Global Healthcare Council
Q2 2021

Global Corporate Venturing

# Why healthcare investors love to commit to their own sector

Global Healthcare Council

Serving a single mission: patients

Cleveland Clinic on 100 years of innovation

B Cap: how to partner effectively with pharma companies

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**Healthcare corporate venture capital is booming, with one proviso: as long as the startup is in healthcare.**

Investment is up by almost every measure, but as Kaloyan Andonov's report shows, it is dominated by deals in the same sector, with digitisation a key driver in both pharmaceuticals and patient care.

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*"The question is whether technology can be harnessed with enlightened self-interest for serving the greater good through helping all parts of the world"*

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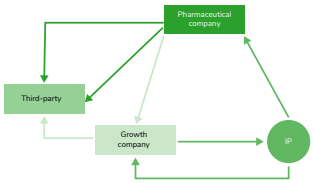




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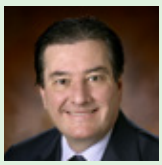

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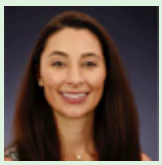

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# Serving one mission

- Healthcare shifts have been accelerated by covid
- Pandemic made clear the end goal, to treat patients
- How technology be harnessed worldwide?

By James Mawson
Editor-in-chief

*"I wasted time, and now doth time waste me."*

Richard II by William Shakespeare

As the healthcare sector races towards the longevity escape velocity where people add more than a year of life expectancy for every year they live, covid-19 has brought into stark relief the widening inequality within and between countries.

As my colleague Kaloyan Andonov, in the main feature for the Global Healthcare Council quarterly, writes: "The health sector has been going through various shifts in the context of an increasingly digitised, mobile and data-driven world. This trend predates the covid-19 pandemic and last year's lockdowns but it was undoubtedly accelerated by them. The life sciences sector has also given the world hope – by developing effective vaccines – that the world will be back to normal soon."

The impact of covid-19 along with other potentially fatal diseases, viruses and illnesses are often greater for people and societies struggling with more than one issue or comorbidity.

The question is whether technology can be harnessed with enlightened self-interest for serving the greater good through helping all parts of the world.

As Will Morris at Cleveland Clinic, in discussion on its centenary with Chris Coburn, the founding executive director of Cleveland Clinic Innovations and chief innovation officer at Mass General Brigham, said: "It takes a pandemic to realise that even though, perhaps in one world, Cleveland Clinic and Mass General and others can compete against [each other], at the end of the day, we all serve one mission which is to serve patients."

Looking at the power and influence of the Global Healthcare Council and the wider group of corporate venturers in the sector coming together, there is certainly grounds for optimism.

Sector report

# Life sciences sector gives hope and continues to grow

- Both deal count and dollars up year-on-year
- Exits and exit dollars also significantly up year-on-year
- Funding initiatives up in number but down in dollars

By Kaloyan Andonov
Analyst

The health sector has been going through various shifts in the context of an increasingly digitised, mobile and data-driven world. This trend predates the covid-19 pandemic and last year's lockdowns but it was undoubtedly accelerated by them. The life sciences sector has also given the world hope – by developing effective vaccines that the world will be back to normal soon.

**The GCV Analytics definition of the health sector encompasses pharmaceuticals, medical devices and diagnostics, healthcare IT services and administration, care provision and on-demand services and other life sciences products and services.**

When it comes to innovation in drug discovery, medical devices and the digitisation of health services, the role of general economic conditions and, particularly, low interest rates cannot be overstated. We had been living in a low interest rate environment since the end of the global financial crisis in 2008 and with the shock of the covid-19 pandemic, rates have hit a record low. The benefits for life sciences sectors stemming from cheap credit are simple – abundant cash translates into more capital available for their costly research and development (R&D) activities.

Inventing new medicinal drugs and devices is an infamously

expensive, slow and risky undertaking. According to data from Pharmaceutical Research and Manufacturers of America, it takes at least 10 years, on average, for a new drug to go from initial discovery to the marketplace. The average costs of a successful drug are estimated at $2.6bn. According to a study on clinical trial success rates in the US from 2019, only about seven out of every hundred newly created molecules obtain approval from the Food and Drug Administration.

Despite all this, the pandemic has highlighted how vital the pharmaceutical sector is for normal human existence.

Given the magnitude of business risk involved and cheapness of credit, it is no surprise that many incumbents have opted to externalise R&D costs and share risks with other co-investors – through licensing, spinouts, mergers and acquisitions, venture investing and joint ventures. As long as there are no drastic changes in the costs of capital, this is unlikely to change.

The life sciences sector has also been undergoing digitisation and datafication, like most other sectors of the economy. The "2021 Global life sciences outlook" by auditing and consulting firm Deloitte notes the central role of digital tech in the sector over the past year: "Corporate funding for digital health reached a record $21.6bn globally in 2020 – an increase of 103% over 2019. One thing is clear – with the help of digital health tools, virtual care can fundamentally change healthcare access and deliver an improved care experience. Digitisation in the life sciences sector has also led to an increase in new point of care systems, digital pharmacy setups, and easy and efficient access to healthcare."

The report also notes that the accelerated digitisation may bring about a new patient-centric business model, which would enable customers to meet physicians on their terms and from any place.

The report, however, notes that remote care provision may change or stay in the post-pandemic world: "Remote selling soared in 2020 as doctors and hospitals resorted to virtual meetings with sales reps. Companies conducted more than 316,900 remote meetings with doctors globally in April 2020. However, in the future, even this change is subject to the post-covid requirements of each country. Companies will also focus on driving value to through digital channels to educate health care providers in the post-pandemic world."

According to a report entitled "Global Digital Therapeutics Market (2021 to 2027)" by report aggregator ResearchandMarkets.com this world's digital therapeutics market is expected to reach $8.91bn in size by 2027, up from $2.1bn in 2020, growing at a compound annual growth rate (CAGR) of 22.93% during the forecast period. While the report acknowledges the progress that has been made by this emerging field of life sciences over the past decade and its adoption due to the pandemic, it contends that its biggest potential lies in treatment of chronic diseases: "Importantly, digital therapeutics tends to target conditions that are poorly addressed by the healthcare system today, such as chronic diseases or neurological disorders. In addition, they can often deliver treatment more cheaply than traditional therapy by reducing demands on clinicians' time. And

### Anja König, global head, Novartis Venture Fund

Anja König is the global head of Novartis Venture Fund (NVF), the corporate venturing arm of Switzerland-based pharmaceutical company Novartis. She focused on the European and Asia-Pacific ecosystems as a managing director before stepping into the top role.

NVF has most recently participated in the financing rounds raised by biotechnology startups including Amphista Therapeutics, TScan Therapeutics, Exo Therapeutics and Faze Medicines. The corporate has also exited Renovacor, Inflazome, Zikani Therapeutics, Annexon Biosciences and Forma Therapeutics in the past year.

Before joining NVF in 2006, König was a US-based associate partner at management consultancy firm McKinsey for six years , where she worked with healthcare, pharmaceutical and biotech firms on both sides of the Atlantic.

König studied physics throughout her academic career – she holds a bachelor's degree from University of Oxford, a master's degree from Ludwig Maximilian University of Munich and a PhD from Cornell University.

all the while, more evidence is emerging to demonstrate their value in clinical terms."

In addition to the digitisation of health service, there has been a similar process taking place in pharmaceuticals, specifically in drug discovery. Digital technology has enabled new types of collaborations and it is reshaping clinical trials.

The Deloitte report notes: "It is believed that covid-19 accelerated digital transformation of the pharma sector by several years. During the pandemic, life sciences saw agility, increased speed to market and greater efficiencies. While the sector average for a new drug development and review is 8.2 years, the two novel covid-19 vaccines were developed, tested, and authorised in less than a year. As a result, companies are reassessing and challenging their previous processes to enhance efficiencies. They are also looking at innovative partnerships to excel. Additionally, companies are moving towards virtual trials and remote monitoring to involve more patients into their studies via telemedicine and mobile healthcare."

Digitisation is also taking roots in the medical devices and diagnostics space. According to "Pulse of the industry: Medical technology report 2020" by auditing and consulting firm EY, virtualised and digitally-enabled business models for medical care accelerated at an unprecedented pace last year. The global medical technology industry was coming off a record $407bn top line estimated for 2019, with a 5% decline in medtech revenue during the first half of 2020 due to the impact of the pandemic on operations. Though the tone of the report remains cautious on the assessment of longer-term impact of the pandemic, it did suggest that the presence of strong R&D spending and investor confidence would eventually make innovation and profitability rebound. The report also concluded that building resiliency and transparency into supply chain operations may be key to the industry's long-term health.

The pharmaceutical sub-sector is among the most important and nothing has made that more evident than the pandemic. As we have observed in previous years, the global outlook for the pharmaceutical industry appears relatively promising, though with certain concerns on pricing. On the one hand, there is pressure on governments that pay or co-pay for medicines of their citizens to reduce costs by placing limits on drug pricing. On the other hand, health insurers and care providers are increasingly more demanding and require evidence of effectiveness, cost savings and clinical benefits before including a new drug.

According to the "Pharmaceuticals Global Market Report 2021: Covid-19 Impact and Recovery to 2030" by ResearchAndMarkets.com, the global pharmaceuticals market is set to grow modestly from $1.22 trillion in 2020 to $1.25 trillion by the end of 2021, implying a CAGR of 1.8%. The marginal growth is attributed mainly to pharmaceutical companies rearranging operations, supply chains and recovering from the pandemic impact.

The market is forecast to reach $1.7 trillion in size by 2025 at a CAGR of 8%. The medium and longer term growth is driven

### Christopher Picariello, president, Johnson & Johnson Innovation – JJDC

Pharmaceutical firm Johnson & Johnson has the longest surviving corporate venturing programme in the world. After carrying out direct investments in the 1960s, the corporate established Johnson & Johnson Development Corporation (JJDC) in 1973.

As president of Johnson & Johnson Innovation – JJDC, Chris Picariello oversees a global team of investment professionals based at J&J Innovation Centres spread across the world including San Francisco, Boston, London and Shanghai.

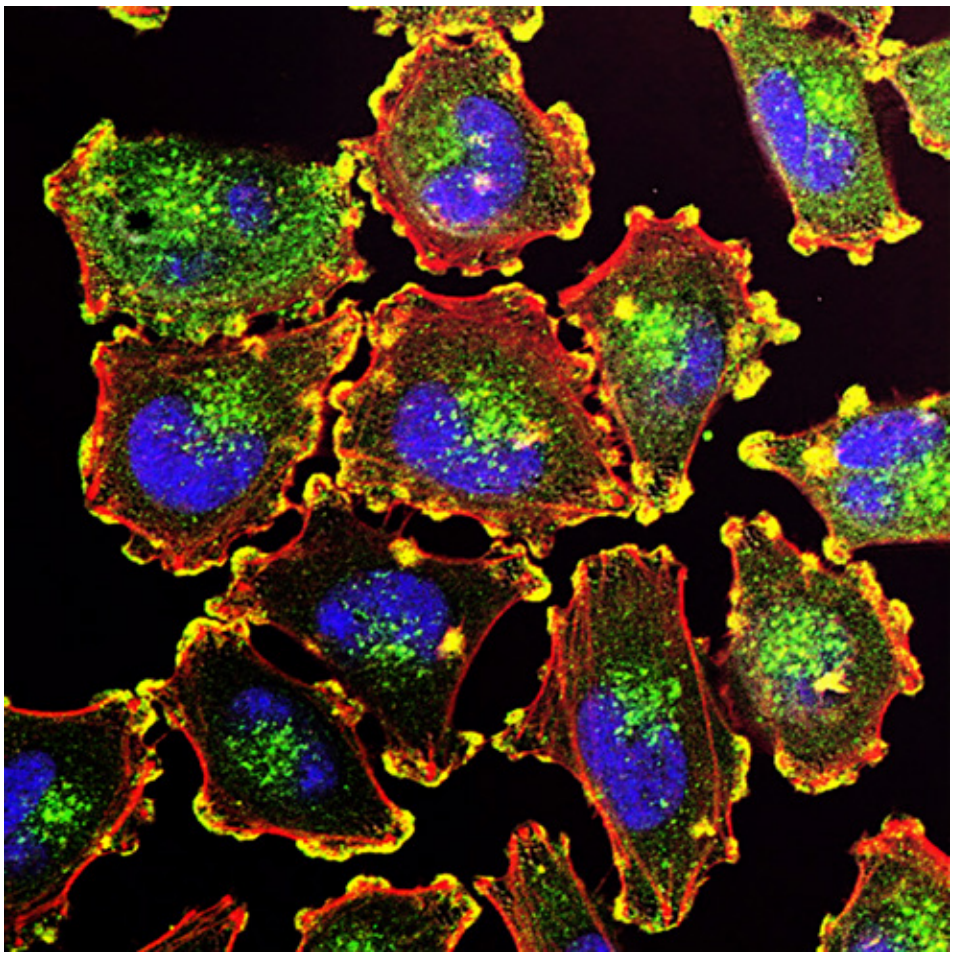
The unit, rebranded Johnson & Johnson Innovation – JJDC in 2013, focuses on areas of strategic significance including medical devices, diagnostics, pharmaceuticals, biotechnology and consumer products.

JJDC invests at all stages, having most recently backed rounds raised by fibroblast technology developer Mestag Therapeutics, textured hair care provider Sunday2Sunday, near vision loss treatment startup Visus Therapeutics, tissue imaging technology producer TechsoMed and diagnostics software company Paige.

mostly by demographic factors such as ageing population: "This rise in the ageing population increased the patient pool of many chronic diseases such as rheumatoid arthritis, hypertension, diabetes and cancer. The increase in the patient pool drove the demand for pharmaceuticals used in the treatment of these diseases, significantly impacting market growth during this period."

Within the realm of pharmaceuticals and biopharmaceuticals, cancer treatment is a has experienced a significant transformation in recent years. According to a report entitled "Oncology Drugs Market – Opportunities And Strategies – Global Forecast to 2030" by ResearchandMarkets.com the global cancer treatment market reached $167.9bn in 2019, after growing at a CAGR of 9.8% since 2015. In 2020, that market size was expected to go down to $149.9 billion in 2020, representing an 11% decline, due to lockdown, social distancing and the economic slowdown. However, the report ventures to forecast a growth from $201.1bn estimated in 2021 up to $284.5bn, implying a CAGR of 9.7%.

Companies in the oncology drugs market are increasing their product innovation through strategic collaborations. To sustain themselves in the increasingly competitive market, organisations are developing innovative products and sharing skills and expertise with other enterprises. While oncology drug companies have long collaborated with each other as well as with academic and research institutions in this market by way of partnerships, the trend has been increasing over the recent years.



**A National Cancer Institute slide showing melatastic melanoma cells**

The report highlights the important role of new technologies and collaborations in the oncology space: "New technologies are being implemented in the cancer drug market, such as artificial intelligence (AI) in the research and development process, as well as 3D printing devices to mimic the human body for trials and testing of the drugs developed. Companies are also investing in technologies to develop next generation biologics such as antibody drug conjugates, bispecifics, fusion proteins, cell and gene therapy that will be more effective as they are expected to have better potency against the target disease as well as have the ability to treat more than one aspect of the disease."

It also notes that approval of novel treatments has accelerated in recent years, thanks to new technologies that streamline drug development processes: "Over the last few years, there has been a significant rise in accelerated approval of cell and gene therapies for cancer treatment by regulatory bodies across the globe. CRISPR technology can be used to discover the non-coding cancer genome.

"CRISPR-Cas9 genome editing reduces the processing associated with the generation of cell line and animal models of cancer and complex generations. Thus, it generates a better cancer model for target validation and drug evaluation. CRISPR–Cas9 is accelerating the different stages of oncology drug discovery including target identification, validation and deconvolution, drug synthesis, assessment of drug sensitivity and resistance."

# Key sub-sectors

## Healthcare IT and administration

A decade or more after corporate venturing units that were set up with a focus on life sciences and healthcare, such as US-listed conglomerate Alphabet's GV (formerly known as Google Ventures) and US-listed drugs company Merck's Global Health Innovation Fund (GHIF), and the returns have surpassed many expectations.

GHIF has seen $6.2bn of exits in the past 18 months as the covid-19 pandemic has increased attention on the sector, according to Venture Capital Journal (VCJ).

William Taranto, president of GHIF, told VCJ he expected to see six more exits this year following on from Livongo's exit to Teladoc for $18.5bn, Preventice Solutions' acquisition by Boston Scientific for $1bn, the sale of Asuragen to Bio-Techne for $215m and Exostar's private equity purchase by Thoma Bravo for $100m.

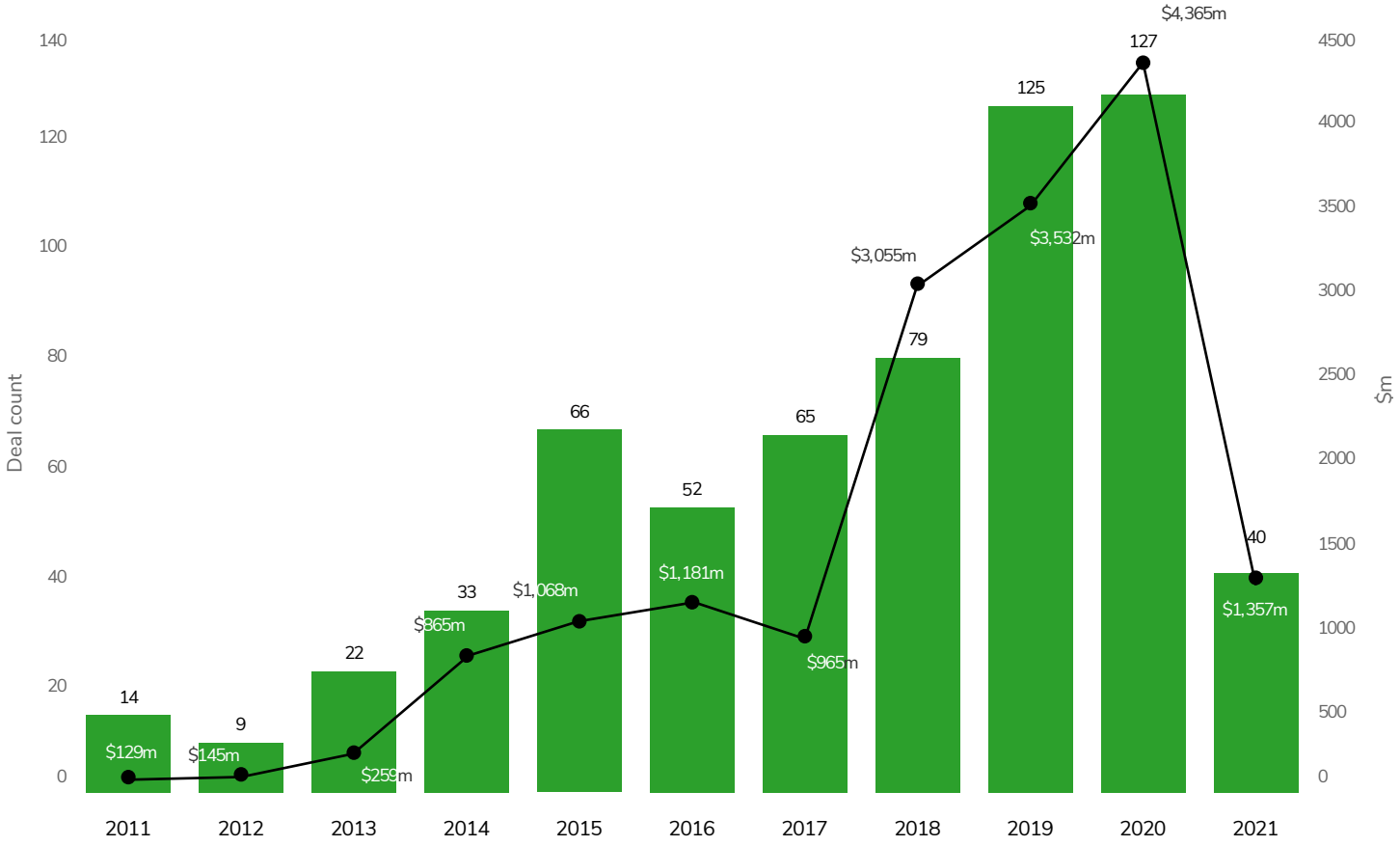
These exits, among others, have seen GHIF's $500m evergreen fund repaid more than twice, Taranto, who is also co-chairman of the Global Healthcare Council, told VCJ in its latest issue.

