

Digital transformation

The COVID-19 pandemic overwhelmed health care systems worldwide, resulting in a surge in the number of patients, increased health care demands, labor shortages, and supply chain issues. Providers turned to technology as one solution to help address these challenges.

Providers who had been slow to embrace technologies such as telemedicine and electronic health records (EHRs), are now accelerating adoption of new technology as they attempt to reduce costs, deal more effectively with the changing patterns of demand, address a shrinking clinical workforce, and prepare better for the next global health crisis.

At the same time, one in three adults worldwide have chronic conditions that increase the burden on health care systems, one in four will experience mental illness during their lifetime and more than 75 percent of health consumers expect more accessible personalized care.¹ The cost of this care will be significant — for mental health alone the cumulative loss in economic output over a 20-year period ending in 2030 is projected to be US\$16.3 trillion.²

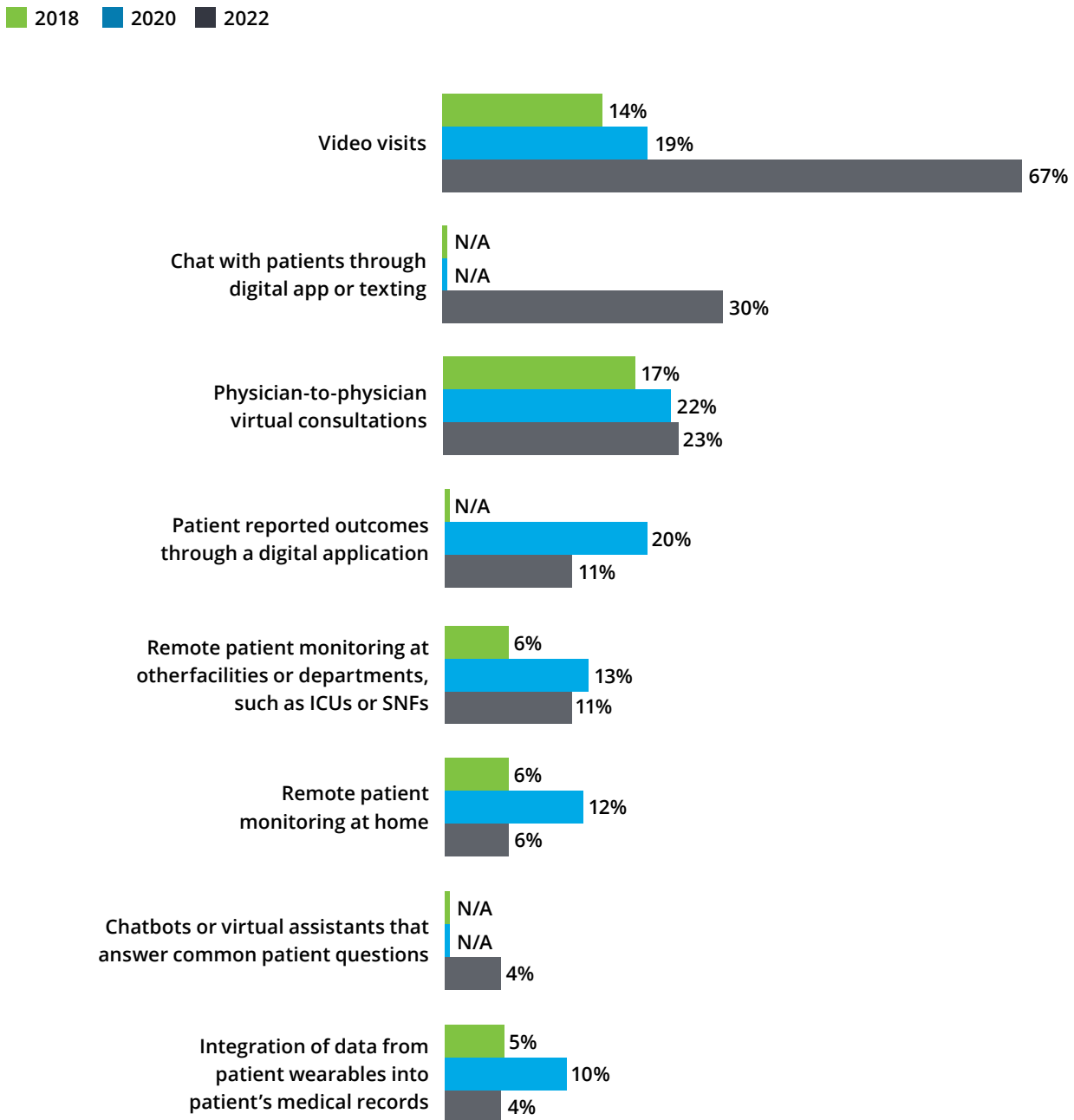
But health care capacity remains constrained by fragmented funding and reimbursement practices, outdated treatment models, excessive administration, inefficient processes, and labor shortages.

