

Health & Wellness Tech

Q1 2020





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We’ve discontinued the reports individually covering the healthtech and wellness tech sectors. Going forward, we will combine coverage of those industries and segment them by retail and enterprise focus. This is the first Health & Wellness Tech: Retail report, which will be updated on a quarterly basis to reflect changes in venture capital deal activity and other market-related updates deemed valuable by the research analyst.



Executive summary

Increasing recognition that traditional provider-based medicine is not keeping up with the evolving needs of the population is giving rise to a new era of consumer-focused healthcare products and services designed to improve personal health & wellness at a lower cost than traditional alternatives. These emerging products largely rely on digital technologies that enable convenient at-home or mobile use, the ability to integrate with other services, and large-scale data collection and analysis to help drive personalized offerings.

Startups in this sector are working to develop solutions that can help reduce ongoing epidemics related to chronic diseases, reign in healthcare costs and improve overall wellbeing. While this burgeoning industry includes new ways to obtain traditional care (e.g. telehealth), it also includes a range of alternative health & wellness tech products such as digital therapies and behavioral tools; fitness-related products, including exercise equipment, health-monitoring tools and nutrition-related services; and emerging tools related to genomic science.

In the wake of the coronavirus pandemic, we expect governments and organizations will prioritize technologies that can help mitigate the health impacts of future pandemics. This is likely to accelerate investment into technologies in the realm of telehealth.

In general, VC activity within the health & wellness tech space has spiked significantly as consumers, employers and policymakers adopt related initiatives. Today, the venture ecosystem is a vital incubator for this space. In the first quarter of 2020, VC funding for retail-oriented companies in the health & wellness tech industry totaled \$1.9 billion across 135 deals.

In this report, we focused in particular on the retail side of this industry, segmenting it into the following five categories: virtual health, mobile & digital health, biometric wearables & devices, dietary supplements and personalized medicine & testing. In coming quarters, we will also explore enterprise health & wellness tech.



Industry drivers

COVID-19 pandemic crisis: We believe a robust pandemic preparedness and response infrastructure is likely to consist of several technology-based capabilities focused on predicting, identifying, tracking, containing and treating outbreaks. This will benefit companies developing solutions in disease testing and telemedicine. It is unlikely these responses will all emerge as a singular effort but will consist of several overlapping systems funded by various stakeholders, including governments, non-governmental organizations (NGOs), health systems and businesses. We expect startups focused on these opportunities could benefit from current and future investment into pandemic infrastructure. Furthermore, stay-at-home orders have eliminated people's ability to attend "non-essential" doctor appointments in person and demanded all fitness centers close their doors indefinitely. This pushes consumers to adapt their usual health & wellness routines, increasing the use of mobile wellness applications, remote monitoring devices and at-home fitness devices.

Doctors focusing more on preventive care and healthy lifestyles: Healthcare professionals have come to view healthy lifestyles as a key preventive measure to improve health outcomes. This includes a focus on diet, sleep and regular exercise. Medical caretakers have highlighted the benefits of these practices, which include reducing high-cost curative solutions. In addition, they've indicated that healthy lifestyles can potentially yield several non-financial benefits, such as heightened productivity, improved morale and enhanced interpersonal relationships.

Increased consumer health awareness and healthy eating index: Consumers are seeking ways to boost daily activity levels, driving demand for wellness-related products and services. The global health and fitness industry lured in \$94 billion in revenue in 2019.¹

1: The 2019 IHRSA Global Report, IHRSA, 2019

Consumer wellness startups partnering with corporations: We expect workplace benefits platforms to partner with wellness startups to improve employee benefits. For example, HR software platform **Zenefits** announced a partnership with well-being platform Thrive Global in October 2018 to offer its wellness-tracking app on **Zenefits'** platform. In August 2019, payroll and HR provider **Justworks** teamed up with **ClassPass** to offer exclusive rates to its global network of over 10,000 fitness studios.

Growing elderly population and increased life expectancy: The geriatric population has expanded as baby boomers have aged and life expectancy has extended. This has driven the demand for wellness solutions among the elderly, who are looking to stay healthier as they age. Younger consumers are also pursuing these solutions, hoping to delay the impacts of aging.

Digital economy opens door to telehealth, personalized solutions and fitness applications: Smartphone apps are an effective tool for delivering personalized physical activity interventions while enabling providers to reach a large audience. According to one estimate, the global fitness app market was valued at approximately \$3.2 billion in 2019 and is anticipated to grow close to 26% annually over the next several years.² Digital solutions enable personalization, allowing consumers to curate fitness plans and adopt healthy behavior modifications with services including individualized meal plans, exercise monitoring devices and shopper-tailored grocery lists. Furthermore, the mass adoption of mobile devices expands the userbase for telehealth providers that offer apps enabling real-time health monitoring.

2: Fitness App Market Share, Size, Trends, & Industry Analysis Report: Segment Forecast, 2020-2026, Polaris Market Research, February 2020



INDUSTRY DRIVERS

Population increase coupled with lack of medical providers: By 2032, the AAMC predicts a primary care physician shortage of 21,100 to 55,200 and a non-primary care specialty physician shortage between 24,800 and 65,800 in the US.³ Hospitals have begun launching virtual care centers to help meet rising demand for wellness solutions, which can further decrease the need for in-person visits.

Growth of social media: Active lifestyles and working out have become ubiquitous on social media, with consumers relying on photo- and video-sharing platforms as go-to sources for fitness inspiration and motivation. Social challenges on platforms such as Facebook can increase participation, as users share their activities and vie for influencer status. For example, a quick search of the popular “#fitspo” hashtag on Instagram brings up tens of millions of posts related to fit and active lifestyles. New technology such as Snapchat glasses, improved cameras and video-editing tools make it easier to post quality content and drive more activity and engagement across social platforms.

Consumer and provider demand for healthcare flexibility: Consumers and physicians are seeking more convenient and accessible models of care. Mobile applications, telehealth and biometric devices allow for greater workout flexibility and enable individuals to create personalized health plans, discuss medical conditions and share monitored data with physicians remotely.

Expanding cost of traditional healthcare: National health spending is projected to grow at an average annual rate of 5.4% for 2019-2028, reaching \$6.2 trillion by 2028.⁴ Several factors have contributed to the swelling costs of traditional healthcare, including the prevalence of chronic diseases, rising obesity rates, increased sleeping disorder rates and

the expanding geriatric population. These costs are especially burdensome in emerging countries where out-of-pocket spending on healthcare to combat communicable and non-communicable diseases is higher. In the US as well, company-sponsored private health insurance has allowed for a significant escalation in cost of care. This puts pressure on consumers, providers and insurers to find ways to reduce the growing cost burden, such as promoting lower-cost alternatives.

Advancements in AI and Big Data: Providers of health & wellness services are using new technologies such as AI to gain new insights and opportunities. These include accelerating diagnostic capabilities, automating processes and providing AI-based treatments.

³: The Complexities of Physician Supply and Demand: Projections from 2017 to 2032, Association of American Medical Colleges, April 2019

⁴: National Health Expenditure Data, Centers for Medicare & Medicaid Services

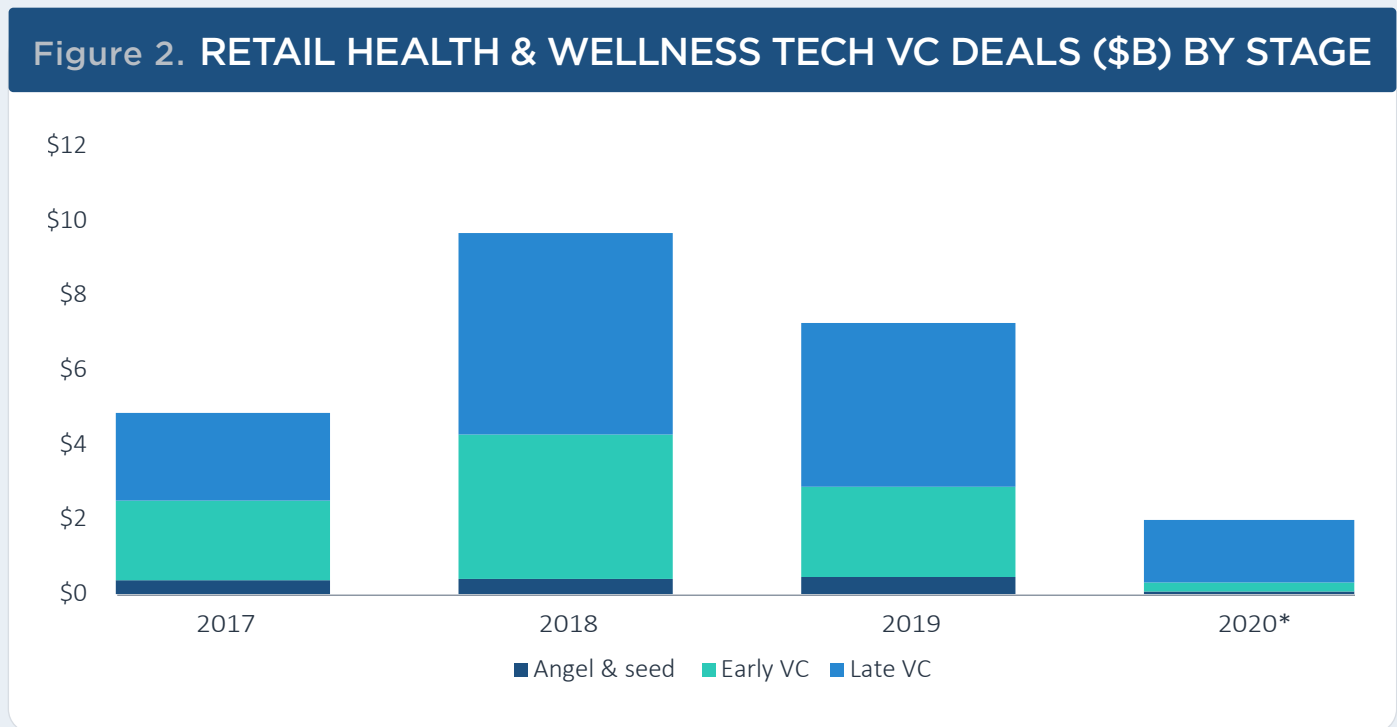
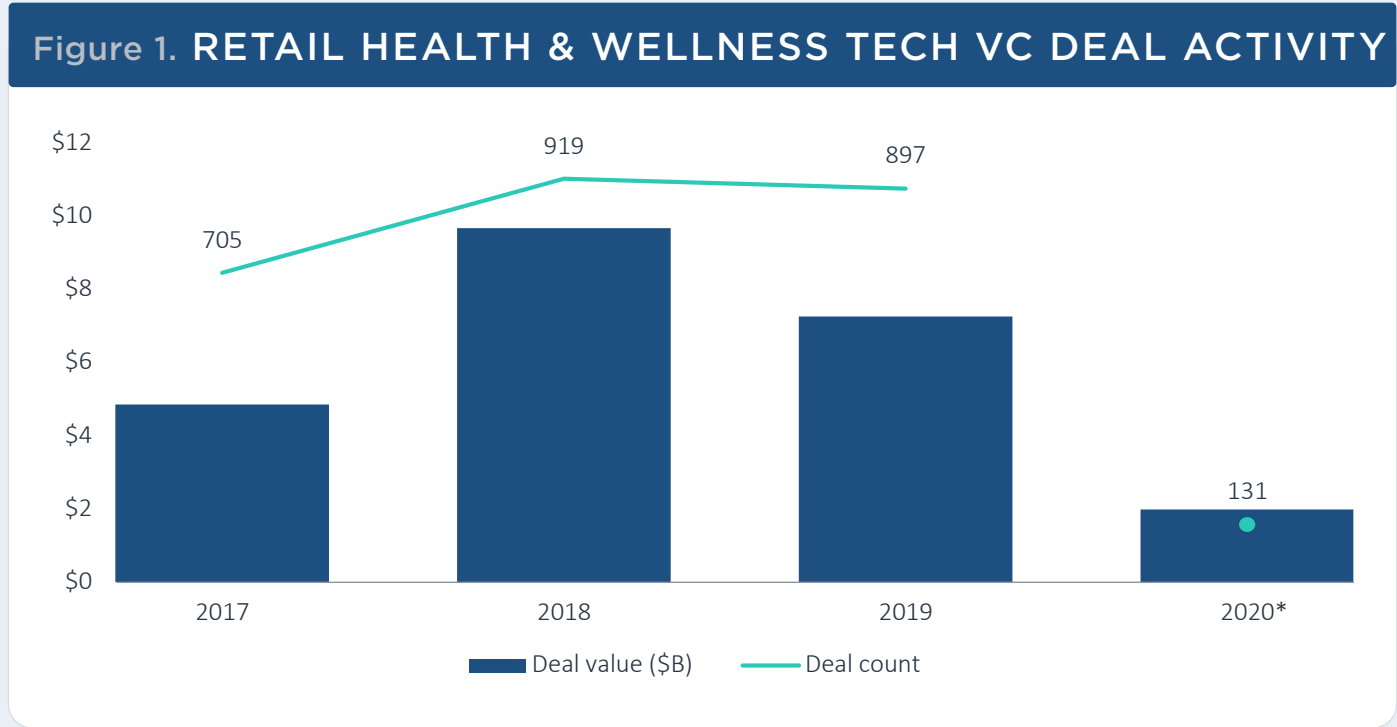


VC activity

In the retail health and wellness tech sector, 131 deals closed in Q1 2020 for \$1.9 billion in total VC funding. In the year prior, we saw several large deals close, including **Babylon Health**’s \$550 million Series C, **iFit**’s \$200 million late-stage VC round, and **Maze**’s \$191 million Series A. In 2020, we have yet to see any deals of similar size. The largest of them included **Karius**’ \$165 million Series B, **KRY**’s \$156 million Series C and **Element Science**’s \$146 million Series C. Despite the smaller deal sizes, the late stage comprised 38.9% of the quarter’s overall deal count and 84.3% of deal value, reflecting industry maturity.

In 2018, the number of VC exits to close in the retail health and wellness tech space doubled to 50 from years prior, and in 2019 we saw a total of 62. 2020 is not on pace thus far. There were only five exits in Q1 2020, the largest being **One Medical**’s \$245 million IPO. In comparison, the largest VC exits in 2019 were **Peloton**’s \$1.2 million IPO and **Stoke Therapeutics**’ \$142 million IPO. The sector’s muted VC exit activity in Q1 2020 mirrors that of all industries worldwide. Global VC exit count dropped from about 3,500 in 2019 to about 550 in Q1 2020. The disappointing early aftermarket performances of some of the most notable tech IPOs—including **Livongo**, **Uber** and **Peloton**—highlight a growing concern about public market appetite for tech unicorns seeking to list without a path to profitability. While the challenged economy may reduce exit activity in 2020, healthtech providers able to provide aid in the pandemic may be more likely to complete a favorable exit.

