



The age of **opportunity**

Empowering the
next generation to
transform healthcare

The Future Health Index is commissioned by Philips



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“We’re at a healthcare tipping point. The next generation of healthcare workers will be vital to transform healthcare solutions and achieve better outcomes for all.”

**Nancy Brown, CEO,
American Heart Association**

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The age of opportunity

Jan Kimpfen, Philips Chief Medical Officer



We stand at a critical point in healthcare

The world's healthcare systems are facing unprecedented challenges from both growing and aging populations and an increasingly burnt-out workforce.

Physicians, nurses and support staff are juggling the challenges of patient care with increased administration, while managers deal with staffing issues and increasing pressure to reduce costs. Those working in healthcare face professional and personal stress.

But there is opportunity

The current generation of younger professionals will soon make up the majority of our global healthcare workforce. They have the responsibility – and the privilege – of delivering the changes that are needed to ensure healthcare systems are fit for purpose. Value-based care is the ultimate aspiration of this, delivered through the Quadruple Aim of better health outcomes, improved patient and staff experience, and lower cost of care.

The burden of expectation to transform healthcare lies on this group's shoulders, but too often their views are not widely understood. The Future Health Index 2020 report explores this generation's expectations around technology, training and job satisfaction, and the reality of their experience as healthcare professionals.

Their responses are revealing and inspiring

These younger healthcare professionals are dedicated to their patients and their careers and are driven by a desire to help others.

But they are concerned by the administrative demands that deflect from their core duties, and frustrated by what they perceive as the slow pace of technological change.

These are warning signs that need to be addressed at all levels to avoid paying the price later. We cannot afford for these talented professionals to become disengaged or we risk losing their skills and commitment to the sector.

Technology has the power to transform delivery, improve patient care, provide work satisfaction and drive value-based care. It presents a platform to address the high costs and waste that destabilize budgets.

It also gives younger healthcare professionals the ability to shape future healthcare systems with care at the core.

The report findings are relevant across healthcare – from junior staff to senior management – and herald a dynamic future. I urge healthcare leaders to absorb these valuable insights and to consider how they can be applied within their own hospital or practice.

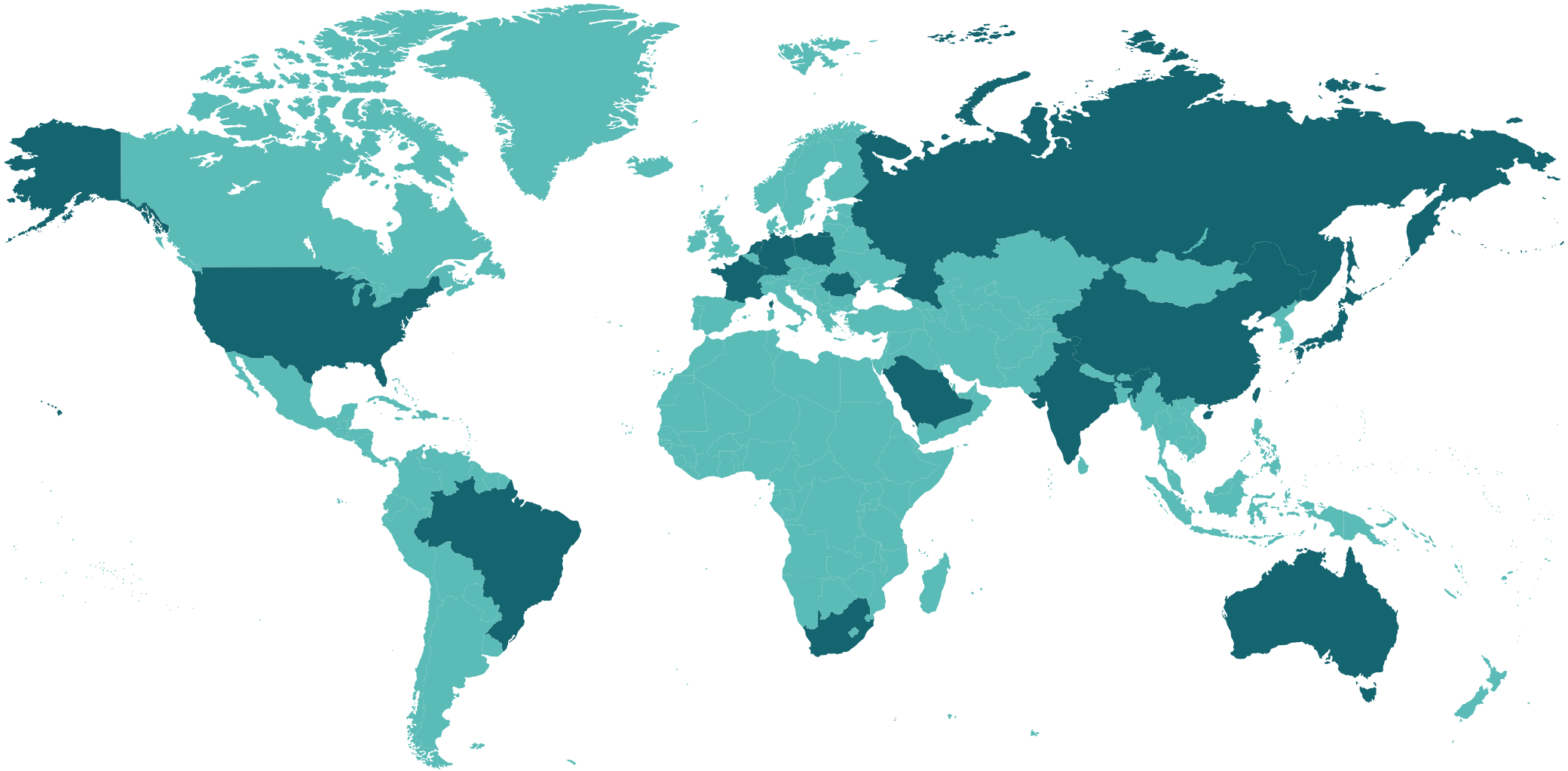
This is the age of opportunity.

Future Health Index 2020 report: **research premise**

In its fifth year, the Future Health Index 2020 report is based on **proprietary research across 15 countries.**

The research explores how to support and empower the next generation of healthcare professionals* and leaders who will **deliver tomorrow's healthcare**, specifically exploring their perceptions of today's reality and the role technology plays in supporting them to deliver better care.

This is the first global survey of its kind focused on the **next generation** of healthcare professionals.



Countries included in the research

1. Australia
2. Brazil
3. China
4. France
5. Germany
6. India
7. Japan
8. Netherlands
9. Poland
10. Romania
11. Russia
12. Saudi Arabia
13. Singapore
14. South Africa
15. United States of America

*Includes all medical staff under the age of 40.



Exploring the gaps in healthcare education and training

A risk of leaving prematurely

Younger healthcare professionals typically spend up to seven years or more in training before qualifying to practice, no doubt with the intention of remaining long-term in their chosen profession. Despite this, recent studies indicate they are at risk of leaving. Data from the Future Health Index 2020 report shows that 34% of younger healthcare professionals have considered changing careers because of work-related stress.

A lack of preparedness is demotivating

Having chosen a medical career to treat patients, their expectations are not being met. They feel unprepared for the non-clinical demands of real-life practice, such as business administration. This can reduce job satisfaction, potentially compromising their willingness to stay in the profession. Ultimately, this adds to pressures on healthcare systems, impacting the ability to deliver value-based care.

The following insights reveal how education, training and the application of technology must be coordinated to drive change, create fulfilling working environments, and minimize loss of staff.

The skills gap

Highly trained younger healthcare professionals are **unprepared** for non-clinical demands, potentially leading to burnout

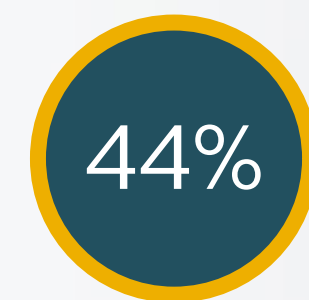
Many younger healthcare professionals feel their medical education has **not prepared** them for some aspects of practice.

They have identified significant skills shortages in key areas such as driving efficiencies and implementing new technologies. Managing job-related stress is also an area that many younger healthcare professionals feel unprepared for, with **many** feeling their medical education did not prepare them at all for it. They also reported managing stress as the area in which they have the least continuous education.

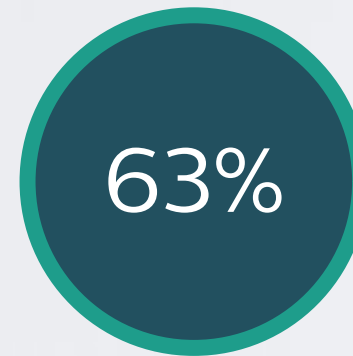
“We should be trained for managing patients, teams and business administration, besides clinical aspects of care.”

Radiologist, France, 8 years in practice

Younger healthcare professionals say that they feel least prepared for the business administration tasks of their roles, and only around a third (**37%**) said their hospital or practice provides them with continuous education on this.



Medical education has **not prepared** them at all for business administration tasks



Continuous education on business administration is **not available** in their hospital or practice

Only about **50%** feel their medical education prepared them to manage stress

50%



Further, **66%** report a **lack** of continuous education on stress management from their hospital or practice

66%



Base (unweighted): Total younger healthcare professionals (n=2,867)



The knowledge gap

Reliance on **volume-based metrics** and the lack of understanding of **value-based care** hinders its widespread adoption

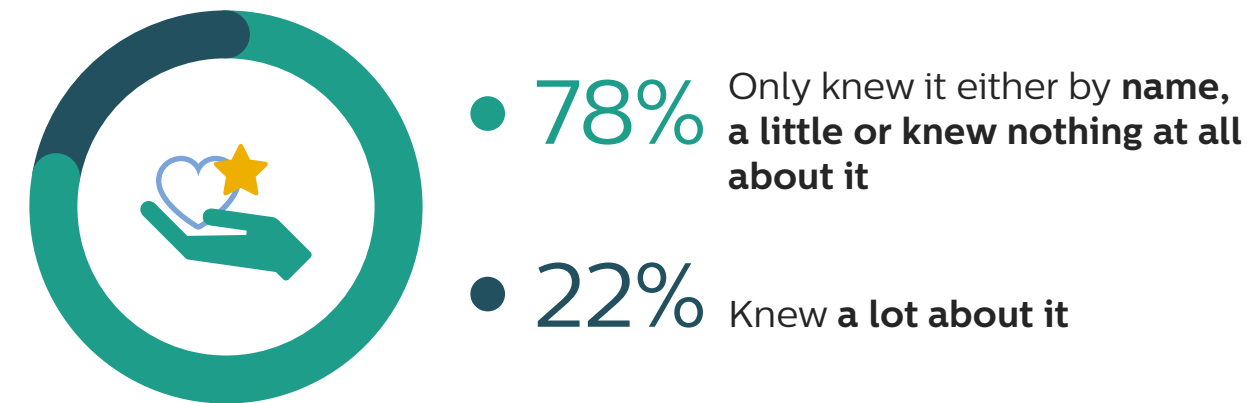
Hospitals and healthcare practices are increasingly shifting towards **value-based care models***. Yet, younger healthcare professionals lack knowledge about the concept, even though they share the aim of improving healthcare.

What is more, many of the hospitals and practices in which they work are still using volume-based performance indicators. It is likely that this is perpetuating the lack of knowledge of value-based care within their workplaces.

“Value-based care is a concept that is leading us towards more efficient allocation of healthcare personnel and resources.”

Anesthesiologist, Germany, 6 years in practice

The vast majority of younger healthcare professionals had limited or no **knowledge of value-based care** prior to taking this survey. This indicates that, despite its growing adoption, the concept is not being covered in medical schools or during on-the-job training.



But there are some outliers, particularly among emerging countries like Saudi Arabia and Romania. This could be due to **bold public announcements** such as Saudi Arabia’s ‘people-centered health systems’ G20 agenda, shaped around value-based care, or a general interest in global concepts from internationally minded younger healthcare professionals.

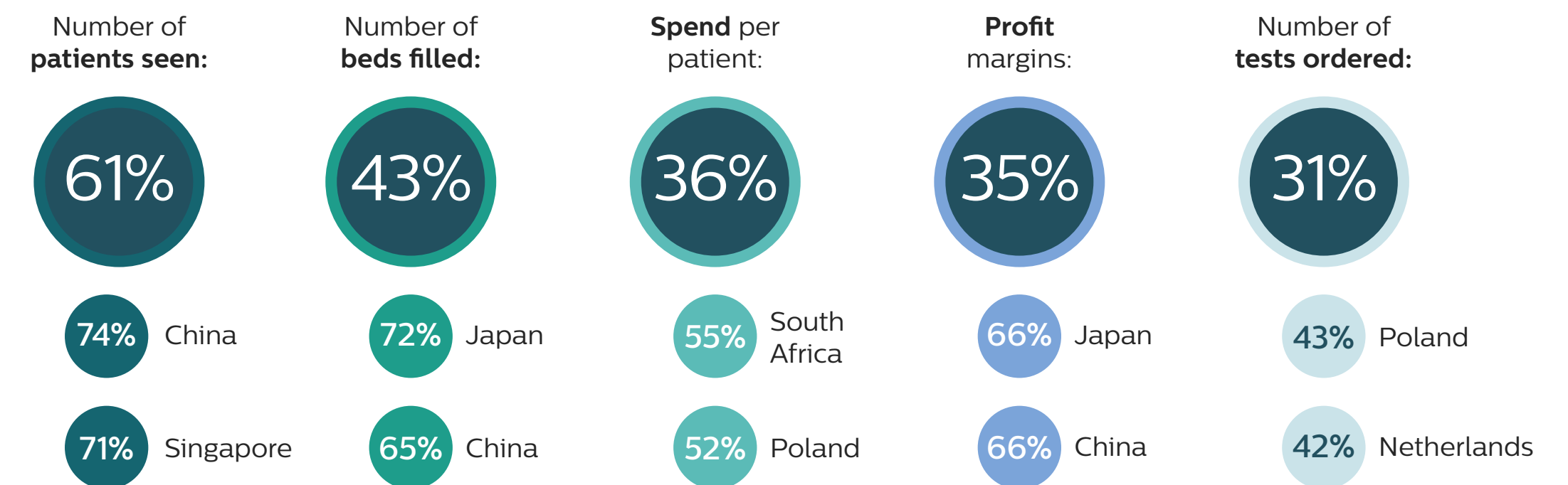


Base (unweighted): Total younger healthcare professionals (n=2,867), Romania (n=202), Saudi Arabia (n=201)

For many younger healthcare professionals, their day-to-day experience reinforces their **lack of knowledge about value-based care**. A high number of hospitals and practices are still using volume-based metrics to measure performance, while key value indicators like preventative care are not generally used to measure success.



The percentage of hospitals or practices using these volume-based performance measures:



Base (unweighted): Total younger healthcare professionals (n=2,867; Singapore (n=100); India (n=202); China (n=201); France (n=202); Japan (n=202); South Africa (n=201); Poland (n=201); Germany (n=200); Netherlands (n=201); Saudi Arabia (n=201); Russia (n=200)

*Value-based care is the concept of healthcare providers receiving reimbursement based on patient health outcomes rather than on the volume of tests or procedures completed.

