future health index

2016

The capacity to care

Measuring perceptions of accessibility and integration of healthcare systems, and adoption of connected healthcare

THE FUTURE HEALTH INDEX IS COMMISSIONED BY PHILIPS

Contents

Foreword

Urgent health challenges and fast-emerging digital technologies are prompting a global rethink of how healthcare is organized and delivered. Health leaders recognize the need for a more integrated approach to care that maximizes efficiency, improves patient experience and ultimately fosters a healthier population.

"Health leaders recognize the need for a more integrated approach to care that maximizes efficiency, improves patient experience and ultimately fosters a healthier population."

Rachel Maguire
Research Director, Health Futures Lab, Institute for the Future

The Future Health Index highlights the opportunities and barriers to a more connected and integrated form of healthcare that will better serve future generations. By measuring the attitudes and opinions of patients, healthcare professionals and industry thought leaders, this study seeks to identify key areas where digital innovation has the potential to improve not just the provision of healthcare, but overall health and well-being.

Over the next decade, health systems will need to address both clinical and community determinants of health, empower individuals and families to participate more actively in their own health, and embrace patient-centered design to transform the care experience. With this study, Philips inspires healthcare leaders and policymakers to think purposefully about the ways connected technologies can support these goals, and transform delivery to achieve better health, higher quality care and lower costs.

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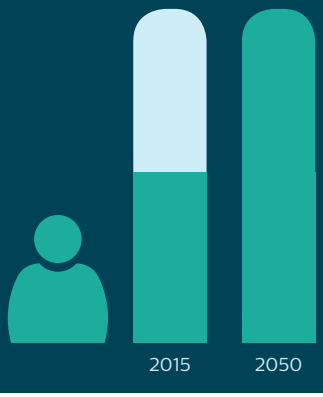
About the Institute for the Future (IFTF)
IFTF is an independent, non-profit research group based in Palo Alto, California, celebrating more than 48 years of forecasting experience. The core of its work is identifying emerging trends and discontinuities that will transform global society and the global marketplace.

Executive summary

The Future Health Index (FHI) at the core of this report provides a benchmark for a country's readiness to meet some of the key healthcare challenges emerging globally.



By 2050, the proportion of the world's population over 60 will nearly double to 22%, according to the World Health Organization.[1]

The FHI measures readiness by examining perceptions about the accessibility and level of integration of healthcare services, and the adoption of connected care technology throughout national healthcare systems. It is based on the input and self-reported behaviors of patients and healthcare professionals throughout 13 geographically and developmentally diverse countries, which collectively produce a snapshot of how healthcare is experienced on both sides of the patient-professional divide.

It is a difficult truth that one of the greatest achievements of modern times – the overall global advance of public health – has created one of humanity's most pressing dilemmas. Around the world, healthcare systems are under strain as populations swell and grow older, helped by the extension of sanitation and medical services, as well as breakthroughs in technology and disease treatment. By 2050, the proportion of the world's population over 60 will nearly double to 22%, according to the World Health Organization.[1] Much of this growth will be concentrated in low and middle-income countries, where many people already lack access to health services and infrastructure. The aging trend will also drive the need for palliative care and the treatment of chronic conditions such as cancer, diabetes and dementia, which require significant resources and long-term commitment on the parts of both patient and healthcare system.

Key definitions

Access	The perceived level of access for all people to a range of healthcare solutions and services across all health needs
Integration	The perceived state of functional integration and interoperability between healthcare systems
Adoption	The perceived proliferation, take-up, and use of; and familiarity with, connected care technology
Patient	People aged 18 or older who have visited a healthcare professional within the past 3 months
Healthcare professional	Those who work in healthcare as a doctor, surgeon, nurse practitioner, registered nurse, licensed practical nurse or nurse across a variety of specializations
Connected care technology	Technology that enables sharing of information throughout all parts of the health system (e.g. doctors, nurses, community nurses, patients, hospitals, specialists, insurers and government) that can range from computer software that allows secure communication between doctors and hospitals, to a watch that tracks a person's heartbeat

Meeting these emerging challenges will require a new approach to healthcare; one that applies technology to address the communication gaps between the various parts of a healthcare system and create a constant feedback loop between patients and the institutions and healthcare professionals that provide treatment. This 'connected care' facilitates the integration of all parts of the health system, from patients and their carers, family and friends to doctors to hospitals to insurers and governments. It is based on real-time communication, enabled through emerging technologies that include secure networks, linking software and devices that monitor key health indicators. It is underpinned by three core tenets: increasing access to healthcare, integrating systems, and promoting the adoption of connected technology – all of which combine to enhance efficiency and outcomes.

To some extent, this transformation is already underway. A recent study by Healthcare Information Systems Society (HIMSS Analytics), for example, estimated 61% of US healthcare organizations have already adopted telemedicine solutions such as electronic consultations and remote monitoring.[2] However, there is no denying that technological adoption, alongside fundamentals such as access to health services, can vary considerably according to demographics and income levels, within and between countries. The FHI highlights both successes and areas where connected care is proving more elusive. It provides a means to look deeper into perceptions of healthcare, to inform innovation in the delivery of improved healthcare integration and, ultimately, the delivery of higher-quality health services at greater scale and lower costs.

Key highlights

1 United Arab Emirates
65.3 FHI

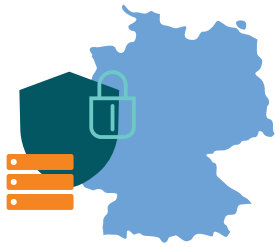
13 Japan
49.0 FHI

The United Arab Emirates (UAE) ranks highest on the FHI, Japan lowest.

The UAE leads the other countries on the index by a significant margin due to positive views on the current state of integration throughout the health system and patient and healthcare professional readiness to adopt technology – 43% of UAE patients feel the health system is very or completely integrated, the highest rate among countries polled. Japan, meanwhile, is stifled by a perceived lack of access to health services and a perceived lack of knowledge regarding connected care – just 27% of Japanese patients say they have access to the information and resources they need to live healthily, by far the lowest rate among countries surveyed.

Developed countries score better in terms of access; emerging countries are blazing a trail for technology adoption.

Three-quarters (76%) of healthcare professionals in developed countries agree their patients have access to the treatments needed for current and future medical conditions, versus just over half (58%) of those in the emerging countries polled. However, some emerging countries, such as South Africa and the UAE, appear to be leading the way in terms of connected technology adoption, and more healthcare professionals in the emerging economies surveyed expect connected technology to be used to manage health in the future.



76% Developed countries

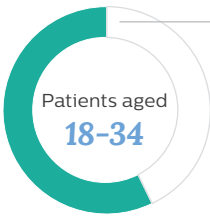
58% Emerging countries

Regulations can stop integration in its tracks.

The rigorous data and privacy protection regulations designed to protect patients in developed countries present challenges to the free flow of information needed in more integrated, technology-driven healthcare systems. In the US, for example, Health Insurance Portability and Accountability Act (HIPAA) laws prevent healthcare professionals from sharing any medical information without written consent from the patient. In Germany half (50%) of healthcare professionals see privacy and security concerns as a top barrier to the adoption of connected care technology.

Technology is a generational issue, for both healthcare professionals and patients.

Across the countries surveyed less experienced healthcare professionals and younger patients are more likely to see, use and share information from connected technology than their older peers. This indicates that adoption will rise in the years ahead as a 'digitally native' generation comes of age. Over half (57%) of patients aged 18-34 report owning or using at least one health monitoring device, and one-quarter (25%) feel they are knowledgeable about connected care technology, versus 14% of those aged 55 and older. However, the poll also indicates older patients are more conscious of the potential benefits of connected technology, indicating many could well be adopters under the right conditions. For example, 79% of patients 55 and older see connected care as important to improving treatment, versus 69% of those aged 18-34.



57% Own at least one health monitoring device

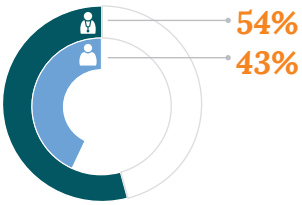
56% Have the tools to manage their own health

Patients and healthcare professionals are divided about patients' ability to monitor themselves.

Technology is making it easier for patients to track their health indicators, and, perhaps not coincidentally, a majority of patients surveyed feel they have the tools (56%) to manage their own health effectively. However, less than half of healthcare professionals (46%) agree, and some experts note the potential misuse of connected technology could raise possible legal and reputational issues for healthcare professionals, making them reluctant to recommend it.

Data is proliferating, but doesn't travel.

Sharing data between institutions or agencies is a key step in integrating healthcare. Yet despite progress towards universal medical records in some countries, the vast majority of patients (74%) report having to repeat the same information to multiple healthcare professionals, and most (60%) have also experienced repeatedly taking the same tests. Many patients also have yet to share data from connected technology with their healthcare professionals even though two-thirds (60%) own or use the technology.

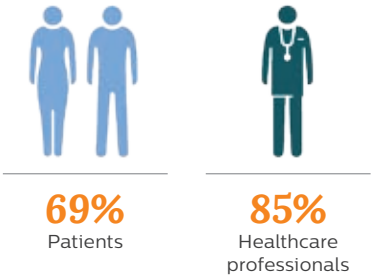


Bureaucracy is seen as a major stumbling block.

Over half (54%) of healthcare professionals and 43% of patients name health system bureaucracy as a major barrier to the further coordination of healthcare in their country. This view is especially prevalent in countries with large publicly funded systems, such as the Netherlands and Sweden, whereas those in emerging nations are generally less conscious of a bureaucratic barrier.

Trust is key – and, in many cases, lacking.

While according to the survey a majority of healthcare professionals and patients overall trust their national healthcare systems, rates of trust are low in some emerging countries (only 20% of patients and 35% of healthcare professionals in Brazil trust the system), and healthcare professionals tend to be more confident than patients. The survey indicates there is a strong relationship between trust and technology adoption: healthcare professionals who trust their healthcare systems are more likely to say their patients are sharing information, and view their countries' health systems as more integrated.

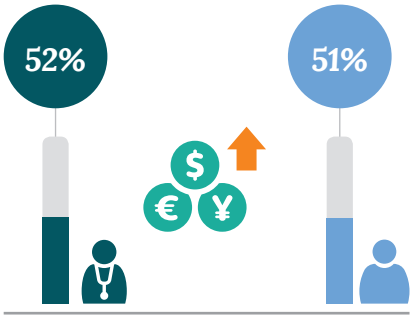


Integration is viewed as worth pursuing.

Sizeable majorities of both patients and healthcare professionals (69% and 85%, respectively) believe integration of the health system can improve the quality of care for patients, and most healthcare professionals (88%) agree that integration can have a direct positive impact on the health of the population. These views are widely shared across countries with the exception of Japan, where nearly one-third (30%) of healthcare professionals think integration would have no or a negative impact on the population's health.

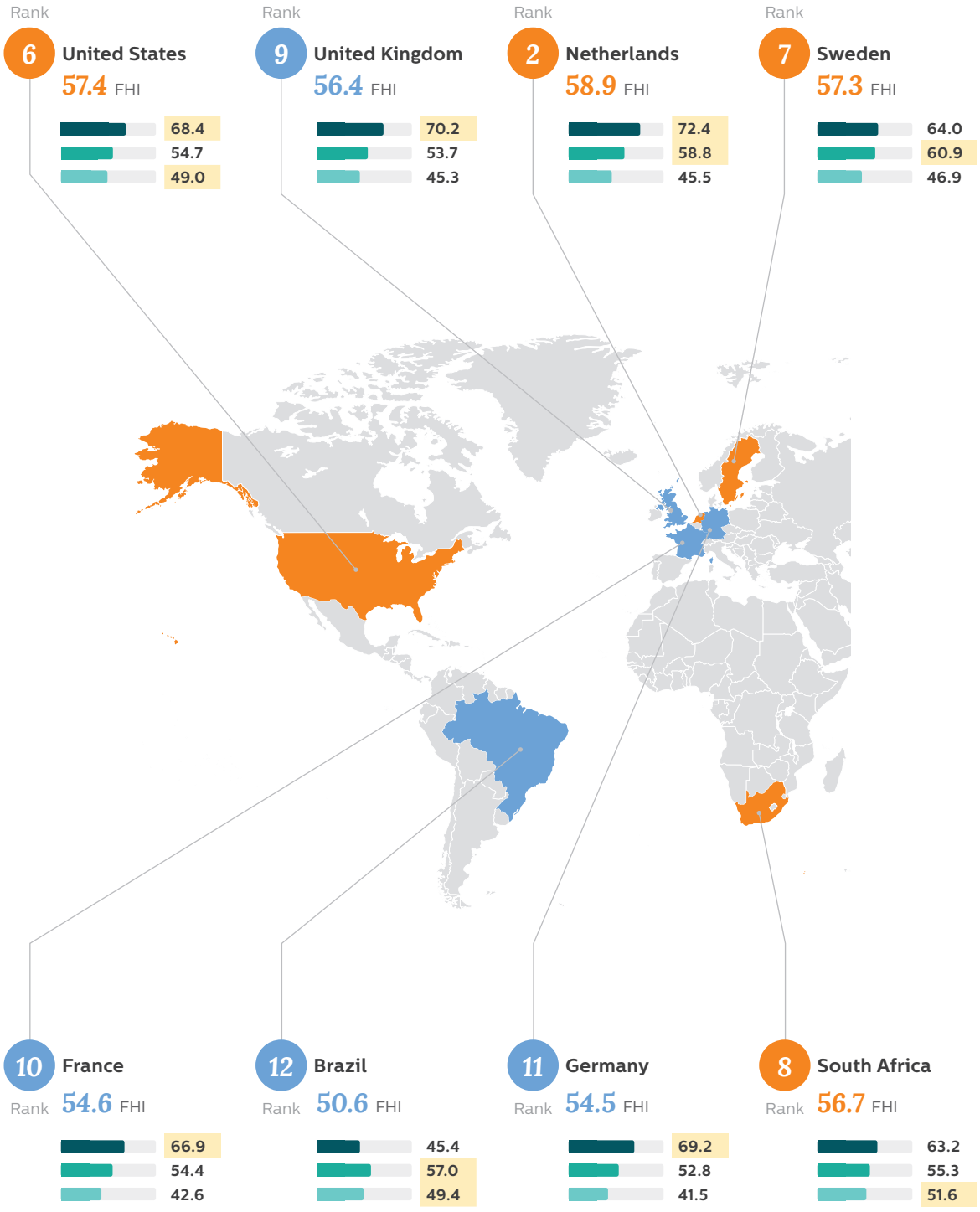
Yet connection comes at a cost.

