

Germany

## Healthcare hits reset

Priorities shift as healthcare leaders  
navigate a changed world



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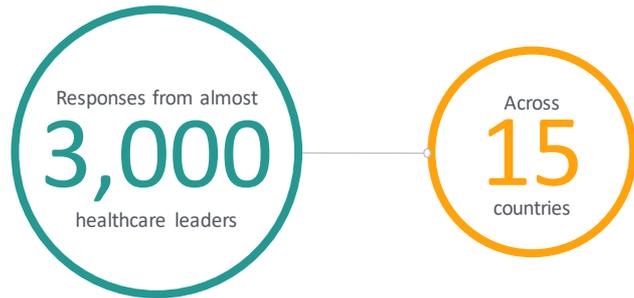
Research methodology

# Research premise

The largest global survey analyzing key concerns of healthcare leaders\*.

**The Future Health Index 2022 report – now in its seventh year – is based on proprietary research conducted in 15 countries.**

In 2022, the Future Health Index focuses on how data and advanced analytics are giving healthcare providers new tools which enhance their ability to deliver care to all sectors of their communities, both in and out of traditional hospital settings.



## Countries included in the research

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

\* Healthcare leader is defined as a C-suite or senior executive/decision maker/influencer working in a hospital, medical practice, imaging center/office-based lab, ambulatory center or urgent care facility

# Foreword

Facing a worldwide crisis, the healthcare industry has been challenged both on a global and a local level. In trying to meet the demands of the moment, the development of digital structures was accelerated and new ways of delivering care proved their worth. In Germany, this changing perception of innovative health technologies fuelled new regulatory and financial opportunities, which in turn allow for the local healthcare market to take a decisive step toward the future of care. Today, healthcare leaders both in Germany and abroad are required and, crucially, willing to adapt to the shift enhanced by the pandemic – and are refocusing on a number of new and existing priorities, from addressing staff shortages, to sustainable practices, to leveraging data and predictive analytics, as they navigate new realities in healthcare management.

The Future Health Index 2022 provides a detailed picture of the most pressing issues for today's healthcare leaders, in Germany as well as in other European, Western or global countries. The survey shows their priorities and how they plan to address them. Top of the list are staff satisfaction and retention, which have become increasingly difficult to maintain in a sector facing widescale labour shortages, a problem that was evident before 2020 and was further enhanced by the toils of the pandemic. Another pressing priority in the face of yet another global crisis is sustainability. The necessity of focussing on a more ecological approach within the health industry has become much more prevalent in the leaders' mindset than it was only twelve months ago in [last year's report](#).

Beyond this, there is a drive towards innovative and remote ways of delivering care and to invest in digital health technologies in order to better reach and treat patients.

Driven by a federal push to improve digitization in the sector, German healthcare leaders are striving to leverage the momentum and financial support provided by the Hospital Future Act (Krankenhauszukunftsgesetz, KHZG) to establish or evolve their digital strategy and infrastructure.

They see the benefits of standardized data and interoperable systems, but also recognize the barriers that hinder their implementation. To overcome these hurdles, German leaders are – compared to their peers from other countries – especially keen to form strong strategic partnerships with industry. And they see real value in this, particularly because their trust of and confidence in the possibilities of data and data-driven technologies like AI and predictive analytics is very robust.

The 2022 report reflects all these changed priorities as German healthcare leaders emerge from a fundamentally changed world and embark on an exciting journey toward a brighter future of care.



*Emerging from a crisis that changed the way we view healthcare, German healthcare leaders are shifting their priorities and taking steps toward a digital and more sustainable future, supported by initiatives like the KHZG.*

**Dr. Uwe Heckert**  
Market Leader Philips DACH



## Healthcare leaders look forward as they reassess their needs

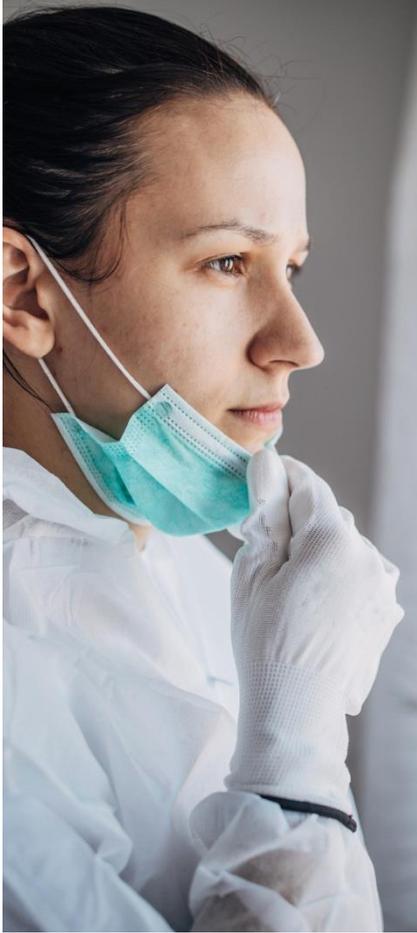
### **A much-needed refocus on staff**

German healthcare leaders today face a 'human capital' crisis following the impact of the pandemic. Staff satisfaction and retention are two of the most pressing issues that must be tackled before addressing other important developments, such as furthering the implementation of AI-based solutions and a more sustainable approach to healthcare.

