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Strategic Costing

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The Future of Health is Digital

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"As healthcare costs increase to less sustainable levels, digital can 'bend the cost curve', making healthcare affordable to more."

– Klaus Mitterer, CFO, OVIVA, award-winning digital healthcare provider

KEY TAKEAWAYS

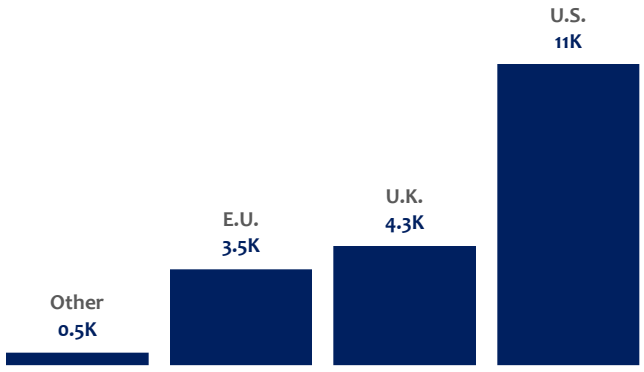
The global digital health sector has seen major increases in market value over the last few years. This article explores the recent developments in digital health, looking at various areas of value, opportunities, and challenges.

- Over the last two decades, global healthcare spending has increased rapidly at an annualised rate of almost 6%.
- Although the digital health sector has seen considerable expansion, the health industry is relatively under-digitalised.
- Momentum from the COVID-19 pandemic can provide enormous opportunities for efficiency gains and cost reductions in the industry.
- Challenges such as inadequate infrastructures, privacy concerns, and security risks create significant obstacles for health digitalisation.
- Governments and the private sector both have a leading role to play when it comes to the development of digital health.
- Investments in digital care delivery, financial and operational optimisation, R&D, and secure data infrastructures are especially crucial.

A major problem that faces the global economy is the continuous increase in healthcare costs. In 2019, global healthcare spending stood at $8.5 billion, according to the World Health Organisation (WHO) data. This accounted for around 10% of the global gross domestic product (GDP). Health spending was only worth $2.9 billion in 2000, implying an annual compound growth rate (CAGR) of close to 6%. For governments in developed countries, this translates into higher budgetary costs. For poorer countries who cannot afford the substantial fiscal burdens, it results in a lack of access to primary healthcare (Figure 1).

Figure 1

Global Healthcare Expenditure, per capita



Source: Global Health Expenditure Database, World Health Organisation.[1]

The global rise in healthcare costs is driven by population growth, ageing populations, increases in the prevalence of chronic illnesses such as diabetes, higher use of medical services, and increased price and intensity of health services.[2] Higher healthcare costs pose a burden not only on governments but also on employers and consumers as their out-of-pocket costs inflate.

Digital health solutions hold huge promises when it comes to improving the efficiency of the global health system, providing better outcomes at lower costs. This article explores the latest developments in the digital healthcare sector while looking at the latest trends, potential opportunities, and challenges.

What is Digital Health?

Digital health can broadly be defined as the use of information and communications technologies (ICT) to improve healthcare. According to the WHO, digital health is the broad umbrella that includes eHealth in addition to other advanced technologies that strengthen the health system, improve access to health services, and promote universal health coverage.[3] The WHO defines eHealth as *"the cost-effective and secure use of ICT in support of health and health-related fields, including health-care services, health surveillance, health literature, and health education, knowledge and research."*

Digital health encompasses technologies such as telehealth, wireless health, mobile health (mHealth), electronic medical and health records (EMRs/EHRs), digital health systems and informatics, in addition to the use of advanced technologies such as artificial intelligence (AI) and genomics to improve healthcare (Figure 2).[4]

Although different digital health segments compose distinct industries, their definitions and functions overlap. As industries expand to serve consumers better, functional overlaps will become

