Thematic Intelligence
Medical Devices

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Virtual Care and Telemedicine

Contents

Executive Summary

Virtual care and telemedicine have revolutionized healthcare

Virtual care and telemedicine refer to the use of technology to provide healthcare services remotely and more efficiently, enabling patients to consult with healthcare professionals and receive medical care without being physically present in a healthcare facility. Virtual care encompasses a wide range of healthcare activities, including teleconsultations, telehealth, connected medical devices, remote monitoring, mobile device apps, and electronic health records.

Virtual care and telemedicine have revolutionized the healthcare industry, providing unprecedented access to medical services and transforming the way healthcare is delivered. This rapidly evolving field has gained significant momentum in recent years, especially due to the global COVID-19 pandemic and the accompanying surge in demand for remote healthcare solutions. As a result, telemedicine has become an indispensable tool in the healthcare industry, bridging the gap between patients and healthcare providers and enabling the delivery of high-quality care anytime and anywhere.

Virtual care and telemedicine have had a profound impact on the healthcare industry, bringing about numerous benefits for patients, healthcare providers, and the healthcare system as a whole. By utilizing technology, telemedicine has overcome geographical barriers, enabling patients to access medical expertise regardless of their location. It has facilitated remote consultations, diagnosis, and treatment, empowering patients with greater convenience and reducing the need for in-person visits, particularly for non-emergency cases.

Virtual care and telemedicine have brought about a transformative shift in the healthcare industry, offering unprecedented access to medical care and improving outcomes. The adoption of telemedicine is expected to continue accelerating, driven by global trends and the recognition of its potential to address healthcare challenges, improve patient experiences, and enhance healthcare system efficiency. As telemedicine evolves, it holds the promise of revolutionizing healthcare delivery and shaping the future of medicine.

Leaders

The virtual care and telemedicine market can be broken down into the segments of telemedicine, electronic medical records (EMRs), and remote patient monitoring (RPM)

Telemedicine

- **Leaders:** Teladoc Health, Medtronic, Doctor on Demand, MeMD, SnapMD, Cleveland Clinic, Royal Philips, One Medical, MDLIVE, Practo Technologies, SteadyMD, Teladoc, Zoom, Amazon.

Electronic medical records

- **Leaders:** Epic Systems, athenahealth, eClinicalWorks, Meditech, MEDHOST, Cerner, Allscripts, NextGen.

Remote patient monitoring

- **Leaders:** Boston Scientific, Philips, Medtronic, Biotronik, Nihon Kohden.

Inside

Related reports

- Virtual Care
- Personal Health Data
- EMR Systems

Report type

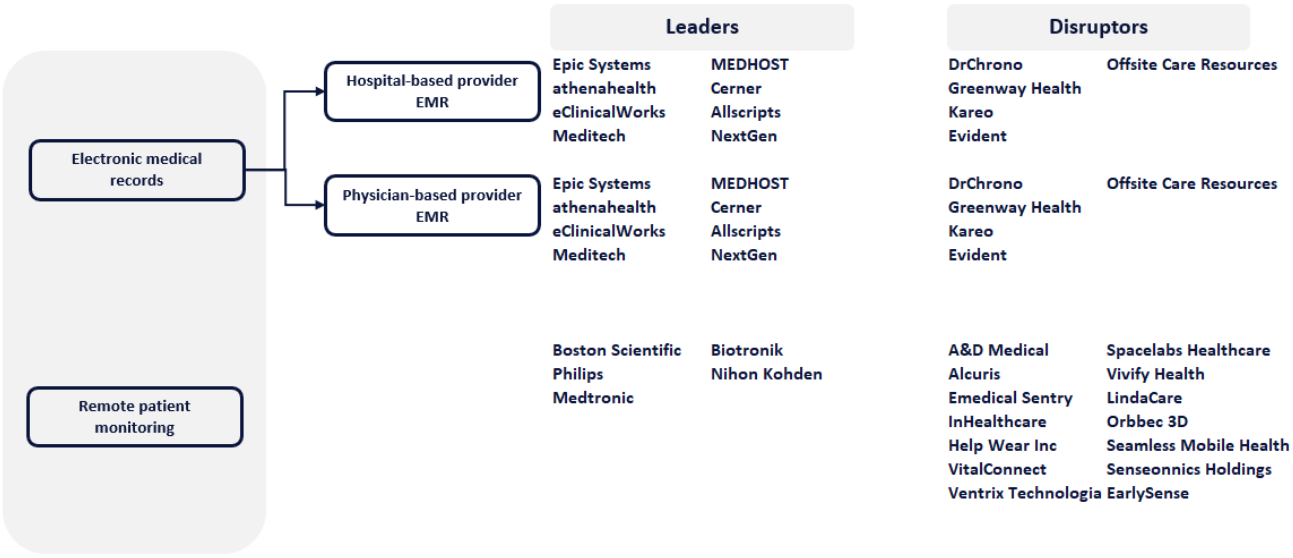
- **Single theme**
- Multi-theme
- Sector scorecard

Players

This report analyzes the current state of the virtual care and telemedicine theme.

The schematic below identifies some of the key market leaders and where they sit in the market segments. The sectors covered in this report are EMRs and RPM.

Who are the leading players in the virtual care and telemedicine theme?



Source: GlobalData

Technology Briefing

Virtual care is a broad term that encompasses ways healthcare providers remotely interact with their patients. This can be in the form of using RPM devices, telemedicine platforms, or EMRs.

Electronic medical records

EMR and electronic health record (EHR) systems are often referred to interchangeably, but they are technically different. An EMR is best understood as an electronic version of a patient's medical chart collected from one practice. It contains all the patient's history and medical treatments from that practice. An EHR differs in that it contains all the patient's records from multiple doctors and includes their demographics, test results, medical history, history of present illness (HPI), and medications. An EHR is designed to be shared and accessed by the patient's healthcare network. Despite the technical difference, the trends and goals of EMRs and EHRs align, and both seek to merge these systems into a program that is easily accessible by the patient and all their healthcare providers.

EMR systems in medical practices have been increasingly adopted around the world. The EMR system is an important tool that is replacing paper records and charts. EMR systems organize important patient information into easy-to-manage computer/web-based programs.

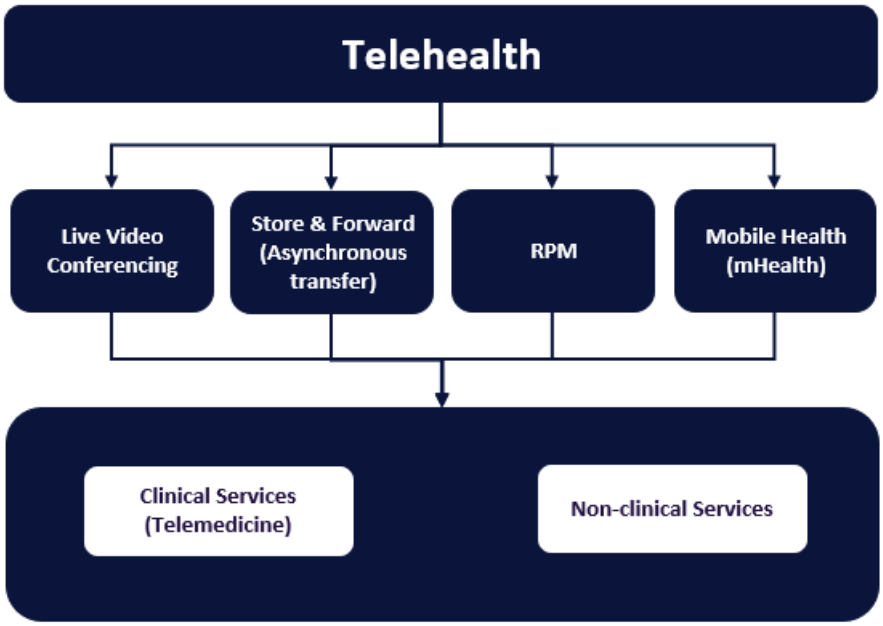
When a virtual visit occurs or when biometric data is recorded on the telehealth platform, it integrates into the EMR, streamlining record collection and ensuring that all patient data is consolidated in one place. Companies such as Telus Health have integrated EMRs.

Telehealth

Telemedicine is the use of electronic communication, such as videoconferencing or phone calls, for the delivery of remote clinical care via virtual consultations. Telemedicine is a subset of telehealth and can be divided into the following categories:

- **Live video conferencing (synchronous) or on-demand urgent care:** This involves real-time, two-way interactions between a patient and a healthcare provider using audio-visual telecommunications technology as an alternative to emergency department visits, urgent care, and out-of-hours services. This is often used to treat common conditions, assist with triage decisions, and conduct mental or behavioral health sessions.
- **Store-and-forward or asynchronous transfer:** Patient data or records are transmitted via electronic communications to a provider, usually a specialist, to store and use to treat patients. This is often used in rural areas by primary care providers to send data to specialists at another location for consultation.
- **RPM:** Personal health and medical data for a patient are collected and can then be stored and remotely transferred to a provider for use in care and related support.
- **Mobile health (mHealth):** Mobile devices, including smartphones and tablets, are used alongside software applications to support healthcare services. This can also involve secure messaging and text-based care, but these categories are not considered telemedicine and are therefore often not covered by insurers.

Telemedicine is a subset of telehealth



Source: GlobalData

Remote patient monitoring

Remote patient monitoring allows health providers to monitor disease and symptom progression remotely and then engage with patients virtually to modify care plans and provide education on self-care based on changes in the patient's condition. For example, a patient's vital signs and biomarkers, including blood pressure, weight, and blood sugar levels, can be tracked in their own home. This information is then transmitted to a physician for continual daily monitoring without requiring a patient to appear physically in the physician's office. Clinicians and clinical staff can communicate modifications in medication and other self-care to the patient and provide answers to patient questions. If symptoms and the disease progress to the point that hospital services are needed, providers will be able to arrange for care and transport that will ensure the safety of the patient and health personnel. Continuous patient monitoring technologies can also be used in hospitals and other healthcare settings to continuously monitor patients for signs of deterioration.

Trends

The main trends shaping the virtual care and telemedicine theme over the next 12 to 24 months are shown below. We classify these trends into four categories: technology trends, industry trends, macroeconomic trends, and regulatory trends.

Technology trends

The table below highlights the key technology trends impacting the virtual care and telemedicine theme.

Trend	What's happening?
5G	The full-scale mainstream adoption of 5G, which is still a few years away, has the potential to increase data consumption globally. 5G is expected to enable faster speeds of up to 20 gigabits per second (Gbps) per user and to connect around one million devices per square kilometer (approximately 10 times more than with 4G). 5G is also likely to have a significant impact on applications that rely on real-time data analytics. It will allow for better RPM systems and the sharing of high-resolution medical images. 5G will provide an opportunity for healthcare to fully embrace digitization and create new ways of treating patients. Virtual care methods will benefit immensely from this technology.
Artificial intelligence (AI)	One of the benefits of using AI technology is that it can greatly improve data quality. This improvement is needed within any analytics-driven organization where the proliferation of personal, public, cloud, and on-premise data has made it nearly impossible for information technology (IT) to keep up with user demand. AI tools are required to organize, screen, and analyze personal health data. They can help extract insights about healthcare trends, track patients over time, and forecast the likelihood of developing a disease.
Blockchain technology	Blockchain technology has the potential to enhance the security, privacy, and interoperability of telemedicine data. It can facilitate the secure sharing of patient information between healthcare providers, enable consent management, and enhance data integrity and traceability.
Cloud	As computing moves from in-house corporate data centers to third-party cloud data centers, corporations need to buy less of their own IT equipment. The rise in the use of cloud computing in the healthcare industry has allowed for a more scalable, cost-effective, and interconnected method of storing and sharing health data. Cloud computing brings numerous benefits to telehealth. Telehealth systems require rapid deployment capabilities, which cloud computing provides. Additionally, the cloud facilitates the use of telehealth by providing connections between remote patients without the need for centralization.
Internet of Things (IoT)	The IoT is a system of wireless, interrelated, and connected digital devices that can collect, send, and store data over a network without requiring human-to-human or human-to-computer interaction. IoT provides fast connectivity that allows a range of medical devices to be connected to a server. As such, telemedicine technology can function efficiently with the use of real-time data from these devices, allowing high-quality virtual care.

Trend	What's happening?
Cybersecurity	While the rapid integration of telemedicine into traditional healthcare systems benefits medical personnel, healthcare systems, and patients, the number of cyberattacks in the healthcare industry continues to increase. Various healthcare facilities are particularly sensitive to cyberattacks due to the nature of the information they contain (sensitive personal information and medical records). Telemedicine has been adopted so rapidly that there was little to no time to ensure all the necessary cybersecurity precautions were covered properly. Healthcare institutions must quickly increase their cybersecurity against cyberattacks in order to avoid financial and clinical losses. Additionally, improving cybersecurity and the way that data from newly adopted technologies is collected and handled will increase acceptance among patients and medical professionals.
Virtual reality (VR) and augmented reality (AR)	VR and Augmented Reality (AR) technologies are being explored for various applications in telemedicine. They have the potential to enhance remote training for healthcare professionals, facilitate virtual consultations with enhanced visualization, and even provide immersive therapy experiences for patients with mental health conditions.
Wearable devices	Wearable devices use sensors to measure various vital signs such as heart rate, glucose levels, and blood pressure. This data is then transmitted for real-time feedback. Much of this data may end up being recorded in EHRs. The market for wearables has continued to grow in the past few years, and the COVID-19 pandemic has prompted the implementation and development of wearable devices at a much faster rate. Wearables can track real-time biometric signals across a large segment of the population without the constant monitoring of a healthcare professional. This function became incredibly useful throughout the pandemic as it reduced the number of unnecessary hospital visits, thus allowing optimization and the allocation of resources in hospitals and healthcare systems. There is also an increasing array of consumer wearables in the form of smartwatches, hearables, and fitness trackers. The adoption of these consumer wearables in the healthcare industry is having a profound effect on how healthcare is delivered. For example, research projects are now using the data accumulated from these trackers to analyze a variety of health outcomes and disease states.
Source: GlobalData	

Industry trends

The table below highlights the key industry trends impacting the virtual care and telemedicine theme.

Trend	What's happening?
Big Tech moves into healthcare	Large technology competitors, such as Amazon, Google, and Microsoft, have been developing partnerships and technology solutions in the healthcare space for years. Over the last couple of years, these efforts have intensified, and the COVID-19 pandemic has driven an increased adoption rate of technology in the healthcare space overall. These players have a powerful grasp on cloud, AI, and retail technology, which makes them obvious disruptors in the healthcare sector. Everything from ambient clinical intelligence to AI-based diagnostic tools and virtual care platforms has been introduced by big tech recently. The healthcare sector is ripe for disruption, and players in this space must be aware of what big tech is capable of and what they are currently involved in.
Personal health data	Personal health data may refer to EHRs, EMRs, and any other health data transmitted through telehealth, wearables/sensors, or apps. It includes patient-reported and objective data about a patient's medical history, diagnostic tests, vitals, treatments, medications, and more. The digitalization of health data has allowed for easier access and sharing among patients, family physicians, emergency departments, and specialists. The adoption of EHRs is increasing globally, and this trend is expected to continue. While this digitized data promotes the sharing of data between healthcare providers and empowers patients to drive their own healthcare interactions, concerns remain over data privacy and data usage regulations. Barriers to adoption are also amplified by the fragmented ecosystem of EHR implementations. In order to benefit from data aggregation and the rise of AI, standards among EHRs will need to be established both locally and internationally.
RPM	RPM technologies were already playing a vital role in healthcare delivery prior to the COVID-19 pandemic. However, the pandemic has pushed physicians to limit in-person appointments unless necessary to minimize transmission risk for patients. Patients adapted by using telehealth platforms and apps to continue receiving care from their homes. This experience of decentralized healthcare may have improved patients' views on the use of RPM devices (wearable sensors that upload real-time health metrics to a physician) after the pandemic. Through RPM, physicians could access health data that would usually require an in-person visit to collect while the patient had the convenience of remaining at home without a loss of care quality.
mHealth	The main targets of virtual care technologies are those who suffer from chronic diseases such as diabetes, arrhythmias, heart failure, and chronic kidney conditions. The health of these patients needs to be closely monitored, as an improperly managed condition could quickly turn into an emergency. MHealth apps are therefore commonly used by patients with chronic conditions to help them remotely manage their different therapies, monitor their symptoms, and improve their adherence to the therapies. Physicians can then implement the necessary interventions that aid the patients' specific conditions as these apps facilitate remote monitoring. mHealth applications proved to be an essential and promising tool in the fight against the COVID-19 pandemic. Assessment apps using advanced AI tools, RPM, and mobile screening helped to alleviate the number of patients being admitted to the hospitals, limit the risks of COVID-19 transmission, and provide essential care for the patients with chronic diseases.