### **Empowering digital health technology in Germany**

The pandemic has led healthcare leaders to act with agility, build resilience and adopt smarter ways of working to help future-proof care. It has also pushed them to rethink how care is delivered. In Germany, this has meant embedding many of the care practices developed during the pandemic, such as the widespread use of telehealth and remote patient monitoring. It has also created a greater focus on advanced digital technologies that will fuel the future of better healthcare.

**The following insights explore the current priorities for healthcare leaders and how their planned investments can support these priorities.**



## German healthcare leaders move beyond COVID-19

### Leaders prioritize staff and innovative healthcare delivery

While Germany has faced a shortage of medical staff for some time, the issue has worsened during the pandemic. In 2017, there were 3,900 vacant nursing positions in normal wards. By 2021, the figure had more than tripled to 14,000, with an additional 8,000 vacancies in intensive care units across the country.\*

As German healthcare leaders work to fill these vacancies, they cite staff satisfaction and retention (36%) as their top priority. The situation is reflected elsewhere, with their counterparts in the United States (29%) and France (31%) also prioritizing staffing. Healthcare leaders in Italy appear to face greater challenges with staff shortages than other European nations, with 41% reporting staff satisfaction and retention as a current priority.

German healthcare leaders also prioritize being at the forefront of healthcare delivery, with more than one-quarter (28%) saying they aim to lead their peers in healthcare innovation, including research and development.

### Top priorities of healthcare leaders today



### Staff satisfaction and retention is a priority in Germany today and an issue that healthcare leaders aim to address in the future



### Country comparison of staff satisfaction and retention as a priority



\* [https://www.dki.de/sites/default/files/2021-12/20211221\\_Final\\_KH-Barometer-kompriert.pdf](https://www.dki.de/sites/default/files/2021-12/20211221_Final_KH-Barometer-kompriert.pdf)

# Investments are strong in remote and innovative care

## While remote care remains a key investment today, artificial intelligence is set to take center stage

As in many countries, the pandemic led to a shift toward telehealth in Germany, highlighting the adaptability and accessibility of remote healthcare. As a result, more than half (55%) of German healthcare leaders cite telehealth as their top investment this year. However, the number of healthcare leaders who anticipate telehealth will continue to be an investment priority three years from now drops considerably, suggesting an expectation that those functionalities will be largely built out and implemented by then.

Digital health records are also a priority. In 2021, 72% of German leaders invested in digital health records, compared with 47% now and a projected 33% in three years' time. Another prominent investment projected to decline is extended care delivery (from 25% now to 15% three years from now). With many healthcare facilities

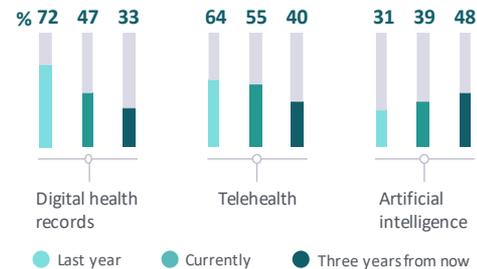
having already implemented various telehealth and remote monitoring solutions, it appears that German healthcare leaders anticipate them to be firmly entrenched in the coming years. Viewing the digitization of healthcare as a short-term investment, however, bears risks – especially when tied to funding programs that expire within a few years' time and could instead be used to lay the foundation for a sustainable, long-term digital strategy.

Alongside the declining future investments in telehealth, digital health records and extended care delivery, leaders plan to increase their investments in artificial intelligence (AI). In 2021, almost one-third (31%) of German healthcare leaders invested in AI. This has grown to 60% this year and is expected to rise to 79% three years from now. This growing focus on AI indicates more widespread adoption and integration across operational and clinical functions.

## Prioritizing care delivery beyond the hospital in Germany has sharply increased, but is set to decline in the future



## As anticipated investments in digital health records and telehealth decline, AI investments are on the rise



**Boosting digital capabilities across German hospitals**  
Introduced in late 2020, the Hospital Future Act (KHZG) is one way the German healthcare system is addressing the digital stagnation Germany faces today. With the overarching goal of improving patient care in hospitals, it aims to modernize the IT structure, improve cybersecurity and data privacy and ensure funding for German hospitals that wish to digitize their processes and medical services.\* The initiative allows public hospitals to apply for government funding for projects that can boost digital health.

\* <https://www.bundesgesundheitsministerium.de/kraenkenhauszukunftsgesetz.html>

# Embarking on a fast track to sustainability

## German healthcare leaders are prioritizing sustainability

As pressures from the pandemic begin to ease, German healthcare leaders are turning their attention to the issue of sustainability.