He added telemedicine, remote monitoring and clinical trials as well as artificial intelligence and therapeutics were important.

Originally founded by Bill Maris in 2009, GV's life sciences and healthcare deals cover care delivery, health IT, devices, diagnostics and therapeutics investments and made up more than a third of its portfolio. This means more than 80 portfolio companies with home runs including Clover Health, which agreed a $3.7bn reverse merger with a special purpose acquisition company in October, and Oscar, which had a blow-out flotation in March to raise $1.44bn.

All investors in healthcare have seemingly reaped the rewards, as my colleagues Kaloyan Andonov and Rob Lavine noted on healthcare sector exits after Oscar's initial public offering. And more seem to be on the way, which will encourage further dealmaking and investments.

### Corporate-backed deals in healthcare IT and administration




Source: GCV Analytics

Data as of 26 April

## Biotechnology and pharmaceuticals

The covid-19 pandemic has been regarded as the long-awaited start of the "biological century". The rapid development of vaccines and the use of novel methods, such as messenger RNA, to do so has created optimism that the same speed and execution is possible for a host of other viruses and more broadly to effectively create the longevity escape velocity – where people's life expectancy increases by more than a year for each year they live.

But research and startups is just part of the challenge in a geopolitical world with concern about sovereignty of supply and requirements for manufacturing bases as well as requirements to carry out large-scale trials.

The UK plans to build on the recovery trial, which uncovered two treatments for covid-19, by streamlining research and embedding it in the health service, and through fast regulation.

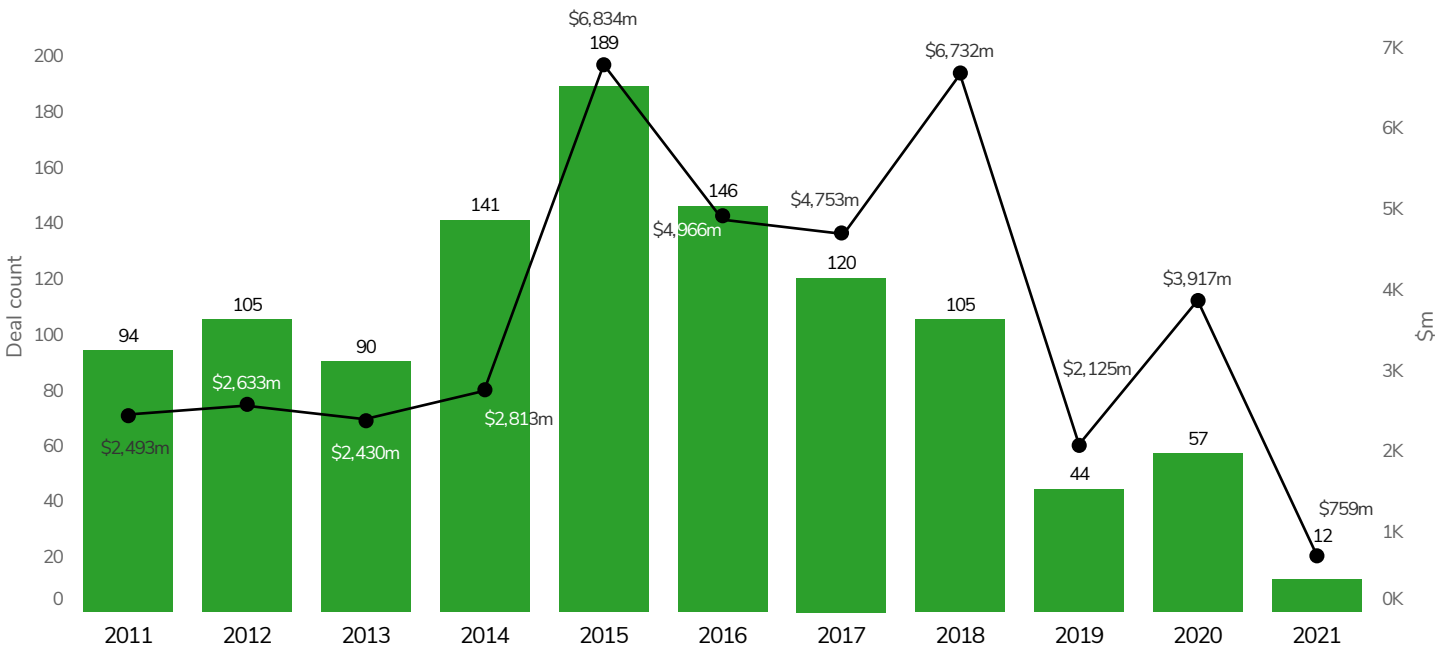
UK-based venture capital firm Abingworth raised $582m for its second clinical co-development fund in May.

Abingworth has previously invested through its co-development portfolio companies, Avillion and SFJ Pharmaceuticals, which finance and facilitate clinical trials, taking on all of the clinical and regulatory risk in return for a pre-agreed return if the drug is approved.

When Abingworth first got into clinical co-development back in 2009, it primarily worked with pharma companies who only paid out if the project was successful, by which time the cost of the deal could be amortised over the sales of the product.

The market has since expanded to cover biotechs, which want to reduce the dilutive impact that raising the money on the public

## Corporate-backed deals in biotechnology




Source: GCV Analytics

Data as of April 26

market would have. And there are plenty more of them.

The Financial Times noted Magdalen College was selling a 40% stake in the Oxford Science Park "after a surge of investor interest in the fast-growing life sciences sector increased the site's value almost sevenfold in five years".

As sole owner of the park since 2016, Magdalen has invested in new labs and research space on the site and gained planning consent for a new 165,000 square foot development to support its more than 100 businesses based there, including Vaccitech, which raised $111m from an initial public offering on the Nasdaq stock exchange in April.

Last year British firms raised £1.4bn ($2bn) of venture capital, The Economist said, which was more than anywhere else in Europe but less than the American hubs, Massachusetts (£4.7bn) and San Francisco (£4.5bn).

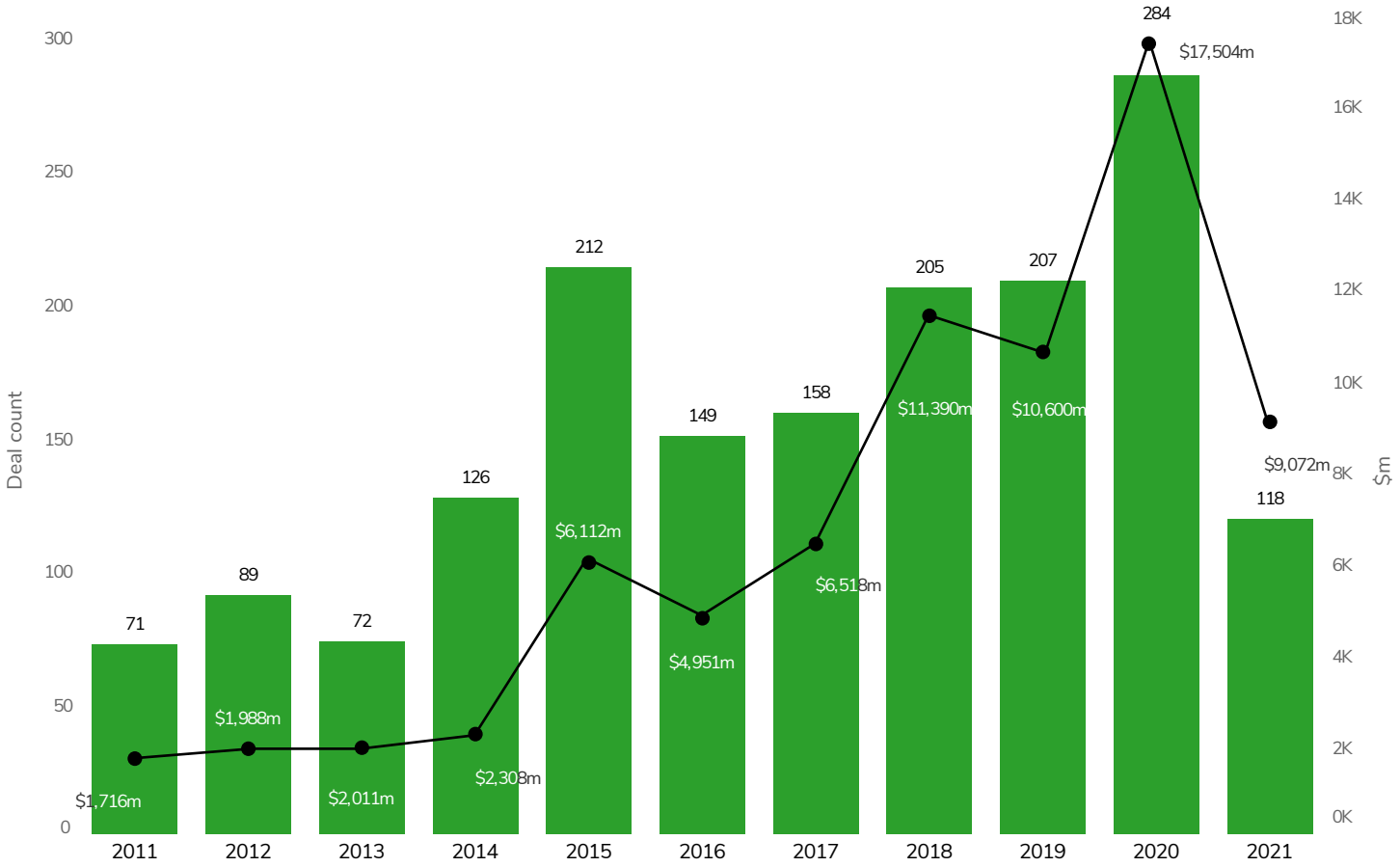
But the parallels between the UK and US are growing.

A few years ago, Seth Harrison, an American venture capitalist at Apple Tree Partners, was looking to open an office in Europe. The choice came down to Britain or Switzerland, he told The Economist. "I got quite acquainted with the whole UK biotech scene.

"The fantastic research ferment that occurs in the Golden Triangle. You know, the London, Cambridge, Oxford area... And I just said: 'Wow, this reminds me of Cambridge, Massachusetts, 25 years ago.'"

**To learn more about the golden triangle, our sister publication, Global University Venturing, will start its review of the three university-led ecosystems, starting with Imperial College, London, in July before discussion and interaction at the GCV Symposium in November.**

## Corporate-backed deals in pharmaceuticals




Source: GCV Analytics

Data as of 26 April

## Medical devices and diagnostics

Medical devices and diagnostics has often been regarded as the underloved part of the healthcare venture market compared with biotech and pharma, with relatively few deals and limited exit options.

This has changed. Last year's near-doubling in corporate venturing deal values to more than $5bn has continued this year. Most recently, in late May, Germany-based Smart4Diagnostics (S4DX) raised €5m ($6m) in its series A round, including local medical technology manufacturer Sarstedt and the EIC Fund, established in 2020 by the European Commission for direct equity investment in breakthrough technologies.

The startup has developed the "digital human blood sample fingerprint", a data picture of all quality aspects for blood samples from collection to arrival in the lab.

As Hans Maria Heyn, chief executive and co-founder of S4DX, said: "As many as three in four medical decisions are based on diagnostic results – often blood samples. Currently, this process is being managed manually which can lead to errors and can cause many issues including slow diagnosis, repeated tests on the patient, and wasted resources."

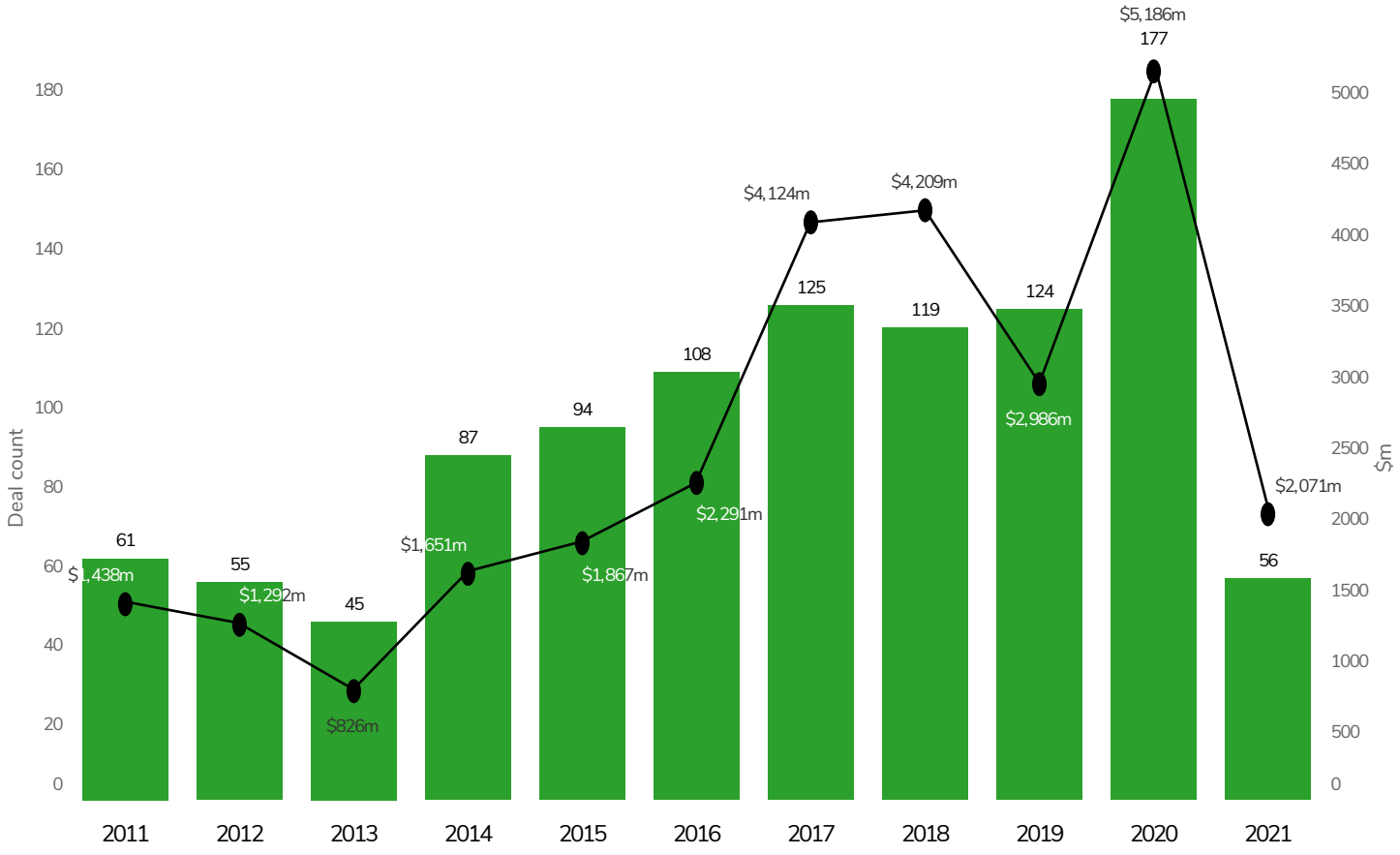
The covid-19 disease has focused more attention on diagnosis and whether treatment can be done remotely from hospitals. But the take-off in attention to medical devices and diagnostics started with the flotation, then purchase, of Merck-backed Livongo, a digital diabetes management platform, which had its initial public offering in 2019 and was acquired by Teladoc for $18.5bn last year.

Livongo had been incubated by venture capital firm 7wireVentures, which has recently closed its second venture fund at $150m with limited partners including health plans Florida Blue and Cigna, hospitals and health systems Atlantic Health, Wellforce, Rush University Medical Center, Memorial Hermann Health System and Spectrum Health and large employer Boeing, according to Fierce Biotech.

Similarly, E-merge Capital Partners is raising its debut fund focused on early-stage medical device companies and technologies coming out the Evolve MedTech Venture Studio.

The fund, led by managing partners Brad Klos and John Xitco, is focused primarily on class II

### Corporate-backed deals in medical devices and diagnostics




Source: GCV Analytics

Data as of 26 April

medical devices in cardiovascular and orthopedics.

Others are also trying to use strategic ties to add value. Private equity firm Revival Healthcare Capital closed its second fund at $500m. It said it will invest where a corporate strategic partner will have a structural option or right to acquire the company in the future.

Rick Anderson, who is chairman and managing director (MD) at Revival, said: "Consolidation has made it increasingly difficult for medtech leaders to move the needle on growth."

Lauren Forshey, Revival president and MD, added: "By removing the guesswork and gamesmanship that often defines the relationship and instead aligning goals at the outset, target companies benefit from increased focus, speed, and capital efficiency in driving towards milestones they know they will get rewarded for."

And the goal remains to gain scale. Venture-backed digital health company Ro has agreed to acquire Modern Fertility, a US-based provider of at-home fertility tests for women, for at least $225m according to Fierce Biotech.

Ro started out four years ago selling erectile dysfunction medication and hair loss supplements to men but after raising $876m has started to acquire other startups, including workpath, to move into the home-based healthcare market.

## Care provision and on-demand services

The gamification of life continues, just updated for the modern world, it seems.

Akili Interactive, a US-based company that has raised $110m in its series D round from Japan-based pharma group Shionogi, has taken it further than most by developing video games approved by the US Food and Drug Administration to tackle attention-deficit hyperactivity disorder and major depressive disorder.

Akili Interactive is clinically proven to improve cognitive function, something so-called brain-training games have touted for years.

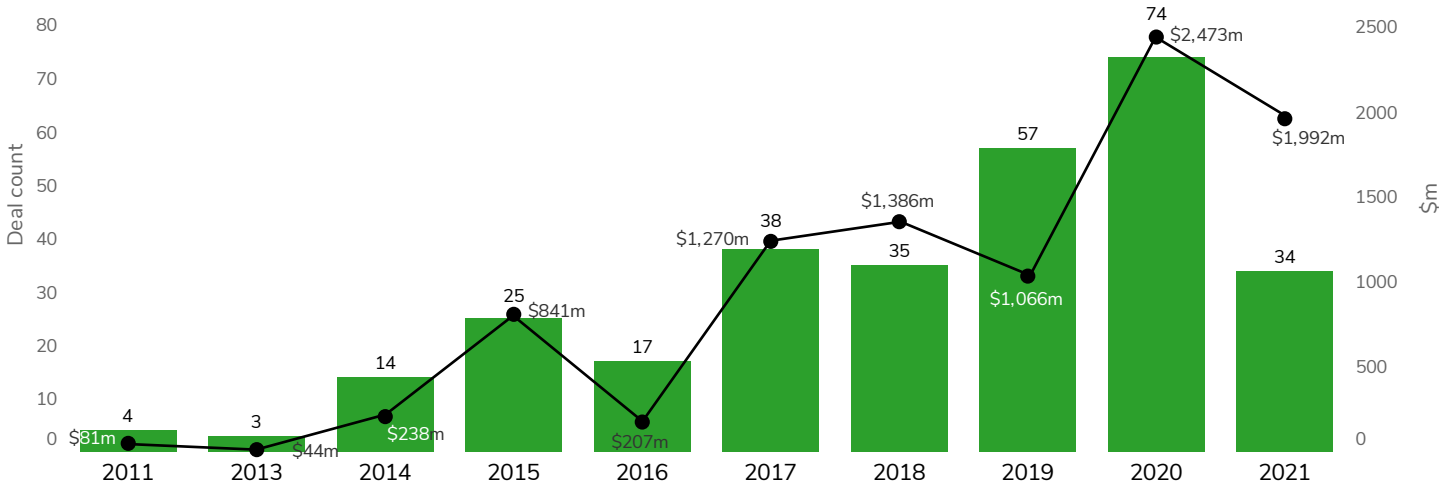
In this case Akili is tackling neurodivergent issues and fits squarely into the wellness trends to tackle people without medical procedures.

Likewise, Germany-based Ada Health, which uses artificial intelligence to try to diagnose symptoms and in a peer-reviewed study was found to be the most accurate on the market, has been backed by the corporate venturing units of local drugs group Bayer and South Korea's Samsung's Catalyst Fund.

