Digital Health: Below The Surface

Tools for healthcare delivery and discovery

APRIL 2023

Jefferies

Digital Health: Below The Surface

We've only scratched the surface of healthcare in the digital age

Digital health is so much more than telehealth.

Institutional investors are always looking into healthcare innovation – **we're all incentivized to increase the length and quality of our lives**. From an economic perspective, healthcare has generated uncorrelated returns across market cycles, and aims to **outperform across different strategies and asset classes.**[1]

Digital health is the latest healthcare theme capturing investors' attention. Data breakthroughs in life sciences have been around for decades (Think: CRISPR DNA editing), but our healthcare systems are going through a complete digital transformation in the wake of Covid-19. Over just the last three years, digital health companies have seen nearly $60 billion in venture funding, over 160 mega-round ($100mm+) deals and over 560 acquisitions.[2] **Yet this is only a fraction of the addressable digital health universe.**

Headlines suggest some forms of digital health may have fallen out of favor, as patients return to see doctors in-person over Zoom, but this doesn't account for other forms of digital health. Less publicized corners of digital health, such as **digitized delivery, tools, and services**, are now taking the spotlight, and health tech is constantly innovating and drawing in new investors. **Hospital systems, healthcare providers and pharma companies with dry powder** are looking for new return streams and opportunities for their businesses to scale.[3]

Digital Health: Below the Surface unpacks this critical and emerging universe, its investors, opportunities and challenges. Key themes include:

- **A unique investor base –** Generalists are investing alongside healthcare specialists, and pharma companies, hospital systems, and governments continue to spend on health tech innovation.
- **Expanded access to care** – Digital health can help providers and companies scale and expand their reach.
- **Unclear path to adoption–** As health systems and delivery becomes more digital, what challenges will arise?

"The shift from **longevity to wellness** doesn't just change how we approach healthcare. It unlocks all sorts of **amazing opportunities for people and societies to thrive.**"

Bill Gates,
Professor Hawking Fellowship Lecture

Emerging Healthcare Technology: Digital Health

When investors hear the term 'digital health', areas like telehealth and wearables typically come to mind, but more broadly, it defines the entire ecosystem of healthcare technology.

Digital health includes any **technology or tools used to manage digital humans and digital populations** and is often bucketed into two main categories, 1) Bioinformatics and 2) Biomedical Informatics.[4]

Digital Health: Technology or tools used to manage digital humans and digital populations

Bioinformatics

Anything from within the body that can be turned binary, or into data.

Investment Areas: Life Sciences/ Therapeutics

Use Cases: i.e. The Human Genome Project – sequencing our DNA so doctors can read it

Biomedical Informatics

Data from around the human body.

Investment Areas: Healthcare IT, Delivery, Devices, etc.

Use Cases: i.e. Wearables that can track your activity/heart rate and turn it into data

Sources: Colombia Business School, GICS, Jefferies

Technology has disrupted nearly every aspect of our lives, and digital health tools are transforming our approach to healthcare – there's a greater focus on wellness and preventative care, and ability to treat patients with more personalized medicine. Investors across tech, consumer, and healthcare alike are excited about the extensive and growing number of digital health themes, including:

TELEMEDICINE/ TELEHEALTH	**ELECTRONIC HEALTH RECORDS**	**CLINICAL WORKFLOW SOLUTIONS**
PATIENT-FACING APPS	**WEARABLES AND MOBILE TECH**	**DIGITAL THERAPEUTICS AND MEDICAL DEVICES**

BIG DATA & ANALYTICS – Tech innovation like AI and machine learning aren't unique to healthcare, but increasingly allow scientists and clinicians to sift through medical datasets and make new discoveries. Many notable digital breakthroughs in life sciences, like precision medicine, wouldn't have been possible without advanced technology, and investors are optimistic about the potential for further innovation using these tools.