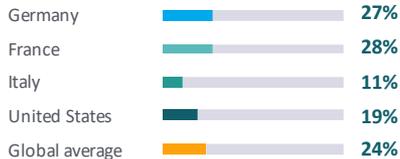
Last year, just 3% said implementing sustainability practices in their facility was a priority. Today, more than one-quarter (27%) are prioritizing sustainability, with a similar number (26%) expecting to do so three years from now, a drop from 59% in 2021.

German (27%) and French (28%) healthcare leaders are more likely to prioritize sustainability than leaders in Italy (11%). The United States' figure (19%) is also noticeably lower than those in European countries.

## Sustainability remains on the German leadership agenda in the future



## Sustainability as a priority across other countries



## Healthcare plays a role in Germany's goal for lower greenhouse gases

The Paris Agreement strives to mitigate harmful health consequences of climate change by imposing a radical reduction of greenhouse gas (GHG) emissions. Globally, the health sector is a large contributor to climate change, with the German healthcare system responsible for 6.7% of national emissions. Although not all German hospitals are currently tracking their emissions\*, Germany aims to reduce all emissions by 65% by 2030\*\*. To help achieve the countrywide goal, German hospitals are being encouraged to begin measuring the amount of GHG emissions they produce, along with identifying the top sources of their emissions.\*\*

\* <https://www.mdpi.com/2071-1050/13/3/1430/htm>

\*\* <https://www.umweltbundesamt.de/en/data/environmental-indicator-s/inicator-greenhouse-gas-emission-stat-at-a-glance>

## 2

# Unlocking the power of data

### **A strong sense of confidence**

German healthcare leaders are positive about the data they have available and believe that it can help unlock enormous potential. They regard their data as robust and do not see lack of trust as an impediment to data utilization in the German healthcare system.

### **Navigating the remaining frustrations**

While acknowledging the value of data, healthcare leaders continue to experience frustrations in capturing and deploying that data effectively.

Perhaps driven by significant staff shortages, German healthcare leaders are open to a broad range of partnerships to help them achieve their goals while also bringing valuable expertise to bear in leveraging data to the fullest.

The research that follows demonstrates both the challenges and opportunities that greater data use brings to the German healthcare system.





## Healthcare data proves its worth

### German healthcare leaders are confident in the value data can bring to their work, but less so than their peers

Data plays a crucial role in delivering high-quality healthcare, driving swifter and smarter clinical decisions while encouraging greater operational efficiencies. German healthcare leaders fully recognize its multiple benefits.

Although confidence in data use is lower among German healthcare leaders than their colleagues in other countries, it is still high. Almost two-thirds (65%) believe their facilities can extract actionable insights from the data they have available. They say their facilities have the digital health technology required and accurate data available to them (both 62%).

Trust in the insights provided by data is also strong across all settings. Only a small number (11%) of German healthcare leaders report a lack of trust in data analytics as a barrier to fully expanding the use and integration of data across their facilities. In fact, distrust is the least reported hindrance to data use by German healthcare leaders.

### Confidence in data utilization among German healthcare leaders

My facility is able to extract actionable insights from the data we have available



My facility has the digital health technology needed to fully utilize data



The data available to my facility is accurate



## However, healthcare leaders in Germany continue to face challenges

**Despite high levels of confidence in their data, German leaders struggle to use it to its full potential**

### Siloed data

A lack of federal standards to regulate collecting, sharing, and securing digital data, as well as limited interoperability across the German healthcare system, has encouraged data silos. Almost one-third of German healthcare leaders believe this hinders hospitals from fully capitalizing on data. Meanwhile, one-fifth (21%) cite a lack of interoperability and data standards as impediments to unlocking the true potential of data use. Siloed data, frequently kept and shared in analog form, not only causes operational difficulties by complicating the exchange of information but also directly impacts the efficiency and quality of patient care.\*

While the Hospital Future Act (KHZG) aims to modernize the system and promote intersectoral networking\*, implementing the proposed standardization remains the responsibility of the healthcare industry.