Source: GlobalData

Macroeconomic trends

The table below highlights the key macroeconomic trends impacting the virtual care and telemedicine theme.

Trend	What's happening?
COVID-19	The COVID-19 pandemic has greatly disrupted healthcare systems on a global level. Due to overloaded hospitals, elective procedures and visits have been delayed or changed. To reduce patient exposure to the virus, modes of access to healthcare services now include an increased amount of telehealth and RPM.
Increase in healthcare costs	Globally, healthcare costs continue to skyrocket. This is due to aging populations, an increased burden of diseases, and expanded access to healthcare. There is a need to reduce waste, become more efficient, and streamline processes to save money while at the same time providing patients with the same level of care or higher. Technologies mentioned in this report, including telehealth, continued patient monitoring, and health apps, may help achieve this goal.
Direct-to-consumer healthcare	Rising healthcare costs and unexpected billing have opened a clear avenue for direct-to-consumer healthcare offerings. Digital technology, with retail sensibilities, has begun to introduce healthcare services directly to consumers, bypassing the typical health system and hospital infrastructure. These players tend to offer telemedicine and virtual care, as well as in-home diagnostics, drug delivery, and mental health services. These types of services offer convenient ways for patients to access healthcare and only pay for the services they know they will use. Many of these services also accept patients' health insurance plans for reimbursement. Classical health systems and hospitals need to be aware that patients have additional avenues to get care outside of specific medical and surgical needs that are currently only offered through hospitals.
Increased Medicaid utilization	The COVID-19 pandemic has negatively impacted global economies. In the US, this volatility has led to job losses and shifts, and for some individuals, this has forced them to turn to public health funding, in the form of Medicaid, to meet their healthcare needs. As the economy stabilizes, this trend may reverse, but not if recovery isn't robust at all economic levels.
Source: GlobalData	

Regulatory trends

The table below highlights the key regulatory trends impacting the virtual care and telemedicine theme.

Trend	What's happening?
Telehealth regulations	Telehealth regulations were eased to make it easier for patients to continue to access healthcare while limiting exposure to the COVID-19 infection. In the US, waivers allowed telehealth to be accessed outside of rural areas. Further, many permanent and temporary codes for telehealth reimbursement were added to the 2021 physician fee schedule. It is currently unclear what will happen post-pandemic. The Centers for Medicare & Medicaid Services (CMS) has not added new permanent telehealth codes for 2022 but has proposed to extend the temporary codes until December 2023.
Software as a medical device regulation	In Europe, the new Medical Device Regulation and *In Vitro* Diagnostic Device Regulation include a medical device software (MDSW) consideration. A software digital health app will qualify as a "medical device" if it is intended to be used for one or more of the medical purposes specified in the definition of a medical device or *in vitro* diagnostic, which include, among other things, diagnosis, treatment, and monitoring of a disease, injury, or disability. The regulations are still evolving as technology evolves. Regulations are likely to remain behind technological developments and therefore become an impediment or bottleneck to new product launches. On the other hand, FDA policies on apps are based on function, not platform. The FDA intends to apply its regulatory oversight to only those software functions that are medical devices and whose functionality could pose a risk to a patient's safety if the device were not to function as intended. This is a significant difference from the EU approach, which may consider for regulation any software that is intended to benefit a patient.
Medicare reimbursement	Globally, regulations around the connected patient theme, especially telehealth reimbursement, have continued to loosen, allowing for easier access for patients. The COVID-19 pandemic has accelerated this trend. It is likely that many of the reimbursement policies for telehealth set during the pandemic will remain after the pandemic ends. For example, the CMS has continued to loosen regulations around telemedicine services and has proposed expanding its coverage beyond the COVID-19 pandemic. The CMS is a US federal agency that administers and regulates healthcare reimbursement for the largest healthcare programs in the country. The CMS sets policies and guidelines about what healthcare services and products can be reimbursed, as well as how they can be reimbursed.
The Health Insurance Portability and Accountability Act of 1996 (HIPAA)	HIPAA is US legislation that protects medical data privacy and security. It provides guidelines to ensure compliance related to the security and proper management of confidential information.
General Data Protection Regulation (GDPR)	The GDPR was introduced in the EU in May 2018. It is a regulation in EU law about data protection and the privacy of EU and European Economic Area residents. In the first year of its enforcement, more than 89,000 personal data breach notifications were sent to EU data protection authorities (DPAs), while over 144,000 queries and complaints were made to DPAs by individuals who believed their rights under the GDPR had been violated. Authorities have begun using the powers provided by the GDPR to levy significant fines on non-compliant companies.
Source: GlobalData	

Industry Analysis

Virtual care offerings have previously been met with resistance. However, the COVID-19 pandemic has highlighted the tremendous value of care delivery at a distance not only to prevent infections but also to provide access to care under these extraordinary circumstances.

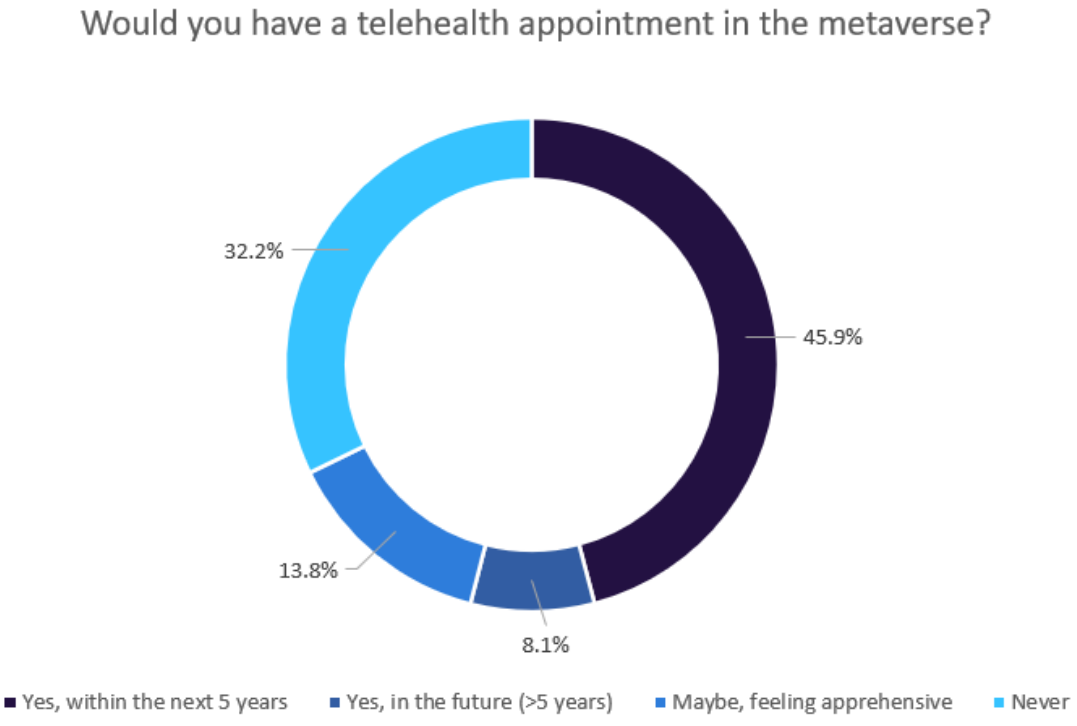
Telehealth adoption was driven by COVID-19

The COVID-19 pandemic caught global healthcare systems unprepared, and as a result, caseloads spiked all over the world and threatened to overrun hospital capacity. As healthcare systems became overwhelmed, they began to limit or cancel elective procedures and other routine care visits to spare resources and keep non-urgent patients safe from virus exposure. To continue to meet the healthcare needs of their patients, providers turned to virtual care solutions in the form of RPM and telehealth. These virtual care modalities allowed providers to address common health problems, keep an eye on chronic condition management, and ensure their patients weren't suffering adverse health effects.

The COVID-19 pandemic has changed the way patients interact with physicians and vice versa. Furthermore, the development and further adoption of the metaverse have made telehealth appointments with physicians more accessible. Telehealth appointments through the metaverse present an innovative and futuristic approach to healthcare delivery. The metaverse refers to a VR space where individuals can interact and engage in various activities. Integrating telehealth appointments into the metaverse can offer unique advantages and opportunities in the healthcare industry due to expanded access to care and an enhanced patient experience.

According to GlobalData, a recent poll showed that 45.9% of respondents will have a telehealth appointment in the metaverse within the next five years, 13.8% responded with maybe but were apprehensive, and 32.2% said they will never have a telehealth appointment in the metaverse.

Telehealth appointment through the metaverse, response count



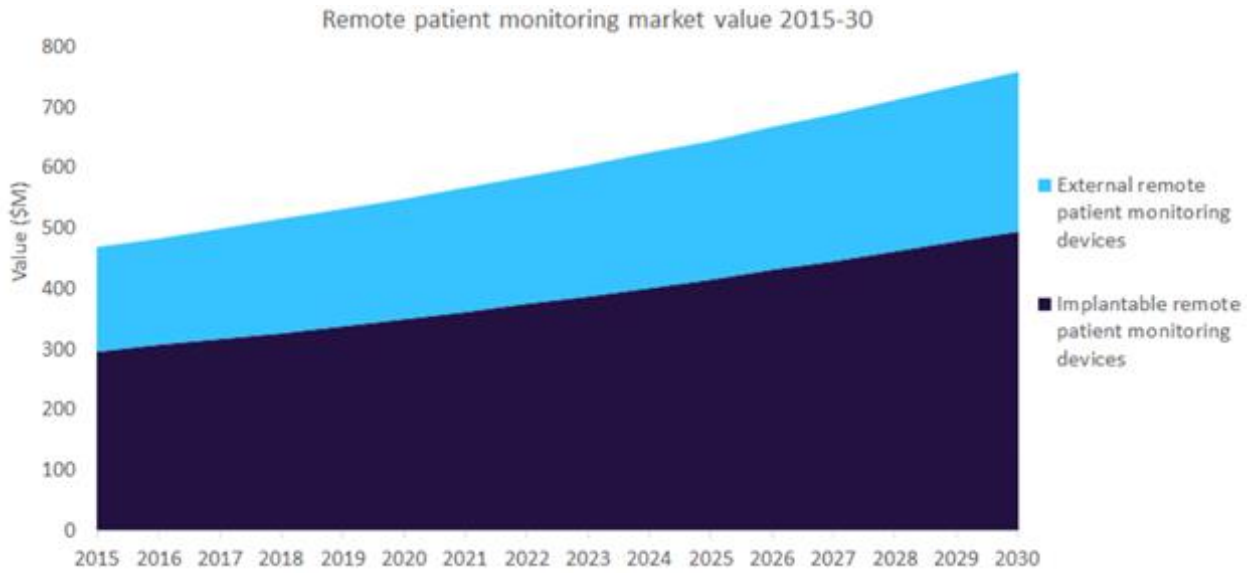
Source: GlobalData

Market size and growth forecasts

RPM devices have gained significant attention and adoption in the healthcare industry, revolutionizing the way patients are monitored and managed outside of traditional healthcare settings. The RPM device market has experienced rapid growth and is expected to continue expanding. Factors such as the increasing prevalence of chronic diseases, the aging population, and the need for efficient and cost-effective healthcare solutions contribute to the market's growth.

According to GlobalData forecasts, the RPM market will reach $760 million by 2030, up from $548.90 million in 2020, with a compound annual growth rate (CAGR) of 3.3% over the period.

RPM monitoring market value, 2015–30



Source: GlobalData

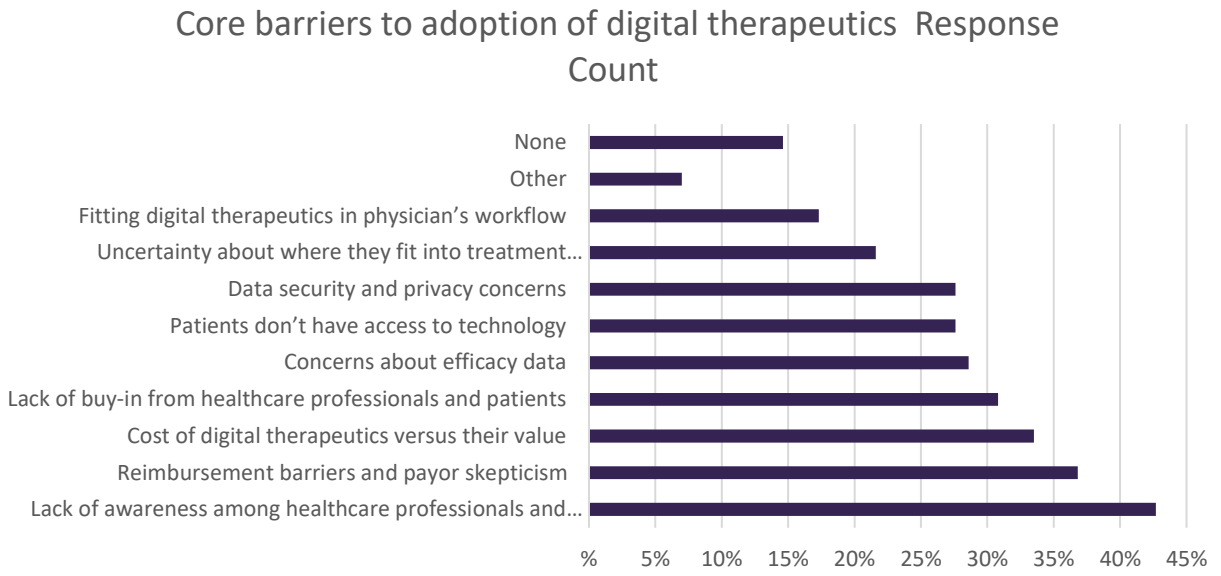
Remote patient monitoring device acceptance has increased since the pandemic

The COVID-19 pandemic forced a shift away from the majority of in-person physician visits in order to minimize the risk of spreading COVID-19. A recent GlobalData poll found that this experience may have accelerated the adoption of RPM devices.

Since early 2020, the COVID-19 pandemic has pushed physicians to limit in-person appointments unless necessary to minimize transmission risk for patients. Patients adapted by using telehealth platforms and apps to continue receiving care from their homes. This experience of decentralized healthcare may have improved patients' views on the use of RPM devices (wearable sensors that upload real-time health metrics to a physician) after the pandemic. Through RPM, physicians could access health data that would usually require an in-person visit to collect while the patient had the convenience of remaining at home without a loss of care quality.

According to GlobalData's recent poll of 201 respondents, 66% said they were now more willing to use a remote monitoring device compared to before the pandemic. Additionally, only 6% of respondents were less willing to use them due to efficacy concerns, indicating that the vast majority of patients trust in the capabilities of these devices. The main concern, from 17% of respondents, was that of privacy.

