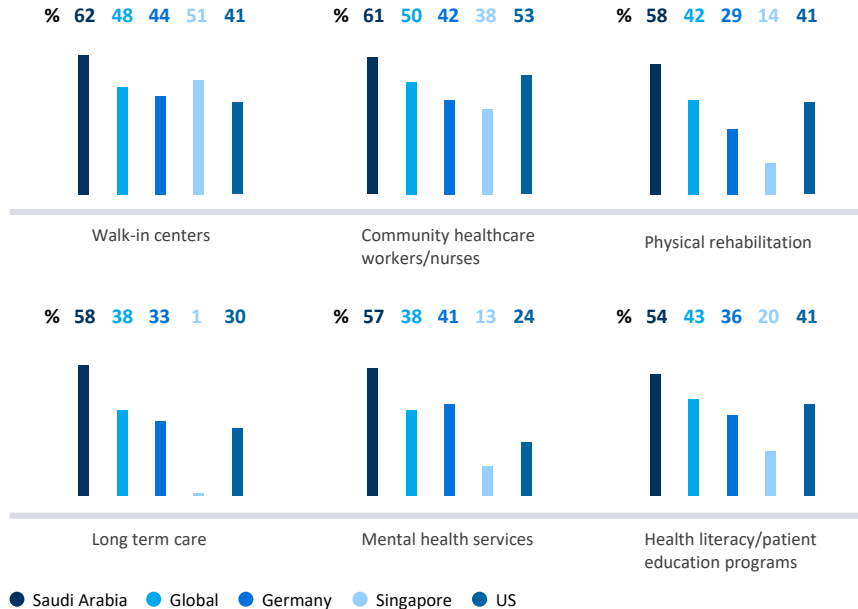
Expanding access to care

Increased provision of more holistic care

Healthcare leaders in Saudi Arabia state multiple patient access points and services, including walk-in centers, community healthcare workers, health literacy and patient education programs, physical rehabilitation, mental health services and long-term care which are already available in Saudi Arabia (see Figure 10). These levels are higher than the global average and comparison markets.

Within the next three years, healthcare leaders are looking to broaden their services. They say their hospital or healthcare facility plans to provide a nutritionist (46%), surgery centers or ambulatory surgery centers (44%) and also plan to provide more virtual support for intensive and critical care services (41%).

Figure 10: Areas of patient care healthcare leaders say their hospital or healthcare facility is currently providing

% 62 48 44 51 41

Walk-in centers

% 61 50 42 38 53

Community healthcare workers/nurses

% 58 42 29 14 41

Physical rehabilitation

% 58 38 33 1 30

Long term care

% 57 38 41 13 24

Mental health services

% 54 43 36 20 41

Health literacy/patient education programs

● Saudi Arabia ● Global ● Germany ● Singapore ● US

Younger healthcare professionals desire more holistic care provision

Younger healthcare professionals in Saudi Arabia are also interested in expanding care. Where such services aren't currently provided, 85% would like to offer office-based labs and 82% would like to offer mental health services or walk-in centers, such as pharmacies or community centers. They are more likely to say so than the global average (60% and 56%, respectively). They are also more likely than their global counterparts to want long-term care provided (72% versus 54% globally).