### Staff resistance to upgraded technology

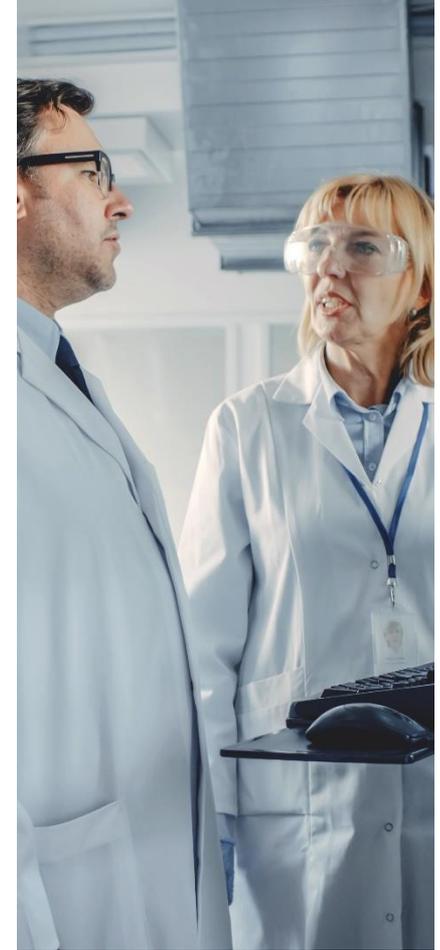
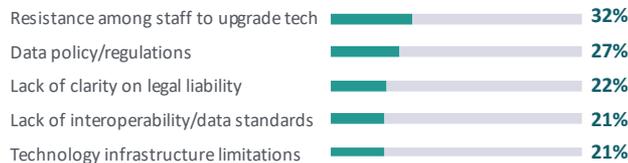
Almost one-third (32%) of healthcare leaders in Germany perceive staff resistance to new technology as a barrier to greater data use, with one-fifth (20%) expressing concerns about a lack of knowledge and understanding about data use among their staff. The pandemic

exacerbated existing staffing shortages and created additional burdens on the entire healthcare system, forcing other priorities to the sidelines. With limited time for training on new technologies, 39% of German leaders feel that their employees are overwhelmed with the amount of available data and one-third (34%) see data as more of a burden than an asset.

### Data security, policy and liability

Legal issues surrounding data constitute another major issue. Data privacy laws differ across the 16 states within the country, resulting in incompatible healthcare regulations, a lack of clarity on data security standards, and unclear guidelines regarding the legal liability of healthcare facilities. Each of these challenges impacts data utilization, creating a need among healthcare leaders to lobby for federal-level solutions.

### Top barriers to effective use of data



\* [https://www.medicatrade.com/en/News/Interviews/PreviousInterviews/Interviews\\_2021/Population\\_health\\_management\\_networking\\_ver\\_su\\_data\\_silos](https://www.medicatrade.com/en/News/Interviews/PreviousInterviews/Interviews_2021/Population_health_management_networking_ver_su_data_silos)

# Driving data adoption across the German healthcare system

## Leaders identify specific measures to improve adoption of data technologies

To help drive greater use of data technologies, German healthcare leaders need more support, including more clarity about data usage, better KPI tracking, and improvements to their technology infrastructure.

Germany's healthcare leaders say the key to effective data integration is having greater clarity on data usage in current applications in their own facilities (38%). Implementing data usage transparency measures is likely to increase comfort and confidence in the broadening use of data across clinical and operational settings. Leaders express more interest in having a deeper understanding of the depth and scope of their facilities' incorporation of data than their counterparts in France (22%), Italy (26%) or the United States (26%).

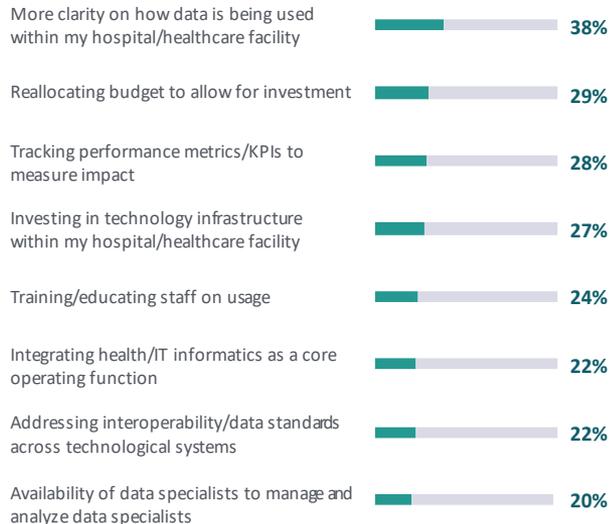
Additionally, they cite technology infrastructure (28%) and a lack of countrywide interoperability and data standards (22%) as barriers to data utilization, indicating a need for IT modernization.

## Healthcare leaders in Germany want clarity on data usage in facilities as way to expand use



\* <https://www.healthcareitnews.com/news/emea/european-digital-health-revolution-wake-covid-19>  
 + Techniker Krankenkasse (TK) is a public health insurance company (Krankenkasse) in Germany. TK is the largest health insurer in the country, with around 10.4 million members. Like all public health insurers in Germany, it's a non-profit company.

## Top factors that would support German healthcare leaders in using data effectively



## Utilizing electronic patient records (ePA) in the German healthcare system

Since January 2021, all insured German citizens are entitled to a national electronic patient record (ePA). While its use is voluntary, it gives patients control over their medical data, requiring prior authorization before data is shared with healthcare providers. The system also provides the data standardization necessary to overcome the barriers created by numerous proprietary primary data collection systems. Dr Susanne Ozegowski, head of corporate development and digitization at Techniker Krankenkasse (TK)\*, explained why the German healthcare system should fully utilize the ePA: "I think the electronic patient record is one of the major things that we need in Germany. Otherwise, you're going to have all this fragmented health data here and there, but you need a common digital infrastructure in order to have real exchange of information and the opportunity for better care decisions based on each individual's health data."