As much as US\$935 billion, or 25 percent of all US health care expenditure, is wasted, primarily on administrative complexity, pricing failures, and poor care delivery.³ In addition, 42 percent of physicians report feeling burned out, and health care providers face a global deficit of 12.1 million skilled professionals by 2035.⁴ As a result, more providers are looking to digital technology to boost efficiencies and lower the cost of care.

Deloitte US consumer surveys show that during the past five years, patients' appetite for virtual and digital health tools has steadily increased, but adoption rate among physicians is mixed (Figure 1). Some are unsure how to best use virtual health in a clinical setting while others are concerned about losing the human connection that is an integral part of in-person care.⁵

Figure 1. Adoption of video visits increased, but adoption of other virtual health modalities stalled.

Which of the following virtual health approaches have you implemented at your primary work setting? (respondents selected all that applied.)



Notes: Skilled nursing facilities (SNFs); wearables (where the data is collected passively from fitness, sleep quality, basic heart-rate activity and other consumer health-tracking devices); physician-to-physician virtual consultations (virtual communication tools or portals for physicians to consult with each other about a patient); patient-reported outcomes (where the patient actively submits the data through a digital app or text messages). N(2018) = 624; N(2022) = 660

Source: Deloitte survey of US Physicians conducted in 2018, 2020 and 2022.

One of the silver linings of COVID-19 was that it accelerated advances in digitization and telemedicine that previously were hard to be accepted by either patients or clinicians.

For example, in the UK, efforts to develop a framework for virtual consultations, which had languished for years, have advanced because of COVID-19-related staff shortages and Brexit work restrictions. The National Health Service (NHS) plans to have 40 to 50 virtual ward beds per 100,000 people by 2023.⁶

Even as lockdowns and other restrictions have lifted in many parts of the world, the use of telehealth remains above its pre-pandemic levels. For example, Kaiser Permanente found that 15 percent of its members in the US used virtual consultants before the pandemic. After reaching a peak of 80 percent during the outbreak, it is now about 35 percent. Similar patterns have emerged in Europe and Asia. The European Parliament recently announced the EU4Health program, which encourages the sharing of EHRs, e-prescriptions and telehealth. Saudi Arabia is adopting a system that uses smartphone applications to connect patients in remote areas with primary care centers and hospitals.⁷

For some specialties, notably mental health, virtual care remains popular because of its convenience, flexibility and user experience for both clinicians and patients alike. Eighty-nine percent of mental health consultations are conducted virtually, and well-designed virtual care models have been found to have comparable clinical efficacy to face-to-face contact — in some cases delivering superior outcomes and patient satisfaction.