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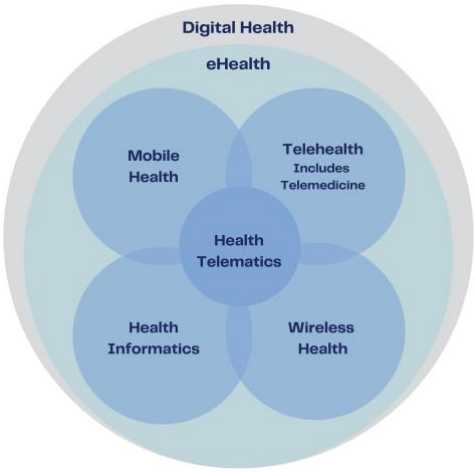
evident. For example, the U.S. pharmacy CVS has been offering telehealth services through its MinuteClinic virtual visits since 2006. In 2018, the company expanded to merge its telehealth with mHealth services, offering virtual visits through its mobile app.[5] Those services have proven especially useful during the COVID-19 pandemic. The company reported an increase of 600% in its virtual visits in May 2020 compared to a year earlier.[6] Moreover, one of the largest U.S. telemedicine companies, Teladoc, has recently acquired Livongo last year, a firm that helps patients control their diabetes through its mHealth apps and smart devices. It is of no surprise then that the scopes of digital health industries are often defined differently or that many of the digital health terms are used interchangeably.

Figure 2

Defining the Digital Health Sector



Source: Author's Diagram. Adapted from Arthur D. Little (2016). [7]

What are the Current Trends in Digital Healthcare?

Telehealth and Telemedicine

Telehealth is the use of ICT to provide care and services remotely. Although telehealth and telemedicine are often used synonymously, the former is a broader term. Telemedicine is the largest telehealth segment and relates to the provision of clinical services. Telehealth, however, can include other non-clinical services such as health education, training, and administrative assistance.[8]

The WHO defines telemedicine as *"the practice of medicine at a distance."* This involves a remote interaction between the patient and the health care provider, either in real-time (synchronously) or with a lag (asynchronously or store-and-forward). The global telemedicine industry has grown substantially over the last few years and is expected to reach a market value of $225 by 2030.[9]

Mobile and Wireless Health

Mobile health or mHealth is the use of mobile devices for medical and public health purposes as screening, monitoring, diagnosis, or treatment. Devices can include mobile phones, monitoring devices, personal digital assistants (PDAs), and wireless devices.[10] A closely related field is wireless health, which utilises wireless devices for health purposes. While both might often intersect, not all wireless devices are mobile and not all mHealth tools are wirelessly equipped.[11] Yet, both markets are often treated as one.

According to Precedence Research, the global mHealth sector is forecasted to be worth $243.57 billion by 2030.[12] In 2020, mobile apps had a share of 85% of the total mHealth market, while wearables captured the remaining 15%. The growth in the mHealth sector has been facilitated by the rapid development of smartphones and other mobile devices, as well as wider access to the internet. The emergence of 5G networks will even come with higher promises for future digital healthcare.[13] The market for wearables is mainly expected to witness massive growth over the coming years. Today, many consumers wear health and fitness trackers that gather real-time data, allowing them to adopt healthier behaviours, track their illnesses, and improve prevention.

Electronic Records, Artificial Intelligence, and Data Analytics

Healthcare information systems is a rising term in the industry. Today, investing in secure and capable electronic medical and health records (EMRs/EHRs) is essential for compiling and synchronising the vast and insightful amounts of patient data.

Artificial Intelligence has the potential to transform the health industry into a more accessible, affordable, and effective version. With the massive amounts of generated health and other consumer data, AI can provide analysis not otherwise possible. Personalised care based on valuable insights and predictions will be the next frontier for the health system. Moreover, AI can automate repetitive and time-consuming tasks, saving time and costs for both patients and healthcare providers.

Global Digital Health Market Development

According to Precedence Research, the global digital health market was worth $220 billion of revenue in 2021, up from $182 billion in 2020 (Figure3).[14] Indeed, with the emergence of the COVID-19 pandemic and the urgent need for remote health services, the digital health market grew by an impressive 21% last year. The

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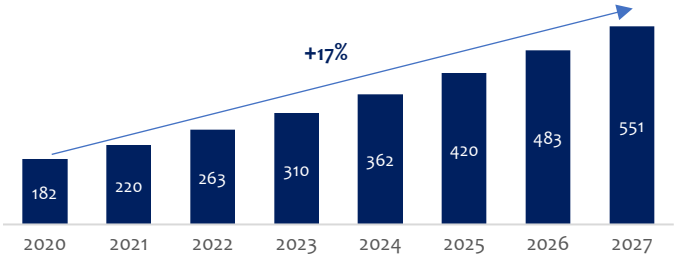
market is forecasted to balloon further, reaching $362 billion by 2024 and $551 billion by 2027. That's a 17% CAGR over the next six years.