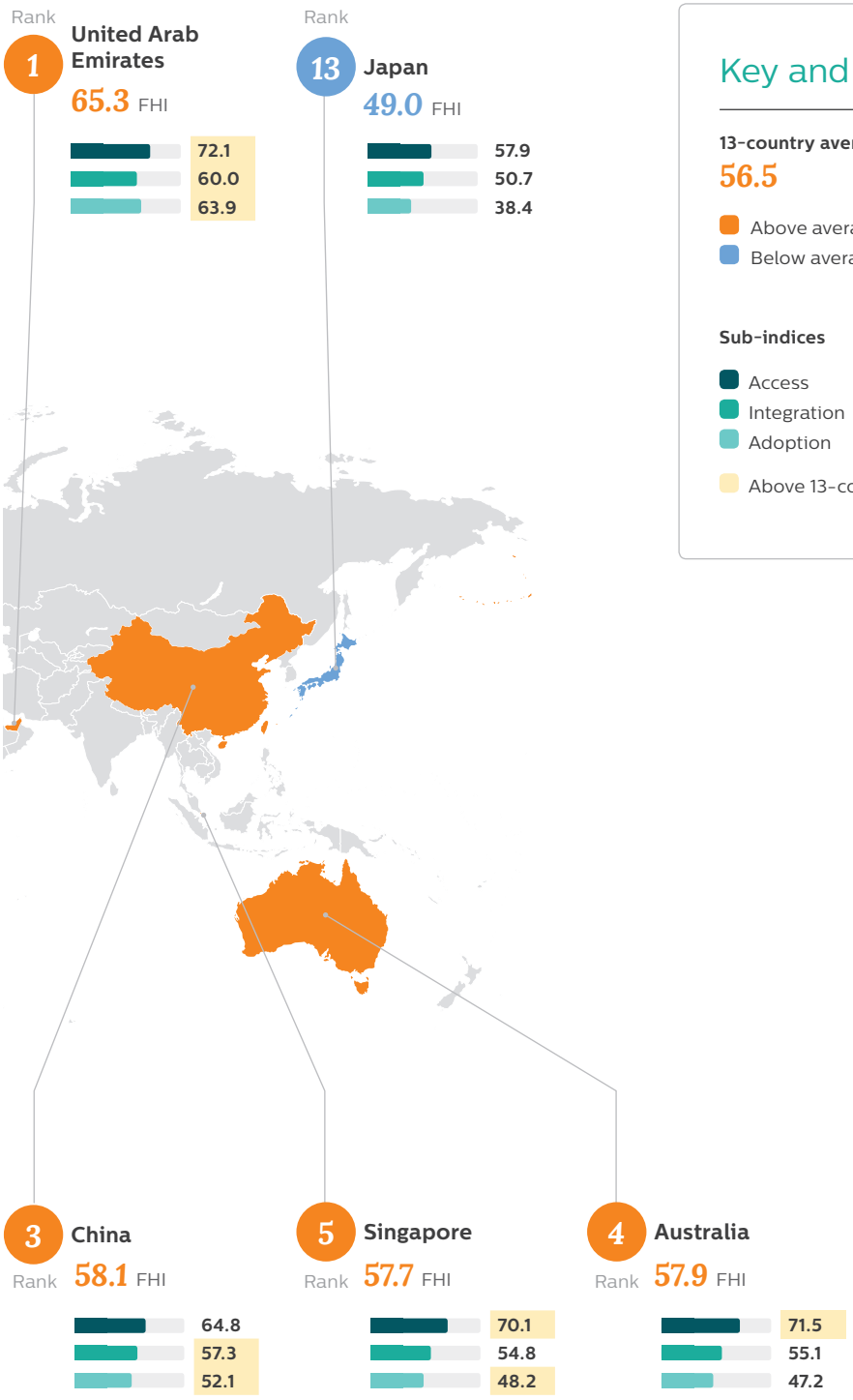
The investments required to encourage the adoption of connected technology are a concern across developed and emerging countries, and are shared by the patient and healthcare professional populations. Half of healthcare professionals and patients (52% and 51%, respectively) believe connected care technology would increase the cost of healthcare overall, and there are also worries about the resources needed for associated needs, such as training and data security.



The Future Health Index

The Future Health Index (FHI) measures the perceived readiness of 13 key countries to realize the benefits of integration and connected care, assigning each a score out of 100. You can find more details on each country's score in Appendix I.





Key and total averages

13-country average

56.5

- Above average
- Below average

Sub-indices

Access	**65.9** 13-country average
Integration	**55.8** 13-country average
Adoption	**47.8** 13-country average

Above 13-country average

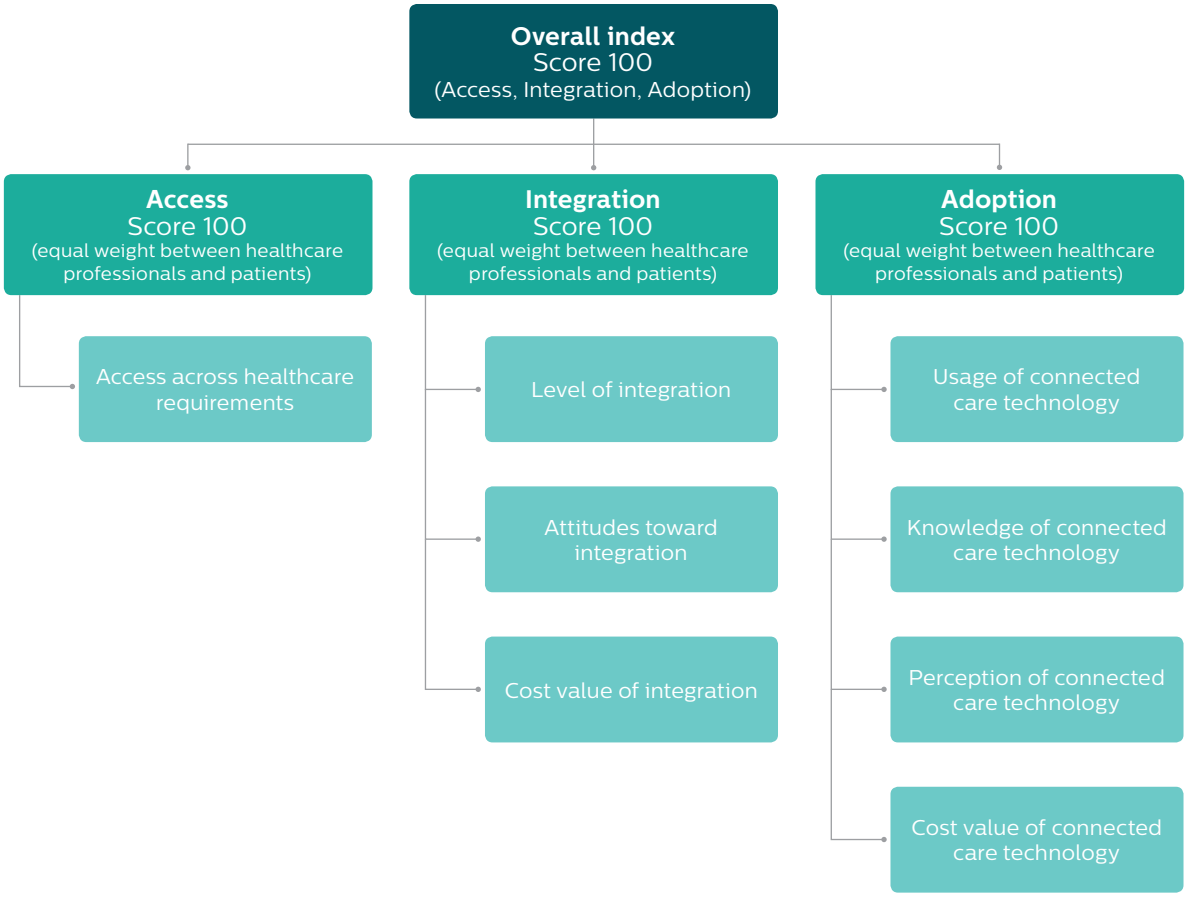
Methodology overview

Philips commissioned the Future Health Index (FHI) to globally gauge perceptions towards the accessibility and integration of health systems, and the adoption of connected healthcare. The intention is to annually monitor how perceptions of connected healthcare shift over time. This first edition of the FHI covers 13 countries: Australia, Brazil, China, France, Germany, Japan, the Netherlands, Singapore, South Africa, Sweden, the United Arab Emirates, the United Kingdom and the United States.

Index scores for each country are on a scale of 0 to 100 points. Scores are the average of three equally weighted sub-indices, measuring access (across the health continuum; that is, from healthy living to disease prevention, diagnosis, treatment and home care); integration (of the health system); and adoption (of connected care technology). Scores on the three sub-indices (also on a scale of 0-100) are based on the combined responses of patients and healthcare professionals in a quantitative survey to a series of questions around corresponding themes.

The survey that underpins this research was conducted online, in person and via phone from February to April 2016. It reached a total of 2,659 healthcare professionals (defined as those working in healthcare as a doctor, surgeon or nurse across a range of specializations) and 25,355 adult patients (defined as those aged 18 or older who had visited a healthcare professional within the past three months). This equates to approximately 200 healthcare professionals and 2,000 patients per country. Patient samples were, to the extent practically possible, weighted to be representative of the population of each country based on census statistics for key demographics such as age and gender.

Future Health Index scoring structure



Each country was given equal weighting in regional and total survey outcomes. At the 95% confidence level, the margin of error is +/- 0.6 percentage points for the total sample of patients and an estimated +/- 1.9 percentage points for the total sample of healthcare professionals.

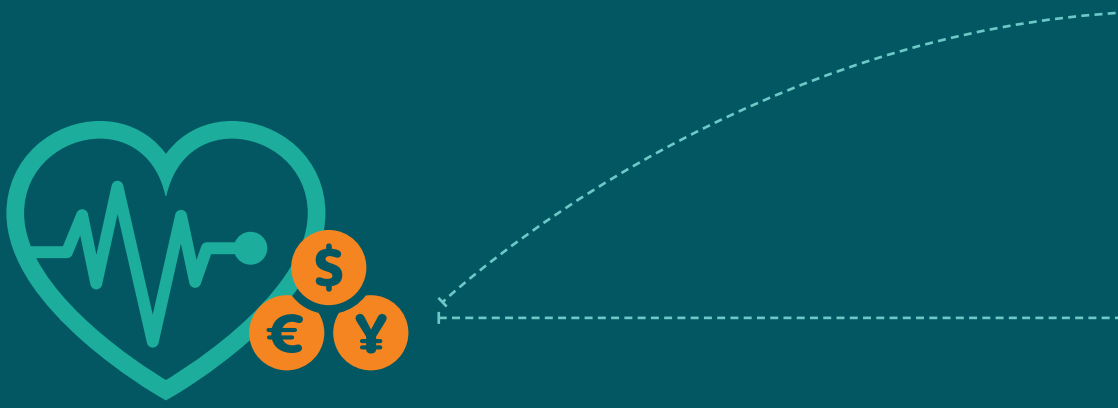
To provide context around the quantitative data, the survey was supplemented with in-depth interviews of healthcare professionals, insurance professionals, policymakers and industry analysts from countries included in the index. These interviews were conducted from March to May 2016. Due to the sensitivity of the issues raised, many interviewees preferred to remain anonymous; when quoted in the report they are therefore identified by their role and location only.

Secondary research was also conducted to gather reputable third-party data or case studies where appropriate to further explain or validate the primary research results.

Country overview

	GDP (per capita, 2014 – USD)	Population (millions)	Healthcare spend as % GDP	Average age of population	Life expectancy	Type of health system
Australia (AU)	$61,979	22.7	6%	38	83	Public – regionally administered
Brazil (BR)	$11,726	204.3	8%	31	74	Public and private – three-quarters depend on free care from Brazil's Unified Health System (SUS)
China (CN)	$7,590	1,367.5	6%	37	75	Public – merger of the New Rural Cooperative Medical Scheme (NCMS) with the Medical Financial Assistance Scheme (MFA)
France (FR)	$42,725	66.6	12%	41	82	Public – statutory health insurance system
Germany (DE)	$47,773	80.9	11%	46	81	Public and private – statutory health insurance system
Japan (JP)	$36,194	126.9	10%	46	84	Public – statutory health insurance system
Netherlands (NL)	$52,138	16.9	11%	42	81	Public and private – statutory health insurance system
Singapore (SG)	$56,284	5.7	5%	34	83	Public and private – government subsidies at public healthcare institutions and some providers
South Africa (ZA)	$6,483	53.7	9%	26	59	Public – rollout of the National Health Insurance (NHI) system
Sweden (SE)	$58,898	9.8	12%	41	82	Public – national healthcare system
United Arab Emirates (UAE)	$43,962	5.8	4%	30	76	Public – UAE nationals covered under the government-funded healthcare program
United Kingdom (UK)	$46,296	64.1	8%	40	81	Public – National Health Service (NHS)
United States (US)	$54,629	321.4	17%	38	79	Public and private – insurance coverage mandated, with some exemptions

GDP per Capita: World Bank, (2014). HC Expenditure per Capita: World Bank, (2014). Type of health system: Commonwealth Fund, (2014). Average life expectancy: World Health Organization, (2012). Population: United Nations, Department of Economic and Social Affairs, Population Division, (2015). Average age of population: CIA Factbook 2015.



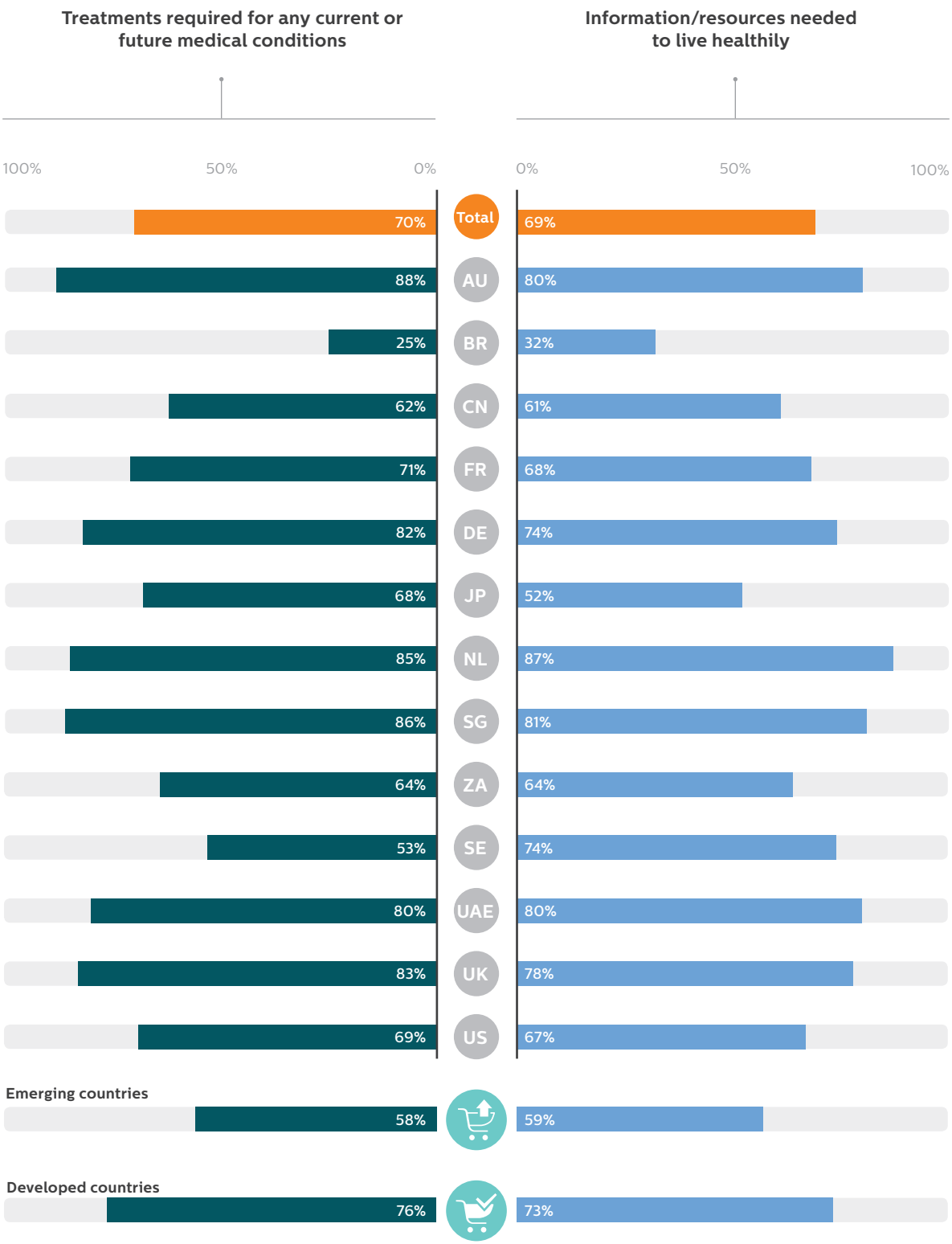
Health and wealth: lagging and leapfrogging

One of the most significant findings of the Future Health Index (FHI) is that high levels of wealth or development do not necessarily correspond to positive views about the state of integration in a country's healthcare system, the adoption of new technologies, or even the quality of care available.

