

Singapore

Taking healthcare everywhere

Addressing staff and patient needs with new
care delivery models





Contents

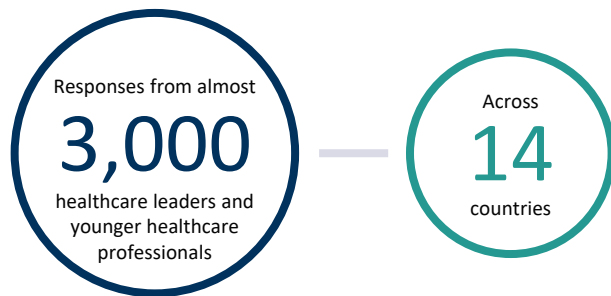
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Research premise

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 and smart technology, which integrate physical and virtual care within and beyond hospital walls.



Countries included in the research

Singapore

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



Foreword

A glimpse of the patient journey of the future is rapidly taking shape, thanks to the accelerated changes in healthcare delivery brought about by the pandemic. Increasingly, we now see a healthcare system that extends beyond the boundaries of hospitals, into homes and communities, with the aid of digital technology connecting care across different settings.

This shift is long overdue and highly welcome, alongside Singapore's Healthier SG strategy urgently ushering in much-needed coordinated, effective and inclusive preventive care. It's heartening to see that this year's Future Health Index demonstrates the alignment of healthcare leaders and younger professionals in their vision to innovate new care delivery models that meets patients where they are.

Against a backdrop of rising chronic disease incidence and an aging population, healthcare leaders worldwide face the mounting strain of maintaining quality care amid staff shortages and financial pressures. Patient expectations have also changed since the pre-pandemic era, with more having a deeper appreciation of how important it is to stay healthier for longer. As digital transformation continues to advance in various aspects of our lives, including how we shop, work, and learn, we now expect speed, personalization and convenience at every interaction and transaction, including in healthcare. Optimizing current ways of working can

only go so far towards mitigating the looming caseloads on future healthcare systems, and healthcare leaders understand the need to go beyond traditional models of care delivery comprised of primary and acute care in clinics, hospitals, and intensive care units. Any refreshed approach needs to redefine value for resource-efficient financially viable care, centered around long-term health outcomes and preventing existing illnesses from deteriorating further.

Helping people live healthier for longer is the only sustainable way forward and the highest prerogative of any healthcare ecosystem of the future. The 2023 Future Health Index Singapore report provides insights into what this will entail. Investments in AI and virtual care are on the rise, indicating the commitment of healthcare leaders to heavily rely on digital technology's potential to enhance efficiency, experiences, and outcomes. Simultaneously, they are exploring opportunities to extend care delivery to lower-cost settings outside of hospitals, offering patients a broader range of virtual and in-person access points.

Younger healthcare professionals eagerly embrace this shift, and the results show that they actively seek to be at the forefront of digital innovation. Sharing the same vision as healthcare leaders, they aspire towards a more personalized and interconnected approach to patient care – one where digital technologies like AI

can support on everyday tasks so they can focus on patients and facilitate skills and knowledge transfers to combat high staff attrition.

However, both groups acknowledge that they cannot achieve these goals alone. Partnerships have emerged as a central theme in this year's Future Health Index, reflecting a stronger trend than in previous reports. Both healthcare leaders and younger professionals stress the need for closer collaboration among providers to deliver integrated patient care across various settings. They also recognize the crucial role of data/IT providers and health technology companies in liberating and transforming data into valuable insights when and where needed. Lastly, they see value in seeking help from partners to enhance environmental sustainability, an area where healthcare has much to gain.

As you delve deeper into the survey findings presented in this report, I encourage you to have a think on their implications for your organization or practice. How do you imagine people receiving care in 2033? Where will you take healthcare next? Be inspired through the lens of both current and future healthcare leaders, and join us as we redesign healthcare for future generations.



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Helping people live healthier for longer is the only sustainable way forward and the highest prerogative of any healthcare ecosystem. Innovating new care delivery models that meets patients where they are will be the future of health’.

Ivy Lai
Country Manager, Philips Singapore

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 financial pressures and workforce shortages with innovation

Faced with acute workforce shortages and growing financial pressures, healthcare leaders are seeking to streamline processes for improved efficiencies. They are ramping up their investments in automation and AI to alleviate pressure on staff and to ultimately empower them with more predictive insights for clinical decision support. This is welcomed by younger healthcare professionals, who are also eager to embrace new digital technology and consider it a key factor in choosing where to work.



Chapter 2

Bringing healthcare closer to the patient

Healthcare leaders and younger healthcare professionals share a common vision for a more distributed, holistic healthcare system that meets patients where they are. Efficiency, convenience and patient compliance are all regarded as core benefits of this vision, along with environmental sustainability. While virtual care and services offered beyond hospital walls are already a mainstay of care in Singapore, more holistic care including long-term care and physical rehabilitation are future priorities.