The data gap

Younger healthcare professionals are **digital natives** but many still need support to use data to strengthen clinical performance

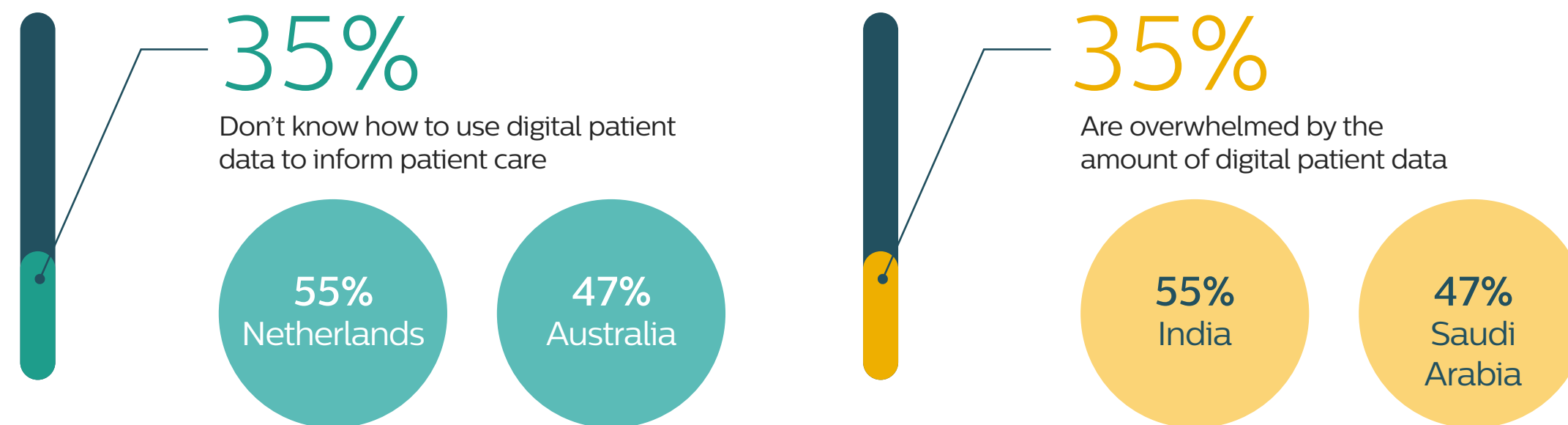
35% of younger healthcare professionals say they do not know how to use digital patient data to inform patient care. Moreover, the volume of data they encounter in daily practice can be overwhelming. There is a clear need for training and resources on new technologies, data management and how to understand and apply data.

At the same time, younger healthcare professionals report that their workplaces are very open to new technology, which usually goes hand in hand with more data. This indicates that already overwhelmed healthcare professionals are likely to face even higher volumes of data in the future. Healthcare leaders need to address this now.

“Many younger medical professionals are digital natives and accustomed to interacting with large amounts of data in their personal lives. However, in their work life, they find most patient data is not easy to navigate or translate. We have an enormous untapped opportunity to structure patient data available in clinical practice to drive improvements in medical care.”

Nancy Brown, CEO, American Heart Association

Around **one-third** of younger healthcare professionals are underinformed or overwhelmed by digital patient data.



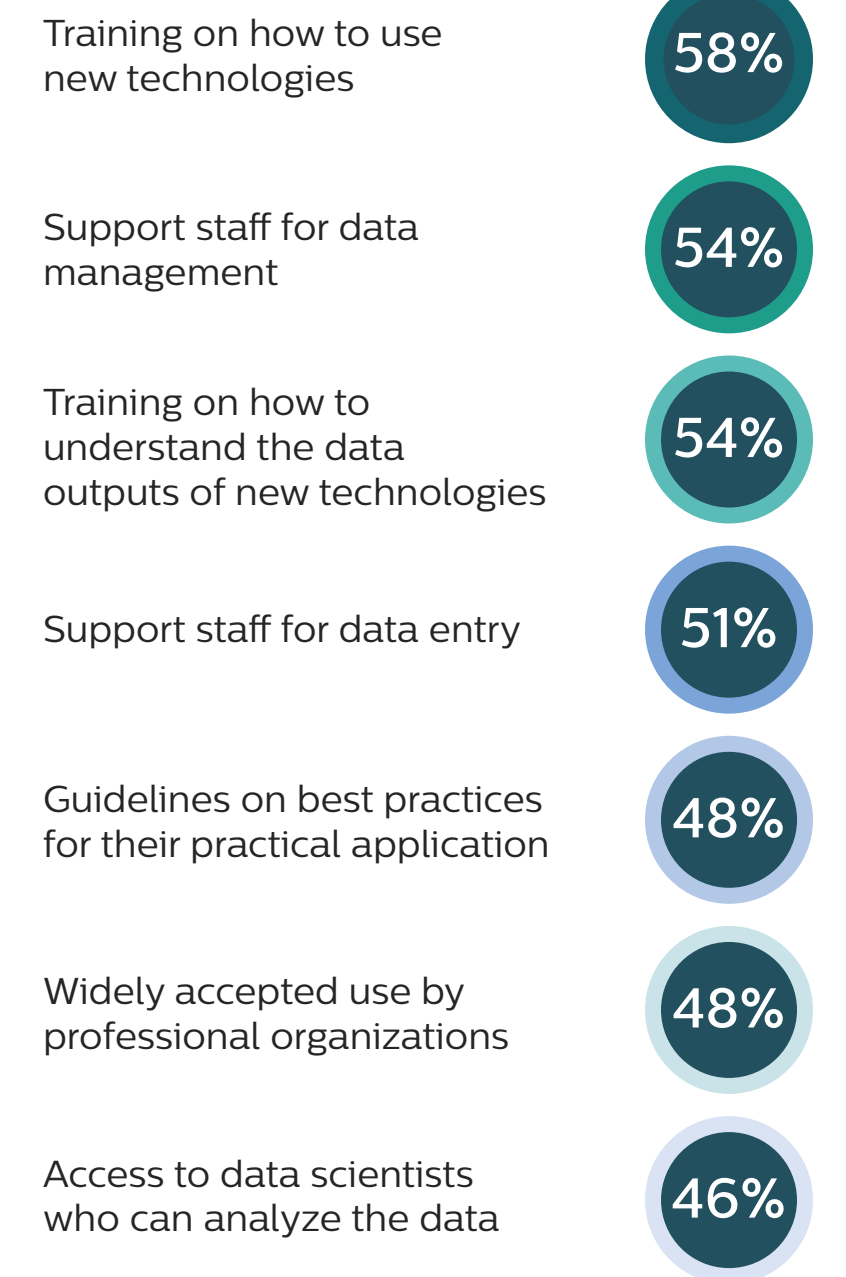
Base (unweighted): Total younger healthcare professionals (n=2,867), total younger healthcare professionals in the Netherlands (n=201 unweighted), India (n=202), Saudi Arabia (n=201)

Most (**78%**) younger healthcare professionals say their hospital or practice is completely or somewhat willing to embrace new technology. This is particularly true where countries are large adopters of technology. For example, China, in its Health 2030 mandate, has put technology at the heart of its healthcare strategy*.



Base (unweighted): Total younger healthcare professionals (n=2,867; China (n=201)
*<https://www.who.int/healthpromotion/conferences/9gchp/healthy-china/en/>

Resources that would be helpful to ensure younger healthcare professionals are able to use **digital patient data** most effectively:



Base (unweighted): Total younger healthcare professionals (n=2,867)

The career expectation gap

Hospitals and practices need to **rethink** how they address the gap between education and reality

Worryingly, many younger healthcare professionals feel a **gap** between the reality of their career and what they had hoped it would be. The danger is that these disenchanted professionals will leave healthcare prematurely.

Appropriate training in technology can help to reduce this career expectation gap. Smart hospitals can too, by deploying technology that makes it easier for healthcare professionals to improve their skills and deliver patient care.

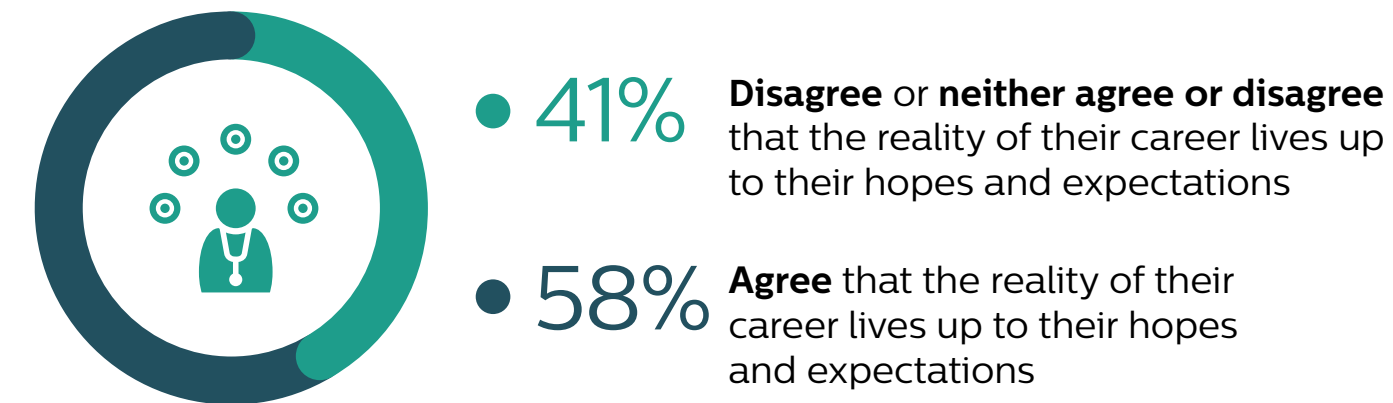
Working in a practice where technology is widely deployed to augment clinical delivery may offer wider benefits to staff. Younger healthcare professionals working in smart environments report a smaller career expectation gap than those in analog hospitals or practices.

Smart: advanced connected care technologies are used, in addition to patient data and communications being handled electronically.

Digital: simple/basic technologies are used, with most or all patient data and communications being handled electronically.

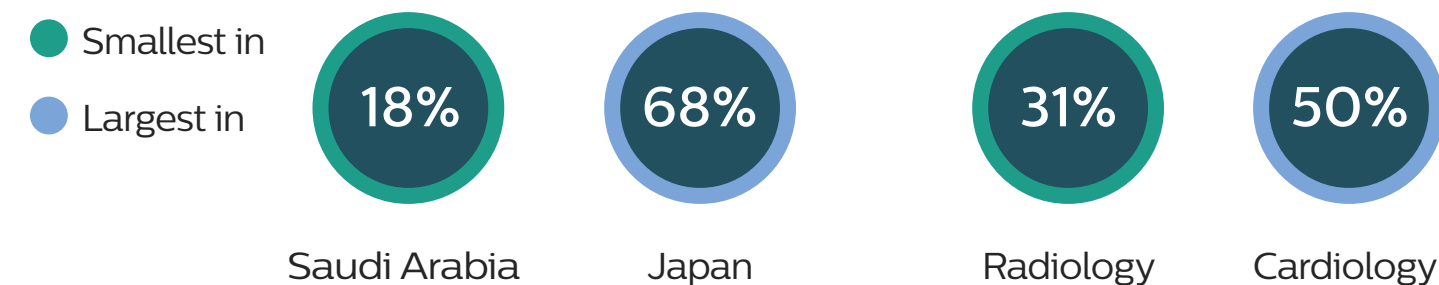
Analog: most or all patient data is handled in a paper-based format or using traditional communications (e.g. phone, fax, etc.).

Many **(41%)** say the reality of their career either **does not live up** to the hopes and expectations that they had during their medical education, or they are undecided:



Base (unweighted): Total younger healthcare professionals (n=2,867)

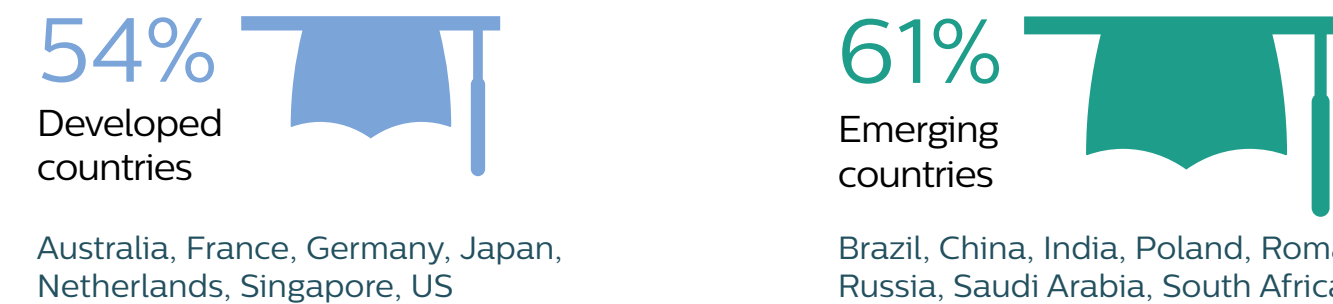
The **career expectation gap** among younger healthcare professionals is:



Base (unweighted): Total younger healthcare professionals (n=2,867); Saudi Arabia (n=201); Japan (n=201); radiology (n=111); cardiology(n=325)

Technology can play a role in alleviating some of the career expectation gaps. In emerging countries, where **technology training** is more prominent, the gap is smaller:

Percentage of younger healthcare professionals that **agree** the reality of their career lives up to the hopes and expectations they held during their medical education



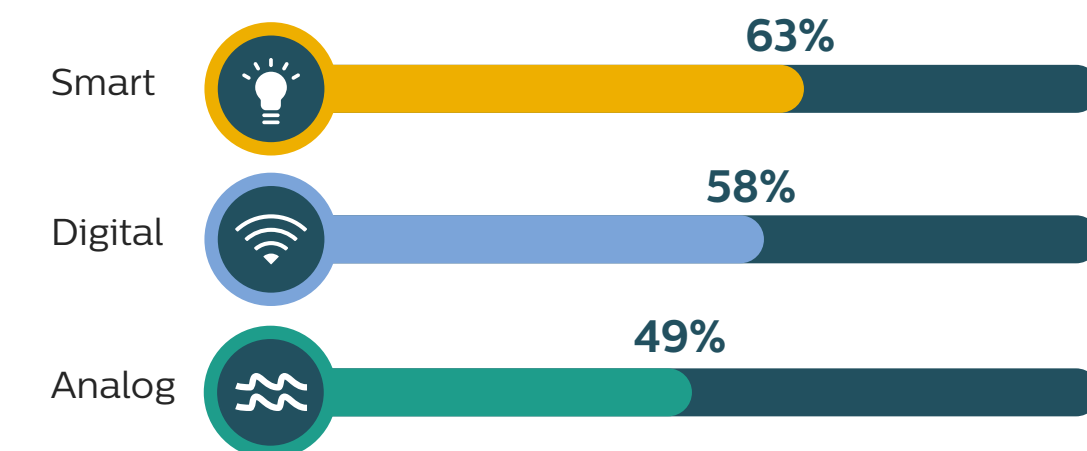
Australia, France, Germany, Japan, Netherlands, Singapore, US

Brazil, China, India, Poland, Romania, Russia, Saudi Arabia, South Africa

Base (unweighted): Total younger healthcare professionals in emerging countries (n=1,611), total younger healthcare professionals in developed countries (n=1,256)

Smart hospitals, where technology plays a greater role than in analog hospitals, can also be a factor in reducing the career expectation gap. The **smarter the hospital**, the more likely employees are to have career expectations in line with reality*. This is likely linked to the fact that the smart technology deployed in these workplaces can drive efficiencies, reducing non-clinical workloads and giving healthcare professionals more time to spend with patients.

Percentage of younger healthcare professionals that agree the reality of their career lives up to the hopes and expectations they had during their medical education:



Base (unweighted): Total younger healthcare professionals working in a smart hospital/practice (n=672), total younger healthcare professionals working in a digital hospital/practice (n=1,790), total younger healthcare professionals working in an analog hospital/practice (n=399)

*See methodology for details on statistical analysis.



Conclusions

“There’s a lack of connection between learning and real-world practice. You get the clinical knowledge but that is no longer enough. There are organizational and management issues that come with being a healthcare professional that you are simply not made aware of when you are a student.”