Both CVC units, along with peers from Hitachi, Sony and Unilever backed UK-based diagnosis firm Huma's $130m round. Huma's software lets clinicians monitor patients remotely through a mobile app. Huma, like Ada, also uses a range of wearables and other devices to gather data on things like heart rate and oxygen saturation.

Effectively, taking people out of the doctor's surgery or hospital visit for routine checks and earlier monitoring of symptoms should limit expensive, time-consuming checks at a time when medical services risk being overwhelmed by covid-19.

### Corporate-backed deals in care provision and on-demand services




Source: GCV Analytics

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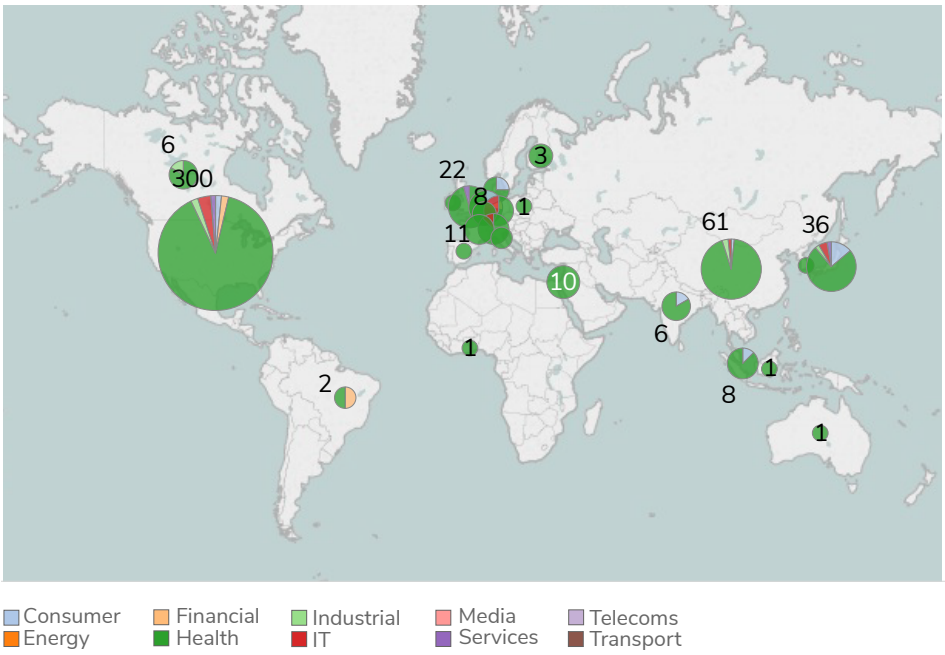
# The sector in charts

## Global view of past year's deals




For the period between May 2020 and April 2021, we reported 503 venturing rounds involving corporate investors from the life sciences sector. A considerable number of them (300) took place in the US, while 61 were hosted in China and 36 in Japan.

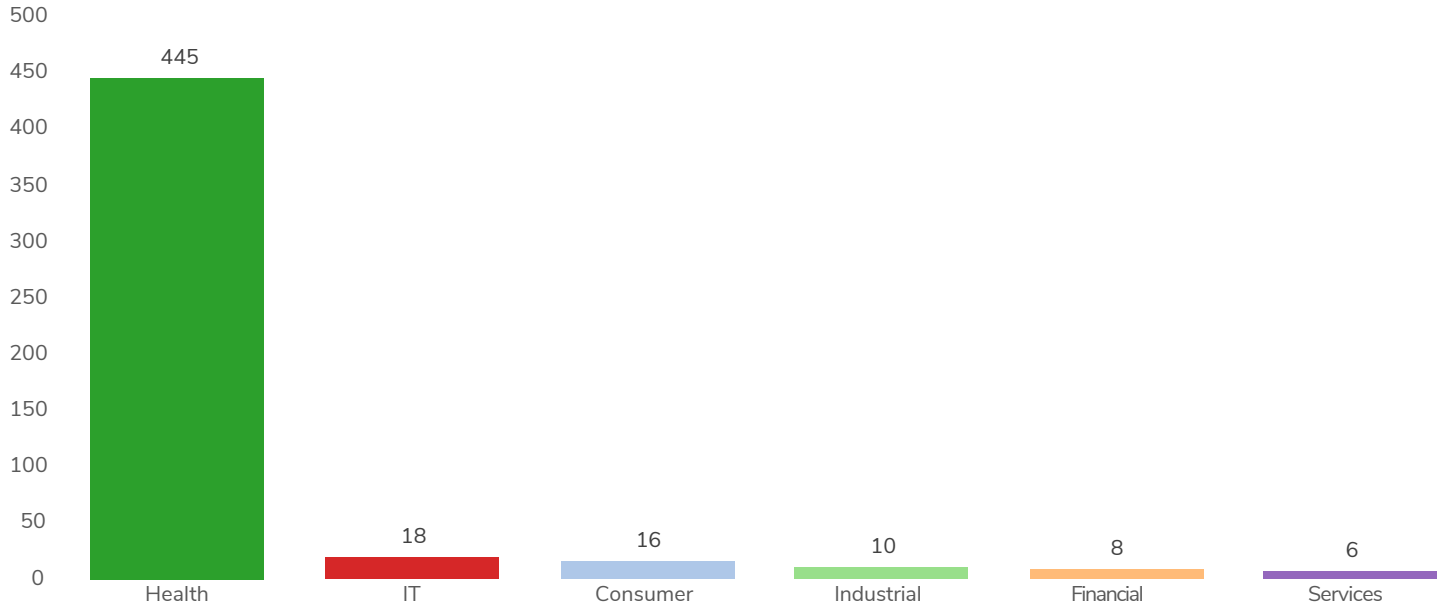
## Investments of health sector corporates over the past year

**Health** 445 (pharmaceuticals, medical devices and healthcare IT)

**IT** 18 (cybersecurity, big data, AI and other)

**Consumer** 16 (food and beverages, hygiene and beauty)

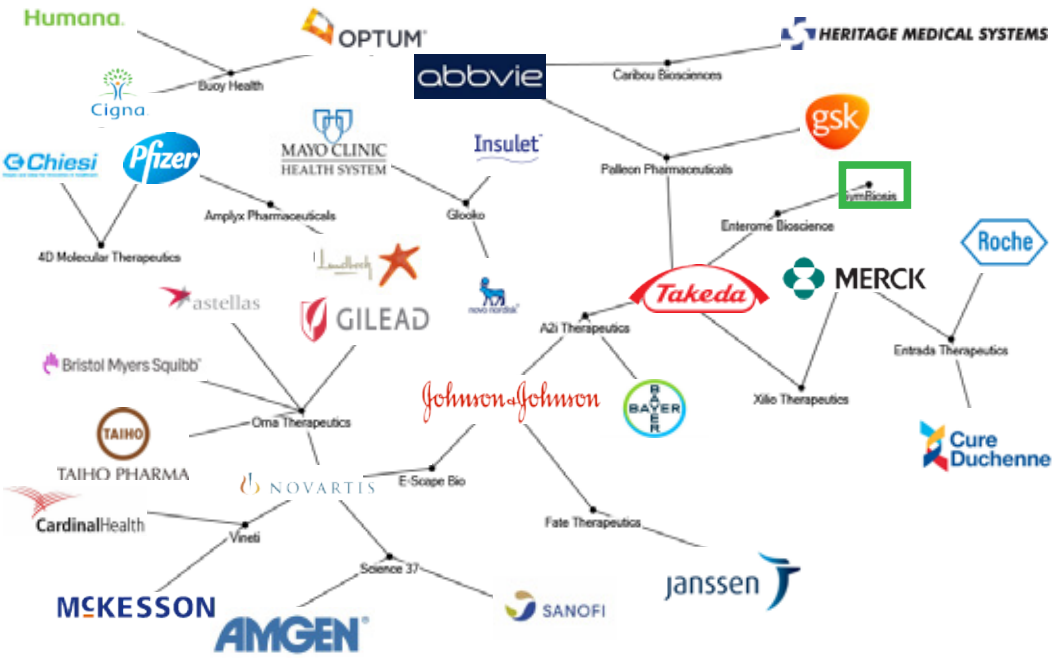
**Industrial** 10 (agtech and industrial chemicals)




Source: GCV Analytics

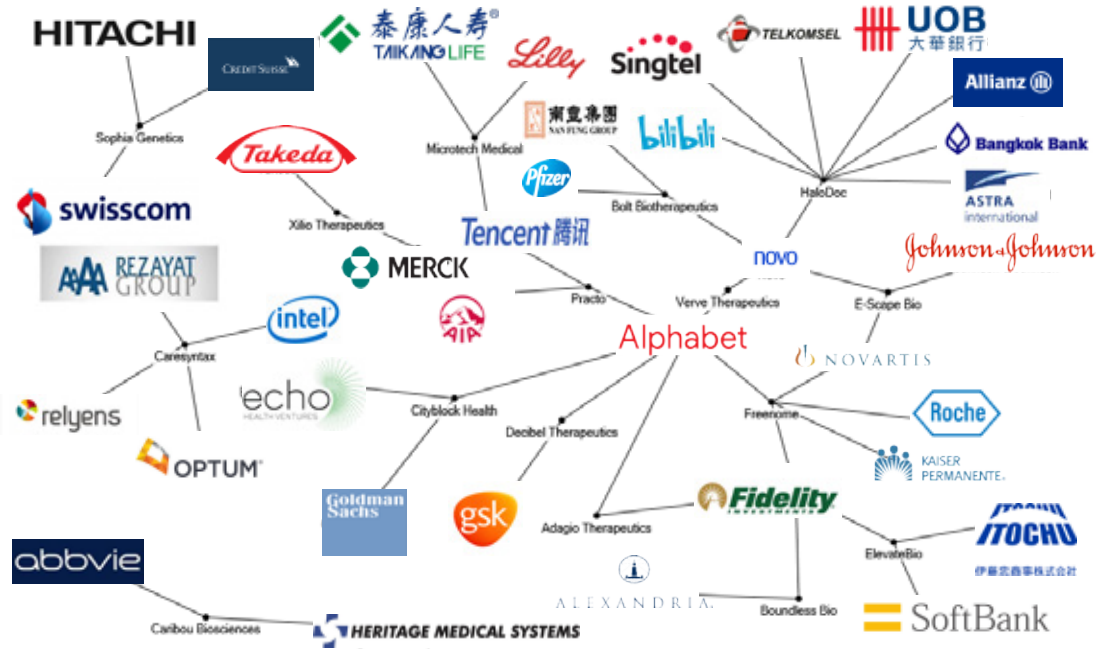
## Co-investments of health sector corporate venturers

- Genetics and gene therapeutics (4d Molecular, Caribou, Vineti, Entrada)
- Cancer treatment (A2i, Palleon, Fate, Orna, Xilio)
- Telehealth and digital health (Buoy Health, Science 37)
- Neurodegenerative disease treatments (E-Scape Bio)
- Diagnostics and monitoring (Enterome Biosciences, Glooko)




## Corporate co-investments in health sector enterprises

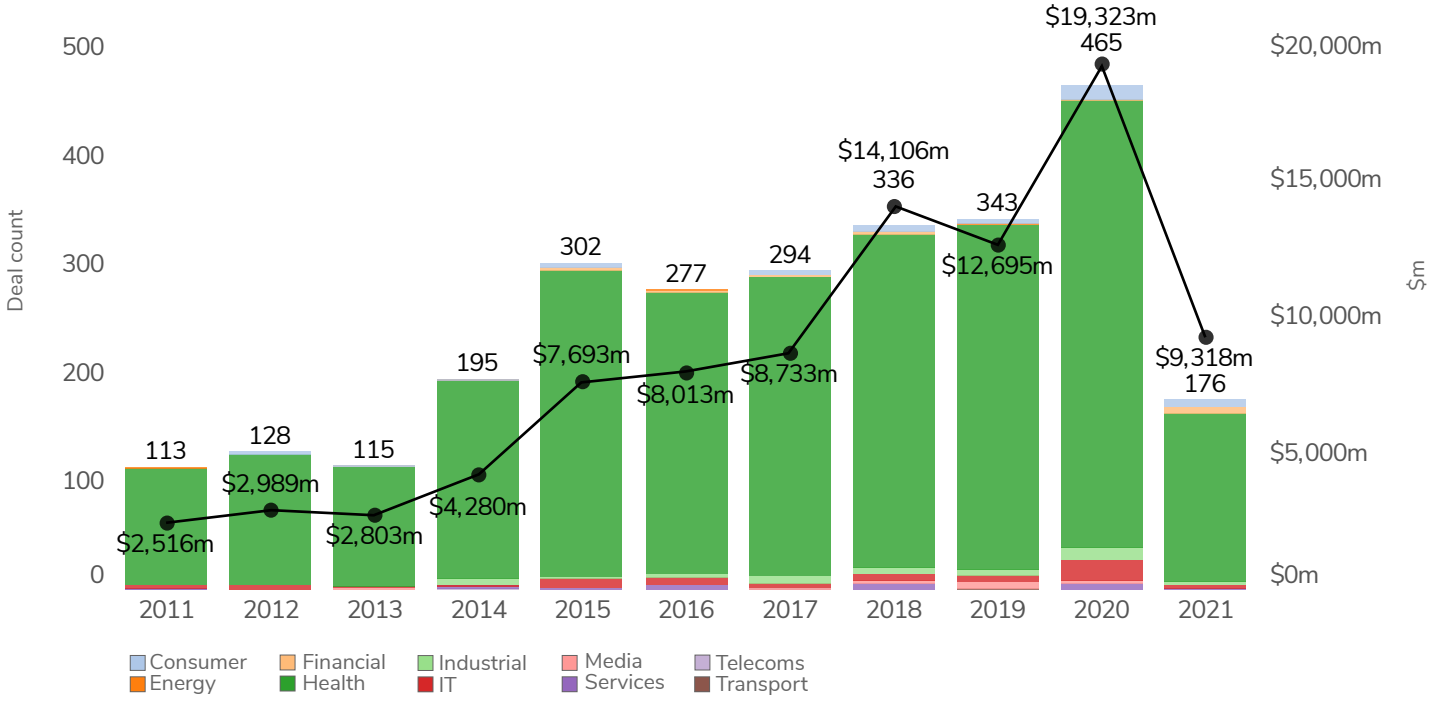
- Genetics and gene therapeutics (Sophia Genetics, Caribou, Verve, Freenome)
- Cancer drugs and treatments (Bolt, Boundles, Xilio)
- Medical equipment makers (Microtech Medical)
- Hearing loss treatments (Decibel)
- Antivirals (Adagio)
- Healthcare IT and digital health application (Cityblock Health, HaloDoc, Practo).



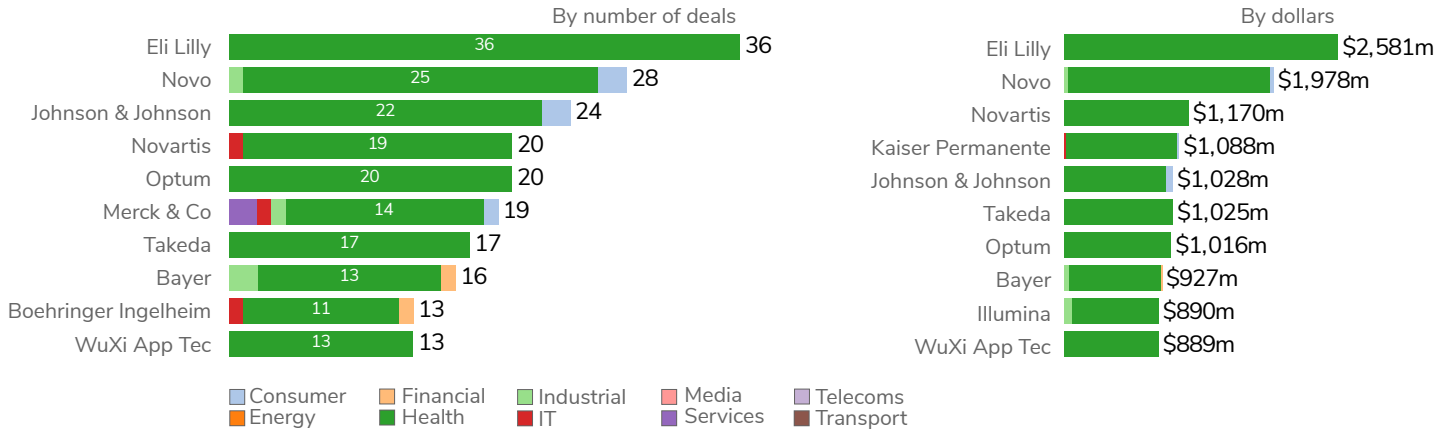

Source: GCV Analytics

## Deals by health corporates

On a calendar year-on-year basis, total capital raised in corporate-backed rounds went up from $12.7bn in 2019 to $19.32bn in 2020, suggesting a 52% increase. The deal count also increased considerably by 36% from 343 deals in 2019 up to 465 tracked by the end of last year. The ten largest investments by corporate venturers from the health sector were all in the same industry.




## Top health investors over the past year

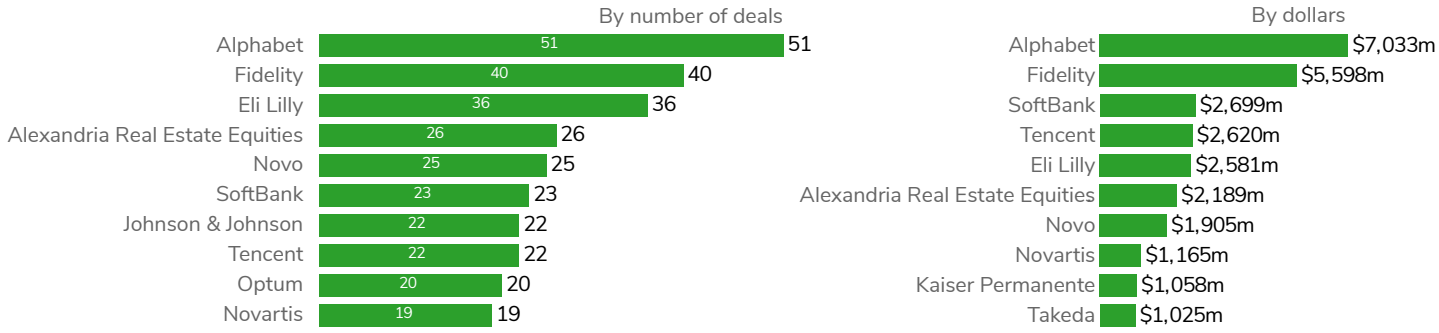



Source: GCV Analytics

The leading corporate investors from the health sector in terms of largest number of deals were pharmaceuticals Eli Lilly, Novo and Johnson & Johnson. The list of life sciences corporates committing capital in the largest rounds was headed by Eli Lilly, Novo and Novartis.