Startups in the personalized medicine & testing and virtual health spaces had much larger deal sizes than the other segments in the retail health and wellness tech industry. The lofty median deal size of personalized medicine & testing startups may be due to the segment’s large number of biotech-related companies, which typically close larger deals than retail-oriented startups.





Retail health & wellness tech market map

Virtual health



Remote patient monitoring (RPM) tools

ELEMENT^{SCIENCE} EarlySense

NovaSom vitalconnect

glooko Propeller

inui FIRE1

PEERBRIDGE PURSUIT HEALTH

Telehealth

amwell babylon KRY 高客网 SaiKeWang roman

lyra ondemand Quartet 98point6 NURX

MDLIVE InTouch Health talkspace k health tytoCare

halodoc Preventice MAVEN AliveCor BardyDX

Min Doctor greatcall INFOBISNIC medici Healthylia

MINYI 医药国际 PILL CLUB AbleTo JAWBONE HEALTH

Mobile & digital health



Fitness application

ZWIFT keep 咕咚

fatfit fun STRAVA

Fitbit FREEletics Lifesum

LifeBEAM FiNC

Behavioral modification tools

headspace mindstrong happify

Biometric wearables & devices



Biometric monitoring wearables

ROB WHOOP willow beam APNICURE 8 SLEEP

OURA Owlet elvie NOVELA VALENCELL

Smart fitness devices

GYM TONAL MIRROR TOCA TEMPO hydrow

Dietary supplements



Sports supplements

FRS HEALTHY ENERGY foodspring KILL CLIFF

Vitamins & supplements

hims spoonful one care/of

ALOHA ELYSIUM 疯狂小狗 Crazy Doggy

kate farms CYGOWE Goodlife

microphyl

Personal health tools & tracking

掌上精英 Zhangshang Tangyi omada

noom vida

zipongo OVAO

OVIVA

Digital therapeutics

virta PEAR Hinge Health AKILI cognoa

neurotrack PIVOT AppliedVR BrainCo

Personalized medicine & testing



Ad-hoc personalized testing

uBiome V.I.O.M.E EverlyWell OUB

Bioinformatics

WuXi NextCODE KALLYOPE insitro M2

efaroma AGENDIA scyba DNAexus

CENTRILLION AI Therapeutics Pathwork PAIGE

celmatix gmi NuGEN GENOMICS PLC

bio Pendulum

Genomic testing

23andMe 23ME Helix color

NantOmics Counsyl iCarbonX PGD

PATHWAY GENOMICS ORIG3N SINGERA Singular

DAY TWO MyHeritage Circle Veritas Genetics

Companies included are VC-backed, segmented by primary use case and sorted by total capital raised.

SEGMENT DEEP DIVE

Virtual health



VIRTUAL HEALTH

Overview

The virtual health (or telehealth) category includes companies involved in the distribution of health services via telecommunication platforms accessed through the web or mobile applications. Telehealth products and services provide remote communication between patients and providers. They also transmit and collect medical imaging information and data. The current segments within this category include:

Remote patient monitoring (RPM) tools: RPM tools utilize at-home diagnostic technology to electronically collect and transmit information between patients and physicians. This technology can be deployed in healthcare settings and at home via mobile devices, carts, robots and other digital tools.

Telehealth services: Telehealth connects patients and healthcare providers via computers, mobile devices and audio-visual systems so treatment can be provided remotely. This category also contains AI-powered chat bots that can provide medical advice and cognitive therapy. Telehealth service providers can be segmented into two different buckets:

- **Direct-to-consumer (D2C) telehealth companies:** These companies contract with employers, insurers or patients directly to provide an on-demand telehealth service—typically urgent care or primary care. Players in this area hire or contract their own physicians to provide consultation and/or create AI-powered chat-bots that can service the patient.
- **Telehealth service platforms:** These companies provide IT infrastructure to healthcare providers who wish to develop and provide their own telehealth services.

Telehealth has the potential to provide benefits across the ecosystem, not just for the end consumer. For example, hospitals deploying telehealth services reduce costs for consumers and insurers, increase convenience to users and improve capacity constraints. We outline these benefits in Figure 3 on the following page.





VIRTUAL HEALTH

Figure 3.
The benefits of telehealth to providers, patients, payers and employers

BENEFIT	PROVIDER/HOSPITAL	PATIENT	INSURER/PAYER	EMPLOYER
Reduces readmissions and avoids penalties	X	X	X	
Reduces length of hospital stay	X	X	X	
Increases patient satisfaction	X	X	X	X
Reduces overuse	X			
Reduces no-shows	X			
Improves medication management	X	X	X	X
Improves complex condition management	X	X	X	X
Increases quality of care	X	X	X	X
Increases provider efficiency	X			
Provides goodwill opportunities	X			
Increases market access	X			
Provides better medical access		X		
Increases retention rates	X		X	
Lowers total cost of care		X	X	X

Source: PitchBook



VIRTUAL HEALTH

Business model

Telehealth companies sell to healthcare providers through D2C, B2B or B2B2C models, offering either software or hardware (e.g. video devices for hospital exam rooms and RPM devices).

Revenue is generated via unit sales, SaaS subscriptions and digital visits. B2B and B2B2C

Telehealth service platforms sell strictly to healthcare providers who offer telehealth services to patients, these patient are often unaware of what telehealth platform is being utilized as they are on the back end and may be white labeled. D2C providers attract consumers to their platform and connect them with their own or third-party medical providers.

B2B: On a B2B basis, providers sell their platforms and services to hospitals, employers and/or insurers through a SaaS business model. Prices vary based on physician and employee usage as well as session volumes and additional features. RPM devices are typically sold directly to the hospital for patient distribution, which may or may not be covered by insurance.

D2C: D2C telehealth providers target individuals directly. In the US, D2C providers partner with insurers and employers to ensure coverage; however, in countries with universal healthcare, they receive funding from the government and may bypass that step. Consumer prices vary based on insurance levels and whether employers offer telehealth benefits. Telehealth services that use only chat bots, text messaging and/or online risk assessments typically have standard prices and do not partner with insurers, though they may partner with employers. For example, **98point6**, which diagnoses patients through text messaging, charges individuals a \$120 annual fee and \$1 for each visit. Employee-sponsored plans cover the annual fee, but users still may have to pay the visitation fee. Primary customer acquisition channels include physician referral and direct marketing.



VIRTUAL HEALTH

Market size

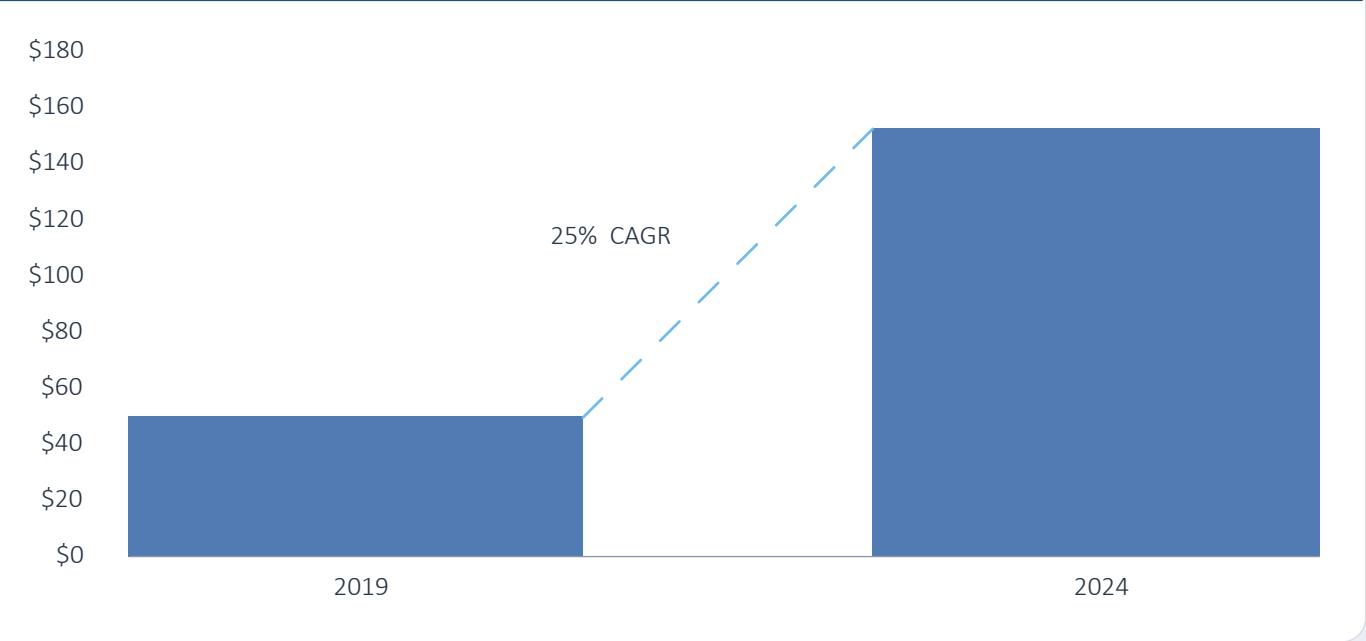
Before the COVID-19 pandemic swept through the world, the global virtual health market was projected to grow at a CAGR of 23.4% to \$266.8 billion in 2026 from \$49.8 billion in 2018.⁵ Most of this growth is driven by telehealth platforms and services as opposed to remote patient monitoring devices. While we expect the COVID-19 pandemic will serve as a strong catalyst for near-term growth, we believe the total size of the market in the long term will remain relatively unchanged from pre-pandemic forecasts. In the US, the telehealth services industry, driven by advancements in medical technology and telecommunications, is in the growth stage of its life cycle. It is expected to grow at an annualized rate of 9.2% to \$3.7 billion in 2024 from \$2.4 billion in 2019.⁶ The global remote patient monitoring devices and equipment market is expected to grow to \$3.7 billion in 2024, growing at a CAGR of 15.8%.⁷

Industry drivers

Technological innovation: Advances in technology have led to significant innovation in remote patient and self-monitoring devices, including at-home diagnostics that measure heart and respiratory rates, insulin levels and skin PH levels; mobile communications and high-speed networks that enable real-time communication between patients and providers; and online triage bots that can assist with routing patients to the appropriate clinical teams.

5: Telehealth: Global Market Analysis, Insights, and Forecast, 2019-2026, Fortune Business Insights, July 2019
6: Telehealth Services in the US, IBISWorld, Jack Curran, October 2019
7: “World Remote Patient Monitoring Devices & Equipment Markets: Analyses & Projections (2015-2030)—ResearchAndMarkets.com,” Businesswire, November 12, 2019

Figure 4. VIRTUAL HEALTH MARKET SIZE (\$B)



Source: PitchBook estimates | Geography: Global

COMMON INDUSTRY KPIS

- Lifetime value (LTV)
- Customer acquisition costs (CAC)
- CAC/LTV ratio
- Gross profit margin
- Customer churn & revenue churn (software)
- Monthly recurring revenue (software)
- Per-unit manufacture cost (hardware)
- Cost of goods (COG)/unit sales (hardware)



VIRTUAL HEALTH

The COVID-19 pandemic as an adoption catalyst: The COVID-19 pandemic is driving a surge in demand for telehealth capabilities to help in diagnosing and treating patients. Telehealth can help extend treatment to rural locations, scale treatment in dense cities and protect front-line healthcare workers from the highly contagious disease. To facilitate the use of telehealth, regulators have eased restrictions, and payers have extended insurance coverage. This is likely to be a significant near-term catalyst for the industry that could have long-term ramifications as patients, providers and insurers become accustomed to telemedicine and as the technology itself improves to address the crisis. Telehealth is also likely to remain a critical component of future pandemic response systems.

Rising healthcare costs and the push for value-based care: Telemedicine is often less expensive to provide relative to facility care because remote treatment requires fewer resources. As providers can reduce costs and as studies continue to validate the efficacy of telemedicine, both private and public health insurers are more likely to cover telehealth services. For example, at the University of Pittsburgh Medical Center, a video-based home monitoring program helped drop hospital readmissions among patients with congestive heart failure to just 5% from 28%.⁸ D2C clear aligners (alternatives to braces) cost approximately 50% less than doctor-directed aligners and are conveniently delivered.

Demand for healthcare in rural areas: The patient-to-primary care physician ratio in rural areas is only 39.8 physicians per 100,000 people, compared to 53.3 physicians per 100,000 in urban areas,⁹ and about 20% of Americans live in rural areas without suitable access to dentists and orthodontists.¹⁰ Telehealth can also give rural residents better access to specialists who may not be available physically.

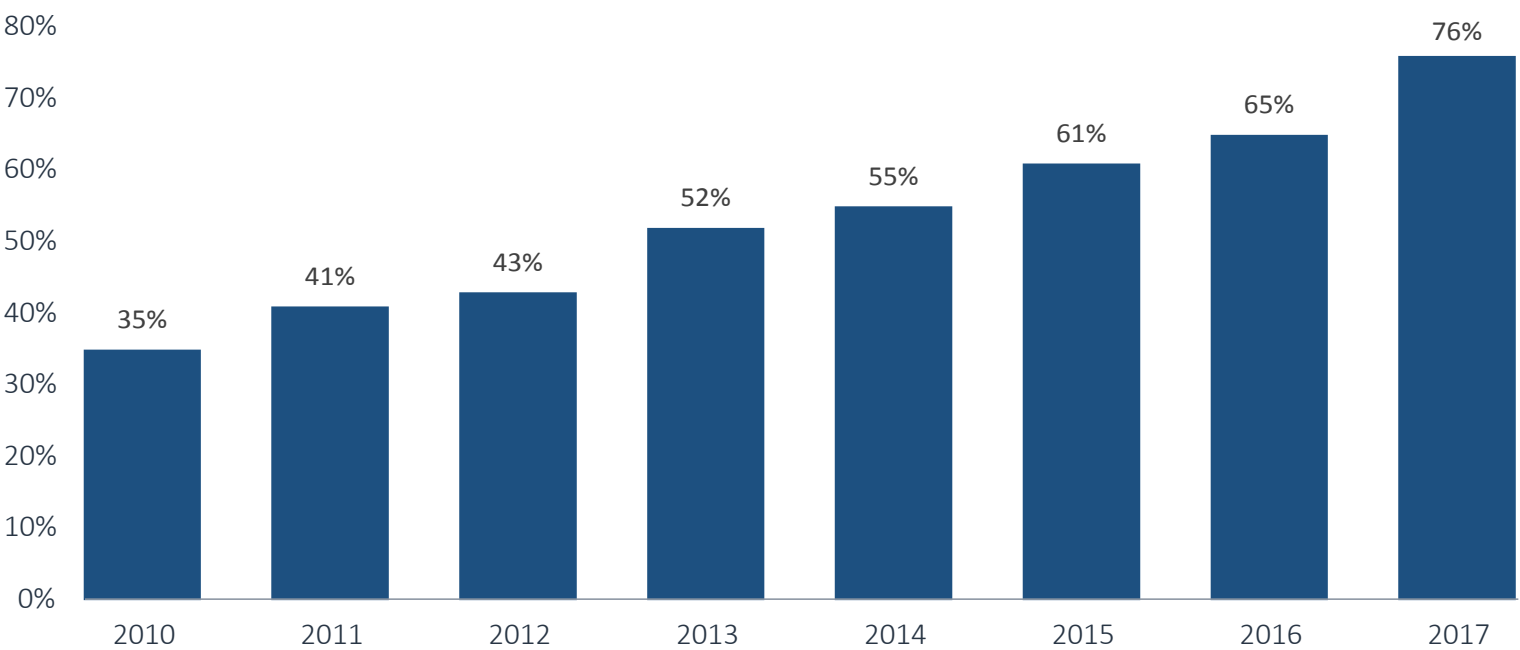
8: "Use of Telemedicine Surges at UPMC," Biz Journals, Kris B. Mamula, May 23, 2014

9: CDC, NCHS, National Ambulatory Medical Care Survey, Electronic Health Records Survey

10: "Facts About Teledentistry," American TeleDentistry Association, n.d.