Benefits of new ways to deliver care

Saudi Arabia's Vision 2030 plans progress

As global healthcare leaders look to establish new ways to deliver care, Saudi Arabia's Vision 2030 is already making progress. The plan called for the training of 345,000 volunteers to support hospital and healthcare facility staff in raising awareness about healthy habits in their communities[11]. The Kingdom's e-health initiative includes healthcare services, health monitoring, health literature, health education, and support for research.
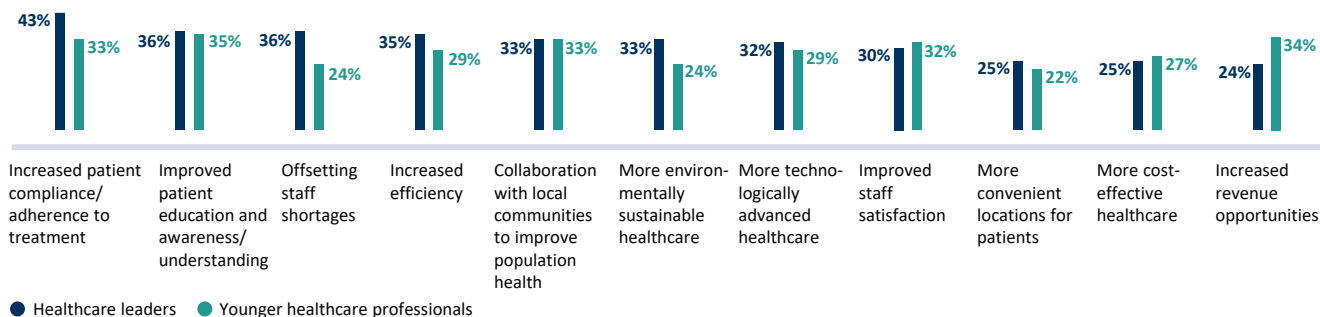
These supports are a priority for healthcare leaders, 43% of whom said increased patient compliance/adherence to treatment is one of the benefits of new ways to deliver care (see Figure 11). The next most chosen benefits were improved patient education and offsetting staff shortages (both 36%).

Younger healthcare providers also see improved patient education, as well as patient awareness and understanding (35%) as a key benefit of new care delivery models, alongside increased patient compliance or adherence to treatment, and collaboration with local communities to improve population health (both 33%). This demonstrates an understanding among younger professionals of the broader positive impacts new ways to deliver care can have.

Ensuring new ways of delivering care improve patient outcomes

When asked what actions their hospital or healthcare facility was taking to ensure their new delivery care methods were improving patient outcomes, technology was a key focus for healthcare leaders, as 30% said they are investing in new, more innovative technology, or updating existing technology solutions. Alongside this, 30% also noted that they are using research to understand what patients need from a new care model.

Increasing value and affordability

More than half of Saudi Arabian healthcare leaders (57%) and younger healthcare professionals (56%) believe it's likely that new ways to deliver care will bring more affordable care or provide better value for money for patients.

Improved patient safety, including a decline in adverse events (53%) and faster access to diagnostics (52%), were also seen as likely outcomes of new care delivery models for both groups combined.

Figure 11: Benefits of new ways to deliver care, besides improved patient outcomes

	Healthcare leaders	Younger healthcare professionals
Increased patient compliance/ adherence to treatment	43%	33%
Improved patient education and awareness/ understanding	36%	35%
Offsetting staff shortages	36%	24%
Increased efficiency	35%	29%
Collaboration with local communities to improve population health	33%	33%
More environmentally sustainable healthcare	33%	24%
More technologically advanced healthcare	32%	29%
Improved staff satisfaction	30%	32%
More convenient locations for patients	25%	22%
More cost-effective healthcare	25%	27%
Increased revenue opportunities	24%	34%

● Healthcare leaders ● Younger healthcare professionals

3

Partnering across the healthcare ecosystem

Saudi Arabia's healthcare leaders are increasingly collaborating with a broad range of partners to deliver new models of care, with health technology companies topping their list for future partnership.

They are also exploring environmental sustainability measures, though they acknowledge challenges in implementing them as they look to reduce the environmental impact of their facilities.

Partnering with external organizations to deliver new models of care

Partnerships cross care settings

Last year's Future Health Index research found that Saudi Arabia's healthcare leaders were nurturing strategic partnerships with health technology companies for access to a range of expertise, including technology integration and support in healthcare management services. This year, when asked what external and private partnerships they plan to have three years from now, healthcare leaders said health technology companies are at the top of their list (38%), a result higher than the global average (25%) and several other countries (see Figure 12).

Partnerships with private organizations are a key area of focus for the government's healthcare strategy[12]. When asked which organizations they are partnering with today,

35% of Saudi Arabian healthcare leaders cited social services, the highest result of any market surveyed, and higher than the global average (17%), Singapore (6%), and the US (14%). One-third mentioned other hospitals or clinics (33%), and medical or non-medical educational institutions (33%). Both of these results were also above the global average.