Professor Rafael Bengoa, former Basque Minister of Health and Director of the Institute for Health and Strategy

Younger healthcare professionals are clearly committed to their roles, but they are concerned by **gaps in education** and **training** that are impeding their efficacy.

The role of training

The danger is that these deficiencies are limiting the time they can spend with patients and potentially discouraging them from a long-term career in healthcare. There is an imperative to address training so that they are encouraged to stay and use their clinical skills rather than becoming disillusioned. It is vital that this generation’s concerns and experiences are understood and their training is revitalized to enhance job satisfaction and minimize the risk of burnout.

A smaller gap in emerging countries

There is a marked difference in the knowledge and expectations of younger healthcare professionals in emerging countries and those in developed countries. In fact, research from the World Economic Forum* highlights the willingness of emerging economies to embrace change and become early adopters of

innovation across a range of sectors. In emerging countries, technology often has a bigger role in medical education and training**. This can be linked to a smaller career expectation gap and a greater knowledge of value-based care. Overall, it seems that younger healthcare professionals in emerging countries feel better prepared for their careers than their peers in developed ones. Clearly, there are lessons that healthcare leaders can take from this.

The smart dividend

The research suggests that smart hospitals and practices are generating more realistic career expectations. This highlights the benefit of having technology and healthcare professionals working in harmony. Awareness of this discrepancy can help today’s leaders to act and improve outcomes, efficiencies and staff retention and, ultimately, accelerate the more widespread adoption of value-based care.

*www.weforum.org/agenda/2019/09/emerging-economies-healthcare-data/

**<https://www.forbes.com/sites/teconomy/2015/03/17/emerging-market-medical-education-goes-digital/#b5cee6b4739d>



Harnessing technology to help transform healthcare

Data and technology offer great promise

Data, and the rapidly evolving technology behind it, has the power to build healthcare systems robust enough to deliver value-based care. The next generation of healthcare professionals is firmly convinced of this great potential. For them, it is a necessary tool that improves their performance and has the ability to reduce work-related stress.

Daily experience doesn't live up to that potential

However, digital technology adoption is not always a positive experience. One-fifth of healthcare spending is deemed ineffective or wasteful, with various studies pointing towards digital health record systems resulting in financial losses in medical practices*. As with many other technologies, digital health records have huge transformative potential but are frequently not used to maximum effect. It is unsurprising then, that these younger healthcare professionals have a balanced and pragmatic attitude towards technology. Rather than yearning for the latest innovation, they are clear in their desire to have the technology foundations in place to improve patient care and enhance their own work experience. These foundations include usable digital health records and data that is relevant, accurate and interoperable across platforms. When these fundamentals are in place, this group is more open to the new technologies that can help make marked improvements across healthcare systems.

This is a generation of digital natives who have seamlessly incorporated technology into their personal lives. In their working lives, they expect it to work for them, not against them.

The following insights explore their expectations and experiences of technology adoption in the workplace. They provide a mandate for the industry to make it easier for younger healthcare professionals to benefit from existing and new technologies, while preserving the time they spend with patients.

*<https://www.medicaleconomics.com/article/physician-outcry-ehr-functionality-cost-will-shake-health-information-technology-sector>

Technology's role in improving patient care

Most younger healthcare professionals see digital health technologies as tools to **enhance outcomes** and **improve patients' experiences**

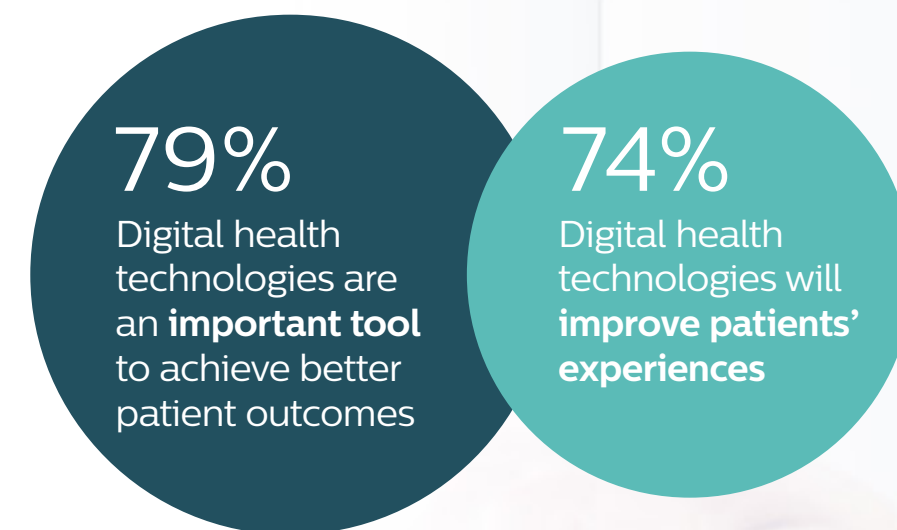
Younger healthcare professionals view technology as critical when it comes to achieving **better patient outcomes** and **experiences**.

This generation also recognizes the importance of anonymized healthcare data in improving care. This recognition is particularly high in Asian and Middle Eastern countries, perhaps due to a combination of cultural attitudes and medical training.

“Easier and faster information, and the possibility of viewing the patient's history, surely helps to prevent errors.”

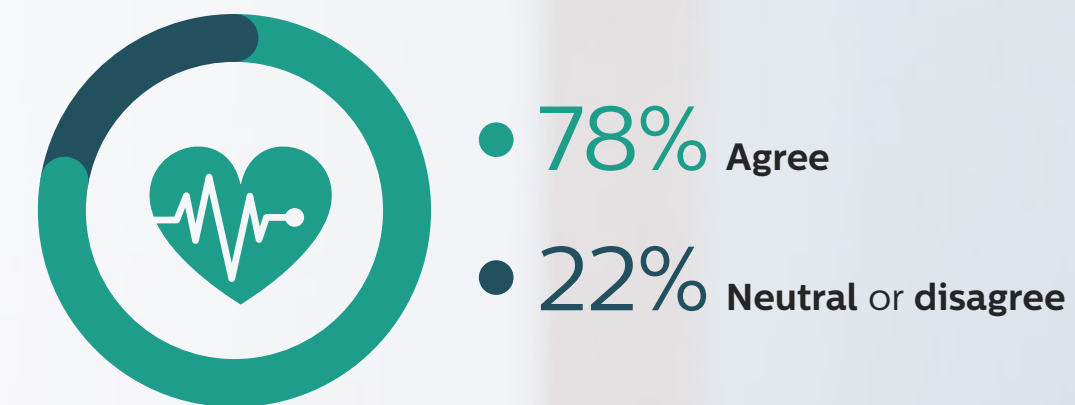
Urologist, Brazil, 10 years in practice

Percentage of younger healthcare professionals who agree with the following statements:



Base (unweighted): Total younger healthcare professionals (n=2,867)

Most younger healthcare professionals agree that “the societal benefits of improved patient care from the use of **anonymized health data** outweigh the perceived data privacy concerns of the individual”:



The **highest** and **lowest** levels of agreement are seen among younger healthcare professionals in:



Base (unweighted): Total younger healthcare professionals (n=2,867), Saudi Arabia (n=201), Singapore (n=100), US (n=201) and France (n=202)

Dismantling data barriers

To provide **real value**, data must be relevant, actionable and available

Data has a **vital role** to play in improving healthcare but there are barriers preventing it from reaching its full potential.

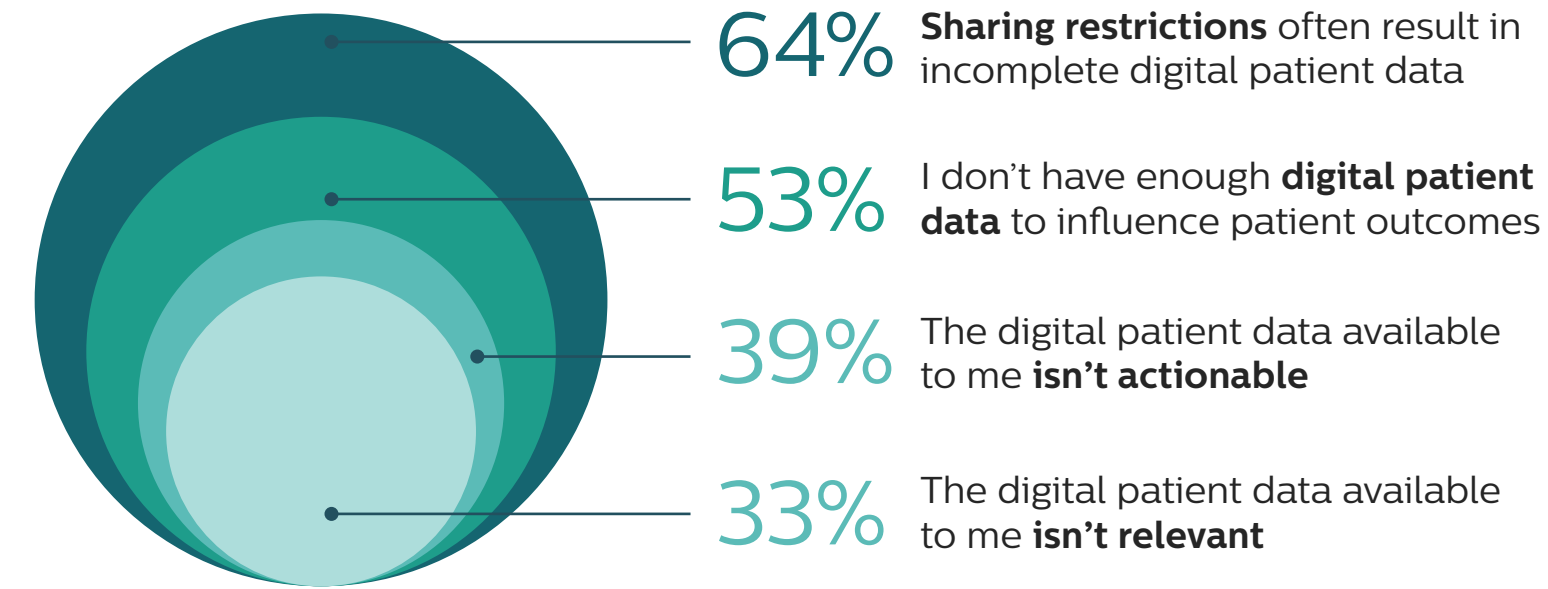
Sharing restrictions can prevent younger healthcare professionals accessing pertinent patient information. This, and a lack of digital data, top their list of data issues. These two challenges can mean that the right patient data isn't **available** to them.

Adding to the problem, many also feel that the patient data they receive isn't always **relevant** or **actionable**, which likely contributes to the feeling of being overwhelmed by data that was identified in theme one.

Younger Romanian and Indian healthcare professionals report some of the highest challenges with patient data, but, more than many of their peers in other countries, those in India feel that training would help address the situation.

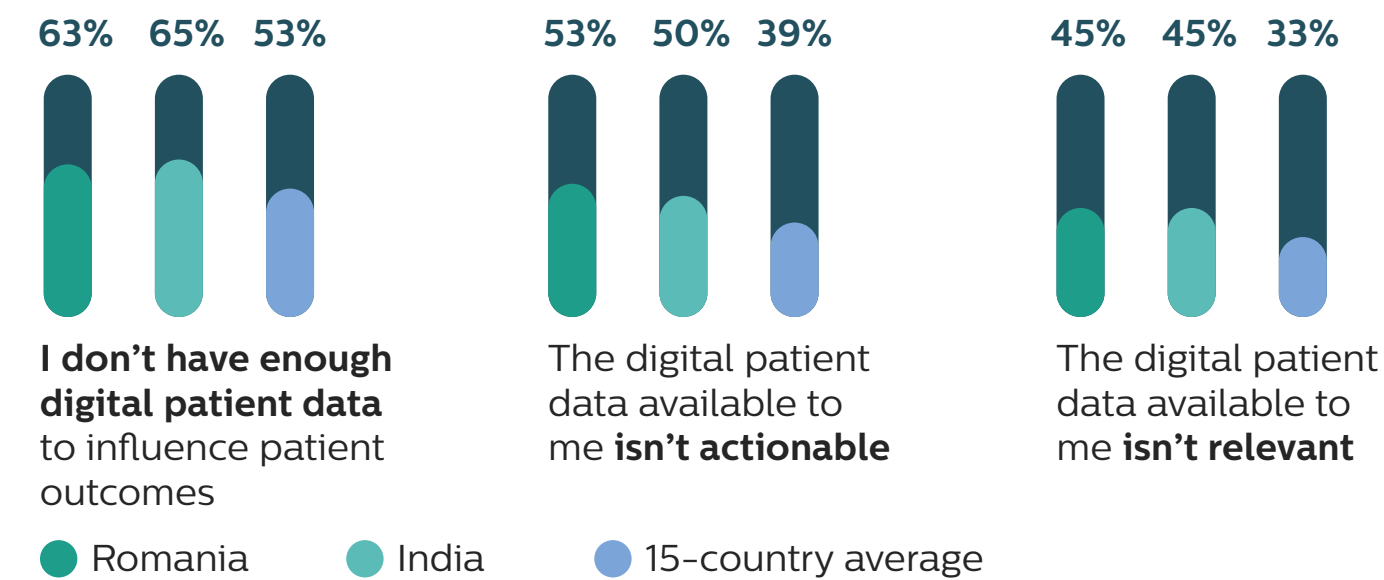
Overcoming these barriers can build younger healthcare professionals' **trust** and **confidence** in data, increasing its effectiveness.

When dealing with patient data, younger healthcare professionals agree that:



Base (unweighted): Total younger healthcare professionals (n=2,867)

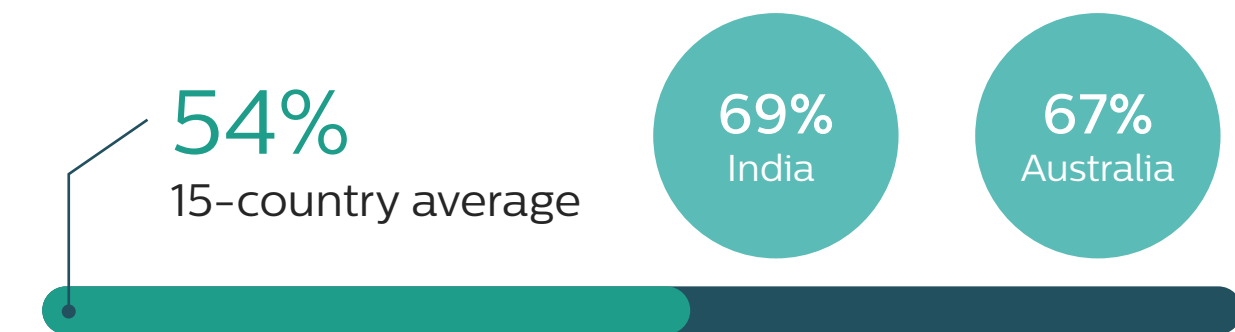
Younger **Romanian** and **Indian** healthcare professionals say that they experience the following issues at higher rates compared to many other countries:



Base (unweighted): Total younger healthcare professionals (n=2,867), Romania (n=202), India (n=202)

To derive **real value** from digital patient data, younger healthcare professionals need support. They say that the following would help them to use digital patient data effectively:

Training on how to understand the **data outputs of new technologies**



Support staff for **data management**



Base (unweighted): Total younger healthcare professionals (n=2,867), India (n=202), Australia (n=150), Netherlands (n=201).

"I anticipate smart technology and information-heavy analysis will continue to grow in relevance. The capacity for data analysis and interpretation will be very important."