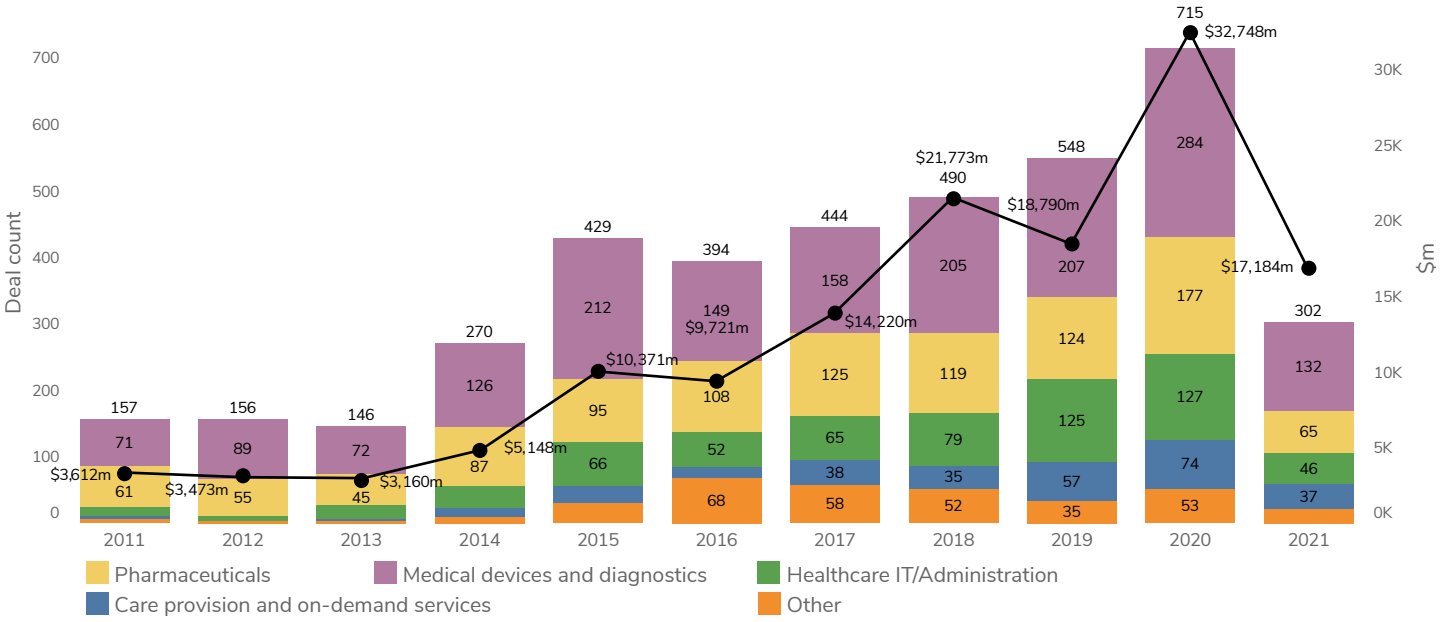
## Top investors in the health sector over the past year

The most active corporate venture investors in the emerging life sciences companies were diversified internet conglomerate Alphabet, financial services firm Fidelity and Eli Lilly.




## Corporate-backed deals in health enterprises

Overall, corporate investments in emerging health-focused enterprises went up from 548 rounds in 2019 to 716 by the end of 2020, suggesting a 31% increase. Estimated total dollars in those rounds nearly doubled from $18.79bn in 2019 to $32.75bn in 2020. Overall, the pandemic shock did not affect much dealmaking and flow of capital into emerging businesses.




Source: GCV Analytics

# Deals

## Top 10 deals by health sector corporates (May 2020-April 2021)

| Portfolio Company | Location | Sector | Round | Round size | Investors List |
|---|---|---|---|---|---|
| Grail | USA | Health | D | $390m | Canada Pension Plan \| Illumina \| Public Sector Pension Investment Board \| undisclosed investors |
| BlockFi | USA | Financial Services | D | $350m | Akuna Capital \| Bain Capital \| Bracket Capital \| Breyer Capital \| Castle Island Ventures \| China Medical System Holdings (CMS) \| DST Global \| Gaingels \| Hudson River Capital \| Jump Capital \| Kenetic Capital \| Morgan Creek Capital Management \| Pacific Century Group \| Paradigm \| ParaFi Capital \| PJC Capital \| Pomp Investments \| Susquehanna International Group \| Third Prime \| Tiger Global Management \| Valar Ventures \| Venture Collective |
| LianBio | China | Health | Undisclosed | $310m | BlackRock \| Casdin Capital \| CMG.Asia \| Farallon Capital Management \| Logos Capital \| Perceptive Advisors \| Pfizer \| RA Capital Management \| Sphera Global Healthcare \| T Rowe Price \| Tybourne Capital \| VenRock \| Vida Ventures \| Viking Global Investors \| Wellington Management |
| Pionyr Immunotherapeutics | USA | Health | Stake purchase | $275m | Gilead Sciences |
| Freenome | USA | Health | C | $270m | Alphabet \| American Cancer Society \| Andreessen Horowitz \| Bain Capital \| Catalio Capital Management \| Colorectal Cancer Alliance \| Cormorant Asset Management \| Data Collective \| EcoR1 Capital \| Farallon Capital Management \| Fidelity \| Janus Henderson Investors \| Kaiser Permanente \| Novartis \| Perceptive Advisors \| Polaris Venture Partners \| RA Capital Management \| Roche \| Rock Springs Capital \| Sands Capital \| Section 32 \| Soleus Capital \| T Rowe Price |
| VillageMD | USA | Health | Undisclosed | $250m | Walgreens Boots Alliance |
| Recursion Pharmaceuticals | USA | Health | D | $239m | Advantage Capital Partners \| Baillie Gifford \| Bayer \| Casdin Capital \| Catalio Capital Management \| Data Collective \| Epic Ventures \| Felicis Ventures \| Intermountain Healthcare \| Laurion Capital Management \| Lux Capital \| Mubadala \| Obvious \| Samsara BioCapital \| Two Sigma Investments |
| 3DMed Diagnostic | China | Health | Undisclosed | $224m | China International Capital Corporation \| Citic Guoan \| Haier Biomedical \| Jemincare \| LanShang Capital \| Luxin Venture Capital Group \| Ruiyi Investment \| Sangel Capital \| Shandong Transportation Industrial Development Fund \| Spinnotec |
| DispatchHealth | USA | Health | D | $200m | Alta Partners \| Echo Health Ventures \| Oak HC/FT \| Questa Capital \| Tiger Global Management |
| Tempus | USA | Health | E and beyond | $200m | Alphabet \| Baillie Gifford \| Franklin Templeton \| Novo \| T Rowe Price |

Source: GCV Analytics

1 US-based cancer diagnostics technology developer Grail received $390m in a series D round backed by genomics company Illumina. Pension funds Public Sector Pension Investment Board and Canada Pension Plan Investment Board also took part in the round, as did several unnamed new and existing backers.

Spun out of Illumina in 2016, Grail has created an early detection blood test for more than 50 cancer indications with a false positive rate of less than 1%. The test uses a proprietary database and machine learning algorithms to detect the presence of cancer and identify where in the body it is located. This series D funding will go towards the continued development of Grail's test.

2 US-headquartered, crypto-focused financial services provider BlockFi closed a $350m series D round featuring quantitative trading firms Hudson River Trading and Susquehanna International Group (SIG).

The round was co-led by Bain Capital Ventures, the venture capital arm of private equity firm Bain Capital, with Pomp Investments, Tiger Global Management and partners of DST Global, while SIG invested through its Susquehanna Government Products subsidiary. China Medical System Holdings, a pharma company, is also a backer.

BlockFi's online platform manages crypto assets on behalf of financial services providers and wealth managers. It will put the funding into product development and an expansion into new markets that may be supported by strategic acquisitions.

3 China-based, Asia-focused drug developer LianBio secured $310m in crossover financing from investors including pharmaceutical firm and vaccine developer Pfizer.

Investment management firm RA Capital co-led the oversubscribed round with investment firm CMG-SDIC Capital and Venrock Healthcare Capital Partners, a branch of VC firm Venock.

LianBio is developing therapeutics licensed from pharmaceutical partners including MyoKardia and BridgeBio for conditions such as cancer and cardiorenal diseases which affect the heart and kidneys. The company was launched in August 2020 with an undisclosed amount of funding from life sciences investment firm Perceptive Advisors.

4 Biopharmaceutical firm Gilead Sciences agreed to pay $275m for a 49.9% stake in US-based immuno-oncology therapy developer Pionyr Immunotherapies as part of a wider agreement. The deal gives Gilead the option to fully acquire Pionyr for a further $315m, and the latter's shareholders could eventually earn a total of $1.47bn in option exercise fees and milestone payments. Gilead can exercise its option at any point up to the completion of phase 1b clinical trials for Pionyr's two lead assets.

Founded in 2015, Pionyr is working on cancer treatments that are intended to promote anti-tumour immunity in patients who do not benefit from checkpoint inhibitor therapies. Its lead candidates, PY314 and PY159, are aimed at solid tumours and have shown promise in preclinical studies.

5 US-based oncology diagnostics technology developer Freenome completed a $270m series C round, featuring pharmaceutical firms Roche and Novartis, healthcare provider Kaiser Permanente and Alphabet. Corporates Alphabet, Kaiser Permanente and Roche participated through respective corporate venturing units GV,

Kaiser Permanente Ventures and Roche Venture Fund. Bain Capital Life Sciences and Perceptive Advisors co-led the round, which included investment and financial services group Fidelity, American Cancer Society's BrightEdge Ventures fund, Janus Henderson Investors, Farallon Capital Management and Rock Springs Capital, among other investors. Freenome has developed a system that can detect cancer with a single blood draw using multiomics technology that combines multiple forms of biological analysis. It has a screening test for colorectal cancer in clinical trials along with one that will detect precancerous lesions.

**Walgreens has formed a strategic parthernship with VillageMD**

6 Pharmacy operator Walgreens Boots Alliance (WBA) formed a $1bn strategic partnership agreement with US-based primary care provider VillageMD that included an initial investment of $250m.

The $1bn figure will consist of an undisclosed mix of equity and convertible debt financing over the next three years. The $250m equity investment represented the first instalment and WBA will own a 30% stake in VillageMD once the debt has been converted into equity.

Founded in 2013, VillageMD runs a nationwide network of primary care services providers called Village Medical. It has partnered more than 2,800 physicians, with 600,000. The partnership will enable WBA to offer full-service doctor offices at its pharmacies. It plans to launch them in 500 to 700 facilities across more than 30 markets over the next five years, before adding hundreds more.

VillageMD will be responsible for recruiting more than 3,600 physicians to operate the outlets and will integrate Walgreens into its healthcare service.

7 Pharmaceutical and agricultural product manufacturer Bayer invested $50m to lead a $239m series D round for US-based drug discovery technology provider Recursion through its Leaps by Bayer subsidiary. Fellow new investors Casdin Capital, Catalio

Credit: Bayer

**Bayer led a series D round for a drug discovery technology developer**

Capital Management, Laurion Capital Management and Samsara BioCapital also took part in the round, which valued Recursion just below $1bn pre-money, a source told The Information.

The round was filled out by existing backers which include Intermountain Ventures, care provider Intermountain Healthcare's corporate venturing unit, as well as Baillie Gifford, Mubadala Investment and other investors.

Recursion is combining automation and machine learning technology with what it claims is the largest biological image dataset in the world to discover drug treatments for a range of conditions including cancer and genetic disorders such as neurofibromatosis or GM2 gangliosidosis.

## 8

China-based medical test developer 3DMed Diagnostic closed a RMB1.5bn ($224m) funding round featuring pharmaceutical firm Jemincare and biomedical cold chain storage provider Haier Biomedical. The round was led by CPE, the alternative asset management arm of state-owned investment firm Citic Group, and included CICC Capital, a private equity arm of investment bank China International Capital Corporation.

Spun off by precision cancer drug developer 3D Medicines in 2018, 3DMed Diagnostic focuses on diagnostic tools, including a test for covid-19, based on technology developed at its parent company.

Proceeds from the round will support research and recruitment activities as 3DMed Diagnostic targets international growth.

## 9

US-based home healthcare service DispatchHealth secured $200m in series D funding from investors including health insurance provider Humana at a $1.7bn valuation. Investment firm Tiger Global Management led the round, which included Echo Health Ventures, the partnership between healthcare provider Cambia Health Solutions and investment firm Mosaic Health Solutions, as well as Alta Partners, Oak HC/FT and Questa Capital.

Founded in 2013 as True North Health Navigation, DispatchHealth provides a home care platform that delivers on-demand emergency medical services encompassing treatments for common injuries and complex diseases. The proceeds from the round will be used to increase its presence in a hundred markets and promote its Advanced Care programme, an in-home clinical service that functions as an alternative to hospitalisation.

## 10

US-based precision therapeutics developer Tempus raised $200m in a series G2 round featuring Alphabet and Novo, at an $8.1bn post-money valuation. The corporates joined investment management firms Baillie Gifford and Franklin Templeton in the round along with funds and accounts managed by investment manager T Rowe Price. Tempus applies AI to large volumes of clinical and molecular data to develop precision medicine products for cancer, infectious and neurological diseases. The capital will help it expand into new areas such as depression and cardiology.

## Top investments in health sector enterprises (May 2020-April 2021)

| Portfolio Company | Location | Sector | Round | Round size | Investors List |
|---|---|---|---|---|---|
| MGI Tech | China | Health | B | $1bn | China Renaissance \| Citic \| Co-Stone Asset Management \| Huatai Securities Company \| International Data Group \| Sailing Capital \| Shanghai Guofang FoF \| Shenzhen Green Pine Capital Partners |
| Resilience | USA | Health | Undisclosed | $800m | Alphabet |
| Sana Biotechnology | USA | Health | Undisclosed | $700m | Alaska Permanent Fund \| Alphabet \| Altitude Life Science Ventures \| Arch Venture Partners \| Baillie Gifford \| Bezos Expeditions \| Canada Pension Plan \| Fidelity \| Flagship Pioneering \| Omega Funds \| Public Sector Pension Investment Board \| undisclosed investors |
| Verily Life Sciences | USA | Health | Undisclosed | $700m | Alphabet \| Ontario Teachers' Pension Plan Board \| Silver Lake \| Temasek |
| ElevateBio | USA | Health | C | $525m | EcoR1 Capital \| EDBI \| Emerson Collective \| F2 Ventures \| Fidelity \| Invus \| Itochu \| Matrix Capital \| MPM Capital \| Redmile Group \| Samsara BioCapital \| SoftBank \| Surveyor Capital \| undisclosed investors \| Vertex Ventures |
| Dxy.cn | China | Health | Undisclosed | $500m | Hillhouse Capital Management \| Tencent \| TrustBridge Partners |
| EQRx | USA | Health | B | $500m | Alphabet \| Andreessen Horowitz \| Arboretum Ventures \| Arch Venture Partners \| Casdin Capital \| Nextech Invest \| Section 32 \| undisclosed investors |
| Miaoshou Doctor | China | Health | E and beyond | $466m | China International Capital Corporation \| Citic Securities \| Qiming Venture Partners \| Sequoia Capital \| Tencent |
| Insitro | USA | Health | C | $400m | Alexandria Real Estate Equities \| Alphabet \| Andreessen Horowitz \| Arch Venture Partners \| BlackRock \| Canada Pension Plan \| Casdin Capital \| Foresite Capital \| Hof Capital \| SoftBank \| T Rowe Price \| Temasek \| Third Rock Ventures \| Two Sigma Investments \| undisclosed investors |
| Grail | USA | Health | D | $390m | Canada Pension Plan \| Illumina \| Public Sector Pension Investment Board \| undisclosed investors |

Source: GCV Analytics

There were other interesting deals in emerging health-focused businesses that received financial backing from corporate investors from the same and other sectors.

1 Spun off by China-based genomics services provider BGI, gene sequencing technology developer MGI Tech raised a $1bn series B round. VC firm IDG Capital and private equity fund CPE Capital co-led the round, which featured also investment bank China Renaissance's New Economy Fund and Goldstone Investment, among many other investors.

Founded in 2016, MGI develops gene sequencing systems for use in life sciences research, drug development, precision medicine and agriculture. The applications of the company's systems range from mass spectrometry and medical imaging to laboratory automation. Its technology has been used for the rapid detection of covid-19 and its equipment has been sold internationally. MGI products cover genetic testing, gene editing and synthesis, and include sequencing reagents, materials and biochemical reaction systems.

2 Resilience, a US-based developer of medical manufacturing technology, emerged from stealth with more than $800m in funding from investors including GV, a subsidiary of Alphabet. GV participated in a recently closed $750m series B round co-led by Arch Venture Partners and 8VC and also backed by fellow VC firm New Enterprise Associates and unnamed pharmaceutical companies, public mutual funds, foundations, family offices and pension funds.

Founded in 2020 and also known as National Resilience, Resilience is developing technologically advanced pharmaceutical manufacturing facilities that will help therapeutics developers concentrate capital on drug discovery activities. The technology is intended to allow gene and cell therapies, vaccines, proteins and viral vectors to be produced quickly and safely at scale. The startup intends to bring more than 750,000 square feet of operating space online over the next year and will also offer drug chain development and supply chain management services.

3 US-based stem cell medicine developer Sana Biotechnology closed its inaugural funding round, having raised more than $700m from investors including GV. The round also featured F-Prime Capital, a fund owned by investment and financial services group Fidelity, as well as Canada Pension Plan Investment Board, Alaska Permanent Fund and the Public Sector Pension Investment Board. Sana is working on technology intended to repair and control genes in cells and replace missing or damaged cells to tackle the underlying causes of serious diseases, ranging from cancer and

central nervous system conditions to heart disease and various genetic disorders. The funding has been allocated to advancing the startup's core platforms, including those focusing on gene delivery, immunology, stem cell biology and gene modification and control.

4 Verily, a US-headquartered developer of data-focused life sciences technology, received $700m in funding from investors including its parent company Alphabet. The company said the funding was provided by its current investors and named private equity firm Silver Lake, Singaporean state-owned investment firm Temasek and pension fund manager Ontario Teachers' Pension Plan alongside Alphabet. The cash will go to commercialising the product range, which includes Verily Health Platforms, an umbrella that oversees covid-19 testing service Healthy at Work, diabetes management platform OnDuo and Coefficient, a health insurance product. Launched in 2015 after being incubated within Alphabet's Google X division, Verily is working on hardware and software products in partnership with other companies to use data in drug development and disease management.

5 US-based gene therapy developer ElevateBio secured $525m in a series C round that included telecoms and internet group SoftBank's Vision Fund 2 and diversified trading firm Itochu. The round was led by investment manager Matrix Capital Management and also featured investment and financial services group Fidelity Management & Research Company in addition to an undisclosed large insurance firm.

ElevateBio is working on cell, gene and regenerative therapies for a wide range of potential illnesses. The company launched in May 2019 with $150m from a series A round featuring investment bank UBS's Oncology Impact Fund.

6 China-based online medical community operator DXY closed a $500m financing round that included Tencent Investment, the corporate venturing subsidiary of internet group Tencent. Growth equity firm Trustbridge Partners led the round, which also featured hedge fund manager Hillhouse Capital's VC arm, GL Ventures.

Founded in 2000, DXY operates an online platform where physicians can share expertise, and has expanded into consumer-facing medical advice, medical staff recruitment and online consultations. It has some 5.5 million professionals on its platform including 2 million doctors. The company has also established a

**Singapore's state-owned investment firm Temasek invested in Verily**

**Affordable medicine developer EQRx and drug discovery technology provider Insitro are backed by Alphabet**

real-time information service on the covid-19 pandemic along with a service that refutes rumours about the disease.

7 US-based affordable medicine developer EQRx secured $500m in a series B round featuring healthcare software producer Nextech and GV. The round included all the participants in the $200m series A round EQRx disclosed when it emerged from stealth in January 2020, including Andreessen Horowitz, Section 32, Casdin Capital, Arch Venture Partners and Arboretum Ventures.

The series A investors were joined by undisclosed payers and health systems, life science specialists, family offices and mutual, sovereign wealth and private equity funds. EQRx is looking to utilise advanced technology to develop more affordable monotherapies and drug combinations in partnership with biopharmaceutical companies. The company has identified late-stage liver, breast and on-small cell lung cancer medication and drugs for inflammatory conditions as areas to pursue.

8 Yuanxin Technology, the China-based developer of a telemedicine platform, closed a RMB$3bn ($466m) series E round co-led by Tencent. VC firm Sequoia China co-led the round, which also featured peer Qiming Venture Partners, investment bank Citic Securities and CICC Capital, a subsidiary of investment banking firm China International Capital Corporation.