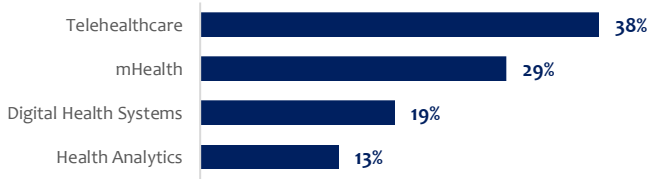
Figure 3
Global Digital Health Market Size, $ billion



Source: Precedence Research.

Telehealth and mobile health (mHealth) were the leading market segments, capturing together a share of 68% in 2020 (Figure 4). Digital health systems and health analytics accounted for 19% and 13% of the market, respectively. There is no doubt that the pandemic has created more demand for telehealth and mHealth services, accelerating their growth. Indeed, the telemedicine market has grown by 14% between 2020 and 2021. Similarly, the mHealth market has grown by close to 18% over the same period. Both markets are expected to flourish at a CAGR of around 18% up to 2030.

Figure 4
Global Digital Health Market by Segment, 2020



Source: Precedence Research.

The Emerging Pools of Value

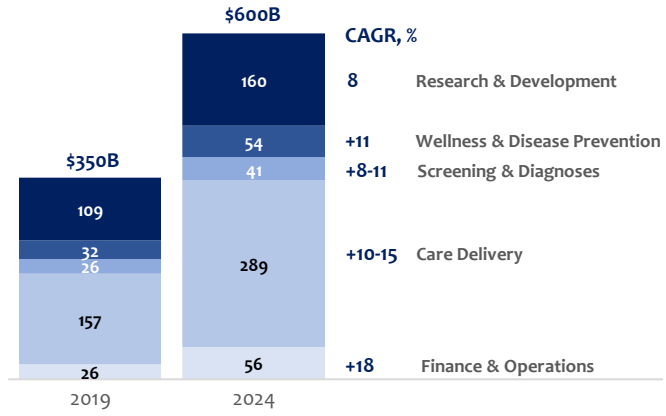
In a broader analysis, McKinsey & Company defined the digital health market in terms of its value pools. The 2019 global market size was estimated at $350 billion (Figure 5).[15] The analysis considered all value pools related to care delivery, screening and diagnosis, wellness and disease prevention, in addition to activities such as finance, operations, and research and development (R&D). The total market was forecasted to experience a CAGR of 11%, reaching $600 billion by 2024.

Value pools are especially relevant for companies interested in entering the digital health market to take advantage of significant market values as well as high growth rates. The market for care delivery, which constitutes the largest segment of the digital health market, is especially of great significance. Care delivery technologies captured 45% of value in 2019, standing at $157 billion. This category encompasses innovative digital solutions through mHealth (e.g., Livongo for diabetes), those that facilitate access to health care through telemedicine (e.g., Teladoc remote support), or those offering online pharmacies (e.g., PillPack). Technologies in this segment are expected to grow at an annualised rate of 10-15% up to 2024.

The R&D market was valued at $109 billion in 2019, expected to reach $160 billion by 2024. While it holds enormous potential in terms of revenue streams, the market growth rate is relatively low (8% CAGR), given its higher maturity level.

Finance and operations are segments that can particularly offer great future value and potential. Those include companies that help improve operational efficiency or optimise the financial model of digital health. This market segment is still small as it held only $26 billion in 2019 (7% of the digital health market). Nevertheless, it is expected to experience the highest growth rate, expanding at a CAGR of 18% up to 2024. This is not surprising given the increasing need for more efficient and less costly healthcare solutions.