# Leaders seek collaborations to ignite innovation

## Leaders see numerous benefits to partnerships with health technology companies and named trade organizations

Nearly two-fifths (37%) of German healthcare leaders would welcome a partnership with a health technology company. They believe this type of collaboration would allow their facilities to gain access to resources and services to help accelerate the adoption and implementation of new technology (32%). Partnering with tech companies would also provide guidance and services for data analysis (30%) and help to develop a strategic vision for their facility (30%).

Similarly, over one third (38%) indicate they would partner with industry organizations (38%), stating that such co-operation would help enhance facilities' expertise and commitment when it comes to improving healthcare.

It is notable that a partnership with other hospitals is not the preference for most healthcare leaders in Germany. Fewer than a third (30%) indicate this as a preference. Considering the recently widespread implementation of electronic patient records (ePA), a large project to digitize Germany's healthcare system and enable seamless data sharing\*, German leaders may view other hospitals as a less necessary partner. If the ePA continues to ease data-sharing among hospitals, then leaders will have more room for collaboration with other organizations that would further innovation.

## German healthcare leaders seek a range of benefits from health technology companies



## Industry and trade organizations were the top partner of preference for German leaders, while other hospitals were less prominent



## Healthcare leaders in Germany are less likely than leaders in France and Italy to want to partner with other hospitals



\* <https://blogs.bmj.com/bmj/2021/02/18/new-german-digital-project-paves-the-way-for-online-access-to-personal-electronic-health-records/>



# 3

## How predictive analytics can supercharge care

### **The potential to transform healthcare**

German healthcare leaders recognize the power of predictive analytics to improve clinical care across the healthcare system, while at the same time driving operational efficiencies within their own facilities.

### **Without support, implementation lags behind**

However, despite this high awareness and the desire to drive change, challenges remain when it comes to implementing predictive analytics tools, specifically from a funding perspective. And, while positive, healthcare leaders identify several concerns, including data security.

**The insights that follow suggest financial hurdles and security issues must be addressed before leaders can focus on the real benefits of predictive analytics and implement the tools required for them to supercharge care.**

# Leaders focus on the benefits of predictive analytics



## Predictive technologies can improve care and reduce the administrative burden

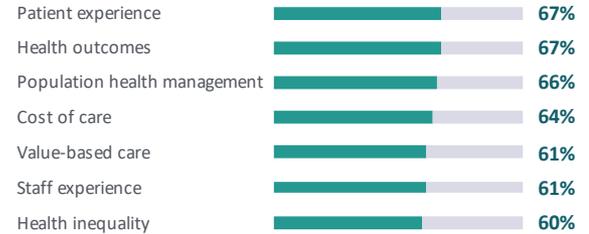
Predictive technologies are playing a growing role in advancing care in Germany.\* Offering both real-time and future clinical decision support, from diagnosis to prognosis and treatment, predictive analytics is seen as a path to improve care across settings.

Today, most German healthcare leaders (54%) report they have already adopted – or are in the process of adopting – predictive analytics in their hospital or healthcare facility.

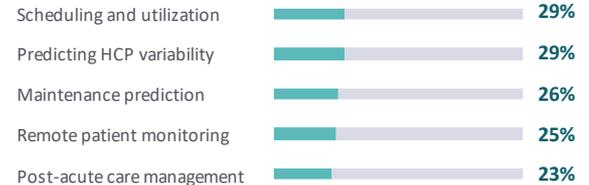
Looking ahead, leaders are optimistic about the future of predictive analytics in healthcare, identifying the greatest benefits in the patient experience (67%) and health outcomes (67%). This positivity extends across multiple aspects of care, from health inequality (60%) to the staff experience (61%).

Leaders believe that operational uses of predictive analytics would most benefit hospitals. Scheduling and utilization (29%), predicting HCP-to-HCP variability (29%), and equipment maintenance predictions (26%) are the top three benefits leaders identified. They also feel predictive analytics would benefit clinical aspects of care, such as remote patient monitoring (25%) and post-acute care management (23%).