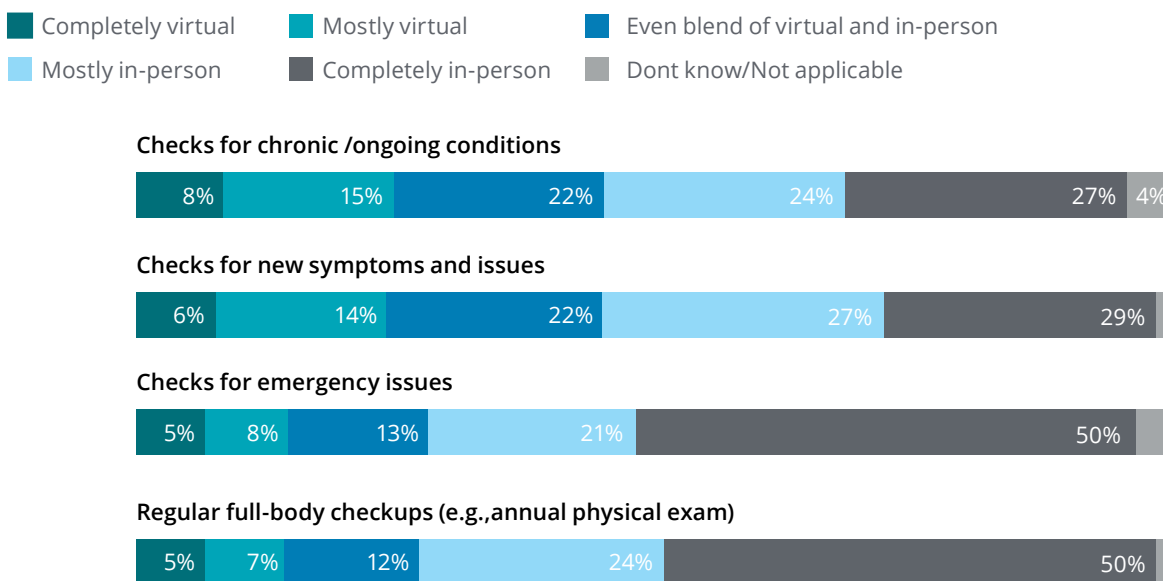
Patients in many countries have become more comfortable with managing their own pathways to care. The widespread use of home COVID-19 tests and vaccination scheduling and reporting has made many people more comfortable with self-testing for other types of diagnostics and screenings as well.

In this post-pandemic era, more than 40 percent of patients have expressed a desire to continue to use telehealth (Figure 2).⁸ This demand will encourage health care providers to invest in digital transformation to connect patients with personalized services that suit their needs and preferences.

These interconnected systems can enable patient choice and control, improve health delivery, increase greater access, make administration faster and more efficient, and lower costs.

Figure 2. Consumers who have had virtual health care visits over the past year intend to keep using virtual or hybrid options for some future health care needs.

When the COVID-19 pandemic eases what would be your preferred way to attend appointments for the following?



Notes: Respondents represent people who attended at least one virtual health care appointment (as a patient or with a patient) in the last year.

Source: 2022 Connectivity and Mobile Trends, 3rd edition.

Understanding depths of digital transformation

Many countries are making progress in adopting EHRs. The NHS, for example, plans to adopt electronic health records (EHRs) at all hospitals and community practices in the UK by 2025.⁹ While this provides a strong digital backbone, the challenge in many countries is interoperability — getting related hospital systems to link with each other — and extending those connections to external services such as primary care centers.

In addition, the quality and comparability of the data is inconsistent. Unstructured or “dirty” patient data can provide an incomplete picture of a patient’s health. Most organizations are adopting standard data sets, building data “lakes” to combine data, and using the latest artificial intelligence (AI) tools to develop meaningful insights.

Despite this, in many countries, vital medical information is still stored on paper. When information or images are shared, it is often done by fax, mail, social messaging applications, or patients themselves, who carry their physical documents from one provider to the next.

The advent of Health Information Exchanges (HIEs), in which health care organizations can exchange electronic health information, is growing rapidly. New payment and reimbursement approaches are increasing the focus on care coordination. For example, HIEs can help providers avoid unnecessary readmissions and medication errors, improve diagnoses, and decrease duplicate testing.¹⁰ The exchanges are standardizing technology to allow providers and patients to connect more effectively and allow care to be distributed more broadly across multiple care pathways, care settings, and geographical regions.