Chapter 3

Collaboration critical to the future of healthcare

As payers are expecting more cost-effective care that delivers better outcomes, healthcare leaders are partnering across the healthcare ecosystem to overcome technology barriers, break down data silos, and deliver more integrated care that improves patient outcomes. In addition, they see a role for partnerships, particularly with peers and third-party organizations, in furthering environmental sustainability in healthcare.



1

Tackling workforce shortages and financial pressures with innovation

With unprecedented workforce shortages, high staff turnover, rising demand from an aging population¹, and escalating financial challenges², healthcare leaders in Singapore are prioritizing efficiency measures and turning to digital health technologies to relieve the pressure. Technology has become a key enabler for knowledge and skills transfers in the context of soaring staff attrition.

They are embracing innovation as one solution. Appetite for artificial intelligence (AI) is increasing as healthcare professionals become aware of its transformative benefits. For younger healthcare professionals, access to data and digital technologies on-the-go and AI are key factors for their choice of workplace and work satisfaction.

Easing staff shortages with smarter health technology

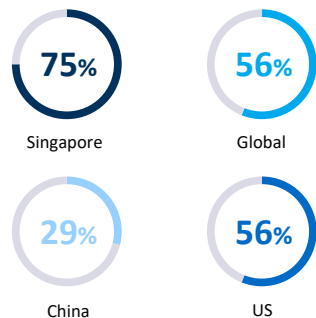
Increasing strain on the workforce

With one-quarter of all Singaporeans expected to be over age 65 by 2030, there is greater demand than ever for healthcare professionals and support care workers. The Ministry of Health predicts as many as 24,000 additional allied health professionals and support care staff are needed to meet the demands of this aging population and to operate hospitals, clinics and eldercare centers by 2030¹.

Digital solutions lead the way

Today, three-quarters (75%) of healthcare leaders are already using or plan to use digital health technology solutions to reduce the impact of workforce shortages. Singapore healthcare leaders, working in one of the most technologically advanced healthcare systems in the world, outrank the global average (56%), US (56%) and China (29%) in their attitudes toward using digital technology to reduce pressure on staff and address workforce shortages (see Figure 1).

Figure 1: Healthcare leaders using or planning to use digital health technology to reduce the impact of workforce shortages



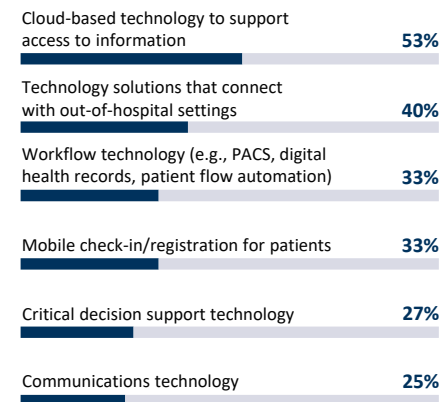
Cloud-based technologies rise to the top

Of those Singaporean healthcare leaders utilizing technology to alleviate staffing pressures, just over half (53%) are using or planning to use cloud-based technology to support access to information (see Figure 2).

Choosing technology solutions that connect with out-of-hospital settings is also a popular choice, as selected by 40% of healthcare leaders. One third (33%) of healthcare leaders chose workflow technology, such as PACS, digital health records and patient flow automation. The same number (33%) chose mobile check-in or registration for patients.

To reduce the impact of workforce shortages, healthcare leaders are less inclined than the global average to opt for critical decision support technology (27% versus 39%) or communications technology (25% versus 38%).

Figure 2: Technologies that healthcare leaders are using or planning to use to reduce the impact of workforce shortages



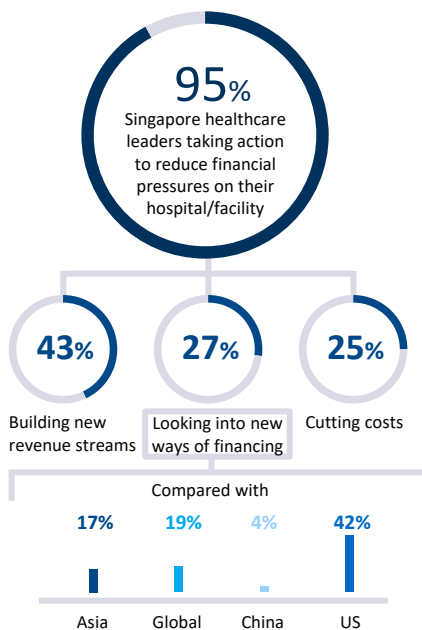
Taking steps to address financial pressures

Looking for new revenue streams and financing models

As is the case with most of their global peers surveyed, 95% of Singapore healthcare leaders are taking action to reduce financial pressures on their hospitals and facilities. According to the Ministry of Health, healthcare spending is expected to account for 5.9% of GDP and could go up to 9.0% by 2030, taking spending from other government initiatives. This increase is partly fuelled by the country's aging population and highlights the urgent need for action².