## German leaders have a largely positive outlook on how predictive analytics can impact healthcare



## The expected benefits of predictive analytics within German hospitals are mostly in operational settings



\* <https://www.trade.gov/knowledge-product/germany-health-care>

# Financial hurdles remain in adoption of predictive analytics



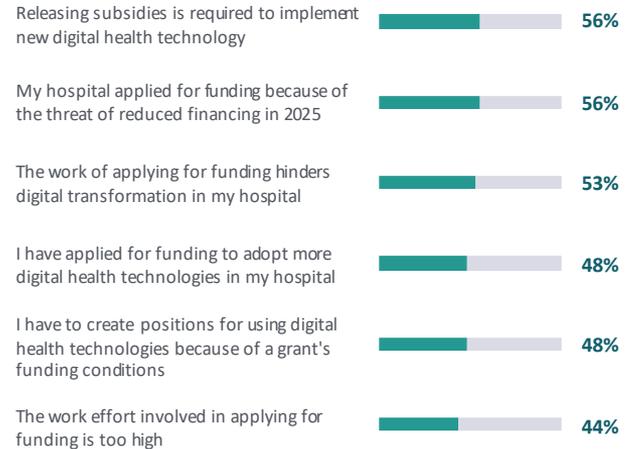
## German leaders are challenged by a funding process that negatively impacts implementation

German healthcare leaders report that telehealth (55%) and AI (39%) will be their top investments this year, yet they are likely to face funding challenges to pay for these advanced technologies.

While the Hospital Future Act (KHZG) aims to provide funding for hospitals to invest in modern emergency capacities, digitization, and IT security, the process of unlocking that funding can be arduous for hospitals by themselves. As a result, some suggest there may be a slowdown in the predictive analytics adoption rate in Germany (54%) compared to other countries.

Multiple financial hurdles can slow, or even deter, German leaders from fully investing in digital health technology\*. While most leaders (56%) acknowledge that implementing health technology requires the release of subsidies, 44% say that too much work is involved in applying for funding. Furthermore, over half (53%) agree that the amount of work required in the application process hinders digital transformation in the hospital. Because applying for funding is a vital component to integrating digital innovations in their facilities, German leaders are open to forming partnerships and utilizing external consulting services that will both identify the most useful areas to invest in and reduce the time required to complete the application process.

## German leaders apply for funding for digital technologies despite associated challenges



\* <https://www.philips.de/healthcare/technolog-ie-partnerschaften-und-consulting>

# Resolving security and privacy concerns can unlock benefits of predictive analytics

## The full potential of predictive analytics remains elusive

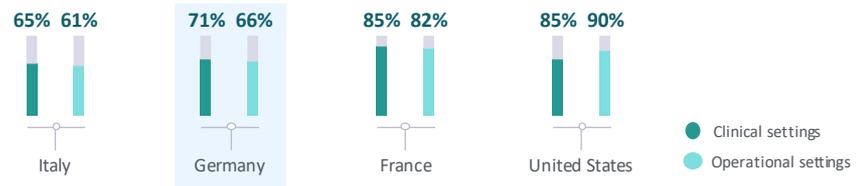
Despite high levels of trust in predictive analytics across both clinical (71%) and operational (66%) settings, Germany's adoption rate remains below that of France and the United States. Over the next three years, just 21% of healthcare leaders have said they plan to adopt predictive analytics.

While convinced that more advanced analytics will drive better health outcomes, healthcare leaders are concerned whether the data they collect and deploy is responsibly managed. In both clinical (36%) and operational (40%) settings, leaders report that improved data security and privacy systems are vital in order to boost confidence in and provide reassurance about the full potential of predictive analytics.

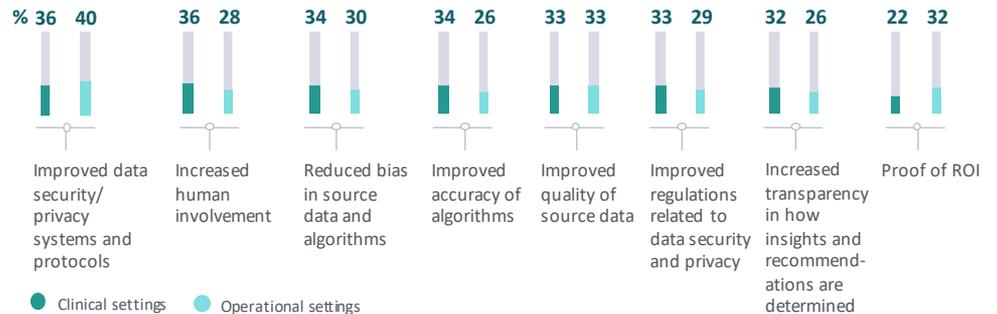
A lack of data and security standardization across Germany is therefore a critical issue to address before healthcare facilities are fully comfortable incorporating the latest technological advances into their patient care and diagnostic offerings.

It is clear that data security and integrity will underpin greater confidence in predictive analytics across the board. But users of predictive analytics applications in clinical and operational functions have vastly differing needs: operationally, efficiencies are important, while clinically, accuracy and human oversight take precedence. Proof of return on investment is more important to leaders in operational (32%) than clinical (22%) settings, whereas the accuracy of algorithms is a bigger factor in clinical settings (34% vs. 26% in operational). Additionally, leaders want increased human involvement in clinical uses of predictive analytics (36%), tied with data security as the most important factor.