Finland, for example, has already established a process for sharing EHRs on a regional basis. The gold standard for digital health, however, is Estonia. Estonia’s health service has been digital for 12 years, and more than 99 percent of the data generated by doctors and hospitals is electronic. Residents can access their medical records via online portals, and video consultations and e-prescriptions are common practice. Not only do patients renew their prescriptions without visiting a doctor in person, but they also don’t have to go to the pharmacy, either. Most prescriptions are delivered to patients’ homes.¹¹

Meanwhile, the US Department of Health and Human Services is calling for a nationwide, interoperable health IT ecosystem by 2024 that would provide health data across products and organizations in a way that could be more meaningfully used by recipients. The system would be continuously updated and give consumers the ability to share information securely with their providers of choice. It is designed to lower costs, improve population health, drive innovation, and empower consumers.¹²

Heading to the cloud

Financial pressures are a double-edged sword in the digital transformation of health care. On the one hand, technology can improve efficiency and reduce costs. On the other, the expense of moving systems to new digital platforms can slow the adoption of cloud solutions.

In the UK and Scandinavian countries, concerns about margin pressure are driving digitization, yet in the US and Australia we see margin preservation restricting the adoption of new technology. In response, pricing is becoming subscription- or usage-based and is moving from capital to operating expenditures. Deloitte, for example, has formed a partnership with Amazon Web Services (AWS) to use third-party data in the cloud to create an efficient, robust, and secure health care data ecosystem that can improve population health, reimbursement and provide other real-world insights.¹³

Nevertheless, most health executives recognize the longer-term benefits of digitization. A survey of almost 400 health executives across six countries found that two-thirds of respondents expect to move their IT infrastructure to the cloud within a year, and 96 percent expect to do so within three years.¹⁴

Much of the focus around digitization has been on operations — specifically, the managing and delivery of care — but, technology, and specifically automation, is also reducing costs and improving back-office processes such as clinical coding, billing, scheduling, payroll, and procurement.

COVID-19 accelerated the shift to cloud-based technologies designed to strengthen business operations and drive more customer interactions into the digital realm. This trend is forcing the large EHR providers to migrate their products and services to the cloud and develop partnerships with Customer Relationship Management (CRM) and Enterprise Resource Planning (ERP) providers.

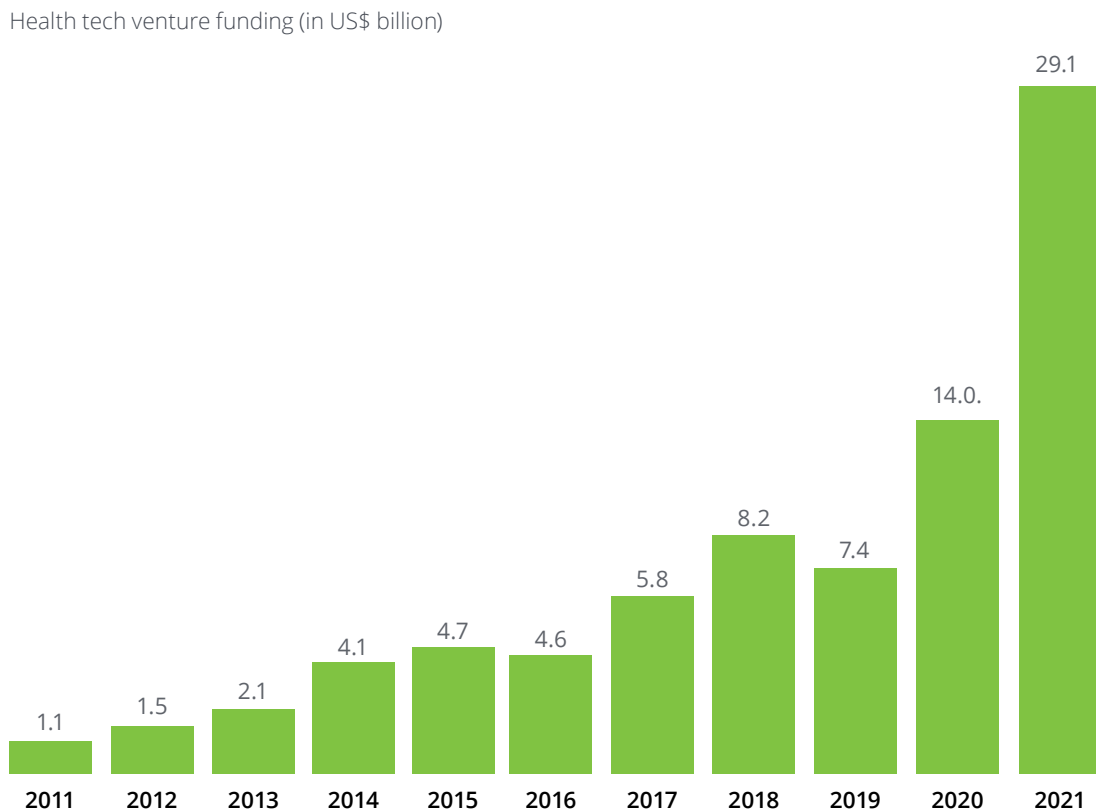
In June 2022, for example, Oracle completed its acquisition of Cerner with plans to expand Oracle’s cloud business in the hospital and health system market, both in the US and internationally. Oracle said the acquisition will enable it to provide a new generation of information to health professionals that will improve treatment decisions and patient outcomes while lower providers’ administrative workload, enhancing patient privacy and reducing costs.¹⁵