Healthcare leaders' primary strategy to reduce the impact of financial pressures is building new revenue streams (see Figure 3). This was selected by almost half of healthcare leaders (43%) with more than one-quarter (27%) considering new ways of financing, higher than global healthcare leaders (19%) as well as the Asia-wide average (17%). For one-quarter of Singaporean healthcare leaders (25%), cutting costs is a core means to reduce financial pressures.

Figure 3: Healthcare leaders' actions to reduce the impact of financial pressure

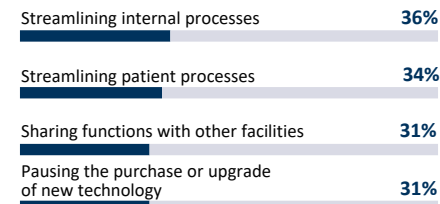


Focusing on efficiency

Beyond building new revenue streams and initiating cost-cutting measures, Singapore's healthcare leaders are considering solutions to drive efficiency while mitigating financial pressures (see Figure 4). These include using advanced technology, such as streamlining internal (36%) and patient (34%) processes through automated appointment bookings. Sharing functions with other hospitals (31%) and pausing the purchase or upgrade of new technology (31%) were also top choices.

Although one-fifth (21%) of healthcare leaders say their facility is merging with other hospitals/health systems and 15% are reducing energy usage in a bid to streamline processes and cut costs, they are less likely to be doing so than their global peers (32% and 25%, respectively).

Figure 4: Financial solutions used by Singaporean healthcare leaders who are taking action to mitigate financial pressures



AI investments pivot to predictive uses and clinical decision making

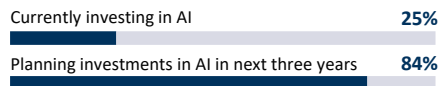
Growing appreciation for AI

Although Singaporean healthcare leaders are less likely to be currently investing in AI technologies than the global average (25% versus 59%), they recognize the opportunities offered by AI and show an increased appetite for future investment. As many as 84% plan to invest in the technology three years from now, indicating a definitive long-term commitment to AI, in line with the global average of 83% (see Figure 5).

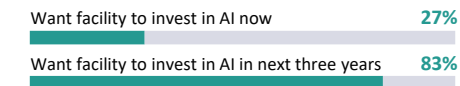
Younger healthcare professionals are aligned and also believe in the benefits AI affords for the future. While today just one-quarter (27%) want their facility to invest in AI, more than three-quarters (83%) want their facility to invest within the next three years.

Figure 5: Current and future investments in AI

Healthcare leaders



Younger healthcare professionals

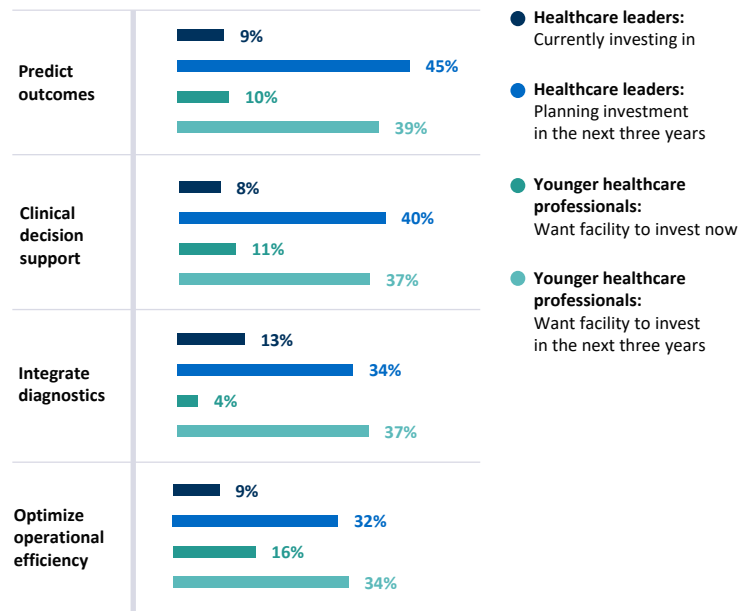


Priorities for future investment

Within the next three years, Singaporean healthcare professionals are most likely to prefer to invest in AI to predict outcomes: 45% of healthcare leaders and 39% of younger healthcare professionals favored this functionality (see Figure 6). The next most popular choice is AI for clinical decision support (40% for leaders and 37% for younger professionals). This reflects how AI and machine learning are poised to feature prominently in healthcare, aiding in the diagnosis of diseases, personalized treatment plans, and predicting health outcomes⁶.