While some of the countries that lead the index, such as the United Arab Emirates (UAE) and the Netherlands, are indeed prosperous, China comes in third place, well ahead of the United States and the United Kingdom. The world's third-largest economy, Japan, comes in last, trailing far less-developed countries like South Africa and Brazil.

Looking more closely at the pillars that constitute the FHI, some expected differences do appear. Emerging countries tend to lag their developed counterparts when it comes to access to healthcare at all stages of the continuum, from prevention to diagnosis and treatment. Three-quarters (76%) of healthcare professionals in developed countries agree their patients have access to the treatments required for current and future medical conditions, versus 58% of those in emerging countries. And just 40% of Brazilian patients agree they have access to the information and resources needed to live healthily, compared to 68% in Australia and 70% in Singapore. The Netherlands, meanwhile, clearly outperforms the 13-country average in terms of access to care across the health continuum, helping it to second place on the FHI overall. For example, 87% of healthcare professionals and 67% of patients in the Netherlands say patients have access to the information and resources needed to live healthily, compared to the averages of 69% and 59% respectively.

Percentage of healthcare professionals who perceive patients have access to:



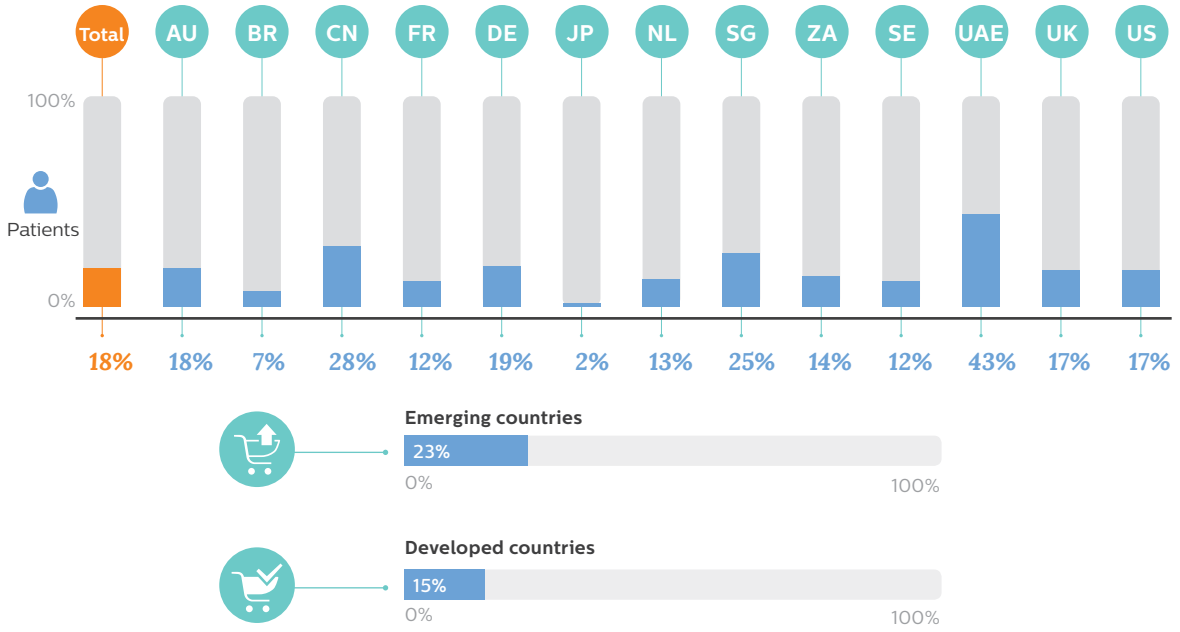
Japan is a clear developed country outlier when it comes to patient views on access to care, accounting to a large extent for its low ranking in the index. Just 27% of Japanese patients say they have access to the information and resources needed to live healthily, and only 18% feel they have access to the medical resources needed to take care of a sick family member or themselves in their homes, well under the average of 43%. This contrasts with the views of Japan's healthcare professionals, who are far more optimistic about the ease of access across the healthcare spectrum.

Healthcare professionals and patients across all 13 countries in the index see technology playing a more important, and positive, role in healthcare. A majority (58%) of healthcare professionals surveyed feel connected technologies that track health indicators have enabled patients to better understand and improve their health, and 74% of patients believe connected technology is important for improving treatment of medical issues.

Yet optimism around connected care is strikingly more pronounced in emerging countries, accounting for the strength of many of these countries on the index. Almost three-quarters (73%) of healthcare professionals in emerging economies see a future where everyone owns devices, software and mobile applications to help manage health. In developed countries, only 44% think the same. Emerging countries also appear to be relatively early adopters; in the UAE and South Africa, 73% and 48% of healthcare professionals respectively feel connected technology is already often or always being used when patients are being treated for a medical condition, versus just 12% of their counterparts in Japan and 23% in the UK. Similar patterns are visible among patient populations. In China almost half (61%) of patients say they own or use devices, software or applications that help them monitor their weight, one of the highest rates among countries polled and compared to about one-quarter of patients in France (29%) and 35% in Sweden.

Bringing together the disparate segments of healthcare systems has proven elusive everywhere. But there are often more positive assessments of the state of integration in emerging countries. In the UAE 43% of patients feel the health system is very or completely integrated, the highest rate among countries polled, followed by China (28%) and Singapore (25%). In South Africa, 27% of healthcare professionals feel the same, compared to 11% in the US and a mere 6% in France.

Percentage of patients who believe health systems in their country are very or completely integrated currently



"For a GP (general practitioner) in the countryside facing some difficulty to manage a patient, if there was an integrated device that allowed connection to a reference center, or perhaps to ask questions to a quaternary health center – that would be very interesting. You could refer this patient faster."

Gastroenterologist, Brazil

Leaping ahead

The tendency of emerging countries to embrace technological change more rapidly than developed countries is in the view of many experts connected to their experience with 'leapfrogging' – that is, adopting new technologies without necessarily fully importing earlier iterations first, or having to deal with the problems that legacy systems and processes impose. The explosion of mobile devices in continents lacking fixed-line infrastructure, such as Africa (and the consequent rise of industries like mobile banking), is a prime example.

The potential of the leapfrogging phenomenon in delivering improved healthcare in emerging countries is becoming increasingly apparent. A three-year investigation by the World Economic Forum, for instance, emphasized the importance of leapfrogging through targeted partnerships to address pressing healthcare issues through initiatives like UNAIDS to end AIDS or treating non-communicable diseases.[3]

In addition, some medical technologies have also been applied and tested more rigorously in emerging countries to help bridge infrastructure gaps, meaning these countries may be in a position to serve as models when it comes to their effective use. Certainly, healthcare professionals in both emerging and developed countries seem aware of the potential of connected technology to address geographical and infrastructure limitations.

> *"In the past, not being able to collect vital health data from remote areas made home care difficult, but with connected care devices, it'll be possible, and this may improve the quality of care as healthcare professionals have access to better data," says a government physician in Japan.*

Once bitten, twice shy

Also, as noted, developed countries tend to approach integration and connected care with more historical baggage. Expensive, controversial and largely unsuccessful efforts to digitalize and centralize patient records in countries such as the UK[4] and France[5] may have fostered a degree of cynicism. In France, for example, only 21% of healthcare professionals feel integration of the health system is 'extremely important,' compared to 43% of healthcare professionals with this view overall.

> *"Integration was the objective of the RSS (Réseau Santé Social (Social Health Network)); it was a failure essentially caused by the National Committee on Informatics and Liberty (CNIL) and the data protection issue," says one French insurance professional.*

Views on connected care technology may also stem from a lack of familiarity, and point to a need for more education and training, particularly in developed countries. Overall, nearly half (43%) of healthcare professionals say they are not knowledgeable about connected care technology, with significantly more lacking knowledge in developed countries than emerging ones (49% versus 30%).

Heightened vigilance around data privacy and security in developed countries – among both regulators and patients – also presents a significant≈potential obstacle to connected care in some countries. In Germany, 50% of healthcare professionals see privacy and security concerns as a top barrier to the adoption of connected care technology, as do 44% of those in Japan and Sweden, versus 16% in South Africa and 18% in the UAE.

> *"Data could be abused by hackers or even insurers, who could use it to raise insurance contributions," notes one intensive care specialist at a public hospital in Germany.*

> *"There's no protection from the fact that potentially anyone could have access (to records)," says a public sector doctor in the UK.*

Patients in emerging countries are also generally less apprehensive about privacy concerns; in Brazil and South Africa only 8% and 15% of patients respectively see them as a barrier to the further coordination of healthcare, versus 22% of patients overall.

> *In general, patient trust in – and demand for – medical technology is likely to grow as it develops further. "On the whole patients think, 'if it's going to help me', they tend not to worry too much about [privacy and security issues]," notes one nurse in the UK. "They trust healthcare professionals to have worked out the kinks."*

Connected care: where the fault lines lie

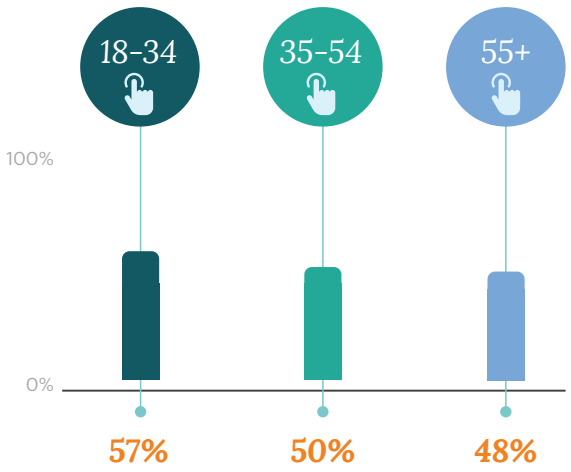
Beyond the disparities among developed and emerging countries, the research points to other divides in views on health system integration, medical technology, and the promotion and maintenance of health overall – between young and old, and healthcare professionals and their patients – that will have to be addressed for connected care to take root.

As in many other fields, there is a clear generational gap when it comes to connected care. One-quarter (25%) of all 18-34 year-old patients surveyed claim to be somewhat or extremely knowledgeable about connected care technology, versus just 14% of those aged 55 and older. And 57% of 18-34 year-olds report owning or using at least one health monitoring device, compared to less than half (48%) of 55+ year-olds.

Unsurprisingly, patients and healthcare professionals that came of age in the mobile era are more likely to use technology in a medical context. Nearly three-quarters (72%) of patients 55 or older say they have never shared information from connected care technologies with a healthcare professional, but the rate falls to 63% among 18-34 year-olds. Similarly, 38% of healthcare professionals practicing for over 20 years say no patients have shared information with them; while for those with 0-10 years of experience the rate is 22%.

Older and younger patients also have different views on health and accountability. Almost three-quarters of patients and healthcare professionals overall (72% and 73%, respectively) agree that individuals are fully responsible for preventing poor health, followed by parents (44% and 54%), healthcare professionals (38% and 38%) and national governments (34% and 37%). However, the belief in individual responsibility for health is firmer among patients 55 and over (79%) than among 18-34 year-olds (66%). Younger patients are more likely to believe that the national government has full responsibility to prevent poor health (37% versus 29% of those 55 or over).

Percentage of patients who own or use connected care technology by age



Across the age groups, many patients are not habitually monitoring key health indicators despite the proliferation of mobile and wearable devices making it easier to do so. Less than half of patients regularly keep track of their weight and diet (47% and 42%, respectively) and only one-third (34%) regularly keep track of exercise routines. Older patients are more likely to cite lack of motivation as the main reason they aren't more proactive about their health (55+: 36% versus 18-34: 25%), while patients under the age of 55 are more likely to say that they don't have the time (18-24: 25%; 34-54: 26%; 55+: 12%).

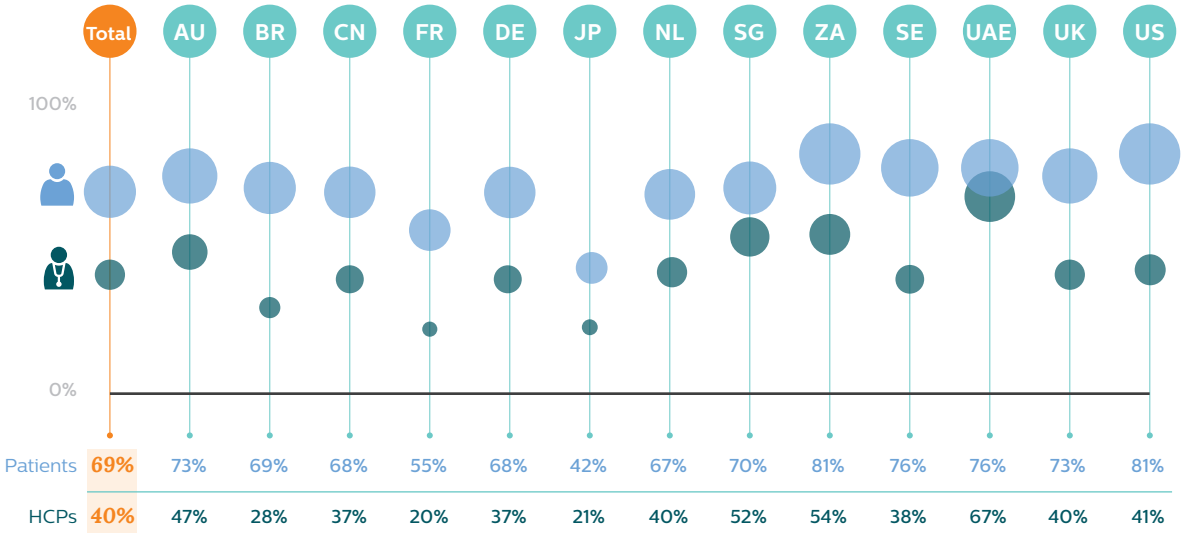
This indicates that healthcare technologies could be more successful in motivating patients when they take age, habits and lifestyles into account. Much can be done to improve the accessibility of technology for older patients – the growing cohort of whom stand to be the first to benefit from connected technology. Studies suggest the use of 'human-centered design', that is design that takes into account the differing capabilities of older users (such as worsening eyesight or hearing), could increase the usability of connected care technology among such groups.[6]

Healthcare professionals and patients: towards a shared understanding

Though more integrated healthcare promises benefits for healthcare professionals and patients, the two groups often have different views on how technology should be applied to facilitate integration, and the most significant roadblocks to its adoption. Even as technology makes self-monitoring easier than ever, healthcare professionals are generally far less confident about patients' maintaining their own health than patients themselves. Only 40% of healthcare professionals overall agree that patients have enough knowledge to manage their own health effectively, compared to 69% of the patient population.

It is in the UAE, which tops the FHI, that healthcare professionals appeared to have the most faith in their patients; 67% say patients have the knowledge to manage their health themselves, while just 21% of healthcare professionals in Japan and 20% of those in France, both of which are placed in the bottom half of the index, say the same.

Percentage of healthcare professionals who agree patients have the knowledge to manage their own health compared to patients' perception of their own knowledge



Such differences of opinion persist despite healthcare professionals and patients across all countries overwhelmingly agreeing that most patients have a degree of proficiency with connected care technology: 94% and 88% of healthcare professionals say their patients at least somewhat understand how to properly use connected care technology and interpret the results, respectively. Nonetheless, healthcare professionals seem to feel more patient education is needed; almost one-quarter (24%) cite training patients as a key barrier to the adoption of connected care technology, rising to 30% in the US, 31% in Singapore and 35% in France. Only 16% of all patients see this as a significant obstacle.