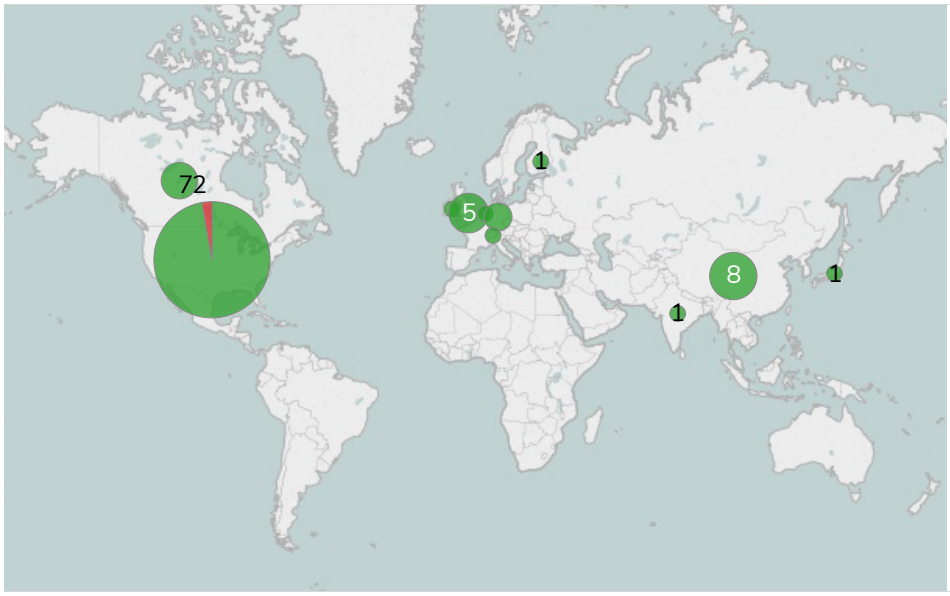
Founded in 2015, Yuanxin has created a mobile app called Miaoshou Doctor that enables users to access a network of 1.3 million doctors for online consultations outside normal work hours, in addition to paying for prescription medicine and buying health insurance. The company has about 7 million daily active users and also manages online portals for some 200 Chinese hospitals across 80 cities.

9 US-headquartered drug discovery technology provider Insitro received $400m in a series C round featuring GV and Softbank Investment Advisors, on behalf of Alphabet and SoftBank. Canada Pension Plan Investment Board led the round, which included Alexandria Venture Investments, the VC arm of life sciences real estate investment trust Alexandria Real Estate Equities, as well as an unnamed healthcare provider and undisclosed investment group.

Insitro uses machine learning technology to support drug development through enhanced medicine design, the creation of predictive cell-based disease models and the deployment of statistical genetics in locating druggable targets.

# Exits

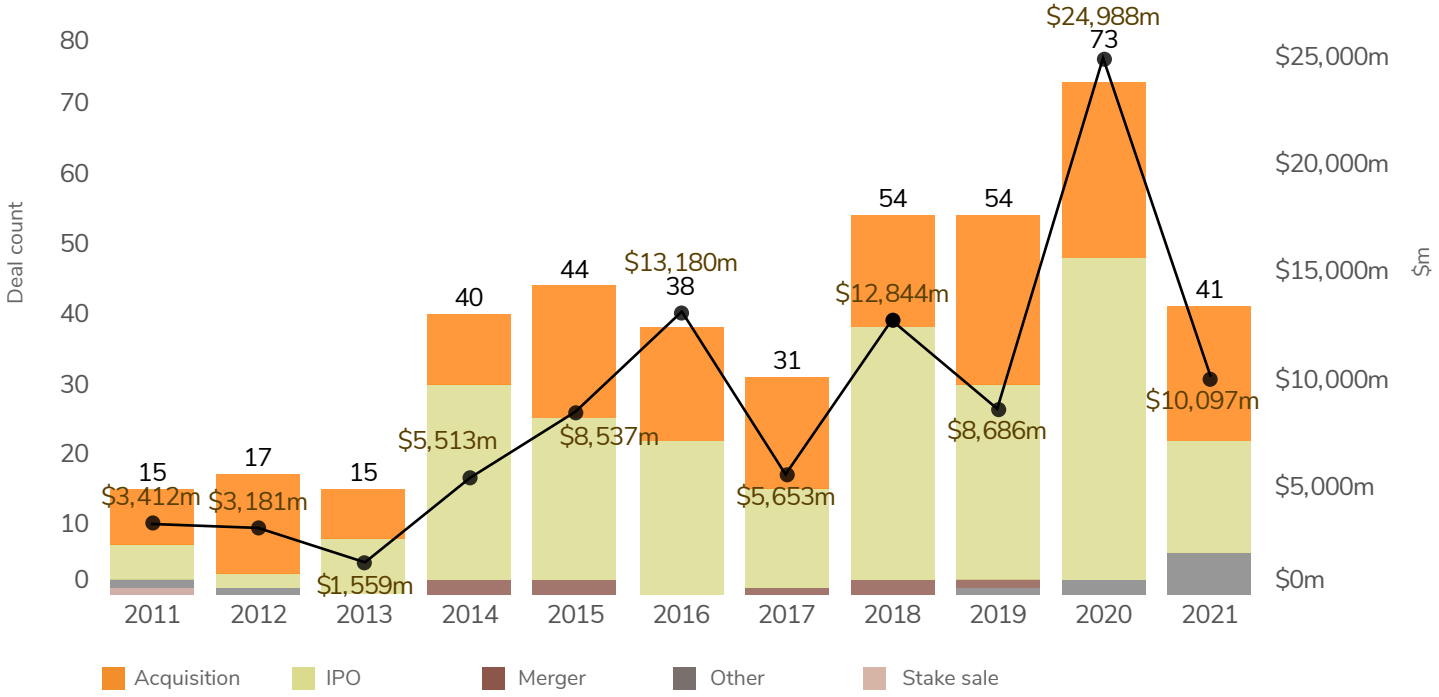
## Global view of past year's exits




Corporate venturers from the health sector completed 97 exits between May 2020 and April 2021 – 54 initial public offerings (IPOs), 35 acquisitions and eight other transactions.

## Exits by health corporates

As for year-on-year, the transaction volume went up from 54 to 73 between 2019 and 2020, while the estimated dollar value increased almost threefold from $8.69bn down to $24.99bn.




Source: GCV Analytics

## Top exits by health corporate investors (May 2020-April 2021)

| Portfolio Company | Location | Sector | Exit Type | Acquirer | Exit size ($m) | Exiting investors |
|---|---|---|---|---|---|---|
| Grail | USA | Health | Acquisition | Illumina | #$8bn | Ally Bridge Group \| Alphabet \| Amazon \| Arch Venture Partners \| Bezos Expeditions \| Blue Pool Capital \| Bristol-Myers Squibb \| Canada Pension Plan \| Celgene \| China Merchant Securities International \| CRF Investment \| Decheng Capital \| Hillhouse Capital Management \| HuangPu River Capital \| ICBC International \| Illumina \| Johnson & Johnson \| McKesson Corporation \| Memorial Sloan Kettering \| Merck & Co \| Milky Way Ventures \| private investors \| Public Sector Pension Investment Board \| Sequoia Capital \| Sutter Hill Ventures \| Tencent \| Varian Medical Systems \| WuXi AppTec |
| VelosBio | USA | Health | Acquisition | Merck & Co | $2.75bn | Adage Capital Management \| Arix Bioscience \| Chiesi \| Cormorant Asset Management \| Decheng Capital \| Farallon Capital Management \| Foresite Capital \| Janus Henderson Investors \| Johnson & Johnson \| Logos Capital \| Matrix Capital \| OrbiMed Advisors \| Pappas Capital \| Sofinnova Partners \| Surveyor Capital \| T Rowe Price \| Takeda \| VenRock \| Viking Global Investors \| Wellington Management |
| Kymab | UK | Health | Acquisition | Sanofi | $1.45bn | Bill & Melinda Gates Foundation \| Malin Corporation \| ORI Capital \| Shenzhen Hepalink Pharmaceutical \| Wellcome Trust \| Woodford Equity Income Fund \| Woodford Patient Capital |
| ArcherDX | USA | Health | Acquisition | Invitae | $1.4bn | ArrowMark Partners \| Boulder Ventures \| Driehaus Capital Management \| Longwood fund \| PBM Capital Group \| Peierls Foundation \| Perceptive Advisors \| Qiagen \| Redmile Group \| Sands Capital \| Soleus Capital |
| Moderna Therapeutics | USA | Health | Other | | $1bn | AstraZeneca |
| 23andMe | USA | Health | Other | | $980m | Alphabet \| Altimeter Capital Management \| Casdin Capital \| Fidelity \| Foresite Capital \| GSK \| Illumina \| Johnson & Johnson \| Roche \| VG Acquisition Corp \| Virgin \| WuXi AppTec |
| Mobidiag | Finland | Health | Acquisition | Hologic | $795m | Autobio Diagnostics \| Springvest |
| Amwell (American Well) | USA | Health | IPO | | $742m | Allianz \| InVenture Partners \| Philips \| Takeda \| Teva Pharmaceutical Industries |
| Rodeo Therapeutics | USA | Health | Acquisition | Amgen | $721m | AbbVie \| Accelerator Corporation \| Alexandria Real Estate Equities \| Arch Venture Partners \| Eli Lilly \| Johnson & Johnson \| Watson Fund \| WRF Capital \| WuXi AppTec |
| SomaLogic | USA | Health | Other | | $615m | Casdin Capital \| CM Life Sciences II \| Farallon Capital Management \| iCarbonX \| Illumina \| Janus Henderson Investors \| Nan Fung Group \| Novartis \| Otsuka Pharmaceutical \| Perceptive Advisors \| Quest Diagnostics \| SoftBank \| T Rowe Price |

Source: GCV Analytics

1 US-based medical diagnostics technology Grail agreed to an $8bn acquisition by genomics technology producer Illumina, which was originally spun out the former. With this transaction, Grail received $3.5bn in cash and another $4.5bn in stock. Grail and Illumina had also signed a $315m merger termination agreement.

2 Pharmaceutical firm Merck & Co agreed to acquire oncology therapy developer VelosBio for $2.75bn in cash, enabling pharmaceutical companies Chiesi and Takeda to exit. Founded in 2017, VelosBio is working on cancer drugs targeted at a type of protein known as the tyrosine kinase-like orphan receptor 1. The company's lead candidate, VLS-101, is an antibody-drug conjugate in a phase 1 clinical trial for haematologic malignancies and a phase 2 trial for solid tumours. It had secured $202m in funding prior to the acquisition agreement.

3 Pharmaceutical firm Sanofi agreed to acquire UK-based monoclonal antibody therapy developer Kymab in a deal sized at up to $1.45bn that will enable pharmaceutical manufacturer Shenzhen Hepalink to exit. The transaction consisted of $1.1bn in cash and up to $350m in milestone payments. It comes after approximately $220m in funding for the company.

Founded in 2010, Kymab is developing treatments for cancer and immune-mediated diseases. Its lead product candidate, KY1005, is a monoclonal antibody that could potentially treat a range of immune-mediated diseases and inflammatory disorders.

4 Genetic information provider Invitae agreed to acquire US-based genetic testing technology developer ArcherDX in a deal valued at about $1.4bn that will allow medical researcher Qiagen to exit. The transaction will consist of $325m in cash and 30 million shares of

Invitae stock, in addition to 27 million more shares dependent on certain milestones being met.

ArcherDX has created a range of precision oncology products informed by genetic sequencing technology and bioinformatics software to assist in cancer research. It had been preparing a regulatory submission for its debut in-vitro diagnostics product in late 2020. The company was formed in 2015 when Qiagen bought the Enzyme Solutions division of biological research technology provider Enzymatics. It had filed for a $100m initial public offering in June 2020.

5 Pharmaceutical firm AstraZeneca divested its stake in US-listed RNA therapeutics and vaccine developer Moderna for an amount likely to be above $1bn. Moderna specialises in drugs and vaccines that inject messenger RNA into human cells to spur production of certain proteins. In the past year its share price has soared multifold, mainly due to it being one of the first to successfully produce a vaccine for covid-19. The company had floated in a $604m initial public offering in 2018 following nearly $1.75bn in funding. AstraZeneca then held a 7.8% stake worth approximately $587m.

6 23andMe, the US-based genetic testing service backed by corporates Alphabet, WuXi AppTec, Johnson & Johnson, GlaxoSmithKline, Roche and Illumina, agreed a reverse merger with a special purpose acquisition company (Spac).

VG Acquisition Corp, which is sponsored by conglomerate Virgin Group, floated on the New York Stock Exchange in a $480m initial public offering in October 2020, and the merged business will take its listing on the exchange.

The transaction valued the company at $3.5bn and was supported by $500m in financing from Virgin founder Richard Branson, 23andMe co-founder and CEO Anne Wojcicki, funds managed by investment and financial services group Fidelity, Altimeter Capital, Casdin Capital and Foresite Capital.

Founded in 2006, 23andMe provides home testing kits that customers send back in order to get information on genealogy and/or their potential genetic susceptibility to certain diseases. The information also supports genetic research carried out by the company.

7 Women-focused medical technology producer Hologic agreed to acquire Mobidiag, a Finland-headquartered molecular diagnostics technology developer backed by clinical diagnostics product maker Autobio Diagnostics, for €668m ($795m). The deal involves a cash payment of $714m combined with $81m of net debt financing. Founded in 2000, Mobidiag produces polymerase chain reaction-based tests and equipment for acute care conditions including gastrointestinal and respiratory infections. The company's offering includes the Amplidiag range, for high-throughput molecular diagnostics, and the Novodiag platform for fast on-demand molecular diagnostics. It generated approximately $42m of revenue during 2020. The acquisition will strengthen Hologic's portfolio of diagnostics businesses and enable it to enter the acute care market.

8 Amwell, a US-based telehealth technology provider backed by electronics and medical technology producer Philips, insurance group Allianz and pharmaceutical firms Teva and Takeda, raised $742m in its IPO. The company has increased the number of shares in the offering from 35 million to 41.2 million and priced them at $18.00, above the $14 to $16 range it had set. Internet technology provider Google invested $100m in a separate

Credit: GSK

**GlaxoSmithKline backed 23andMe**

**US-listed drugs group Amgen agreed to acquire Rodeo Therapeutics**

private placement. Formerly known as American Well, Amwell has built a telehealth technology platform that links patients with healthcare providers and health insurers. It manages telehealth operations for 55 health insurance plans and 150 healthcare systems. The company increased revenue 77% year on year to $122m in the first half of 2020, though net losses near tripled to $113m.

9 US-listed drugs group Amgen agreed to acquire Rodeo Therapeutics, a US-based small-molecule therapy developer for tissue, for up to $721m. Amgen will pay an initial $55m and up to $666m in cash subject to milestones. In July 2017, Rodeo raised $5.9m in series A financing from investors including pharmaceutical firms AbbVie, Eli Lilly, Johnson & Johnson and WuXi AppTec. AbbVie and Johnson & Johnson had invested through their respective corporate venturing units: AbbVie Ventures and Johnson & Johnson Innovation – JJDC. Previous backers also include Alexandria Venture Investments, among others. Rodeo is developing small-molecule therapies, including its lead 15-prostaglandin dehydrogenase modulators, that will help regenerate and repair various types of tissue, for use in dealing with conditions such as ulcerative colitis and for haemopoietic recovery after bone marrow transplants.

10 SomaLogic, the US-based healthcare management software provider backed by Novartis, Nan Fung, iCarbonX, Otsuka and Quest Diagnostics, agreed a reverse takeover with special purpose acquisition company CM Life Sciences II. The deal gave SomaLogic a pre-transaction enterprise value of approximately $1.23bn and will involve it acquiring the spot on the Nasdaq Capital Market taken by CM Life Sciences II – sponsored by Casdin Capital and Corvex Management – in a $240m IPO. SoftBank's SB Management unit, Novartis and genomics technology provider Illumina were among the participants in a $375m private investment in public equity (PIPE) financing supporting the transaction.

SomaLogic pools data from users and its partner network to provide detailed health data that helps users manage their personal health more effectively. It specialises in proteomics, the science of proteins.

## Top exits from health enterprises (May 2020-April 2021)

| Portfolio company | Location | Sector | Exit Type | Acquirer | Exit size | Exiting investors |
|---|---|---|---|---|---|---|
| Grail | USA | Health | Acquisition | Illumina | $8bn | Ally Bridge Group \| Alphabet \| Amazon \| Arch Venture Partners \| Bezos Expeditions \| Blue Pool Capital \| Bristol-Myers Squibb \| Canada Pension Plan \| Celgene \| China Merchant Securities International \| CRF Investment \| Decheng Capital \| Hillhouse Capital Management \| HuangPu River Capital \| ICBC International \| Illumina \| Johnson & Johnson \| McKesson Corporation \| Memorial Sloan Kettering \| Merck & Co \| Milky Way Ventures \| private investors \| Public Sector Pension Investment Board \| Sequoia Capital \| Sutter Hill Ventures \| Tencent \| Varian Medical Systems \| WuXi AppTec |
| JD Health | China | Health | IPO | | $3.48bn | Bank of America \| Baring Private Equity Asia \| CICC Capital \| Citic \| Haitong Securities \| Hillhouse Capital Management \| UBS |
| VelosBio | USA | Health | Acquisition | Merck & Co | $2.75bn | Adage Capital Management \| Arix Bioscience \| Chiesi \| Cormorant Asset Management \| Decheng Capital \| Farallon Capital Management \| Foresite Capital \| Janus Henderson Investors \| Johnson & Johnson \| Logos Capital \| Matrix Capital \| OrbiMed Advisors \| Pappas Capital \| Sofinnova Partners \| Surveyor Capital \| T Rowe Price \| Takeda \| VenRock \| Viking Global Investors \| Wellington Management |
| Kymab | UK | Health | Acquisition | Sanofi | $1.45bn | Bill & Melinda Gates Foundation \| Malin Corporation \| ORI Capital \| Shenzhen Hepalink Pharmaceutical \| Wellcome Trust \| Woodford Equity Income Fund \| Woodford Patient Capital |
| 23andMe | USA | Health | Other | | $980m | Alphabet \| Altimeter Capital Management \| Casdin Capital \| Fidelity \| Foresite Capital \| GSK \| Illumina \| Johnson & Johnson \| Roche \| VG Acquisition Corp \| Virgin \| WuXi AppTec |
| Arvelle Therapeutics | Switzerland | Health | Acquisition | Angelini Pharma | $960m | Andera Partners \| BRV Capital Management \| Fidelity \| HIG BioHealth Partners \| KB Investment \| NovaQuest |
| Mobidiag | Finland | Health | Acquisition | Hologic | $795m | Autobio Diagnostics \| Springvest |
| Amwell (American Well) | USA | Health | IPO | | $742m | Allianz \| InVenture Partners \| Philips \| Takeda \| Teva Pharmaceutical Industries |

Source: GCV Analytics

Global Corporate Venturing also reported two exits of emerging life sciences-related enterprises that involved corporate investors.

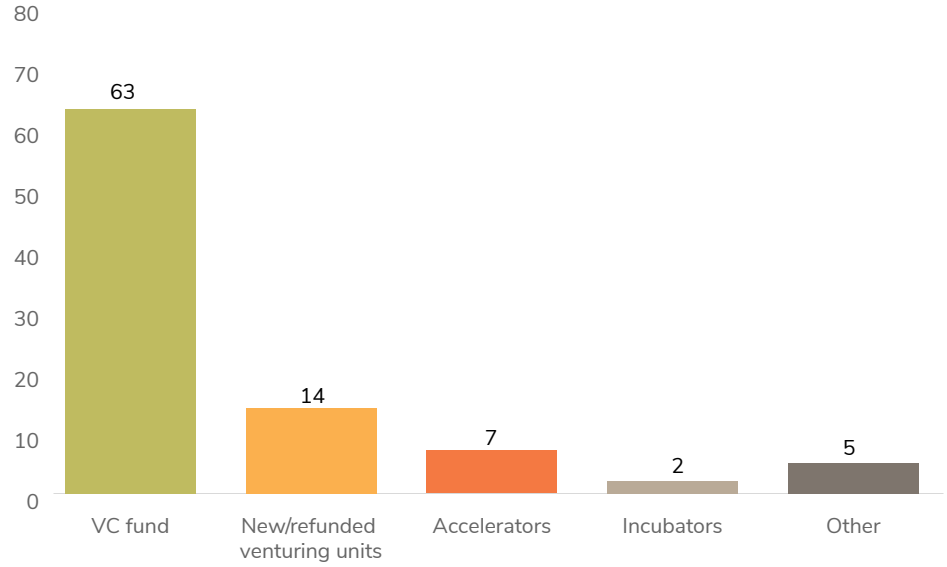
1 China-based e-commerce group JD.com's healthcare-focused spinoff, JD Health, floated on the Hong Kong Stock Exchange in a HK$27bn ($3.48bn) IPO. JD Health issued approximately 382 million shares priced at HK$70.58 each, at the top of the HK$62.80 to HK$70.58 range set, valuing it at almost $29bn. JD Health's online platform sells prescription medication and a range of products including health supplements, medical supplies and contact lenses. It also manages a telemedicine service that allows users to book online consultations with doctors.