Investing in AI for operational efficiency was another area of alignment for healthcare leaders (32%) and younger healthcare professionals (34%). Examples of this technology include automated completion of required documentation and scheduling of patients, staff and tasks. These applications play a vital role in enabling more efficient use of resources to mitigate the impact of workforce shortages.

Figure 6: Preferred areas of AI investment, now and within the next three years



AI bolsters talent acquisition and retention

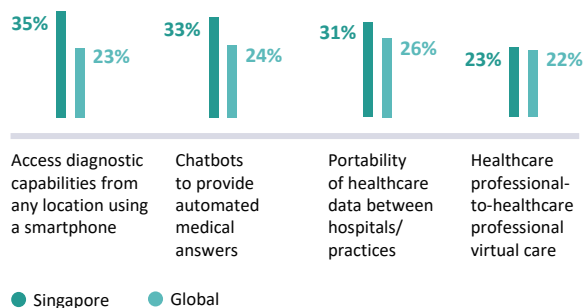
Appealing to younger healthcare professionals

When choosing where to work, being at the forefront of AI emerges as the top choice for younger healthcare professionals (39%), above professional autonomy, a strong record of patient outcomes, and having technology available for everyday tasks (all 24%).

When it comes to technology improving work satisfaction, the ability to access diagnostics via smartphone (35%) and to use chatbots to provide patients with basic medical information (33%) were the top choices for younger healthcare professionals (see Figure 7). These responses were higher than the global averages: 23% for diagnostics via smartphone and 24% for chatbots.

Nearly one-quarter (23%) say that healthcare professional-to-healthcare professional virtual care would improve work satisfaction. These findings suggest that having digital innovation in the workplace is a key factor in attracting and retaining young talent, essential for addressing the workforce shortages. They might also indicate that younger healthcare professionals, would appreciate the support of AI, perhaps to help deal with data overwhelm or when more experienced colleagues are unavailable.

Figure 7: Technology to improve work satisfaction for younger healthcare professionals



A person is holding a smartphone in their left hand, displaying a video call with a male doctor in a white coat and stethoscope. In the foreground, the person's right hand is holding a white pill bottle. The background is a blurred indoor setting with a window and greenery.

2

Bringing healthcare closer to the patient

Virtual care has long been a mainstay of Singapore's health system, so healthcare professionals do not foresee increasing investments in the coming years to build up those services. Delivering care beyond hospital walls is the norm in Singapore, with most healthcare facilities already providing ambulatory care centers and many offering acute care in the home, although there is still more to do when it comes to diversifying care offerings.

Efficiency, cost savings, convenience and patient compliance are all regarded as core benefits of new ways to deliver care, along with environmental sustainability. Looking to the future, the country's healthcare leaders are keen to forge a more holistic care offering, with long-term care and physical rehabilitation ranking highly. In the long run, the country's Healthier SG strategy envisions healthcare, social support systems and societal habits coming together to help make a population healthy.

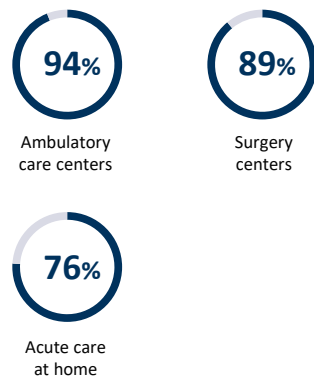
Room to improve holistic care in a variety of settings and aspects

Broad array of services expected to further expand

Singapore’s hospitals and healthcare facilities lead the way in providing patient care outside the hospital³.

Most healthcare leaders (94%), for example, say their hospital or facility is already offering services at ambulatory care centers (highest of all countries surveyed, and far higher than the global average at 53%) (see Figure 8). Almost as many (89%) say their workplace offers surgery centers – again, much higher than the global average (46%). Three-quarters (76%) work in a hospital or facility that provides acute care at home, either virtually or via in-person visits. Nearly half (45%) of Singaporean healthcare leaders say their hospital/facility plans to provide virtual intensive or critical care support, emergency care outside main hospitals (43%) or office-based lab services (42%) in the next three years.

Figure 8: Current offerings from healthcare leaders’ hospitals or facilities

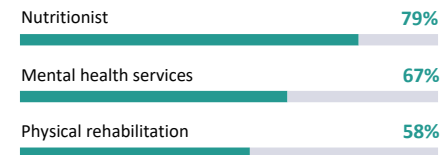


Services desired, but not planned

In line with the government’s Healthier Singapore Program⁴, with its focus on holistic services for preventive and population health management, Singaporean healthcare leaders have a vision for more diversified, coordinated and well-rounded healthcare delivery. Healthcare leaders say that the services they would most like to provide, although their hospital or facility doesn’t have plans to do so, are additional long-term care (81%) and physical rehabilitation (64%). Other services they would like to offer, though their facility has no plans to initiate them, include mental health services (55%), health literacy/patient education (54%), and nutritionist services (53%). Offering holistic health services is important to younger healthcare professionals, too. In the facilities where such services are not already available, they would prioritize nutritionist and mental health services (see Figure 9).