Figure 5
Global Digital Health Market Size by Value Pools, $ billion



Source: McKinsey & Company.

What Will Future Health Care Look Like?

According to Deloitte insights, healthcare as we know it will no longer exist twenty years from now. The future healthcare market will develop into a state where consumers can manage their healthcare and control their data. The healthcare ecosystem will become more data-driven, proactive, and focused on wellness,

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prevention, and early diagnosis rather than radical intervention and reactive treatment. [16,17]

A collection of disaggregated institutions such as hospitals, health plans and insurance companies, pharmaceutical companies, and medical device manufacturers characterise the existing health care system. The future healthcare ecosystem will transform to a more consumer-centric system instead of the current institutional-centred setting. Interoperable data and open and secure platforms, harnessed by artificial intelligence, analytics, and insights will be the centrepiece of this transformation.

Figure 6

Four Main Patterns of The Future Health System

Source: Author's Diagram. Based on Deloitte and Dealroom.

The future healthcare ecosystem will be characterised by four main patterns (Figure 6):

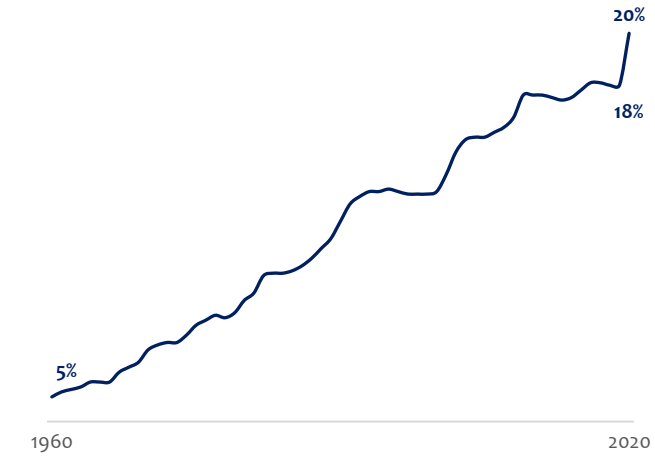
1. **Data-Driven and Personalised:** Massive streams of health, as well as other data, are becoming increasingly available from wearable devices that track consumers' sleep patterns, physical activity, heart rate, diet, and other behaviours. Always-on sensors will play a more significant role in the future as they become incorporated in devices that surround us, continuously capturing individual, institutional, population, and environmental data. Such data will hold both challenges (e.g., cybersecurity and privacy risks) and enormous opportunities for better-personalised consumer analysis and insights. If anything, with the aid of data and AI, future health services will become tailored to each consumer's characteristics and needs.
2. **Consumer-Controlled Wellbeing:** With more integrated data, the scope of health should shift to a more holistic definition of wellbeing, including mental, social, emotional, physical, and spiritual health. With the proper regulations in place, consumers will own and control their data. This will enable them to manage their health better as they become more aware of their behaviours and needs. Moving forward, consumers will demand more robust mobile and portable services that provide real-time and integrated data, analysis, and insights on how to improve their health and wellbeing.
3. **Proactive and Precise:** Prevention and early diagnosis will become the norm as health data and insights enable more proactive interventions. According to Ali Parsa, CEO of Babylon Health, almost 70% of healthcare expenses go into predictable, preventable diseases that create wasteful spending.[18] Those huge costs could be cut in the future as data and AI increases precision and early-on micro-interventions, preventing many chronic illnesses.
4. **Efficient and Cost-Effective:** With the increasingly rising cost of traditional healthcare, future demand will be focused on services that can reduce health expenses for consumers, employers, and governments. The current health system desperately needs greater efficiency gains, calling for improved health outcomes at lower costs.

Digital Health: Huge Opportunities for Cost Reduction

Total national health spending in the U.S. amounted to $3.8 trillion in 2019 (Figure 7). This represented around 18% of the country's GDP and $11 thousand per capita health spending. Similarly, health expenditure accounted for almost 10% and 12% of 2019 GDP in the U.K. and Germany, respectively. In the U.S., health expenditure has been growing at an annualised rate of 5.5% since 2000. If such an annual rate persisted for the next twenty years, health spending could explode to around $11.8 trillion by 2040.[19]

Figure 7

U.S. Healthcare Expenditure, 1960-2020, % of GDP



Source: National Health Expenditure, Centers for Medicare & Medicaid Services.