Some suggest the concerns of healthcare professionals around patient understanding and ownership of information may be rooted in fears of a loss of authority – or even a sense of feeling threatened, due to possible legal issues. "Patients themselves are clearly playing a bigger role in their own care. Advancing digital technology is a great tool to improve medical care and share best practices, and also for patients to understand health issues and share information on which doctors are best," says Dr. Kiyoshi Kurokawa, adjunct professor at Japan's National Graduate Institute for Policy Studies (GRIPS). But, he cautions, "this democratization of knowledge has two sides, because increased patient knowledge also can increase litigation, which can stifle advances."

> *"In the US, many physicians are very concerned about the legal liability that might result from having all this data. For example, if a reading signals that the patient is experiencing a clinically significant event which requires an intervention, is the physician liable for malpractice if he doesn't act on that information?"*
>
> *Lynne A. Dunbrack, research vice president for IDC Health Insights*

Information that doesn't travel

While technology can drive integration, the research shows medical information often struggles to flow around the tangled bureaucracies constructed around healthcare services in many countries, stifling the effort to develop integrated care.

Some lack of information-sharing seems to be down to personal choice; while over half (57%) of patients own a connected care technology that allows them to monitor health indicators, only one-third (33%) have ever shared this information with a healthcare professional. Again, most sharing takes place in emerging countries; 58% of patients in China and 46% of UAE patients report having shared technology information with healthcare professionals, compared to 26% in the UK, 17% in Sweden and 12% in Germany.

Experts say some patients would inevitably elect to keep their data to themselves over fear of possible consequences if it made its way to an insurance provider or employer. "There are some patients who are suspicious this data is somehow going to be used against them, i.e. that they won't have access to health insurance or it will become prohibitively expensive. Consequently, they don't necessarily want to share their user-generated health information," notes Ms. Dunbrack of IDC.

From the point of view of healthcare professionals it is important that any systems set up to handle data do so effectively. "What we need is a reference system for diagnoses and therapies that is constantly updated, where you type in the patient's data and get an answer … of course every patient must be individually considered and although a computer might help, it does not replace the doctor," says a German oncologist in a public hospital.

> *"Connectivity means that we're sharing information, we build a data resource, we share the data and are able to say what the trends with respect to disease are," explains a private pediatrician from South Africa. "You might even be able to project into the future and share the information with other stakeholders in the healthcare delivery system."*

Within many countries various facets of the healthcare system often fail to communicate in this way. A universal medical history that patients share effortlessly with different healthcare professionals would seem to be the first building block of connected care, but only 22% of all patients feel they have complete ownership of their own medical record. Three-quarters (74%) say they have repeatedly told the same information to multiple healthcare professionals. Additionally, three-fifths (60%) say they have experienced the same tests being run multiple times as a result of seeing different healthcare professionals or institutions. This issue is particularly prevalent in emerging economies such as China (79%), Brazil (73%) and the UAE (71%), but also exists in developed countries such as Germany (66%) and Japan (60%).

> *In Japan "basically, any person can go to any healthcare professional at any time for any reason," Dr. Kurokawa notes. "They can go to one doctor today, a different hospital tomorrow, another one after that, and there is no connection in their care, no linking of data, and no effective gatekeeper to control expensive imaging and diagnosis technology and so on. This is costly, unsustainable and ineffective from a patient care point of view."*

In the US, meanwhile, where only 11% of healthcare professionals surveyed see the health system as very or completely integrated, "from the device manufacturers to the drug companies and professionals on the ground, it's all very fragmented and everyone has different incentives," says Greg Damron, Chief Financial Officer at Augusta University Medical Center. "It's not like manufacturing automobiles where all the inputs to the industry are aligned around producing a high-quality vehicle at the lowest cost. We're not aligned like that at all, which is baffling … it's almost like there's too much money in the whole thing for people to get their act together and make it efficient."

Even in the far smaller, more publicly funded country of Sweden, "there is an intention for more cooperation between hospitals, primary care and municipalities, but there are a lot of gaps in a lot of places. The problem is that it varies so much. Looking at our hospital, which serves a whole region that consists of a number of municipalities, every municipality has their own system and that's not very easy."

Neurologist, public institution, Sweden

Technology and the human touch

Patients seem eager for technology to complement human interaction in some healthcare situations, especially where it's likely to save time or increase convenience. For instance, 71% say they would be interested in scheduling appointments online and 66% in receiving medical test results online. External data indicates many patients have already taken steps in this direction. In a recent McKinsey study of US healthcare patients, for example, 40% of respondents aged 18–34 reported using devices to schedule appointments or check their health status.[7]

Making procedures such as appointment booking more efficient could have direct health dividends. While healthcare professionals think that fear is one of the biggest factors dissuading individuals from seeking medical help, patients are more put off by the difficulty of getting an appointment (30%) and lack of time (29%) – issues that could be addressed by connected technology that make these processes faster and more hassle-free.

"Connected care is good for monitoring issues; for example, I get a WhatsApp message (from a patient) with a picture of an eye inflammation and I give feedback to the patient after I review it," says a doctor and surgeon with a private practice in the UAE. "The patient can then come to me for a detailed checkup."

Technology can also fuel patient motivation. Among those healthcare professionals whose patients have used devices, apps or other trackable technology solutions and shared the data with their healthcare professionals, 59% agree their patients are more motivated to adhere to treatment plans. One-third (33%) of all healthcare professionals surveyed feel patients would manage their health more effectively if they used technology to keep track of health indicators, and 30% of patients agree.

Even so, regardless of how technology advances, the research makes it clear that it is important to both patients and healthcare professionals that healthcare retains a human element – and indeed, that using technology to support personalized care may be one of the best ways to encourage its adoption. When asked what would make patients effective in managing their health, among the highest proportion of both healthcare professionals and patients polled (40% and 32%, respectively) cite more personalized consultations and treatments.

"If there is only data being sent and the examination takes place via video conference, I think the quality of medical care will drop," notes a healthcare professional in Japan. "There are examinations that can only be performed when meeting in person, by touch."

Governments and gut feelings: integration and trust

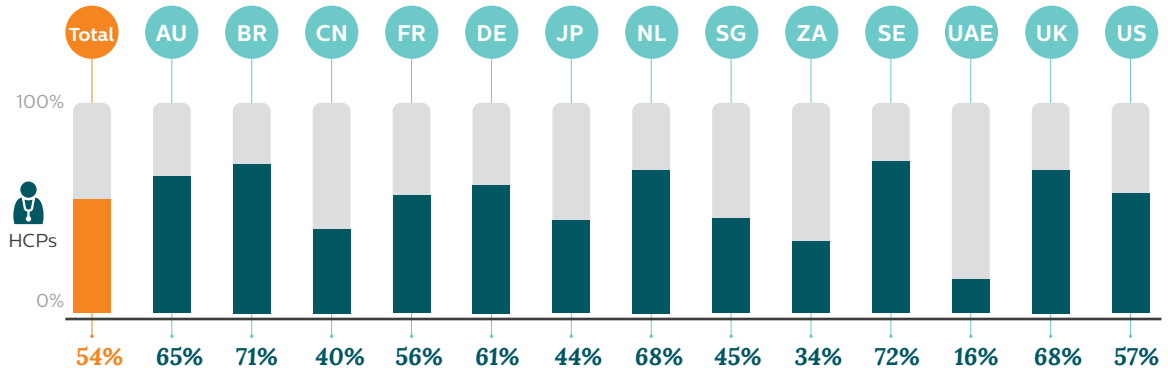
Research for the Future Health Index shows that in the eyes of many patients and healthcare professionals, the state has a duty to not only promote health, but to also make healthcare more connected. In multiple emerging countries, a majority of healthcare professionals feel the government should provide citizens with connected technology to help them manage their health (61% of healthcare professionals in China, 63% in South Africa and 78% in the UAE).

Three-quarters of the patient population (77%) and four-fifths (83%) of healthcare professionals say it is important for the healthcare system in their country to be integrated. However, there is also a shared assessment that integration remains a relatively distant prospect. Only 14% of both healthcare professionals and patients surveyed believed their national health system is 'very' integrated, and only 1% and 3%, respectively, that it is 'completely' integrated. The UAE is the clear exception, with nearly half (43%) of patients and 56% of healthcare professionals viewing the health system as very or completely integrated.

Responsibility for integration

Inevitably, as the primary provider of healthcare in most countries, governments will have a leading role in the integration of medical services. Yet in the eyes of many, the government itself is an obstruction to this process. Over half (54%) of healthcare professionals and 43% of patients name health system bureaucracy as a top barrier to the further coordination of healthcare in their country. Rates tend to be higher in developed countries such as Sweden (72% of healthcare professionals and 59% of patients), the Netherlands (68% of healthcare professionals and 59% of patients) and the UK (68% of healthcare professionals and 50% of patients), though bureaucracy is also viewed as a major stumbling block in Brazil (71% of healthcare professionals and 57% of patients). In the UAE by contrast, only 16% of healthcare professionals and 17% of patients see bureaucracy as a major barrier.

Percentage of healthcare professionals who cite health system bureaucracy as a top barrier to the coordination of healthcare in their country



The reality in many markets is that healthcare models and practices established decades ago have so far largely failed to move with the times, leaving agencies without the means to process or take advantage of the data and technology that have become available. However, just 19% of healthcare professionals and 11% of patients surveyed feel improving information sharing within the health system should be a top priority for their government to improve the system; ensuring access to healthcare services is seen as the most important need overall (cited by 38% of healthcare professionals and 42% of patients respectively).

Nonetheless, some of the experts interviewed single out information sharing as a crucial initial step to promoting health system efficiency.

> *"I think the way to cast off this anchor [of bureaucracy] is to ensure total transparency in data," says Dr. Kurokawa of the National Graduate Institute for Policy Studies (GRIPS). "The government has data or can obtain it, and we need to use technology to bring transparency. This is the age of e-government. If we can share the primary data on health and population there are lots of different stakeholders who can propose novel policies that could work. But without access to the data we are stuck with the incumbent ways of thinking."*

The wish list of one internal medicine professional in the United States runs as follows: "Let the government take responsibility and assume the financial costs for providing a fully functional and interfaced EHR (electronic health record) system that talks to other systems. Give the patient the opportunity to access this system for themselves. Right now the cost is assumed by the individual doctors and hospitals, and the cost of interfacing the systems is prohibitive."

A question of trust

For integrated health to flourish, a certain baseline of trust is needed; many patients and agencies would be reluctant to share health-related information if they have doubts about how it will be handled or used. Yet trust in the healthcare system is worryingly low in some countries, and patients are often more distrustful than those treating them. Overall, 72% of healthcare professionals and 57% of patients say they are trusting of the healthcare system in their country, but the rates in emerging countries are often much lower; in Brazil, for example, just 35% of healthcare professionals and 20% of patients see the system as trustworthy.

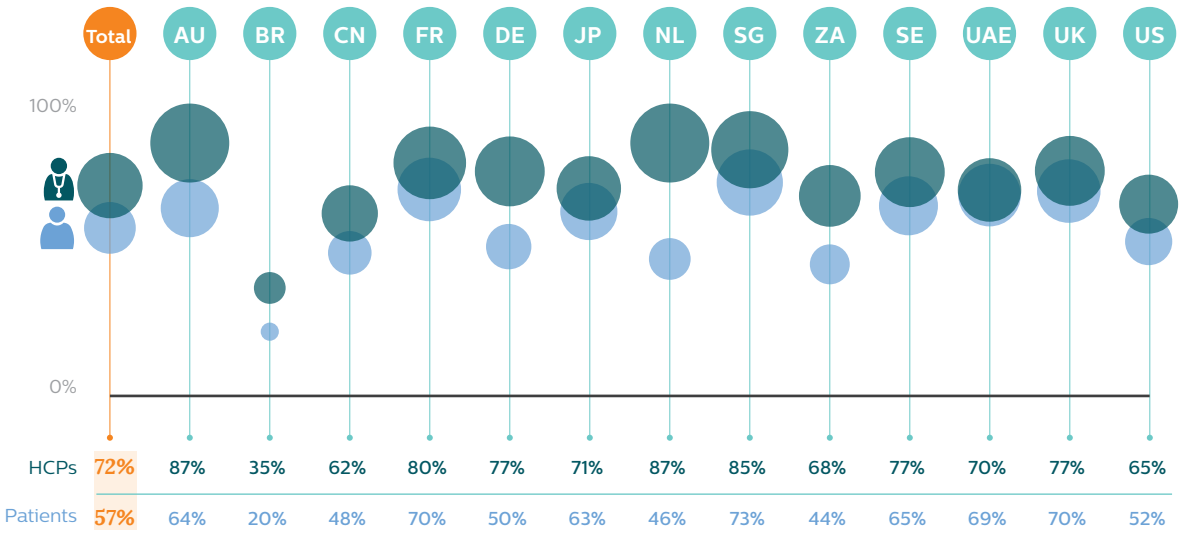
There is also significant divergence at times between healthcare professional and patient views. In the Netherlands, while 87% of healthcare professionals say they trust the national healthcare system, only 46% of patients agree; in Germany the rates are 77% and 50% respectively. In general, as the volume of data proliferates, it will be increasingly important for healthcare professionals to share decision-making with patients when using this data to build patient trust and improve outcomes.[8] When asked about data sharing a healthcare professional in the Netherlands stated "You'll always have the Big Brother is watching you reaction, it's unavoidable, but this can be helped by pilots."

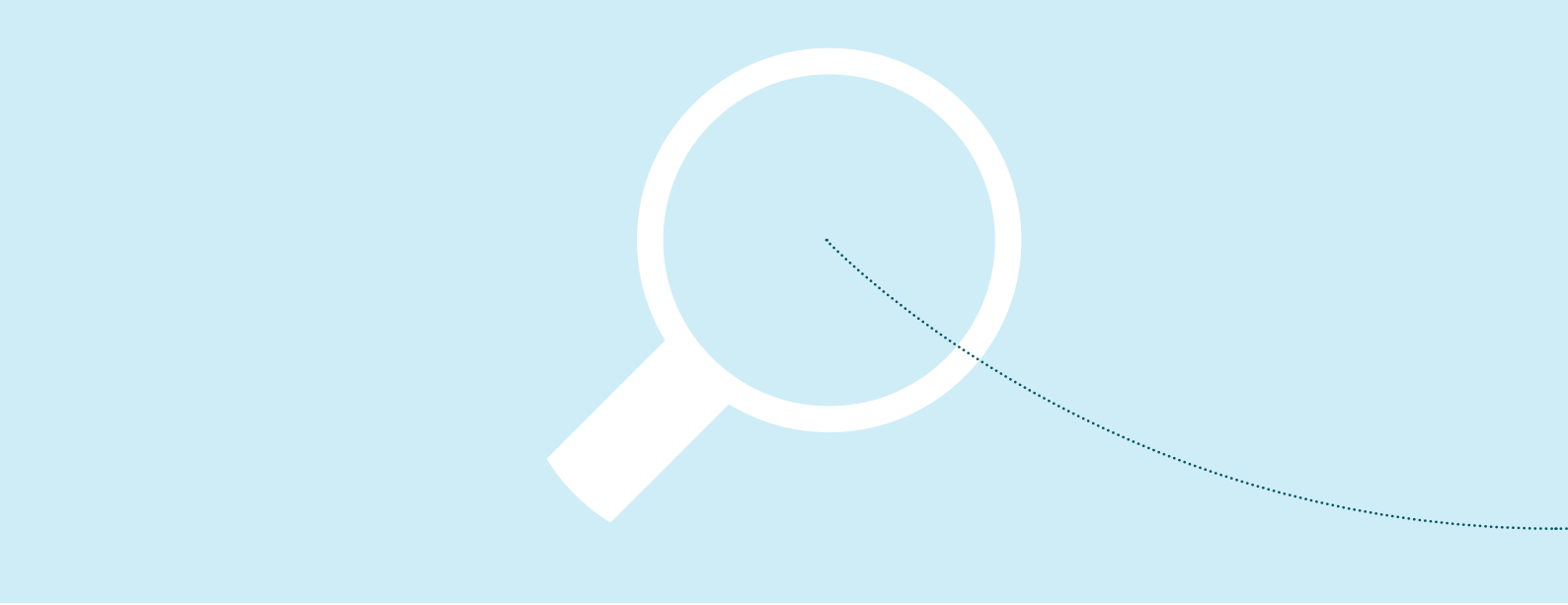
The research indicates that there is a link between trust and technology adoption and use. Healthcare professionals who trust the healthcare system in their country are more likely than those who distrust the system to report that most of their patients share information from connected care technology (10% versus 4%, respectively); the trusting group also viewed their countries' health systems as more integrated. Among patients who trust their healthcare system, 58% believe that connected technologies are often or always accurate, versus under half (46%) of those who do not trust the system.