Core barriers to adoption of digital therapeutics



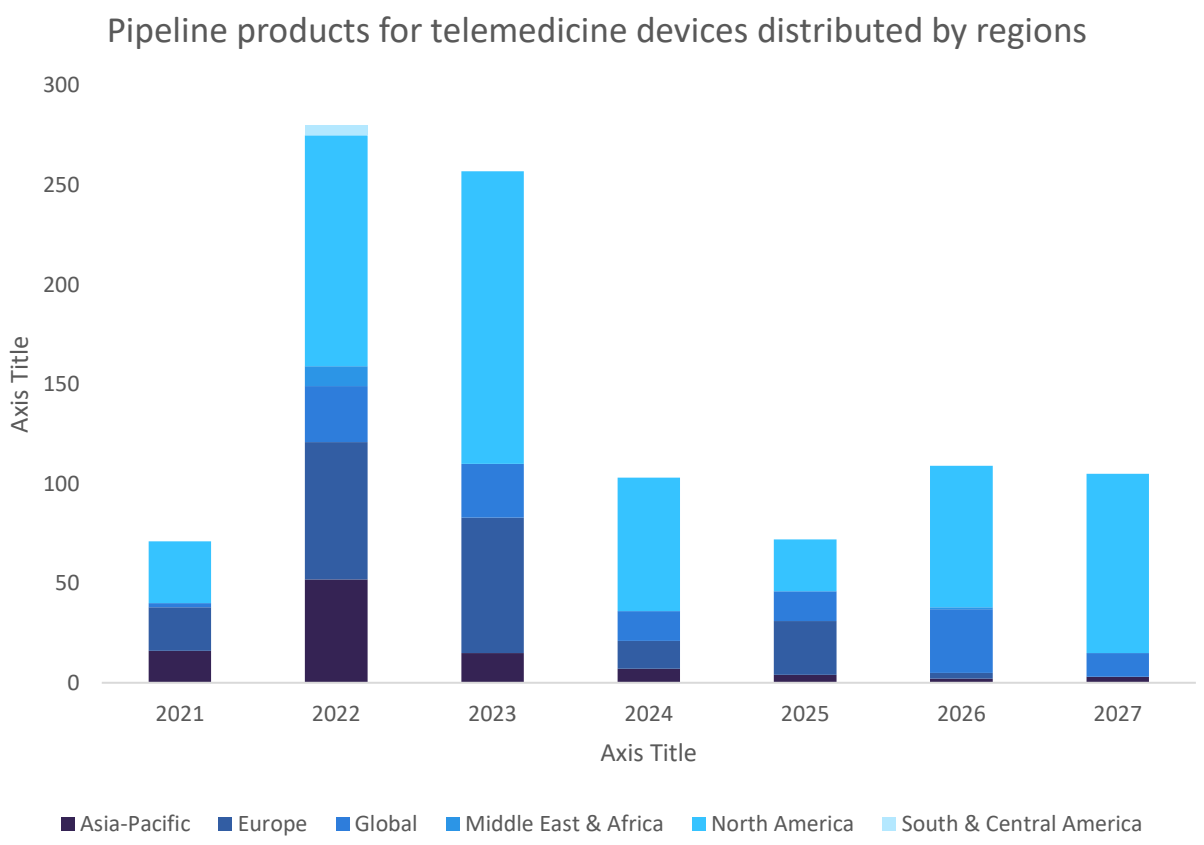
Source: GlobalData

Telemedicine devices: pipeline products

GlobalData is tracking a steady increase in telemedicine devices that are coming to market, with 257 devices entering the market in 2023 compared to the 71 expected in 2021.

Devices developed for the North American market dominate, indicating that perhaps this market is more permissive in terms of reimbursement and acceptance by the healthcare industry. Additionally, in recent years, rural access to healthcare has become a strategic priority in the US, leading to telemedicine solutions being championed.

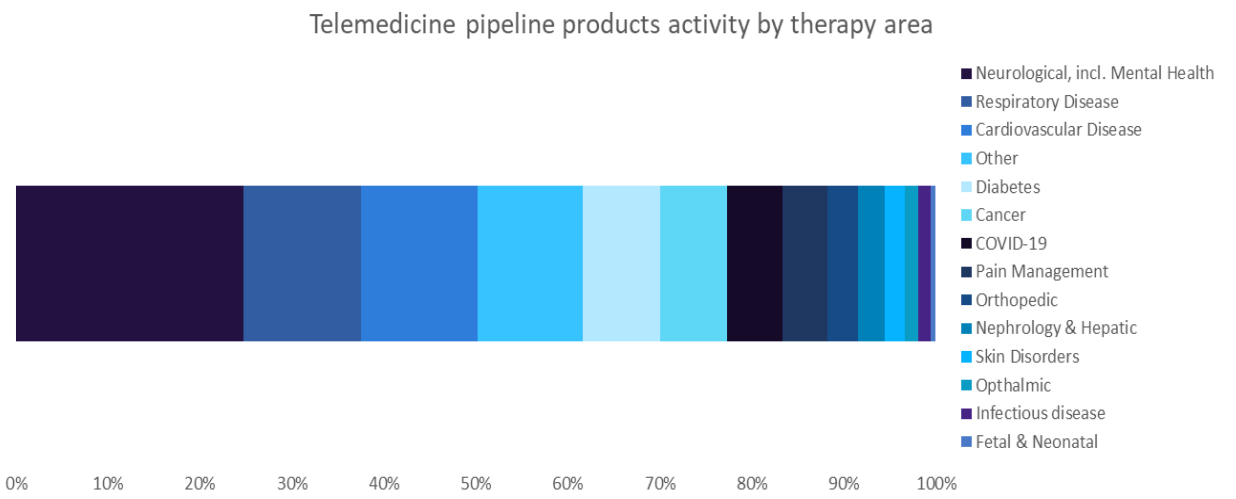
North America dominates the pipeline products for telemedicine devices



Source: GlobalData

GlobalData's pipeline product database also shows that the majority of telemedicine solutions address neurological and mental health conditions. Telemedicine solutions addressing mental health are now introducing new therapies that are uniquely suited to the telemedicine platform, for example, exercises that can calm or train the mind. Solutions for cardiovascular, diabetes, and other indications mostly supplement the existing clinical model, for instance, by allowing measurements previously performed in the hospital to be performed remotely. The results show that telemedicine isn't an answer for all areas of healthcare but might be more suited to certain applications.

Core barriers to adoption of digital therapeutics



Source: GlobalData

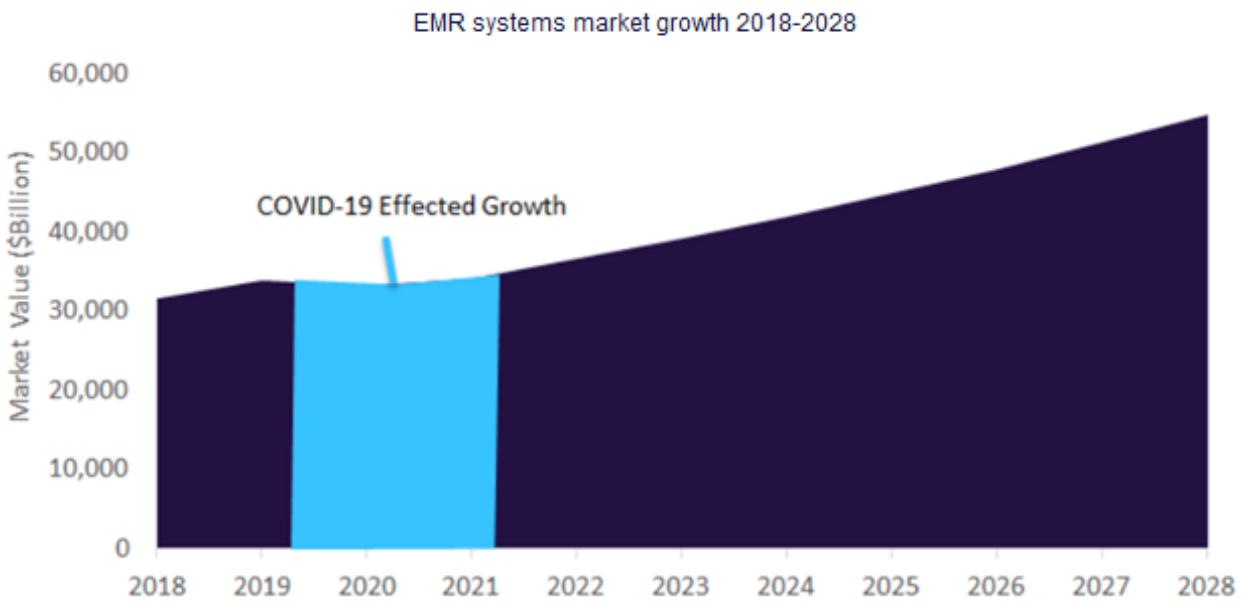
EMR systems to reach $54.9 billion global market value by 2028

The 21st Century Cures Act, signed into law in 2016, was designed to accelerate and bring innovation to patients in the healthcare sphere. The Office of the National Coordinator for Health Information Technology (ONC) and the CMS produced rules surrounding interoperability, patient access, and information blocking. These rules are to promote patient ownership of their own health data and to ensure that this data can flow easily between providers and technology ecosystems to better serve patients and their healthcare needs. One of the major components of this is the interoperability mandate, which ensures that providers and health technology developers cannot prevent the flow of information through reasonable means. This means that health information is going to become more fluid than ever before. This is expected to spur innovation and patient involvement in using their own data to support their health outcomes.

At the very core of patient health data is the EMR. While EMR adoption rates among health providers vary globally, the adoption rate among US hospital providers is over 90%, and the adoption rate among physician practices is 80% and rising. The figure below shows the growth of the global EMR market.

EMR systems have been a rapidly growing global market, with a historical CAGR of 5%. EMR system revenues are largely driven by adoption rates in medical facilities and patient visits to medical practitioners.

Solutions that address neurological conditions and mental health predominate the pipeline



Source: GlobalData

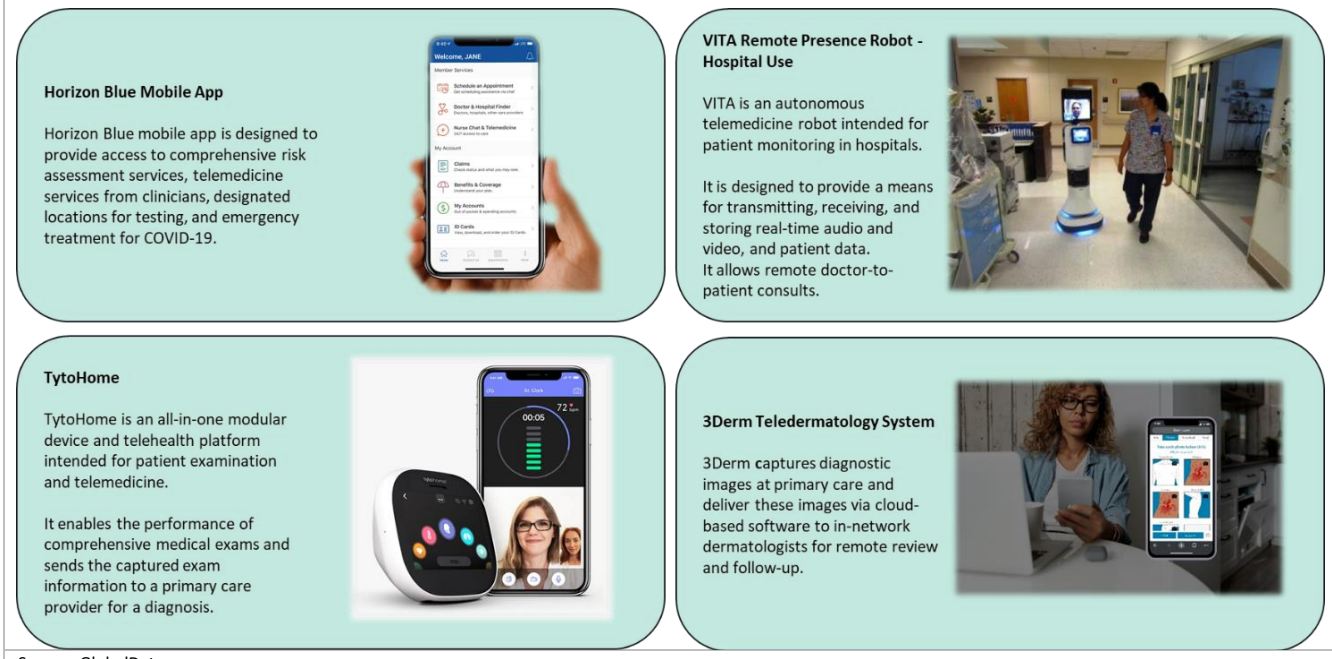
Use cases

Telemedicine

Currently, marketed telemedicine solutions mostly focus on enabling easier access for patients to existing medical services. More recently, there have been telemedicine devices that either make the device more integral to the delivery of healthcare or utilize the functionality of the platform to provide a level of clinical competence not previously seen. Below are examples of such applications.

Virtual care use cases

Examples of technology capabilities in the virtual care space



Source: GlobalData

Horizon Healthcare's Horizon Blue App: A platform that was rolled out relatively quickly, working with Pager to respond to the COVID-19 pandemic when its network of 2.1 million members could no longer access primary care in the normal way. The app includes a COVID-19 chatbot, a 24-hour nurse chat, and the ability to access appointments, billing, and coverage details.

InTouch Technologies's VITA Remote: A presence robot that enables physicians to conduct virtual patient consultations or ward rounds. This addresses the regional shortages of clinical specialists as physicians can be in "two places at once", but also contributes to the reduction of hospital-acquired infections.

TytoCare's TytoHome: A modular solution that consists of components that sync with a phone, enabling physicians to carry out patient examinations remotely through the performance of basic physiological measurements or to remotely monitor the patient.

3Derm's Teledermatology: Utilizes the camera on a smart phone to image skin lesions and connects with a network of specialists to provide a diagnosis in a way that a general practice was not able to do previously without a referral.

GlobalData expects that in the future, telemedicine devices will not only be able to supplement existing healthcare but also enhance it by offering new therapeutic options.

Remote patient monitoring

The COVID-19 pandemic has accelerated the RPM market. RPM devices have demonstrated the potential to improve patient care, reduce readmissions, and facilitate early discharge. In particular, RPM models using pulse oximetry and other measurements such as temperature that seek to remotely monitor patients have been implemented for suspected COVID-19 cases across numerous countries.

Pulse oximeters

Home pulse oximeters have long been used in primary care settings, usually for monitoring chronic lung disease and heart failure. However, because of the pandemic, many people have purchased their own pulse oximeters for self-monitoring. A new way to deploy pulse oximeters to monitor discharged COVID-19 patients was reported by Dr. Christine Patte and colleagues in the Academic Emergency Medicine Journal (2020). Patte, from the Swedish Hospital Emergency Medicine Residency Program, described new guidelines for appropriate home care for patients suffering from COVID-19, as well as public management of any close contacts. They developed a novel use for home pulse oximetry monitoring in COVID-19 patients discharged from the emergency department as well as for monitoring patients staying at home. The protocols allow for safe monitoring for silent hypoxia in patients affected by COVID-19, enabling timely intervention and thus reducing hospital re-admission rates. The study protocol describes the discharge of non-severe COVID-19 patients from hospitals and subsequent recovery at home using portable pulse oximetry devices that report a patient's oxygen saturation levels. This helps identify if an individual needs to be hospitalized based on the pulse oximeter readings. Patients can safely and comfortably recover at home, enabling healthcare facilities to manage resources and reduce overcapacity issues. The study results pointed out that an at-home resting blood oxygen level of less than 92% may result in hospitalization. GlobalData predicts that the usage of pulse oximetry devices in home care settings may grow in the future to monitor COVID-19 patients. This may result in increased demand for these devices, especially in countries with limited healthcare resources and significant patient populations. Below are examples of companies expanding their pulse oximetry solutions in response to COVID-19.

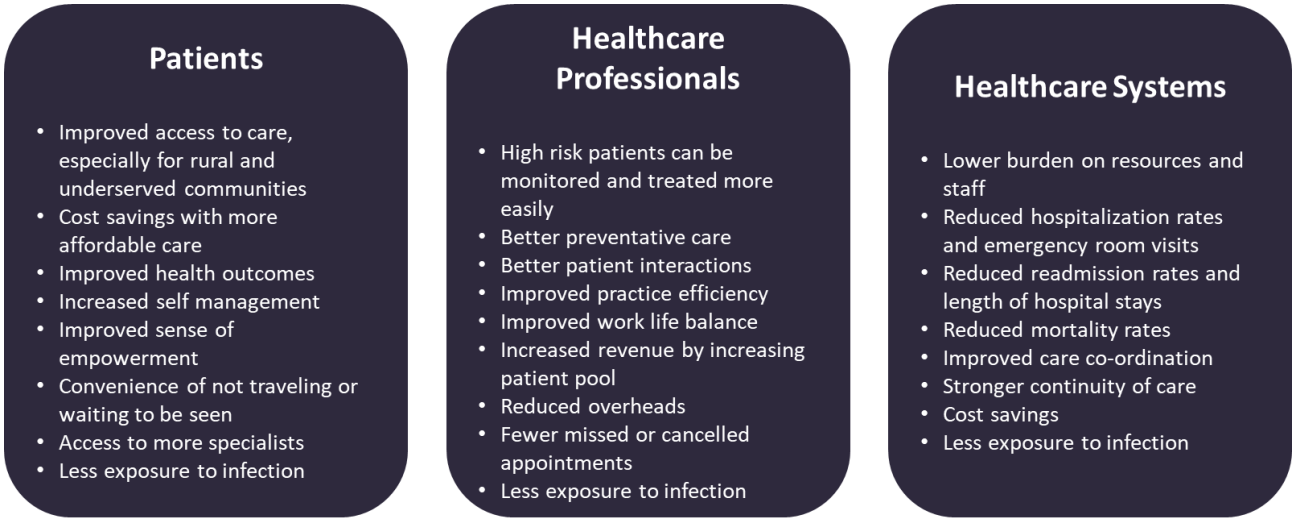
Tytocare: Telehealth company Tyto Care has launched a pulse oximeter to enable patients to check their blood oxygen saturation at home. Patients can use the device in a synchronous or asynchronous (live telehealth) format. Tyto Care is currently offering the pulse oximeter to providers, payers, and employers but plans to expand to retail in the future.