Gastroenterology intensivist, United States, 5 years in practice

The power of interoperability

To reap the full benefits of health data, **integration** must be improved

Most hospitals and practices run multiple, incompatible systems. To get a complete view of a patient, healthcare professionals regularly have to sift through data from multiple sources and are frustrated with incompatible systems and platforms.

If not addressed, this **lack of interoperability** could lead to lower confidence in the ability of data to improve patient care.

“We need to be able to connect across all systems and hospitals.”

Ophthalmologist, United States, 8 years in practice

Lack of interoperability is a **top barrier** to adopting additional digital health technologies, ranking only behind budgetary constraints (**43%**) while being on par with bureaucratic processes (**25%**). Hospitals or practices being resistant to change is less of a concern, with only 10% choosing it as a top barrier.



25% of younger healthcare professionals say a **lack of interoperability** across technological systems and platforms is a top barrier

Base (unweighted): Total younger healthcare professionals (n=2,867)

Younger healthcare professionals in **developed countries** are more likely to say interoperability needs to be improved between platforms to change how healthcare data is handled, than their counterparts in emerging countries. This is likely due to the greater number of disparate legacy systems currently in use in developed countries.

Percentage of younger healthcare professionals who say that interoperability between systems and platforms **needs to be improved**:



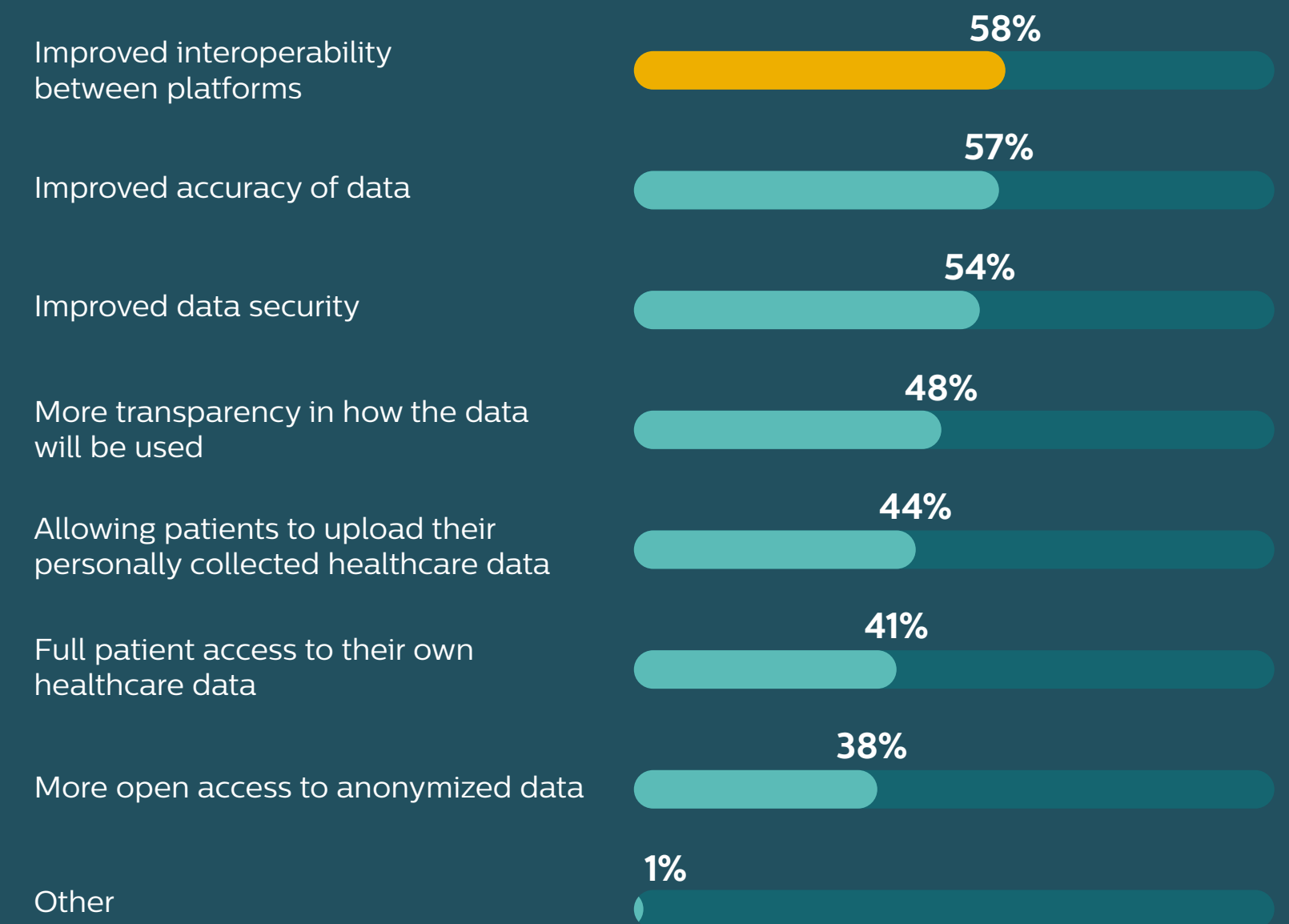
62%
Developed countries



54%
Emerging countries

Base (unweighted): Total younger healthcare professionals in emerging countries (n=1,611), total younger healthcare professionals in developed countries (n=1,256)

Improved interoperability between systems and platforms is also one of the **top opportunities** to ensure utilization of healthcare data to its fullest potential.



Base (unweighted): Total younger healthcare professionals (n=2,867)

Technology's role in healthcare professionals' satisfaction

It brings **value** to both patient care and professionals' experiences

While technology is a crucial part of **improving patient outcomes**, it also plays a key role in determining **job satisfaction levels** among younger healthcare professionals.

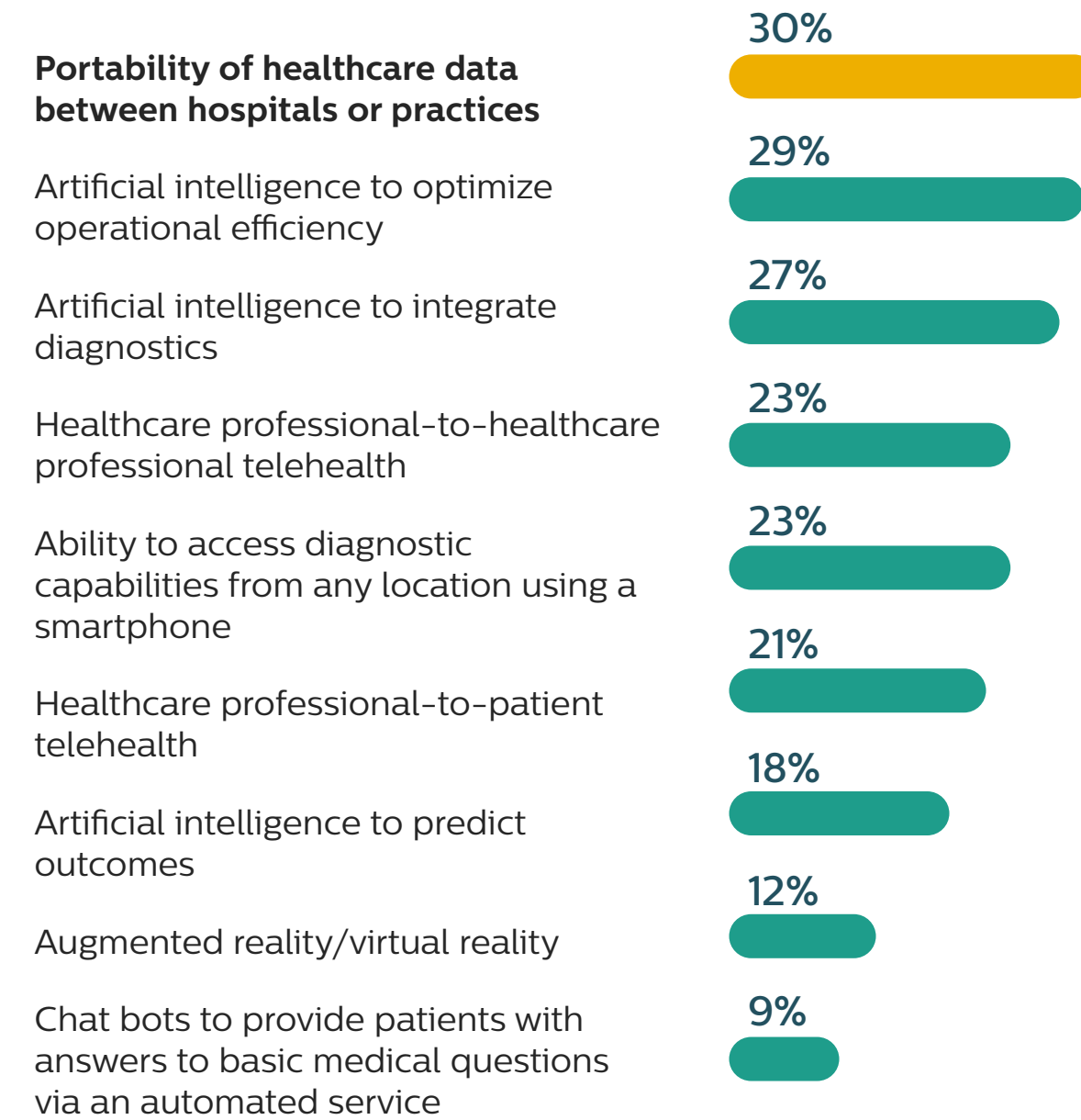
Across all countries surveyed, younger healthcare professionals have confidence that technology can reduce their workloads. They also see a clear link between appropriate technologies and lower stress levels.

Involving younger healthcare professionals in the specification and selection of technologies can be an important step in improving their professional satisfaction.

“Personally, being able to access records in an organized fashion from the comfort of my computer terminal seems like a no-brainer.”

Critical care specialist, Australia, 5 years in practice

Portability of healthcare data is cited as one of the top technologies that would most improve younger healthcare professionals' workplace satisfaction.



Base (unweighted): Total younger healthcare professionals who believe that at least one digital health technology can improve their work satisfaction (n=2,809)

Younger healthcare professionals agree that the right technologies have the potential to **lower their workload and stress levels**

81%
The right technologies have the potential to **reduce my workload**

67%
I expect the adoption of digital health technologies to **decrease my stress levels**

Base (unweighted): Total younger healthcare professionals (n=2,867)

Smart hospitals make happier professionals

The smarter the hospital or practice, the **better the experience** of the healthcare professional

As seen, younger healthcare professionals working in smart hospitals and practices have a lower career expectation gap*. Smart hospitals and practices also impact the experience of this group, **improving satisfaction and reducing stress**. This reinforces the point that technology has significant potential to improve the experience of younger healthcare professionals, which ultimately leads to lower rates of burnout and increased levels of retention.

Smart: advanced connected care technologies are used, in addition to patient data and communications being handled electronically.

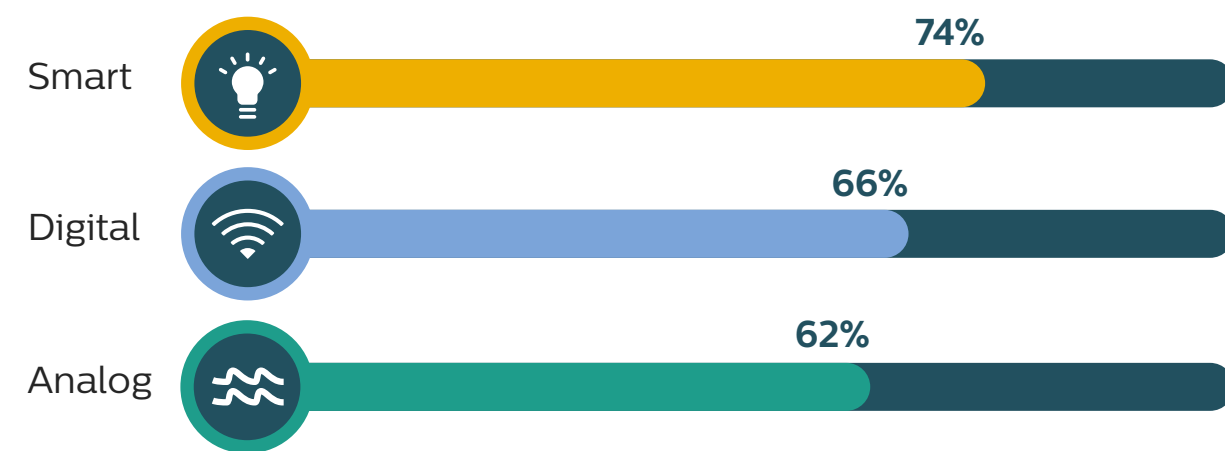
Digital: simple/basic technologies are used, with most or all patient data and communications being handled electronically.

Analog: most or all patient data is handled in a paper-based format or using traditional communications (e.g. phone, fax, etc.).

Younger healthcare professionals who work in **smart facilities** are more likely than those in both digital and analog facilities to be **satisfied with their work**. Those in analog facilities are more likely to be dissatisfied.



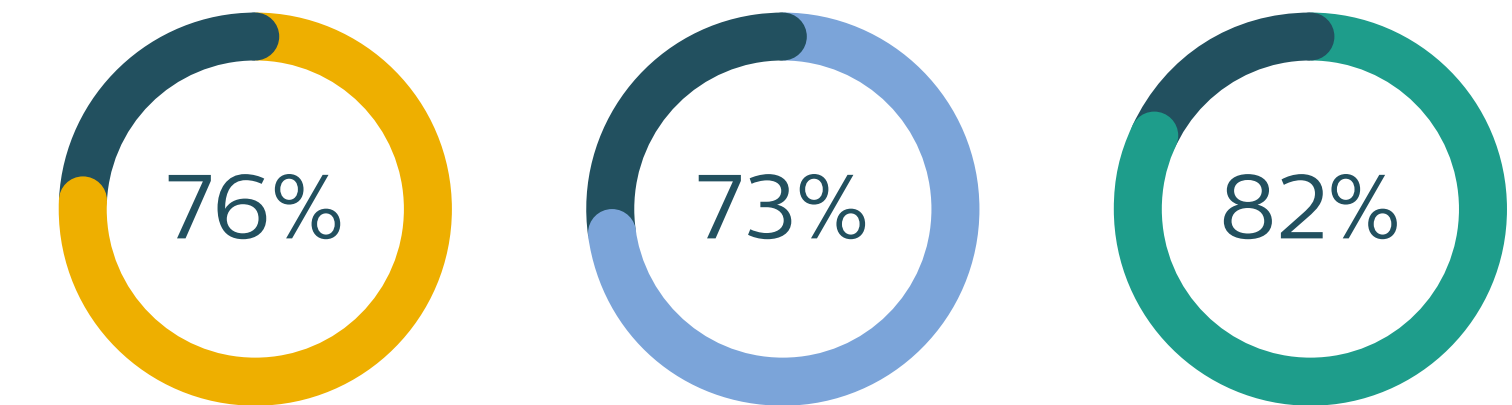
Younger healthcare professionals who work in **smart facilities** are also more likely than those in other types of facilities to say they are **likely to recommend medicine** as a career to others.