Figure 5.

Percent of hospitals fully or partially implementing computerized telehealth system (2010-2017)



Source: 2011 to 2019 American Hospital Association Annual Survey IT Supplement | Geography: US

Increase in number of patients requiring ongoing monitoring: The growing elderly population and an increasing number of patients with chronic conditions, such as diabetes, cancer and obesity, has expanded the use of RPM devices that allow patients to reduce hospital trips and recuperate at home. Management of chronic illnesses accounted for more than 75% of healthcare costs in 2016, with chronic heart diseases, diabetes and strokes named the leading global causes of mortality by the World Health Organization.¹¹

11: "The Top 10 Causes of Death, World Health Organization, May 24, 2018



VIRTUAL HEALTH

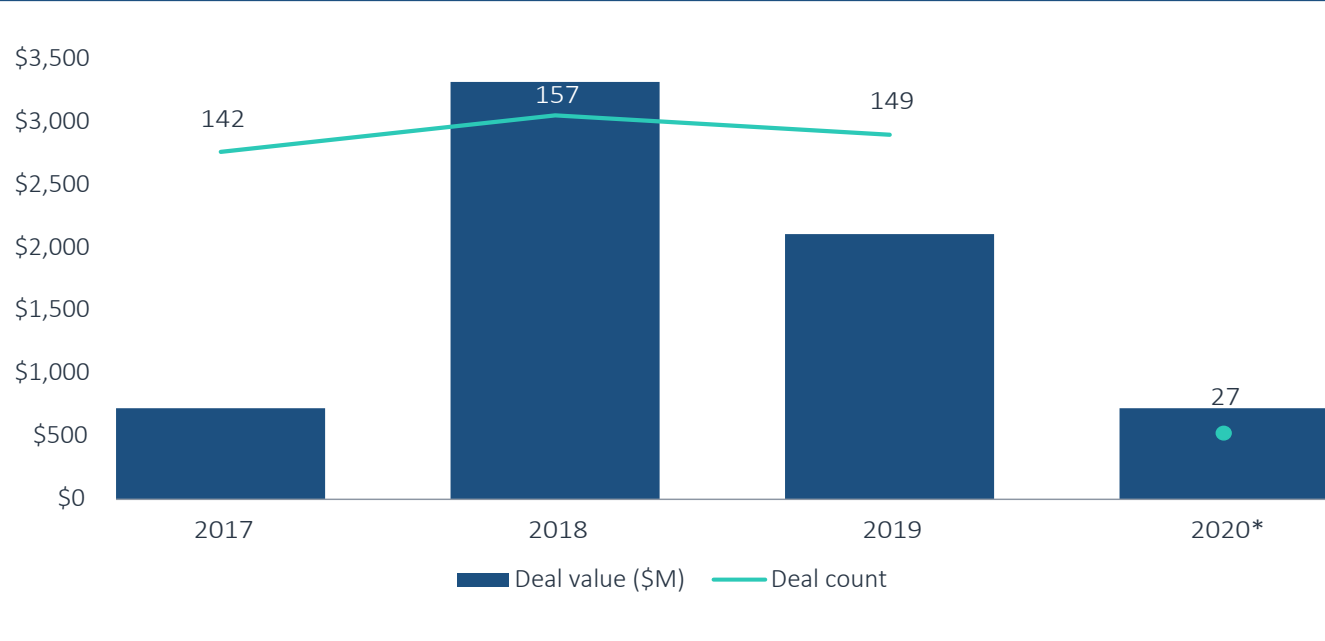
Government funding and grants for telemedicine: The National Health Institute and the US-funded Office for the Advancement of Telehealth (OAT) provide funds to support technology development for telehealth. Furthermore, we expect to see increased government investment in healthcare technology as legislators prioritize public health over lingering privacy concerns. This could boost investment in telemedicine.

Growing support for expanded coverage of telehealth: While US policy generally restricts telehealth reimbursement, we expect continued loosening of regulations and expansion of Medicare reimbursement as telehealth is further embraced by politicians and consumers. We note many of these regulations were significantly eased in response to COVID-19, and we believe it may be hard to reverse these changes.

VC activity

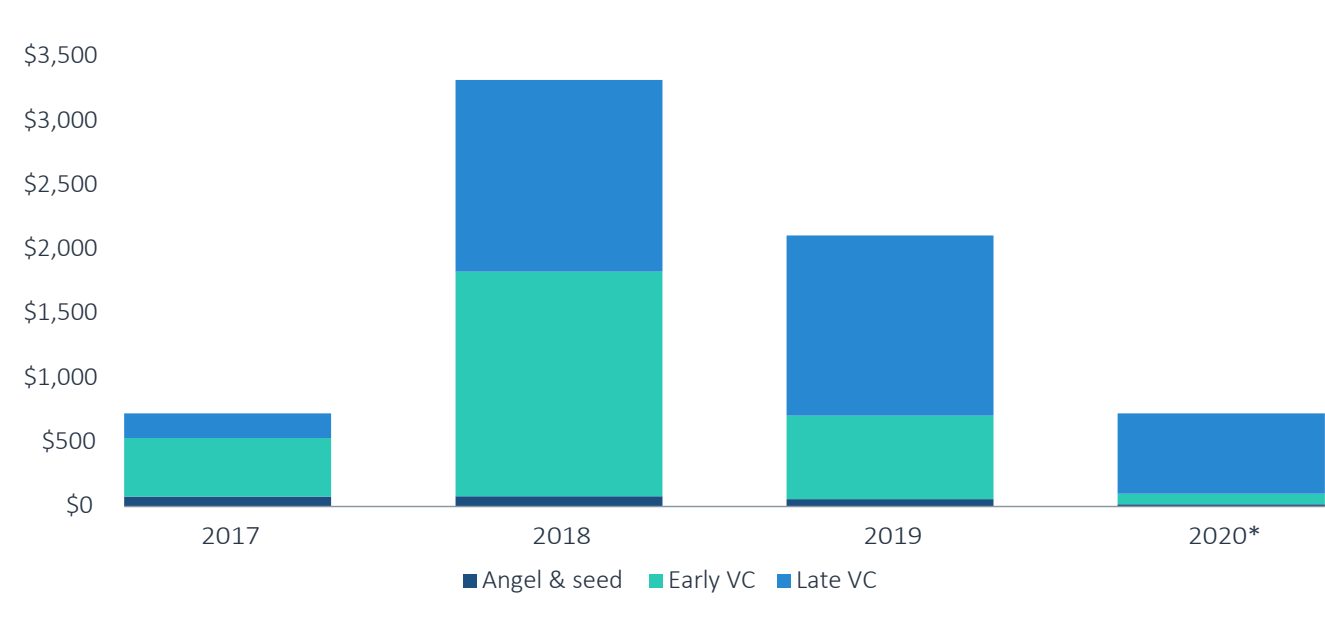
Companies tracked in this segment raised roughly \$725 million in venture funding in the first quarter of 2020, up from \$322 million in Q1 2019. Fourteen late-stage VC deals accounted for about 86.2% of the deal funding this quarter, which is higher than in previous years (44.9% in 2018, 66.5% in 2019) and signals industry maturity. In Q1 2020, notable raises include **KRY**’s and **Element Science**’s Series C deals for \$155 million and \$145 million, respectively. **KRY**’s mobile application allows patients to book virtual appointments with the company’s registered doctors and therapists. **KRY** recently launched CareConnect, a free-to-use platform that enables doctors to treat their patients remotely. CareConnect is currently free for doctors and was created in response to COVID-19. However, we would not be surprised if **KRY** began charging doctors for CareConnect in the future. **Element Science** created an RPM device that monitors a patient’s heart to protect against sudden cardiac death.

Figure 6. VIRTUAL HEALTH VC DEAL ACTIVITY



Source: PitchBook | Geography: Global

Figure 7. VIRTUAL HEALTH VC DEALS (\$M) BY STAGE

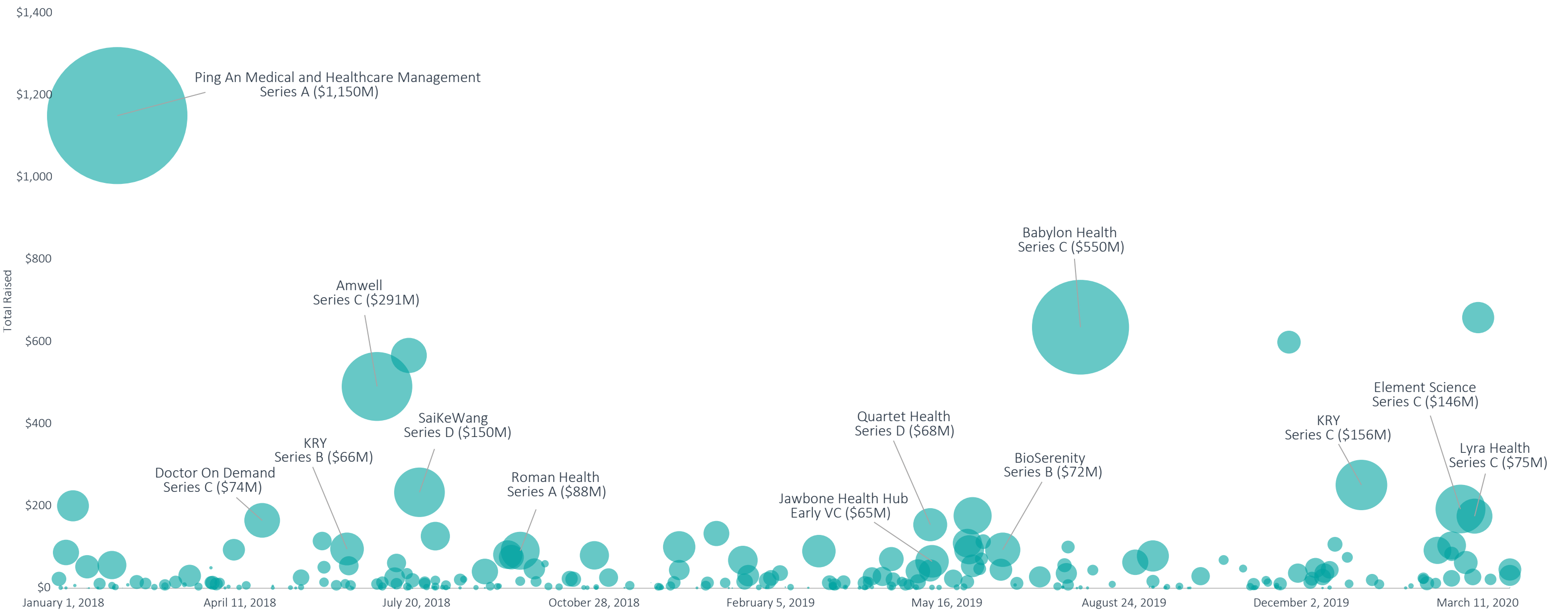


Source: PitchBook | Geography: Global



VIRTUAL HEALTH

Figure 8.
Current virtual health VC landscape (\$M)



Source: PitchBook
Note: The left axis indicates total VC raised as of deal date. Bubbles indicate amount raised.



VIRTUAL HEALTH

Figure 9.
Notable virtual health VC deals






COMPANY	CLOSE DATE	SUBSEGMENT	DEAL SIZE (\$M)	DEAL TYPE	LEAD INVESTOR(S)	VALUATION STEP-UP
 KRY	January 7, 2020	Telehealth	\$156	Series C	Teachers' Innovation Platform	N/A
 ELEMENT ⁺ SCIENCE	March 3, 2020	RPM tools	\$146	Series C	Qiming Venture Partners, Deerfield Management	N/A
 lyra	March 11, 2020	Telehealth	\$75	Series C	IVP	2.00x
 amwell	March 13, 2020	Telehealth	\$60	Late-stage VC	N/A	N/A
 k health	February 27, 2020	Telehealth	\$48	Series C	Mangrove Capital Partners, 14W	2.05x

Figure 10.
Notable virtual health VC exits

Source: PitchBook






COMPANY	CLOSE DATE	SUBSEGMENT	EXIT SIZE (\$M)	EXIT TYPE	ACQUIRER OR TICKER	VALUATION STEP-UP
 one medical	January 31, 2020	Telemedicine	\$1,469	IPO	NASDAQ	0.98x
 SnapMD	December 12, 2019	Telemedicine	N/A	Buyout/LBO	Virtrial, Kinderhook Industries	N/A
 GENEVA HEALTH SOLUTIONS	March 1, 2019	RPM tools	\$66	M&A	BioTelemetry	6.64x
 centervue	April 30, 2019	RPM tools	\$67	M&A	Revenio Group	N/A

Source: PitchBook



VIRTUAL HEALTH

Figure 11.
Key VC-backed virtual health companies





COMPANY	VC RAISED TO DATE (\$M)	SUBSEGMENT	KEY PRODUCTS	PRODUCT DIFFERENTIATION
	\$659	Telehealth	Virtual telehealth platform	Targets healthcare providers, patients and payers; integrates into EHR systems
	\$635	Telehealth	Telehealth video appointments, chatbot, healthcheck survey	Chatbot uses AI to identify cause and connect users
	\$251	Telehealth	Remote telehealth appointments, CareConnect	CareConnect enables professionals to treat patients by video, KRY platform targets consumers
	\$233	Telehealth	Remote mental health counseling	Provides anonymous psychological counseling
	\$193	RPM tools	Wearable cardioverter defibrillator	Minimizes risk of sudden cardiac death by enabling continuous heart monitoring

Source: PitchBook



VIRTUAL HEALTH

Figure 12.
Key virtual health incumbents

COMPANY	HOLDING STATUS	SUBSEGMENT	ENTERPRISE VALUE (\$B)	KEY PRODUCTS
 TELADOC	Public	Telemedicine & RPM tools	\$42,924	Enterprise telehealth services; suite of patient monitoring devices
 Aerotel Medical Systems	Public	Telemedicine	\$13,076	Virtual care solution to connect organization to individuals
 SHL Telemedizin	Public	Telemedicine & RPM tools	\$61	ECG, blood pressure, Oximeter devices; 24/7 telemedicine center
 PHILIPS	Corporation	RPM tools	N/A	Remote ECG monitoring software

Source: PitchBook



VIRTUAL HEALTH

Opportunities

Credentialing software: Medicare eligibility requires healthcare facilities and providers to have a physician credentialing and privileging process for in-person and telehealth treatment. Obtaining and proving these credentials can be streamlined through a process called “credentialing by proxy (CBP).” CBP permits hospitals to rely on the privileging and credentialing decisions made by the hospital providing the telemedicine services and can reduce onboarding and go-live time from months to days. However, only 33% of respondent hospitals use telemedicine credentialing by proxy (CBP).¹² This is due to fear of losing control with CBP and a lack of understanding regarding the benefits of CBP. Credentialing software could help save money and time. **Modio Health** is currently the largest medical credentialing software. However, startups such as **Kareo** are hoping to enter the space. **Kareo** raised a \$9.9 million Series H round in October 2018, raising its post-money valuation to \$359.9 million.