Masimo and St. Luke's University Health Network: St. Luke's University Health Network was one of the first in the world to pilot Masimo SafetyNet, a remote patient management solution, to aid hospitalized COVID-19 patients. Through Masimo's pulse oximeter, the hospital could track a patient's blood oxygen saturation as well as respiratory rate. St. Luke's rolled out this solution to in-home and in-hospital patients that are suspected to have the virus, have been confirmed to have the virus, and all other patients in the healthcare system at particular risk.

CereVu: CereVu is developing a remote COVID-19 sensor device consisting of a small, wearable, single-use patch with a reusable monitoring console. The device uses proprietary signal processing and algorithms to enable health professionals to determine COVID-19 symptoms and track the effectiveness of medicines that have been prescribed to patients. The COVID-19 sensor is a RPM device designed to monitor and measure blood oxygen saturation levels, muscle aches, temperature, and breathing in patients infected with COVID-19.

Virtual care and telemedicine market drivers

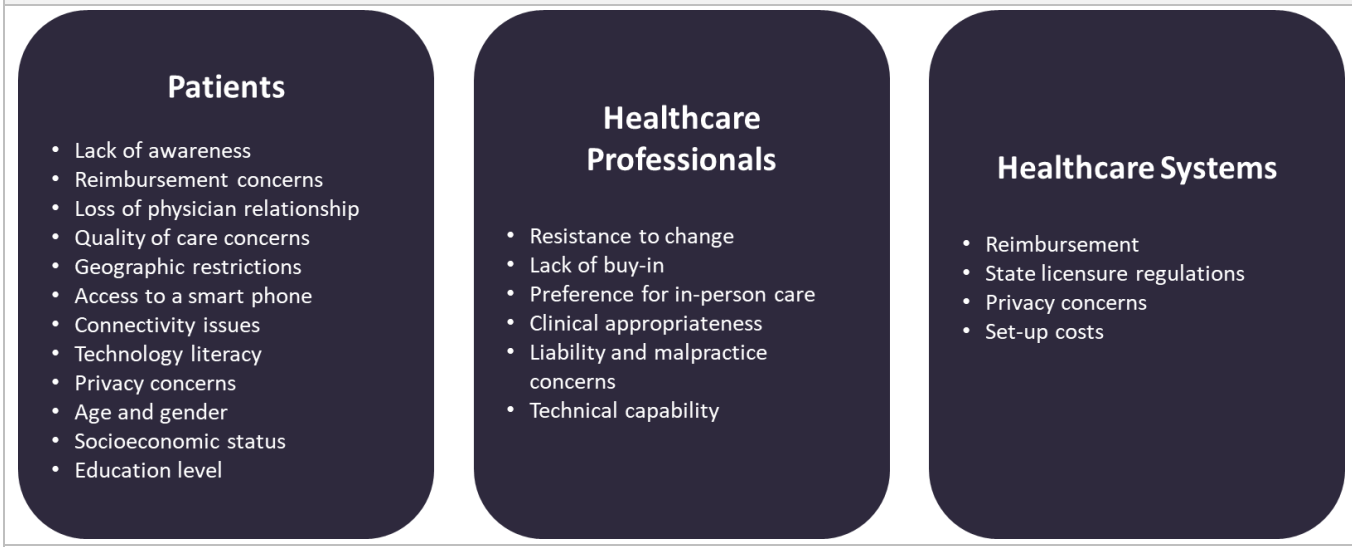
Virtual care and telemedicine services offer convenience and continuous patient engagement opportunities



Source: GlobalData

Virtual care and telemedicine market barriers

Virtual care and telemedicine services still suffer market penetration, user privacy, and regulatory concerns



Source: GlobalData

Timeline

The major milestones in the journey of the virtual care and telemedicine themes are set out in the timeline below.

The virtual care and telemedicine story

How did this theme get here, and where is it going?

Early 1990s	Telecommunication technologies evolve to the point where they are more available and affordable internet is born
1993	Founding of the American Telemedicine Association
1996	California State Senator Mike Thompson sponsors the state's Telemedicine Development Act of 1996
1997	The Balanced Budget Act of 1997 (BBA) mandates Medicare reimbursements for telehealth care and funding for telehealth demonstration projects
2009	ARRA drives digital connectivity in medical technology, and the number of connected devices exceeds the number of people on Earth
2010	The first Apple smartwatch is developed, and CMS rules on the meaningful use of EHRs
2014	The American Recovery and Reinvestment Act (ARRA) aims to provide additional funding towards incentives for adopting EMR systems
2016	The HRSA (Health Resources and Services Administration) receives funding to expand the use of telehealth in rural areas
2020	COVID-19 disrupts the entire healthcare system due to declines in patient visits to primary care physicians. EMR systems gain investment to facilitate healthcare needs and promote telehealth initiatives
2021	Wearable RPM devices become fully connected with EMR systems

Source: GlobalData

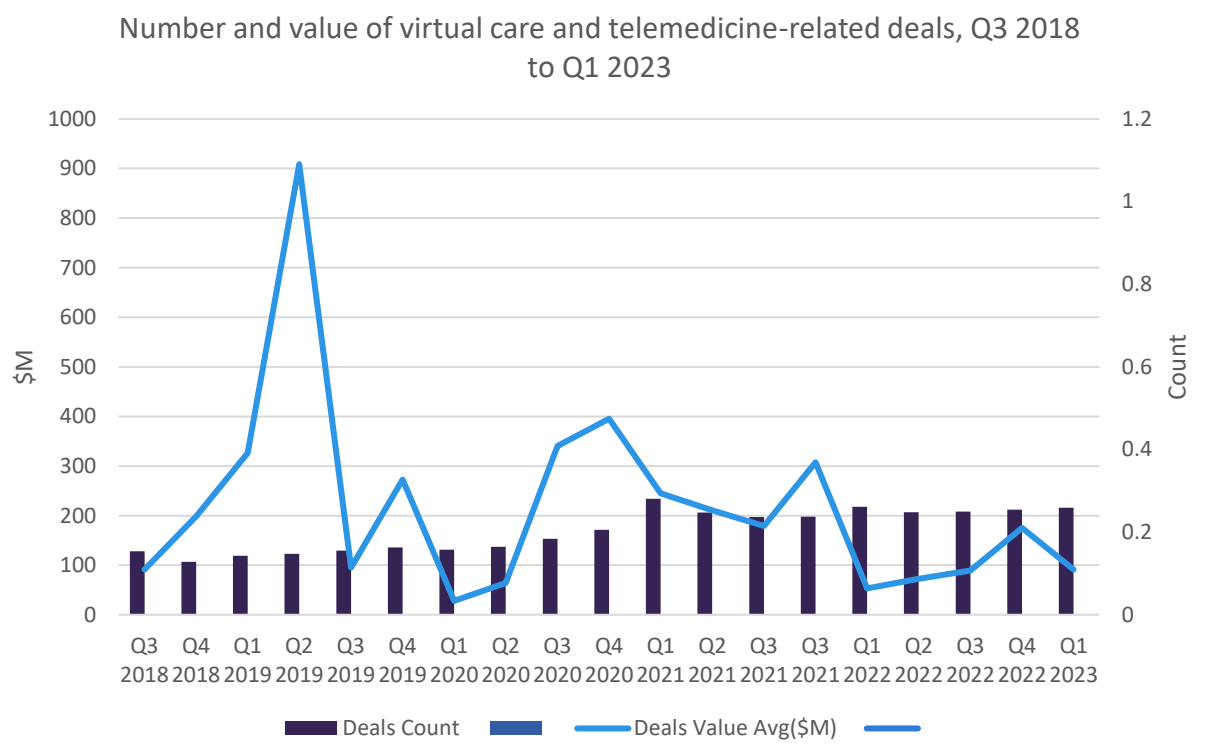
Signals

In this section, the 145 million signals generated by the thematic engine to predict how the virtual care and telemedicine theme will develop and who the likely leaders are. These signals are a useful source of competitor intelligence in the eSports market. Signals include mergers and acquisitions (M&A), venture financing deals, patents, company filings, hiring, and social media mentions.

M&A trends

These deals indicate the increasing maturity of the virtual care and telemedicine industry as providers aim to create comprehensive and integrated solutions that go beyond basic teleconsultations. The focus on chronic disease management, mental health, and holistic care demonstrates the industry's evolution towards addressing a broader spectrum of healthcare needs through virtual care platforms.

Virtual care and telemedicine-related M&A activity rebounded strongly post-COVID



Source: GlobalData

The key M&A transactions associated with the virtual care and telemedicine theme in the last three years since January 2021 are listed in the table below.

Date announced	Acquirer	Target	Value ($M)	Target company description
May 2023	Medtronic	EOFlow	738	Manufacturer of the tubeless, wearable, and fully disposable insulin delivery device

Date announced	Acquirer	Target	Value ($M)	Target company description
May 2023	Philips Healthcare UK	DIA Imaging Analysis	100	Developer of AI-powered software for improving ultrasound imaging analysis
May 2023	OrthoPediatrics	Medtech Concepts	15	A medtech company focused on diabetes healthcare
Apr 2023	Pfizer	Lucira Health	36	A biotechnology company
Mar 2023	Transcarent	98point6.	100	A digital care service
Feb 2023	GE HealthCare Technologies	Caption Health	Not disclosed	Medical technology manufacturer
Jan 2023	GE HealthCare Technologies	Imactis	Not disclosed	A medical technology manufacturing company
Dec 2022	Arraigo	Atrys Health	21	Provider of diagnostic services and precision medical treatment
Dec 2022	Olympus	Odin Medical	80	A cloud-AI endoscopy company
Dec 2022	Prenetics Global	ACT Genomics	60	A cancer solution provider
Dec 2022	PanGenomic Health	Mindleap Health	3	A biotechnology company
Oct 2022	Google	Sound Life Sciences	Not disclosed	A digital therapeutics company
Sep 2022	Biomed Industries	MedAware Systems	20	Biotechnology company
Sep 2022	CVS Health	Siginify Health	8,000	Healthcare platform
Aug 2022	908 Devices	TRACE Analytics	17	A provider of online analysis and sampling systems
Jul 2022	MGC Pharma (UK)	ZAM Software	1	A bio-pharma company
Nov 2022	ResMed	MediFox DAN	1,001	A company that specializes in the development of innovative software solutions and services for professional and non-professional care, therapeutic practices and child, family, and youth welfare facilities
Apr 2022	Pfizer Australia Holdings Pty	ResApp Health	116	A digital health company
Mar 2022	SD Biosensor	Bestbion dx	13	An *in vitro* diagnostic product distributor
Feb 2022	Dreamtech	Cardiac Insight	228	A digital healthcare company

Date announced	Acquirer	Target	Value ($M)	Target company description
Feb 2022	Omron	JMDC	974	A provider of medical statistics and data services
Dec 2021	Oracle	Cerner	29,600	A supplier company of health IT services
Nov 2021	Mirion Technologies	Computerized Imaging Reference Systems	54	A provider of medical imaging and radiation therapy
Oct 2021	Castle Biosciences	Cernostics	80	A life science company
Aug 2021	Hibercell	Genuity Science	100	A biotechnology company
Aug 2021	ModicCare	VRI Intermediate Holdings	315	A provider of RPM solutions
Jul 2021	AptarGroup	Voluntis	93	A medical software company
Jun 2021	Dentsply Sirona	Propel Orthodontics,	131	A manufacturer of orthodontic devices
May 2021	BICO Group	Visikol	20	A contract research services company
May 2021	Roman Health Ventures	Modern Fertility	225	A women's health company
Apr 2021	Humana	Kindred Healthcare	5,700	A post-acute healthcare services company
Apr 2021	Accolade	PlushCare	410	Telemedicine service provider
Apr 2021	WELL Health Technologies	ExecHealth	10	Provider of corporate and executive health, primary care, and integrated health services
Feb 2021	Hill-Rom	Earlysense	30	Provides patient monitoring solutions for the remote patient care market
Jan 2021	Boston Scientific	Preventice	1,225	Mobile healthcare care delivery and RPM solutions
Jan 2021	Philips	Capsule Technologies	635	Provider of medical device integration, clinical surveillance, and patient monitoring
Jan 2021	CareXM	Touchpointcare	Not disclosed	Provider of RPM and telehealth solutions for healthcare providers

Source: GlobalData

Venture financing trends

These venture finance deals highlight the significant investor interest in virtual care and telemedicine startups. The funding supports the development and expansion of innovative telehealth platforms, enabling improved access to healthcare services, enhanced patient experiences, and the advancement of technology in the field.

The key venture financing deals associated with the virtual care and telemedicine theme since January 2021 are listed in the table below.

Date announced	Company	Amount raised ($M)	Company description
Jun 2023	Alfie Health	2.1	A virtual obesity management platform
Jun 2023	Gleamer	29.55	A medical imaging company
Jun 2023	Flywheel Excahnge	54	The leading medical imaging data and AI platform
May 2023	Adaptive Phage Therapeutics	12	A clinical-stage biotechnology company
May 2023	Moon Surgical	55.4	A robotics company
Apr 2023	Shenzhen Zero One Life Technology	14.53	A high-tech firm dedicated to the application of human micro-ecological technology to develop solutions for a healthy life.
Apr 2023	Noah Medical	150	A medical robotics innovation company
Apr 2023	Distalmotion	150	A medical device company
Feb 2023	Cydar Limited	11.5	A global cloud-based surgical software
Feb 2023	Faro Health	20	A cloud-computing company
Jan 2023	Clearsense	50	A software company that provides healthcare analytics and data management solutions for patients and organizations
Jan 2023	Aluna	15.3	A lung health management platform
Jan 2023	Smile CDR	30	A health data fabric and integration platform
Jan 2023	Asimov	175	A synthetic biology company
Nov 2022	Bionaut Labs	43.2	A biotech company
Oct 2022	RapidSOS	75	A provider of an intelligent safety platform
Jul 2022	Cleerly	223	A digital health care company
Jun 2022	Aidoc	110	A provider of healthcare AI solutions

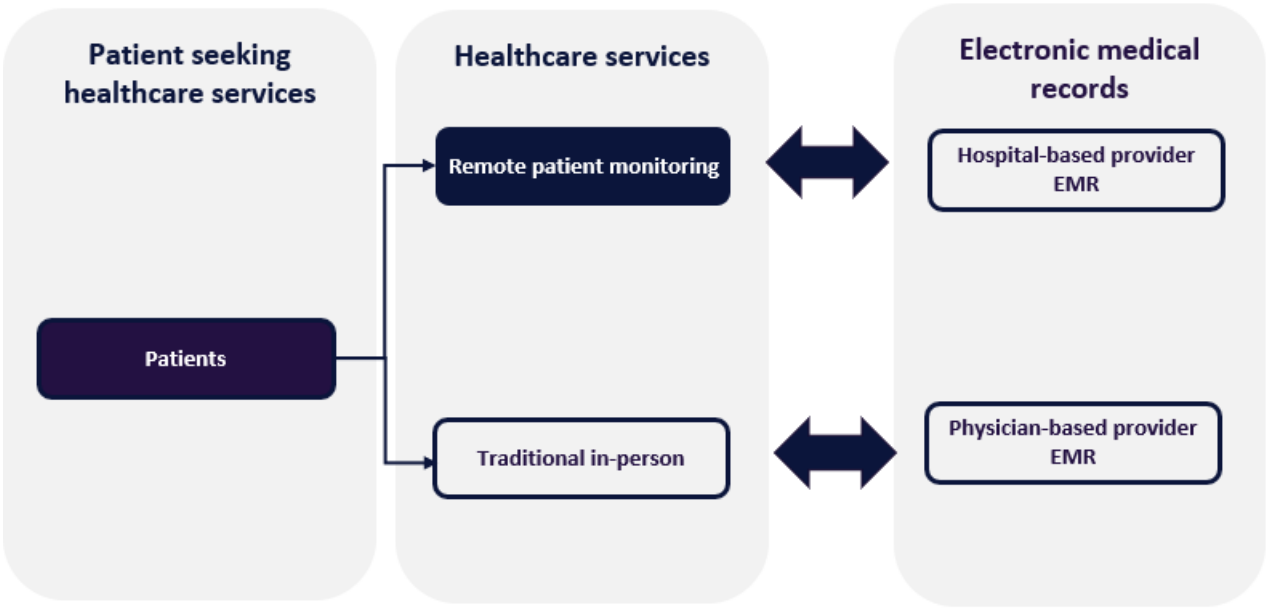
Date announced	Company	Amount raised ($M)	Company description
Jun 2022	Vayyar Imaging	108	Radar imaging sensor technology company
Apr 2022	Biofourmis Pte	300	A developer of an AI-enabled monitoring platform
Apr 2022	Reify Health	220	A cloud-based software company
Apr 2022	Viz.ai	100	An AI-powered disease detection and care coordination platform company
Apr 2022	BostonGene	150	A biomedical software company
Mar 2022	DNAnexus	200	Cloud-based biomedical data analysis software
Feb 2022	MindMaze	105	A digital neurotherapeutics company
Jan 2022	Iterative Scopes	150	A medtech company
Dec 2021	Iterative Scopes	140	A medtech company
Nov 2021	Owkin	180	An AI and precision medicine company
Oct 2021	Immunai	215	A biotech company
Oct 2021	Medable	304	A cloud platform
Jul 2023	eXo Imaging	220	A health information and device company
Jul 2023	Beijing Infervision Technology	139.1	A provider of AI medical imaging solutions
Jun 2021	CMR Surgical	600	A surgical robotics company
Jun 2021	InSilico Medicine	225	An AI-technology company
May 2021	PathAI	165	An AI-powered technology
Apr 2021	Exscientia	225	A clinical-stage pharmatech company
Mar 2021	GoForward	225	A healthcare system company
Jan 2021	Valo Health	190	A technology company

Source: GlobalData

Value Chain

The virtual care and telemedicine value chain contains three major segments where value can be added by innovative technologies. These segments are patient engagement, virtual healthcare services, and patient data.