Of the 18 potential partners listed in the survey, Saudi Arabian healthcare leaders were more likely than their global counterparts to say they are currently partnering with half of them. In addition to health technology companies, social services, other hospitals, and educational institutions, these leaders are partnering with private home care, physician groups, NGOs or trade organizations, residential care homes, community centers, and wellness providers.

Figure 12: Healthcare leaders planning to partner with health technology companies three years from now

Saudi Arabia **38%**

Global **25%**

Germany **23%**

US **20%**

Singapore **9%**
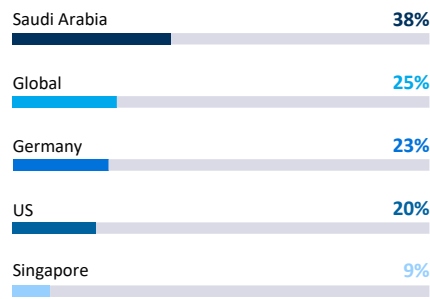
Younger healthcare professionals welcome new partnerships

When asked what actions they would like their organization to take to ensure that new ways to deliver care improve patient outcomes, 29% of younger healthcare professionals in Saudi Arabia opted for building partnerships outside of the healthcare system to be able to provide the best possible care.

Looking to the future, technology partnerships come to the forefront for younger healthcare professionals. Twenty-seven percent would like to see their hospital/facility partner with IT or data providers in the future, a higher result than Germany (11%), Singapore (7%) and the US (13%). The second most desired partner is health technology companies (25%), again higher than some comparison markets (Singapore 11%, US 10%).

Barriers to implementing environmental sustainability initiatives

The 2021 and 2022 editions of the Future Health Index saw a sharp increase in the prioritization of environmental sustainability among all global healthcare leaders surveyed. Considering Saudi Arabia's geography, healthcare leaders' environmental sustainability initiatives seek to conserve water and utilize solar energy to reduce the carbon footprint of hospitals[13].

This year's findings indicate that, while all (100%) Saudi Arabian healthcare leaders say they are taking steps to address environmental sustainability, most cited facing at least one implementation challenge.

Lack of measurement

When asked what challenges healthcare leaders are facing in implementing environmental sustainability initiatives, no means of measuring improvements or success (38%) topped the list for Saudi Arabia's healthcare leaders (see Figure 13). This was followed by a lack of an implementation strategy (34%), initiatives being a lower priority compared to other goals (33%) and a lack of time (32%). All these factors suggest that it may not be a lack of physical resources that prevents the implementation of these initiatives.

Figure 13: Challenges healthcare leaders face when implementing sustainability initiatives

38%
No means of measuring improvements/success

34%
Lack of an implementation strategy

33%
Lower priority compared to other goals

32%
Lack of time

Diverse approaches and divided responsibility for green goals

Possible solutions to advance sustainability initiatives

To overcome challenges in implementing environmental sustainability initiatives, over one-third (36%) of healthcare leaders in Saudi Arabia report that their hospital or healthcare facility plans to set targets and measure progress or recruit more staff with specialist skills (see Figure 14).

These selections are closely followed by working with or consulting a third party to deliver or support sustainability programs (33%) and sharing of best practice examples/learning from peers (32%) to address these challenges.

Figure 14: Ways in which healthcare leaders in Saudi Arabia plan to address barriers to implementing sustainability initiatives

Set clear/ambitious targets and measure progress **36%**

Recruit more staff with specialist skills **36%**

Work with or consult a third party to deliver or support sustainability programs **33%**

Share best practice examples/learn from peers **32%**
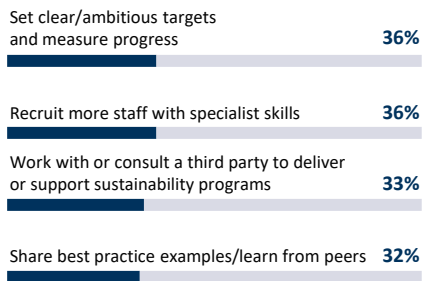
Responsibility for industry sustainability standards

Interestingly, when asked who they thought is most responsible for creating environmental sustainability standards in healthcare, 23% of Saudi Arabian healthcare leaders ranked industry associations as number one, just ahead of the government (21%) and individual hospitals or health systems (21%).