## German healthcare leaders' levels of trust in predictive analytics are lower than those in France and the United States



## While trust in clinical and operational predictive analytics relies on different factors, data security prevails across settings





Conclusion

# Conclusion

Dr. Uwe Heckert, Market Leader Philips DACH

The Future Health Index 2022 paints a picture of a sector that has seen dramatic transformation in recent years, which has accelerated rapidly over the past 12 months. Rather than continuing to focus solely on the pandemic, we see today's healthcare leaders radically shifting their priorities to meet new norms in medical management. Specifically, leaders have indicated three key priorities for 2022 and beyond:



#### Improving the staff experience

With the sector facing a significant labor shortfall of up to one million doctors and medical professionals by 2030, improving the staff experience has become a top priority for today's leaders. This year's report has shown that leaders believe increased training in digital health technologies will be key to progress, helping staff feel less overwhelmed by data-centric processes and more ready to embrace new workflows. However, increased training is just one piece of the puzzle – fixing the labor crisis in the long term will ultimately depend on the successful coordination of governments, regulators and the industry as a whole to improve working conditions across the board.



#### Bridging the gap between the current usage of data and the promise of predictive analytics

We're seeing a number of leaders recognize the value of data-driven systems and show confidence in the quality of the data for both clinical and operational settings. So, the willingness to leverage insights and technologies like AI and predictive analytics is there; however, there are obstacles to overcome in order to drive their adoption. One of the main challenges is the lack of interoperability. A more standardized and interchangeable approach to data and to the way that the different systems in a hospital communicate with each other is necessary. Once this, as well as additional factors like reluctance or missing expertise by staff and prevailing regulatory limitations, can be resolved, health data offers great opportunities for better patient outcomes.



#### Driving innovation through partnerships

A way to mitigate the influence of lacking expertise when it comes to digitizing processes and overhauling current structures within hospitals is to partner up with health technology companies. While other countries' leaders seek to cooperate with other hospitals, almost 40% of German healthcare leaders emphasized that they would welcome collaborations with industrial partners. External consulting services are viewed as beneficial for the success of transformation processes, especially when facing the implementation of digitization projects in the context of the KHZG. Hence, strategic partnerships are viewed as helpful not only in driving data adoption, but also in supporting the development of a clear vision and strategy for the digital future.

All things considered, our sector has taken stock and reprioritized in the wake of another year of transformations, as well as against a growing backdrop of complex challenges that will endure far beyond the pandemic – from staff shortages and security threats to the exponential rise of chronic diseases. Ultimately, we see healthcare leaders embarking on a reset to meet the demands of a fundamentally changed world – a world they hope to shape and improve with the help of data and predictive analytics.



Glossary of terms

# Glossary of terms

## Ambulatory primary care center

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

## Analog facilities

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

## Artificial intelligence (AI)

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

## B2B health technology companies

Companies that sell products, equipment, or solutions to hospitals and healthcare facilities.

## Data privacy

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

## Data security

Protecting data against unauthorized access.

## Digital facilities

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

## Digital health records

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

## Digital health technology

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

## Digital transformation

The integration of digital technology into all aspects of how a healthcare business interacts with patients, healthcare providers and regulators.

## Early adopters of digital health technology

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

## Early adopters of digital health technology and predictive analytics

These leaders are defined as those who are the first to adopt innovations in digital health technology and who have already adopted predictive analytics.

## Early adopters of predictive analytics

Early adopters are defined as leaders who indicated that their hospital has already adopted predictive analytics or is in the process of adopting predictive analytics.

## Global non-governmental organizations

A nonprofit organization that operates independently of any government.

## Health equity or equality

The absence of unfair, avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically, or geographically or by other dimensions of inequality.

## Health IT/Informatics companies

Companies that build communications protocols with healthcare systems (e.g., Cerner, Epic, etc.)

## Health technology companies

Companies that sell or provide wearables, health apps and other technology to the general public.

## Healthcare leader

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

## Healthcare professional

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

## Healthcare professional-to-healthcare professional telehealth

Virtual communication between healthcare professionals through sharing images, recommending treatment plans, etc.

## Healthcare professional-to-patient telehealth

Communication between healthcare professionals and their patients via video calls, patient portals, etc.

## Interoperability

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

## Late adopters of digital health technology

Late adopters are defined as leaders who indicated that, compared to other hospitals or facilities, they adopt innovations later than most others.

## Late adopters of digital health technology and predictive analytics

These leaders are defined as those who are among the last to adopt innovations in digital health technology and have no plans to adopt predictive analytics.

## Late adopters of predictive analytics

Late adopters are defined as leaders who have not yet adopted predictive analytics but they are planning to in the future.

## Machine learning

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

## Out-of-hospital procedural environments

Care centers such as ambulatory surgical centers, office-based labs, etc.

## Predictive analytics

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

## Predictive technologies

A body of tools capable of discovering and analyzing patterns in data so that past behavior can be used to forecast likely future behavior.

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

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

## Remote patient monitoring

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

## Resilience

The capacity of hospitals or healthcare systems to quickly recover from challenges.