The virtual care and telemedicine value chain



Source: GlobalData

The following sections, will look more closely at each segment of the value chain.

Patient seeking healthcare services

Convenient access to care and affordability are the two biggest factors involved in patient engagement with healthcare services. Barriers to patient access to healthcare often involve them not being able to physically access healthcare services due to factors such as distance or time and the fear of not being able to afford the services themselves. Innovative movements in the virtual care space involve subscription-based services that charge monthly fees or that offer very specific services, so patients don't pay for things they won't use. Through increasing patient engagement, care providers can build patient trust and loyalty, which ultimately will lead to greater patient retention.

Healthcare services

Healthcare services refer to a wide range of medical and non-medical activities, procedures, and interventions designed to promote, maintain, diagnose, treat, and rehabilitate individuals' health and well-being. These services encompass a broad spectrum of activities delivered by healthcare professionals, institutions, and organizations to address various aspects of health, from preventive care to specialized treatments. Healthcare services include Virtual Care and telemedicine, remote patient monitoring and traditional in-person services.

Remote patient monitoring

In the RPM market, key players are focused on launching new devices as well as forming strategic partnerships and taking part in M&A to strengthen existing product portfolios. For example, Philips strengthened its position as a leader in the RPM market by launching products to address unmet needs. In June 2020, the company announced its new obstetric monitoring solution for high-risk expectant mothers. This device provides clinicians with detailed, up-to-date information

on the health of the mother and fetus, providing peace of mind for the mother and allowing the clinician to remotely monitor for potential complications. In February 2021, the company completed the acquisition of BioTelemetry, a medical technology company that specializes in cardiac diagnostics and RPM services. This deal allowed Philips to expand its RPM business beyond hospitals and into patients' homes.

The virtual care and telemedicine value chain

Remote patient monitoring: leaders and disruptors

Source: GlobalData

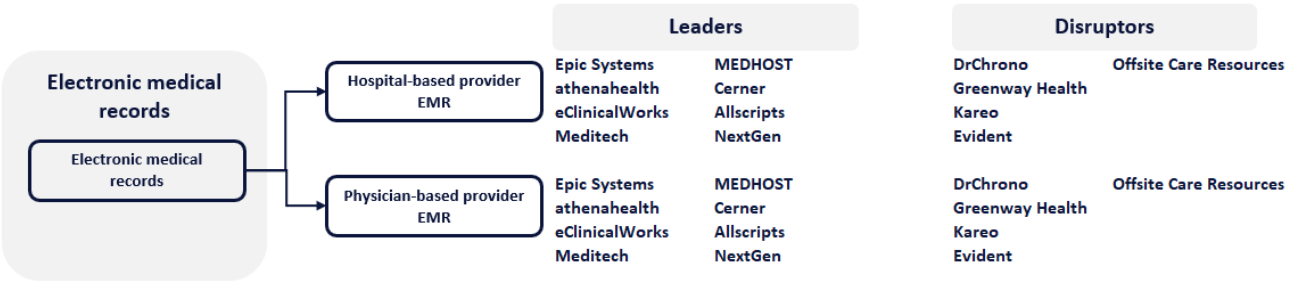
Electronic medical records

Tracking, storing, and leveraging patient data is critical to healthcare providers in modern healthcare systems. Hospital-based provider EMR and physician-based EMR solutions provide effective ways for providers to both store data and make it accessible to patients to support their health journeys. The data stored in EMRs can also be leveraged to support revenue cycle management, population health management, and cost containment measures, among many other uses. By leveraging patient data to its fullest, providers can increase their reimbursement, lower costs, reduce administrative burden, and eliminate redundant care. Solutions that naturally fit into hospital and physician-based provider workflows are going to have the sharpest competitive edge, as less time documenting means more time treating patients.

Hospital-based provider EMR and physician-based EMR solutions are prohibitively expensive for smaller healthcare organizations. However, new, more affordable options are entering the market that will help small hospitals and independent practices compete. One of the main differences in cost is determined by whether the EMR system is deployed on-premises or in the cloud. Cost-effective solutions are vital to competing in this fragmented and saturated market. While the US is a highly competitive market, there is opportunity for lightweight, innovative, and flexible EMR systems in developing countries all over the world.

The virtual care and telemedicine value chain

Electronic medical records: leaders and disruptors



Source: GlobalData

Companies

In this section, GlobalData highlights companies making their mark within the virtual care and telemedicine theme.

Public companies

The table below lists some of the leading players associated with this theme and summarizes their competitive positions.

Company	Country	Competitive position in the virtual care and telemedicine theme
Allscripts	US	Allscripts key solutions include EHRs, financial management solutions, population health management solutions, precision medicine, and consumer solutions. They serve retail pharmacies, pharmacy benefit managers, physicians, hospitals, governments, health systems, health plans, retail clinics, and post-acute organizations in North America, Asia, Australia, the Middle East, and the UK. Allscripts purchased McKesson's EMR technology in 2017 and holds prominent market share across both hospitals and physician practices with their offerings.
Amazom	US	Amazon offers a service known as Amazon Care for employers to offer their employees as a benefit, which allows users to access virtual urgent and primary care services. Amazon's huge penetration into the retail market affords it a powerful brand loyalty and trust benefit with users who will want to leverage this service through their employer. The service is not yet direct-to-consumer, which blunts some of this potential.
Amwell	US	Amwell is a telehealth company. The company offers an entire telehealth service through services, software, and clinical services accessible via mobile and web technology. It offers services such as breastfeeding support, psychiatry, urgent care, pediatrics, women's health, menopause counseling, menopause care, pregnancy and postpartum care, pregnancy and postpartum therapy, nutrition counseling, pregnancy and postpartum nutrition, and menopause nutrition. Amwell uses telehealth technology for personalized offerings, integration, mobile software development kits (SDKs), connecting and exchanging services for clients and partners, multi-way video calls, online scheduled doctor visits, providing insights, and data security. It offers services to various healthcare providers through telemedicine carts, hospital TV kits, touchpoint tablets, Tytocare, SDKs, peripherals, and kiosks across the US. American Well's telehealth offerings rank well in patient satisfaction, but the industry has become quite competitive due to the pressures of COVID-19. Price sensitivity from both providers and patients will dictate competitive dynamics moving out of the pandemic.
Boston Scientific	US	Boston Scientific is a medical technology company that develops, manufactures, and commercializes devices for a range of interventional medical specialties. They serve hospitals, clinics, outpatient facilities, and medical offices across the world. Boston Scientific offers a large suite of RPM solutions in the cardiovascular electrophysiology sector with technology to aid providers in managing patient data flow. The cardiovascular RPM sector is one of the biggest areas of expansion in order to allow providers to better manage a patient's chronic cardiovascular disease.

Company	Country	Competitive position in the virtual care and telemedicine theme
Cerner	India	Cerner offers a comprehensive range of solutions and services that assist the clinical, financial, and operational needs of organizations. Its major solutions include ambulatory, critical care, acute EHR solutions, women's health, customer relationship management, patient engagement, and revenue cycle management. Cerner is one of the major providers of hospital-based EMRs in the US. Their top position in this sector affords them brand recognition and trust from some of the biggest players in the healthcare space.
Medtronic	Ireland	Medtronic is a medical technology company that designs, develops, manufactures, and markets a wide range of medical devices and solutions for the treatment of heart valve disorders, heart failure, diseases of the coronary artery, aortic, peripheral vascular, venous renal, and neurological diseases, spine and musculoskeletal disorders, and diseases of the ear, nose, and throat. It serves hospitals, third-party healthcare providers, clinics, and institutions, including governmental health care programs, distributors, and group purchasing organizations in Asia-Pacific, Europe, the Americas, the Middle East, and Africa. Medtronic offers several RPM solutions in the cardiovascular space that enable patients to seamlessly stream their monitoring data to their provider from anywhere with a wi-fi or cellular connection, allowing flexibility for patients. Medtronic's vast array of medical devices positions them well to tap into any growing RPM field in the medical space.
NextGen	US	NextGen, formerly Quality Systems, provides tailored solutions to serve the needs of ambulatory and specialty practices of all sizes. NextGen offers specialty-specific EMR solutions that are fully cloud-enabled. This positions the company well with smaller and more specialized providers. Specialty and cloud-enabled solutions allow providers to scale with their needs. This position will need to be leveraged to compete against the enterprise-level top-tier players in this space.
One Medical	US	One Medical is a membership-based primary care offering that is engaged in providing healthcare services. One Medical provides both in-person and virtual care visits, for which it charges an annual fee to patients who wish to access the service. Through offering direct-to-consumer services, One Medical is well positioned to gain brand loyalty for both its in-person and virtual care offerings.
Philips	Netherlands	Philips is a diversified technology company that develops and manufactures medical systems and consumer electronics products. The company offers products and solutions in the areas of diagnostic imaging, enterprise diagnostic informatics, image-guided therapy, ultrasound, monitoring and analytics, sleep and respiratory care, population health management, connected care informatics, and therapeutic care. Philips offers technology that can help providers leverage RPM programs in oncology, cardiovascular, and orthopedic segments in order to provide value-based care and optimize revenue. With their deep expertise in various therapeutic areas, the services they offer are well positioned to meet the needs of the providers they serve.

Company	Country	Competitive position in the virtual care and telemedicine theme
ResApp Health	Australia	ResApp Health, formerly Narhex Life Sciences, is a digital health company that develops smartphone applications for the diagnosis and management of respiratory disease. Its digital healthcare solutions assist doctors and patients to diagnose and manage respiratory diseases. The company's products include SleepCheck, an at-home sleep apnea screening app for customers to self-assess their risk of sleep apnea, and ResAppDx-EU, a smartphone-based acute respiratory disease diagnostic test for respiratory disease in adults and children. ResApp has a license from the University of Queensland for technology that uses sound to diagnose respiratory diseases, including upper respiratory tract infections, bronchitis, pneumonia, asthma, and chronic obstructive pulmonary disease (COPD). Markets for ResApp's technology include emergency department and regular clinic use by healthcare providers, at-home use by consumers, and telehealth use through partnerships with telehealth service providers. ResApp offers a smartphone app that can diagnose respiratory disease and inform physicians of the diagnosis via telehealth. Reliable remote diagnostic technologies are well positioned as the telehealth sector continues to grow.
Teledoc Health	US	Teladoc is a provider of virtual healthcare services for wellness, the prevention of acute care, and complex healthcare needs. It offers primary care services for managing chronic conditions, mental health guidance, personalized digital healthcare solutions, and virtual access with experts specializing in episodic needs such as flu and upper respiratory infections, cancer, and congestive heart failure. Teladoc Health utilizes an application programming interface (API)-driven technology platform for virtual healthcare delivery with multiple real-time integrations across the healthcare ecosystem. The company serves public and private sector employers, hospitals, insurance companies, and health plan clients. Teladoc leads the way in the telehealth explosion due to the COVID-19 pandemic.
Zoom	US	Zoom is an enterprise video communications provider. The company provides a cloud platform for chat, audio and video conferencing, and webinars across desktop, mobile, and room systems. It offers telehealth, Zoom rooms, business instant messaging (IM), a developer platform, and H.323/SIP Connectors. Zoom also provides the Zoom Developer Platform, OnZoom, and Zoom App, which feature various applications and bots. The company caters its products and services to the healthcare, government, education, and finance sectors. It operates in Australia, Canada, China, Germany, Hong Kong, Japan, Singapore, the Netherlands, the UK, and the US. Zoom is well positioned in the virtual care and telemedicine space due to its full suite of virtual communications solutions. While Zoom offers telehealth capabilities, it also offers a deeper suite of communications solutions that can serve the healthcare provider and payer spaces.

Source: GlobalData

Private companies

The table below lists some interesting private companies associated with this theme and summarizes their competitive positions.

Company	Country	Competitive position in the virtual care and telemedicine theme
98point6	US	98point6 offers on-demand diagnosis, treatment, and consultation from board-certified physicians through their messaging-based mobile app (98point6). It allows users to get text-based primary care from the network of doctors in real-time. Asynchronous and 24/7 access digital health ecosystems have the capacity to increase patient loyalty and engagement and are expected to be attractive areas of growth in the healthcare sector over the next few years.
A&D Medical	Australia	A&D Medical is engaged in the manufacturing and distribution of a wide range of highly accurate and reliable blood pressure monitors and health-related products. A&D Medical offers a suite of connected devices to allow for at-home monitoring of vital health parameters. Their solution suite allows users to track their weight and blood pressure from home and increases patient engagement with their physician as needed. Simple offerings such as these packages are poised to become more important as population health management and value-based care initiatives become more common.
Alcuris	UK	Alcuris is a developer of integrated technological solutions for the healthcare sector and provides real-time information. Alcuris offers its Connect platform to allow caretakers and providers to monitor patients with Alzheimer's disease and other older patients in order to track care delivery and behavioral anomalies. Aging in place and care in the home setting are becoming increasingly hot topics in healthcare. Solutions such as Alcuris's Connect are well poised to tap into this growing space to provide superior care in the home setting.
AMC Health	US	AMC Health is a company that provides continuous visibility into an individual patient's health status by connecting patients to their clinical team on a real-time basis and expanding their care beyond the walls of hospitals, doctors' offices, and outpatient settings. Their strategy includes offering both RPM and telehealth services to health providers in order to increase their efficiency in treating patients and reduce readmissions. Competitors that focus on the provider space will need to ensure they focus on increasing provider efficiency and helping increase overall care quality.
athenahealth	US	Athenahealth is a provider of cloud-based business services and mobile applications for medical groups and health systems. The company offers network-enabled services for revenue cycle management and medical billing, EHRs, patient engagement, population health management, and care coordination, as well as Epocrates and other point-of-care mobile applications. It offers industrial solutions to medical groups and practices, hospitals and health systems, medical specialties, federally qualified health centers, accountable care organizations, academic medical centers, community hospitals, and for starting a medical practice. Athenahealth is a major provider of EMR solutions in the physician practice-based setting and offers a solution that is cloud-based and enables care coordination.