CVS Health and Microsoft announced a new strategic alliance in December 2021 to develop innovative solutions that will help consumers improve their health. The collaboration is designed to allow CVS Health to provide a data-driven and personalized customer experience to clients.

Cigna began using the cloud platform from Majesco’s L&A Group for its supplemental health solutions product suite in July 2022 after partnering with Majesco a year earlier to accelerate its digital transformation.¹⁶

In addition, many venture capitalists, private equity firms, and health care organizations are investing in startup platforms. Globally, health-tech investments in 2021 topped \$44 billion, double the previous year (Figure 3).¹⁷ Large tech-enabled platform companies could help hospitals and health systems improve efficiencies and scale quickly by modernizing existing systems and delivery models, addressing health-equity through a platform approach.¹⁸

Figure 3. Health tech investments continue to grow at an unprecedented pace



Source: Deloitte analysis of Rock Health Digital Health Funding Database

However, migrating to the cloud can raise environmental concerns. Some estimates show that cloud-based computing generates a larger carbon footprint than the airline industry—and that a single data center can consume as much energy as 50,000 homes.¹⁹ As more companies assess their indirect, or Scope 3, emissions, they must gauge the carbon footprints for partners, suppliers, vendors, and other third parties. AWS, Google Cloud, and Microsoft Azure all have introduced tools to help customers assess their carbon footprints and take steps to reduce them.²⁰

Deloitte is collaborating with the International Hospital Federation to develop a dashboard for health care organizations to assess their carbon footprints. The Sustainability Accelerator Tool has been released in a beta version. Learn more about the tool in the Sustainability section of the outlook report.

Emerging technologies

Emerging technologies such as AI, telehealth, blockchain, and monitoring devices, such as sensors, wearable and ingestibles, are providing real-time and continuous data about our health and our environment. This is redefining the future of health care and health delivery. Health care companies can use these innovations to provide more accurate diagnoses, deliver personalized treatment and predict risk or deterioration and intervene early.

Telehealth became widely accepted during the pandemic, and it continues to evolve, incorporating patient portals, telemedicine, mobile health, video conferencing, and remote patient monitoring. Already, patients are frequently using portals to schedule appointments and receive test results via their smartphones, and telehealth applications are expected to expand during the next five to 10 years.