Trust is critical to connected care given the often-sensitive nature of the data involved. While 75% of healthcare professionals say they are willing to share patient data with their peers, only 25% say they regularly share it with insurance companies or government health agencies. Some expressed concerns about the privacy and security issues disclosing data can raise. Similarly, 71% of patients overall note they would be comfortable sharing information from connected care technology with a health professional, but are far less comfortable with sharing this information with health insurers (33%).

> *"I am afraid of the disclosure of medical records incorrectly and improperly," admits a dermatologist in Brazil. "Sometimes patients with oncological problems do not want the family to know about it. But on the other hand, there should be no problem for the patients themselves to access the data."*

Percentage of patients who trust the healthcare system in their country compared to healthcare professionals

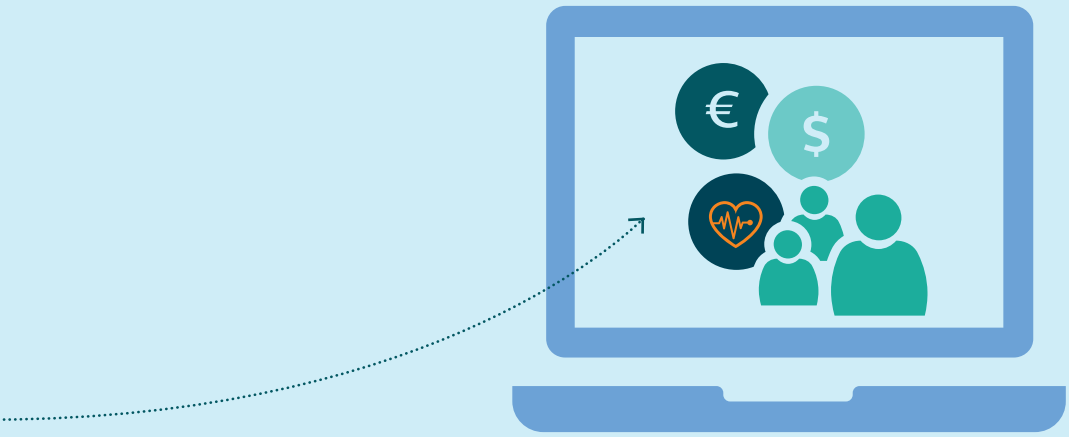




The future and the need for reform: in search of value

Integration at any price?

It has been said that it is impossible to put a price on good health, and certainly both patients and healthcare professionals appear keenly aware of the non-financial value of technology and integrated care. Clear majorities of both patients and healthcare professionals (69% and 85%, respectively) say integration of the health system would enhance the quality of care for patients. Most healthcare professionals (88%) also agree integration could have a direct positive impact on the health of the population, though those in Japan are noticeably more circumspect, with 30% of healthcare professionals having the view that integration would have no or a negative impact on the population's health.

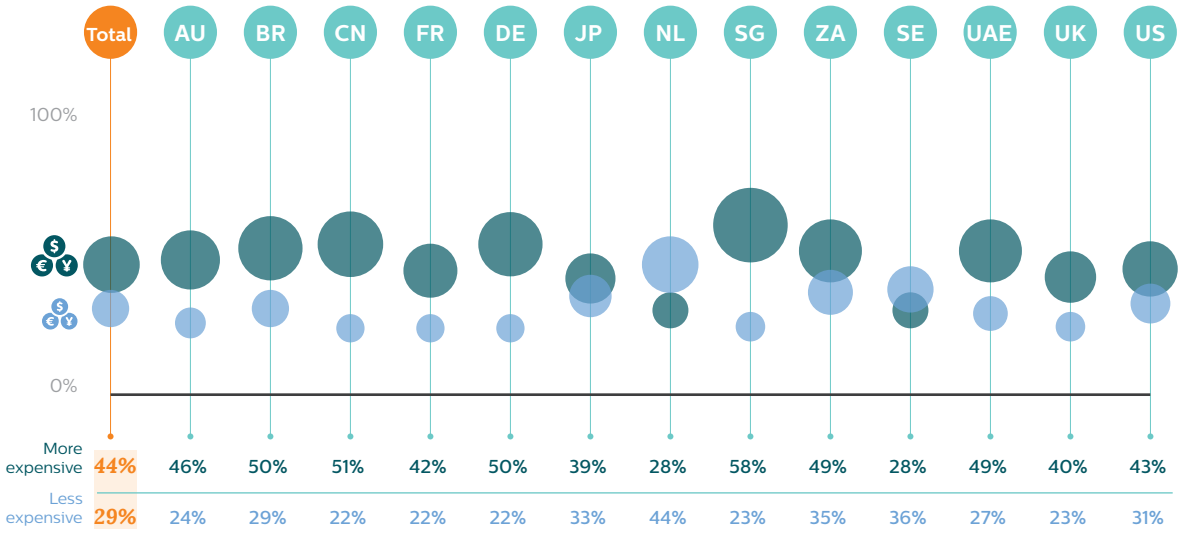


Potential gains aside, cost is a major possible deterrent to the adoption of connected health technology, whether in resource-strapped emerging countries or developed countries that are constantly struggling to rein in the costs associated with complex healthcare delivery systems, such as the UK. The structure of the health system is seen as the largest contributor to the cost of healthcare overall, cited by 33% of healthcare professionals surveyed.

Views on the financial impact of health system integration are somewhat mixed. While almost half (45%) of healthcare professionals say it would make healthcare less expensive overall, 34% believe integration would make healthcare more expensive.

> *"I wonder about the costs. Integrated health might accelerate the collapse of Japanese national health insurance."*
>
> *Cardiologist, Japan*

Patients perceptions on whether the coordination of healthcare would make the cost more or less expensive



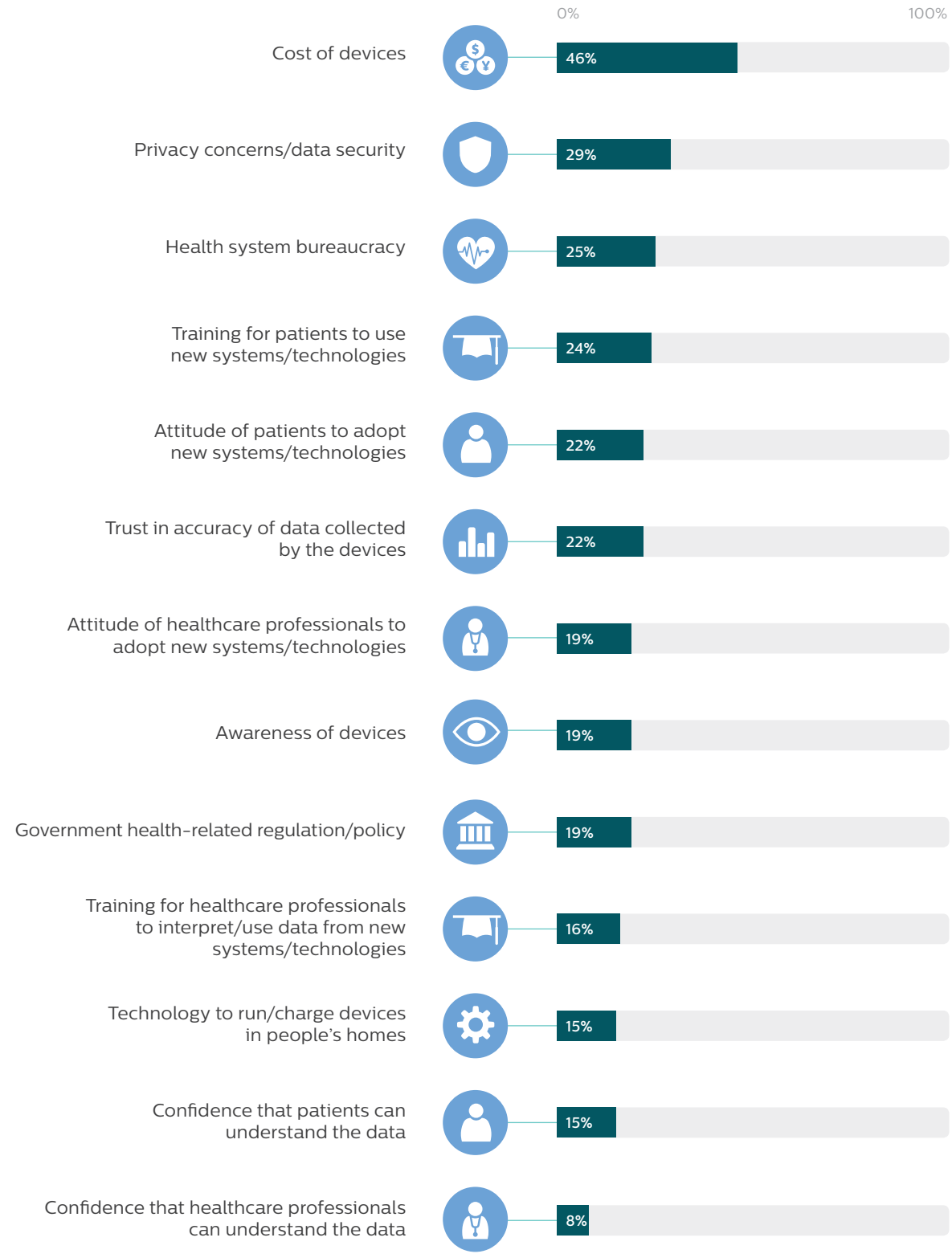
However, experience seems to bear out the view of the optimists; 58% of healthcare professionals in the UAE (where over half of healthcare professionals already see the health system as very or completely integrated) say integration of the healthcare system will reduce costs. Healthcare professionals that are relatively newer to the industry (i.e. those with 10 years of experience or less) are also more conscious of potential integration-driven cost savings, with 48% believing integrated health will make healthcare less expensive for patients.

Almost half of healthcare professionals and patients (46% and 42%, respectively) see the cost of connected care technology as a major barrier to its adoption, a concern shared across emerging and developed countries. In addition, half of healthcare professionals and patients (52% and 51%, respectively) believe connected care technology will increase the cost of healthcare overall.

Some healthcare professionals are understandably worried about the impact on their incomes of connected care, especially given the inability of legacy compensation and payment systems to factor in the realities of modern communication. "When the patient is in front of us, they pay for their consultation," notes a doctor of endocrinology in France. "When the patient is at home and sends us his data over the Internet, we cannot get compensated. Hence connected care cannot advance if we do not establish a clear compensation structure."

For many, the price of integration also extends beyond the purely financial: medical technologies can be time-consuming to implement and learn and may add processes to a healthcare professional's workflow that are seen as disruptive or burdensome. Over one-third (36%) of healthcare professionals see training of either healthcare professionals or patients in new technologies or systems as a major barrier to the adoption of connected care technology, rising to 49% in France and 50% in the UAE. Piled on top of that are the costs of the unforeseen; the American Action Forum estimated in 2015 that data breaches and security threats had cost the healthcare industry over $50 billion since 2009.[9]

Top perceived barriers to connected technology adoption from healthcare professionals*



*Those surveyed were asked to select their top three perceived barriers

> *"Technologies are not inexpensive to install or procure. In a lot of cases they have reduced the productivity of the physician, particularly in the inventory setting. They are able to see fewer patients, or they spend a lot more time in the system documenting. I think in the long run those are areas for improvement [and] it's the right thing to do. But for right now it has been very expensive and I'm not so sure very many people can point to examples of where it has paid off."*
>
> *Mr. Damron of Augusta University Medical Center*

Leading by example

Positive examples can do wonders for the appetite to implement healthcare technology, and this is why experts advise that a road map to fully integrated care begins with relatively quick, straightforward projects where the application of technology produces clear cost or efficiency gains for both healthcare professionals and patients.

It is important therefore that the return on investment in integration and connected care are examined – but return can mean many things, and may not always be a straightforward measurement. Research that has attempted to measure the costs associated with chronic conditions, and the results of spending on programs or technologies to address them, points to a strong case for spending. A 2015 report by the World Economic Forum projected that non-communicable diseases and mental disorders would cause the loss of $47 trillion in cumulative output globally between 2012-2030, and estimated the potential ROI on five projects that attempt to tackle long-term health issues at up to 3,700%.[10]

As Ms. Dunbrack of IDC notes, larger-scale health monitoring initiatives may not necessarily reduce costs directly at the 'moment of impact', but have been shown to deliver results by encouraging early interventions that may prevent serious and economically damaging health conditions down the road. "Care now could for example help someone avoid a stroke later that is very debilitating and has implications in terms of their not contributing to society. But how do we go about calculating that as an ROI [return on investment]? That's been one of the challenging things for healthcare; calculating cost avoidance."

"One of the things we always recommend [in technology implementations] is to get a 'quick win' on the scoreboard. It's important to really stop and think about the problem you're trying to solve. Often people get really excited about the shiny device and all the cool things they can do with it, but the device is really just the tip of the iceberg; a lot of the challenges you have to think through are those below the waterline … is data flowing to physicians in a way that they can use it when they need to make a decision?"

Ms. Dunbrack of IDC Health Insights

Conclusion: beyond healthcare's borders

As this report has illustrated, the further proliferation of technology in healthcare is, to some extent, a given, as it is in fields from retail to banking. With devices growing more sophisticated (and in many cases, cheaper and more user-friendly) and a new, digitally native generation of healthcare professionals and patients emerging, healthcare institutions will have more opportunity than ever – and will find themselves under more pressure than ever – to incorporate technology into the delivery of care in the years ahead.

What is not inevitable, however, is connected technology being applied in a way that fulfills its potential in the healthcare context, or that maximizes benefits for patients and healthcare professionals. The FHI shows that some countries are moving more quickly to seize on the possibilities of connected, integrated care than others. The question is what lessons can be gleaned from these countries, and how nations currently on the lower rungs of the index can best cultivate the development of a more future-ready healthcare environment.

Context and conditions naturally differ greatly from one country to the next, but through the index and accompanying research several core principles have emerged that should inform any technology-driven healthcare reform or implementation. Perhaps the most important is that while technology can facilitate transformation, and even integration, it does not necessarily result in either. A government can establish networks and hand out devices *en masse* and still see few or no results if patients are reluctant to put these advances to use, or if the data outputs remain in a 'walled garden' within the healthcare system where they are rarely shared with other agencies. As the mixed results of large-scale health technology initiatives in the developed world attests, a 'big bang' approach to health system modernization may not be the most effective.