Thinking about who *should* be most responsible, 30% of healthcare leaders in Saudi Arabia ranked the government first, with medical technology companies ranked second (22%), a significant change from those highlighted as currently most responsible. By contrast, younger healthcare professionals said the responsibility for environmental sustainability standards should lie with medical technology companies (22%) and industry associations (22%). While different, both viewpoints show an opportunity for wider ecosystem collaboration in protecting the health of our planet, including the participation of both public and private organizations.

Conclusion

Building a collaborative healthcare ecosystem

Healthcare leaders and younger healthcare professionals share the same vision for the future: one in which healthcare is delivered in more connected, convenient, and sustainable ways across care settings, enabled by digital technology. Yet to fully realize this vision, both groups recognize that greater collaboration is essential, both within and beyond their organization.

As this year's Future Health Index shows, collaboration is taking many different forms. Healthcare providers are partnering with other organizations across the healthcare value chain to offer more personalized and integrated care. They are turning to health technology companies and data/IT providers to alleviate pressure on staff with automation, AI, and data-driven insights at the point of care. And they are also looking to share best practices with other providers and specialized partners to make healthcare more environmentally sustainable.

Other stakeholders such as governments and payers have an equally crucial role to play in advancing new care delivery models. In partnership with all involved, they can help develop and implement the common standards and incentives that are needed to reduce variation and promote harmonization across the healthcare ecosystem – whether it is to increase interoperability and facilitate the secure flow of data across care settings, or to support sustainable innovations and accelerate the decarbonization of healthcare.

Going forward, clinical and economic evidence of the benefits of new care delivery models will be an essential driver for further adoption by providers and payers. Small-scale pilots conducted in partnership can help generate that evidence, showing how digital innovations can improve patient health outcomes as well as the patient and staff experience. Similarly, being able to measure progress on environmental sustainability goals will help propel green initiatives in healthcare.

Ultimately, that's how both patients and the planet will benefit from new care delivery models which serve everyone, everywhere.

Appendices

Research methodology

Research overview and objectives

Commencing in 2016, Royal Philips has conducted original research every year with the goal of understanding the ways various countries around the world are addressing global health challenges and how they are improving and expanding their ability to care for their communities. Building and expanding on previous years, the Future Health Index 2023 focuses on addressing staff shortages and meeting patient needs with new care delivery models, speaking to both healthcare leaders and younger healthcare professionals* globally.

The first Future Health Index, released in 2016, measured perceptions of how healthcare was experienced on both sides of the patient-professional divide. The following year, the research compared perceptions to the reality of health systems in each country that was studied. In 2018, the Future Health Index identified key challenges to the large-scale adoption of value-based healthcare and overall improved access, evaluating where connected care technology could speed up the transformation process. In 2019, the Future Health Index explored the healthcare experience for both patients and healthcare

professionals and how technology was moving us to a new era of healthcare delivery transformation. In 2020, the Future Health Index examined the expectations and experiences of healthcare professionals aged under 40. In 2021, the Future Health Index report considered how healthcare leaders were meeting the continuing demands of the pandemic and what the new reality of healthcare post-crisis might look like. Last year's Future Health Index, the 2022 report, concentrated on the role of digital tools and connected care technology in meeting the complex needs of healthcare leaders.

In 2023, the Future Health Index looks to both healthcare leaders and younger healthcare professionals – those aged 40 and under – in 14 countries to quantify the experience and expectations of those in different roles and at various stages of their healthcare careers. It focuses on their perception of new care delivery models, which integrate physical and virtual care within and beyond hospital walls.

2023 quantitative survey methodology

The quantitative study was executed by iResearch, a global business and consumer research services firm employing a mixed methodology of online and telephone surveying.