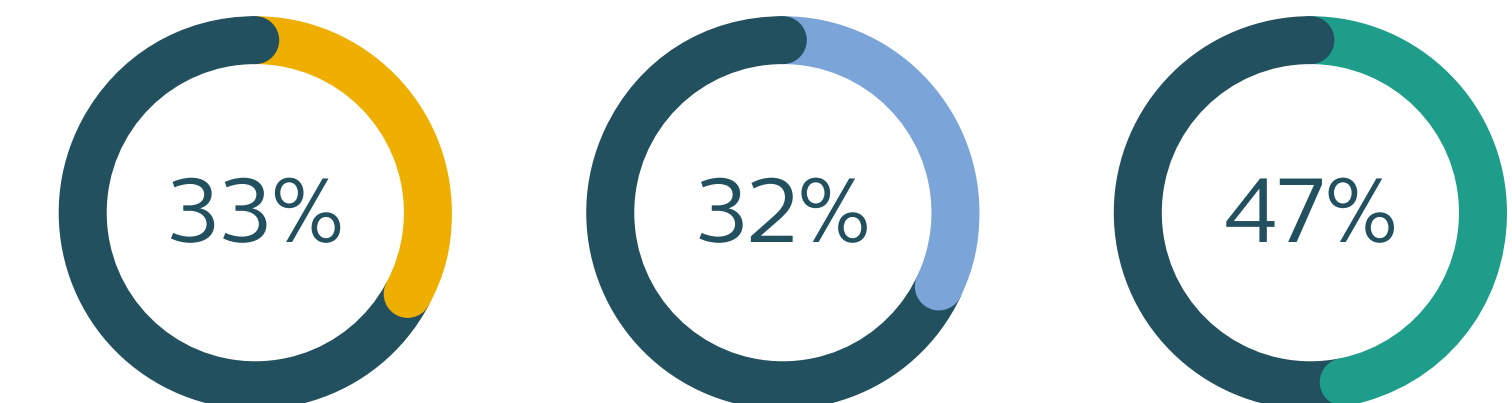
Base (unweighted): Total younger healthcare professionals (n=2,867), total younger healthcare professionals working in a smart hospital/practice (n=672), total younger healthcare professionals working in a digital hospital/practice (n=1,790), total younger healthcare professionals working in an analog hospital/practice (n=399)

Younger healthcare professionals working in **analog facilities** are more likely to **experience stress** than those in smart or digital facilities. They are also more likely than those in smart or digital facilities to have considered leaving as a result of stress.

I regularly experience work-related stress



I have considered **leaving the healthcare profession** as a result of work-related stress



● Young healthcare professionals in smart facilities
 ● Young healthcare professionals in digital facilities
 ● Young healthcare professionals in analog facilities

Base (unweighted): Total younger healthcare professionals working in a smart hospital/practice (n=672), total younger healthcare professionals working in a digital hospital/practice (n=1,790), total younger healthcare professionals working in an analog hospital/ practice (n=399)

*See methodology for details of the statistical analysis completed.

Laying the foundations for improved patient care

Digital health records are highly valued by younger healthcare professionals

Accurate and accessible digital health records are an asset that could lead to **greater confidence** in deploying technology across healthcare.

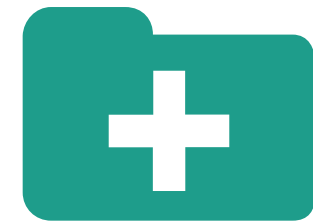
Despite negative coverage of the technology, one in four younger healthcare professionals regards digital health records as the most effective technology for improving patient care over the next five years.

Digital health records are also seen as a vital technology to enable younger healthcare professionals to feel confident treating patients remotely.

Based on this data, there is a clear case for healthcare leaders to put more resources into improving digital health record technologies.

“Digital health records must be the first thing to be developed because they should be the basis for any other proposed technological developments.”

**Infectious diseases specialist, France,
6 years in practice**

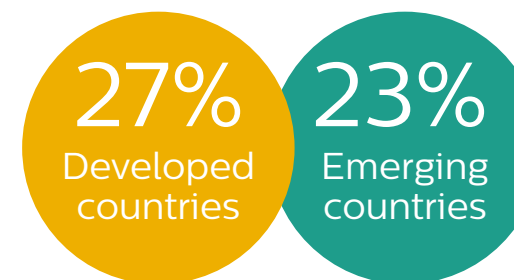


When asked which digital health technology will be **most beneficial** for improving patient care over the next five years, digital health records topped the list.

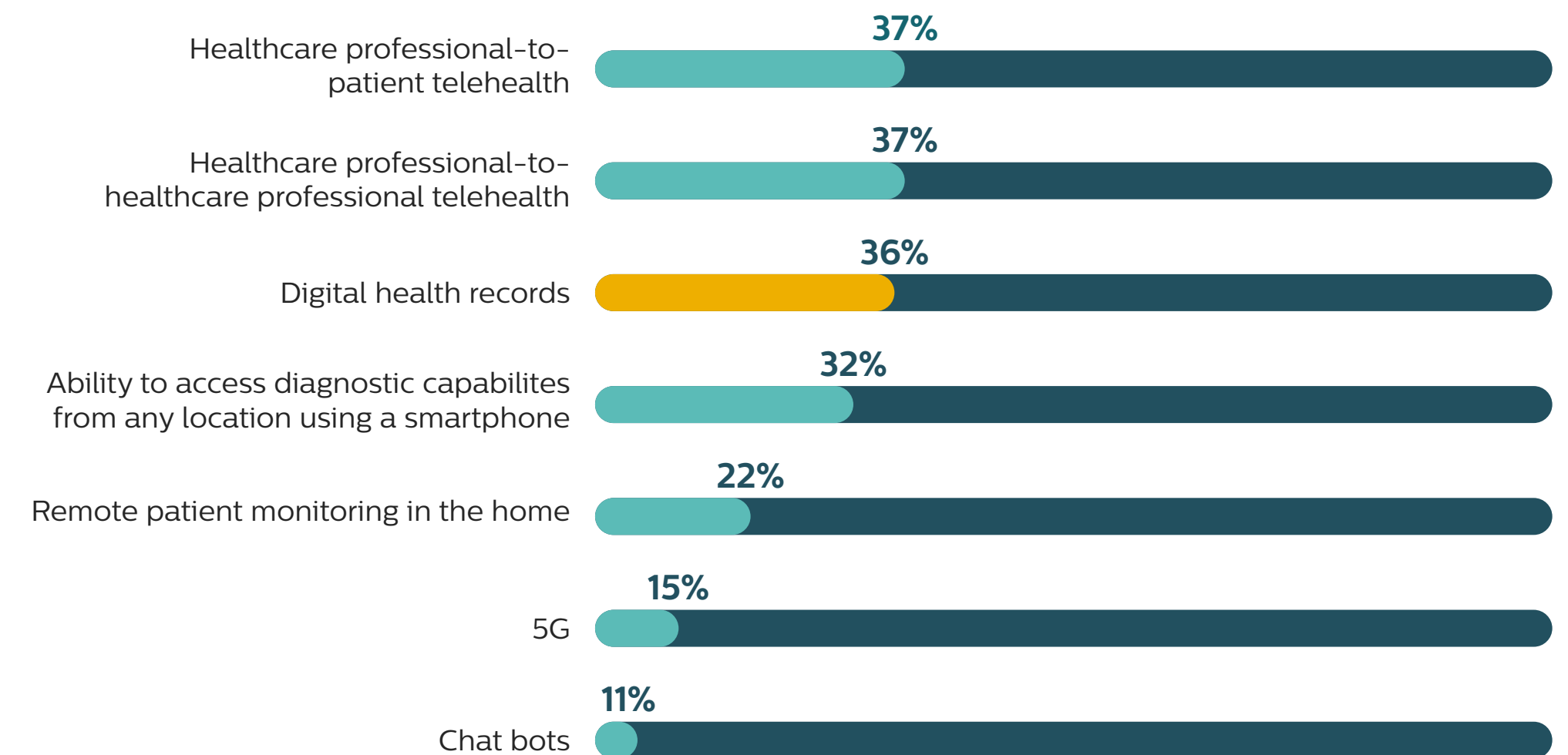
This sentiment about digital health records is even stronger in France, Germany and Poland, where digital health records have been on the **governments’ agendas** for many years.



Younger healthcare professionals in developed countries are more likely to rank **digital health records** as the tool with the most potential benefit to improve patient care.



Digital health records are also one of the top technologies younger healthcare professionals say are necessary for them to **feel confident** treating patients remotely.



Base (unweighted): Total younger healthcare professionals who believe digital health technologies will make them feel confident treating patients remotely (n=2,706)

Base (unweighted): Total younger healthcare professionals who believe digital health technologies will be beneficial for improving patient care during the next five years (n=2,834), younger healthcare professionals who believe digital health technologies will be beneficial for improving patient care during the next five years: France (n=200), Germany (n=195), Poland (n=198), developed countries (n=1,236) emerging countries (n=1,598).

An openness to technology

The younger generation has a balanced approach to the **potential of technology**, including artificial intelligence

Younger healthcare professionals are pragmatic in their approach to technology.

Despite the hype around artificial intelligence (AI) and automation replacing healthcare jobs, the overwhelming majority of this generation do not seem to be overly concerned about the impact of new technology on their job security. In fact when it comes to AI, many are enthusiastic about the potential it offers to help them improve patient outcomes.

Younger healthcare professionals, particularly in developed countries, have some concerns about their workloads that can be alleviated by higher rates of adoption of the right digital health technologies.

Younger healthcare professionals want technology to work well with the basics – scheduling, diagnostics and data sharing – to really improve patient care and their own working lives.

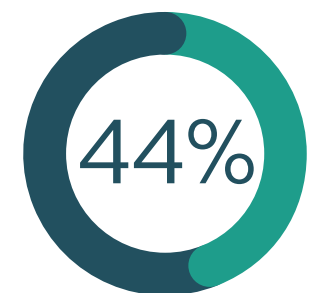
“AI, if developed properly and in direct collaboration with doctors, could bring huge benefits. Intelligent software solutions could be a big relief with respect to the daily workload.”

Radiologist, Germany, in the first year of practice

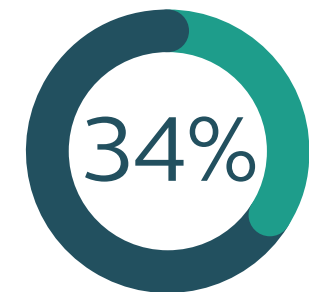


13% Few younger healthcare professionals cite **future job security** due to new technological advancements as a top concern.

However, those in **developed countries** still have some concerns for the future:



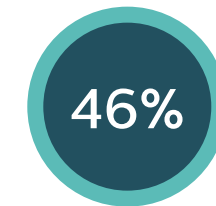
44% are most worried about increased administrative burden during their career going forward, compared to **29%** in emerging countries



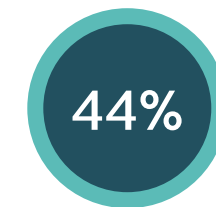
34% are most concerned about unsustainable clinical workload, compared to **26%** in emerging countries

Base (unweighted): Total younger healthcare professionals (n=2,867), total younger healthcare professionals in developed countries (n=1,256), total younger healthcare professionals in emerging countries (n=1,611)

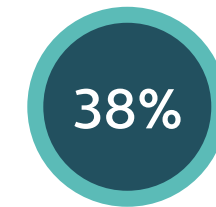
When it comes to future technologies, they see a lot of potential for **AI's use in healthcare**, notably for improving patient diagnostics and reducing inefficiencies in administrative work:



46% Reducing inefficiencies in **administrative work** (e.g. automating charting)



44% Integrating big data into patient records to **predict conditions/diagnoses**



38% **Driving research** through large-scale analysis of data



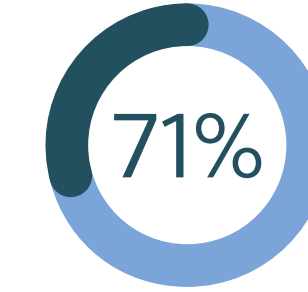
34% **Improving work-life balance** for healthcare professionals



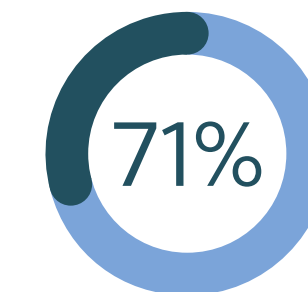
27% Analyzing data worldwide to **predict epidemics**

Base (unweighted): Total younger healthcare professionals who believe that potential uses of AI in healthcare are important (n=2,810)

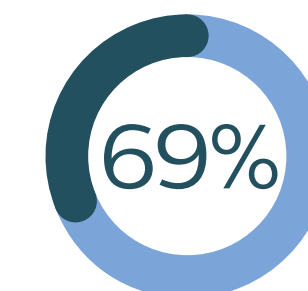
Furthermore, an overwhelming number of these younger healthcare professionals are excited about the **potential of AI** to help improve patient outcomes.



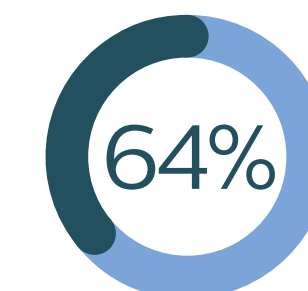
71% Agree AI will give them the tools needed to **keep patients healthy**



71% Agree it could help them **provide more accurate diagnoses**



69% Agree that with AI they will be able to **offer personalized care**



64% Agree AI will help them **spend more time with patients**

Base (unweighted): Total younger healthcare professionals (n=2,867)