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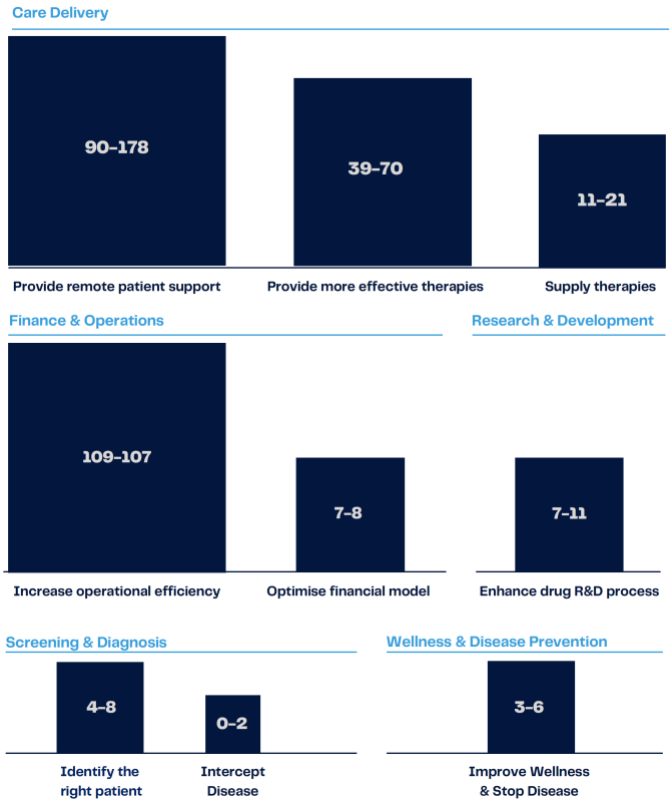
Digital health technologies can offer great value for healthcare cost reduction. In 2017, an analysis by IQIVA Institute estimated that if digital health apps were to be widely utilised in acute care such as diabetes, asthma, cardiac rehabilitation, and pulmonary rehabilitation, this could save the U.S. healthcare system around $7 billion per year. If the market was extended to cover all disease areas in the country, annual cost savings could reach $46 billion.[20]

The analysis by McKinsey & Company estimated that if digital health interventions were fully adopted by 2024, utilising the different value pools (as previously explained in Figure 5), this alone could save the U.S. close to $500 billion. The highest efficiency savings would come from innovations in care delivery and operational efficiency (Figure 8). Advances in care delivery, such as providing remote patient support, providing more effective therapies, and supplying medicines to patients, could save the U.S. healthcare system up to $269 billion. Innovations in increasing operational efficiency could add savings of up to $179 billion. Moreover, R&D and optimising the financial model could each save the healthcare sector between $7-11 billion.

Figure 8

Potential U.S. Healthcare Cost Savings by Value Pool, $billion



Source: McKinsey & Company.

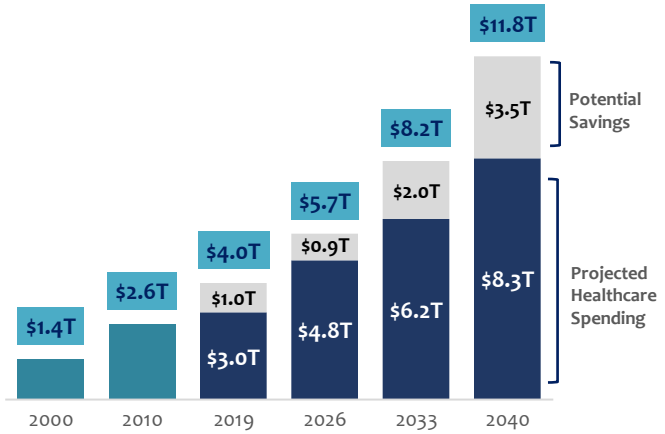
Another study by McKinsey also highlighted the critical role that MedTech companies can play in driving global healthcare costs down. The company forecasted that with today's level of digitalisation in the sector, global healthcare spending would escalate to $14.5 trillion by 2030. Yet, suppose MedTech companies were to change how they operate, positioning the patient at the centre of their business model. In that case, they could lead digital transformation in the sector resulting in global efficiency savings of between $1.5-3.5 trillion a year by 2030.[21]