Connected care technology may prove most successful when it supports the personalized care that this report has shown both healthcare professionals and patients view as crucial to the effective management of health. This argues for a focus on the local context, patient experience and specific goals when it comes to implementation. Industry insiders already see a shift in this direction when technology investments are assessed, with an emphasis on practicality and outcomes, and more governments and institutions seeking solutions tailored to individual needs. Mr. Damron, of Augusta University Medical Center, notes:

> *"Unless being hi-tech is your calling card, where it's almost more of a marketing investment, then you're probably going to start to look at the base functionality you need to deal with the population you serve. It won't be an arms race anymore, it won't be who has the [technology] first ... it will be a much more targeted investment in proportion to what you're trying to achieve, versus trying to have a piece of technology that can do a lot of things but [if] perhaps you lack the capacity to utilize it, you're over-investing."*

At the same time, emerging technologies give healthcare institutions the ability to be ambitious, and to deliver tailored services on an industry-wide scale. Cloud computing has brought robust, secure and virtually limitless storage and processing resources within the reach of even the smallest institutions, providing a centralized, cost-effective environment for electronic records and clinical data. The global healthcare cloud computing market is forecast to nearly triple to $9.5 billion by 2020 as more institutions seek to deliver better care at lower costs.[11]

To fully capitalize on the opportunities that connected care technology presents, healthcare systems and the institutions within them will have to strive for a measure of interoperability. Connections are difficult to forge, after all, when devices and systems are unable to communicate. The adoption of common standards and terminology in healthcare technology will be crucial to connected care and giving patients access to data they need to inform health decisions. Thankfully there are already signs of this in the emergence of frameworks like Health Level Seven[12] and the conclusion of open data agreements between health authorities in the US and UK.[13]

Over the longer term, greater technological adoption and information exchange should empower and encourage healthcare systems to experiment with new business models that amalgamate data and use metrics to enhance efficiency and service quality, such as bundled payments and accountable care. In addition, multiple entirely people-driven processes – doctor and patient education, legal reforms, promotional campaigns – will have to accompany any lasting technological change.

For healthcare to be truly 'connected,' it must also establish lines of communication with other segments of society and institutions, since health is at the core of so much activity and is in turn influenced by so many factors beyond the formal healthcare environment. In the view of Dr. Kurokawa of GRIPS, the greater the diversity of voices that are involved in the dialogue on improving healthcare, the better.

> *"Granting access to data is the way to encourage a broader range of stakeholders – economists, medical researchers, demographers and so on – to propose new ideas. Data technology is the way to empower the tools to create different policy options."*

This is the goal of accessible, integrated, connected care. How much more perceived progress various countries have made towards that goal will be revealed in subsequent editions of the Future Health Index.

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Professor of the National Graduate Institute for Policy Studies

Lynne Dunbrack
Research Vice President for IDC Health Insights

Appendix I
Country profiles

Australia (AU)

Market background

GDP per capita (2014 – USD)	**$61,979.90**
Healthcare expenditure per capita (2014 – USD)	**$6,031.11**
Healthcare expenditure as a percentage of GDP	**9%**
Type of health system	Public • Regionally administered • Joint national and state public hospital funding • Universal public medical insurance program (Medicare)
Average age of population	**38**
Average life expectancy	**83** • Healthy life expectancy: 73
Infant mortality rate (per 1,000)	**3**
Top 10 causes of death	1. Ischemic heart disease 2. Stroke 3. Alzheimer's/dementia 4. Trachea, bronchus, lung cancers 5. Chronic obstructive pulmonary disease 6. Colon and rectum cancers 7. Diabetes mellitus 8. Prostate cancer 9. Breast cancer 10. Kidney diseases

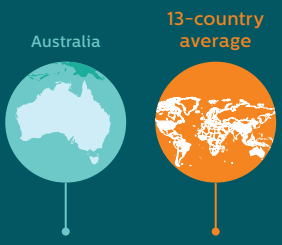
Sources: GDP per Capita: World Bank (2014), Healthcare Expenditure per Capita: World Bank (2014), Type of health system: Commonwealth Fund (2014), Average age of population: CIA Factbook 2015, Average life expectancy: World Health Organization (2012), Healthy life expectancy: World Health Organization (2013), Causes of death: World Health Organization (2012)

Other key findings

1. There is a disconnect between healthcare professionals and patients on the most important challenges the country is facing. That said, the overall health of the population is considered less of a concern than other social issues by both audiences.
2. Additionally, despite these differences, healthcare professionals and patients are aligned on a vision of the healthcare system that is more integrated, with greater adoption of connected care technologies.
3. Australia ranks higher than average across all dimensions of the health continuum in terms of access. However, consistent with a majority of countries, home healthcare is seen as needing improvement given the aging population.
4. Integrated health and connected care technologies are perceived to improve the patient experience and the quality of care, but the implementation costs are seen as substantial.
5. Data sharing via connected care is still an emerging practice, but interest is high.

Australia's Future Health Index (FHI) score of 57.9 (ranked 4th out of 13 countries) is driven by its high perceived access to healthcare across the continuum.

- Access is Australia's strong point and the main reason for its high index score, likely due to national and state hospital funding and a universal insurance program. Healthcare professionals and patients rate the overall health of the population and healthcare positively.
- Australia came in on par with the 13-country average in terms of the adoption and integration of connected care technology. Concerns around connected care often centered on cost, as well as ownership and knowledge.



	Australia	13-country average
Overall index	**57.9**	**56.5**
Access to care across the health continuum sub-index	**71.5**	**65.9**
Integration sub-index	**55.1**	**55.8**
Connected care technology adoption sub-index	**47.2**	**47.8**

6. Compared to other countries, patients and healthcare professionals generally feel comfortable sharing data.
7. Older and younger patients have differing needs and attitudes to managing their personal health; motivation and time are key barriers. Both need to be considered as the healthcare system evolves.

Brazil (BR)

Market background

GDP per capita (2014 – USD)	**$11,726.81**
Healthcare expenditure per capita (2014 – USD)	**$947.43**
Healthcare expenditure as a percentage of GDP	**8%**
Type of health system	Public and private • 75% of the population depends on free care from Brazil's Unified Health System (SUS) • Largest public health system in the world • 25% enrolled in private health plans (many use the public system as well)
Average age of population	**31**
Average life expectancy	**74** • Healthy life expectancy: 65
Infant mortality rate (per 1,000)	**15**
Top 10 causes of death	1. Ischemic heart disease 2. Stroke 3. Lower respiratory infections 4. Diabetes mellitus 5. Interpersonal violence 6. Hypertensive heart disease 7. Road injury 8. Chronic obstructive pulmonary disease 9. Trachea, bronchus, lung cancers 10. Cirrhosis of the liver

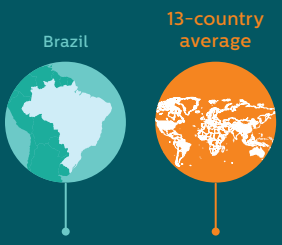
Sources: GDP per Capita: World Bank (2014), Healthcare Expenditure per Capita: World Bank (2014), Type of health system: Commonwealth Fund (2014), Average age of population: CIA Factbook 2015, Average life expectancy: World Health Organization (2012), Healthy life expectancy: World Health Organization (2013), Causes of death: World Health Organization (2012)

Other key findings

1. Healthcare professionals and patients rank the overall health of the population as a top challenge facing the country.
2. Few patients and healthcare professionals believe the healthcare system currently meets patient needs; this likely exacerbates concerns with overall health. Improved access across the health continuum is clearly needed to improve public health in the view of both patients and healthcare professionals.
3. While patients and healthcare professionals do not currently think of Brazil's healthcare system as integrated, they do see the value integration could bring to the system.
4. Health system bureaucracy and government health-related regulations/policies are considered the main barriers to the further coordination of care.
5. Patients and healthcare professionals agree that patients often lack access to the health information, medical resources and treatments they need to manage their health effectively.
6. The cost of healthcare is top of mind for healthcare professionals and patients in Brazil, which has been adversely impacted by market conditions. Yet the two sides differ on the cost implications of health system integration.

Brazil's Future Health Index (FHI) score of 50.6 (ranked 12th out of 13 countries) is a result of below-average access to healthcare across the continuum, while integration and connected care technology adoption are above average.

- The index score reflects a population that experiences poor health and a lack of infrastructure to support the improvement of health (as per external sources).
- Patient and healthcare professionals alike recognize the situation, and their perceptions on access are the main factor behind the country's low overall score.



Overall index	**50.6**	**56.5**
Access to care across the health continuum sub-index	**45.4**	**65.9**
Integration sub-index	**57.0**	**55.8**
Connected care technology adoption sub-index	**49.4**	**47.8**

7. Knowledge and usage of connected care technologies is limited, particularly among patients.
8. Despite limited usage and knowledge of connected care technology, it is widely perceived as important to improving healthcare.
9. While healthcare professionals and patients consider connected care technology valuable, there are barriers related to cost and health system bureaucracy that must be considered in implementation.

China (CN)

Market background

GDP per capita (2014 – USD)	**$7,590.02**
Healthcare expenditure per capita (2014 – USD)	**$419.73**
Healthcare expenditure as a percentage of GDP	**6%**
Type of health system	Public • Merger of the New Rural Cooperative Medical Scheme (NCMS) with the Medical Financial Assistance Scheme (MFA)
Average age of population	**37**
Average life expectancy	**75** • Healthy life expectancy: 68
Infant mortality rate (per 1,000)	**9**
Top 10 causes of death	1. Stroke 2. Ischemic heart disease 3. Chronic obstructive pulmonary disease 4. Trachea, bronchus, lung cancers 5. Liver cancer 6. Stomach cancers 7. Road injury 8. Hypertensive heart disease 9. Diabetes mellitus 10. Lower respiratory infections

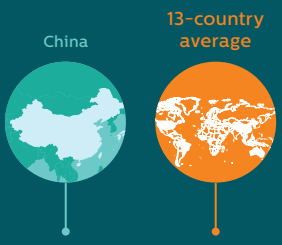
Sources: GDP per Capita: World Bank (2014), HC Expenditure per Capita: World Bank (2014), Type of health system: Deloitte (2014), Average age of population: CIA Factbook 2015, Average life expectancy: World Health Organization (2012), Healthy life expectancy: World Health Organization (2013), Causes of death: World Health Organization (2012)

Other key findings

1. Patients and healthcare professionals are aligned on the top three challenges facing China today – aging, health and the economy.
2. Trust in the healthcare system is high, particularly among healthcare professionals, but many still rate the overall patient experience on the low end. Healthcare professionals cite a lack of prevention focus, regional disparities, and being short-staffed and under-equipped as the main challenges to quality of care.
3. Healthcare professionals and patients have differing opinions on the value of healthcare relative to what they think it costs the system overall. Healthcare professionals are more inclined than patients to think it is priced too low.
4. While views on the extent of health system integration are above the 13-country average, there is a large disparity between healthcare professionals' and patients' perceptions. Patients are more likely to believe the system is integrated than healthcare professionals. That aside, both sides agree that integration is important and could improve the quality of care.

China's Future Health Index (FHI) score of 58.1 (ranked 3rd out of 13 countries) is driven by high perceived usage and knowledge of connected care technologies and openness to integrated care as a concept.

- China's index score is driven by its high adoption of connected care technology. A country known for rapid technological progress, it earns the second-highest adoption score, with particularly strong rankings in usage and perception. Patients are comfortable with owning devices as well as sharing data.
- China also has a high level and perception of integration; however support and investment from the government is needed to sustain this.
- Access keeps China from taking the top spot, with patients and healthcare professionals viewing the overall health of the population as a major challenge. Patients are unhappy with the healthcare system and healthcare professionals feel that resources are insufficient.



	China	13-country average
Overall index	**58.1**	**56.5**
Access to care across the health continuum sub-index	64.8	65.9
Integration sub-index	57.3	55.8
Connected care technology adoption sub-index	52.1	47.8

5. The government, cost and health system bureaucracy are perceived as the largest barriers to care being more coordinated.
6. Patients claim to be more knowledgeable about connected care technology than healthcare professionals and many say they have shared information from connected care technology with their healthcare professional. However, cost and privacy concerns are barriers to increasing usage further.

France (FR)

Market background

GDP per capita (2014 – USD)	**$42,725.74**
Healthcare expenditure per capita (2014 – USD)	**$4,958.99**
Healthcare expenditure as a percentage of GDP	**12%**
Type of health system	Public • Statutory health insurance system • All statutory health insurers incorporated into a single national exchange
Average age of population	**41**
Average life expectancy	**82** • Healthy life expectancy: 72
Infant mortality rate (per 1,000)	**4**
Top 10 causes of death	1. Ischemic heart disease 2. Alzheimer's/dementia 3. Stroke 4. Trachea, bronchus, lung cancers 5. Colon and rectum cancers 6. Breast cancer 7. Lower respiratory infections 8. Diabetes mellitus 9. Pancreas cancer 10. Hypertensive heart disease

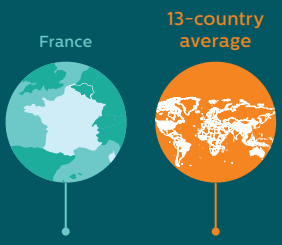
Sources: GDP per Capita: World Bank (2014), HC Expenditure per Capita: World Bank (2014), Type of health system: Commonwealth Fund (2014), Average age of population: CIA Factbook 2015, Average life expectancy: World Health Organization (2012), Healthy life expectancy: World Health Organization (2013), Causes of death: World Health Organization (2012)

Other key findings

1. The overall health of the population does not rank as one of the most important challenges facing France today in the eyes of patients or healthcare professionals. However, these groups diverge in some key perceptions of the healthcare system.
2. In measuring access to care along the health continuum, a lack of support and resources for homecare is apparent.
3. Difficulties in France's past attempts at integration (such as the introduction of a universal electronic health record) have fueled skepticism that integration will become a reality. This skepticism is also connected to concerns about cost (particularly among patients) and bureaucracy.
4. Connected care technologies face the same cost concerns, as well as worries about training.
5. According to healthcare professionals, widespread healthcare access may make the French healthcare system inefficient from a cost perspective.

France's Future Health Index (FHI) score of 54.6 (ranked 10th out of 13 countries) is driven by relatively negative perceptions of connected care technology, and integrated care as a concept.

- France's low index score can be attributed to negative attitudes toward and concerns about the costs of integration, and limited adoption of connected care technology.
- The country's access scores fall at or above average, likely due to its public health insurance system.
- However, this same insurance system is at the root of some negative attitudes towards integration, with some healthcare professionals citing it as a barrier to the coordination of healthcare and expressing fears that it will gain an even bigger share of the market.



	France	13-country average
Overall index	**54.6**	**56.5**
Access to care across the health continuum sub-index	**66.9**	**65.9**
Integration sub-index	**54.4**	**55.8**
Connected care technology adoption sub-index	**42.6**	**47.8**

6. The 'human element' of medical consultation is considered essential in France. Healthcare technologies should enable and improve, rather than replace, these healthcare professional-patient interactions to gain traction.
7. Healthcare professionals and patients recognize that integration and connected care technology can improve the patient experience and quality of care, but the aforementioned concerns must be addressed to harness this optimism.
8. Healthcare professionals and patients disagree on patients' ability to effectively manage their health. There is an opportunity to empower patient ownership of healthcare via integrated health.