Company	Country	Competitive position in the virtual care and telemedicine theme
AMD Global Telemedicine	US	AMD is a cloud-based telemedicine platform that provides virtual care technology and telemedicine products. It offers medical cameras and scopes, stethoscopes, spirometers, colposcopes, and dental cameras. AMD offers telehealth-based solutions for both the post-acute care clinical setting and the direct-to-consumer digital setting. While the rapid growth of telehealth has ended, solutions that offer patients and providers a wide variety of telehealth options can build brand loyalty as the space becomes more competitive over time.
BetterHelp	US	BetterHelp is a healthcare technology company. It offers an online e-counseling platform that provides direct-to-consumer access to mental health services. Providers that offer focused and specialized care are capable of building brand trust and loyalty during the pandemic, which could be an asset in a post-pandemic world when competition in the space is expected to heat up.
Biotronik	Germany	Biotronik is a medical device company that develops, manufactures, and distributes cardiovascular and endovascular solutions. The company's cardiac rhythm management solutions include implantable devices, leads, accessories, and external devices to treat and manage arrhythmia-related diseases. Biotronik offers a suite of home monitoring platforms that are capable of pulling data from all of its implantable devices. Coupled with trusted medical devices, the capacity to integrate RPM programs post-implantation is a differentiation factor for Biotronik. Their specialty focus in the cardiovascular space allows them to draw on provider trust in their implantable devices.
CaptureProof	US	CaptureProof offers a smart medical camera app that facilitates visual asynchronous communication between a medical patient and their healthcare provider. The app utilizes advanced computer vision in the live camera of the mobile device, which enables users to share clinical images and videos of their health symptoms with the practitioners and tracks the patient's progress from remote locations. Asynchronous solutions, such as those offered by CaptureProof, are expected to tap into the growing RPM and telehealth markets. Providers need ways to expand their reach beyond the walls of their hospitals and clinics and will need to turn to similar solutions to continue to keep patient engagement high.
CareCenter Software	Austria	CareCenter Software is a provider of software solutions for players in the healthcare space. It offers solutions for inpatient, rehabilitation, disability, telehealth, and outpatient care settings. Aging populations and a growing demand for aging in place are expected to spur growth with solutions that allow patients to monitor and share their vitals with healthcare providers from their own homes. Solutions that only monitor a few basic vital parameters, such as weight and blood pressure, run the risk of competing against more sophisticated solutions that can measure additional vitals for providers to track.

Company	Country	Competitive position in the virtual care and telemedicine theme
Cleveland Clinic	US	The Cleveland Clinic is a non-profit, multi-specialty medical organization providing clinical and hospital care services. It operates through a network of hospitals and clinics. Cleveland Clinic's network of facilities includes regional hospitals, regional care centers, a children's hospital, research labs, and facilities for pathology and cancer, eye, heart, and urologic care. Cleveland Clinic has various specialty and sub-specialty departments, providing services in the areas of dermatology, oncology, pediatrics, pain management, ophthalmology, orthopedics, and respiratory, among others. It has a presence in Florida and Nevada, the US, Canada, and Abu Dhabi, the UAE. Cleveland Clinic is a world-renown provider of top-tier healthcare, and they offer their virtual services through their telehealth platform, Cleveland Clinic Express Care. The Cleveland Clinic is well positioned to compete in the telehealth space post-pandemic due to the awareness of their brand around the world and their network of provider locations.
Crossover Health	US	Crossover Health delivers workplace healthcare services to employees and employers. The company offers a variety of primary, urgent, and online care services, including urgent care, chronic disease management, preventive care, health risk assessment, health coaching, health education biometrics, physical therapy, acupuncture, chiropractic, optometry, travel vaccines, weight management, care coordination, health analytics, and remote care. Digital ecosystems that allow patients to seek timely and convenient care are in high demand due to COVID-19 and are expected to remain popular in a post-pandemic world.
curai	US	Curai is a company based in the US that uses AI and machine learning to provide instant medical expertise to its users. The platform leverages a subscription model with a monthly fee to give users access to primary care and prescription renewal services. Competitors such as this will see increased competition post-pandemic.
Doctor On Demand	US	Doctor On Demand operates an online health platform that allows patients to connect, schedule visits, and consult US-licensed healthcare providers, psychologists, and doctors over their smartphone, tablet, or computer. It offers solutions for employers, retail clinics, health systems, and health plans. Doctor on Demand is a major player in the telehealth space and has capitalized on the explosive growth of this sector during the COVID-19 pandemic. As market growth begins to decline, the field is expected to see fierce competition, where brand loyalty and market share will be important differentiators when integrating with healthcare providers.
DrChrono	US	DrChrono provides an EHR platform for physicians and patients. The platform offers cloud-based scheduling, clinical documentation, a patient portal, and billing software. DrChrono is a smaller player in the EMR space but offers a cloud-based and mobile-enabled platform that comes equipped with several tiers of service plans. With the high level of EMR adoption, especially in the US, price points will drive EMR decisions in the wake of the 21st Century Cures Act interoperability mandate.
EarlySense	US	EarlySense is the global leader in contact-free, continuous monitoring solutions for the healthcare continuum. EarlySense offers a contact-free, telehealth-enabled platform to collect patient biometric data remotely. Solutions that can easily integrate into the home environment tap into both the growing RPM market as well as the aging at home market.

Company	Country	Competitive position in the virtual care and telemedicine theme
eClinicalWorks	US	eClinicalWorks is a provider of ambulatory healthcare IT solutions. The company provides solutions for practice management, revenue cycle management, population health, and patient engagement. Its major products include eClinicalWorks HEDIS, a tool for population health planning; eClinicalWorks RCM, a solution for revenue cycle management; and Healow, a patient engagement solution. The company offers its products to accountable care organizations, physician practices, community health centers, hospitals, departments of health, and convenient care clinics. eClinicalWorks has solid penetration into the US physician practice-based EMR market.
Emedical Sentry	US	E-Medical Sentry is a provider of RPM services post-discharge. Emedical Sentry offers a connected healthcare solution to monitor a patient's health from their own home and is not confined to a single condition. With trends moving towards aging in place and care at home, solutions such as this are well positioned to tap into several growing markets and provide superior health outcomes.
Epic Systems	US	Epic Systems provides clinical systems for doctors, nurses, emergency personnel, and other care providers; ancillary systems for lab technicians, pharmacists, and radiologists; and billing systems for care providers and insurers. It also provides services such as implementation, optimization, and training. Epic's MyChart provides shared medical records to patients. Epic offers its software to mid-size and large medical groups, hospitals, and integrated healthcare organizations. Epic Systems is one of the biggest providers of EMR solutions in both the hospital-based and physician practice-based provider spaces. With top-tier brand recognition in the sector, coupled with patient engagement solutions, Epic is strongly positioned to continue as a sector leader in the EMR space.
Evident	US	Evident offers an EMR solution specifically for community hospitals and clinics. Evident is a small player in the US EMR market, but they have focused on integrating interoperability capabilities, and as the market moves towards this way of operating, they could see an early mover advantage.
EvoCare	Germany	EvoCare is a provider of digitalized medical treatment. The company offers evaluated treatment procedures with electronic therapy contents and treatment processes. Digital health ecosystems that increase patient engagement and shift the care setting from health facilities to the home are well positioned to capitalize on aging populations and increases in chronic health conditions. EvoCare offers a solution that allows providers to extend their reach to patients, an important element in controlling costs and increasing patient engagement.
Forefront Telecare	US	Forefront Telecare is a provider, based in the US, of behavioral telehealth to vulnerable seniors in rural facilities. Behavioral health is one of the fastest-growing subsectors of telehealth. Platforms that support extending the reach of behavioral and mental health treatment are well positioned to see growth due to growing demand for these services.
Greenway Health	US	Greenway Health is a provider of health information technology (HIT) and services. Through its EHR and practice management solutions, the company provides clinical insights to healthcare providers to deliver personalized medication and care to their patients. Greenway Health offers specialty-specific ambulatory EMR solutions. While a small player in the space, the 21st Century Cures Act interoperability mandate could be an opportunity to expand their footprint.

Company	Country	Competitive position in the virtual care and telemedicine theme
Greybox Solutions	Canada	Greybox Solutions is a provider of a healthcare platform that offers personal human coaching between patients and healthcare professionals. Aging populations are expected to drive the prevalence of chronic conditions. Solutions, such as Greybox's TakeCare, allow providers to efficiently manage their patients care without requiring them to constantly visit healthcare facilities. This allows care quality to be monitored closely while also reducing the burden on physical healthcare facilities.
Health Management	US	Health Management (LiveHealth Online) is a provider of on-demand medical or urgent care for non-emergency conditions. LiveHealth charges no monthly fees and is free to sign up for. Instead, they charge a per-visit fee, which could be attractive to many patients who only seek care occasionally.
HealthTap	US	HealthTap is an online platform that connects people looking for health information to a network of doctors. The company offers HealthTap SOS, which provides organizations and population managers with immediate access to doctors when a disaster occurs anywhere in the world, and HealthTap Global Rounds, which allows doctors to learn and earn continuing medical education (CME) credits by answering patient questions or discussing interesting medical cases shared by other doctors or patients. It also offers HealthTap HOPESTM, a health operating system for hospitals and clinics worldwide, which streamlines and simplifies the process of administering and receiving care. The company enables medical students to review health questions and craft personalized answers, which get reviewed by experienced doctor-mentors and provide feedback. HealthTap's telehealth solutions cover a wide variety of treatment areas, such as urgent care and behavioral health, and accept patients health insurance. Direct-to-consumer offerings such as this are expected to create a convenient avenue for patients to seek out healthcare, which will build brand loyalty. Platform familiarity and trust will be important as the telehealth competition becomes fiercer in a post-pandemic world.
HelpWear	Canada	HelpWear is a provider of accessible, better at-home healthcare products for patients all over the world. It offers a product, the HeartWatch, that provides 24/7 heart monitoring at home, detects heart attacks, and contacts emergency medical services (EMS). The company's product records cardiovascular data on the device for review. HelpWear works in collaboration with various technical groups and clinical and academic organizations. The HeartWatch is a wearable that can enable increased patient engagement with healthcare services and help individuals prevent adverse health outcomes due to heart disease. Heart disease is a very common chronic condition, but single-disease wearable devices could run into difficulty justifying their value in remote monitoring programs.
iCliniq	India	iCliniq offers a digital medical second opinion service. They provide access to physicians all over the world and are well positioned to greatly increase patient access to quality healthcare in a variety of healthcare markets.

Company	Country	Competitive position in the virtual care and telemedicine theme
Inhealthcare	UK	Inhealthcare is a digital health technology provider. Its digital health platform enables healthcare providers to monitor remote patient information. The platform also enables clinicians to build digital services and supports connections to primary, secondary, and community care systems via telephone, email, and text. Its digital health services include type 2 diabetes, mental health, medication reminders, international normalized ratio (INR) self-testing, undernutrition, chronic pain, weight management, and a surgical outcome tracker. Inhealthcare's offering is well positioned for growth due to aging populations and increases in chronic conditions that need to be managed. The platform's capacity to be customized for particular patient needs is a powerful differentiator.
Kareo	US	Kareo provides a cloud-based medical technology platform that meets the needs of healthcare providers. The company offers a cloud-based EHR that helps clinicians manage patient care and records and access required information at the point of care. It also provides medical billing services with a cloud-based billing module that enables healthcare providers to get paid faster. In addition, the company offers practice management, patient engagement, telemedicine, analytics, and billing company software. These services are offered to doctors, practice managers, and billing companies. Kareo offers an EMR platform specifically designed for independent practices. Kareo operates in a crowded field but has been in the EMR business since 2004 and can demonstrate expert knowledge for the clients they serve.
LindaCare	Belgium	LindaCare is a software company specializing in the field of tele-monitoring solutions for chronic cardiovascular disease patients. LindaCare's OnePulse offering can integrate with EMRs and all major implantable devices. The ability to work across different types of devices is a powerful advantage in the creation of an effective provider RPM program to manage chronic cardiovascular disease.
Maven Clinic	US	Maven Clinic provides a digital care platform for women. Its platform provides a network of doctors, nurse practitioners, mental health providers, and specialists in all areas of women's and children's health and enables women to connect with them directly through video appointment or private message. The company also offers the Maven Maternity Solution, which supports parents from conception through pregnancy, postpartum, and back to work, thus helping companies reduce maternity costs. Specialties focused on the digital health space will help companies such as Maven Clinic build trust within their patient pool to be able to offer the highest quality of care.
MDLIVE	US	MDLIVE (formerly MDLiveCare) is a telehealth provider of online and on-demand healthcare delivery services. They are one of the major players in the explosive telehealth market, and this market penetration is expected to help them in the post-pandemic competition that will result from a market contraction.

Company	Country	Competitive position in the virtual care and telemedicine theme
Medhost	US	Medhost is a healthcare technology company that offers healthcare delivery solutions. The company offers an enterprise EHR, a financial suite of applications, and workflow-enabled revenue cycle and patient access solutions. It provides integration, marketing, and hosted and managed services that offer tools, processes, and professional expertise to manage the complexities of the HIT environment. Medhost's enterprise EHR provides a solution that complements physician and administrative capabilities and workflow. The company caters to multi-facility health systems, rural health, and a range of specialty and post-acute care facilities. Medhost has significant penetration into the hospital-based EMR market but lags far behind the largest players in this space. The US interoperability mandate could be an opportunity to increase their market share with price points that are attractive to hospitals and health systems that have been hurt financially due to COVID-19.
Meditech	US	Meditech is a HIT solutions provider. The company develops, manufactures, licenses, and supports computer software products for the hospital market. Meditech has significant penetration into the US hospital-based EMR market.
MeMD	US	MeMD is a telehealth company that helps connect patients seeking care for minor medical issues or behavioral health concerns with licensed medical providers. MeMD offers patient-based solutions and telehealth integration with businesses to help reduce their healthcare costs. MeMD offers a wide variety of treatment areas and is well positioned to innovate in the telehealth space post-COVID-19. Competition is expected to be fierce in a post-pandemic world, and players who have built enough trust and convenience for their patients will reap high market shares.
OffSite Care Resources	US	OffSite Care Resources is a healthcare company that specializes in cloud-based EHR solutions. Like other smaller players in this space, OffSite Care could have issues increasing market share in a crowded market. They have, however, focused on interoperability as a key feature in order to allow providers to establish a health information exchange.
Orbbec 3D	US	Orbbec 3D is a designer and manufacturer of 3D sensors capable of detecting patient falls, tracking in-home rehabilitation, and monitoring patient behavior. Aging in place and care in the home setting could drive increased demand for devices and solutions such as those that Orbbec offers.
PlushCare	US	PlushCare is a telemedicine service provider. Its mobile application allows patients to book appointments and contact physicians over the phone for diagnosis and treatment. It offers treatment and testing for colds and flu, sinus infections, allergies, pink eye, sore throat, strep throat, ear infections, and bronchitis. PlushCare operates in the US. PlushCare leverages a membership model to access their services, which could be leveraged to build brand trust and loyalty if executed correctly.

Company	Country	Competitive position in the virtual care and telemedicine theme
Practo Technologies	India	Practo Technologies operates an online platform that enables users to book appointments with doctors and diagnostic labs. It also enables posting health-related queries to doctors and obtaining tips from health experts. The company offers a suite of software products that help healthcare providers digitize and deliver efficient and higher-quality healthcare services to their patients. Its product portfolio includes Practo Consult, Practo Health Feed, Practo Profile, Practo Pro App, Ray by Practo, Practo Reach, and Practo Prime, among others. Technologies that increase patient access to healthcare are expected to be in great demand as the pandemic carries on and healthcare is top of mind for most people.
Seamless Mobile Health	Canada	Seamless Mobile Health is a technology company based in Canada. The company offers a cloud-based digital patient engagement platform that allows hospitals to educate, engage, and monitor patients digitally. This solution offers a different take on RPM. Rather than just ingesting biometric data, the patient can record qualitative information about their wellbeing, such as pain or wound healing. Solutions that enable patients to engage more seamlessly with their care providers are well positioned for growth as digital technologies continue to empower patients to drive their own health outcomes.
Senseonics	US	Senseonics is a medical technology company. The company designs, develops, and commercializes glucose monitoring systems to improve the lives of patients with diabetes. It offers a continuous glucose monitoring system, a sensor, a smart transmitter, and a data management system. Senseonics continuous glucose monitoring system measures interstitial fluid glucose levels in adults with diabetes for the operating life of the sensor. Devices and solutions that can continuously monitor chronic conditions instead of providing snapshots in time are going to be important players in the management of aging population health and chronic condition management.
SnapMD	US	SnapMD provides a telemedicine platform. The company offers software and services for healthcare providers to improve care. Its platform also allows providers to extend their reach of care by leveraging secure live video consultations between patients and their care physicians. It also enables healthcare providers to engage patients in a virtual care environment by conducting virtual consultations for patients receiving ongoing treatment and on-demand consultations. They are well positioned to capitalize on the growing demand for patients to seek convenient and effective care and for providers to extend the reach of their care beyond their facilities.
Spacelabs Healthcare	US	Spacelabs Healthcare, a subsidiary of OSI Systems, is a medical device company that develops, manufactures, and markets monitoring, diagnostic, and clinical information systems. The company offers products such as patient monitoring and connectivity, diagnostic cardiology, and anesthesia delivery and ventilation products. Its patient diagnostic cardiology products comprise connectivity, holter analyzers and recorders, stress testing, event recording, resting electrocardiogram (ECG), ambulatory blood pressure (ABP) monitoring, and supplies and accessories. Cardiac home monitoring solutions offered by Spacelabs Healthcare allow providers to extend their care of heart disease patients into the home setting to avoid as many trips to the clinic and hospital as possible. Shifting care settings to the home is expected to drive further demand for products such as this.