MedTech firms should think of ways to pinpoint and digitally solve the significant problems patients, physicians, and health professionals face along the whole patient process. Those range from screening and primary prevention to diagnosis and treatment. While most MedTech companies have strong capabilities in selling hardware and physical products, they need to develop more modern and flexible IT infrastructures that allow them to collect, integrate, and analyse data through their devices. MedTech enterprises need to integrate their systems into the broader ecosystem to be part of the coming digital transformation, collaborating with players in other industries. These include finance, AI and technology, and legal and regulatory bodies to better collect, harness, manage, and protect data.

In a recent analysis, Deloitte experts forecasted that digitalisation in the U.S. health sector could save the country $3.5 trillion of *"well-being dividend"* by 2040 (Figure 9). A well-being dividend is defined as the return on investment from tools and systems that could allow consumers to play an active role in their health and wellbeing. In a future healthcare system, where consumers are enabled and in control of managing their wellbeing, huge costs could be saved through prevention and early interventions.

Figure 9

U.S. Well-Being Dividend Cost Savings by 2040, $trillion



Source: Deloitte.

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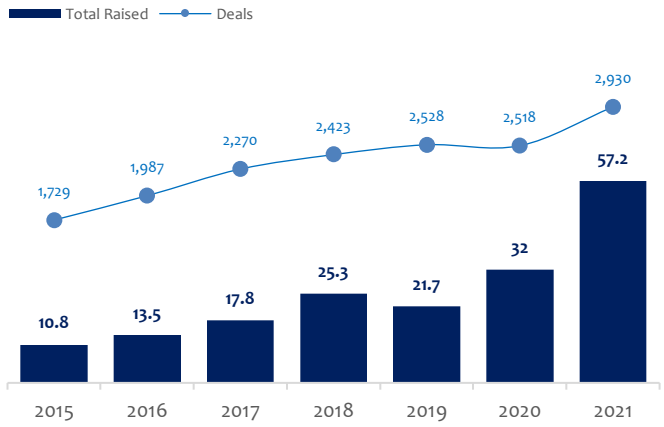
Where Does Money Flow?

The year 2021 has shown impressive investor demand for digital health. According to CB Insights, global digital health funding recorded a record high of $57.2 billion in 2021, up by 79% from 2020 and more than five times the level in 2015 (Figure 10). The average deal size has considerably increased to reach $25 million in 2021 compared to $17 million in 2020, as investors became more willing to pour their money into the market. The total number of deals has also surged to 2,930, indicating greater entrepreneurial activity. The U.S. was in the lead as it attracted $37.9 of funding, representing 66.3% of the total. Asia came in second place, capturing 18.7% of funding activity, while Europe accounted for 11.7%.[22]

Figure 10

Global Digital Health Funding, $billion



Source: CB Insights.

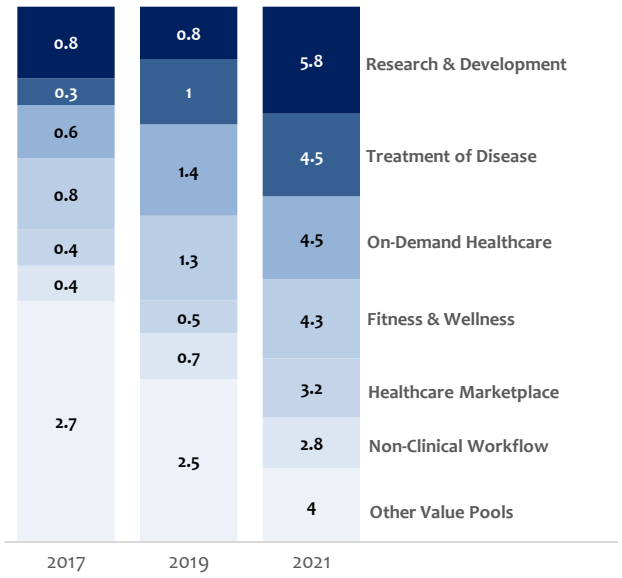
Although the market saw some stagnation in 2019, there is no doubt that the pandemic has accelerated investor demand. This lifted expectations for the future of the digital health industry. According to Rock Health, the U.S. health sector has seen major upgrades to its infrastructure, business models, and talent pool that will drive a new era of market expansion.[23]