1,400 healthcare leaders and 1,400 younger healthcare professionals in 14 countries (Australia, Brazil, China*, Germany, India, Indonesia, Italy, Japan, the Netherlands, Poland, Saudi Arabia, Singapore, South Africa and the United States) participated in a 15-20 minute survey in their native language from November 2022 – February 2023. 100 healthcare leaders and 100 younger healthcare professionals in each of the 14 countries completed the survey.

Below shows the specific sample size, estimated margin of error** at the 95% confidence level, and interviewing methodology used for each country.

	Unweighted sample size (N=)	Estimated margin of error (percentage points) Healthcare leaders	Estimated margin of error (percentage points) Younger healthcare professionals	Interview methodology
Australia	200	+/- 6.0	+/- 6.0	Online and telephone
Brazil	200	+/- 5.5	+/- 6.5	Online and telephone
China	200	+/- 6.5	+/- 7.2	Online and telephone
Germany	200	+/- 6.0	+/- 6.8	Online and telephone
India	200	+/- 5.2	+/- 6.0	Online and telephone
Indonesia	200	+/- 6.5	+/- 6.5	Online and telephone
Italy	200	+/- 6.5	+/- 6.5	Online and telephone
Japan	200	+/- 5.5	+/- 6.0	Online and telephone
Netherlands	200	+/- 6.2	+/- 6.4	Online and telephone
Poland	200	+/- 5.5	+/- 6.0	Online and telephone
Saudi Arabia	200	+/- 6.0	+/- 6.5	Online and telephone
Singapore	200	+/- 5.5	+/- 7.0	Online and telephone
South Africa	200	+/- 6.5	+/- 6.8	Online and telephone
United States	200	+/- 6.0	+/- 7.0	Online and telephone
Total	**2,800**	**+/- 6.23**		

Question localizations

In some instances, certain questions needed to be adjusted slightly for relevance within specific countries. Care was taken to ensure the meaning of the question remained as close to the original, English version, as possible.

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* Survey data is representative of Mainland China only and does not include Taiwan or Hong Kong.
** Estimated margin of error is the margin of error that would be associated with a sample of this size for the full healthcare leader or younger healthcare professional population in each country. However, this is estimated since robust data is not available on the number of healthcare leaders or younger healthcare professionals in each country surveyed.

Glossary of terms

Ambulatory care center
Outpatient care centers (e.g., urgent care, walk-in clinics, etc.).

Artificial intelligence (AI)
AI refers to the use of machine learning and other methods that may mimic intelligent human behaviors, resulting in a machine or program that can sense, reason, act and adapt to assist with different tasks.

As-a-service models
Methods of delivering hardware, software and/or services on a subscription basis.

Automation
The application of technology, programs, robotics or processes to support people in achieving outcomes more efficiently.

Data
Used here to refer to a variety of clinical and/or operational information amassed from numerous sources including but not limited to digital health records (DHRs), medical imaging, payer records, wearables, medical devices, staff schedule and workflow management tools, etc.

Digital health technology
A variety of technology that transmits or shares health data. The technology can take a variety of forms, including but not limited to home health monitors, digital health records, equipment in hospitals/healthcare facilities, and health or fitness tracker devices.

Distributed care
Instead of having patients come into a central location, distributed care brings care to the patient. Increasingly, healthcare could be delivered through a decentralized network of ambulatory clinics, retail settings, and home-based monitoring, coaching, and treatment.

Early adopters of digital health technology
Early adopters are defined as those who indicated that, compared to other hospitals or facilities, they are among the first to adopt an innovation or they adopt innovations before most others.

Global non-governmental organizations
A nonprofit organization that operates independently of any government.

Healthcare ecosystem
Describes people involved in care delivery (including patients, family members and caregivers), the locations of care and services provided, and how they work together to improve efficiencies and optimize experiences.

Health technology companies
Companies that sell or provide medical equipment, wearables, health apps and other technology to healthcare organizations, patients, and the general public.

Healthcare leader
A C-suite or senior executive working in a hospital, medical practice, imaging center/office-based lab, or urgent care facility who is a final decision-maker or has influence in making decisions.

Healthcare professional
All medical staff (including doctors, nurses, surgeons, specialists, etc.), and excludes administrative staff.