Company	Country	Competitive position in the virtual care and telemedicine theme
SteadyMD	US	SteadyMD is a provider of a technology platform that allows collaboration between patients and doctors through web, mobile, phone, text, and video chat interfaces. Their solutions cover patient access to quality digital healthcare and also help support healthcare providers who need to augment their telehealth and expertise capabilities. Unique solutions that manage the technology and healthcare training behind the telehealth services that patients see are a powerful way to compete in a post-pandemic world.
Ventrix Technologia	Brazil	Ventrix Technologia is a developer and marketer of software solutions for the healthcare industry based in Brazil. They offer CardioFit, a remote ECG monitoring solution. The solution allows patients to submit reports to care providers from wherever they are. This is 100% produced locally in Brazil, but outside of the country it will face strong competition.
Virtuwell	US	Virtuwell is a telehealth company that offers telehealth services through mobile and web technology. Its platform provides access to a 24-hour digital clinic to give patients personalized healthcare services. Virtuwell charges a fee per visit, with questions and follow-ups included in the price. Convenient healthcare and predictable charges will help Virtuwell gain brand trust and loyalty in a post-pandemic market.
VitalConnect	US	VitalConnect is a provider of medical devices and healthcare solutions. The company offers solutions for hospital monitoring, post-discharge monitoring, RPM, and clinical trials. VitalConnect's biosensor device, VitalPatch, monitors the critical vitals of patients and keeps track of their health condition. VitalConnect offers the capability to monitor multiple parameters in real time via a single wearable patch. The solution is telehealth-enabled to ensure timely interventions in the case of an adverse health outcome. Aging in place is likely to drive increased demand for products in this space.
Vivify Health	US	Vivify Health is a provider of remote care management and patient engagement for better outcomes and ROI. It provides a cloud-based platform that delivers a pathway to holistic remote care management. Vivify Health's platform allows providers to manage their RPM programs in order to customize the platform to meet their patients' needs. Platforms that can manage entire RPM programs are expected to grow as RPM becomes increasingly relied upon by providers.

Source: GlobalData

Sector Scorecard

At GlobalData, we use a scorecard approach to predict tomorrow's leading companies within each sector. Our sector scorecards have three screens: a thematic screen, a valuation screen, and a risk screen.

For a full explanation of thematic scoring, please refer to the methodology section at the back of this report.

Medical devices sector scorecard

Who's who

Who does what in the medical devices space?

Medical Devices
(34 companies)

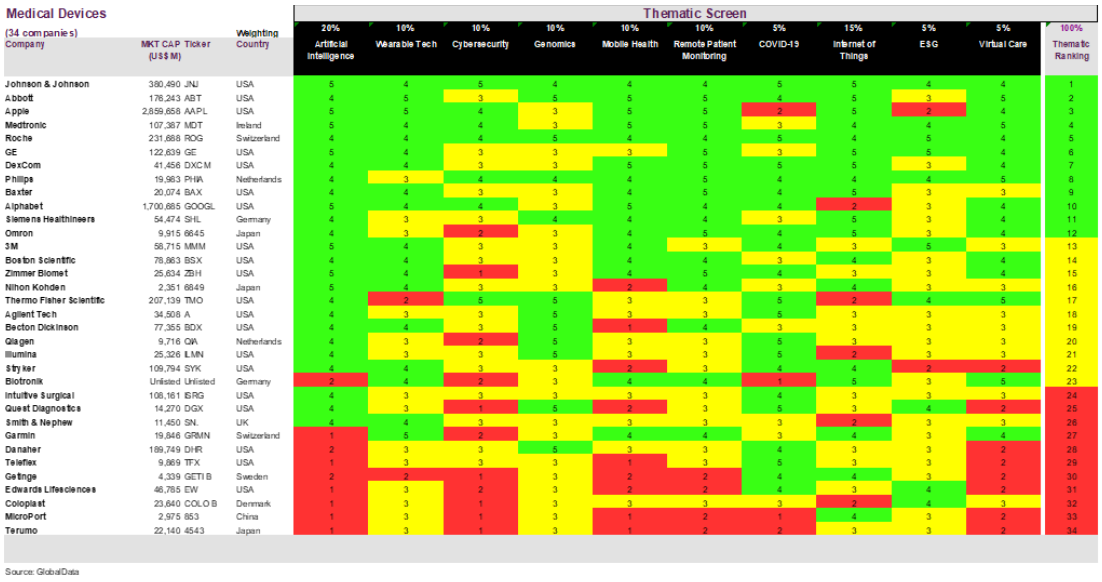
Company	Ticker	Sector	MKT CAP (US$ M)	Country	Description
Apple	AAPL	Mobile phones	2,859,858	USA	Internet ecosystem monetised by the sale of proprietary hardware (smartphones and computers)
Alphabet	GOOGL	Internet ecosystems	1,700,885	USA	Internet ecosystem monetised by advertising, primarily through the Google search engine
Johnson & Johnson	JNJ	Pharmaceuticals	380,490	USA	Researches, develops, manufactures and sells pharmaceutical products, medical devices and consumer products.
Roche	ROG	Medical Supplies	231,688	Switzerland	Biotechnology company that develops drugs and diagnostics to treat major diseases.
Thermo Fisher Scientific	TMO	Medical Equipment	207,139	USA	Develop therapeutic and diagnostic medical products for heart and movement conditions
Danaher	DHR	Industrial conglomerate	189,749	USA	Manufacturer of medical, professional, commercial and industrial products.
Abbott	ABT	Medical Equipment	176,243	USA	Designs, manufactures and markets medical products relational to orthopedic and surgical products
GE	GE	Industrial conglomerate	122,639	USA	Industrial conglomerate
Stryker	SYK	Surgical robots	109,794	USA	Manufacturer of robotic orthopedic solutions
Intuitive Surgical	ISRG	Surgical robots	108,161	USA	Manufacturer of surgical robotic systems
Medtronic	MDT	MedTech	107,387	Ireland	Developer of therapeutic and diagnostic medical products
Boston Scientific	BSX	Medical Equipment	78,883	USA	Provide medical tech for imaging, lab diagnostics and reading solutions for health care applications
Becton Dickinson	BDX	Medical Equipment	77,355	USA	Manufactures eyecare products
3M	MMM	Medical Equipment	58,715	USA	Technology company that creates electronic devices and products
Siemens Healthineers	SHL	Health Care Providers	54,474	Germany	Provider of medical solutions
Edwards Lifesciences	EW	Medical Supplies	46,785	USA	Develops, manufactures and markets products for chronic acute medical conditions
DexCom	DXCM	Medical Supplies	41,456	USA	Develops and markets advanced medical devices such as orthopaedics, endoscopy and wound management
Agilent Tech	A	Measurement equipment	34,508	USA	Manufacturer of bioanalytical and measurement systems
Zimmer Biomet	ZBH	Medical Equipment	25,634	USA	Develop, manufacture and market specialty surgical products including navigation
Illumina	ILMN	MedTech	25,326	USA	Manufacturer of life science equipment used for gene sequencing
Coloplast	COLO B	Medical Supplies	23,640	Denmark	Provides diagnostic, detection and information systems for veterinary food and water testing applications
Terumo	4543	Medical Equipment	22,140	Japan	Manufactures products for ostomy, incontinence, mastectomy, wound healing and skin care
Baxter	BAX	Medical Supplies	20,074	USA	Offers diagnostic services for human infusion, respiratory therapies, ultrasound and echo cardiography
Philips	PHIA	MedTech	19,983	Netherlands	Manufacturer of medical systems and lighting products (sold its TV and consumer businesses in 2013)
Garmin	GRMN	Wearable tech	19,846	Switzerland	Manufacturer of navigation and comms devices - esp. GPS
Quest Diagnostics	DGX	Medical Equipment	14,270	USA	Provider of diagnostic information services to patients and physicians
Smith & Nephew	SN.	Medical Equipment	11,450	UK	Develops, produces and sells personal care products
Omron	6645	Robotic components	9,915	Japan	Manufacturer of electronic components, equipment and systems used for factory automation.
Teleflex	TFX	Medical Supplies	9,869	USA	Develops, produces and sells dental implants that are implantable in the jaw
Qiagen	QIA	Medical Supplies	9,716	Netherlands	Global provider of sample to insight solutions to transform biological materials into valuable molecular sights
Getinge	GETI B	Medical Equipment	4,339	Sweden	Produces and sells medical products for the treatment of neurological disorders
MicroPort	853	Medical equipment	2,975	China	Medical device developer and manufacturer
Nihon Kohden	6849	Medical Equipment	2,351	Japan	Develops, manufactures and sells medical equipment
Biotronik	Unlisted	Medical equipment	Unlisted	Germany	Biomedical technology company

Source: GlobalData

Source: GlobalData

Thematic screen

Our thematic screen ranks companies based on overall leadership in the 10 themes that matter most to their industry, generating a leading indicator of future performance



Medical Devices
(34 companies)

Company	MKT CAP (US$ M)	Ticker	Country	Weighting	Artificial Intelligence 20%	Wearable Tech 10%	Cybersecurity 10%	Genomics 10%	Mobile Health 10%	Remote Patient Monitoring 10%	COVID-19 5%	Internet of Things 15%	ESG 5%	Virtual Care 5%	Thematic Ranking 100%
Johnson & Johnson	380,490	JNJ	USA		5	4	5	4	4	4	5	5	4	4	1
Abbott	176,243	ABT	USA		4	5	3	5	5	5	4	5	3	5	2
Apple	2,859,658	AAPL	USA		5	5	4	3	5	5	2	5	2	4	3
Medtronic	107,387	MDT	Ireland		5	4	4	3	5	5	3	4	4	5	4
Roche	231,688	ROG	Switzerland		4	4	4	5	4	4	5	4	5	4	5
GE	122,639	GE	USA		5	4	3	3	3	5	3	5	5	4	6
DexCom	41,456	DXCM	USA		4	4	3	3	5	5	5	5	3	4	7
Philips	19,983	PHIA	Netherlands		4	3	4	4	4	5	4	4	4	5	8
Baxter	20,074	BAX	USA		4	4	3	3	4	5	4	5	3	3	9
Alphabet	1,700,685	GOOGL	USA		5	4	4	3	5	4	4	2	3	4	10
Siemens Healthineers	54,474	SHL	Germany		4	3	3	4	4	4	3	5	3	4	11
Omron	9,915	6645	Japan		4	3	2	3	4	5	4	5	3	4	12
3M	58,715	MMM	USA		5	4	3	3	4	3	4	3	5	3	13
Boston Scientific	78,863	BSX	USA		4	4	3	3	4	4	3	4	3	4	14
Zimmer Biomet	25,634	ZBH	USA		5	4	1	3	4	5	4	3	3	4	15
Nihon Kohden	2,351	6849	Japan		5	4	3	3	2	4	3	4	3	3	16
Thermo Fisher Scientific	207,139	TMO	USA		4	2	5	5	3	3	5	2	4	5	17
Agilent Tech	34,508	A	USA		4	3	3	5	3	3	5	3	3	3	18
Becton Dickinson	77,355	BDX	USA		4	4	3	5	1	4	3	3	3	3	19
Qiagen	9,716	QIA	Netherlands		4	3	2	5	3	3	5	3	3	3	20
Illumina	25,326	ILMN	USA		4	3	3	5	3	3	5	2	3	3	21
Stryker	109,794	SYK	USA		4	4	3	3	2	3	4	4	2	2	22
Biotronik	Unlisted	Unlisted	Germany		2	4	2	3	4	4	1	5	3	5	23
Intuitive Surgical	108,161	ISRG	USA		4	3	3	3	3	3	4	3	3	3	24
Quest Diagnostics	14,270	DGX	USA		4	3	1	5	2	3	5	3	4	2	25
Smith & Nephew	11,450	SN.	UK		4	4	3	3	3	3	3	2	3	3	26
Garmin	19,846	GRMN	Switzerland		1	5	2	3	4	4	3	4	3	4	27
Danaher	189,749	DHR	USA		2	3	3	5	3	3	4	3	3	2	28
Teleflex	9,869	TFX	USA		1	3	3	3	1	3	5	3	3	2	29
Getinge	4,339	GETI B	Sweden		2	2	1	3	2	2	4	4	3	2	30
Edwards Lifesciences	46,785	EW	USA		1	3	2	3	2	2	4	3	4	2	31
Coloplast	23,640	COLO B	Denmark		1	3	1	3	3	3	3	2	4	3	32
MicroPort	2,975	853	China		1	3	1	3	1	2	1	4	3	2	33
Terumo	22,140	4543	Japan		1	3	1	3	1	2	2	3	3	2	34

Source: GlobalData

Key: 1 (red) implies this theme will have a negative impact on earnings over the next 12 months; 3 (amber) implies a neutral impact; and 5 (green) a positive impact. See the methodology section at the back of this report for an explanation of our research methodology.

Source: GlobalData

Valuation screen

Our valuation screen ranks our universe of companies within a sector based on selected valuation metrics

Medical Devices

(34 companies)

Company	MKT CAP (US$ M)	Ticker	Country	Weighting	Valuation Screen 25% EV/Sales	20% P/E	15% Net margin %	20% P/Book	20% FCF yield %	100% Valuation Ranking
Quest Diagnostics	14,270	DGX	USA		1.8	15.1	9.6	2.4	9.2	1
Getinge	4,339	GETI B	Sweden		1.7	19.3	8.8	1.6	4.6	2
3M	58,715	MMM	USA		2.1	10.2	16.9	4.0	6.5	3
Roche	231,688	ROG	Switzerland		3.6	16.6	19.6	7.4	6.6	4
Qiagen	9,716	QIA	Netherlands		4.7	23.0	19.8	2.8	5.8	5
Medtronic	107,387	MDT	Ireland		4.0	28.6	12.0	2.1	4.3	6
Omron	9,915	6645	Japan		1.6	19.8	8.4	2.0	0.6	7
Garmin	19,846	GRMN	Switzerland		3.8	20.4	20.0	3.2	2.7	8
Nihon Kohden	2,351	6849	Japan		1.5	20.3	8.3	2.1	-3.1	9
Siemens Healthineers	54,474	SHL	Germany		3.0	24.9	9.4	2.6	3.3	10
Johnson & Johnson	380,490	JNJ	USA		4.2	21.2	18.9	5.0	4.5	11
Teleflex	9,869	TFX	USA		4.0	27.2	13.0	2.5	2.7	12
Abbott	176,243	ABT	USA		4.2	25.4	15.9	4.8	4.4	13
Danaher	189,749	DHR	USA		6.5	26.3	22.9	3.8	3.9	14
GE	122,639	GE	USA		1.6	545.1	0.3	3.6	3.6	15
Alphabet	1,700,685	GOOGL	USA		5.7	28.4	21.2	6.6	3.5	16
Smith & Nephew	11,450	SN.	UK		2.7	51.3	4.3	2.2	1.0	17
Zimmer Biomet	25,634	ZBH	USA		4.5	110.8	3.3	2.1	3.3	18
Philips	19,983	PHIA	Netherlands		1.4	-11.6	-9.0	1.4	-5.3	19
Thermo Fisher Scientific	207,139	TMO	USA		5.2	29.8	15.5	4.7	3.3	20
Terumo	22,140	4543	Japan		4.1	36.6	10.9	2.9	1.4	21
Agilent Tech	34,508	A	USA		5.3	27.5	18.3	6.5	3.0	22
Apple	2,859,658	AAPL	USA		7.4	28.7	25.3	56.4	3.9	23
Becton Dickinson	77,355	BDX	USA		4.9	43.5	9.4	3.1	2.1	24
Baxter	20,074	BAX	USA		2.3	-8.3	-16.1	3.4	2.7	25
Edwards Lifesciences	46,785	EW	USA		8.6	30.7	28.3	8.1	2.0	26
Coloplast	23,640	COLO B	Denmark		8.1	34.9	20.8	19.8	2.4	27
Stryker	109,794	SYK	USA		6.6	46.6	12.8	6.6	1.9	28
Intuitive Surgical	108,161	ISRG	USA		16.7	81.8	21.3	9.8	0.9	29
MicroPort	2,975	853	China		4.5	-6.8	-51.9	2.6	-19.5	30
Boston Scientific	78,863	BSX	USA		6.8	113.0	5.5	4.5	1.2	31
DexCom	41,456	DXCM	USA		14.1	121.5	11.7	19.4	0.7	32
Illumina	25,326	ILMN	USA		5.7	-5.8	-96.1	3.8	-0.3	33
Biotronik	Unlisted	Unlisted	Germany							34
Median					4.2	27.2	12.0	3.6	2.7	
Mean					4.9	48.4	7.3	6.5	2.1	

Source: GlobalData

Key: 1 (red) implies this theme will have a negative impact on earnings over the next 12 months; 3 (amber) implies a neutral impact; and 5 (green) a positive impact. See the methodology section at the back of this report for an explanation of our research methodology.