Almost half of consumers said they attended at least one virtual medical appointment in 2021. While many cited avoiding COVID-19 as a primary reason for embracing the technology, they also found it more convenient because they could choose an appointment time that better fit their schedules. Ninety-two percent of those who used virtual appointments said they were satisfied with them, and 48 percent said they were very satisfied.²¹

AI can work in conjunction with data such as EHRs stored on the cloud to develop a system of proactive continuous care designed to keep people well rather than episodic care delivered retrospectively when they are already sick. A new AI-empowered system at Johns Hopkins Health System scours medical records and clinical notes to identify patients who might be at risk of infection before symptoms develop. A study conducted by the health system found that patients are 20 percent less likely to die of sepsis because of the new tool.²²

AI4HealthCro, a not-for-profit public-private consortium based in Croatia, is developing AI technologies for the European Union that it estimates will free up as much as 1,944 man hours annually, save as many as 403,000 lives, and reduce health care costs by as much as €212.4 billion.²³

Not all health conditions or concerns require an in-person consultation with a clinical professional. AI is increasing patients' options for receiving health care. Algorithms can diagnose and provide personalized advice and support to patients in automated channels such as call centers, text messaging, chat bots, and video consultations. According to Kaiser Permanente, 75 percent of enquiries are resolved in one visit using these remote channels.

One study, conducted in an urgent care setting in Sao Paulo, Brazil, during the pandemic, found that the implementation of an AI registration system cut down wait times by an average of 12 minutes and saved more than 2,500 hours a year in employee time.²⁴

AI already is being used to improve diagnostics and make predictive medicine more accurate. Researchers at Google's DeepMind Health designed an AI algorithm that could identify factors for when someone was at risk for advanced kidney failure — and predict it 48 hours in advance. Overall, the algorithm had an accuracy rate of 55.8 percent, but in cases severe enough to later require dialysis, its prediction were accurate 90.2 percent of the time.²⁵

Whilst these new channels of advice and treatment have the potential to increase patient access, operate around the clock, and reduce the workload on already stretched clinical teams, careful testing and implementation is essential. The quality of the experience can be hampered by poor data quality, low data point counts, and lack of trained personnel for handling these technologies. Moreover, these channels must be synchronous so patients can move freely between them with one record being continuously updated and maintained. The risk is that often, when new technologies are added, they are implemented piecemeal rather than integrated throughout an organization or across a patient journey.²⁶

Rising cyber risk

Cloud technology, which began as a backup storage option has now become an all-inclusive computing platform that has fundamentally altered how organizations use, store, and share information.

Hospitals already are prime targets for ransomware attacks and other cybercrime.²⁷ Health information is considered the most sensitive of all personal data, and its importance will intensify as the use of more personalized medicine and genomic data for physical and mental health becomes commonplace.

Using credible cloud computing providers with adequate security controls and practices is vital, but most health care data breaches are caused by unsecured Identity and Access Management (IAM) practices.

As the COVID-19 omicron variant surged in early 2022, medical workers across the world were affected by a ransomware attack on a leading workforce management software service provider. The attack disrupted paychecks and disrupted health workers' ability to manage their schedules and track work hours.²⁸

Similarly, in August 2022, a ransomware attack on the IT provider for the UK's National Health Service affected patient check-ins and compromised health data and payment information.²⁹

The stakes are high, and any misstep can not only impact patient care but also ultimately undermine an organization's ability to build and maintain trust. Surveys suggest that 81 percent of consumers lose trust in an organization after a breach, while 25 completely stop interacting with it.³⁰

One way to prevent such attacks would be to apply blockchain technology to health data.

Because blockchain simultaneously registers every transaction and detects any conflicting information, it can offer accurate and decentralized data, making it ideal for securing EHRs and other confidential health data. Countries such as Australia and the UK are leveraging blockchain to manage medical records, although its application in the health industry remains in its infancy.^{31,32}

Estonia's digital health system uses blockchain to secure much of the data stored on its systems, including records for national health insurance cards and its national health care registry.³³

Blockchain startups such as Medicalchain maintain records on a distributed ledger, which allows patients to manage their EHRs through an app. During the next few years, as blockchain technology improves, more health care companies will likely rely heavily on this technology to increase mobile security.