However, broadening holistic healthcare provision is challenging with financial and staffing pressures already facing the Singaporean healthcare system, against the backdrop of the rapidly aging population⁵.

Figure 9: Holistic services younger healthcare professionals would like to see provided in the future



Diversifying and decentralizing care delivery is good for patients and staff

Perspectives vary on benefits of care models

Although distributed care delivery models that integrate physical and virtual services within and beyond hospital walls have numerous benefits, the perspectives of healthcare leaders and younger healthcare professionals differ.

Singaporean healthcare leaders see benefits in efficiency and convenience, as well as the financial bottom line. Two in five (40%) healthcare leaders in Singapore selected increased revenue opportunities as a benefit of new ways to deliver care, the most selected answer. This result was higher than the global average (30%). This dovetails with leaders' desire to address financial pressures by creating new revenue streams as seen in Chapter 1.

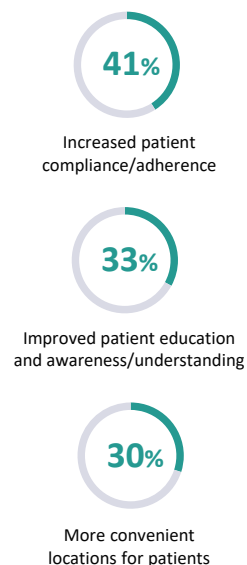
Increased efficiency was the second most chosen benefit (39%), followed by more convenient locations for patients (34%). In contrast, just 26% of leaders selected increased patient compliance as a benefit, much lower than their global peers (42%).

Younger healthcare professionals were more focused on how care models directly affect patients. Increased patient compliance was the most selected response (41%), followed by improved patient education (33%) and more convenient locations (30%), aligning with peers around the world (global average: increased compliance 42%, improved education 39%, convenient locations 32%) (see Figure 10). This reflects people's evolving expectations for their healthcare experiences, where they expect informed choice, convenience and control at every point of interaction⁶.

Investments focus on enhancing patient outcomes

Singaporean healthcare leaders are also enhancing their resources to ensure new care models improve patient outcomes, in alignment with Healthier SG goals. Their top priorities include investing more in staff training (39%), updating existing technology solutions (33%), consulting with vulnerable and underserved populations (32%) and building partnerships outside of the healthcare system (32%). For younger healthcare professionals, building partnerships outside their healthcare system (41%) and automating more tasks to improve productivity are top of mind (33%).

Figure 10: Younger healthcare professionals recognize the benefits of new ways to deliver care



Virtual care investment at its peak

Connecting care via virtual tools now the norm

Virtual care has been an established part of Singapore’s health service, providing virtual medical consultations to improve and support patient care⁷. Almost half of all respondents (49%) recognize it as having already had a significant impact on improving patient care.

Since the pandemic, leaders in Singapore have prioritized solutions that allow them to further extend care delivery beyond hospital walls.

Last year’s Future Health Index indicated a growing interest in extending care outside the hospital setting. Just 15% of healthcare leaders said it was a current priority, but over a quarter (26%) were planning to prioritize it within the next three years. This aligns with the government’s “Beyond Hospital to Community” initiative which aims to address challenges such as rising costs, an aging population and the shortage of healthcare professionals, by shifting care from hospital to primary care combined with care at home⁸.

Signs of virtual care maturation in Singapore

When it comes to virtual care, Singapore appears to have already reached the destination that other countries are aiming for, allowing its healthcare leaders to redirect their resources. This shift is reflected in its healthcare leaders’ investments: about half (51%) are currently investing in virtual care, in line with 54% globally (see Figure 11). However, this falls to just 11% planning to invest in the next three years, considerably lower than the global average (32%).

Moreover, only 15% of Singaporean healthcare leaders see virtual care as a technology that will have the biggest impact on care in the future, below the global average among healthcare leaders (31%).

Figure 11: Healthcare leaders’ current and future investment in virtual care



Likewise, younger healthcare professionals hold a similar view regarding current and future investment in virtual care technologies. Over half (57%) see value in current investment, but only 9% want their hospital or facility to invest in the future – markedly lower than younger professionals’ preferences in other countries (see Figure 12).