Telehealth platforms targeting businesses: With employer-sponsored healthcare benefits approaching \$15,000 per employee,¹³ many companies are looking to telehealth to reverse this trend. Several large employers have introduced telehealth in recent years, with over half of respondents in the 2019 Large Employers’ Health Care Strategy and Plan Design Survey planning to add more virtual care (telehealth) solutions.¹⁴ These expanded offerings are likely to drive higher rates of use. Companies may also view telehealth as an effective means to offer new kinds of treatments. 13% of large employers planned to introduce mental/behavioral and diabetes management telehealth services in 2019, a

reflection of the growing perception that telehealth can help companies address gaps in their healthcare coverage.¹⁵ Startups **98point6** and **TAO Connect** focus on both the employer and consumer markets.

Providing various services through a single channel: Telehealth software can be used as a productivity-enhancing tool in a variety of applications that can help broaden the customer base. For example, **Doctor On Demand** initially launched as a virtual urgent-care clinic. In 2014, it was one of the first to expand into mental health care, offering video-based psychology and psychiatry visits. **Doctor On Demand**’s Synapse platform enables doctors to maintain patient medical records and quickly refer patients to in-network specialists.

Remote patient monitoring devices: RPM devices have many applications and serve as a critical component of pandemic response systems. These devices can also improve patients’ ability to monitor their own health. **BioIntelliSense**’s BioSticker wearable sensor monitors vital signs such as resting heart rate, respiratory rate and skin temperature, as well as other biometrics, including coughing, vomiting and body position.

Considerations

Limited access to high-speed internet and smartphones hinders adoption in rural areas: According to the 2018 Broadband Deployment Report, only 69.3% of rural areas and 64.6% of tribal areas had access to high-speed broadband internet that met the minimum benchmark set by the Federal Communications Commission (FCC).¹⁶ Furthermore, many

12: 2017 Telemedicine & Digital Health Survey Report, Foley & Lardner, November 8, 2017

13: “2020 Large Employers’ Health Care Strategy and Plan Design Survey,” National Business Group on Health, 2019

14: Ibid.

15: Ibid.

16: 2018 Broadband Deployment Report, Federal Communications Commission, February 2, 2018



VIRTUAL HEALTH

mobile health and RPM systems require access to smartphone applications. However, rural populations are less likely to own smartphones when compared to other populations. In 2018, 71% of rural residents reported owning a smartphone, compared to 83% of suburban and urban residents.¹⁷

Telehealth adoption hurdles remain: Today's healthcare industry is the result of decades of regulation, complex stakeholder relationships, and legacy processes and procedures. Telemedicine will require stakeholders to work together to redefine existing regulations and payment structures, while consumers will need to learn to trust and be comfortable with virtual or AI-driven interactions. One significant challenge includes licensing doctors with local medical boards and complying with the complex regulations and licensing rules of each state. We expect demographics will play a large role in this shift as younger, digital-native generations adopt these technologies more quickly and demand their availability.

Complicated implementation process in hospitals: Healthcare providers face significant RPM deployment challenges due to limited budgets and resources. Health systems and hospitals embarking on the virtual care journey often face obstacles when training physicians and nurses to become virtual care providers. Successful deployments are more likely for vendors that can establish a partnership with clinical teams rather than a more traditional vendor-client relationship. Over time, virtual health training could become more standardized. For example, medical students at Weill Cornell can now take a two-week telemedicine and digital health elective in which they learn to interview patients virtually, participate in telehealth visits and understand the legal and regulatory issues around telemedicine.

17: "Mobile Fact Sheet," Pew Research Center, June 12, 2019

Hiring and patent risk: Given the high growth of the industry, startups may have difficulty sourcing talent for product and software development. Additionally, we believe the heavy reliance on technology devices to perform specific tasks increases patent risk.

Outlook

Large employers will launch their own telemedicine services: While we expect telehealth providers to increasingly target corporates, we also anticipate large corporations will launch their own services and partner directly with doctors and local hospitals. In September 2019, **Amazon** began piloting Amazon Care for its employees, a virtual primary care offering. Amazon Care will include telemedicine, online chat with a nurse, medication delivery and app-enabled house calls to the employee's office or home. Amazon Care does not directly employ healthcare providers but contracts with local clinics.

More startups will focus on underserved populations and developing regions: Significant portions of the global population have limited access to healthcare services, and digital health technologies have the potential to close gaps where healthcare infrastructure and engagement are weakest. VC firm **StartUp Health** invests solely in digital health startups, and their portfolio includes 325 startups across 25 countries—one of which, access.mobile, focuses on traditionally hard-to-reach, high-risk and underserved populations.

Startups will expand services and distribute via legacy channels: We expect telehealth startups will continue to find ways to enhance and augment services to drive new adoption and market penetration. Emerging models and partnerships can expand services and add new distribution channels. For example, **MDLive** recently partnered with **Walgreens** to offer telehealth services in 25 states through the **Walgreens'** app. Providers



VIRTUAL HEALTH

are also adding new services to create holistic offerings, such as **Babylon Health**'s app, which includes a virtual assistant and health-mapping tools, as well as text and video consultations with doctors.

Future of elderly care to rely more heavily on technology: Technology will be critical in improving care for the elderly. Next-generation sensors can support home living (e.g. **Carepredict**'s AI bracelet) and robots can help provide physical care (e.g. Embodied). Improved data analysis services will combine personal genetic and wellness data with population data to design individual care plans.

SEGMENT DEEP DIVE

Mobile & digital health



MOBILE & DIGITAL HEALTH

Overview

Mobile & digital health startups are developing tools and apps that can help consumers monitor and improve personal health. In some cases, these tools may be recommended by health providers in conjunction with traditional care. Categories include:

Personal health tools & tracking: Consumer applications for monitoring and managing health concerns such as menstruation cycles, nutrition and sleep.

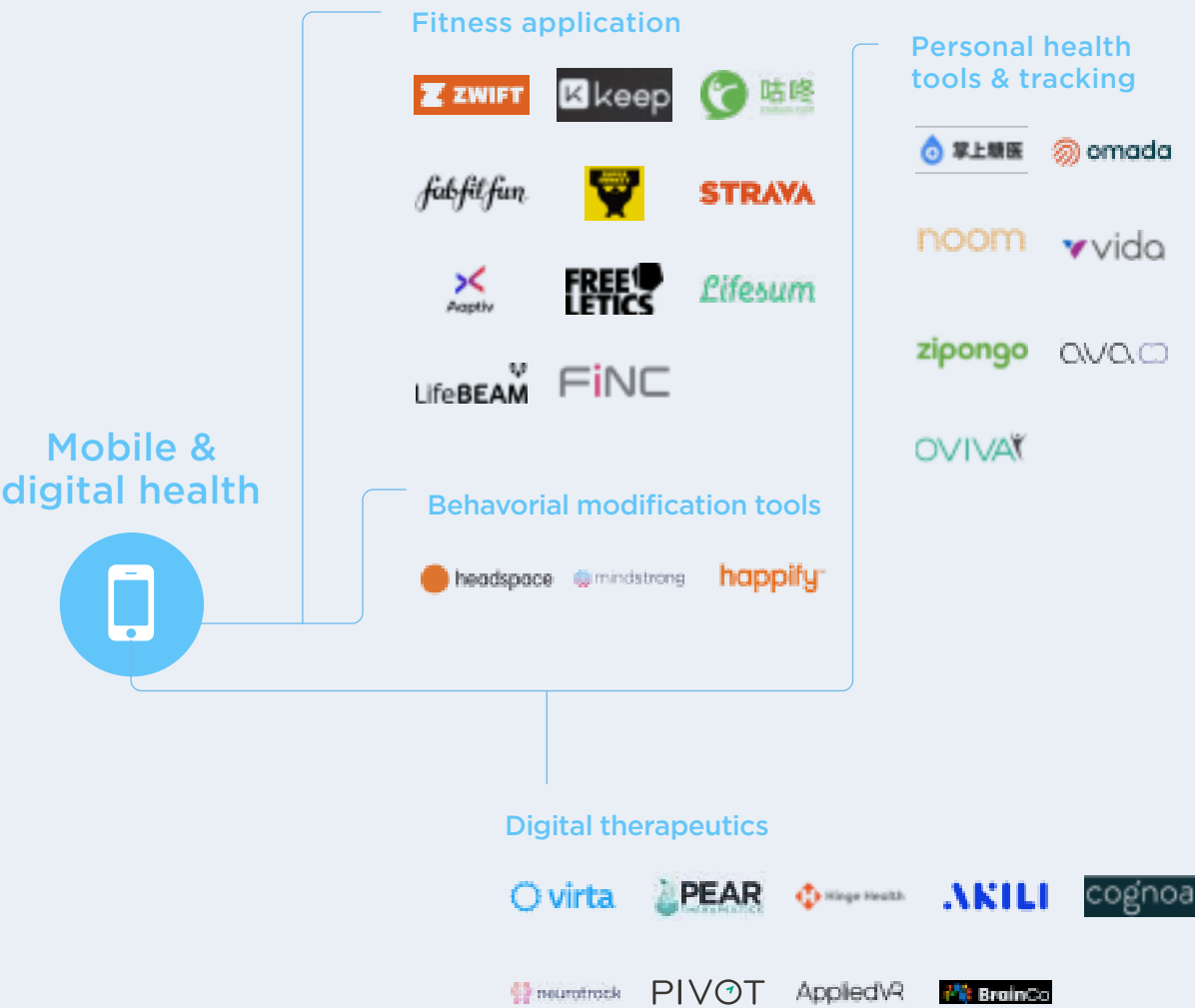
Fitness applications: Applications that enable users to work out anywhere by providing on-demand audio and/or video classes. This segment also includes “on-demand gyms” that allow consumers to access a network of gyms and pay per minute, as opposed to monthly memberships.

Behavior modification tools: Applications aimed at helping users improve critical brain functions, such as memory, attention, communication and ability to learn. This group also includes applications intended to help reduce stress through practices such as meditation, as well as encourage healthy behaviors.

Digital therapeutics: Software solutions designed to treat medical conditions that are used proactively by consumers or prescribed by doctors. For example, **Akili Interactive**’s AKL-T01 is used in place of or in tandem with traditional pharmaceutical therapies for ADHD.

Business model

Mobile & digital health products are generally sold direct to consumer and may be accessible through desktops and/or mobile applications. These companies generate revenue through subscriptions (freemium and premium), ads and selling user data. Some products are covered under insurance plans or paid for by employers as a workplace wellness benefit.





MOBILE & DIGITAL HEALTH

Market size

The global mobile health market is estimated to reach \$173.8 billion by 2024, propelled by a 38.5% CAGR from a market size of approximately \$34.1 billion in 2019.

Industry drivers

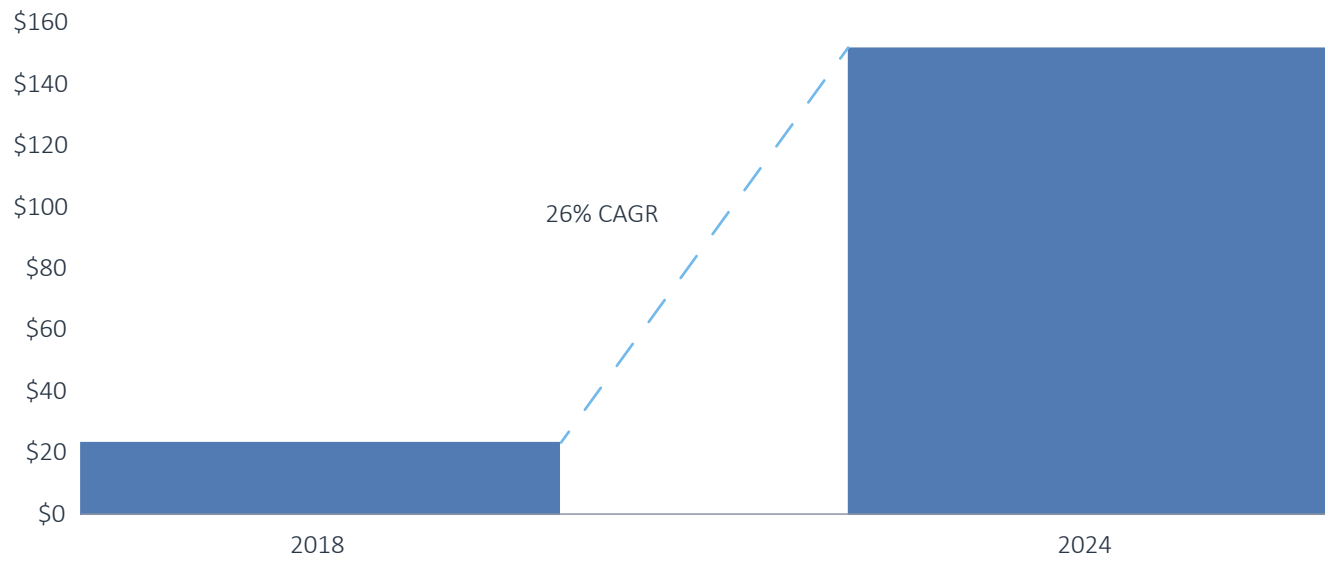
Enabling technologies accelerate adoption: The digital economy has paved the way for convenient, customizable consumer health tools accessible via smartphone apps. Improved connectivity speeds enable consumers to access solutions on-demand, share information instantly and stream high-quality videos. AR and VR technologies have the potential to create powerful new experiences, particularly AR as it applies to brain activity analysis.

Increased monetization opportunities for digital content providers: The monetization potential of streaming platforms such as YouTube provides financial incentives for new and existing content creators (e.g. instructors) to provide free workout video catalogs that can attract advertising dollars.

Destigmatization of mental illness: Declining stigma surrounding mental health disorders is likely to drive more willingness among consumers to seek treatment and technological solutions. Additionally, consumers may be drawn to the lower-cost and privacy of using app-based services that don't require in-person doctor visits.