Germany (DE)

Market background

GDP per capita (2014 – USD)	**$47,773.94**
Healthcare expenditure per capita (2014 – USD)	**$5,410.63**
Healthcare expenditure as a percentage of GDP	**11%**
Type of health system	Public and private • Statutory health insurance system • 131 competing SHI insurers • High-income earners can opt out for private coverage
Average age of population	**46**
Average life expectancy	**81** • Healthy life expectancy: 71
Infant mortality rate (per 1,000)	**3**
Top 10 causes of death	1. Ischemic heart disease 2. Stroke 3. Trachea, bronchus, lung cancers 4. Hypertensive heart disease 5. Alzheimer's/dementia 6. Chronic obstructive pulmonary disease 7. Colon and rectum cancers 8. Diabetes mellitus 9. Lower respiratory infections 10. Breast cancer

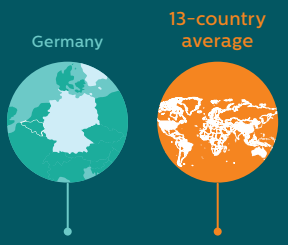
Sources: GDP per Capita: World Bank (2014), HC Expenditure per Capita: World Bank (2014), Type of health system: Commonwealth Fund (2014), Average age of population: CIA Factbook 2015, Average life expectancy: World Health Organization (2012), Healthy life expectancy: World Health Organization (2013), Causes of death: World Health Organization (2012)

Other key findings

1. The overall health of the population is not as significant a concern to patients and healthcare professionals as a variety of other social issues. Healthcare professionals and patients agree that action should be taken by the government to improve public health, but diverge on what steps should be prioritized.
2. Both patients and healthcare professionals agree that individuals are fully responsible for managing their own health. However, the two groups are not aligned on how to best foster patients' ability to effectively manage their own health.
3. Although Germany ranks above the 13-country average in terms of access, a need for improved access to homecare resources is apparent.
4. Healthcare professionals and patients agree on the importance of integration, although they have differing views on the degree to which healthcare is currently integrated.
5. Healthcare professionals are more optimistic about the potential benefits of integrated health, while patients focus on the perceived cost implications.

Germany's Future Health Index (FHI) score of 54.5 (ranked 11th out of 13 countries) is the result of a high level of access to healthcare resources but low scores on integration and adoption.

- While integration and adoption scores are low (both rank only above Japan), Germany's high level of access to resources across the healthcare continuum keeps the country from falling into the bottom rungs of the index.
- German healthcare professionals are more critical of the idea of an integrated health system than patients, hampering Germany's overall index score.



	Germany	13-country average
Overall index	**54.5**	**56.5**
Access to care across the health continuum sub-index	**69.2**	**65.9**
Integration sub-index	**52.8**	**55.8**
Connected care technology adoption sub-index	**41.5**	**47.8**

6. Both healthcare professionals and patients agree that bureaucracy and cost are among the top barriers to integration.
7. Neither patients nor healthcare professionals say they are knowledgeable about connected care technologies, and healthcare professionals' concerns with data overload must be addressed in technology implementation.
8. Both healthcare professionals and patients agree that the healthcare system provides quality care to patients at the right cost.

Japan (JP)

Market background

GDP per capita (2014 – USD)	**$36,194.42**
Healthcare expenditure per capita (2014 – USD)	**$3,702.95**
Healthcare expenditure as a percentage of GDP	**10%**
Type of health system	Public • Statutory health insurance system • >3,400 non-competing public, quasi-public and employer-based insurers • National government: – Sets provider fees – Subsidizes local governments, insurers and healthcare professionals – Supervises insurers and healthcare professionals
Average age of population	**46**
Average life expectancy	**84** • Healthy life expectancy: 75
Infant mortality rate (per 1,000)	**2**
Top 10 causes of death	1. Lower respiratory infections 2. Stroke 3. Ischemic heart disease 4. Trachea, bronchus, lung cancers 5. Stomach cancer 6. Colon and rectum cancers 7. Liver cancer 8. Pancreas cancer 9. Self-harm 10. Kidney diseases

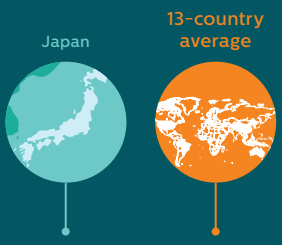
Sources: GDP per Capita: World Bank (2014), HC Expenditure per Capita: World Bank (2014), Type of health system: Commonwealth Fund (2014), Average age of population: CIA Factbook 2015, Average life expectancy: World Health Organization (2012), Healthy life expectancy: World Health Organization (2013), Causes of death: World Health Organization (2012)

Other key findings

1. The aging population is almost universally perceived to be Japan's greatest challenge by a significant margin. However, healthcare professionals and patients are divided on what the government should prioritize to improve health and healthcare.
2. There is a significant disconnect between patients' and healthcare professionals' perceptions of access to care across the healthcare continuum.
3. Additionally there is a dichotomy between how well patients feel cared for versus the care healthcare professionals believe they are giving. Healthcare professionals concede that patients' experiences may be affected by long wait times and lack of personal attention due to healthcare professionals being stretched for time.
4. Patients believe that the cost of healthcare is too expensive for the level of treatment they receive. Opinions vary on how integration will affect the cost of healthcare.
5. Despite the majority of respondents believing Japan's health system is not integrated currently, both healthcare professionals and patients feel that integration is important and would improve the quality of care. Barriers include bureaucracy in the healthcare system, cost and the government.

Japan's Future Health Index (FHI) score of 49.0 (ranked 13th out of 13 countries) is the result of low perceptions of the integration of care and limited adoption of connected care technology.

- Japan's aging population is a key concern for the general public (according to the Pew Research Center).
- Home healthcare is critical to addressing the needs of an aging population; however, patients and healthcare professionals view access to home healthcare as lacking.
- While integration and connected care technology are viewed as important to health, both the state of integration and knowledge of connected technologies are seen as limited, hindering Japan's index score.



	Japan	13-country average
Overall index	**49.0**	**56.5**
Access to care across the health continuum sub-index	57.9	65.9
Integration sub-index	50.7	55.8
Connected care technology adoption sub-index	38.4	47.8

6. Most patients see themselves as fully responsible for their own healthcare, but also feel they lack the motivation and confidence needed to manage their health effectively. Healthcare professionals also believe patients should become more active in managing their health.
7. More personalized care is seen by healthcare professionals and patients as the top means to help patients manage their health more effectively, but healthcare professionals and patients both cite time as the reason more personalized care doesn't exist currently. Older patients, who report potentially benefiting the most from more personalized care, are less likely to consider time management a challenge.
8. Although connected care technology is not being used by many, both patients and healthcare professionals are interested in online interactions, which could potentially save time for both sides – as long as they supplement rather than replace face-to-face interactions.
9. The vast majority of Japanese patients and healthcare professionals say they have little knowledge about connected care technology, although they see its potential to improve care and overall health.
10. Privacy concerns and cost are the two main barriers to the adoption of connected care technology.

Netherlands (NL)

Market background

GDP per capita (2014 – USD)	**$52,138.68**
Healthcare expenditure per capita (2014 – USD)	**$5,693.86**
Healthcare expenditure as a percentage of GDP	**11%**
Type of health system	Public and private • Statutory health insurance system • Universally-mandated private insurance • Government regulates and subsidizes insurance
Average age of population	**42**
Average life expectancy	**81** • Healthy life expectancy: 71
Infant mortality rate (per 1,000)	**3**
Top 10 causes of death	1. Trachea, bronchus, lung cancers 2. Ischemic heart disease 3. Alzheimer's/dementia 4. Stroke 5. Chronic obstructive pulmonary disease 6. Colon and rectum cancers 7. Lower respiratory infections 8. Breast cancer 9. Prostate cancer 10. Diabetes mellitus

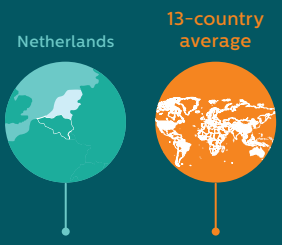
Sources: GDP per Capita: World Bank (2014), HC Expenditure per Capita: World Bank (2014), Type of health system: Commonwealth Fund (2014), Average age of population: CIA Factbook 2015, Average life expectancy: World Health Organization (2012), Healthy life expectancy: World Health Organization (2013), Causes of death: World Health Organization (2012)

Other key findings

1. The overall health of the population is considered less of a challenge than other domestic issues among healthcare professionals and patients. However, healthcare professionals cite the aging population as the biggest challenge facing the country.
2. There is a disconnect between healthcare professional and patient perceptions of the care patients receive, with patients less likely than healthcare professionals to feel cared for and that their needs are met.
3. In line with their overall perceptions of the healthcare system, healthcare professional and patient perceptions of the value of healthcare differ significantly.
4. Healthcare professionals and patients think integration is important and that further integration would improve the quality of care while lowering costs. However, they recognize that the healthcare system is not fully integrated.

The Netherlands' Future Health Index (FHI) score of 58.9 (ranked 2nd out of 13 countries) is driven by high perceived adoption of connected care technology and integration.

- Access to healthcare across the healthcare continuum is also a key driver of the Netherlands' high index score. This may reflect the healthcare system's financial model, which blends both private insurance and state funding.
- In addition, a high proportion of patients and healthcare professionals recognize the positive impact of integration on the cost of healthcare and perceive the system as somewhat integrated currently.



	Netherlands	13-country average
Overall index	**58.9**	**56.5**
Access to care across the health continuum sub-index	**72.4**	**65.9**
Integration sub-index	**58.8**	**55.8**
Connected care technology adoption sub-index	**45.5**	**47.8**

5. Healthcare professionals and patients agree on the major barriers to integration in the Netherlands – specifically bureaucracy in the healthcare system, privacy issues and insurance companies.
6. Both sides agree that individuals are most responsible for preventing poor health, followed by parents. Overall, healthcare professionals are seen as partners, working with patients to prevent poor health.
7. Connected care technologies are not yet playing a large role in healthcare management. Barriers such as cost and security/data privacy concerns are considered hurdles to technology becoming more prolific.
8. There is openness to facilitating greater access to personalized care via online services, though they should serve as a supplement to, not replace, face-to-face interaction.

Singapore (SG)

Market background

GDP per capita (2014 – USD)	$56,284.33
Healthcare expenditure per capita (2014 – USD)	$2,752.32
Healthcare expenditure as a percentage of GDP	5%
Type of health system	Public and private • Government subsidies at public healthcare institutions and some healthcare professionals • Medisave: mandatory medical savings program for routine expenses • MediShield: catastrophic health insurance • Medifund: government endowment fund to subsidize healthcare for low-income earners and those with large bills • Government regulation of private insurance, central planning and financing of infrastructure
Average age of population	34
Average life expectancy	83 • Healthy life expectancy: 76
Infant mortality rate (per 1,000)	2
Top 10 causes of death	1. Ischemic heart disease 2. Lower respiratory infections 3. Stroke 4. Trachea, bronchus, lung cancers 5. Colon and rectum cancers 6. Kidney diseases 7. Liver cancer 8. Breast cancer 9. Chronic obstructive pulmonary disease 10. Stomach cancer

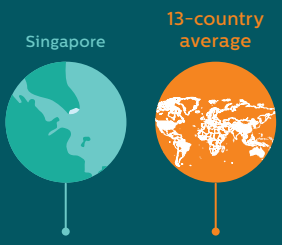
Sources: GDP per Capita: World Bank (2014), HC Expenditure per Capita: World Bank (2014), Type of health system: Commonwealth Fund (2014), Average age of population: CIA Factbook 2015, Average life expectancy: World Health Organization (2012), Healthy life expectancy: World Health Organization (2013), Causes of death: World Health Organization (2012)

Other key findings

1. While the overall health of the population is not considered a top challenge by patients and healthcare professionals, the aging population is a cause for concern. Given this view, and consistent with other countries, the need for greater access to homecare resources and support is apparent.
2. While the system is perceived to meet patients' needs and access across the continuum is high, healthcare professionals tend to think more highly of the healthcare system than patients, and believe it is priced correctly. In spite of this, both healthcare professionals and patients agree that the government needs to prioritize certain areas of the health continuum and reduce costs to improve public health.
3. Despite a belief in the importance and perceived benefits of integration, healthcare professionals in particular note it has not yet been achieved in Singapore.

Singapore's Future Health Index (FHI) score of 57.7 (ranked 5th out of 13 countries) is driven by its perceived access to care across the healthcare continuum.

- Singapore's high index ranking can be attributed to its accessible healthcare, particularly in healthy living, prevention and treatment. Its government-subsidized healthcare program, in addition to the Medisave, MediShield and Medifund programs, allow those with limited means to access healthcare.
- Perceptions of the cost relative to the value of both health system integration and connected care technology adoption negatively weighed on Singapore's overall rating.



	Singapore	13-country average
Overall index	**57.7**	**56.5**
Access to care across the health continuum sub-index	**70.1**	**65.9**
Integration sub-index	**54.8**	**55.8**
Connected care technology adoption sub-index	**48.2**	**47.8**

4. Although connected care technology knowledge and perceived usage are fairly low, the anticipated benefits of emerging technologies are high. As a result, Singapore scores slightly above average on connected care adoption.
5. Cost is seen as a key concern to address in the implementation of healthcare integration and connected care technology. Others include bureaucracy and privacy/data security.
6. Healthcare professionals can see a future where connected care technologies are ubiquitous in health management, and while they see the benefits of these technologies to the patient, many also have concerns about their impact on the profession.
7. There is an opportunity for patients to manage their health more actively, which could be supported through greater adoption of connected care technology.

South Africa (ZA)

Market background

GDP per capita (2014 – USD)	**$6,483.85**
Healthcare expenditure per capita (2014 – USD)	**$570.21**
Healthcare expenditure as a percentage of GDP	**9%**
Type of health system	Public • National Health Insurance (NHI) system designed to ensure that all South African citizens have access to essential healthcare • NHI system expected to be funded through personal taxation and mandatory employer contributions • System is two-pronged: – Public: large, under-resourced and overused – Private: small, well-funded and well-equipped
Average age of population	**26**
Average life expectancy	**59** • Healthy life expectancy: 52
Infant mortality rate (per 1,000)	**34**
Top 10 causes of death	1. HIV/AIDS 2. Stroke 3. Diabetes mellitus 4. Ischemic heart disease 5. Lower respiratory infections 6. Tuberculosis 7. Hypertensive heart disease 8. Interpersonal violence 9. Diarrhoeal diseases 10. Road injury

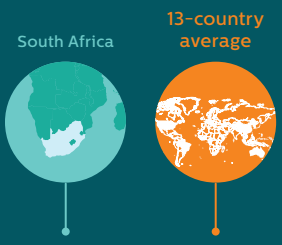
Sources: GDP per Capita: World Bank (2014), HC Expenditure per Capita: World Bank (2014), Type of health system: Commonwealth Fund (2014), Average age of population: CIA Factbook 2015, Average life expectancy: World Health Organization (2012), Healthy life expectancy: World Health Organization (2013), Causes of death: World Health Organization (2012)

Other key findings

1. The overall health of the population is viewed as less of a challenge than other key issues affecting the country, particularly crime.
2. Healthcare professionals and patients differ on the effectiveness of the health system in meeting the needs of the population, particularly when comparing the public and private systems. South Africa's healthcare system is one of the lowest-rated by its citizens among the 13 countries surveyed.
3. Cost is a bigger barrier to healthcare overall than in any other country surveyed.
4. Although South Africa's health system is not considered very integrated at present, patients and healthcare professionals alike see clear value in future integration.
5. To realize a fully integrated health system, concerns regarding cost must be addressed. Both patients and healthcare professionals worry that integration of the health system could lead to healthcare becoming more expensive in the long term.

South Africa's Future Health Index (FHI) score of 56.7 (ranked 8th out of 13 countries) is based on low access to healthcare resources but a high adoption of connected care technology.

- While South Africa ranks highly in the adoption of connected care technology, low access to healthcare resources drags its overall score down. South Africans are conscious of some of the benefits of health system integration, but without basic access to healthcare, integration is difficult to achieve.



	South Africa	13-country average
Overall index	**56.7**	**56.5**
Access to care across the health continuum sub-index	**63.2**	**65.9**
Integration sub-index	**55.3**	**55.8**
Connected care technology adoption sub-index	**51.6**	**47.8**

6. Openness to connected care technologies raises South Africa's connected care technology adoption index score above the average, with South African healthcare professionals and patients acknowledging the benefits of connected care across the health continuum.
7. As with integrated health, connected care technologies face concerns regarding cost.
8. Patients and healthcare professionals agree that individuals are fully responsible for managing their health. However, there is a disconnect on whether patients have the ability and knowledge to do so.