Figure 12: Younger healthcare professionals’ desired investment in virtual care



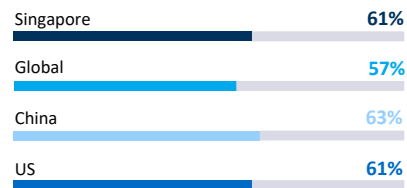
Extending care while striving for a healthier planet

Improving patient care in an environmentally friendly way

Besides improving outcomes and experiences for patients, healthcare professionals believe that the evolution towards more distributed and virtual care is good news for the planet.

Both groups, healthcare leaders and younger healthcare professionals, are likely to agree that new care delivery models are more environmentally sustainable (61% and 60% respectively). Sustainability-related benefits are high on the global agenda when it comes to care delivery. Among leaders and younger professionals combined, 63% in China, 61% in the US, and 57% globally agree new care delivery models are more environmentally friendly (see Figure 13).

Figure 13: Healthcare leaders and younger healthcare professionals who agree that new ways to deliver care are more environmentally friendly or sustainable



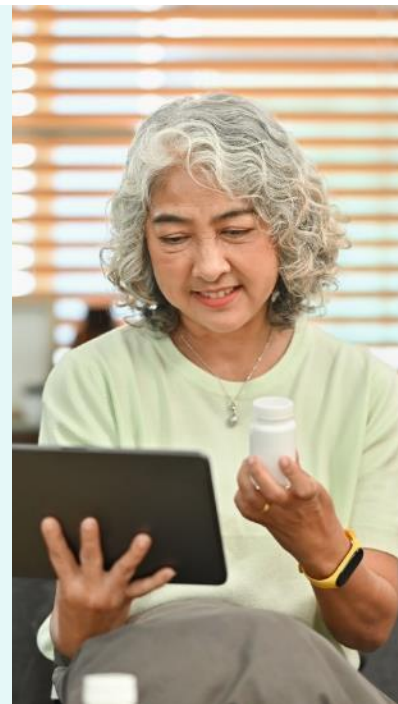
Sustainability in action

Galvanized by progress already being made on the government's Green Plan 2030⁹, Singapore's health sector is committed to supporting the nation's sustainability journey.

More convenient and accessible care services, as well as increased digital technology, reduce the need for travel and physical paperwork, helping to lower the healthcare sector's carbon footprint.

Research shows that an average of 3.057 kg of net CO₂ emissions are avoided for every digital appointment and 1.5 kg avoided for every medical report downloaded instead of being physically collected in the clinic¹⁰.

The Khoo Teck Puat Hospital (KTPH) provides a perfect example of an energy efficient and sustainable hospital in Singapore, paving the way for other facilities to become more environmentally friendly. Its renewable energy initiatives, including solar panel energy, a solar thermal system and natural ventilation have enabled the hospital to increase its energy efficiency by up to 30% when compared with other hospitals¹¹.





3

Collaboration critical to the future of healthcare

Healthcare leaders and younger healthcare professionals in Singapore embrace collaboration across healthcare settings to implement cost-effective, efficient care delivery, and to smooth the adoption of new technologies.

With a growing appetite for innovation and broader healthcare services, healthcare leaders are shifting their focus for future partnerships. Collaborations with peers and third-party organizations are increasingly valued when it comes to implementing environmental sustainability programs.

Partnering across care settings key to the success of new care models

Patient-centric care networks

Singaporean healthcare leaders recognize the importance of partnership in successfully delivering new models of care. Almost a third (32%) are actively building partnerships outside their healthcare system to ensure that new ways of delivering care improve patient outcomes.

When asked which organizations they are partnering with today, ambulatory care centers (43%), physician groups (36%) and emergency medical centers (30%) were the top three choices for healthcare leaders (see Figure 14).

Almost one-fifth (17%) are partnering with diagnostic imaging centers and 14% of healthcare leaders are partnering with IT/data providers and mental health services. Only 5% of Singaporean healthcare leaders, however, are currently partnering with other hospitals and clinics, compared with a global average of 22%.

Interestingly, their focus shifts for future partnerships, with 31% planning to partner with physical rehabilitation in three years' time, and 25% with mental health services – significantly higher than the global average (12% and 11%, respectively). In the same way, Singapore's public health system is focusing on preventive measures to improve population health and reduce future pressure on hospitals.

Younger healthcare professionals align with healthcare leaders

Younger healthcare professionals' preferences are similar to the leaders'. Ambulatory centers (23%), physician groups (19%), and emergency medical centers (18%) are also their top three preferred partners now (see Figure 15).

In future, they would most like to partner with retailers/pharmacies (22%), physical rehabilitation (20%) and mental health services (17%).