Growing market for fertility products: The rise in dual income households and the trend among women to have children later in life is fueling demand for fertility tracking applications that can help with conception.

Figure 13. MOBILE & DIGITAL HEALTH MARKET SIZE (\$B)



Source: PitchBook estimates | Geography: Global

COMMON INDUSTRY KPIS

- Customer retention
- Customer penetration
- Monthly recurring revenue (MRR)
- Churn rate
- Customer acquisition costs (CAC)
- Viability ratio (LTV/CAC)
- Seasonal retention
- Mobile apps: app downloads, app store ranking, active users, number of users who grant location permission, advertising partners
- User engagement metrics: number of users who improve their sleep quality, allow push notifications or log in daily/weekly



MOBILE & DIGITAL HEALTH

Digital alternatives can help fill traditional care gaps: As more studies indicate that digital health apps can result in similar outcomes where traditional care may be unavailable, we expect the market for digital alternatives to remain robust. Physicians can recommend digital weight loss apps for patients who cannot obtain personal trainers. Expensive psychotherapy inaccessible to low-income demographics or rural populations can be obtained at lower cost via digital apps. Sleep disorders can be diagnosed and treated digitally.

Pandemic-related demand spikes could signal longer-term shift: The COVID-19 pandemic has driven a surge in demand for mental health applications. For example, from December 29, 2019 to March 1, 2020, startup **Headspace** experienced double the average amount of inbound requests from members looking for content to help them cope with pandemic-related stress, as well as a 100% increase in corporate clients seeking support for their employees’ mental wellbeing.¹⁸ We expect the crisis could also drive longer-term interest among organizations seeking to make mental-health products available to their employees.

18: According to Megan Jones Bell, Headspace’s Chief Science Officer

Figure 14.
Median age at first birth, by urbanization level



Source: NCHS, National Vital Statistics System | Geography: US
Note: County designation is based on mother’s county of residence. County classification is based on the 2006 and 2013 NCHS Urban–Rural Classification Scheme for Counties. Age in years.



MOBILE & DIGITAL HEALTH

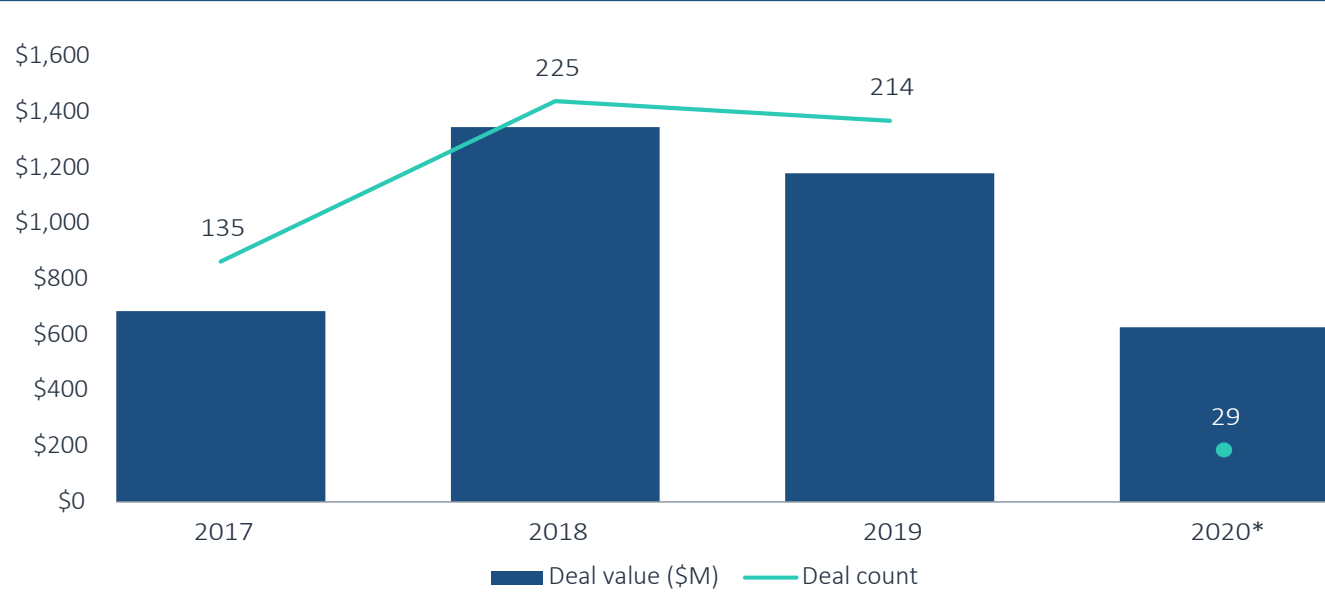
VC activity

Companies tracked in this segment raised \$554 million across 29 VC deals in the first quarter of 2020, up from \$401 million YoY but producing far fewer deals than every quarter in 2019.

In Q1 2020, we saw four deals raise at least \$90 million dollars each. In 2019, only two companies secured deals over \$90 million: **CureFit** and **Zhangshang Tangyi (ZyHealth)**. **CureFit** raised a \$120 million Series D, and **ZyHealth** raised a \$100 million Series C. In Q1 2020, **ZyHealth** pulled in an additional \$143 million for the largest deal of the quarter, and **CureFit** raised \$40 million in D2 funding. **ZyHealth** offers a diabetes management application that enables diabetics to track their blood glucose and diet. Most recently, the company created an app for doctors that allows them to communicate with patients and track their health. As a result, the app may also be considered an RPM device. **CureFit** provides a fitness-based online platform intended to address preventive healthcare techniques.

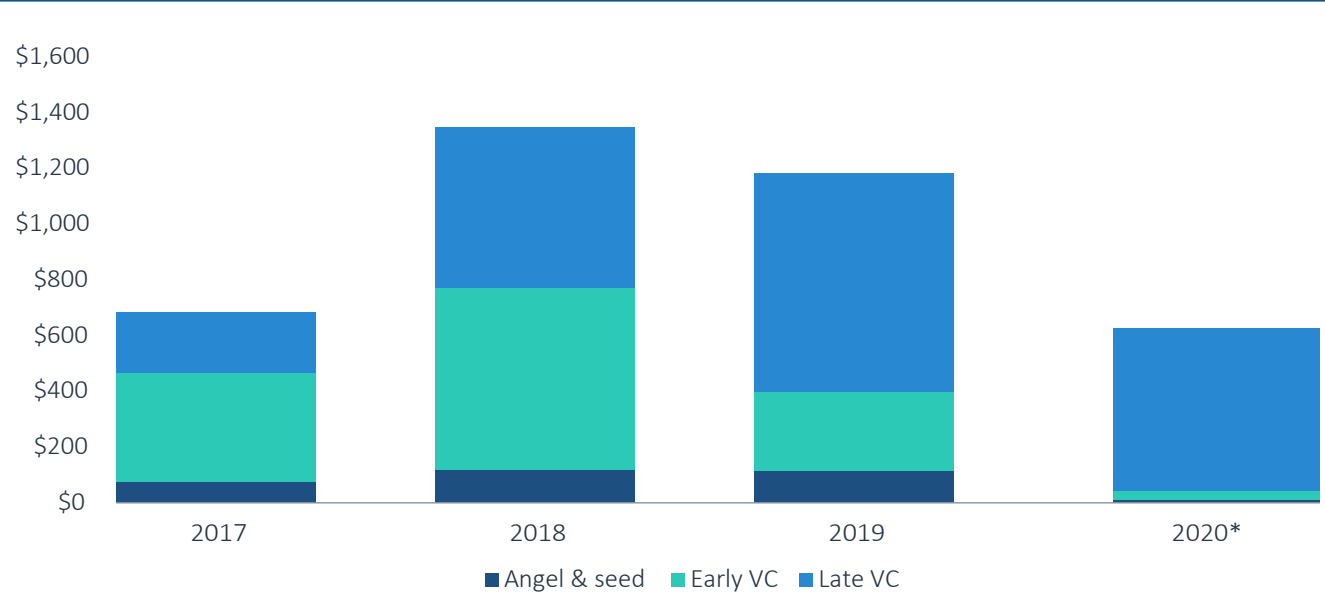
The second largest deal of Q1 2020 belonged to **Virta Health**, which raised a \$93 million Series C. The company operates an online diabetes reversal clinic intended to reverse Type 2 diabetes without medication or surgery. Its clinic offers health coaching, an online community, education resources and nutrition tracking to help patients restore metabolic health.

Figure 15. MOBILE & DIGITAL HEALTH VC DEAL ACTIVITY



Source: PitchBook | Geography: Global
*As of March 31, 2020

Figure 16. MOBILE & DIGITAL HEALTH VC DEALS (\$M) BY STAGE

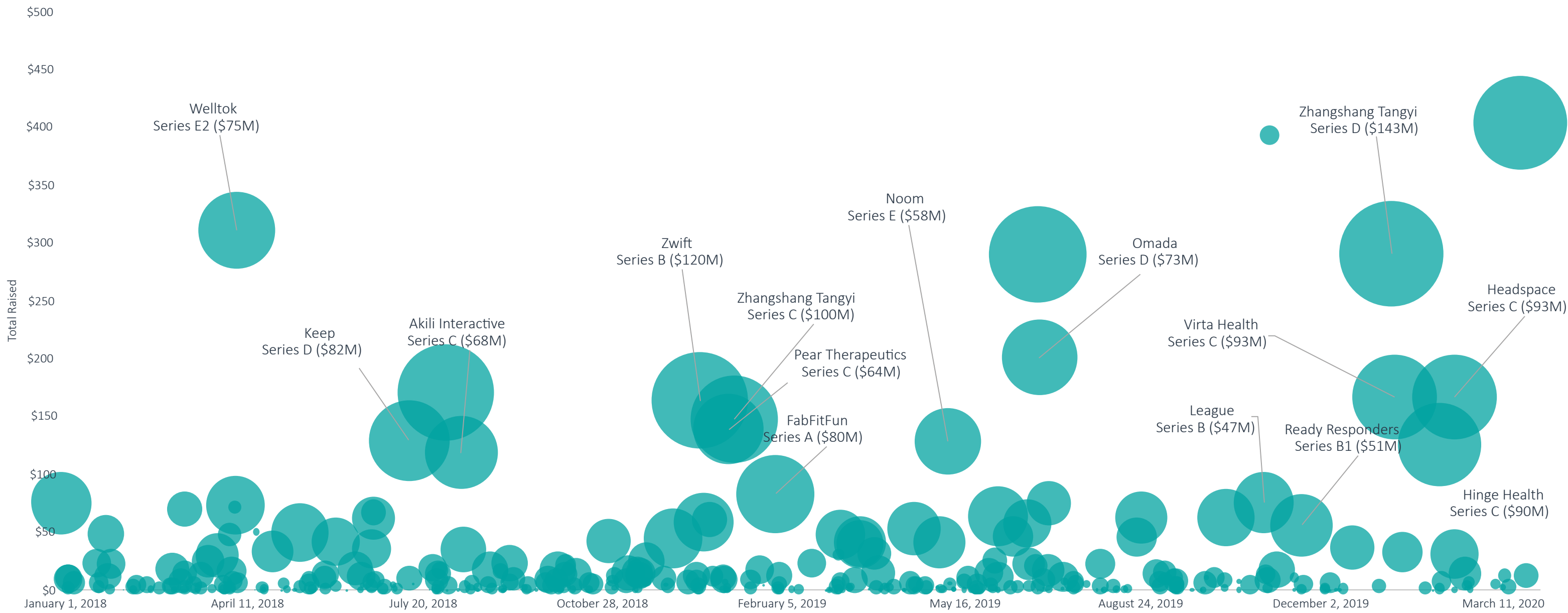


Source: PitchBook | Geography: Global
*As of March 31, 2020



MOBILE & DIGITAL HEALTH

Figure 17.
Current mobile & digital health VC landscape (\$M)



Source: PitchBook
Note: The left axis indicates total VC raised as of deal date. Bubbles indicate amount raised.



MOBILE & DIGITAL HEALTH

Figure 18.
Notable mobile & digital health VC deals






COMPANY NAME	CLOSE DATE	SUBSEGMENT	DEAL SIZE (\$M)	DEAL TYPE	LEAD INVESTOR(S)	VALUATION STEP-UP
 掌上糖医 Zhangshang Tangyi	January 8, 2020	Personal health tools & tracking	\$143	Series D	CMB International Capital, Susquehanna Asia Investments	N/A
	January 10, 2020	Digital therapeutics	\$93	Series C	Caffeinated Capital	1.39x
	March 20, 2020	Fitness applications	\$40	Series D2	Temasek Holdings	N/A
	February 24, 2020	Personal health tools & tracking	\$11	Series A	N/A	N/A
	March 18, 2020	Fitness applications	\$4	Early-stage VC	N/A	N/A

Figure 19.
Notable mobile & digital health VC exits

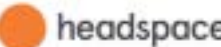

Source: PitchBook

COMPANY NAME	CLOSE DATE	SUBSEGMENT	EXIT SIZE (\$M)	EXIT TYPE	ACQUIRER OR TICKER	VALUATION STEP-UP
	September 16, 2019	Personalized health tools & tracking	\$30	Buyout/LBO	Odyssey Investment Partners, Audax Group, TrialCard	0.59x
	July 22, 2019	Fitness applications	\$20	Buyout/LBO	Beachbody, The Raine Group	0.83x
	January 7, 2020	Digital therapeutics	N/A	Buyout/LBO	Marlin Equity Partners, Virgin Pulse	N/A



MOBILE & DIGITAL HEALTH

Figure 20.
Key VC-backed mobile & digital health companies





COMPANY	VC RAISED TO DATE (\$M)	SUBSEGMENT	KEY PRODUCTS	PRODUCT DIFFERENTIATION
 掌上糖医 Zhangshang Tangyi	\$291	Personal health tools & tracking	Self-monitoring diabetes platform	Enables diabetics to track their blood glucose, diet and medication programs
 omada	\$201	Personal health tools & tracking	Self-management platform for Type 2 diabetes, hypertension and behavioral health	Bills employers and health insurers, not individuals; real-time data and personalized coach feedback
 headspace	\$167	Behavioral modification tools	Meditation application	Employer and individual subscription models
 virta	\$167	Digital therapeutics	Digital diabetes traversal platform	Proven to reverse Type 2 diabetes without the use of traditional medicine
 ZWIFT	\$164	Fitness applications	Indoor cycling and running app	Structured training plans; encouraging online community

Source: PitchBook



MOBILE & DIGITAL HEALTH

Figure 21.
Key mobile & digital health incumbents

COMPANY	HOLDING STATUS	SUBSEGMENT	ENTERPRISE VALUE (\$M)	KEY PRODUCTS
	Corporation	Fitness applications	N/A	1000+ classes, separate running and yoga-focused apps
	Acquired	Personal health tools & tracking	N/A	Diet management application and calorie counter
	Public	Fitness applications	\$141,001	Training app with HIIT classes, run club app tracks and coaches runs
	Acquired	Personal health tools & tracking	N/A	Women's digital health platform; fertility tracking

Source: PitchBook



Opportunities

Over-the-counter family planning products: We believe a significant market exists for family planning products that can be sold over the counter at significant discounts to traditional methods. Birth control products allow women to more easily engage in family planning without visiting a doctor, while providing alternatives to traditional birth control methods, such as IUDs, pills and patches, that can be costly, time-consuming to retrieve and capable of causing severe side effects. Startups pursuing this opportunity include Ava, which sells a fertility bracelet alternative to mainstream fertility treatments; **Natural Cycles**, which sells an FDA-approved birth control app; and **Inne**, which manufactures a device that tracks hormones and analyzes chances of becoming pregnant.