Sweden (SE)

Market background

GDP per capita (2014 – USD)	**$58,898.93**
Healthcare expenditure per capita (2014 – USD)	**$6,807.72**
Healthcare expenditure as a percentage of GDP	**12%**
Type of health system	Public • National healthcare system • Regulation, supervision and some funding by national government • Responsibility for most financing and purchasing/ provision devolved to county councils
Average age of population	**41**
Average life expectancy	**82** • Healthy life expectancy: 72
Infant mortality rate (per 1,000)	**2**
Top 10 causes of death	1. Ischemic heart disease 2. Stroke 3. Alzheimer's/dementia 4. Trachea, bronchus, lung cancers 5. Colon and rectum cancers 6. Chronic obstructive pulmonary disease 7. Prostate cancer 8. Hypertensive heart disease 9. Diabetes mellitus 10. Lower respiratory infections

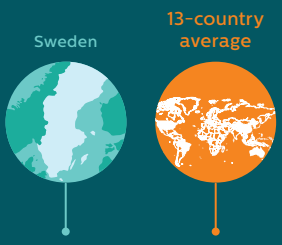
Sources: GDP per Capita: World Bank (2014), HC Expenditure per Capita: World Bank (2014), Type of health system: Commonwealth Fund (2014), Average age of population: CIA Factbook 2015, Average life expectancy: World Health Organization (2012), Healthy life expectancy: World Health Organization (2013), Causes of death: World Health Organization (2012)

Other key findings

1. Although the overall health of the population is less of a concern to healthcare professionals and patients than other domestic issues, the broader social challenges that impact Sweden have implications for the country's healthcare overall.
2. Homecare and the aging population are key concerns among healthcare professionals, while patients place a greater priority on housing.
3. Many patients and healthcare professionals believe the healthcare system meets patient needs, yet there is room for improvement, particularly in regard to patient access to healthcare resources, treatments and services.
4. While Sweden's healthcare system is not considered integrated currently, audiences understand integration's importance and potential value.
5. Patients and healthcare professionals recognize the barriers to an integrated healthcare system. Patients see these barriers as largely internal, while healthcare professionals are more conscious of external infrastructure challenges.
6. Both healthcare professionals and patients consider individuals to be the owners of their personal health, but healthcare professionals also see the role of external parties and organizations as important for health overall.

Sweden's Future Health Index (FHI) score of 57.3 (ranked 7th out of 13 countries) is slightly above average. This is driven by Sweden's positive attitude towards integration and understanding of its value; less from perceptions that the healthcare system is currently integrated.

- Sweden leads all other countries on the integration sub-index (60.9). However, it ranks lower than average on access (64.0), and adoption (46.9).



	Sweden	13-country average
Overall index	**57.3**	**56.5**
Access to care across the health continuum sub-index	**64.0**	**65.9**
Integration sub-index	**60.9**	**55.8**
Connected care technology adoption sub-index	**46.9**	**47.8**

7. Patients consider themselves knowledgeable about their health, yet healthcare professionals believe there is a need for further patient health education.
8. There is also a perceived knowledge gap in regards to connected care technologies, which while deemed important, are believed to present their own set of challenges.
9. Patients and healthcare professionals have varying opinions on the current value of healthcare overall, with integration viewed as likely to have little financial impact. This presents an opportunity to educate stakeholders on integration's potential to enhance cost efficiency.

United Arab Emirates (UAE)

Market background

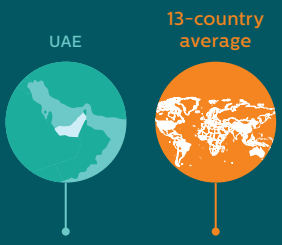
GDP per capita (2014 – USD)	**$43,962.71**
Healthcare expenditure per capita (2014 – USD)	**$1,610.80**
Healthcare expenditure as a percentage of GDP	**4%**
Type of health system	Blend of private and public, depending upon nationality • UAE nationals are covered under the government-funded healthcare program • Expatriates pay for private health insurance
Average age of population	**30**
Average life expectancy	**76** • Healthy life expectancy: 67
Infant mortality rate (per 1,000)	**6**
Top 10 causes of death	1. Ischemic heart disease 2. Road injury 3. Stroke 4. Congenital anomalies 5. Pre-term birth complications 6. Diabetes mellitus 7. Self-harm 8. Lower respiratory infections 9. Endocrine, blood, immune disorders 10. Interpersonal violence

Sources: GDP per Capita: World Bank (2014), HC Expenditure per Capita: World Bank (2014), Type of health system: Commonwealth Fund (2014), Average age of population: CIA Factbook 2015, Average life expectancy: World Health Organization (2013), Healthy life expectancy: World Health Organization (2013), Infant mortality rate: World Bank (2015), Causes of death: World Health Organization (2012)

Other key findings

1. Patients and healthcare professionals have different perceptions of the top challenges facing the country, with healthcare professionals far more likely than patients to consider the overall health of the population an important challenge.
2. Satisfaction with the healthcare system, particularly with regard to access, is high. Healthcare professionals think patients have greater access to resources than patients believe they do, but healthcare professionals also see enhancing access as a key area for improvement.
3. Healthcare professionals are less inclined to think that patients are fully responsible for preventing poor health, but may also overestimate the tools patients have at their disposal to manage their health.
4. Healthcare professionals see the government playing a prominent role in patients' health management.
5. Healthcare professionals and patients view the healthcare system as integrated and recognize the importance of coordinated care, but concerns surrounding cost, training and insurance may hinder further progress.

The UAE's Future Health Index (FHI) score of 65.3, the highest among the 13 countries surveyed, is driven by its strength in access, integration and the adoption of connected care technologies.



	UAE	13-country average
Overall index	**65.3**	**56.5**
Access to care across the health continuum sub-index	**72.1**	**65.9**
Integration sub-index	**60.0**	**55.8**
Connected care technology adoption sub-index	**63.9**	**47.8**

- The UAE ranks above average on all sub-indexes that make up the Future Health Index, placing it first among the 13 countries surveyed.
- Overall, patients and healthcare professionals in the UAE feel that patients have access to care across the health continuum. The gap between the UAE and the 13-country total is greatest in perceived access to homecare, where the UAE leads by 19 percentage points among patients and 26 percentage points among healthcare professionals.
- However, there are some significant gaps between patient and healthcare professional perceptions of access to care, in for example levels of perceived access to treatment (80% of healthcare professionals agree patients have access, versus 63% of patients) and information/resources for healthy living (80% healthcare professionals agree patients have access versus 64% of patients).
- The UAE scores highly in terms of connected care technology, including current levels of usage and perceived importance. For example, healthcare professionals and patients in the UAE lead the 13-country total by 34 and 20 percentage points respectively in terms of feeling knowledgeable about connected care technologies. More healthcare professionals in the UAE also agree that connected care technology is important for improving all aspects of the health continuum, with for example 80% agreeing it is important in improving daily healthy living, versus 59% of healthcare professionals among the 13-country total.

6. Connected care technology is perceived positively in the UAE with high levels of knowledge, use and importance. This may be what makes healthcare professionals in the UAE far more likely than those in other countries to say some patients should be forced to use these technologies.
7. Interest in online interactions and digital information sharing is high, especially among healthcare professionals. Patients, comparatively, favor in-person interactions.
8. Addressing patient concerns with cost, especially the potential financial impact of integrated health systems, will be important in implementation.
9. Likewise, to fully deliver on healthcare professionals' optimism on the future of healthcare, their concerns with data overload and being pressed for time must also be considered.

United Kingdom (UK)

Market background

GDP per capita (2014 – USD)	**$46,296.98**
Healthcare expenditure per capita (2014 – USD)	**$3,934.82**
Healthcare expenditure as a percentage of GDP	**8%**
Type of health system	Public • Coverage is universal • Everyone 'ordinarily resident' is automatically entitled to healthcare which is largely free at the point of use through the National Health Service (NHS)
Average age of population	**40**
Average life expectancy	**81** • Healthy life expectancy: 69
Infant mortality rate (per 1,000)	**4**
Top 10 causes of death	1. Ischemic heart disease 2. Stroke 3. Trachea, bronchus, lung cancers 4. Alzheimer's/dementia 5. Lower respiratory infections 6. Chronic obstructive pulmonary disease 7. Colon and rectum cancers 8. Breast cancer 9. Prostate cancer 10. Oesophagus cancer

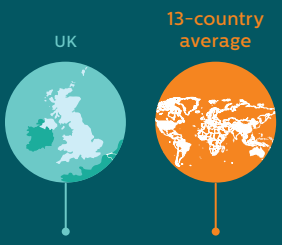
Sources: GDP per Capita: World Bank (2014), HC Expenditure per Capita: World Bank (2014), Type of health system: Commonwealth Fund (2014), Average age of population: CIA Factbook 2015, Average life expectancy: World Health Organization (2012), Healthy life expectancy: World Health Organization (2013), Causes of death: World Health Organization (2012)

Other key findings

1. Health issues are seen as slightly less of a priority than other domestic challenges by UK patients and healthcare professionals.
2. The healthcare system is perceived as inefficient from a cost perspective.
3. In thinking about the healthcare continuum, healthcare professionals in general want a greater focus on healthy living and prevention. Patients on the other hand want more emphasis on improving access to healthcare services when needed.
4. Despite perceived inefficiencies and issues with access, patients are significantly more positive about the healthcare system and their experience of it than the 13-country average.
5. Healthcare professionals and patients are acutely aware of the lack of integration in the health system, as well as the importance and potential benefits of integration.
6. The UK scores relatively low in terms of connected care technology usage and engagement. In spite of this, patients are more likely than healthcare professionals to believe technology can play an important role across the health continuum.

The UK's Future Health Index (FHI) score of 56.4 (ranked 9th out of 13 countries) is the result of low perceived levels of integration and adoption of connected care technology.

- Although access to healthcare in the UK is generally high due to universal coverage, its low level of integration, along with a lack of knowledge regarding and negative perceptions of connected care technology, pulls its overall index ranking down.
- Although healthcare professionals tend to have a positive attitude toward integration, they also feel much more work is needed for integration to be complete.



	UK	13-country average
Overall index	**56.4**	**56.5**
Access to care across the health continuum sub-index	**70.2**	**65.9**
Integration sub-index	**53.7**	**55.8**
Connected care technology adoption sub-index	**45.3**	**47.8**

7. To usher in widespread adoption of healthcare integration and connected care technologies, concerns with cost and bureaucracy must be addressed in implementation.
8. Healthcare professionals have reservations about connected care technologies in general, which may limit their willingness to fully embrace these technologies.
9. There is an opportunity to empower patient ownership of healthcare via integrated health.

United States (US)

Market background

GDP per capita (2014 – USD)	**$54,629.50**
Healthcare expenditure per capita (2014 – USD)	**$9,402.54**
Healthcare expenditure as a percentage of GDP	**17%**
Type of health system	Blend of public and private • Medicare: age 65+, some disabled • Medicaid: some low income; for those without employer coverage, state-level insurance exchanges with income-based subsidies • Insurance coverage mandated, with some exemptions • 11.9% of US adults are uninsured
Average age of population	**38**
Average life expectancy	**79** • Healthy life expectancy: 69
Infant mortality rate (per 1,000)	**6**
Top 10 causes of death	1. Ischemic heart disease 2. Alzheimer's/dementia 3. Trachea, bronchus, lung cancers 4. Chronic obstructive pulmonary disease 5. Stroke 6. Diabetes mellitus 7. Hypertensive heart disease 8. Colon and rectum cancers 9. Kidney diseases 10. Lower respiratory infections

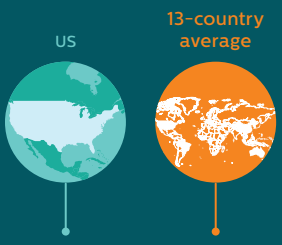
Sources: GDP per Capita: World Bank (2014), HC Expenditure per Capita: World Bank (2014), Type of health system: Commonwealth Fund (2014), Uninsured adults http://www.gallup.com/poll/188045/uninsured-rate-fourth-quarter-2015.aspx, Average age of population: CIA Factbook 2015, Average life expectancy: World Health Organization (2012), Healthy life expectancy: World Health Organization (2013), Causes of death: World Health Organization (2012)

Other key findings

1. Economic and financial concerns significantly outweigh health issues in the view of patients and healthcare professionals as a key challenge for the country. Health is not seen as a priority by patients in particular.
2. While healthcare professionals and patients rate current levels of access to healthcare across the continuum as high, they believe there is still room for improvement, particularly for home healthcare. Access and reducing the cost of healthcare are considered the top priorities the government needs to address.
3. Patient and healthcare professional expectations regarding the government's role in preventing poor health are not being met.
4. Patients are more likely than healthcare professionals to believe that the healthcare system meets their needs, and to rate their overall experience positively.
5. Healthcare system integration is recognized as important and beneficial, but is still in the early stages nationally. Pockets of integration exist but they tend to be regional.

The US's Future Health Index (FHI) score of 57.4 (ranked 6th out of 13 countries) is driven by slightly higher than average perceptions of access across the healthcare continuum, and greater perceived usage and knowledge of connected care technologies.

- While the US scores just above average on healthcare access and connected care technology adoption, it falls below average on healthcare integration, indicating potential missed opportunities to leverage connected care technology to promote integration of the health system.
- In evaluating access, healthcare professionals stated in interviews that the Affordable Care Act (ACA) has given most US patients access to basic coverage, but tends to be expensive and inefficient. They viewed this as a top challenge facing the healthcare sector.



	US	13-country average
Overall index	**57.4**	**56.5**
Access to care across the health continuum sub-index	**68.4**	**65.9**
Integration sub-index	**54.7**	**55.8**
Connected care technology adoption sub-index	**49.0**	**47.8**

6. Since cost concerns impact the perceived overall value of healthcare, it is important to note that US patients and healthcare professionals are more likely than their counterparts in other countries to recognize that integrated healthcare can address these concerns. However, the initial investments required still provoke caution, which must be addressed for successful implementation.
7. Although interest in connected care technology is high, the US is not yet taking advantage of opportunities to realize the full benefits of these technologies in enabling integrated healthcare. Bureaucracy and cost concerns, as well as reservations about technology in general, stand in the way of widespread adoption.
8. Patients and healthcare professionals differ in their perceptions of patients' knowledge and effective management of personal health. Connected care technologies could improve self-management of health.

Appendix II
Glossary

Glossary

Future Health Index scoring definitions

Access: the perceived level of access for all people to a range of healthcare solutions and services across all health needs.

Adoption: the perceived proliferation, take-up and use of; and familiarity with, connected care technology.

Connected care technology: technology that enables sharing of information throughout all parts of the health system (e.g. doctors, nurses, community nurses, patients, hospitals, specialists, insurers and government) that can range from computer software that allows secure communication between doctors and hospitals, to a watch that tracks a person's heartbeat.

Electronic health records (EHR): digitalized patient records available to access in real time.

Health continuum: from healthy living to disease prevention, diagnosis, treatment and home care.

Healthcare professional: those who work in healthcare as a doctor, surgeon, nurse practitioner, registered nurse, licensed practical nurse or nurse across a variety of specializations.

Integrated health system: a health system where all parts of the system (general practitioners, nurses, doctors, patients, hospitals, specialists, insurers and governments) are working together to coordinate care effectively (e.g. sharing medical results and data, aligning on treatment plans, etc.).

Integration: the perceived state of functional integration and interoperability between healthcare systems.

Patient: people aged 18 or older who have visited a healthcare professional within the past three months.


PHILIPS