2 Angelini Pharma, a subsidiary of conglomerate Angelini, agreed to buy Arvelle Therapeutics, a central nervous system disorder drug developer spun off by pharmaceutical company Axovant, for up to $960m. The deal involved a $610m upfront payment, with up to $350m in additional capital to be paid should Arvelle's epilepsy drug, cenobamate, achieve revenue targets. Arvelle was formed in 2019 to commercialise cenobamate to treat drug-resistant focal-onset seizures. The company expects to secure approval from the European Medicines Agency for the drug, and it has received Promising Innovative Medicine designation by the UK's MHRA. Cenobamate was originally licensed from pharmaceutical firm SK Biopharmaceuticals, which will sell its 12% stake in Arvelle to Angelini as part of the transaction.

**Angelini Pharma, a subsidiary of Angelini (headquarters pictured), will buy Arvelle**

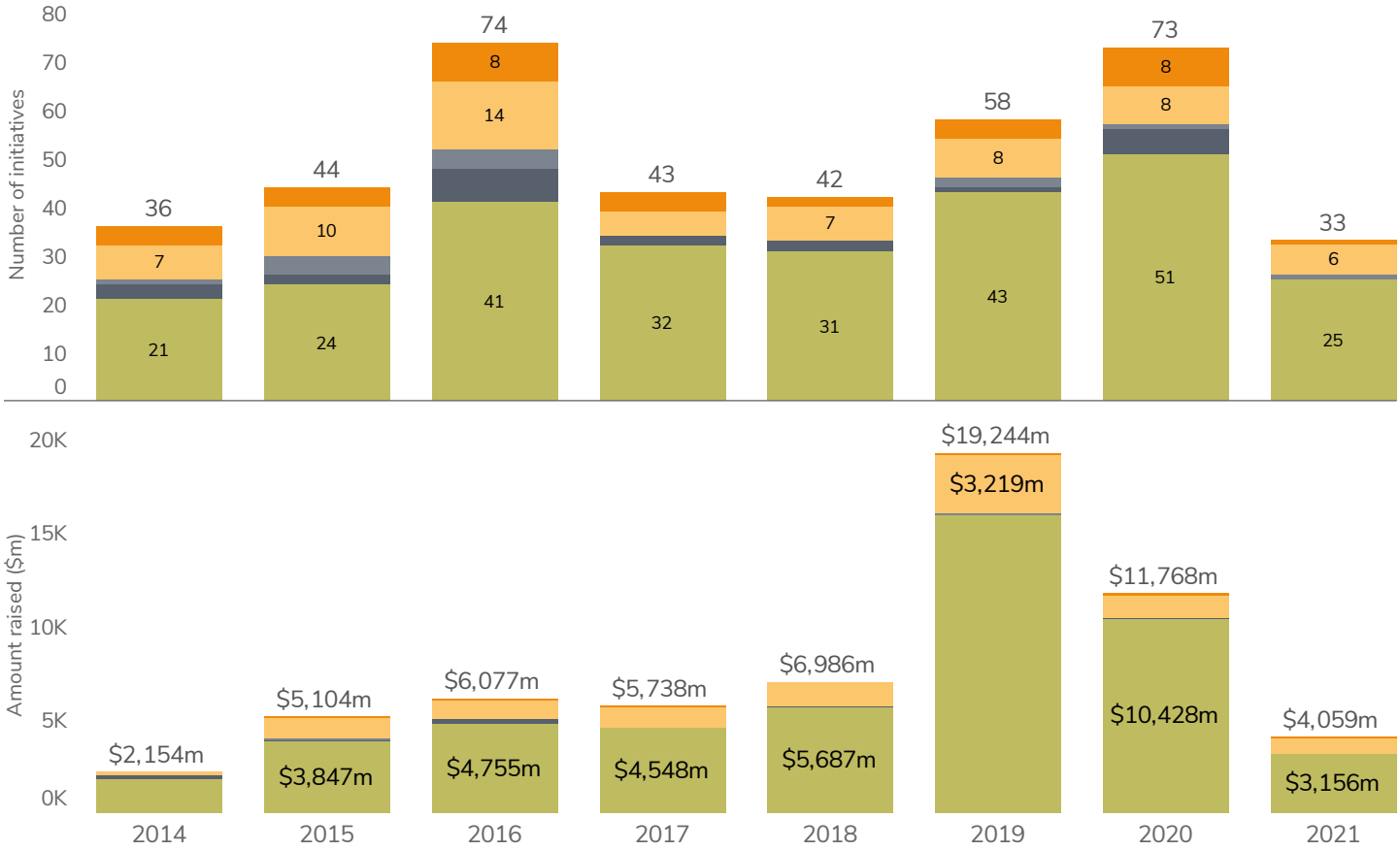
# Funds

## New funding initiatives




For the period between May 2020 and April 2021, corporate venturers and corporate-backed VC firms investing in the health sector secured $11.25bn in capital via 91 funding initiatives, which included 63 VC funds, 14 new or refunded venturing units, seven accelerators, two incubators and five other initiatives.

## Health sector funding initiatives




Source: GCV Analytics

On a calendar year-to-year basis, the number of funding initiatives in the health sector went up by 26% from 58 in 2019 to 73 registered by the end of last year. Total estimated capital, however, drastically decreased from $19.24bn in 2019 down to $11.77bn in 2020.

## Top health funding initiatives (May 2020-April 2021)

| Fund Name | Type | Funds Raised | Location | Focus | Backers |
|---|---|---|---|---|---|
| Antimicrobial Resistance (AMR) Action Fund | VC Fund | $1bn | Switzerland | Health | Almirall \| Amgen \| Bayer \| Boehringer Ingelheim \| Chugai Pharmaceutical \| Daiichi Sankyo \| Eisai \| Eli Lilly \| GSK \| Johnson & Johnson \| Leo Pharma \| Lundbeck \| Menarini \| Merck & Co \| Merck KGaA (M Ventures) \| Novartis \| Novo Nordisk \| Pfizer \| Roche \| Shiniogi \| Takeda \| Teva Pharmaceutical Industries \| UCB Pharma |
| B Capital II | VC Fund | $820m | USA | Services, IT, Financial, Health, Transport, Consumer | Boston Consulting Group (BCG) |
| Unnamed SR One Fund | VC Fund | $500m | UK | Health | GSK |
| Pfizer Breakthrough Growth Initiative | VC Fund | $500m | USA | Health | Pfizer |
| TVM Life Science Innovation II | VC Fund | $478m | Germany | Health | Eli Lilly \| TMV |
| Qiming Venture Partners RMB Fund VI | VC Fund | $441m | China | IT, Telecoms, Media, Health | Qiming Venture Partners \| Xiamen C&D |
| Wuxi AstraZeneca CICC Investment | VC Fund | $338m | China | Health | AstraZeneca \| CICC Capital |
| Heritage Healthcare Innovation Fund III | VC Fund | $317m | USA | Health | AdventHealth Central Florida \| Amedisys \| Blue Cross Blue Shield of Tennessee \| Cardinal Health \| Cerner \| Community Health Systems \| Health Care Service Corporation (HCSC) \| Heritage Group \| Horizon Blue Cross Blue Shield of New Jersey \| Intermountain Healthcare \| LifePoint Health \| Memorial Hermann Healthcare System \| Sutter Health \| Tenet Health \| Trinity Health \| UnityPoint Health |
| Adjuvant Capital Unnamed Fund | VC Fund | $300m | USA | Health | Adjuvant Capital \| Anthos Capital \| Beacon Pointe Advisors \| Bill & Melinda Gates Foundation \| CDC Group \| Children's Investment Fund Foundation \| Dalio Philanthropies \| Elma Investments \| Ford Foundation \| International Finance Corporation (IFC) \| John D and Catherine T MacArthur Foundation \| KFW \| Laerdal Million Lives Fund \| Merck & Co \| Novartis \| Rock Creek Advisors \| Sonanz and Sorenson Impact Foundation |
| Ascension Ventures V | VC Fund | $285m | USA | Health | AdventHealth Central Florida \| Ascension Health \| Carle Foundation \| CentraCare Health \| Children's Medical Center of Dallas \| Intermountain Healthcare \| Luminis Health \| Novant Health \| OhioHealth \| OSF Healthcare \| Sentara Healthcare \| Texas Health Resources |

Source: GCV Analytics

1 Switzerland-based investment fund Antimicrobial Resistance (AMR) Action Fund launched with almost $1bn in capital from biopharmaceutical companies to invest in developers of new antibiotics.

AMR Action Fund is intended to operate as a partnership between 23 biopharmaceutical companies with the aim of bringing two to four new antibiotics to market by 2030. Pfizer, Merck & Co and Johnson & Johnson have each pledged $100m in capital for the initiative while Boehringer Ingelheim is providing $50m and Daiichi Sankyo and Shiniogi put up $20m each. Novo Nordisk, Leo Pharma, Lundbeck and Novo Nordisk Foundation are combining to jointly invest about $76m. Novartis, Almirall, Bayer, Roche, Amgen, GlaxoSmithKline, Eli Lilly, Merck Group, Takeda, Eisei, Chugai, Menarini, Teva and UCB also backed the fund.

The initiative is being launched as increased AMR among viruses and bacteria is reducing the effectiveness of existing antibiotics. Some 700,000 patients die from AMR each year, a figure expected to rise to up to 10 million by 2050.

2 B Capital Group, the US-based VC firm affiliated with consulting firm Boston Consulting Group (BCG), closed its second fund at $820m. Founded in 2014, B Capital targets growth-stage deals and pursues a portfolio management strategy that involves connecting its companies to corporates which can help them scale, through a network provided by BCG. The firm invests between $10m and $60m per round, at series B to D stage, and its areas of interest include healthcare, enterprise software as well as financial, consumer, transportation and logistics technology.

3 GSK spun off its corporate venturing unit, SR One, into an independent VC firm. GSK remains the largest investor in newly rebranded SR One Capital Management's latest fund, an oversubscribed $500m vehicle also backed by undisclosed asset managers, pension funds, family offices,

endowments and foundations. Founded in 1985, SR One has made strategic investments in innovative drug developers on behalf of the pharmaceutical company. Its portfolio currently includes Palleon Pharmaceuticals, an immunotherapy developer that raised $100m in 2020, and oncology drug developer Arcellx, which secured $85m in late 2019.

4 Pfizer pledged to invest up to $500m in biotech companies while also providing expertise through a scheme dubbed Pfizer Breakthrough Growth Initiative. Pfizer intends to acquire minority stakes in publicly listed companies with small to medium-sized market caps that are developing internal medicine, inflammation, immunology cancer and rare disease drugs, vaccines and hospital-related products, that are at the clinical stage.

The company is already an active investor in the healthcare VC space, off its own balance sheet and through Pfizer Ventures, the CVC subsidiary it established in 2004.

5 Germany-headquartered VC TVM Capital Life Science closed its latest vehicle, TVM Life Science Innovation II, at $478m, with Eli Lilly among the LPs. The list of backers included undisclosed strategic investors in addition to US-based banks, funds of funds, endowments, foundations, pension funds, wealth managers and family offices.

TVM Capital Life Science makes early and late-stage investments in companies developing medical products, diagnostic technology and biopharmaceuticals, in the European Union and North America. This latest fund will allocate between 50% and 60% of its cash to what TVM Capital refers to as project-focused companies that it will hold a majority stake in, and is focusing its investments on assets expected to provide a clear route to an early exit.

6 China-based VC firm Qiming Venture Partners raised RMB 2.9bn ($441m) for the final close of its RMB Fund VI, with backing from state-backed conglomerate Xiamen C&D. Existing LPs for the firm's previous funds also made capital commitments to the fund, including China-headquartered insurance companies, fund of funds manager Oriza FOFs Investment Management and science and technology-focused funds of funds.

Founded in 2006, Qiming manages nine US-dollar and six renminbi-denominated funds, boasting $5.9bn of assets under management. It currently has investments in more than 380 companies, 40 of which have achieved a valuation of over $1bn. The firm typically targets early and growth-stage companies in the healthcare, technology, telecoms and media sectors.

7 AstraZeneca launched a RMB2.2bn ($338m) healthcare investment fund with investment banking firm China International Capital Corporation's private equity vehicle, CICC Capital. Wuxi AstraZeneca will target developers of innovative therapeutics, medical devices, diagnostics technology and AI-equipped healthcare technology. In addition to technology, the

**Eli Lilly is working on antibody treatments for covid-19**

fund will back the development of innovative supply chain solutions for pharmaceutical companies.

AstraZeneca had previously partnered China International Capital Corporation to establish a vehicle called Healthcare Industrial Fund in late 2019 with $1bn in capital. The drug producer already maintains a life science incubator in the Chinese city of Wuxi dubbed the Wuxi International Life Science Innovation Campus. It also teamed up with Chinese Future Industry Investment Fund to launch a drug commercialisation company called Dizal Pharmaceutical in 2017.

8 Heritage Group, a US-based VC firm backed by 15 strategic LPs in healthcare, raised $317m for its third fund. Heritage Healthcare Innovation Fund III has about 50 investors and the firm references AdventHealth, Amedisys, Blue Cross Blue Shield of Tennessee, CardinalHealth, Cerner, Community Health Systems, Health Care Service Corporation, Horizon Blue Cross Blue Shield of New Jersey, Intermountain Healthcare, LifePoint Health, Memorial Hermann, Sutter Health, Tenet Health, Trinity Health and UnityPoint Health as strategic partners.

Heritage had previously raised $220m for its second fund in 2016 and has invested in companies including Medical Solutions, Sharecare, HealthChannels, Abode Healthcare, MDLive, Lumere and Spero Health.

9 US-based life sciences investment firm Adjuvant Capital raised $300m for an oversubscribed fund from investors including pharmaceutical firms Merck and Novartis.

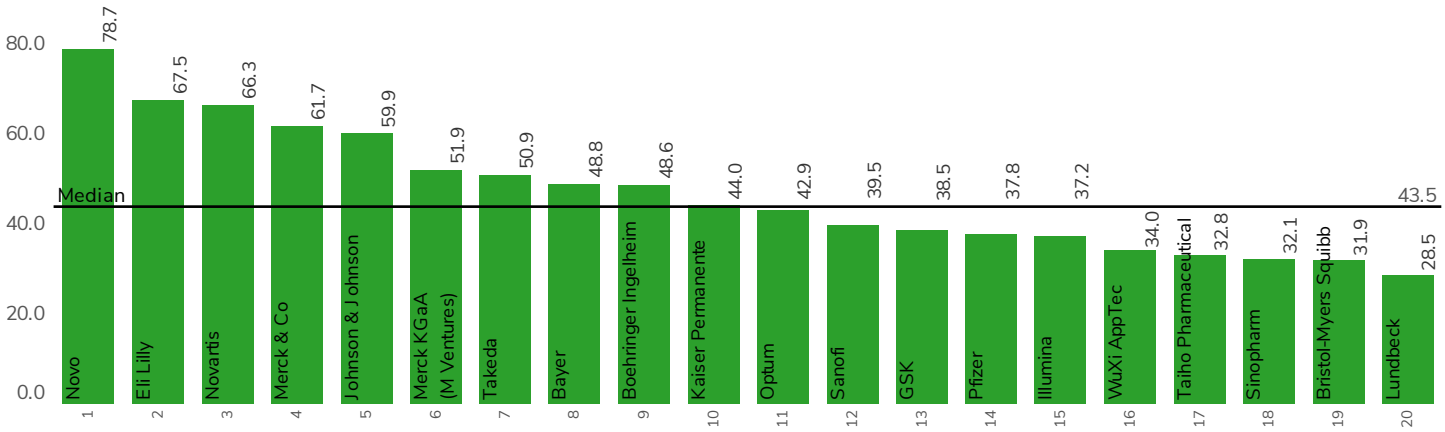
LPs also include Bill and Melinda Gates Foundation, Anthos Fund and Asset Management, Beacon Pointe Advisors, CDC Group, Children's Investment Fund Foundation, Dalio Philanthropies, Doris Duke Charitable Foundation and Elma Investments. Ford Foundation, International Finance Corporation, John D and Catherine T MacArthur Foundation, Global Health Investment Corporation (with funding from KfW), Laerdal Million Lives Fund, RockCreek, Sonanz and Sorenson Impact Foundation have also invested. The fund has also welcomed unnamed LPs.

Launched in 2019, Adjuvant Capital's fund is focusing on medical technologies aimed at public health issues that have traditionally struggled to attract VC funding. Areas of interest include malaria, tuberculosis and Lassa fever. The fund has already backed 14 companies, such as US-based herpes vaccine developer X-Vax Technology, Austria-based vaccine developer Themis Bioscience and Denmark-based vaccine developer MinervaX.

10 Ascension Ventures the VC firm formed by health system Ascension, closed its fifth fund with $285m in capital supplied by 13 healthcare providers. LPs included Ascension, as well as AdventHealth, Carle Foundation, CentraCare, Children's Medical Center of Dallas, Intermountain Healthcare, Novant Health, OhioHealth, OSF HealthCare, Luminis Health, Sentara Healthcare and Texas Health Resources. One unnamed health system has also joined the roster of investors.

Ascension Ventures was launched in 2001 and now has more than $1bn under management. The firm has backed approximately 80 companies in the software, services, medical device and diagnostic sectors. It operates as a stage-agnostic investor with a strategic focus on the needs of its LPs.

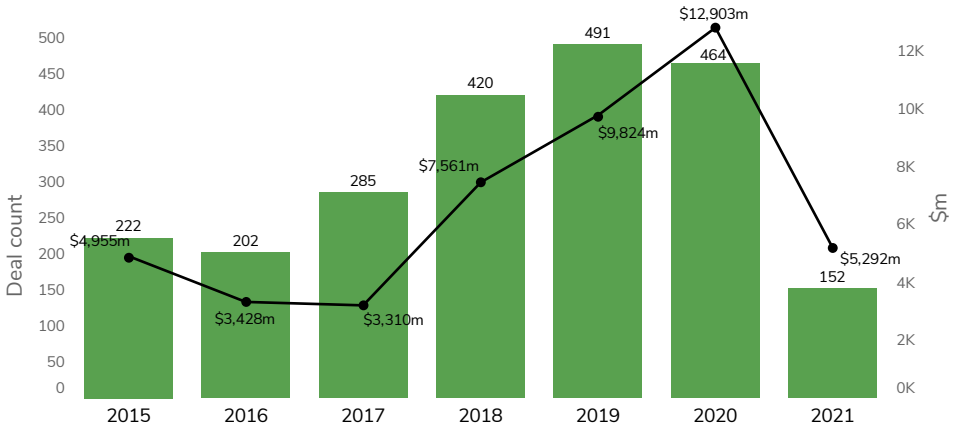
## Power ranking




Source: GCV Analytics

# Universities

## Deals in university spinouts




Source: GCV Analytics

Over the past few years, we reported various commitments to university spinouts in the health sector through our sister publication, Global University Venturing.

By the end of 2020, there were 464 rounds raised by university spinouts, slightly down from the 491 registered in the previous year. The level of estimated total capital deployed last year stood at $12.9bn, up 31% from $9.82bn in 2019.

1 German government-owned development bank KfW agreed to invest €300m ($339m) in CureVac, a Germany-based RNA therapy developer spun out of Eberhard Karls University of Tübingen. The transaction gave KfW a stake sized at about 23% and it came after the company agreed a $90m loan from the European Investment Bank, when it announced it would concentrate efforts on developing a coronavirus vaccine.

CureVac is working on messenger RNA (mRNA)-based drugs but its technology could also influence development of a vaccine for covid-19. It has two drug candidates in phase 1 clinical trials, each of which is targeted at forms of cancer.

2 Hinge Health, a US-based digital therapeutics company backed by commercialisation firm IP Group, closed a $300m series D round co-led by Coatue Management and Tiger Global. Atomico, Insight Partners, Quadrille, 11.2 Capital, Lead Edge Capital, Bessemer Venture Partners and Heuristic Capital also took part in the round, which valued Hinge at $3bn post-money.

Founded in 2014, Hinge Health has built a digital healthcare platform for people living with chronic musculoskeletal conditions, such as back and joint pain. The offering consists of an app, wearable sensors and access to remote health coaching to deliver physical and behavioural health therapy. Hinge Health was co-founded by chief executive Daniel Perez, who gained a PhD in medical sciences from University of Oxford in 2013, and president Gabriel Mecklenburg, who obtained an MPhil in bioengineering from Imperial College London in 2014.