Figure 22.
Key mobile & digital health incumbents

COMPANY/TREATMENT	PRICE
In vitro fertilization (IVF)	\$11,500
Visit to reproductive endocrine fertility specialist 2	\$200-\$400
Ava	\$259/device; app included
TempDrop	\$159/device; app included
Natural Cycles	\$89.99/year; \$9.99/month

19: “Verto Index: Health & Fitness Apps,” Verto Analytics, Connie Hwong, July 19, 2018

Sleep medicine alternatives: In April 2019, the FDA announced that commonly used over-the-counter sleeping pills must include a box warning to alert patients to serious or life-threatening risks associated with usage. We believe this could drive consumers to opt for non-prescription alternatives such as sleep trackers and coaches. For example, **Dreem**, which raised \$35 million in June 2018, manufactures a headband that analyzes sleep stages and uses AI to provide personalized metrics and tips to improve sleep.











Fitness trackers: Fitness trackers include third-party apps that run on any device as well as proprietary fitness devices. Of the top 10 fitness apps as ranked by Verto Analytics (see Figure 22),¹⁹ only **Fitbit** and **Garmin** Connect Mobile run on proprietary devices. The rest run on any device, such as a smartphone. The latter approach can reduce hardware development and ongoing manufacturing costs but increases the risk of connectivity glitches. Startups in the space include **Lose It**, which tracks calorie consumption, food intake, exercise habits and weight. **Fiit**, which raised a \$9 million Series A in February 2019, tracks workouts instead of daily activity. Its device tracks heart rate, repetitions and calories, and it provides personalized training plans, on-demand workouts and leadership boards. Incumbents remain competitive, for example, **Fitbit** recently launched subscription offerings and a connected health platform for health plans and employers.

Flexible fitness applications: “Flexible fitness,” or non-committal fitness subscriptions, represents a fast-growing trend that taps into the shifting preferences of consumers. These applications are modernizing how gyms and fitness studios are used. **Flexit** allows consumers to use in-network gyms at per-minute rates. **ClassPass** gives members the ability to attend workout classes at reduced rates without having to become a member.



MOBILE & DIGITAL HEALTH











Figure 23.
Top health & fitness apps for May 2018 by monthly average users

APP	MONTHLY AVERAGE USERS (M)	STICKINESS
 fitbit	27.4	36%
 myfitnesspal	19.1	22%
 SAMSUNG Health	14.9	22%
 WW	3.7	27%
 Google Fit	2.6	17%
 verto	1.9	21%
 GARMIN. connect mobile	1.7	20%
 Sleep Cycle	1.4	31%
 NRC	1.4	26%
 WALK	1.4	32%

Source: **Verto Analytics**

Note: Stickiness represents average daily users (#) divided by monthly users (#). Users tracked are US adults aged 18 and above.

Figure 24.
Top health & fitness apps in the US for June 2019 by overall downloads

Source: **SensorTower**



MOBILE & DIGITAL HEALTH

Advertising and content creation models: The growth of digital fitness and nutrition applications has created an opportunity for influencers and content creators to leverage these distribution channels. **Octoly** is an influencer marketing platform that lets digital creators receive free products in exchange for publishing reviews on social media, helping brands directly market via influencer channels.

Corporate-sponsored health & wellness benefits: Several startups offer corporate plans that generally provide lower per-user prices. **Calm** offers a 15% discount on bulk purchases of five or more yearly subscriptions (regularly \$59.99 a year). **Headspace** offers starter, premium and enterprise versions, which offer additional resources such as custom virtual events and scientific study partnership opportunities. **Noom** advertises that pricing for its personalized nutrition and exercise app is tied to outcomes, charging only if members participate in the program and experience results.

Senior-focused healthcare apps: According to the UN, the global population aged 60 and over is expected to double to nearly 2.1 billion by 2050.²⁰ This is expected to add significant stress to the healthcare system, driving strong demand for scalable care solutions. Apps catering to seniors with existing conditions or who may not be digital-native represent a compelling growth opportunity. Startups focused on this market include **CareMessage**, **HomeTeam** and **CarePredict**.

Monitoring noncommunicable diseases (NCDs): Environmental and inherited NCDs such as cancer, heart disease and diabetes are prevalent in wealthy countries and are on the rise in developing countries. Exposure to the primary risk factors for these diseases (i.e. tobacco and alcohol use, obesity, poor diet and inactivity) are prime candidates for

digital monitoring. **Zyhealth**'s smart medical ecosystem (device and application) provides customized disease management and professional services for patients with diabetes and related diseases. **Pivot**'s suite of products (application, nicotine patch, carbon monoxide breath sensor, remote coaching, etc.) aims to help individuals quit smoking.

Considerations

Data accuracy and fraudulent science: Startups have a history of bad science. **Theranos** is the poster child for fraud having raised money based on incorrect claims about its capabilities. While government agencies such as the FDA and the FTC are closely watching for fraud, it is not always clear to outsiders if a company—especially a startup with little to no track record—can really do what it claims.

On-demand workout providers face strong competition: On-demand workout providers face competition from a myriad of mobile applications, online platforms and websites. Many of these sources provide workouts free of charge (e.g. YouTube) or as a free bonus (e.g. Amazon Prime). Additionally, the low cost to enter the market has led to a crowded marketplace of providers. During the first quarter of 2019, there were over 37,000 health and fitness applications available on the Google Play store.

Minimal evidence proving effectiveness of digital mental health apps: A recent analysis of 73 top-rated mental health apps found that while 64% of apps claimed effectiveness at diagnosing mental health conditions and symptoms and improving mood or self-management, only one provider published literature as evidence for consumers.²¹ While

20: "2017 World Population Ageing," United Nations, 2017

21: "Using Science to Sell Apps: Evaluation of Mental Health App Store Quality Claims," npj Digital Medicine, Mark Erik Larsen, Kit Huckvale, Jennifer Nicholas, John Torous, Louise Birrell, Emily Li, and Bill Reda, Volume 2, Article 18, March 22, 2019



MOBILE & DIGITAL HEALTH

providers with clinical evidence supporting their products have clear competitive advantages, conducting such studies is costly and risks proving the app ineffective.

Mental health application consumer retention rate: A meta-analysis of clinical trials of smartphone apps intended to diagnose depressive symptoms showed drop-out rates approaching 50%.²² High dropout rates reduce business performance and may dissuade insurance providers from covering digital therapeutics aimed at improving mental health.

Outlook

Personalization and convenience will drive consumer demand for fitness and wellness

innovation: Biometric sensors, genetic testing and other data-collection technologies will help drive customized health and fitness products. For example, digital health startups **iamYiam** and **FitnessGenes** use genetic data to create custom workout and nutrition plans that best match genetic and lifestyle factors. We expect to see more investment in personalized health services that could prove more effective than one-size-fits-all products.

Increased data sharing among providers: While sharing health data has been fraught with privacy concerns and regulatory limitations, we expect consumers and regulators to grow more comfortable with the practice. Innovative privacy technologies can help ensure security, while health events such as COVID-19 underscore the importance of widespread data availability.

Workout providers will offer fitness gamification through VR and AR: VR and AR have contributed to the growth of “fitness gamification,” which motivates consumers to exercise by creating fun, immersive fitness experiences. As VR technology advances rapidly, the

“immersive fitness” space is expected to expand. With only a few startups focused on this space (e.g. **FitXR**), we expect increased attention from current on-demand fitness providers as the technology improves.

Consolidation of fertility-tracking application market: There are over 30 different types of multiphasic birth control pills. While each pill is slightly different and may affect one’s body in various ways, fertility-tracking applications are side-effect free, which may make the industry easier to consolidate. **Natural Cycles** has first-mover advantage in terms of gaining FDA approval; however, providers such as **Mira** that integrate devices and simplify use may also be well positioned to gain share.

Corporate wellness programs to become critical distribution channel: We believe the corporate channel could prove to be a more effective distribution approach relative to consumer direct. While corporate distribution involves longer selling cycles, usage could be stickier, and customer acquisition costs are likely lower on a per-user basis. Corporate sales could also offer unique partnership or product-development opportunities. **Headspace**, **ClassPass** and **Calm** are each developing corporate-focused products. Many corporations have begun providing **Calm** subscriptions to their employees free of charge. **Headspace** specifically targets corporations and offers a starter, premium and enterprise version.

AI integration via chat bots to become more prominent: AI has the potential to enable unique solutions in the digital health industry. For example, chat bot nutritionists can provide personalized recommendations based on health and exercise habits. AI could also open the door for chat bots and robots to provide emotional and mental support tools with broad applicability across both consumer and corporate channels. Startups focused on AI-based solutions include **Woebot**, Forksy AI and **Virtual Sports**.

22: “Dropout Rates in Clinical Trials of Smartphone Apps for Depressive Symptoms: A Systematic Review and Meta-Analysis,” Journal of Affective Disorders, Jon Torous, Jessica Lipschitz, Michelle Ng and Joseph Firth, December 2019

SEGMENT DEEP DIVE

Biometric wearables & devices



BIOMETRIC WEARABLES & DEVICES

Overview

Startups in this space integrate biometric technology into both wearable and non-wearable devices that can monitor and/or improve user health. The current segments within this category include:

Biometric monitoring wearables: Hardware worn by users that continuously monitors a multitude of data points (e.g. biometric indicators, physical activity, location) or performs a specific function (e.g. improve circulation). Wearables gained mainstream popularity in the mid-2000s with the launch of **Fitbit** and other fitness trackers. Since then, wearable technology has evolved to measure more sophisticated health & wellness indicators such as heart rate, fertility, blood sugar and more.

Smart fitness devices: Adaptive exercise equipment designed to enable a customized workout by dynamically adjusting to the user and/or providing tracking information.

Business model

Biometric wearables & devices startups primarily sell products and services to healthcare providers and payers (through a B2B2C model) or D2C. Both hardware and software could be sold through a one-time purchase or through a SaaS subscription model.





BIOMETRIC WEARABLES & DEVICES

Market size

The biometric wearable & device technology market is expected to grow at a CAGR of 16.8% from \$22.8 billion in 2019 to \$70.9 billion in 2024. Biometric monitoring wearables represent most of the market, growing at a rate of 15.8%, while the smart fitness devices market is expected to grow at a rate of 24%.

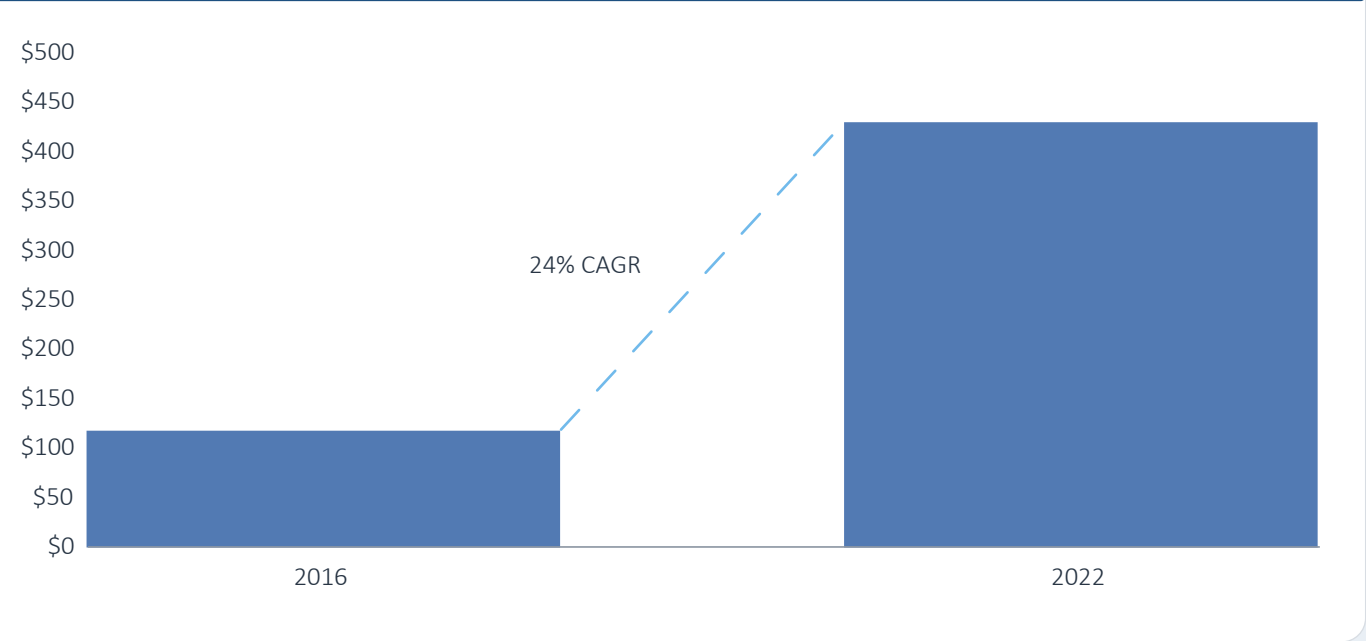
Industry drivers

COVID-19 driving more at-home workouts: Gym closures have driven demand for at-home workout equipment. Innovative providers, including Peloton, have experienced a surge in demand. In addition, several workout applications, such as **Down Dog**, are offering free trials in an effort to capitalize on the situation and attract new users. As consumers get used to at-home workouts and fear of infection lingers, a full return to gym exercise may not occur for several months or years.

Smart sensor innovation and IoT: Sensor technology continues to advance, enabling the widespread use of low-cost sensors with reduced power and hardware requirements. The expansion of connected devices and IoT permits real-time progress measurement and continual updating. For example, heart rate monitors were once single-purpose devices that were strapped to one’s body. Today, they can be embedded in smart wearables that continually transmit data to the cloud. Biometric sensors in earbuds and posture monitoring tT-shirts represent examples of ongoing innovation.