Wearables and sensors

Personal health management tools, such as wearable or remote sensors and monitors, help consumers manage their health and wellness by tracking symptoms, diet, and exercise, as well as monitoring chronic illnesses. These devices are designed to sense the human body or the environment around the wearer. In recent years we have seen disparate tracking systems integrate to provide a more holistic view for the consumer. For example, the latest Apple Watch™ (series 8)³⁴ has features that measure sleep patterns, heart rate, oxygen level, balance, and gait, as well as temperature sensing and exercise monitoring. This data is brought together, with the wearer's goals, on the Apple Health™ app. Data from other sources such as weight scales and pollen levels, can also be integrated into this app.

When this data is shared with clinicians, it helps track patients' conditions in real time.

The global market for fitness trackers is expected to grow at a compound rate of 18.9 percent by 2028, reaching a total market value of US\$138.7 billion, making wearables a huge focus for technology companies in the years ahead.³⁵

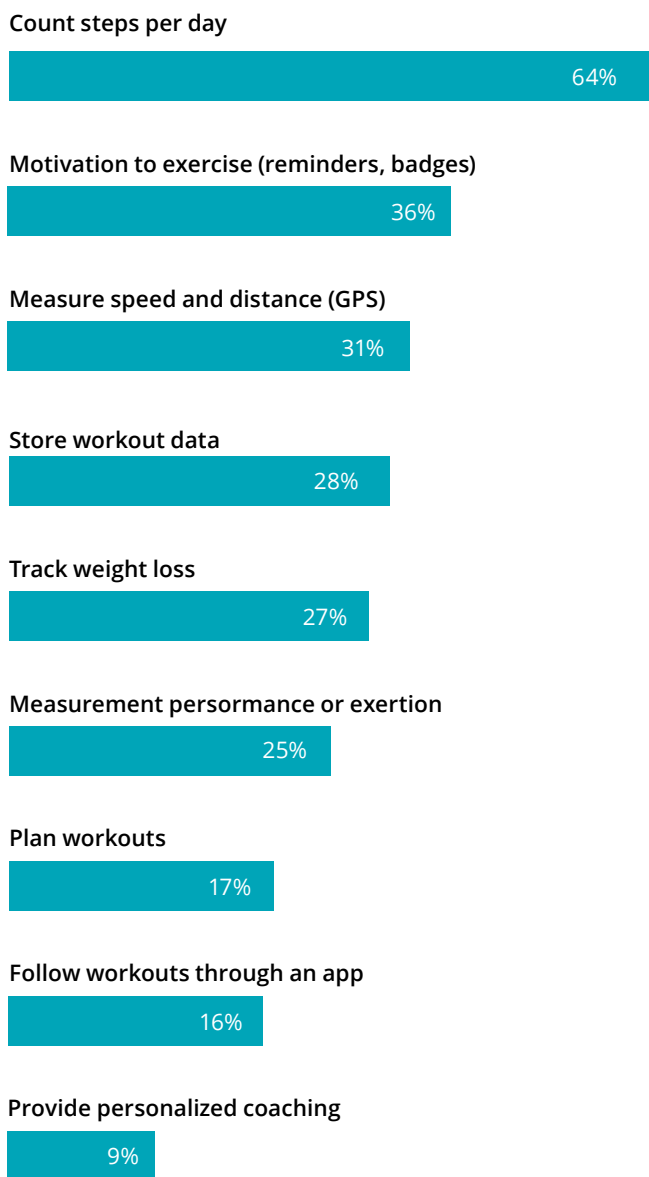
Forty-two percent of US consumers surveyed by Deloitte said they use a fitness tracker or a smartphone with a fitness app, and six in 10 said they have such devices in their household. Of those who use them, nine in 10 do so to monitor health metrics such as daily steps, pulse rate, calorie intake, heart health and sleep habits (Figure 4).³⁶

Heart rate monitors are now standard on most smartwatches, and some have regulatory approval for detecting abnormalities such as atrial fibrillation, a major cause of stroke. As these devices get more sophisticated, the percentage of consumers using them to manage chronic conditions and detect symptoms of serious diseases will likely increase.