3 Thrive Earlier Detection, a US-based cancer screening technology spinout of Johns Hopkins University, collected $257m in a series B round co-led by Casdin Capital and Section 32.

Thrive Earlier Detection is commercialising a blood test called CancerSeek that detects multiple forms of the disease at early stages of progression by distinguishing biomarkers such as circulating tumour DNA – fragments from cancerous cells which roam freely in the patient's bloodstream. The hope is that CancerSeek could be combined with existing tests to diagnose most cancer subtypes effectively and in asymptomatic patients, enabling treatment before disease progression becomes severe.

**For more on university spinouts, visit www.globaluniversityventuring.com**

Global University Venturing

# People

Jieyu Zou was promoted to managing director at Lilly Asia Ventures (LAV), the VC firm spun out of Eli Lilly. Based in Shanghai, Zou has worked her way up from investment manager since joining LAV in 2015. She is on the boards of portfolio companies Gracell, Transcenta and Virtue DX. Her earlier deals included Geneception, CARsgen, Edigene, Tmunity and Passage Bio in new modality therapeutics, Sansure in molecular diagnostics/genomics and Avedro, which was acquired in November 2019 for about $500m by Glaukos after an earlier flotation.

US-based healthcare product supplier McKesson Corporation promoted Dave Schulte to senior vice-president and head of its corporate venturing arm, McKesson Ventures. The unit hired Schulte in 2015 as managing director under former head Tom Rodgers, who has since been appointed executive vice-president and chief strategy officer at McKesson. Global Corporate Venturing had selected Schulte as a Rising Star in 2016 and 2017. Schulte has nearly two decades of healthtech investment experience, having spent 12 years from 2003 at Kaiser Permanente's corporate venturing arm, Kaiser Permanente Ventures. He ran the unit for four years prior to his departure, helping it grow its resources from $20m under management to $400m.

Schulte's investments at McKesson Ventures included healthcare provision network Aledade, healthcare plan manager AllyAlign Health, healthcare macrodata platform provider Komodo Health, infusion centre operator IVX Health, clinical trial services provider Lightship and Oncology Analytics, the developer of a cancer treatments analytics tool. Two of his portfolio companies have also led to exits. Biotechnology analytics platform developer Shyft Analytics was acquired by medical research firm Medidata for $195m while growth equity firm General Atlantic purchased a majority stake in telecare service provider Landmark Health.

The unit also appointed Lizzie Lee as senior director. Lee will oversee portfolio development and help foster collaboration between McKesson's business units, portfolio companies and customers. She will also lead the firm's market research, including the development of thought leadership content on emerging trends. Lee joined McKesson in 2017 and was a director on its enterprise strategy team. She has a decade of healthcare experience, part of which was spent as a consultant at professional services firm, ZS Associates.

Later in the year, McKesson Ventures promoted Jennifer Carter and Carrie Hurwitz Williams to partner positions. Carter had been McKesson's director of marketing communications before she joined the unit in 2015 as vice-president of portfolio development and marketing, helping to find synergy between the corporate and its portfolio companies. She added the role of vice-president of venture operations in September 2019.

Williams had a five-year stint at McKesson that ended when she moved to digital care provider Omada Health in 2014. She rose to vice-president of strategy and business development before she was hired by McKesson Ventures as a principal in 2017.

Ben Luckett, head of Aviva Ventures, the CVC arm of UK-listed insurance firm, Aviva, was promoted to chief innovation officer at the parent. Luckett set up Aviva Ventures in 2015 and its deals have included home security system developer Cocoon and DIY services marketplace Opun, which were later acquired by Ecobee and John Lewis respectively. Ant Barker has been promoted from senior manager at Aviva Ventures to head the unit. It has also formed an external collaboration agreement with VC firm Anthemis Group, which will deploy capital on behalf of Aviva through funds focused on early and growth-stage financial and insurance technology deals.

US-based medical care provider Tampa General Hospital (TGH) launched a CVC unit led by Rachel Feinman. Feinman joined TGH in the new created role of

vice-president for innovation and now heads TGH InnoVentures from her position as executive director of the Florida-Israel Business Accelerator.

TGH InnoVentures will be comprised of three primary vehicles and act as the healthcare partner for educational innovation hub Embarc Collective, taking up residence in its 32,000 square foot facility alongside more than 50 early-stage startups. The TGH Innovation Lab will look for operational efficiencies and methods of solving problems within the organisation, while TGH Accelerator will use the hospital to develop ideas by physician-scientists as well as emerging companies, providing space, expertise and capital.

Ilka Wicke was appointed head of Making More Health, an impact investment partnership between Germany-based pharmaceutical firm Boehringer Ingelheim and non-government organisation Ashoka. Wicke had been an investment director at Boehringer Ingelheim's CVC unit, Boehringer Ingelheim Venture Fund (BIVF), and was a 2018 GCV Rising Stars award winner. Wicke spent the past decade at BIVF and her deals included Promethera Bioscience, Pcovery, MetaboMed, Anagenesis and Cardior. She has also been on the investment committee of state and corporate-backed VC fund High-Tech Gründerfonds.

US-based oncology research centre and hospital Dana-Farber Cancer Institute launched a CVC unit. The unit, Binney Street Capital (BSC), will invest between $250,000 and $2m over the next three years in eight to 10 companies developing research and technologies to treat incurable cancers.

Luba Greenwood was appointed managing partner at BSC, after having left US-listed Alphabet's healthcare subsidiary, Verily, in 2019 to teach at Harvard University and advise Dana-Farber. Greenwood said: "Excited to be leading Dana-Farber Cancer Institute's first venture capital fund, Binney Street Capital. Honoured to have the opportunity to invest in the breakthrough innovation coming out of the Dana-Farber Cancer Institute and support its mission to cure cancer."

Reza Halse, president of US-listed pharmaceutical firm Merck & Co's MRL Ventures investment vehicle, joined healthcare-focused investment manager RA Capital Management. Halse reconnected with Joshua Resnick, an inaugural managing partner at MRL Ventures, who joined RA Capital in 2018 to set up its venture funds after a few years as a partner at VC firm SV Life Sciences. RA Capital hired Halse as a partner, having closed its second venture fund, RA Capital Nexus Fund II, at $461m in October 2020. Its first fund closed in July 2019 with about $300m and funded 59 companies, 15 of which have since floated or been acquired. Halse joined Merck's MSD London Innovation Hub in 2015, also becoming a partner at MRL Ventures, which targets startups in therapeutics and complements Merck's other main corporate VC unit, Global Health Innovation fund, which is run by William Taranto.

Jack Miner, former managing director at Cleveland Clinic Ventures, the corporate venturing arm of US-based healthcare system Cleveland Clinic, joined the State of Maryland's venture investment unit. Miner will serve as chief investment officer at Tedco, which runs the Builder, Seed and Maryland Venture Funds backing more than 400 investments. He has replaced Tedco's interim managing director, Elizabeth Good Mazhari. At Cleveland Clinic Ventures until April 2020, Miner oversaw a team focused on its portfolio companies and led efforts to spin off new companies. Previously, Miner was the director of the Venture Center at University of Michigan Tech Transfer where he launched more than 50 startup companies and worked with a portfolio of more than 300 emerging technologies spanning all industries.

Nicola Broughton and Alexandre Ouimet-Storrs co-founded and serve as managing partners at Óskare Capital, a firm targeting medical cannabis product developers from seed to patient stage. Their first investment was in Octarine Bio, a developer of cannabinoid and psilocybin derivatives. Ouimet-Storrs was managing director for Europe at Solvay Ventures, the $100m evergreen corporate venturing unit for France-based chemicals and materials producer Solvay. In November 2019, he backed a University of Edinburgh spinout

called Invizius in a round led by asset manager Mercia Asset Management. Broughton was previously principal and head of universities at Mercia.

Broughton and Ouimet-Storrs said in a joint statement: "Our goal is to help bring technologies in Europe to other geographies as well as be a founding member of the medical cannabinoid ecosystem in Europe. We are raising and advising a €150m ($170m) fund based in Ireland."

Søren Thinggaard Hansen joined Denmark-based pharmaceutical firm Novo as a senior partner to set up a private equity initiative to complement its existing corporate venturing strategy. Hansen had spent more than 17 years at local pension fund Industriens Pension, mainly as head of private equity. Novo already provides seed and venture capital to development stage companies and takes significant ownership positions in well-established companies within life science through a public corporate venturing strategy. The Novo Holdings Repair Impact Fund also has an investment proposal to life sciences companies developing new treatments to combat anti-microbial resistance.

Blake Byers has stepped down as a general partner at GV, a corporate venturing arm of US-headquartered internet and technology group Alphabet, to launch what appears to be his own firm, dubbed Byers Capital. The firm will reportedly invest evenly between technology and biotech companies at series A and B stage, and opportunistically in growth equity deals. GV confirmed that other investors at the firm would take up some of Byers' board seats at its portfolio companies.

GV has hired Daniel Lynch as an executive venture partner and appointed Mojca Skoberne to an entrepreneur-in-residence position.

Lynch is chairman of five biopharmaceutical companies: Xilio Therapeutics, SpringWorks Therapeutics, Blueprint Medicines, Translate Bio and BlueBirdBio, having previously held similar positions at peers including Surface Oncology, Bind Therapeutics and Nimbus Discovery.

Skoberne had been a senior vice-president for gene therapy developer Repertoire Immune Medicines, where she offered her expertise in immunology, cancer and infectious diseases. Her role at GV will involve her mentoring entrepreneurs building immunotherapy-themed companies.

SR One, the VC firm spun off by GSK, recruited Chris Chai and Peter Van Vlasselaer as venture partners. GSK spun off the unit into an independent firm in November 2020 with $500m in funding and operates out of offices in London, San Francisco and Philadelphia. Chai had been chief financial officer of Principia Biopharma, the biopharmaceutical company that floated in 2018 having raised $127m in funding from investors including SR One, since 2013. Van Vlasselaer was a pharmaceutical executive for two other SR One portfolio companies. He had been chief executive and president of iPierian, which was bought for $725m in 2014, as well as co-founder and chairman of True North Therapeutics, which was acquired for $825m in 2017.

Japan-headquartered biotechnology producer Eisai appointed Manabu Aruga, formerly China-based business development director, as strategic investment officer covering Japan and Asia for its Corporate Venture Investment (CVI) division. His new role involves relocating to headquarters in Tokyo and leading CVI investment initiatives. He will collaborate with chief strategy officer Kazumasa Nagayama and chief financial officer Ryohei Yanagi to strengthen the unit's corporate venturing strategies.

Formed in May 2019, CVI is armed with approximately $137m in capital and partners innovative technology developers in a bid to accelerate Eisai's drug discovery activities and build an ecosystem around its strategic areas of nervous system disorder and cancer treatments.

Edward Kliphuis departed from his position as an investment director at M Ventures, the investment arm of Germany-headquartered pharmaceutical company Merck Group. VC firm Amadeus Capital Partners has hired Kliphuis as a partner, and he will help lead its scale investment activities under the firm's managing partner, Andrea Traversone. Investments led by Kliphuis during his time at M Ventures included Akili Interactive Labs, the developer of the first prescription video game to get approval from the Food and Drug Administration, as well as battery-free Bluetooth tag provider Wiliot and voice analysis technology developer Sonde Health. Prior

to M Ventures, Kliphuis was a life sciences market analyst at investment bank Kempen, covering listed small and mid-cap life sciences equities, having originally begun his career as an analyst in M Ventures' biopharma investment team in 2009.

Illumina's corporate venturing subsidiary, Illumina Ventures, promoted Wouter Meuleman from principal to partner. Part of the initial Illumina Ventures team when the unit was formed in 2016, Meuleman had been director of corporate and business development for Illumina since the previous year, a post he held until 2019. Meuleman led investments in Biota Technology and Fluent Biosciences, where he also holds board seats, in addition to Delfi Genomics and Ribometrix.

Binoy Bhansali, former managing director at Sandbox Industries, provider of fund management services for more than 30 Blue Cross Blue Shield health insurers, joined US-based healthcare provider Scan Group. Scan provides healthcare for patients on Medicare Advantage health insurance plans. As vice-president of corporate development, Bhansali will identify opportunities for strategic partnerships, external investments and acquisitions. At Sandbox, he sourced more than 1,000 healthcare technology and services companies from seed to growth equity-stage, led diligence efforts for hundreds of them and completed investments in eight companies.

# Annual survey results

Every year, Global Corporate Venturing asks the industry questions about investment priorities, strategies and fit with the corporate. We have broken out the consumer sector answers and compared them with the overall answers.

| | | Overall (n=141) | Health (n=14) |
|---|---|---|---|
| What is your priority, financial and/or strategic returns? | A mix of both strategic and financial | 67% | 71% |
| | Strategic returns mostly | 23% | 14% |
| | Financial returns mostly | 9% | 14% |
| How do you invest? | From corporate balance sheet with a dedicated unit | 57% | 71% |
| | Off corporate balance sheet with a dedicated unit | 26% | 29% |
| | From corporate balance sheet without a dedicated unit | 11% | |
| | Off corporate balance sheet without a dedicated unit | 3% | |
| If you have a fund structure, what type of fund structure is it? | Not applicable | 55% | 36% |
| | Separate legal entity and fully committed capitalB but fund rem.. | 23% | 21% |
| | Separate legal entity and fully committed capital with significant .. | 20% | 43% |
| What would you define as an important strategic return? | Synergies and/or revenue and P&L impact for parent corporation | 18% | 14% |
| | Entering new markets and/or creating new business lines/units | 11% | |
| | Innovation in product/service of corporate parent or help with stra.. | 9% | 7% |
| | Market intelligence, insights and expertise | 9% | 29% |
| | Commercial partnerships/ contracts/collaborations | 9% | 7% |
| | Deploying/implementing new technology internally | 7% | 7% |
| | Optionality and access to potentially disruptive new technol.. | 6% | 7% |
| | Combination of the above | 6% | 7% |
| | Acquistion of assets/companies | 4% | 14% |
| | Testing new business models | 4% | |

| | | | |
|---|---|---|---|
| | Other | 3% | |
| | Unclear comments | 3% | |
| | Sustainable/environmentally-related goals | 2% | |
| What is your overall CVC fund size? | Under $50m | 23% | 21% |
| | $51m - $100m | 18% | 7% |
| | $101m - $200m | 15% | 21% |
| | Other | 9% | 14% |
| | $301m - $500m | 11% | 14% |
| | $501m - $1bn | 8% | 14% |
| | $201m - $300m | 5% | |
| | Over $1bn | 4% | |
| In light of the pandemic and the economic challenges it entails, what levels of capital do you expect to have at your unit's disposal going forward? | Same as before pandemic | 52% | 57% |
| | More than before the pandemic | 26% | 36% |
| | Less than before pandemic | 14% | 7% |
| | Not sure yet | 7% | |
| Of the deals your unit has backed, what percentage of those deals did your unit act as the lead investor (i.e. leading or co-leading setting valuation, key investment terms and leading negotiation process)? | Less than 25% | 49% | 50% |
| | Greater than 50% | 25% | 29% |
| | Between 25% and 50% | 23% | 21% |
| Do you help your corporation's M&A team identify and buy yours or other venture-backed portfolio companies? | No | 26% | 21% |
| | Yes | 63 | 64% |
| | Not applicable/Corporate parent does not have M&A division | 8% | 7% |
| Do you negotiate in your investments for specific rights related to a sale of the portfolio company? | No | 62 | 86% |
| | Yes, a right of first negotiation | 11% | |
| | Yes, a right of first refusal | 11% | 7% |

| | | | |
|---|---|---|---|
| | Yes, a right of first offer | 7% | 7% |
| | Yes, a block right on a sale transaction | 2% | |
| How many of your portfolio companies has your parent corporation bought? | None | 56% | 71% |
| | 1 to 5 companies | 32% | 14% |
| | None yet but expected to acquire at least one when portfolio matur.. | 6% | 7% |
| | 11 or more companies | 2% | |
| | 6 to 10 companies | 1% | 7% |
| What percentage of the founders/co-founders of your portfolio companies come from a diverse ethnic background (i.e. different from the predominant in the country where you are based)? | 25% or fewer | 48% | 71% |
| | 26% to 50% | 27% | 21% |
| | 76% or more | 11% | 7% |
| | 51% to 75% | 11% | |
| Do you actively take LP stakes in other VC funds? | No | 51% | 43% |
| | Yes | 47% | 57% |
| How many LP stakes in funds do you hold? | None | 35% | 43% |
| | 3 to 5 | 25% | 7% |
| | 2 | 12% | 7% |
| | 1 | 11% | 29% |
| | 6 to 10 | 8% | 7% |
| | More than 10 | 6% | 7% |
| What is your portfolio worth compared to original invested amount by multiple? | 101% to 150% | 30% | 36% |
| | 151% to 200% | 21% | 7% |
| | 201% to 300% | 13% | 21% |
| | 51% to 100% | 8% | 14% |
| | 0 to 50% of invested capital | 6% | 7% |

| | | | |
|---|---|---|---|
| | 301% to 500% | 4% | |
| | 501% to 1000% | 1% | |
| | More than 1000% | 1% | |
| What is yourB net internal rate of return (IRR) on the portfolio? | 11% to 20% | 21% | 21% |
| | 21% to 30% | 14% | 7% |
| | 31% to 40% | 11% | 7% |
| | 6% to 10% | 9% | 7% |
| | 0 to 2% | 5% | 14% |
| | 3% to 5% | 5% | 7% |
| | A negative IRR | 4% | |
| | 41% to 50% | 3% | 7% |
| | More than 50% | 3% | |
| What is the loss rate of your fund (i.e. the percentage of investments that fail to return the capital invested)? | 30% or lower | 62 % | 50% |
| | 31% - 50% | 11% | 7% |
| | 51% B - 75% | 1% | |
| | 76% or higher | 1% | |
| Which C-level executive does the head of your unit report to? | CEO | 30% | 29% |
| | CFO | 17% | 14% |
| | Chief Innovation Officer | 14% | 7% |
| | Head of R&D | 1% | |
| | Head of corporate development | 10% | 7% |
| | Head of strategy | 18% | 21% |
| | Chief Technology officer | 9% | 7% |
| | COO | 3% | |

| | | | |
|---|---|---|---|
| | Chief Information Officer | 1% | |
| | Chief Marketing Officer | 1% | |
| In terms of the compensation of all employees, in addition to base salary and cash bonuses, what other incentives are there in your CVC unit/investment department? | Only corporate stock | 33% | 36% |
| | None of the above | 31% | 7% |
| | Other | 5% | 7% |
| | Shadow/phantom carry only | 6% | 14% |
| | Only carried interest ("Carry"') shared with the team | 6% | 14% |
| | A combination of corporate parent's stock and carried interest | 1% | 14% |
| What is the male-to-female ratio in your team? | Majority male | 49% | 21% |
| | Relatively even | 28% | 57% |
| | All male | 11% | |
| | Majority female | 4% | 14% |
| What percentage of your investment unit's employees are from a diverse ethnic background (i.e. different from the predominant in the country where you are based? | 25% or fewer | 49% | 43% |
| | 26% to 50% | 26% | 21% |
| | 76% or more | 10% | 14% |
| | 51% to 75% | 7% | 14% |

For more from this year's edition of the definitive guide to the CVC industry, click here.

Comment

# Celebrating 100 years of innovation

- How Cleveland Clinic created a commercialisation arm
- Building a team and aiming it towards the market
- Behavioural health will be a key focus

By Chris Coburn
Founding executive director of Cleveland Clinic Innovations and chief innovation officer at Mass General Brigham

Will Morris
Director, Clinic Solutions Center, Cleveland Clinic

Akhil Saklecha
Managing director, Cleveland Clinic Ventures

Adapted from a Health Amplified podcast

To celebrate the centennial of Cleveland Clinic's founding, doctors Will Morris and Akhil Saklecha spoke with Chris Coburn, the founding executive director of Cleveland Clinic Innovations and chief innovation officer at Mass General Brigham, about the establishment of the enterprise's commercialisation arm, the deep-seated culture of innovation at Cleveland Clinic and his efforts at Mass General Brigham.