Insurers using data to encourage healthy lifestyles. As more insurers build policies based on customer data, this will drive more demand for data-capturing devices. For example, John Hancock, one of the nation’s largest life insurers, announced that it will stop

Figure 25. BIOMETRIC WEARABLES & DEVICES MARKET SIZE (\$B)



Source: PitchBook estimates | Geography: Global

COMMON INDUSTRY KPIS

- | | |
|--|--|
| Revenue growth | |
| <ul style="list-style-type: none">• Customer acquisition cost• Volume: Size of dataset per customer (e.g. 5GB)• Variety: Number of data sources• Velocity: Data volume analyze/generated per period | <ul style="list-style-type: none">• Gross profit margin• Per unit manufacture cost• COGS/unit sales• Lifetime value of customer• Customer retention/renewal rate |



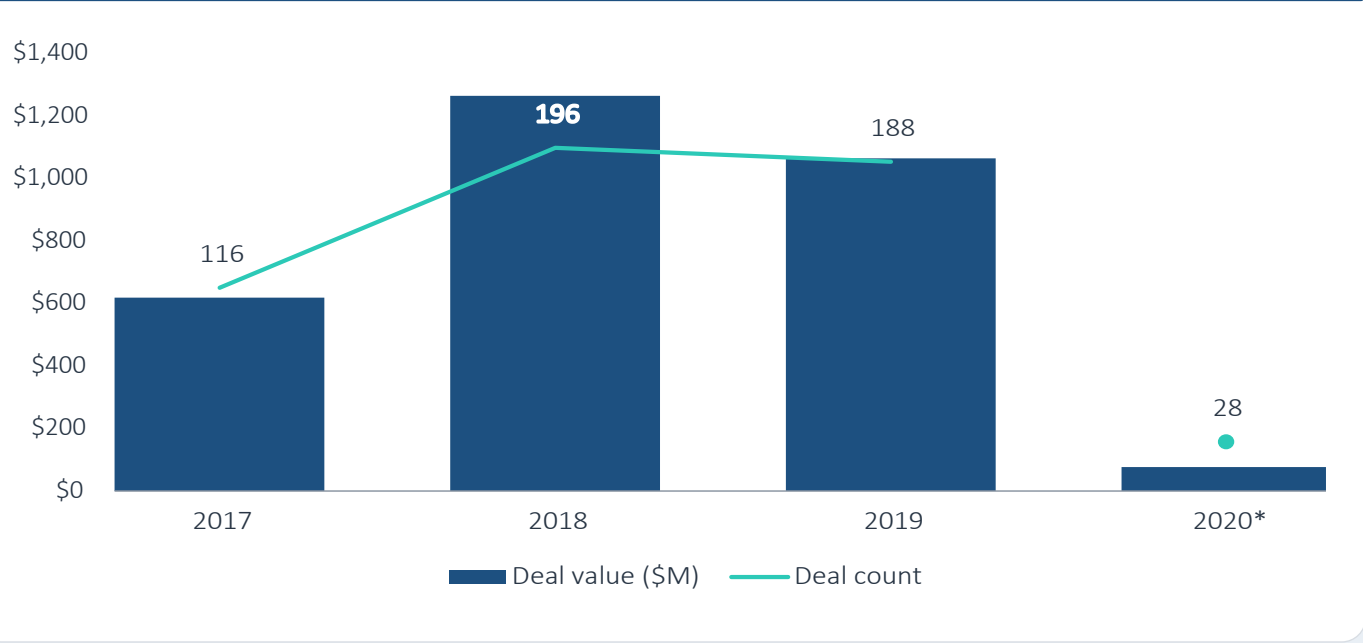
BIOMETRIC WEARABLES & DEVICES

underwriting traditional life insurance and instead sell only interactive policies that track fitness and health data through wearable devices and smartphones.

VC activity

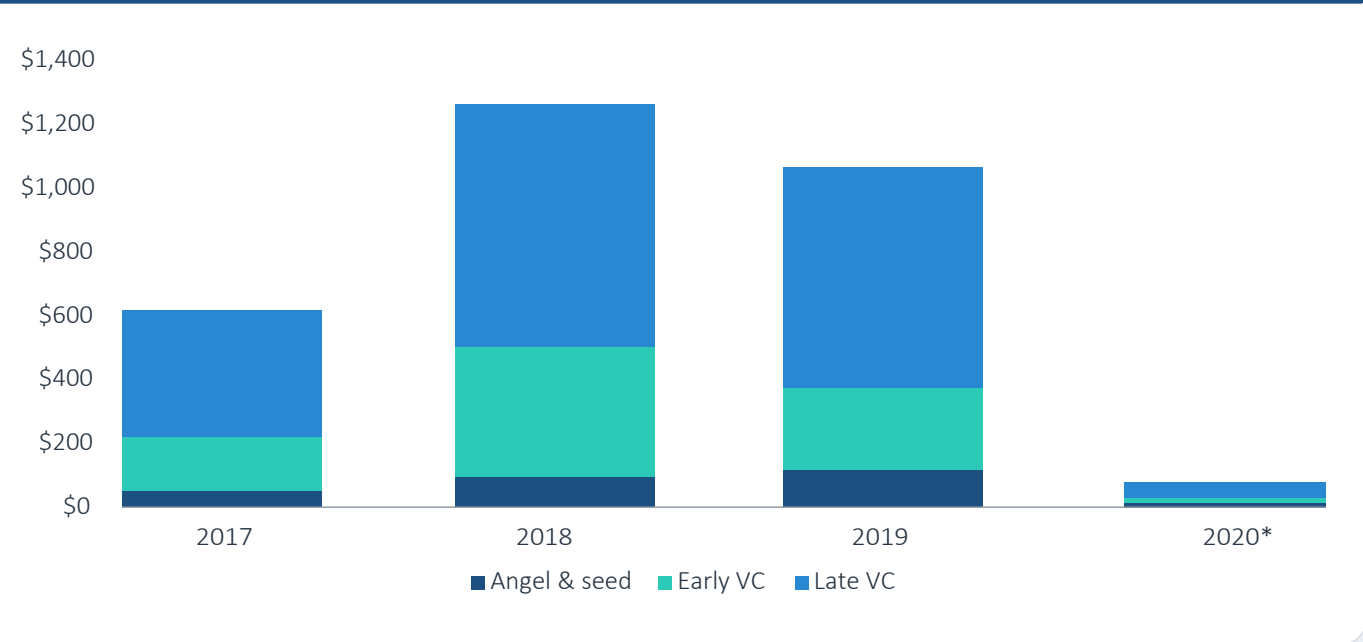
Companies tracked in this segment raised roughly \$80 million in venture funding in the first quarter of 2020, down from \$280 million in Q1 2019. We have experienced a shift away from late-stage deals and toward early-stage and angel & seed deals in recent years. In Q1 2020, **Oura**'s \$28 million Series B was the largest deal. **Oura** developed a wellness ring that tracks sleep quality, stages, ECG-level resting heart rate, body temperature and variability. Users can gain daily insights and view recorded data through their app. We also saw two acquisitions and one LBO in the quarter—a relatively high number considering only five exits occurred in the entirety of 2019.

Figure 26. BIOMETRIC WEARABLES & DEVICES VC DEAL ACTIVITY



Source: PitchBook | Geography: Global
*As of March 31, 2020

Figure 27. BIOMETRIC WEARABLES & DEVICES VC DEALS (\$M) BY STAGE

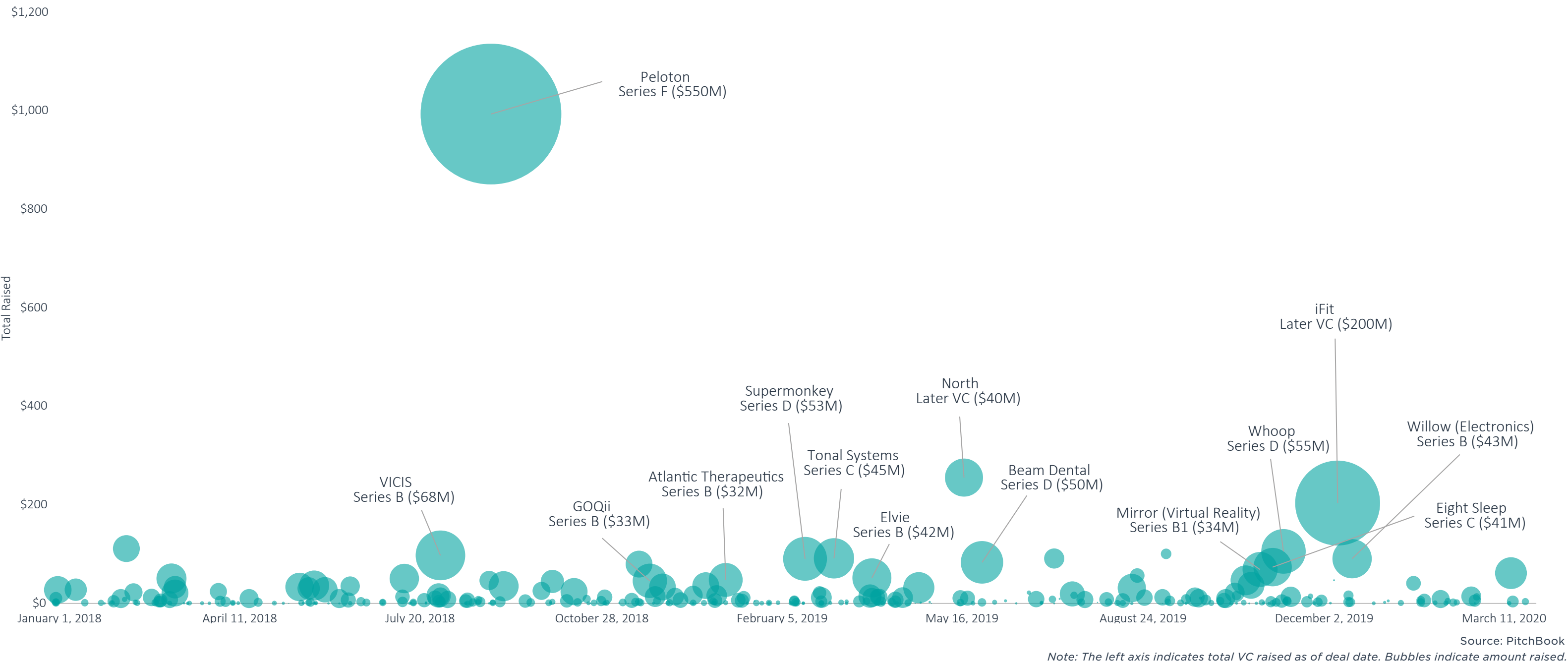


Source: PitchBook | Geography: Global
*As of March 31, 2020



BIOMETRIC WEARABLES & DEVICES

Figure 28.
Current biometric wearables & devices VC landscape (\$M)





BIOMETRIC WEARABLES & DEVICES

Figure 29.
Notable biometric wearables & devices VC deals

COMPANY NAME	CLOSE DATE	SUBSEGMENT	DEAL SIZE (\$M)	DEAL TYPE	LEAD INVESTOR(S)	VALUATION STEP-UP
 OURA	March 17, 2020	Biometric monitoring wearables	\$28	Series B	N/A	N/A
 tended	February 14, 2020	Biometric monitoring wearables	\$2	Seed	N/A	N/A
 NURVV RUN	February 7, 2020	Biometric monitoring wearables	\$9	Series A	Hiro Capital	N/A
 VALENCCELL	January 23, 2020	Biometric monitoring wearables	\$6	Series F	Halma	1.45x
 TATCH	February 26, 2020	Biometric monitoring wearables	\$4	Seed	N/A	N/A

Source: PitchBook

Figure 30.
Notable biometric wearables & devices VC exits

COMPANY NAME	CLOSE DATE	SUBSEGMENT	EXIT SIZE (\$M)	EXIT TYPE	ACQUIRER OR TICKER	VALUATION STEP-UP
 wellinks	January 15, 2020	Biometric wearables	N/A	M&A	Convexity Scientific	N/A
 hug	February 11, 2020	Biometric wearables	N/A	M&A	Titan	N/A
 PELOTON	September 26, 2019	Smart fitness device	\$6,942	IPO	NASDAQ	1.67x

Source: PitchBook



BIOMETRIC WEARABLES & DEVICES

Figure 31.
Key VC-backed biometric wearables & devices companies

COMPANY	VC RAISED TO DATE (\$M)	SUBSEGMENT	KEY PRODUCTS	PRODUCT DIFFERENTIATION
	\$92	Monitoring	At-home adaptive fitness training machine	All-in-one fitness system and virtual personal trainer
	\$46	Monitoring	Fitness tracking watch	Watch able to monitor ECG and blood pressure
	\$91	Smart fitness	Adaptive strength training equipment, software-based training system	Holistic fitness software integrate smart equipment, fitness tools, wearables, gadgets and apps via its open cloud platform
	\$106	Monitoring	Fitness tracker	Subscription-membership-based, provides sleep and fitness analytics
	\$91	Monitoring	Wearable breast pump	Spill-proof, in-bra breast pump

Source: PitchBook



BIOMETRIC WEARABLES & DEVICES

Figure 32.
Key biometric wearables & devices incumbents

COMPANY	HOLDING STATUS	SUBSEGMENT	ENTERPRISE VALUE (\$M)	KEY PRODUCTS
	Public	Biometric wearables	\$42,924	Sleep monitoring headband
	Public	Biometric wearables/smart device	\$28,536	Baby monitors
	Public	Blometric wearables	\$13,651	GPS technology, wearables
	Public	Smart device	\$9,683	Smart bike, live and on-demand classes
	Public	Biometric wearables	\$1,401	Wearable activity trackers

Source: PitchBook



BIOMETRIC WEARABLES & DEVICES

Opportunities

Biometric wearables: We see ample growth opportunity for the biometric wearable industry. However, we expect smart headphones and intelligent apparel to experience the largest CAGR over the coming years. This will drive demand for biometric sensor providers.

Smart headphones: The smart headphone market is expected to experience the fastest growth over the near term, as consumers seek products with improved audio quality and features. For example, **Valencell** recently developed a blood-pressure monitoring technology that can be implemented into in-ear headphones.

Intelligent apparel: Connected apparel consists of implementing IoT technology into clothing to embed performance tracking features. **Clim8** develops intelligent wearable technology designed to regulate body temperature, while **Sensoria** offers body-sensing apparel designed to track running technique and monitor heart rate. We expect athletic retail incumbents will also drive innovation in intelligent apparel. For example, **Nike’s** HYPERADAPT smart sneaker, which is priced at \$350 retail, can self-tighten and track physical activity.

Biometric sensor providers: Most wearable device suppliers purchase biometric sensor technology and hardware from third parties. Startup **Valencell’s** technology measures biometric and physiological data in real time and can be integrated with any wearable device. As technology improves, singular devices will be able to monitor myriad biometrics such as blood pressure, heart rate, velocity and others. For this reason, we believe companies that manufacture devices that track only one biometric will find it harder to succeed on their own, though these companies may be attractive acquisition targets.

Connected fitness products with subscription business models: Traditional workout equipment, such as treadmills, weights and ellipticals, has an average lifespan of seven to twelve years, which puts pressure on manufacturers to generate recurring revenue after selling their core product. Connected fitness products with paid subscriptions, such as Peloton, have emerged as potentially successful alternatives to the one-time sales model. Startups pursuing similar models include Hydrow, a row machine; Tonal, a full-body workout device; and Mirror, an instructor-led cardio device.