Source: GlobalData

Risk screen

Our risk screen ranks companies within a particular sector based on overall investment risk

Medical Devices

(34 companies)

Company	MKT CAP (US$ M)	Ticker	Country	Risk Screen: 40% Operational Risk	30% Financial Risk	15% Industry Risk	15% Country Risk	100% Risk Ranking
Weighting								
Intuitive Surgical	108,161	ISRG	USA	4	4	4	4	1
Roche	231,688	ROG	Switzerland	4	3	4	5	2
Edwards Lifesciences	46,785	EW	USA	4	4	4	5	3
Johnson & Johnson	380,490	JNJ	USA	4	3	4	4	4
Apple	2,859,658	AAPL	USA	5	3	3	4	5
Coloplast	23,640	COLO B	Denmark	4	3	4	4	6
Alphabet	1,700,685	GOOGL	USA	4	4	3	4	7
Thermo Fisher Scientific	207,139	TMO	USA	4	3	4	4	8
Abbott	176,243	ABT	USA	4	3	4	4	9
Quest Diagnostics	14,270	DGX	USA	4	3	3	5	10
Nihon Kohden	2,351	6849	Japan	3	4	4	4	11
Baxter	20,074	BAX	USA	4	3	4	4	12
Stryker	109,794	SYK	USA	4	2	4	5	13
Terumo	22,140	4543	Japan	4	3	4	4	14
Omron	9,915	6645	Japan	3	4	3	4	15
Illumina	25,326	ILMN	USA	4	3	4	3	16
3M	58,715	MMM	USA	4	3	3	5	17
Biotronik	Unlisted	Unlisted	Germany	3	3	4	5	18
GE	122,639	GE	USA	4	3	3	5	19
Agilent Tech	34,508	A	USA	3	3	4	4	20
Philips	19,983	PHIA	Netherlands	3	3	4	4	21
Danaher	189,749	DHR	USA	3	3	4	4	22
Smith & Nephew	11,450	SN.	UK	3	3	4	3	23
Qiagen	9,716	QIA	Netherlands	3	3	4	4	24
Teleflex	9,869	TFX	USA	3	2	4	5	25
Boston Scientific	78,863	BSX	USA	3	2	4	4	26
DexCom	41,456	DXCM	USA	3	3	4	5	27
Garmin	19,846	GRMN	Switzerland	3	4	3	3	28
Becton Dickinson	77,355	BDX	USA	3	2	4	4	29
Getinge	4,339	GETI B	Sweden	3	3	4	3	30
Siemens Healthineers	54,474	SHL	Germany	3	2	4	5	31
Medtronic	107,387	MDT	Ireland	3	2	4	4	32
Zimmer Biomet	25,634	ZBH	USA	3	2	4	3	33
MicroPort	2,975	853	China	2	2	4	4	34

Low risk

High risk

Source: GlobalData

Key: Green denotes low risk; amber denotes medium risk; red denotes high risk. See the methodology section at the back of this report for an explanation of our research methodology.

Source: GlobalData

Glossary

Term	Definition
Augmented reality (AR)	Technology that allows the user to see the real world overlaid with a layer of digital content. This digital content layer can include sensor-based data, sound, video, graphics, or other datasets
Big Data	Extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions.
Data Science	An inter-disciplinary field that uses scientific methods, processes, algorithms, and systems to extract knowledge and insights from structured and unstructured data.
Deep Learning	A field of machine learning that is built using artificial neural networks which model the way neurons in the human brain talk to each other.
Electronic medical record (EMR) system	An electronic version of a patient's medical history that is maintained by the provider over time and may include all of the key administrative clinical data relevant to that person's care under a particular provider.
Image recognition	An image recognition-enabled computers look at an image and discern objects and features. A digital image is a binary representation of visual data which contains a grid of pixels with values that denote how bright and what color each pixel should be.
Remote patient monitoring (RPM)	Technology allowing for patients' health to be tracked outside of the conventional clinical setting (e.g., smart inhalers that track patient use via an app and send it to the physician).
Wearable tech	This is a blanket term for electronic devices that can be worn on the body, either as an accessory (such as a watch or a pair of glasses) or as part of the material used in clothing (such as sportswear that measures biometrics).
HIPAA	The Health Insurance Portability and Accountability Act of 1996
Data privacy	The way in which customers' information is handled and shared by a company based on its importance, an individual's consent, or regulatory obligations.
Source: GlobalData	

Further Reading

GlobalData reports

Publication date	Report title
April 2023	Thematic Research - Electronic Medical Record Systems
February 2023	Thematic Research - Mobile Health Apps - 2023
July 2022	Thematic Research - Remote Patient Monitoring - 2022
Source: GlobalData	

Our Thematic Research Methodology

Companies that invest in the right themes become success stories. Those that miss the important themes in their industry end up as failures.

Viewing the world's data by themes makes it easier to make important decisions

We define a theme as any issue that keeps a senior executive awake at night. GlobalData's thematic ecosystem is a single, integrated global research platform that provides an easy-to-use framework for tracking all themes across all companies in all sectors. It has a proven track record of identifying critical themes early, enabling companies to make the right investments ahead of the competition and secure that all-important competitive advantage.

Traditional research does a poor job of picking winners and losers

The difficulty in picking tomorrow's winners and losers in any industry arises from the sheer number of technology cycles—and other themes—that are in full swing right now. Companies are impacted by multiple themes that frequently conflict with one another. What is needed is an effective methodology that reflects, understands, and reconciles these conflicts.

That is why we developed our thematic engine

At GlobalData, we have developed a unique thematic methodology for ranking all major companies in all major sectors based on their relative strength in the big themes that are impacting their industries.

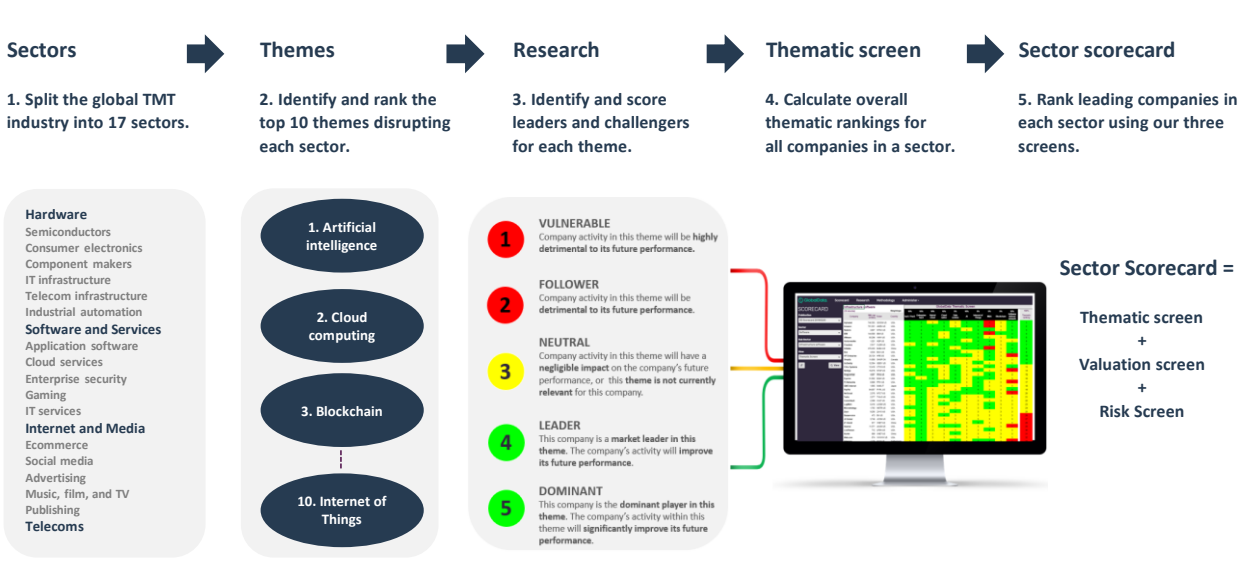
Our thematic engine tags over 145 million data items across five alternative data sets—patents, jobs, deals, filings, and news—to themes. The vast datasets within our thematic engine help our analysts to produce sector scorecards that identify the companies best placed to succeed in a future filled with multiple disruptive threats.

How do we create our sector scorecards?

First, we split each industry into sectors because a different set of themes drives each sector. Taking the TMT (technology, media, and telecom) industry as an example, we split this industry into the sectors shown in the graphic below.

Our five-step approach for generating a sector scorecard

Here we use tech, media, and telecom as an example sector for illustration purposes



Source: GlobalData

Second, we identify and rank the top 10 themes for each sector (these can be technology themes, macroeconomic themes, or industry-specific themes). Third, we publish in-depth research on specific themes, identifying the winners and losers within each theme. The problem is that companies are exposed to multiple investment themes, and specific themes' relative importance can fluctuate. So, our fourth step is to create a thematic screen for each sector to calculate overall thematic leadership rankings after taking account of all themes impacting that sector. Finally, to give a crystal-clear picture, we combine this thematic screen with our valuation and risk screens to generate a sector scorecard used to help assess overall winners and losers.

What is in our sector scorecards?

Our sector scorecards help us determine which companies are best positioned for a future filled with disruptive threats. Each sector scorecard has three screens:

- **The thematic screen** tells us who are the overall leaders in the 10 themes that matter most, based on our thematic engine.
- **The valuation screen** tells us whether publicly listed players appear cheap or expensive relative to their peers based on consensus forecasts from investment analysts.
- **The risk screen** tells us who the riskiest players in each industry are, based on our assessment of four risk categories: operational risk, financial risk, industry risk, and country risk.

How do we score companies in our thematic screen?

Our thematic screen ranks companies within a sector based on overall leadership in the 10 themes that matter most to their industry, generating a leading indicator of future earnings growth.

Thematic scores predict the future, not the past. Our thematic scores are based on our analysts' assessment of their competitive position in relation to a theme, on a scale of 1 to 5:

1	**Vulnerable**	The company's activity in this theme will be highly detrimental to its future performance.
2	**Follower**	The company's activity in this theme will be detrimental to its future performance.
3	**Neutral**	The company's activity in this theme will have a negligible impact on the company's future performance, or this theme is not currently relevant for this company.
4	**Leader**	The company is a market leader in this theme. The company's activity in this theme will improve its future performance.
5	**Dominant**	The company is a dominant player in this theme. The company's activity in this theme will significantly improve its future performance.

How do our research reports fit into our overall thematic research ecosystem?

Our thematic research ecosystem is designed to assess the impact of all major themes on the leading companies in a sector. To do this, we produce three tiers of thematic reports:

- **Single theme**: These reports offer in-depth research into a specific theme (e.g., artificial intelligence). They identify winners and losers based on thematic leadership, market position, and other factors.
- **Multi-theme**: These reports cover all themes impacting a sector and the implications for the key players in that sector.
- **Sector scorecard**: These reports identify those companies most likely to succeed in a world filled with disruptive threats. They incorporate our thematic screen to show how conflicting themes interact with one another, as well as our valuation and risk screens.

About GlobalData

GlobalData is a leading provider of data, analytics, and insights on the world's largest industries. In an increasingly fast-moving, complex, and uncertain world, it has never been harder for organizations and decision makers to predict and navigate the future. This is why GlobalData's mission is to help our clients to decode the future and profit from faster, more informed decisions. As a leading information services company, thousands of clients rely on GlobalData for trusted, timely, and actionable intelligence. Our solutions are designed to provide a daily edge to professionals within corporations, financial institutions, professional services, and government agencies.

Unique Data

We continuously update and enrich 50+ terabytes of unique data to provide an unbiased, authoritative view of the sectors, markets, and companies offering growth opportunities across the world's largest industries.

Expert Analysis

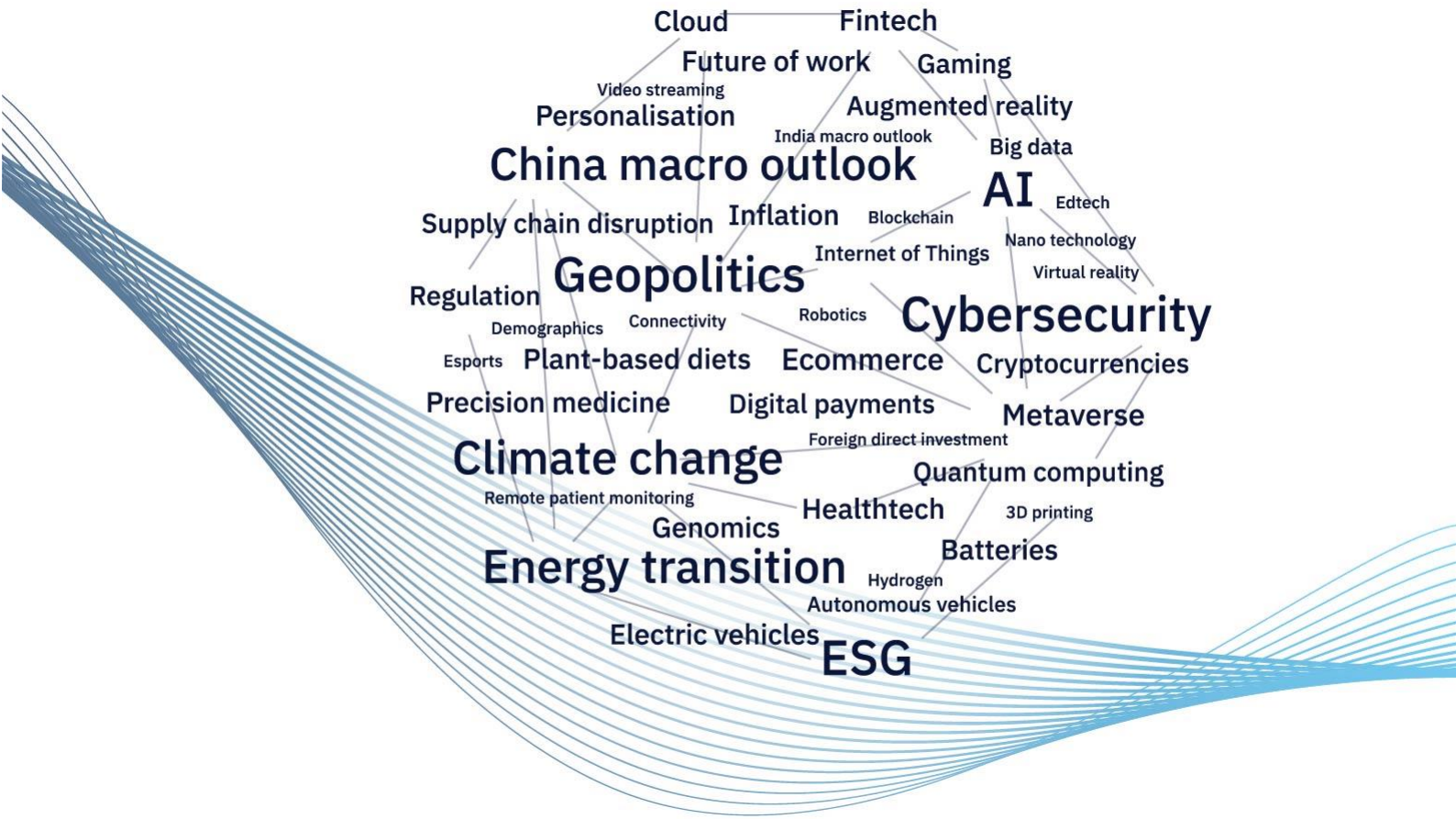
We leverage the collective expertise of over 2,000 in-house industry analysts, data scientists, and journalists, as well as a global community of industry professionals, to provide decision-makers with timely, actionable insight.

Innovative Solutions

We help you work smarter and faster by giving you access to powerful analytics and customizable workflow tools tailored to your role, alongside direct access to our expert community of analysts.

One Platform

We have a single taxonomy across all of our data assets and integrate our capabilities into a single platform – giving you easy access to a complete, dynamic, and comparable view of the world's largest industries.



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