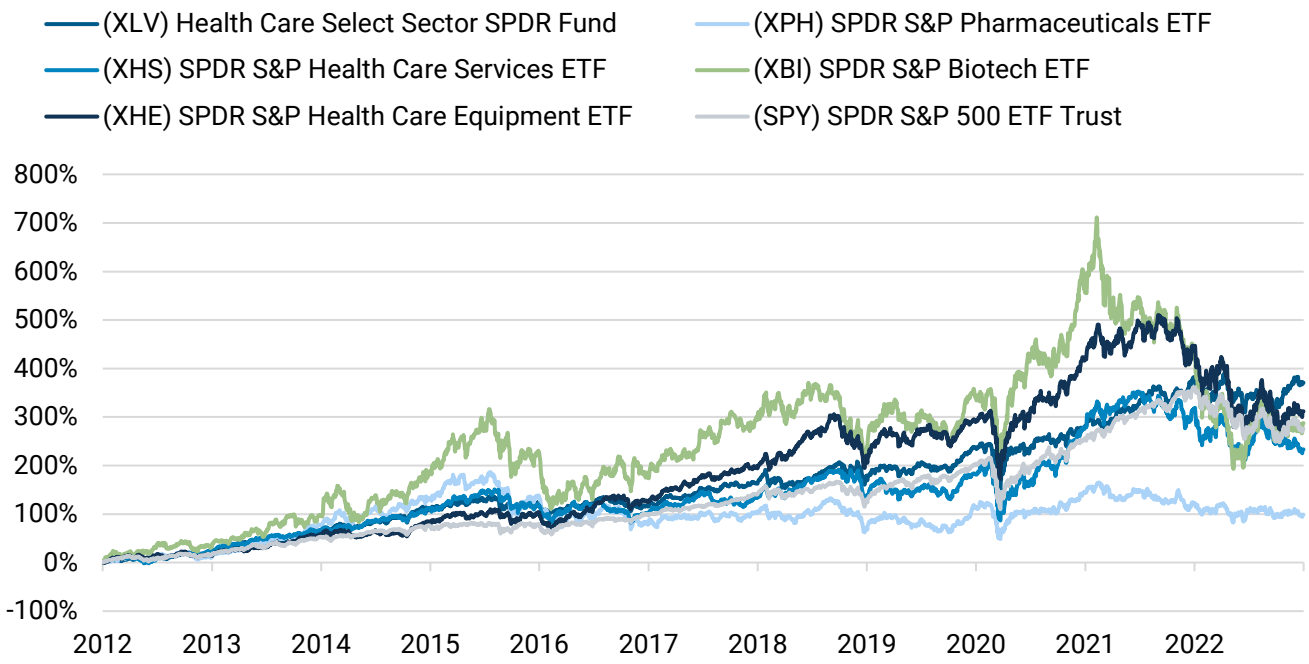
Sources: PitchBook, Jefferies

Evolution of Specialized Healthcare Investing

Healthcare has always represented a complex industry, but its investable universe is now comprised of intricate sub-industries – digital health is just the latest one investors are focused on. **Entirely unique skillsets, knowledge, and networks are required to invest in each sub-industry**, and they can serve different roles in a portfolio.

Since the first generalist healthcare ETF, XLV, started trading in 1998, many other specialty ETFs have come to market – XBI for biotech, XPH for pharmaceuticals, XHS for services, etc.[5] Healthcare-dedicated fund managers have followed suit, evolving not only as sector-specialists, but to focus on specific sub-industries and asset classes. Some groups may stick with a single firm strategy, biotech equities as an example, while others start to bring on diverse talent as they scale, broaden their scope, and invest across multiple strategies.[6]

Cumulative Return of Healthcare Sub-sectors
2012 - 2023



Sources: FactSet, Jefferies

Healthcare Fund Evolution

Flagship Fund
Generalist healthcare or sub-sector focused

Flagship 'Plus'
Add multiple products – Crossover, hybrid, or other specialized sector funds

Healthcare Asset Manager
Invests across multiple products, sub-sectors & asset classes. Headcount significantly increases

Source: Jefferies Capital intelligence

Jefferies

Digital Health Attracts Many Types of Investors – Who Will Win?