Recognizing the value of telehealth

Benefits include increased professional satisfaction and improved patient care

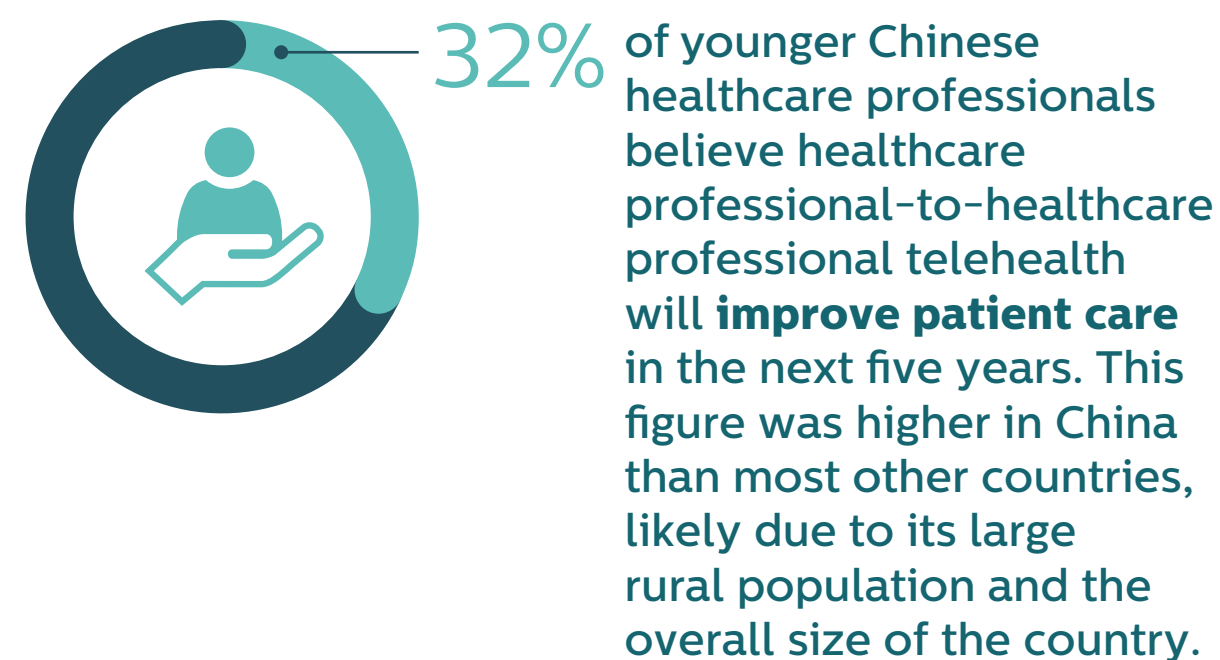
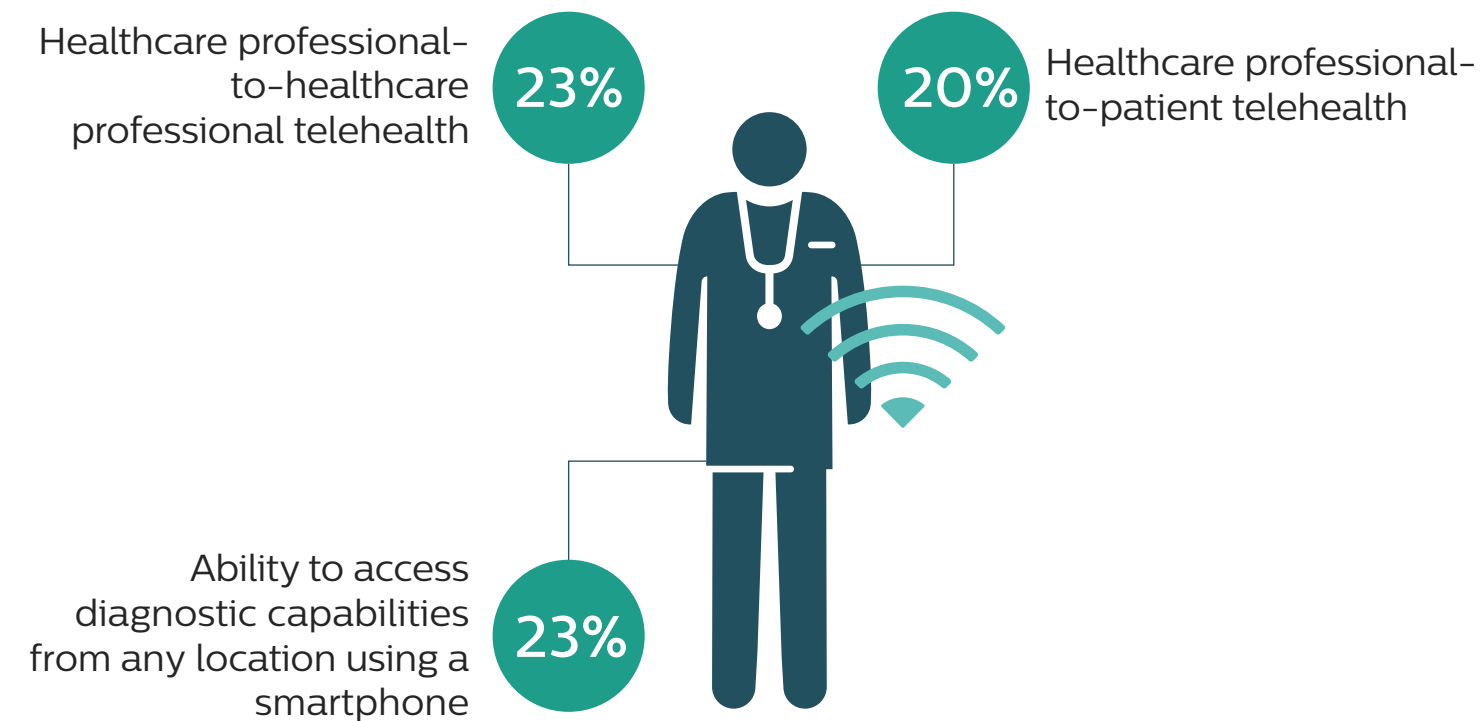
The challenges of an aging population and serving rural communities are **placing a strain on healthcare systems**, which can be mitigated by telehealth.

Remote treatment and monitoring can play a role in responding to these challenges, while having technology ‘on the move’ will enable healthcare professionals to work anywhere and enhance their ability to communicate with fellow professionals and their patients.

“Telehealth is one of the most important technologies for improving patient outcomes. For example, using an app post-surgery can help speed up recovery times and make the experience more positive. Telehealth can take care to the patient, quickly and simply.”

Cecilia Anim CBE, Clinical Nurse Specialist and former President of the Royal College of Nursing

Around a **quarter** of younger healthcare professionals cite telehealth as the digital technology that would **most improve their work satisfaction**.

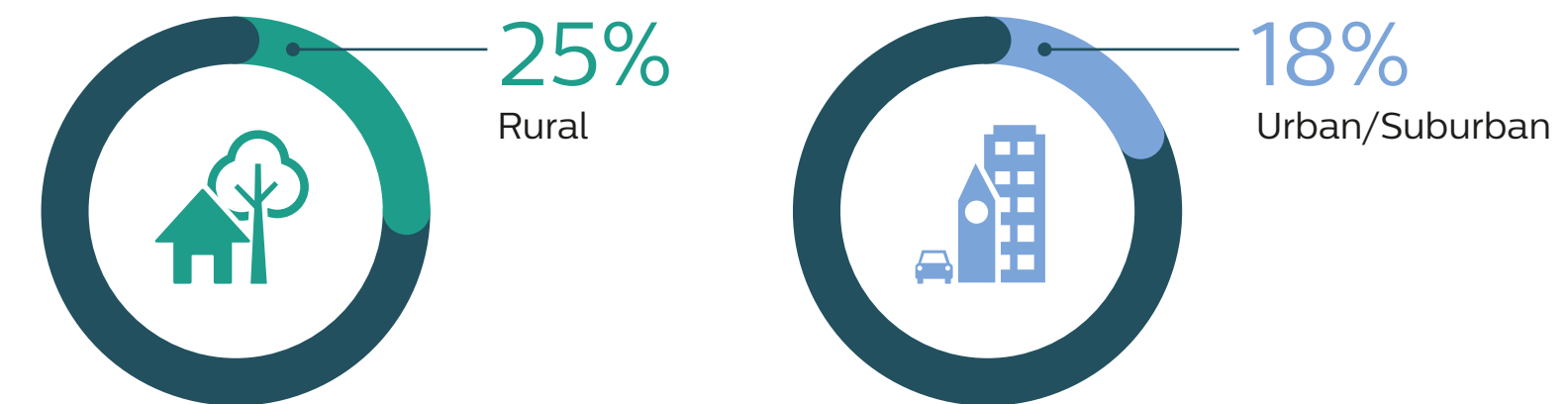


Base (unweighted): Total younger healthcare professionals (n=2,867), China (n=201)

Telehealth is seen as one of the **most beneficial** digital health technologies for improving patient care during the next five years:



Younger healthcare professionals who think healthcare professional-to-patient telehealth will be most beneficial for **improving patient care** in the next five years:



Base (unweighted): Total younger healthcare professional (n=2,867), rural (n=172), urban/suburban (n=2,595)



Conclusions

“The fact that younger healthcare professionals are not out of their comfort zone with technology presents a huge opportunity to implement innovations more quickly and take fuller advantage of it.”

Professor Rafael Bengoa, former Basque Minister of Health and Director of the Institute for Health and Strategy

Younger healthcare professionals have a **positive yet pragmatic attitude** to technology. They acknowledge its potential to ease their administrative workload, resulting in a reduction in work-related stress. And, with almost three-quarters of younger healthcare professionals regularly experiencing work-related stress that could ultimately lead to them leaving the profession, it’s vital that technology is harnessed appropriately.

The promise of digital health records

Digital health records are a good example of this. They hold great promise: the [Future Health Index 2019](#) found that many healthcare professionals who use digital health records in their practice reported a positive impact on quality of care provided, patient outcomes, and their own professional satisfaction. However, for healthcare professionals to reap maximum benefits from this technology, its usability must be further improved.

The importance of interoperability

To make a meaningful difference to both healthcare professionals and their patients, data and technology need to be **accurate, integrated** across the basic tasks of their daily practice, and **interoperable** across different platforms. In this way, it will become a foundation for future advances. It is notable that value-based care cannot be achieved without interoperability. It plays a vital role in the successful measurement and calculation of costs for an episode of care.

Younger healthcare professionals in developed countries are more likely to call for data portability and interoperability than their peers in emerging countries. This likely reflects the narrower career expectation gap identified in theme one.

Technology training leads to a more positive experience

Younger healthcare professionals working in smart facilities are less stressed and report higher levels of job satisfaction. One note of caution for healthcare leaders is that while the younger generation of healthcare professionals is excited about the potential of technology such as AI, it is also concerned about the additional workload it could bring, if not implemented well.

For industry leaders around the world, the **emphasis should be on ensuring the basics are in place**, thereby allowing AI to reach its full potential. This will set the foundations in place to allow hospitals to reap the full benefits of technology and allow value-based care to flourish.



Theme

3

Creating the ideal healthcare working environment

Stress and burnout

The demands of working in healthcare are immense – physician burnout is now deemed a global epidemic and attracts much media attention. This burnout affects 78% of practicing physicians in the US* and more than two-thirds of Chinese physicians**.

Younger healthcare professionals are all too aware of the pressures associated with their role, and they expect a collaborative culture and positive work-life balance in return.

A growing emphasis on work-life balance

Equally, organizations in healthcare and beyond are becoming increasingly aware of the need to focus on staff mental health and well-being. In early 2020, an Australian study***, revealing a link between long working hours and poorer mental health among young doctors, highlighted the urgent need for workplace improvements to help protect mental health and well-being. In Japan, there are plans in place to limit doctors' working hours in an effort to reduce stress and overwork^.

Younger healthcare professionals will actively seek out workplaces that prioritize their well-being in a meaningful way. Neglecting culture and staff satisfaction has a negative effect on both the workforce and the organization's overall performance, so recognizing – and acting upon – these desires is vital.

The following insights explore this generation's wish for a collaborative and supportive culture, and its confidence in its ability to drive transformational change.

“A change of culture is the biggest hurdle in the industry's digital transformation.”

Harold F. Wolf, President and CEO of the Healthcare Information and Management Systems Society (HIMSS)^

*<https://physiciansfoundation.org/wp-content/uploads/2018/09/physicians-survey-results-final-2018.pdf>

**[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(19\)31573-9/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(19)31573-9/fulltext)

***<https://bmjopen.bmj.com/content/10/1/e033525>

^<https://mainichi.jp/english/articles/20190112/p2a/00m/0na/013000c>

^^<https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/promoting-an-overdue-digital-transformation-in-healthcare>

Flexibility first

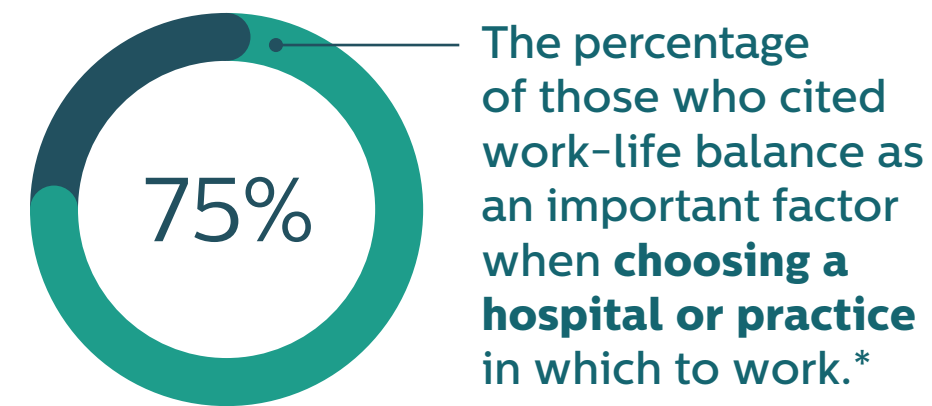
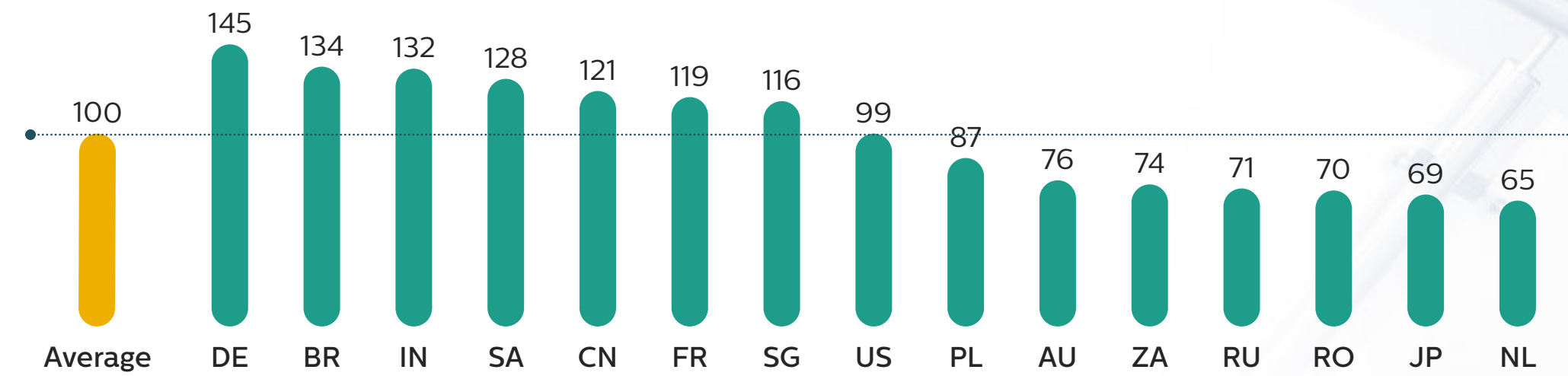
The pressures of long hours and growing patient demands need to be offset by **flexible workplaces**

Due to the high demands on health systems, younger healthcare professionals juggle immense responsibility with long working hours. This likely fuels their desire for a flexible workplace.

“Culture is very important in order to ensure physicians feel appreciated, heard and part of the team... [it] reduces burnout.”

Cardiologist, Australia, 5 years in practice

The average number of patients seen by younger healthcare professionals (per week) country comparisons:



Average number of patients seen by younger healthcare professionals:**



The **Australian Medical Association** warned that half (**53%**) of doctors are working ‘unsafe hours’ (significantly beyond the standard work week of 40 hours a week).***

Of the doctors identified as working **unsafe hours**, the average work week for this cohort was 78 hours and the longest single shift was 76 hours.***
Standard work week of 40 hours a week.***

*Excluding salary. Percentages are NETS. Base (unweighted): Total younger healthcare professionals excluding those who selected ‘salary’ (n=663), total younger healthcare professionals (n=2,867), Australia (n=150), Brazil (n=203), China (n=201), France (n=202), Germany (n=200), India (n=202), Japan (n=202), Netherlands (n=201), Poland (n=201), Romania (n=202), Russia (n=200), Saudi Arabia (n=201), Singapore (n=100), South Africa (n=201), US (n=201).

**This has been calculated without including any assumptions for vacation time, maternity leave, etc. given the differing laws per country.

***<https://ama.com.au/article/2016-ama-safe-hours-audit>

Selecting a **supportive** workplace

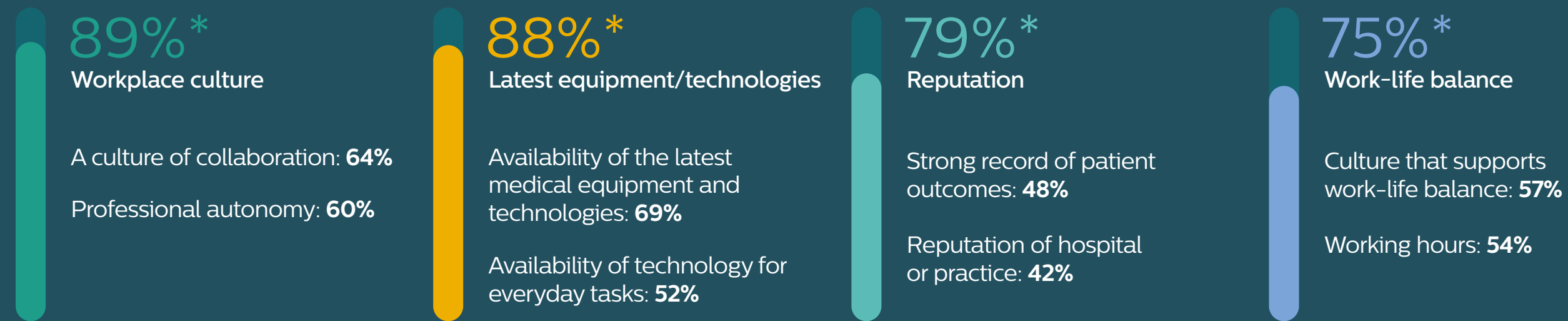
Collaborative working environments **attract talent**

As seen in other industries, younger healthcare professionals actively seek workplaces that offer a **culture of collaboration**. Hospitals and practices should prioritize their culture and work practices to attract and retain staff.