## Smart facilities

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

## Social responsibility

Individuals and companies have a duty to act in the best interests of their environment and society as a whole.

## Staff

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

## Sustainability

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

## Technology infrastructure

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

## Telehealth/virtual care

The distribution of health-related services and information via electronic information and telecommunication technologies.

## Value-based care

The concept of healthcare professionals receiving reimbursement based on patient health outcomes rather than on the volume of tests or procedures completed.

## Voice recognition tools/software

A tool used to convert spoken language into text by using speech recognition algorithms.



Research methodology

# Research methodology

## Research overview and objectives

Commencing in 2016, Royal Philips has conducted original research every year with the goal of understanding the ways various countries around the world are addressing global health challenges and how they are improving and expanding their ability to care for their communities. With a growing list of competing needs facing healthcare leaders, the Future Health Index 2022 focuses on the expanding role digital tools and connected care technology are playing in the ability to deliver more accessible, affordable and customized healthcare.

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

a new era of healthcare delivery transformation. In 2020, the Future Health Index examined the expectations and experiences of healthcare professionals aged under 40. Last year, the Future Health Index 2021 report considered how healthcare leaders\* were meeting the continuing demands of the pandemic and what the new reality of healthcare post-crisis might look like.

In 2022, The Future Health Index concentrates on how healthcare leaders are now refocusing on the priorities and initiatives which were paused during the pandemic. They are increasingly incorporating data, advanced analytics tools and artificial intelligence to mitigate operational and clinical challenges and to enhance their ability to deliver care to communities both in and out of traditional hospital settings. With the pandemic in their rear-view mirror, they are now looking to leverage their growing technology capabilities in a variety of directions. From rethinking how much care needs to occur in a hospital or healthcare facility to expanding social responsibility and sustainability initiatives, technology is giving healthcare leaders the ability to execute customized strategies to fit the exact needs of their communities.

To provide a holistic understanding of the current healthcare systems around the world, the study upon which the Future Health Index 2022 is based incorporates insights derived from a quantitative survey and a series of qualitative interviews.

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

# Research methodology

## 2022 quantitative survey methodology

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

2,900 healthcare leaders in 15 countries (Australia, Brazil, China\*, France, Germany, India, Indonesia, Italy, the Netherlands, Poland, Russia, Saudi Arabia, Singapore, South Africa and the United States) participated in a 15- to 20-minute survey in their native language from December 2021 – February 2022. 200 healthcare leaders in each of the 15 countries completed the survey, except in Indonesia where the total sample was 100.

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

	Unweighted sample size (N=)	Estimated margin of error (percentage points)	Interview methodology
Australia	200	+/- 7.0	Online and telephone
Brazil	200	+/- 6.5	Online and telephone
China	200	+/- 7.5	Online and telephone
France	200	+/- 7.0	Online and telephone
Germany	200	+/- 6.5	Online and telephone
India	200	+/- 6.0	Online and telephone
Indonesia	100	+/- 6.5	Online and telephone
Italy	200	+/- 7.0	Online and telephone
Netherlands	200	+/- 6.5	Online and telephone
Poland	200	+/- 7.0	Online and telephone
Russia	200	+/- 6.0	Online and telephone
Saudi Arabia	200	+/- 6.5	Online and telephone
Singapore	200	+/- 8.0	Online and telephone
South Africa	200	+/- 7.0	Online and telephone
United States	200	+/- 7.5	Online and telephone
Total	2900	+/- 3.5	

## Question localizations

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

## 2022 qualitative interviews methodology

The qualitative portion of the Future Health Index 2022 was conducted by the KJT Group, a market research and consulting firm which specializes in the healthcare industry. To provide context and additional depth to the quantitative data, the quantitative survey results were supplemented with findings from a series of 45-minute interviews with healthcare leaders in their native language. These interviews were conducted during the month of March 2022. There were 30 participants, six from each of the following markets: Australia, China, Germany, the Netherlands and the United States.

\* Survey data is representative of Mainland China only and does not include Taiwan or Hong Kong.

\*\* Estimated margin of error is the margin of error that would be associated with a sample of this size for the full healthcare leader population in each country. However, this is estimated since robust data is not available on the number of healthcare leaders in each country surveyed.



The Future Health Index is commissioned by Philips.

To see the full report visit  
[www.philips.com/futurehealthindex-2022](http://www.philips.com/futurehealthindex-2022)

The Future Health Index 2022 report examines the experiences of almost 3,000 healthcare leaders and their expectations for the future. The research for the Future Health Index 2022 report was conducted in 15 countries (Australia, Brazil, China, France, Germany, India, Indonesia, Italy, the Netherlands, Poland, Russia, Saudi Arabia, Singapore, South Africa, and the United States). The study combines a quantitative survey and qualitative interviews conducted from December 2021– March 2022.

[www.philips.com/futurehealthindex-2022](http://www.philips.com/futurehealthindex-2022)