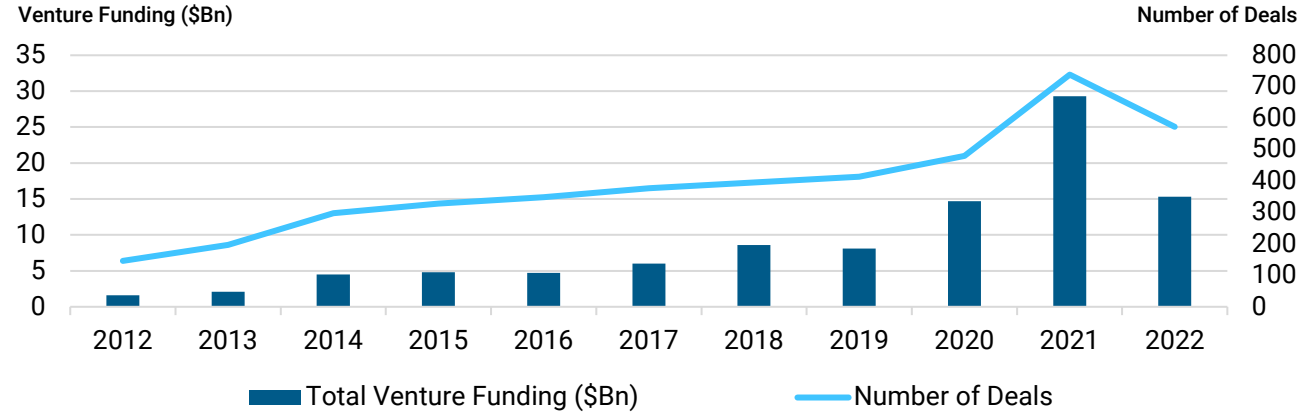
Initial funding in digital health, like other emerging themes, stemmed from venture capital, but a wave of M&A and IPO activity in the past three years, along with increased public/private crossover fund deals, has allowed more types of **institutional investors to put on exposure to digital health.**

Healthcare investing typically requires unique scientific, regulatory, and financial expertise, but opportunities during Covid-19 attracted many first-time healthcare investors to the space. Digital health differs from other sub-sectors, like biotech or pharma, in that generalist, tech and multi-strategy funds continue to be some of the top holders of digital health stocks. As the industry grows and crowding increases, **healthcare specialist investors are well-positioned to identify best ideas in digital health**. Investment teams with medical degrees, science advisory boards, and investment experience should be equipped to meet the rising demands of investing in this sector.[7]

Potential deals over the next decade may present new investment opportunities for healthcare investors. Health systems, some with venture capital arms, are partnering with stable digital health vendors and are looking at digital health investments at attractive values.[8] Proposed drug pricing limitations and near-term patent expirations has many big pharmaceutical companies looking to diversify their revenue streams and optimize R&D efforts, and some firms with dry powder have announced deals or expressed interest in **expanding their digital health assets.**[9]

U.S. Digital Health Venture Funding and Deals

2012-2022



Source: Rock Health

Digital Health M&A and IPO's

2014-2022

Source: PitchBook

Global Biopharma entered 2023 with an estimated $500 billion in cash – not accounting for potential leverage.