Healthcare professional-to-healthcare professional virtual care
Virtual communication between healthcare professionals through sharing images, recommending treatment plans, etc.

Healthcare professional-to-patient virtual care
Communication between healthcare professionals and their patients via video calls, patient portals, etc.

Integrated care
Collaboration between the health and care services required by individuals to deliver care that meets patient needs in an efficient way.

Interoperability
The ability of health information systems to work together within and across organizational boundaries, regardless of brand, operating system or hardware.

Late adopters of digital health technology
Late adopters are defined as those who indicated that, compared to other hospitals or facilities, they adopt innovations later than most others.

New ways to deliver care
This defines the way in which health services are provided. New ways to deliver care combine the needs of patients, caregivers and providers, to achieve the best possible care through integrated services within and beyond hospital walls.

Out-of-hospital services/settings
Care centers such as ambulatory surgical centers, office-based labs, etc.

Payer
A payer is a person, organization, or entity that pays for the care services administered by a healthcare provider. Payers are usually, but not always, commercial organizations like insurance companies; government or public sector bodies; or individuals.

Predictive analytics
A branch of advanced analytics that makes predictions about future events, behaviors, and outcomes.

Remote patient monitoring
Technology that provides care teams with the tools they need to remotely track the health of their patients outside of conventional clinical settings (e.g., at home), collaborate with the patients' other healthcare professional(s) and help detect problems before they lead to readmissions. Examples of this include cardiac implant surveillance, vital-sign sensors at home, etc.

Staff
This refers to all staff, including physicians, nurses, administrative employees, etc.

Sustainability
Meeting the environmental needs of the present without compromising the ability of future generations to meet their own needs.

Technology infrastructure
Foundational technology services, software, equipment, facilities and structures upon which the capabilities of nations, cities and organizations are built. This includes both IT infrastructure and traditional infrastructure that is sufficiently advanced such that it can be considered modern technology.

Telehealth/virtual care
The distribution of health-related services and information via electronic information and telecommunication technologies.

Workflows
A process involving a series of tasks performed by various people within and between work environments to deliver care. Accomplishing each task may require actions by one person, between people, or across organizations – and can occur sequentially or simultaneously.

Younger healthcare professional
A healthcare professional working in a clinician role (all specializations, except psychiatry and dental care), under the age of 40.

Sources

1. https://www.healthcareitnews.com/news/emea/himss22-riyadh-solving-healthcare-workforce-crisis-middle-east

2. https://english.alarabiya.net/News/gulf/2022/09/13/Saudi-Arabia-needs-20-000-extra-hospital-beds-by-2030-amid-growing-population-Report

3. https://www.mckinsey.com/industries/healthcare/our-insights/ten-ways-to-accelerate-the-benefits-of-digital-health-in-saudi-arabia

4. https://www.moh.gov.sa/en/Ministry/nehs/Pages/Ehealth.aspx

5. https://thejournalofmhealth.com/how-to-increase-health-care-staff-retention-with-technology/#:~:text=Consequently%2C%20if%20hospitals%20reduced%20their,time%20and%20are%20not%20engaging

6. https://www.vision2030.gov.sa/v2030/vrps/hstp/

7. https://www.healthcareitnews.com/news/emea/himss22-riyadh-solving-healthcare-workforce-crisis-middle-east

8. https://www.vision2030.gov.sa/v2030/vrps/hstp/

9. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9553846/

10. https://fastcompanyme.com/technology/how-ai-is-transforming-healthcare-in-saudi-arabia/

11. https://www.vision2030.gov.sa/v2030/vrps/hstp/

12. https://www.pif.gov.sa/en/Pages/VRP2021-2025.aspx?gad=1&gclid=Cj0KCQjwho-lBhC_ARIsAMpgModd5YtNoM38XKNbz4oI_U5RkPqxMwhiXJOrim6mpYV6MZ5VI0gP508aAvOaEALw_wcB

13. https://insights.omnia-health.com/saudi-arabia/sustainability-healthcare-developments-saudi-arabia

www.philips.com/futurehealthindex-2023