“Our job is based on learning from each other. It is essential to promote mutual support and learning between senior and junior professionals.”

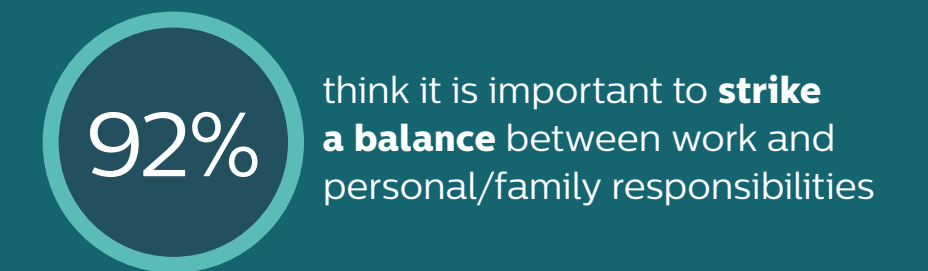
Pediatrician, France, 8 years in practice

Other than salary, factors around **collaboration, autonomy and technology** are important when choosing a hospital or practice in which to work:



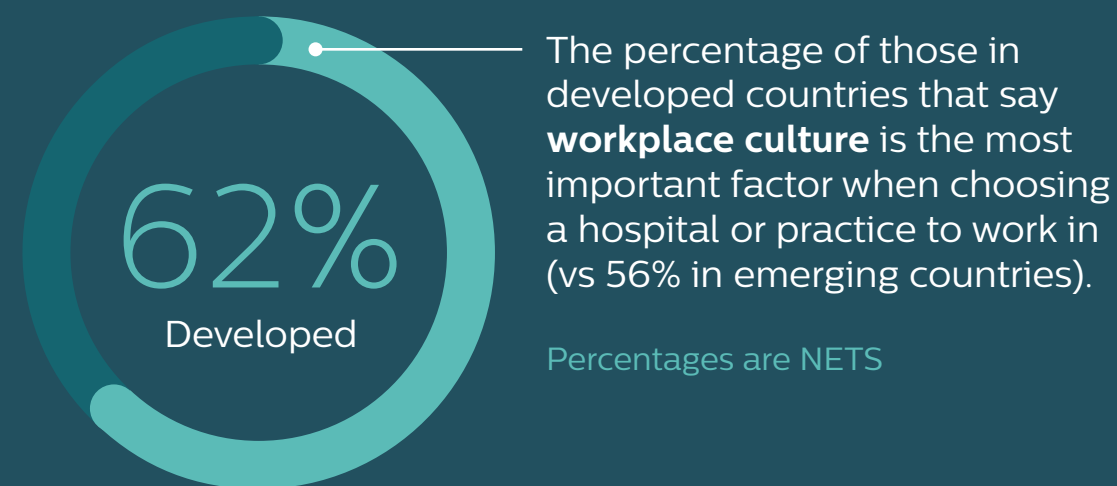
*Percentages are NETS.
Base (unweighted): Total younger healthcare professionals excluding those who selected 'salary - important to you' (n=663)

This sentiment is further supported by data from the **American Medical Association***, which surveyed physicians 35 years and younger, finding that:

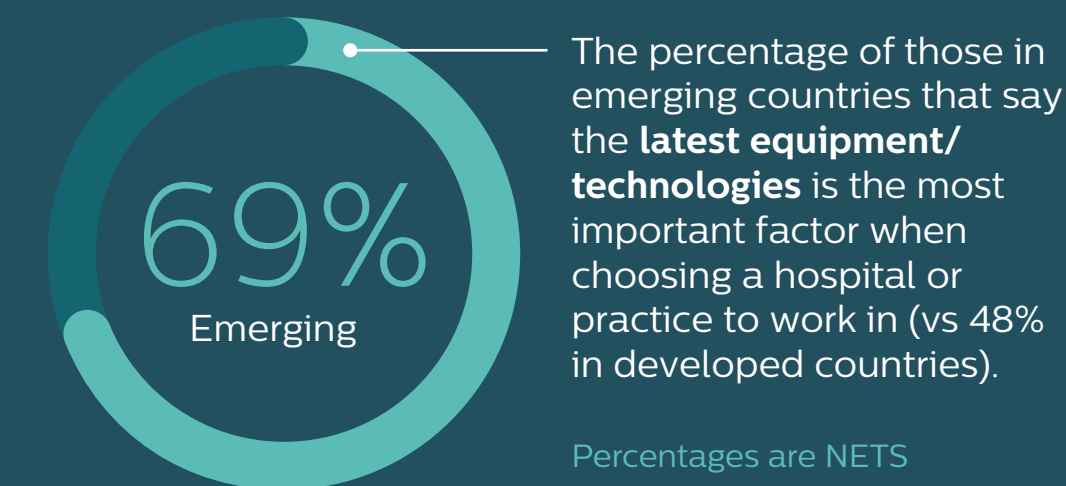


*<https://www.ama-assn.org/practice-management/physician-health/millennial-physicians-sound-state-medicine-today>

Younger healthcare professionals in developed countries value **workplace culture** most highly.



Those in emerging countries value the **newest technology and equipment** most highly.



Base (unweighted): Total younger healthcare professionals in developed countries excluding those who selected 'salary - important to you' (n=766), total younger healthcare professionals in emerging countries excluding those who selected 'salary' - important to you (n=913)

Minimizing stress

Reducing younger healthcare professionals' stress levels can aid retention

Work-related stress is a crucial issue for younger healthcare professionals. In fact, nearly **three in four** regularly experience work-related stress. Worryingly, many of them have considered leaving the profession as a result.

A closer look at the data reveals that stress is more likely to be an issue when it comes to retention of nurses. They are more likely to have considered leaving the profession than general practitioners or specialists as a result of work-related stress. Many countries have some of the largest healthcare professional shortages in the nursing sector, making this a concerning finding.

Technology could be one way to help reduce these stress levels. In theme two, **67%** of younger healthcare professionals identified technology as having the potential to reduce stress. It is also notable that workers in smart hospitals and practices experience stress less often than colleagues in analog facilities*.

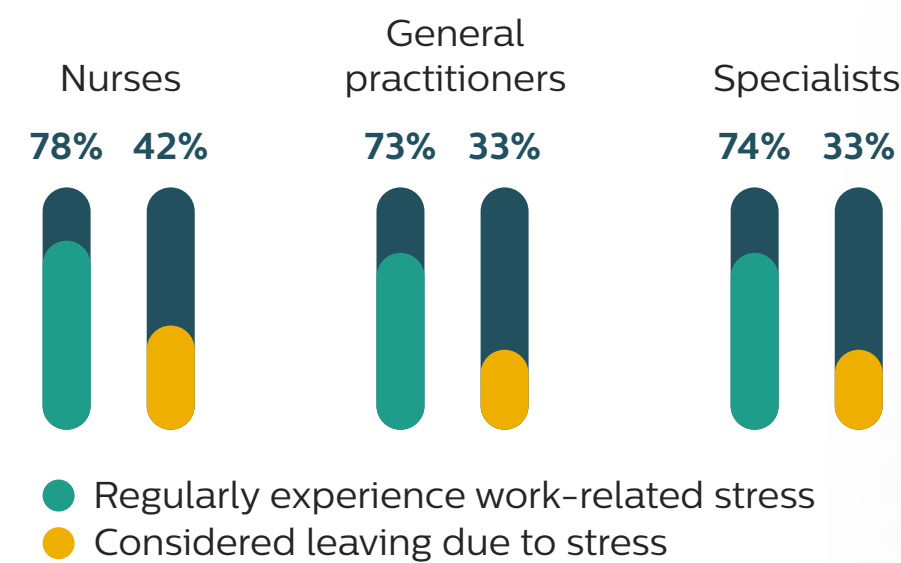
“Many healthcare professionals struggle with stress, anxiety or mental health challenges. Technology has opened a new frontier in mental health support and data collection. How do we balance technology as a solution versus adding to the problem?”

**Nancy Brown, CEO,
American Heart Association**

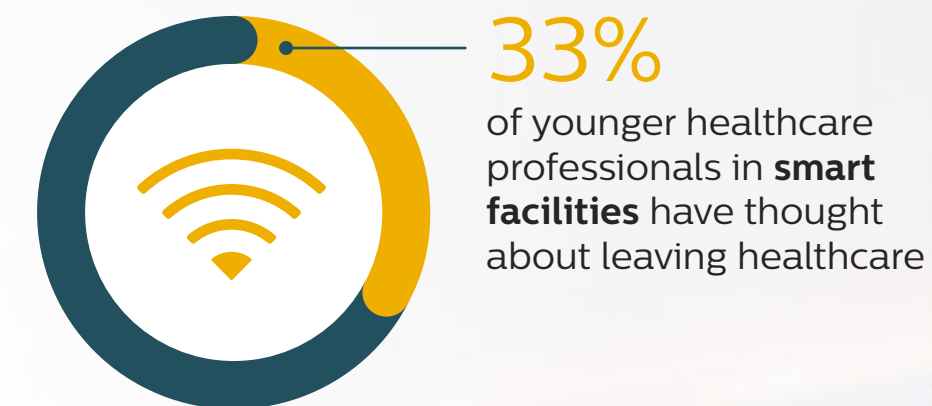
Three-quarters of younger healthcare professionals regularly experience work-related stress with around **one-third** considering leaving their profession.



Nurses are most likely to have considered leaving the profession due to stress.



The **impact of stress** is greater in analog facilities.



Base (unweighted): Total younger healthcare professionals (n=2,867), in smart hospitals/practices (n=672), analog hospitals/practices (n=399), nurses (n=362), general practitioners (n=380), specialists (n=2,125).

*See methodology for details on statistical analysis



Engaging the workforce of the future

Technology has an important role to play in keeping a younger generation motivated

Keeping younger healthcare professionals **engaged and enthusiastic** about their roles is another key factor in workforce retention.

Implementing new technology and keeping systems upgraded could be a way to retain younger healthcare professionals across all facility types. Nearly three-quarters of them say advancements in technology make them excited about the future of the profession. Those in smart facilities are more likely than those in digital or analog facilities to say this.

There is an opportunity for healthcare leaders to capitalize on this enthusiasm. Much of the success of future healthcare systems lies with technology. But for technology to successfully play this key role, healthcare leaders need to foster a culture that encourages an openness towards technology. Alongside refreshing technology regularly and providing continuous training on it, nurturing this aspect of organizational culture can play a vital role in keeping the next generation motivated.

“Means should be prioritized for professionals to be able to integrate and communicate, and investment in information technology facilitates this.”

Oncologist, Brazil, 7 years in practice

Already having experience with medical technologies in their facilities makes younger healthcare practitioners even more excited about them.

Percentage agreeing that “Advancements in medical technology make me **excited about the future** of the healthcare profession”.



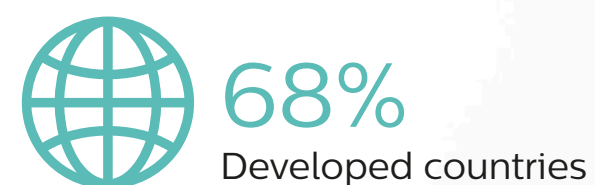
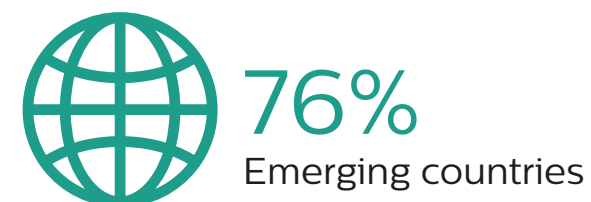
Smart: advanced connected care technologies are used, in addition to patient data and communications being handled electronically.

Digital: simple/basic technologies are used, with most or all patient data and communications being handled electronically.

Analog: most or all patient data is handled in a paper-based format or using traditional communications (e.g. phone, fax, etc).

Advancements in medical technology make younger healthcare professionals excited about the future of medicine.

Those in **emerging countries** tend to be more excited:



Base (unweighted): Total younger healthcare professionals in smart hospitals/practices (n=672), digital hospitals/practices (n=1,790), analog hospitals/practices (n=399), emerging countries (n=1,611), developed countries (n=1,256).

Internal barriers prevent **transformational change**

Younger healthcare professionals believe they can drive change but are discouraged by **decisions from non-medical leaders**

Many younger healthcare professionals see themselves as being able to **drive change in their workplaces**. However, hierarchical structures can hamper this ability.

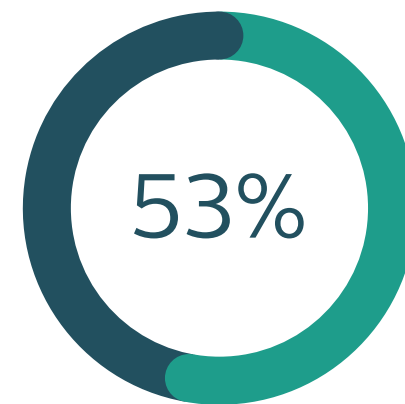
They are also concerned about the impact of decisions made by non-medical staff. Echoing this sentiment, a recent McKinsey study* found that the three barriers to digital transformation most mentioned by leaders in the medical-technology and pharmaceutical industries were culture and mindset, organizational structure and governance, and hiring the right talent.

Failing to involve younger healthcare professionals in hospital management and decision-making could not only lead to the failure of vital transformation projects but ultimately push them towards leaving the profession.

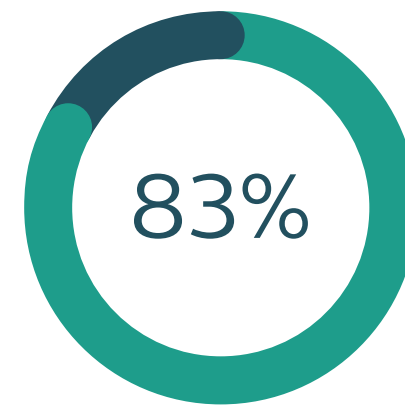
“In one clinic I worked at, a new digital patient record system was installed and all clinical staff were trained on it. Feedback on the system was very positive – almost everyone found it highly effective. However, three years later, it was replaced with another system. Many clinic staff did not understand why and felt that this change was imposed upon them without consultation. As a result, they did not approach the new system so willingly.”

Cecilia Anim CBE, Clinical Nurse Specialist and former President of the Royal College of Nursing

Despite their youth and relative inexperience, many younger healthcare professionals are confident in their ability to drive change. However, their day-to-day working lives are still negatively impacted by the decisions of non-medical leaders.



Around half of younger healthcare professionals feel they are able to **drive change** in how their hospital or practice is managed.