– Jefferies Biopharma Research

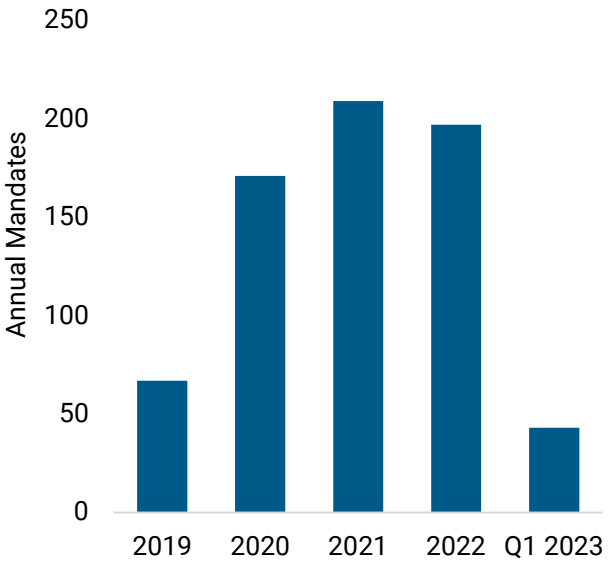
Jefferies

Healthcare Spending and Interest is Only Expected to Continue

Capital is what turns ideas into innovation, and **global healthcare economies are seeing more and more funding from both the public and private sectors.** In the U.S. – home to the world's biggest healthcare industry – healthcare represented more than $4.3 trillion of spend in 2021, or over 18% of G.D.P. CMS projects U.S. health spending will increase at an average rate of 5.4% annually through 2028, reaching $6.2 trillion and 20% of GDP by 2028.[10] Continuous healthcare inflows may lead to further growth in emerging sub-sector themes like digital health, in fact it's forecast that **the digital health market could grow to nearly half a trillion dollars by 2028.**[11]

Looking forward, even in the face of macroeconomic headwinds for secular growth, **investors see long-term opportunity across healthcare, and some are interested in short-term idiosyncratic opportunities**. Healthcare specialist funds have seen massive inflows over the last few years, and LP mandates for these types of managers continue to pop up. Specific searches for digital health and related sub-industries have just started to come up in the last 12-18 months, and investors see attractive entry points for these companies as reasons to invest now.

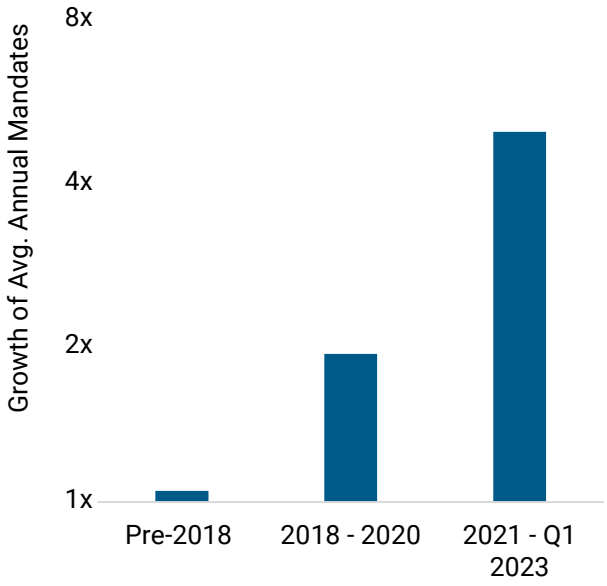
LP Mandates for Healthcare



Source: Jefferies Capital Intelligence

LP Mandates for 'Digital Health'*

*Digital Health, Medtech, Devices, Health Tech



"Customers continue to invest along with macroeconomic tailwinds, such as **increasing healthcare digitization, expanding access to care, and an aging population globally**."

Peter Arduini,
GE HealthCare President and CEO

Jefferies

Healthcare Companies and Providers Spend on Tech

Technology is the key for healthcare businesses to scale.

Hospital systems and other providers are innately incentivized to innovate, expand their digital health offerings, and continue spending on tech. Improvements in tech can help both the top and bottom lines for organizations, and may be even more essential in times of economic uncertainty.

A recent study from KLAS Research shows that 45% of healthcare providers **increased their software investments in 2022**, and **healthcare IT is a top strategic priority** for 80% of providers in 2023.[12]

How does digital health benefit providers over the next 12-18 months?

Bandwidth to ease clinician burnout

- The global healthcare workforce will be **short of nearly 10 million people** by 2030.[13]
- Digital technologies can help **decrease staff resource demand**.[14]

Scale up capacity and patients helped

- US hospitals are consistently over **70% full on average,** but many **lack sufficient beds** for patients in their area.[15]
- Telehealth can **expand healthcare providers' reach** and increase access to care.[16]

Operational efficiency and profitability

- US doctors spend **1/6 of their time on administrative tasks**, and clinical workflow solutions can help reduce this.[17]
- **Revenue cycle management (RCM)** software can enhance all activities related to generating and colleting patient revenue.[18]
- Some groups are acquiring AI solutions to better forecast and manage patient flows.[19]

Increase market share

- New business lines, such as at-home hospital or other services, can diversify revenue streams in tough markets.
- For areas with multiple options, tech innovation allows organizations to take on new patients and gain market share.
- Better outcomes and demand allows providers to **justify higher fees to payers**.[20]

Are doctors adopting new technology?