According to Rock Health data, total venture capital funding in the U.S. also hit a record high of $29.1 billion in 2021. This was almost double the level in 2020 and 3.5 times that in 2019. Investments in R&D activities (e.g., biopharma and MedTech companies) were the top contributors to this increase (Figure 11). R&D investments recorded $5.7 billion, thanks to the increased demand for decentralised clinical trials and real-world evidence fuelled by the pandemic.[24,25] This was followed by investments in digital products for disease treatments, on-demand healthcare, fitness and wellness, healthcare marketplace, and non-clinical workflow.

Together, the top six segments accounted for 86% of total digital healthcare venture capital in 2021, compared to only 70% in 2019 and 55% in 2017. Between 2019 and 2020, investments in R&D and the healthcare marketplace saw the most significant growth at 7.3% and 6.4%, respectively.

Figure 11

Top Funded Value Pools, $ billion



Source: Based on Rock Health.

Challenges Facing Digital Health Transformation

In its existing state, the global health system is anything but efficient. Health costs are continuously rising, and government health budgets are becoming inflated. As a result, many individuals lack access to healthcare, especially in developing countries. As populations continue to age and chronic diseases prevail in developed countries, this will create even more significant financial burdens on the governments, ones that could hardly be sustainable.

Digital transformation can create enormous opportunities for cost reductions; still, the healthcare sector is under-digitalised. Based on a worldwide industrial survey conducted by McKinsey Global Institute, industries such as pharmaceuticals and healthcare systems have only reached 13.4% and 24.3% of their digital potential (Figure 12).[26] According to Harvard Business Review, while many healthcare institutions in the U.S. use sophisticated technologies for diagnostics and treatment, most of the labour force use basic or no technology. Moreover, less than 20% of the U.S. healthcare sector payments are done digitally.

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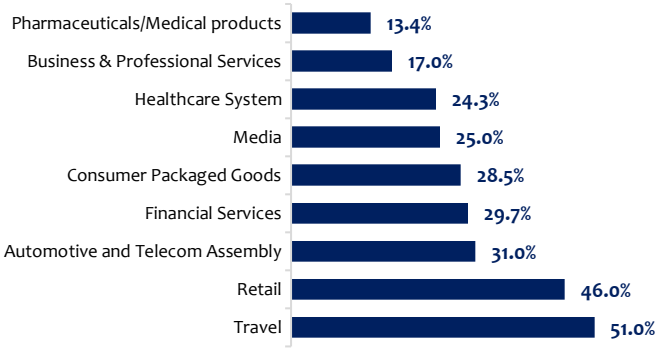
Figure 12

The Global Digital Frontier Gap, (ICT frontier=100%)



Source: McKinsey Global Institute.

Several challenges plague the healthcare sector when it comes to digital transformation. These include data storage, processing issues, security risks, and privacy concerns.

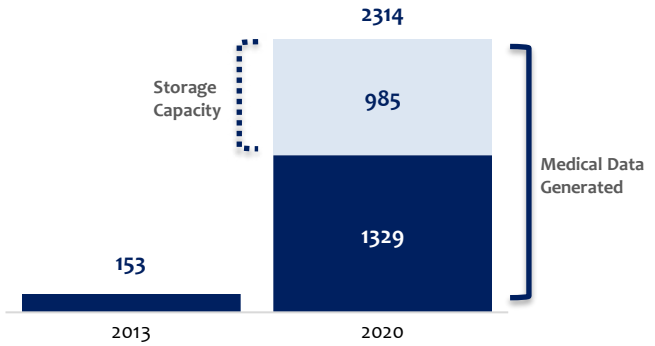
Data Infrastructure and processing

The healthcare sector produces extensive streams of data by the minute. With the upsurge in telehealth, care delivery occurs across a myriad of channels. This creates unique challenges for health providers to update health records precisely and regularly. The industry must find the means to update and synchronise patients' records accurately.