**Will Morris:** Well, I think what we'd like to do is a little throwback and take us back to those founding days. There wasn't a lot of innovation offices within hospital systems and walk us through what was the genesis, what were those barriers? And certainly now 20 years ahead, what do you reflect on doing right?

**Chris Coburn:** Well, thanks. I would say the genesis of innovation at the clinic really was a combination of several factors. One, you had Toby Cosgrove. Dr Cosgrove as chair of cardiac surgery, taking an ever larger role in the leadership of the system, ultimately becoming CEO in 2003. So, it was his activity working with Dr Joe Hahn, who was chair of surgery and I think the combination of those things, looking to leverage the historic commitment to innovation of the institution going back to 1921. So,

it was the right time and I think the right combination of people.

**Akhil Saklecha:** So when you first got involved and you saw the landscape of what Cleveland Clinic had, the leadership, the innovators, how did you get your arms around all of this and feel that something could be started and how it would get started?

**CC:** I would say that first of all, looking over the landscape, the community within the clinic, there's in my view been kind of an unbroken focus on innovation since the founding. The question was really an organisational one. How do we direct ourselves in a way to push that ever further? And again, the blessing of having the most prolific inventor in the history of the clinic at that time, chair of cardiac surgery, and then headed to be CEO, certainly made a big difference. But from my standpoint, the challenge was heavily on the organisation side was connecting, building the team, trying to tie together the enormous reservoir of capability that was resident in the system and then trying to direct it more towards the commercial market.

**WM:** In the 20 years, you kind of look back, I imagine early on, as you mentioned, you had two surgeons at the helm, it was heavy in the devices. What has been the kind of evolution from your purview of kind of those core areas and what do you think is the future white-hot space?

**CC:** Obviously devices have been central to the world of improved care, improved diagnostics, and I think they will stay that way. I think devices have already become intelligent. The combination, obviously with the digital capabilities makes a huge difference. I think, as we look towards the future, several things, one, obviously the role of digital in care transformation and the kind of recreation of the US model of the delivery of care was basically demonstrated full force when the pandemic arrived. So, we won't back away from that and I think that will be an ongoing element of what defines care. Additionally, I think you'll see the application of digital, but also other new technologies, whether they're genetic sequencing or across that romp in fields like behavioural health.

**Chris Coburn**

So, some people see that as the second largest area of expense in all of healthcare and really not efficiently addressed. So, a lot of room for growth there. And then in the area of therapies, of therapeutics, gene and cell therapy, clearly is a rocket ship. Both have been around, you can say cell therapy has been around for more than 100 years, but they've arrived and arrived together. And the power of those technologies is stunning. And obviously a lot of great work going on at the clinic also for us at Mass General Brigham.

**AS:** When you go back and maybe to add on to Will's question, now devices was certainly a big area at the Cleveland Clinic and innovation. And when you were here and setting things up, I'm curious as to some of the challenges that you faced, because starting something new in an environment like this, although innovative, but it's a very large organisation. And so, when you go back to that time, obviously change management and building something new is always difficult, but in your mind, what were some of the big challenges you faced in starting innovations and then as you kind of grew that group?

**CC:** Well, I think in any large organisation, the need is always present to gain the trust and confidence of the people that you have to work with. So for us, the great benefit to have someone like Hahn so revered throughout the organisation and also so visible as someone that was a kind of ever-present element of what we

were trying to do. So, I think that establishing those relationships and then maintaining them was very important. I think also a key from my perspective is the fact that no hospital, no university is set up for, per se, is founded to create commercial outcomes. So you always need to keep in mind that these activities are at times running counter to the more classic outputs and aspirations for the hospital, for the system. So there's a need to, in a sense, almost over-communicate.

So at least for me, that meant continuous rounding where you just drop by and call him, the chair of cardiology and talk about what's occurring in his department. What were the needs and what were the issues? And I started a programme there and continued it in Boston, where I call on every department chair, every clinical and research leader, at least once a year and ask them face to face, "How are we doing? Can we do better? What our success has been?" So, that idea that you need to over-engage and really live from the perspective of what is the role of our team within this broader environment where patients' lives and larger economic decisions are getting made every day?

**WM:** I love that commentary kind of, the simple act, but very, very profound act of engagement being authentic and transparent in seeking the advice and guidance. I'm curious either at the clinic experience or at Mass General, the opportunity for innovation going the other way, right? Industry or startups having something, but they have a solution looking for a problem and they need the clinical input or operational input – your thoughts on that approach? How does that kind of balance out from traditional tech transfer and growing stuff as opposed to kind of out-in-out?

> *"We've assembled a group of leaders from the industry side, very large, very recognisable companies, investors, and entrepreneurs, to be part of an iterative dialogue with our clinician leadership around areas that I think can represent common ground and then ideally drive some of that back even to the discovery realm"*
>
> **Chris Coburn**

**CC:** And that has always been a big priority from my standpoint, which is the market realities, the measure, the work of these functions is in the commercial realm. So, being able to interpret and act on what their priorities are is key. So, kind of that constant engagement. In Boston and also in Cleveland, we used a very active external board. In Boston, we now call it the innovation growth board, some of the top venture funds and most innovative companies are represented on there. And from my standpoint, it's almost a lifeline from this area where we need to be able to discern and then act on these commercial dynamics. And that requirement runs across the board and I think once industry sees you as a part, a real partner, collaborative innovation can take place. They need to be able to count on the things that define academic medicine. These insights, the ability to establish group of biology, or to do an implementation on a digital technology, things that have to occur in the laboratory and the care environment of a big system where patients and the related insights and data are available. Companies will always need that. And so capitalising on that, I think is driven by their ability to see you as an effective partner.

**AS:** Now, when you were either here at the clinic or where you are now at Mass General Brigham, have you ever taken kind of the wide spaces that are out there, or the problems that are needing to be solved and go back to the inventors and say, "Can you work in these areas that we've identified as problems," as opposed to waiting for their eureka moments and bringing things towards you?

**CC:** Well, Akhil, thanks for that question. That exactly characterises some of the work we're doing now in behavioural health. So, if you look at our three hospitals, Mass General Psychiatry, McLean Hospital, and Brigham And Women's, the combination of the psychiatric talent in those three institutions, the aggregate of that has to be the largest in the US, I can't imagine anything being bigger. So, on the clinical side, we have an awesome resource trying to better adopt with dynamics in the investment and

the commercial world is a project we have currently underway. So we've assembled a group of leaders from the industry side, very large, very recognisable companies, investors, and entrepreneurs, to be part of an iterative dialogue with our clinician leadership around areas that I think can represent common ground and then ideally drive some of that back even to the discovery realm and whether it's companies contributing their own insights, their own libraries, where our people are sharing what they see as shortcomings in the realm of commercial products. Ideally that will bring us to new outcomes that might not have happened on their own.

**CC:** So, that's an example. I think we subscribed to that concept that you can look at unmet needs, a model that we follow a number of times, and there's been good government support for this. I think the State of Ohio has been a great partner with the clinic on programmes to be able to drive recognition and ideation around unmet needs and areas of future growth. And as both of you know better than me, there are plenty of fields that are still underserved in terms of the... let's call it the state of technology for whatever reasons, whether it's investment trends or just kind of historical perspectives around a given field. And in my view, those are ripe for this kind of intervention, if you will, around the ability to determine and prioritise around those needs.

**WM:** You brought up the second kind of quiet pandemic, which is behavioural health coming out of covid. I'm curious how covid played and impacted you and your team in either surfacing unmet needs or pain points that we didn't know we didn't know until the system was under duress and stress to: we have a new need. I'm just curious as you reflect back in the past 10 months during these pandemic times, what are the unintended positive things that you could say, "Gosh, you know what? We were able to do amazing things and look at this space."

**CC:** Yeah. Well, first and fortunately for us, we had just adopted a large digital enterprise data and digital health initiative – about a $500 million investment – in the year before the pandemic hit. So, that had shifted, let's call it, the organisational capability to respond. We brought in our first-ever digital health officer and those things combined, I think positioned us and accelerated across a broad spectrum of implementations of technology. And then the numbers for us – I'm sure similar in Cleveland – where we went from something like less than 2,000 remote visits to over 250,000 in just a matter of weeks. So that broad scale disruption, again, tested a lot of concepts and validated a number of technologies and our team, obviously, part of that, part of our giant enterprise of 80,000 people. So we were kind of working within that context.

And so really heartening to see how people were able to drive things through to outcomes, to test assumptions, to better understand the environment that we were operating in. And one of the things that's come out of this is we now have a digital investment fund, $30 million, just in the process of making our first investment on that. And so much of what's been learned over the last year is being reflected in the management of that fund and the creation of the portfolio. So I give that as an example, plenty of other things, but again, our team like everyone else in healthcare in the US and I think around the world, we did have to redefine how we worked. I remember being at the office, I think it was like 12 March and kind of saying goodbye to our team. Really, "Great working with you. I hope we'll be together at some point in the not too distant future." And now a year has gone by.

And I think realistically we're not going to be together until middle of the summer at best, could be a little bit later. So, that's been a challenge for everyone, but it's remarkable how resilient people are and the tools that have emerged to promote resiliency, just an example of kind of the overall response.

**AS:** If you go back to your time here in Cleveland, what is your biggest success? It doesn't have to be economic, but the biggest accomplishment that you're proud of during your time here at Cleveland Clinic.

> *"Our team like everyone else in healthcare in the US and I think around the world, we did have to redefine how we worked"*
>
> **Chris Coburn**

**CC:** Well, again, everything happens as part of a team at the clinic. So, I don't want to have my name associated with this, but I think at the time in 2000 and 1999, prior to that when we started the discussion, I'd like to think the view of innovation and commercial outcome was incidental. There's a small team, two and a half people. They were part of another department and then went to being something where it was top of mind, I like to believe for leadership across the board. People were either prioritising it in their area, or at least appreciating the significance of it. A lot of really good people came to the clinic and became part of the team. Many younger clinicians joined where they saw this right off the bat and truth be told, I guess it was 2007 and 2006.

No, excuse me. It was before that, it's more like 2003 when Toby was still chair of cardiac surgery, he asked if I would help support a recruitment for a young cardiac surgeon from Brigham, Dr Tomislav Mihaljevic, because he was an innovator and I had a chance to spend time with Tom before he ever committed to the clinic. And so, the beautiful thing from at least looking back on it now, 21 years later, is just the embrace of the commitment and the understanding that there needs to be a strong team to pursue this and getting the right people into those positions is so key.

**WM:** Well, Chris, first of all, thank you for your time, but more importantly, your candid and personal remarks as we reflect back on our 100 years, it is about team. It takes a pandemic to realise that even though, perhaps in one world Cleveland Clinic and Mass General and others can compete against, at the end of the day, we all serve one mission, which is to serve patients. And there is more commonality, more partnership, more collaborations. So you are always part of the clinic family. And the degree of reciprocity I think between Boston and Cleveland is rich, but going forward, I think for ourselves and for those listening, it does take a village, it does require this unbelievable opportunity to people to kind of lean in and participate. So, I just wish to thank you. Innovation is alive and well, certainly at the clinic and certainly a part of you and owes you a debt of gratitude.

# Riding the wave of innovation: How to partner effectively with pharma companies

- Fit into current drug development processes
- Seek out early partnerships with big pharma
- Do not discount the "undruggable" or "failed"

By Raj Ganguly, co-founder and partner, B Capital Group

Robert Mittendorff, general partner and head of healthcare, B Capital Group

The covid-19 vaccine has proven beyond a doubt that biopharmaceutical innovation can be spectacularly rapid and life-changing. What made it possible and how do we replicate its success? As biopharma entrepreneurs, how can you take advantage of the positive momentum in the industry to bring your technology to market?

## The tech revolution underway in pharma

First, here is why we are so invested in the biopharmaceutical industry here at B Capital Group. We are witnessing a tectonic shift in drug development. The model may seem unchanged on the surface, but under the hood, technological advances are reprogramming the long-time operating system powering the process. In short:

- **Drug targeting:** Machine learning (ML) is helping researchers rapidly identify druggable targets inside cells and disease pathways. In-silico target identification relies upon the corpus of knowledge that has been created to date and in training ML models to recognise patterns of interactions.

- **Drug discovery:** ML and artificial intelligence (AI) are being used to build computer simulations of molecules and design chemical structures that have a higher probability of clinical success in the small molecule, antibody, peptide and RNA domains.
- **Pre-clinical development:** In-silico testing and the ability to simulate tissue on a chip have reduced the need to test in vivo in some cases, with the potential to dramatically improve efficiency in this stage of development.
- **Clinical development:** Thanks to the 2009 HITECH Act and the 2016 21st Century Cures Act, electronic medical record data is enabling the use of real-world data (RWD) and real-world evidence (RWE) to assess the efficacy, cost effectiveness and safety of a molecule. (The use of RWD was also pivotal in the development of the covid vaccine.) Virtual clinical trials are also enabling clinical development on larger, more diverse populations, reducing enrolment speed and costs.
- **Post-market approval:** RWD and RWE are being used in post-market studies to expand the labels of biopharmaceuticals to cover additional indications and patient populations. They are also being used to more precisely value the effects these incredible new therapies have from an economic perspective.

These examples are just the tip of the iceberg for how technology is transforming the business of biopharmaceutical companies.

But innovative technology is not enough to guarantee business success. Pharma entrepreneurs must also understand how to get their technology to market. Here are three key strategies we share with the companies we advise.

## Show how your innovation fits within the current drug development process

For entrepreneurs starting out in this space, it can be tempting to envision an entirely different process for getting drugs into the hands of patients, given the inefficiencies of the current system.

But throughout history, the companies with the highest chance of success are the ones who start out by framing their innovation within the confines of their industry's existing business model. Look at Netflix: before it became the streaming giant that it is today, the company started out by offering DVDs by mail and improving the delivery of video rentals. Each subsequent innovation evolved the entertainment business model one leap at a time.

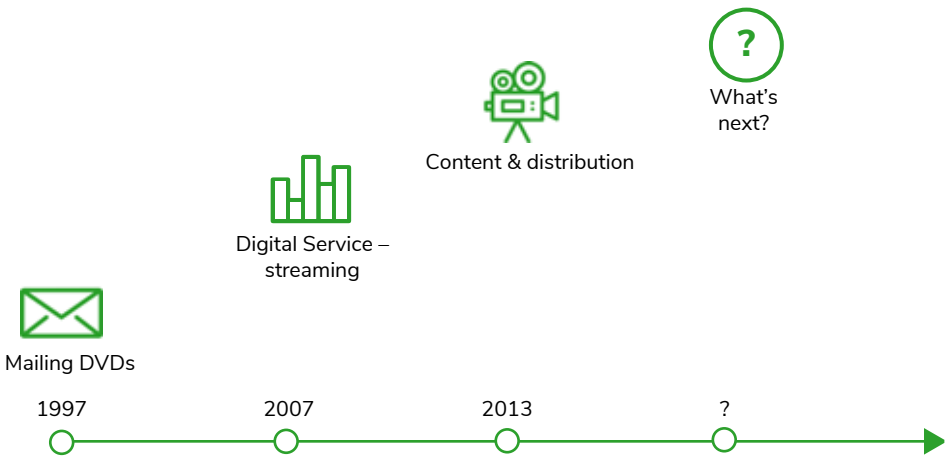
In the same way, you will find faster traction in pharma if you work within the current process and apply your technology to a specific phase or pain point. For example, next-gen pharma company Recursion is revolutionising drug discovery but it will still take its drugs to market via the traditional path: develop them alone or partner with big pharma to do clinical development and ink business development deals. In contrast, 23andMe's first foray with the Food and Drug Administration was an attempt at circumventing the process and they fared poorly; their follow-up "at bat", which improved efficiencies within the current regulatory model, was far more successful.

One day, technological advances may culminate in a complete transformation of drug development. But for now, the biggest opportunities lie in targeting inefficiencies within the current model, instead of skirting the process.

## Seek out early partnerships with big pharma to drive scale

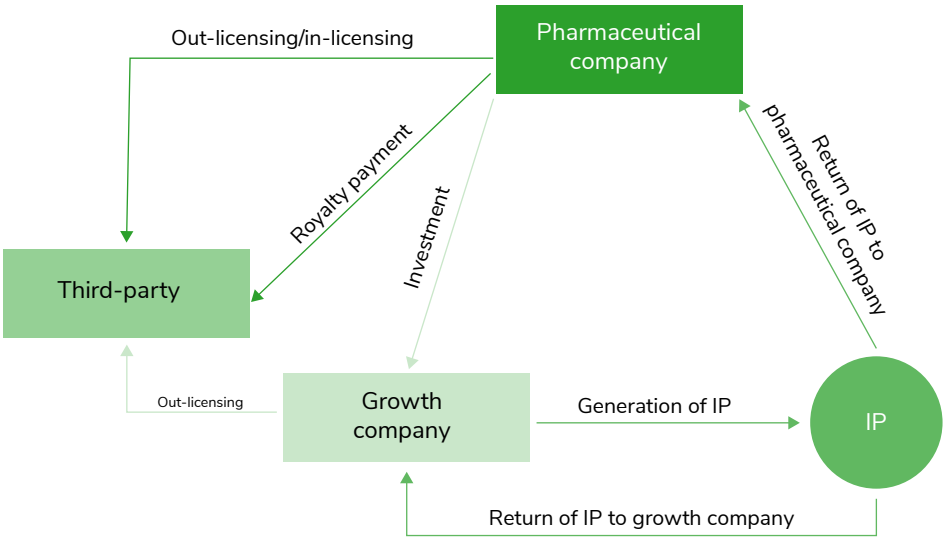
Tech entrepreneurs need to work with pharma companies to validate their technology.

### Evolution of Netflix innovation




Source: Gartner, adapted by GCV

## A network approach to pharmaceutical collaboration




Source: PwC

But oftentimes, we find that entrepreneurs shy away from working with big pharma, opting to partner with smaller firms instead. There's a misconception that working with big pharma is laborious, slow and risky.

But in the face of rising costs, big pharma is increasingly open to collaborating with non-traditional organisations to drastically scale the number of drug targets they can pursue. In return, they offer entrepreneurs critical access to proprietary data, regulatory advice and business development resources. The right partnership can greatly accelerate the growth of early-stage companies.

Case in point: health data analytics platform Evidation Health partnered with a large global pharmaceutical company a few years back to better understand the efficacy of an autoimmune disorder drug and its impact on patients. The drug failed, but what was fascinating was the fact that Evidation's virtual clinical trial platform allowed the pharmaceutical company to unlock deeper, more powerful insights into the drug's performance in just six months, in contrast to the traditional clinical trial that took one and a half years to reach the same conclusion. Having proved the efficacy of its platform, Evidation now has a broad partnership with the pharmaceutical company where it will assist in better understanding the effects of a whole host of autoimmune disorder therapies.

Evidation's experience offers some valuable pointers for creating successful partnerships:

> **Emphasise the value of your algorithms,** not proprietary data. Publish open-source APIs and data to prove that the work you are doing is repeatable.

> **Leverage industry relationships** to get introductions to big pharma researchers (B Capital Group can help).

> **Start with two-way knowledge sharing.** This creates a low-risk environment for identifying pilots that can turn into longer-term platform partnerships if successful.

## Do not discount "undruggable" diseases or "failed" drugs

Increasing clinical development costs, lower clinical success rates and more complex trials have long prevented pharma companies from pursuing drugs for diseases that are thought to be "undruggable" or unprofitable. But with technology delivering efficiencies across all stages of drug development, the tide is turning. In 2019, drug discovery AI firm Atomwise and Eli Lilly embarked on a whopping $560m partnership to find drug potential for 10 novel target proteins in diseases with high unmet need.

Entrepreneurs may also be wise to revisit "failed" drugs. Keep in mind that many drugs are still being tested on a very homogeneous population. In fact, the FDA recently reported that 75% of trial participants in 2020 were white. This means we have yet to understand the full potential of many drugs to address critical diseases affecting smaller populations.

Indeed, in 2015, Atomwise discovered a new Ebola treatment using a compound that had no known anti-viral activity previously. Evidation's emphasis on building a diverse patient population for its clinical trial platform has also led to the discovery of drugs that do not work for the general population but are effective for smaller target populations.

Pharma innovation is nowhere near its peak and the efficiencies it is introducing to drug development are bound to keep fuelling life-changing discoveries for decades to come. We have barely scratched the surface.

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