Although technology solutions should increase efficiency at healthcare organizations, this effect is muted when doctors and other workers don't actually use them. The American Medical Association conducted a study in 2016 and 2022 and found that **adoption of digital tools has grown significantly among all physicians,** regardless of gender, specialty or age. Physicians have nearly doubled the number of digital tools they use on average over the last 6 years, and 93% of doctors feel there is an advantage in leveraging digital health.[21]

Appetite for digital health among healthcare systems and workers has increased, but it remains to be seen how effective integration will be.

Expanding Access to Care: Telehealth and Hospital-at-Home

Two gating factors of healthcare access include access to physicians and availability and transfer of health records – digital health could solve for both. 80% of physician offices and nearly all US hospitals have adopted electronic health records, which means our health data can be sent anywhere with internet access.[22] From telehealth doctor appointments to at-home hospital programs, technology can treat more people at lower costs, and **in the comfort of our own homes**.

Americans have more access to the internet than to specialized healthcare.

37% of Americans live in a healthcare desert*

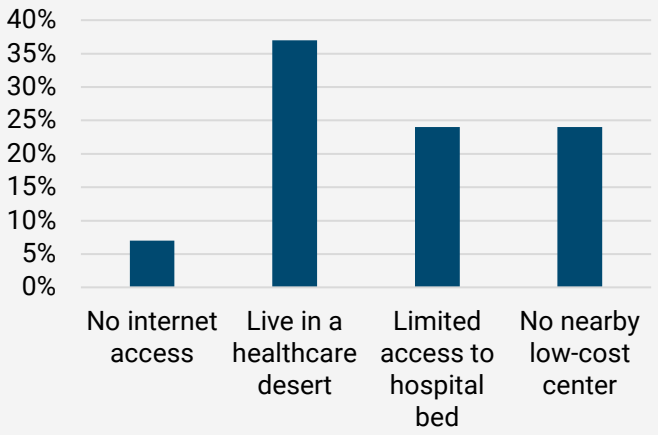
*Counties which most people lack access to pharmacies, primary care, hospitals, hospital beds, trauma centers, and/or low-cost health centers.

24% of Americans don't have enough **access to a hospital bed.**[23]

24% of Americans don't have **a low-cost health** center nearby (over 20-minute drive).[24]

Yet 93% of Americans have access to the internet.[25]

Access to Care vs Internet
By % of US population

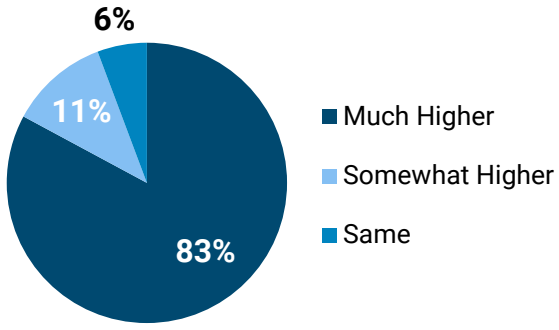


Source: GoodRx

Telehealth can reach more patients for lower costs.

Average virtual visits cost $67 less than offices, and cost savings from time and travel are estimated to total $89 billion each year.[26]

83% of Consultants expect telehealth usage to be 'much higher' in the next 5 years

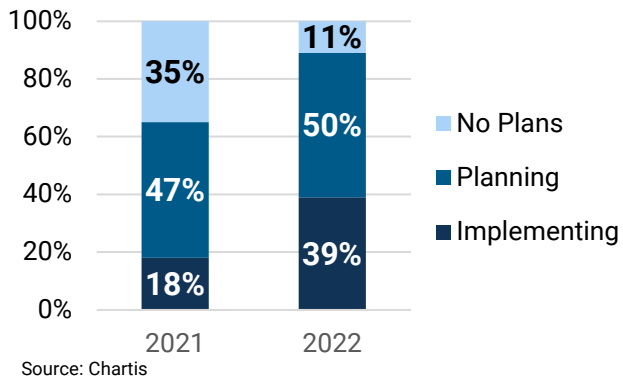


Source: Jefferies Benefits Consultant Survey

Hospital-at-home can improve quality of care and create value for stakeholders.