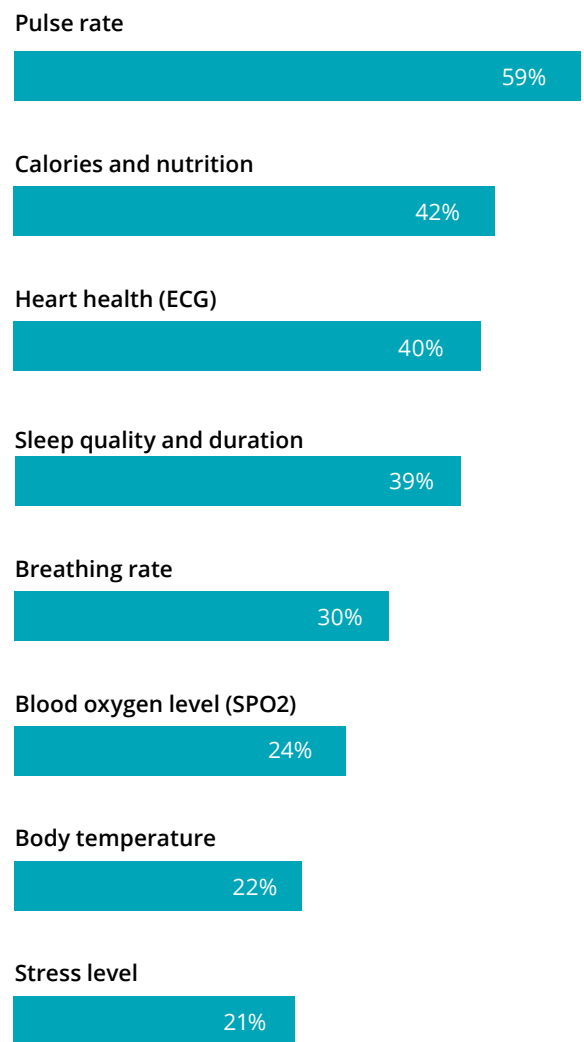
Health care providers who use wearable technology to monitor chronic health conditions and to track vitals, sleep quality, and medications are finding the technology helpful. However, for large-scale adoption clinicians must agree on the parameters for alerts, appropriate clinical governance arrangements, and efficient work flows alongside effective reimbursement models for devices and data. Data accuracy and privacy, as well as cyberthreats, will also act as headwinds to adoption.³⁷

Figure 2. Consumers are using their smartwatches, fitness trackers to measure physical activity and health indicators

In which of the following ways do you use your smartwatch/fitness tracker for your fitness?



Which of the following health metrics do you use your smartwatch/fitness tracker to monitor?



Notes: Respondents represent consumers who personally own a smartwatch and /or fitness tracker and use it for and/or fitness monitoring

Source: 2022 Connectivity and Mobile Trends, 3rd edition.

Questions for providers to consider in approaching the digital transition

Answering these questions will help providers prepare for transformative technologies that are coming in the next five to 10 years. These include:

- Digital front door— As the primary point of digital engagement, the digital front door consists of multi-channel communications platforms, including web portals, mobile applications, and SMS messaging. It provides multiple stakeholders with access to providers' digital and analog services.
- Autonomous monitoring — Enables patient surveillance through video and sensor technology and deploys AI and behavioral analytics to provide real-time insights and timely medical intervention.
- Digital clinical encounters — Offers semi-automated patient interactions with clinical protocols, algorithms, and AI for assessing symptoms, issuing prescriptions and other functions. By using evidence-based clinical knowledge, it reduces clinicians' direct involvement
- Digital health platforms — Allows providers to offer value-based, hassle-free virtual care to patients by addressing health issues through cloud-based platforms and services.

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