Figure 14: Healthcare leaders' external partnership preferences, now and in three years' time

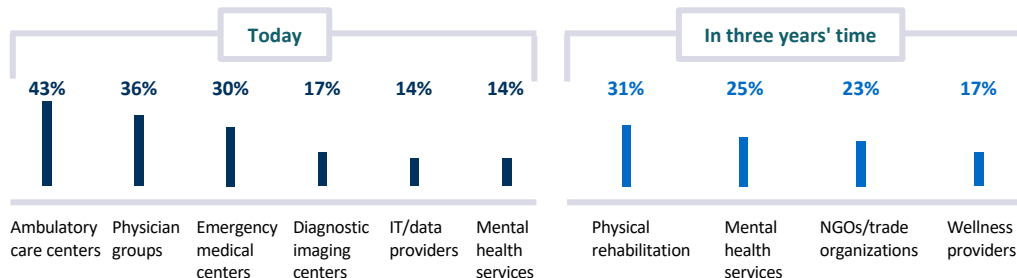
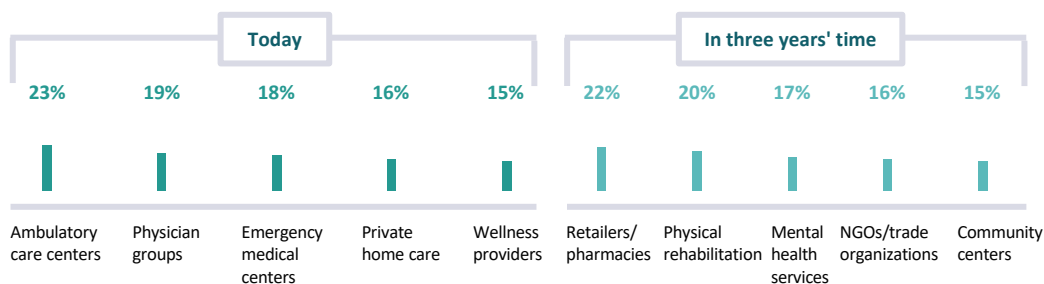


Figure 15: Younger healthcare professionals' external partnership preferences, now and in three years' time



Evolving relationships with payers towards value-based care

Rethinking financial models

As a result of the emergence of distributed care delivery models and exacerbated by financial pressures, all healthcare leaders in Singapore see their relationship with payers changing. This reflects the situation in other countries.

Compared to China and the US, healthcare leaders in Singapore were much less likely though to see payers reducing services, becoming service aggregators or looking for more evidence data, such as complication rates or the mortality case mix (see Figure 16).

When asked about their relationship with payers, almost half (43%) of Singaporean healthcare leaders agreed that payers are trying to reshape the financial models their agreements are based on, while 35% say they are being asked to work with new partners or being driven to use different payment models to enhance sustainability.

An example of how different payment models can enhance the financial sustainability of healthcare provision and reverse rising costs is the value-based care model that Singapore is moving towards. With rigorous evaluation of the value for money provided by treatments, payments and public funding are linked to patient outcomes¹².

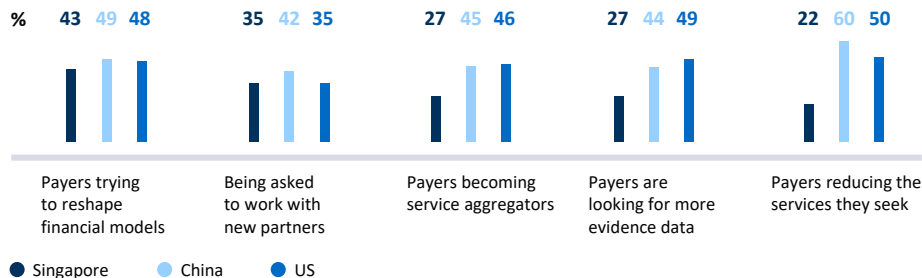
Exploring the benefits, risks and costs of new models of care

In an effort to improve patient outcomes in a cost-effective manner, the Singaporean Ministry of Health has been conducting home-based care pilots with three hospitals, using a range of technologies¹³.

In 2022, it also launched a two-year regulatory and financial sandbox to focus on use cases for treatment at home. By measuring clinical safety and effectiveness indicators and analyzing costs and billing information, the sandbox will allow both hospital leaders and regulators to better understand the risks of at home care and co-create mitigation measures with providers and industry to help a smoother roll-out of these types of service delivery models.

The experience from the sandbox could also be used to guide conversations around care innovation in other care settings such as ambulatory or outpatient care.

Figure 16: Healthcare leaders' changing relationships with payers



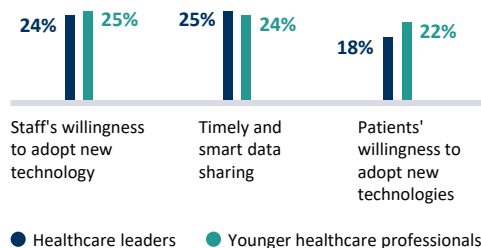
Adoption of new technologies vital to unlocking value

A pathway to successful care delivery

When asked which factors will influence the success of the healthcare ecosystem, both groups were largely aligned on the challenges that need to be resolved.