Home-based healthcare allows patients to self-administer treatment and nurses to monitor/support patients remotely. $265 billion in Medicare costs may be reallocated to homes by 2025.[27]

39% of health executives plan to implement 'hospital-at-home' programs in the next 5 years



Source: Chartis

Jefferies

Expanding Access to Care: Femtech for Women's Health

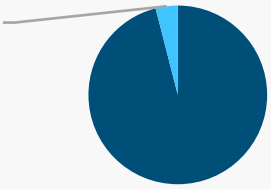
Women have only been included in drug trials and clinical research by law since 1993, and we have still yet to reach gender parity 30 years later.[28] Health technology attempts to remove human error from the equation and help develop personalized medicine for every patient, but lack of female representation across the healthcare and tech fields has hampered this progress.

Many are hopeful an emerging area of digital health, Femtech, will start to bridge this gender gap. Femtech is scaling **women's health discoveries and offering promising, mission-aligned opportunities for investors**.

What is 'Femtech'?

Coined in 2016 by Ida Tin (founder of menstruation tracking app, *Clue*), **Femtech defines the industry of women's digital health tools and devices**. Some believe the term has helped increase funding to a historically underfunded area, as investors can more easily bucket and describe these investments within digital health.[29]

Only 4% of healthcare research spending is devoted to **medical concerns specific to women**.[30]



Femtech products and services address:

Pregnancy
Post-partum
Menstruation
Contraception
Menopause
Cancer
Mental Health & Wellbeing

Why Now?

A Sign of the Times	Opportunity Cost	Strong Consumer Base
Women are in **more investment decision-making seats** than ever.[31]	There is more workplace **awareness of women's health issues** and focus **on family benefits**.	Women are 'Family CMO's', making **80% of the health decisions for their families**.[34]
Female founders closed greater deal value in 2022 than any year prior to 2021.[32]	**Bloomberg reports menopause costs $150 billion per year** in global productivity, and **1/10 women leave the workforce because of it**.[33]	Women's health treatments are expensive and **typically self-funded in the US**. Technology is needed to help reduce costs.[35]

Femtech is Estimated to be a $103 Billion Industry by 2030[36]

"We have to look at **integrated, holistic solutions for women** and for health systems and set a new agenda."

Teresa Harris Graham
CEO of Roche Pharmaceuticals

Jefferies

Digital Health Adoption Across the Globe

While there are massive political and economic discrepancies between healthcare systems across the globe, comparisons to regional markets can help inform investors of potential opportunities and challenges. Regions healthcare investors commonly look at outside of the US – the UK, Israel, and Japan, are all at varying stages of digital health adoption, and present various opportunities for the US digital health marketplace.

United Kingdom

Long-time government investment and focus:

- In 2005, the NHS – payer/provider of UK healthcare innovation, committed £12.7 billion to centralize and digitize health records, and digital transformation continues to be a focus for all health reform.[37]
- In 2022, £2 billion was committed to further digitize the NHS and £150 million for digital social care.[38]
- Centralized IT infrastructure helps transfer electronic patient records, is overseen by the NHS, and complies with national data protection regulation (GDPR).[39]

86% of NHS trusts use electronic patient records[40]

Israel

Leader in technological innovation and adoption:

- High-tech is embedded in Israeli culture, and the country boasts the most unicorns per capita.[41]
- Mandated military service exposes youths to the importance of digital tools like defense tech and cybersecurity at a young age.
- In 2018, the government approved a billion-shekel digital health plan.[42]
- It's mandatory to join one of 4 health maintenance organizations (HMO's), which have universally used electronic medical records and e-pharmacy for decades.[43]

100% of Israelis have ID cards with centralized and universally accessible electronic health records[44]