Complex infrastructures and robust AI systems are essential to store, process, analyse and deliver valuable data. In 2020, the total size of the medical data generated worldwide was 2,314 exabytes (billion gigabytes), more than 15 times the volume of data in 2013. Nevertheless, the available storage capacity was only 43% of the data generated (Figure 13). Investing in such infrastructure is critical for delivering more precise and personalised healthcare to consumers.

Figure 13

2020 Medical Data Generated and Storage Capacity, exabytes



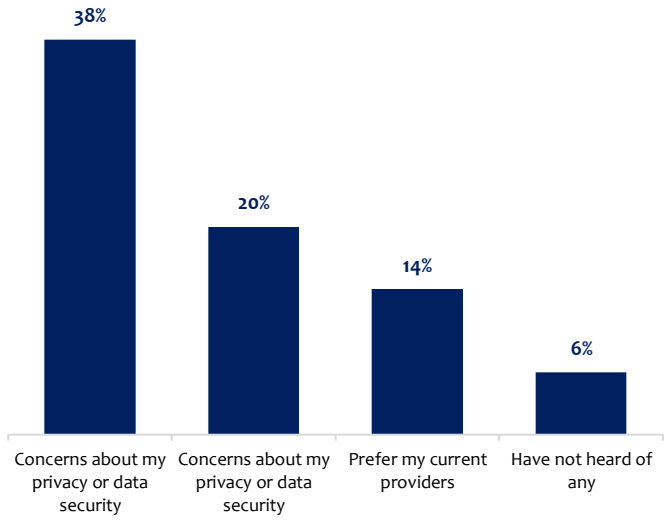
Source: Statista.[27,28]

Cybersecurity

Privacy and security risks become common issues when dealing with large-scale personal data. To expand further, regulators must ensure that consumers are the sole owners and directors of their data for the digital health market. Legislative acts and regulations that control health data storage, access, and use are essential cornerstones in developing the digital health sector. Examples of existing legislation include the E-Health Act and the Digital Care Act in Germany. Still, patients in Germany have complained that the Digital Health Act does not allow them to withdraw from sharing their personal data for research needs.[29] Consumer confidence is a crucial ingredient in the success of digital health. In a 2020 consumer survey, Accenture found that 38% of the respondents reported that "concerns about privacy or data security" were their number one barrier to adopting digital health tools (Figure 14).[30]

Figure 14

Top For Barriers to Adoption of Digital Health Solutions
percentage of respondents ranking this choice as the first barrier



Source: Accenture.

Data infrastructures must have capable technologies that can robustly protect against cyber-attacks. A 2021 study by IBM showed that the healthcare sector lagged in security AI and automation, which placed it as the top industry with data breach costs for 11 consecutive years. The average cost of healthcare data breaches stood at $9.23 million in 2021, compared to an industry average of $4.24. This represented a 29.5% increase over 2020. The highest costs were related to lost business from consumer turnover, loss in reputation, and system downtime.[31]

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Conclusion

As global healthcare costs continue to rise, the digital healthcare sector has expanded rapidly over the last few years. The sector is expected to reach a market value of around $500-600 billion in the coming 4-6 years. The urgency that the COVID-19 pandemic has created for virtual health services especially fuelled such expansion. This resulted in important upgrades in infrastructures and business models, which created great momentum in the industry. Leveraging this momentum can provide enormous opportunities for cost reductions and efficiency gains. Trillions of dollars in yearly health costs could be saved globally if digital solutions were fully adopted.

Nevertheless, challenges such as insufficient data infrastructures and privacy and security concerns create major impediments in the face of healthcare digital transformation. The responsibility falls on both governments and private companies to cooperate in taking the industry to the next level. Investments in expanding digital care delivery, R&D, optimised operational efficiency, better financial models, secure data infrastructures, and artificial intelligence are of most value for the future of digital health.

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Endnotes

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