As they forge relationships to help deliver integrated care across a wider range of settings, healthcare leaders and younger healthcare professionals in Singapore are also seeking ways to smooth the adoption path for new technology.

Figure 17: Technology-related barriers to the successful implementation of new care delivery models



The two groups were also aligned on the importance of data. One-quarter of each group – 25% of leaders and 24% of younger professionals – said timely and smart data-sharing is a critical factor in the success of new care delivery models (see Figure 17).

One-quarter (25%) of younger healthcare professionals and 24% of healthcare leaders cite staff adoption of technology as a challenge. Similarly, 22% of younger healthcare professionals and 18% of leaders say patients' willingness to adopt new technologies needs to be tackled for new care delivery models to be effective.

Funding to speed up technology adoption

To better support technology-driven care and improve patient outcomes, the Singaporean government announced a new grant aimed at intensifying the use of cutting-edge technology in local hospitals in 2022¹⁴.

Supported by the Ministry of Health, the Clinical Innovation and Adoption Initiative launched by the National Health Innovation Centre (NHIC) will disburse up to \$1 million to successful applicants to develop and distribute their technologies island-wide. The first round of funds to be released will focus on detection and screening technologies, particularly for the early onset of chronic disease, with subsequent rounds looking at technologies related to diagnosing, managing and curing existing medical conditions.



The power of partnerships in greening healthcare

Barriers in implementing green initiatives

The 2021 and 2022 editions of the Future Health Index saw a sharp increase in healthcare leaders' prioritization of environmental sustainability.

However, they face multiple challenges when it comes to implementation, and the most frequently cited one – notable for a technologically advanced healthcare system – is access to appropriate technology. This challenge is named more frequently by Singapore healthcare leaders (34%) than those in the US (13%).

Additional barriers faced when implementing environmental sustainability initiatives included personnel issues, such as a lack of internal expertise (33%), a lack of interest from staff (32%) and a lack of staff in general (30%). Further challenges were more programmatic, with 28% noting an inability to measure improvements or success, 23% citing sustainability as being a lower priority than other goals, and 23% identifying a lack of standardization across the healthcare industry.

Decreasing priority among younger healthcare professionals

Limited enthusiasm from younger healthcare professionals is compounding the challenges leaders face with their environmental programs. Having strong policies on sustainability in place is not considered an important factor for younger Singaporean healthcare professionals when deciding where to work – a considerable change of heart from 2020. Just 16% see sustainability policies as a key factor in their choice of workplace, a decrease from 43% in 2020 and significantly lower than the global average (35%).

Keeping environmental sustainability on track

To overcome barriers in implementing environmental sustainability initiatives, healthcare leaders believe in creating a strong business case and building partnerships (see Figure 18). More than one-third (35%) say they see value in sharing best practices with peers, working with a third party (35%), and recruiting staff with more specialist skills (35%).

Figure 18: How healthcare leaders are planning to overcome challenges to implementing sustainability initiatives



Responsibility for environmental standards in healthcare

More than one-quarter (28%) of healthcare leaders and younger healthcare professionals combined believe that industry associations should be most responsible for creating environmental sustainability standards in healthcare. This is significantly higher than the global average (18%) and more than in China (15%), the US (16%) and the Asia-wide average (19%).

Both groups in Singapore, however, are far less likely (12%) than their global counterparts (26%) to believe the government should be most responsible for environmental standards.

They are divided though on their opinion as to who is currently most responsible, with nearly one-third of Singaporean healthcare leaders (32%) saying individual hospitals, and the same proportion of younger healthcare professionals (32%) considering industry associations as currently most responsible.



Conclusion

Building a collaborative and sustainable 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 and aided by AI. 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 industry associations, NGOs 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.

* Healthcare leaders are C-suite or senior executive decision makers/influencers working in a hospital, medical practice, imaging center/office-based lab, ambulatory center or urgent care facility. Younger healthcare professionals are defined as those aged between 18 and 40 who have completed their first medical/nursing degree and are working as a healthcare professional in a clinician role (all specializations, except psychiatry and dental care).

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.

* 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

non-profit 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/dental care), under the age of 40.

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The Future Health Index is commissioned by Philips.

To see the full report, visit
www.philips.com/futurehealthindex-2023

The Future Health Index 2023 report examines the experiences of almost 3,000 healthcare leaders and younger healthcare professionals and their expectations for the future. The research for the Future Health Index 2023 report was conducted in 14 countries (Australia, Brazil, China, Germany, India, Indonesia, Italy, Japan, Netherlands, Poland, Saudi Arabia, Singapore, South Africa and the United States). The study comprises a quantitative survey conducted from November 2022 – February 2023.

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