Japan

Emerging market of digital health consumers

- The aging Japanese population has sharply increased medical expenses, and the government is now seeking to lower costs through digital healthcare investment.[45]
- Post-Covid regulatory measures and new reimbursement policies for digital health has encouraged usage.[46]
- Although hesitant to initially adopt, Japan's telemedicine market is expected to nearly double by 2025.[47]

63% of Japanese hospitals use electronic patient records[48]

Digital Health Adoption in the US

The US is one of the most competitive digital countries in the world, the largest healthcare market, and sees over a third of global digital health revenue.[49] Despite this position of economic and technological strength, the **US has lagged other global healthcare systems in terms of digitalization**.

As healthcare investors know well, regulation dictates much of how healthcare operates in the US. Congress has advanced various measures over the past decade to promote digital health, but there is much uncertainty around forward-looking adoption and regulation.

US Digital Health Regulation Promoting Adoption

1996: HIPAA
Initial privacy law to protect and handle electronic patient health information[50]

2009: HITECH Act
Incentivized health tech adoption and strengthened HIPAA enforcement[51]

2010: Affordable Healthcare Act (ACA)
Rewarded electronic health record use to lower patient costs[52]

2012: FDA Safety and Innovation Act (FDASIA)
FDA initial strategy to regulate health IT and devices[53]

2016: 21st Century Cures Act
Empowered FDA to accelerate medical product development[54]

2020: COVID Public Health Emergency*
Allowed flexibility for telehealth policies[55]

*Expected to end May 11, 2023

2022: Omnibus Bill
Extended telehealth and hospital-at-home programs through 2024[56]

2023 and Beyond: Amendments to HIPAA?
HIPAA was last updated over a decade ago, and proposed changes in 2020 haven't yet been formalized.

Investors wonder where regulators may add more protection for patient data privacy.[57]

Remaining questions on US adoption of digital health

Regulatory crack downs – Covid-19 brought flexibility for areas like telehealth, and investors now wonder whether this will continue. As healthcare leans into big data, and patient concerns now resemble those of tech consumers, will these companies be treated like big tech as it relates to privacy, data breaches, and fraud?

Patient and doctor usage – While tech can help reduce the cost of healthcare treatment, what is the knock-on effect? Will doctors want to charge less? Will patients want to see virtual doctors when they don't have to?

Anti-trust and privacy concerns – For tech ecosystems to work, they must be able to communicate across systems and databases. Health data protections and anti-trust laws prevent centralization, and the path to full adoption of digital health records and interoperability remains unclear.

How Jefferies Can Help

Jefferies global investment bank has built a reputable healthcare franchise across research, trading, corporate access, and banking. Our Capital Intelligence team has connectivity to key healthcare investors and tracks the competitive landscape and fundraising trends across the sector. Below find details on business lines with subject matter experts focused on digital health. Please reach out to your Jefferies coverage person for contact details and more information.

- **Banking:** One of the largest healthcare investment banking teams in the world. 135+ bankers worldwide, including 21 coverage offices in the United States, Europe, China, India, and Japan. Key relationships with digital health founders, sponsors, and investors.
- **Research & Corporate Access:** Broad and unique coverage of healthcare across subsectors and geographies, with a focus on healthcare. Host conference calls and summits with subject matter experts, and annual global healthcare conferences in London and New York which feature dozens of digital health focused companies.