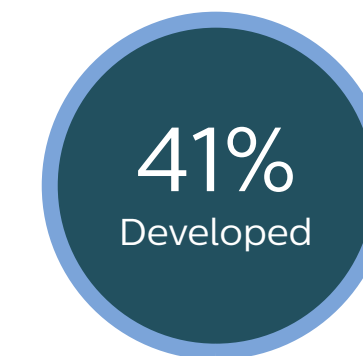
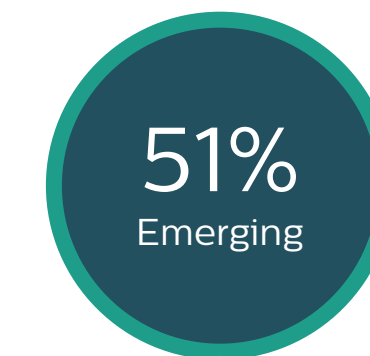
Over three-quarters of younger healthcare professionals say decisions being made by non-medical leaders have a **negative impact** on their satisfaction with their role as a healthcare professional.



Further, **31%** say decisions being made by non-medical leaders within hospitals and practices **concern them the most** about their career.

Around half of younger healthcare professionals in emerging countries also believe that decision making is too hierarchical, citing it as one of the top reasons for not being able to drive change:

Hospital or practice is too **hierarchical**:



Base (unweighted): Total younger healthcare professionals who do not feel or do not know if they feel they are able to drive change in how their hospital/practice is managed in emerging countries (n=678), in developed countries (n=704)

Base (unweighted): Total younger healthcare professionals (n=2,867), total younger healthcare professionals who have at least one concern about their career looking toward the future (n=2,772)

*<https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/promoting-an-overdue-digital-transformation-in-healthcare>



Conclusions

“Demand for our services is on the rise, while a quarter of US radiologists is older than 55 years. It is imperative that we create a desirable work environment to attract new talent. We’re in a competitive market with other hospitals so we must have the collaborative and flexible culture that younger healthcare professionals want.”*

**Christoph Wald, Chairman, Radiology,
Lahey Hospital and Medical Center**

The next generation of healthcare professionals is well prepared for clinical practice and the responsibility that comes with caring for patients. But this new generation will not stand for the current situation in workplace culture and hours.

A good work-life balance

They are clear in their desire for **a good work-life balance**, and **flexibility** and **collaboration** within the workplace. They also understand that the success of future healthcare systems, and in particular value-based care, is intertwined with the adoption of new technologies.

A culture of collaboration

Without a collaborative and empowering workplace culture to underpin uptake, the long-term adoption of digital health technologies will fail.

Hospitals and organizations that prioritize a culture of collaboration – across data, technology and workplace culture – and appropriate technologies will be more likely to **attract and retain staff****.

Doing so also has wider-reaching benefits: the Harvard Business Review noted the success of the Cleveland Clinic’s leadership initiative to consistently assess and improve caregiver engagement as a way of improving patient outcomes***. It also means that hospitals and practices are well-equipped to achieve a structure in which value-based care is at the very core of their day-to-day practice.

*https://pubs.rsna.org/doi/10.1148/rg.2018180015?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed

**<http://blog.indeed.com/2019/09/30/top-rated-hospitals-2019/>

***<https://news.gallup.com/opinion/gallup/170501/inside-cleveland-clinic-cultural-shift.aspx>



Report conclusion
and recommendations

Report conclusion

Jan Kimpfen, Philips Chief Medical Officer

Global healthcare systems are under strain. But this challenge can bring opportunity: through collaboration, sharing initiatives and the use of technology and data.

The coming years will see increased emphasis on delivering **continuous care** outside the hospital and clinic walls. We will also see a push to explore innovative reimbursement models that realize both more value and better outcomes for patients, with technology and data playing a crucial role.

To ensure younger healthcare professionals thrive in this increasingly demanding environment, senior healthcare leaders must **listen to the candid and valuable intelligence** they have shared with us. It can be used to maximize the opportunities these younger professionals offer and, by doing so, shape the future of healthcare.

Change won't happen overnight, but the insights provided by this generation put healthcare leaders in a stronger position to tackle the **high costs and waste in the system**.

There is also a great opportunity for leaders in developed countries to consider how emerging countries have been able to better prepare their younger professionals for the realities of their careers.

I am inspired by this younger generation's understanding of the need to act. I encourage you to **explore our recommendations** on how we can bring their vision to life as we move forward on this transformative journey.

Let's **unleash the power** of the next generation of healthcare professionals.

Recommendations

“Younger healthcare professionals are not going to accept working in an increasingly dehumanized system. We need to bring hospital organization and processes into the 21st century, so this generation can capitalize on the potential of available technology to deliver humanized care. And we need to get them involved in doing this.”

Professor Rafael Bengoa, former Basque Minister of Health and Director of the Institute for Health and Strategy

“Engagement is important, so as a leader I need to create a space for these conversations to find out what it is that drives burnout in the workplace. I deliberately set aside time, ask for input and help leverage informatics solutions which improve work-life balance for healthcare professionals.”

Christoph Wald, Chairman, Radiology, Lahey Hospital and Medical Center

The Future Health Index 2020 report has captured **vital insights** from a new generation of healthcare professionals, revealing the gap between their expectations around training, technology and culture, and the reality of their experience as healthcare professionals.

When considering how to address the issues that have been highlighted in the report, there are three core areas on which healthcare leaders should first focus:



Education and training

- ✓ Increase focus on administrative and business management to reduce the burden on healthcare professionals
- ✓ Provide training on the use and interpretation of technology and data
- ✓ Build an understanding of the principles of value-based care



Technology

- ✓ Invest in data sharing technologies to make them more usable
- ✓ Harness technology to both improve work-life balance and clinical performance
- ✓ Work with payers and government to encourage industry to deliver greater product interoperability



Culture

- ✓ Examine decision-making hierarchy and process to ensure that opinions of younger healthcare professionals are acknowledged and acted upon
- ✓ Involve younger professionals in the operational side of the hospital or practice
- ✓ Enable flexible working through staggered shift patterns
- ✓ Leverage technology to minimize stress and burnout

Glossary of terms

Analog hospitals or practices

Most or all patient data is handled in a paper-based format or using traditional communications, e.g., phone, fax, etc.

Artificial intelligence (AI)

Artificial intelligence (AI) uses data science techniques, designed by people and inspired by intelligent behavior, to create systems and solutions that can sense, reason, act and adapt to assist with complex and repetitive tasks.

Augmented reality (AR)

A technology that superimposes a computer-generated image on a user's view of the real world, providing a composite view. In healthcare, this can allow a surgeon, for example, to see live data or 3D medical imagery in their field of vision when performing procedures.

Data privacy

The cultural expectations, organizational regulations and legislation that protect personal information from unauthorized use and dissemination.

Data security

Protecting data against unauthorized access.

Digital health records

Technology that can store a variety of health information, including medical history, test results, health indicators, etc. Digital health records can be used within a certain healthcare facility, across different healthcare facilities, by only the patients themselves, by one healthcare professional or across all healthcare professionals involved in a patient's care.

Electronic medical records (EMRs) and electronic health records (EHRs) fall within the term 'digital health records'.

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 and health or fitness tracker devices.

Digital hospitals or practices

Simple/basic technologies are used, with most or all patient data and communications being handled electronically.

Healthcare professionals under 40

This is our group of survey respondents: healthcare professionals (all medical staff, including doctors, nurses, surgeons, radiologists, etc.) aged under 40 years at the time of the research. Some of these people will already be leaders in their field, but together they will make up the main body of the healthcare workforce over the next 20 years.

Interoperability

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

Machine learning

A method of AI that provides systems with the ability to automatically learn and improve from experience without being explicitly (re-)programmed.

Medical education

Education related to the practice of becoming a healthcare professional – both the initial medical school training and continuing medical education following qualification.

Quadruple Aim

Philips makes value-based care principles actionable by addressing the Quadruple Aim:

- Improved patient experience – improving the patient experience of care (including quality and satisfaction)
- Better health outcomes – improving the health of individuals and populations
- Improved staff experience – improving the work-life balance of healthcare professionals
- Lower cost of care – reducing the per capita cost of healthcare

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.

Smart hospitals or practices

Advanced connected care technologies are used, in addition to patient data and communications being handled electronically.

Telehealth

The use of electronic information, digital health technology or mobile health applications and telecommunications technologies to support long-distance exchange between healthcare professionals and patients and healthcare professionals and their peers, as well as for health-related education, public health and health administration.

Value-based care

Value-based care describes a healthcare system that aims to increase access to care and improve patient outcomes at lower cost. It is a people-centric approach that spans the entire health continuum. In short, it is about providing the right care in the right place, at the right time and the right level of cost. At Philips, we also focus on improving the experiences of both the patient and the healthcare providers in line with the Quadruple Aim.

Virtual reality (VR)

The computer-generated simulation of a three-dimensional image or environment that, using electronic equipment, can be interacted with by an individual in a seemingly real or physical way.

Younger healthcare professional

All medical staff under the age of 40 who have completed their first medical or nursing degree.

Research methodology

Research background

Since 2016, Royal Philips has conducted original research to help determine the readiness of countries to address global health challenges and build efficient and effective health systems. In the context of ever-growing pressure on resources and costs, the Future Health Index focuses on the crucial role digital tools and connected care technology can play in delivering more affordable, integrated and sustainable healthcare.

In 2016, the Future Health Index measured perceptions of healthcare to produce a snapshot of how healthcare is experienced on both sides of the patient-professional divide. In 2017, it compared these perceptions to the reality of health systems in each country researched. In 2018, the Future Health Index identified key challenges to the large-scale adoption of value-based healthcare and overall improved access. It assessed where connected care technology can help speed up the healthcare transformation process. In 2019, the Future Health Index explored technology's impact on two aspects of the Quadruple Aim: the healthcare experience for both patients and healthcare professionals¹ and how technology is moving us to a new era of continuous transformation.

2020 research overview and objectives

Now in its fifth year, the Future Health Index 2020 report builds on the findings of the previous reports by examining the expectations and experiences of younger healthcare professionals aged under 40 and how they can be empowered to meet the demands of tomorrow's healthcare.

As the first global survey of its kind, the Future Health Index 2020 report features intriguing insights into the next generation of healthcare professionals, a group that will form most of the healthcare workforce over the next 20 years. The research explores this group's expectations around technology, training and job satisfaction, and the reality of their experience as healthcare professionals.

The research gives a clear mandate to healthcare leaders to respond to the concerns of this young generation of healthcare professionals and highlights three areas to address as a matter of urgency: education and training, technology, and workplace culture.

The research for the 2020 Future Health Index was conducted in 15 countries (Australia, Brazil, China², France, Germany, India, Japan, Netherlands, Poland, Romania, Russia, Saudi Arabia, Singapore, South Africa and the United States of America).

To provide a holistic understanding of the current healthcare systems around the world, the 2020 study combines quantitative surveys and qualitative online focus groups conducted from January-February 2020 among the following key stakeholders:

- Healthcare professionals in 15 countries (quantitative)
- Healthcare professionals in 5 countries (qualitative)

2020 quantitative survey methodology

In partnership with SERMO, an independent global market research firm, a survey was fielded from November 15 to December 27, 2019 in 15 countries (Australia, Brazil, China, France, Germany, India, Japan, Netherlands, Poland, Romania, Russia, Saudi Arabia, Singapore, South Africa and the United States of America) in their native language. The survey was conducted online and offline (as relevant to the needs of each country) with a sample size of 200 per country for healthcare professionals under 40 years old. The exceptions were Singapore and Australia³, which each had slightly smaller samples. The survey length was approximately 15 minutes.

The total sample from the survey includes:

- 2,867 healthcare professionals under the age of 40 years old (defined as all medical staff, including doctors, nurses, surgeons, radiologists, etc.), who have completed their first medical or nursing degree.

At the 95% confidence level, the 15-country total for the healthcare professional population has an estimated margin of error⁴ of +/- 1.8 percentage points.

References can be found at the end of this section

Research methodology

Below is the specific sample size, 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)	Interview methodology
Australia	150	+/- 8.0	Online
Brazil	203	+/- 6.9	Online
China	201	+/- 6.9	Online
France	202	+/- 6.9	Online
Germany	200	+/- 6.9	Online
India	202	+/- 6.9	Online
Japan	202	+/- 6.9	Online
Netherlands	201	+/- 6.9	Online
Poland	201	+/- 6.9	Online
Romania	202	+/- 6.9	Online
Russia	200	+/- 6.9	Online
Saudi Arabia	201	+/- 6.9	In-person
Singapore	100	+/- 9.8	Online
South Africa	201	+/- 6.9	Online
United States of America	201	+/- 6.9	Online

Weighting

Total country weighting:

The 15-country average is an average calculation whereby each country's sample size was weighted to have the same value, as such ensuring that each country has an equal weight in this total. The same was done for all regional totals, as well as emerging country and developed country totals⁵.

Country classifications are according to the International Monetary Fund⁶.

- For the Future Health Index 2020 report, Brazil, China, India, Poland, Romania, Russia, Saudi Arabia and South Africa are considered emerging countries.
- For the Future Health Index 2020 report, Australia, France, Germany, Japan, Netherlands, Singapore and the US are considered developed countries.

Statistical analysis

A statistical analysis was performed to explore the relationship between the type of hospital/practice (in this instance, 'smart,' 'digital' or 'analog') and younger healthcare professionals' agreement with several questions asked in the Future Health Index 2020 survey. The analysis showed that there is, in fact, a statistical relationship between the type of hospital/practice and certain aspects of their careers.

The following survey questions were used for this analysis:

To what extent do you agree or disagree with the following?

- The reality of my career lives up to the hopes and expectations that I had during my medical education
- I regularly experience work-related stress
- I have considered leaving the healthcare profession as a result of work-related stress
- Advancements in medical technology make me excited about the future of the healthcare profession

How satisfied or dissatisfied are you in your work as a healthcare professional?

- In Saudi Arabia shown as "How satisfied or dissatisfied are you in your personal decision to become a healthcare professional?"

A chi-square test of independence was performed for the analysis of each of these survey questions. All results showed the relationship between these variables was significant at the $p < .001$ level.

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.

References can be found at the end of this section

Research methodology

2020 qualitative interviews methodology

To provide context to the quantitative data (as described previously), the research was supplemented with two waves of online focus groups with doctors. Wave one, conducted from January 10, 2020–January 13, 2020, had 36 participants across the following markets: Brazil, US, France, Germany and Australia. Wave two, conducted from February 3, 2020–February 6, 2020, had 41 participants across the following markets: Brazil, US, France, Germany and Australia. Online focus groups were conducted in participation with SERMO, an independent global market research firm.

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1. For the purposes of this survey, ‘healthcare professional’ refers to all medical staff, including doctors, nurses, surgeons, radiologists, etc.
2. Each third-party data source approaches data collection for China differently. Some include Taiwan and/or Hong Kong, others treat them separately. For the purposes of this research, when third-party data has been used, we have not adjusted the data from the way it was collected. As such the data is reflective of each source’s approach to measuring China. Survey data is representative of Mainland China only and does not include Taiwan or Hong Kong.
3. Singapore healthcare professional sample: 100 in total; Australia healthcare professional sample: 150 in total.
4. Estimated Margin of Error is the margin of error that would be associated with a sample of this size for the full healthcare professional population in each country. However, this is estimated since robust data is not available on the number of healthcare professionals under the age of 40 and specialty mixes in each country surveyed.
5. Countries are classified as emerging or developed by the International Monetary Fund based on 1) per capita income level, 2) export diversification, and 3) degree of integration into the global financial system.
6. “World Economic Outlook Database.” International Monetary Fund, April. 2018.
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The Future Health Index is commissioned by Philips.

To see the full report visit www.philips.com/futurehealthindex-2020

The 2020 study comprises original research via a survey of 2,867 healthcare professionals under the age of 40 years old, who have completed their first medical or nursing degree, across 15 countries: Australia, Brazil, China, France, Germany, India, Japan, Netherlands, Poland, Romania, Russia, Saudi Arabia, Singapore, South Africa and United States of America.

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