CONTACTS

Annette Rubin
Strategic Content
Arubin2@jefferies.com
(212) 778-8361

Leor Shapiro
Capital Intelligence
lshapiro@jefferies.com
(212) 336-6267

Shannon Murphy
Strategic Content
shannon.murphy@jefferies.com
(212) 336-1139

Footnotes

1 – Alliance Bernstein https://www.alliancebernstein.com/corporate/en/insights/investment-insights/healthcare-stocks-an-innovative-antidote-for-volatile-times.html
2 - Rock Health https://rockhealth.com/insights/2022-year-end-digital-health-funding-lessons-at-the-end-of-a-funding-cycle/
3– Becker Hospital Review https://www.beckershospitalreview.com/digital-health/did-the-digital-health-bubble-pop-cios-weigh-in.html
4 – Columbia Business School
5 – FactSet
6 – Jefferies Capital Intelligence
7 – Jefferies Capital Intelligence
8 – Becker Hospital Review https://www.beckershospitalreview.com/digital-health/did-the-digital-health-bubble-pop-cios-weigh-in.html
9 – Bain & Co https://www.bain.com/insights/where-big-pharma-placing-digital-bets/
10 – CMS https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/nhe-fact-sheet
11 Vantage Market Research https://www.globenewswire.com/en/news-release/2022/10/10/2530630/0/en/Digital-Health-Market-Size-to-Reach-Valuation-of-430-52-Billion-by-2028-Telehealth-Generates-38-Market-Revenue-VMR.html
12– Bain & Company https://www.bain.com/insights/2022-healthcare-provider-it-report-post-pandemic-investment-priorities/
13 – WHO https://www.who.int/news/item/02-06-2022-global-strategy-on-human-resources-for-health--workforce-2030
14 – World Economic Forum
15 – CNN https://www.cnn.com/2022/12/08/health/hospitals-full-not-just-covid/index.html
16 – NIH
17 – NIH https://pubmed.ncbi.nlm.nih.gov/25626223/#:~:text=Administrative%20work%20consumes%20one%2Dsixth,and%20lowers%20their%20career%20satisfaction
18 – Allied market research
19 – https://www.healthcaredive.com/news/Cleveland-Clinic-Palantir-AI-patient-flow/637937/
20 – https://www.beckershospitalreview.com/ehrs/more-health-systems-charging-for-mychart-messages.html
21 – AMA https://www.ama-assn.org/about/research/ama-digital-health-care-2022-study-findings
22 – HealthIT.gov
23 – GoodRx
24 – ibid
25 – Pew Research
26 – Medical Economics
27 – Mckinsey https://www.mckinsey.com/industries/healthcare/our-insights/from-facility-to-home-how-healthcare-could-shift-by-2025
28 – Contemporary Clinical Trials
29 – CNBC https://www.cnbc.com/2023/03/06/meet-the-woman-who-invented-a-whole-new-subsection-of-tech-set-to-be-worth-1-trillion.html#:~:text=Tin%20then%20coined%20the%20term,%2C%20or%20disproportionately%2C%20impact%20women.
30 – Tech4Eva
31 – PitchBook
32 – ibid
33 – Bloomberg https://www.bloomberg.com/news/articles/2021-06-18/women-are-leaving-the-workforce-for-a-little-talked-about-reason
34 – Department of Labor
35 - NIH https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9403754/
36 – BCG Digital health (Precedence Research)
37 – bertelsmann-stiftung Digital health Index
38 – NHS
39 – Statista
40 – NHS https://www.england.nhs.uk/wp-content/uploads/2023/02/board-2-feb-23-item-8-digital-data-and-tech.pdf
41 – TechAviv
42 – The Times of Israel https://www.timesofisrael.com/israel-approves-19-programs-for-30-million-digital-health-initiative/
43 – bertelsmann-stiftung Digital health Index
44 – Commonwealth Fund https://www.commonwealthfund.org/international-health-policy-center/countries/israel#electronic-health-records
45 https://www.trade.gov/market-intelligence/japan-digital-health-industry
46 Health advances analysis https://healthadvancesblog.com/2022/05/04/digital-health-in-japan-and-korea-where-is-it-heading/
47 International Trade Administration https://www.trade.gov/market-intelligence/japan-digital-health-industry
48 Statista https://www.statista.com/statistics/1121012/japan-share-hospitals-electronic-health-record/
49 – https://www.imd.org/centers/world-competitiveness-center/rankings/world-digital-competitiveness/
50 – CDC
51 – HHS
52 – AMA Journal of Ethics https://journalofethics.ama-assn.org/article/promise-health-information-technology/2011-03
53 – FDA
54 – Ibid
55 – HHS
56 – American Hospital Association
57 – Rock Health " https://rockhealth.com/insights/2023-look-ahead-boring-is-the-new-black