Baby-monitoring devices: The interactive baby monitor market is expected to grow 13%, with cordless devices representing more than three-fourths of the market in 2018.²³ In addition to monitoring capabilities, these products provide platforms for content delivery related to parenting and childcare. **Nanit**, a revenue-generating early stage startup, develops AI-based baby-monitoring devices created to track sleep behavior and patterns.

Figure 33.
Select connected fitness products with subscription business models

COMPANY	DEVICE FEE	SUBSCRIPTION FEE (MONTHLY)
Hydrow	\$2,300	\$38
Tonal	\$2,995	\$49
Mirror	\$1,496	\$39

23: Interactive Baby Monitor Market - Global Outlook and Forecast 2019-2024, Arizton, July 2019



BIOMETRIC WEARABLES & DEVICES

Nanit's cameras can track temperature and bedtime and sleep disturbances, as well as provide parents with sleep pattern data and sleep coaching advice.

Automatic ingestion monitors (AIM): Researchers are working to create devices that may help eating habits. The University of Alabama developed an AIM that attaches to a user's eyeglasses and monitors what kinds of foods are eaten, how much, how often and how fast. **HEALBE**, a PE-backed company, currently offers a wrist band that tracks calorie intake, body hydration, sleep level, stress level, heart rate, steps and distance. While accuracy levels of early beta models remain low, the market for such devices could be significant among consumers, doctors and researchers.

Fitness devices for athletes: The fitness-device market can be segmented by use cases including sports, medical treatment and diagnostics, with applications that track heart rate, measure sleep or glucose levels and track sporting activities. Sport-focused devices aimed at reducing injuries and/or enhancing workouts dominate the wearables market as athletes are the most driven toward performance-enhancing products. VICIS raised \$3 million in VC funding in September 2019 to develop headgear designed to minimize the impact of sports-related head injuries. **Diamond Kinetics** provides a Bluetooth-powered sensor to help baseball players improve performance.

Considerations

Baby-monitoring products may not work and could endanger babies: The FDA has not cleared or approved any baby technologies or products as being able to prevent or reduce the risk of sudden infant death syndrome. However, according to the FDA, some

retail baby products have been marketed with false claims that they do. Companies that use false and deceptive marketing claims may face fines and class action lawsuits. In April 2019, **Owlet** Smart Sock baby monitors became the subject of a proposed class-action lawsuit alleging the devices do not monitor babies' heart rates and oxygen levels as promised and can burn infants' feet even when used properly. An article published in the Journal of the American Medical Association in January 2019 noted, "There is no evidence that consumer infant physiologic monitors are life-saving, and there is potential harm if parents choose to use them."²⁴ Furthermore, many researchers advise against placing any wireless device on or near infants due to the potential risks of EMF radiation, which include, but are not limited to, autism, speech disorders and asthma.²⁵ Wired devices also pose a risk as babies could become entangled in the wires.

Recession will shake out lesser capitalized startups: While the pandemic has accelerated demand for at-home fitness products and services, a prolonged recession is likely to drive decreased demand over time for more discretionary goods. Providers that manufacture hardware and that have low margins will struggle to survive the downturn, especially if they are overdue to raise an additional round of capital.

Temporary nature of baby device customer base: One of the complications of providing services that cater to childbirth is that most parents only need the service for a short period of time, and parents who have multiple children can often reuse technology from their first born. This reduces customer retention rate and lifetime value. While providers can expand their products to offer ongoing services targeted at different phases of a child's growth, the temporal nature of the customer base puts more emphasis on

²⁴: Smartphone-Integrated Infant Physiologic Monitors," Journal of the American Medical Association, Volume 317, Issue 4, Christopher P. Bonafide, David T. Jamison, Elizabeth E. Foglia, January 24, 2018

²⁵: "Safe Wireless Baby Monitors? 2019 Review for EMF Radiation," Tech Wellness, August Brice, n.d.



BIOMETRIC WEARABLES & DEVICES

discrete transactions as opposed to long-term subscriptions. Furthermore, with the rise of “recommerce,” it is becoming easier and “trendier” to buy second-hand goods such as baby monitors.

Home equipment requires adequate space and large upfront expenditure: Obstacles such as price and space restrictions are likely to limit the size of the market.

Music licensing fees and lawsuits: Gyms and workout video providers must ensure they have proper rights to play music or to synchronize it during classes. **Peloton** was sued by the National Music Publishers Association (NMPA) in 2019 for failing to obtain a synchronization license (where music is synced to the video) to use certain music in their exercise videos. The company was fined \$300 million and faced considerable disruption as they changed the music played during classes to minimize costs. Workout providers that allow users to select their music, such as Freeletics, do not have to acquire synchronization rights.

Retention and “fad” risk: Fitness is a historically faddish consumer product with significant customer retention headwinds. The Association of Fitness Studios cites a 75.9% customer retention rate at fitness studios (i.e. boutiques),²⁶ while the International Health, Racquet & Sportsclub Association cites a 71.4% retention rate at its traditional health studios (i.e. gyms). High price-variability among products also adds risk that customers may select cheaper alternatives. For example, **Concept2**’s Model D model Indoor rower (\$900) is priced \$1,400 below the **Hydrow** indoor rower.

Consumer neurotechnology lacks scientific support and regulatory oversight: Many neurotechnology devices are categorized as “low-risk” and fall outside of FDA jurisdiction,

which provides an easy path to market and amplifies investor interest. However, we believe lack of FDA oversight and insufficient scientific conclusions may keep consumers on the sidelines until the benefits of these products are better understood.

Outlook

New incentive and partnership programs will focus on “closed-loop” fitness products:

We believe devices that track numerous data points (e.g. nutrition, cardio, strength, sleep, menstrual cycle) and that can use this data to provide personalized workout and nutrition advice will win market share relative to devices and applications that provide only data or content. **Apple** recently announced a new Apple Watch Connected partnership program to incentivize use of the Apple Watch. Their “Earn with Watch” incentive program aims to “close the loop” by providing monetary rewards for reaching personalized goals curated through watch-collected data. **Orangetheory** users receive gift cards for hitting specific goals.

Employer/insurer partnership programs will integrate wellness incentives: Wearables, health applications and other data sources will increasingly be used in partnership with insurance companies to help employers incentivize healthy behavior (e.g. stand up every hour and reduce your insurance premium). **Kazoo**, an employee engagement platform, features a behavior bonus feature that integrates wellness incentives with other employee engagement activities and awards points redeemable for prizes. **Garmin** recently partnered with Blue365, a health & wellness program available to Blue Cross Blue Shield subscribers, to provide **Garmin** devices at up to a 35% discount.

²⁶: 2019 Fitness Studio Operating and Financial Benchmarking Report, Association of Fitness Studios, 2019



BIOMETRIC WEARABLES & DEVICES

Sleep technology will focus on decreasing quantity of sleep needed: Some sleep experts predict that within 20 years, sleep technology developers will create devices and chemicals that can reduce the amount of sleep needed. This technology could include chips implanted in the brain capable of providing stimulation or introducing chemicals that can increase metabolism or alter regular body chemistry.

Motion detector sensors will enable full-body health and movement tracking: Motion sensing and intelligent vision technology will permit more accurate workout feedback (e.g. form, calories burned). **Naked**'s smart mirror scans bodies in 3D to provide data regarding body fat, weight, lean mass, etc. but does not have the ability to track movements.

Mirror's at-home fitness device provides feedback based off the user's heart rate. We expect this technology to improve to the point that it can compete with personal trainers.

SEGMENT DEEP DIVE

Dietary supplements



DIETARY SUPPLEMENTS

Overview

Consumer health products are intended to support the immune system and enable individuals to enhance fitness performance, improve cognitive functions and maintain or achieve a healthy weight. Products in this space include multivitamins, sports nutrition products, herbal supplements and other medicinal goods that can be purchased over the counter. In our analysis, we do not include the sale of natural and organic food products, granola bars, beauty and personal care products, which are often sold alongside dietary supplements.

Vitamins & supplements: In addition to vitamins, dietary supplements can contain minerals, herbs or other botanicals, amino acids, enzymes and many other ingredients. Dietary supplements come in a variety of forms, including tablets, capsules and gummies. This segment includes all providers of dietary supplements that do not focus primarily on athletes.

Sports supplements: This segment includes nutritional products developed primarily for athletes and bodybuilders to improve their overall health, performance and muscle growth. Major categories in this segment include protein and weight gain powders, sport drinks and pre- and post-workout supplements to either lend energy before exercise or enhance recovery after. Sports supplements products are offered in many forms such as powders, tablets, capsules, soft gels and liquids.

Business model

Startups in this space either manufacture unfinished products that are used to increase the nutritional value of other foods or produce finished products which are then sold to third-party marketplaces or D2C. Revenues are acquired through subscription-based memberships and direct one-time sales.





DIETARY SUPPLEMENTS

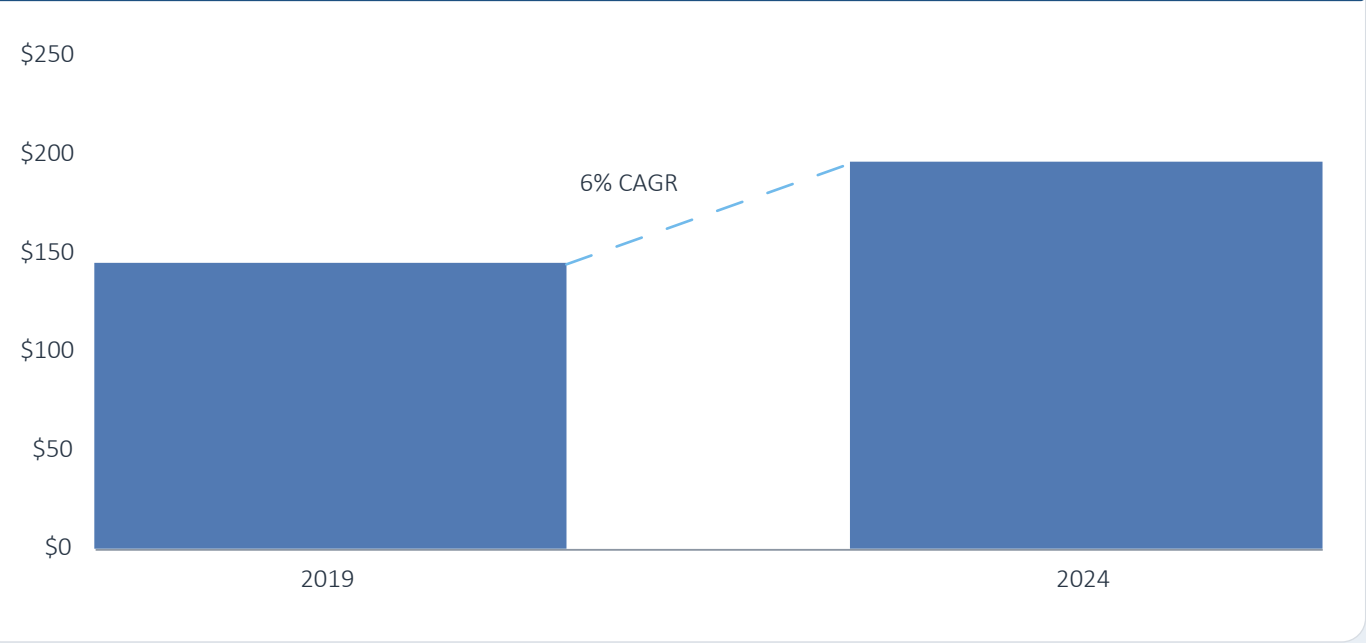
Market size

The global mobile health market is estimated to grow from \$135.3 billion in 2019 at 6% CAGR to reach \$186.8 billion by 2024. This segment is expected to experience the slowest growth rate compared to the other four segments within the retail health & wellness tech industry.

China expected to drive supplement market growth: We expect China to drive about 30% of the growth in the supplement market.²⁷ The US and Canada are expected to grow at a smaller rate but drive a similar amount of the total growth, 25.8%, due to their larger starting market size.

27: Estimates based on “Jefferies Fitness and Wellness Summit” presentation, GNC, September 12, 2019

Figure 34. DIETARY SUPPLEMENTS MARKET SIZE (\$B)



Source: PitchBook estimates | Geography: Global

COMMON INDUSTRY KPIS

- | | |
|--|---|
| <ul style="list-style-type: none">• Churn—revenue & client• Customer acquisition costs (CAC) & CAC/ lifetime value• Return on research capital (RORC)• Ecommerce conversion rate<ul style="list-style-type: none">• Average order value (AOV)• Customer lifetime value (LTV)• Gross merchandise volume (GMV)• Monthly active users (MAU) | <ul style="list-style-type: none">• Churn—revenue & client• Gross merchandise volume (GMV)• Payback period/sales efficiency• CAC recovery time (months to recover CAC)• Upsell potential (ARPU)<ul style="list-style-type: none">• Food cost percentage |
|--|---|



DIETARY SUPPLEMENTS

Figure 35.
Dietary supplements market size (\$B) by region

COMPANY/ TREATMENT	SUPPLEMENT MARKET 2018	2018-2023 CAGR (%)	2024
US & Canada	\$46	5%	\$61
China	\$25	9%	\$42
Europe	\$22	6%	\$31
Japan	\$12	2%	\$13
Latin America	\$7	8%	\$11
Other APAC	\$23	7%	\$34
Middle East & Africa	\$2	11%	\$4
Total	\$137	6%	\$196

Source: GNC’s Jefferies Fitness and Wellness Summit presentation
*As of September 12, 2019

Industry drivers

Rising interest in nutrition as a means to improve health: Increases in chronic illnesses coupled with rising healthcare expenses, particularly pharmaceutical drug prices, is stimulating demand for dietary supplements to help prevent or alleviate common health complications. According to a 2019 poll sponsored by the Council for Responsible Nutrition, 71% of dietary supplement users exercise regularly, 86% try to eat a balanced diet and 80% visit the doctors regularly.²⁸

Technology-driven supplement research: Vitamins and supplement manufacturers rely on technology to discover new ways to extract nutrients from natural ingredients and create new synergistic combinations.

Internet and ecommerce advent: Digital commerce has created multiple sales channels for providers relative to traditional methods. These channels increase the opportunity for providers to develop targeted marketing and content campaigns along with personalized offerings that appeal directly to consumers as opposed to selling through traditional nutritionist or doctor channels.

Growing sports participation: As more people exercise and play sports, demand for sports nutritionals and meal replacements is expected to increase.

Rapid pace of urbanization: Urbanization fuels the demand for sports nutrition products globally. It is characterized by change in lifestyle, the growing pool of working women, and heightened consumption of ready-made and fast food. These factors result in increased consumption of junk foods that may lead to health disorders, such as obesity,

28: 2019 CRN Consumer Survey on Dietary Supplements, Council for Responsible Nutrition, 2019



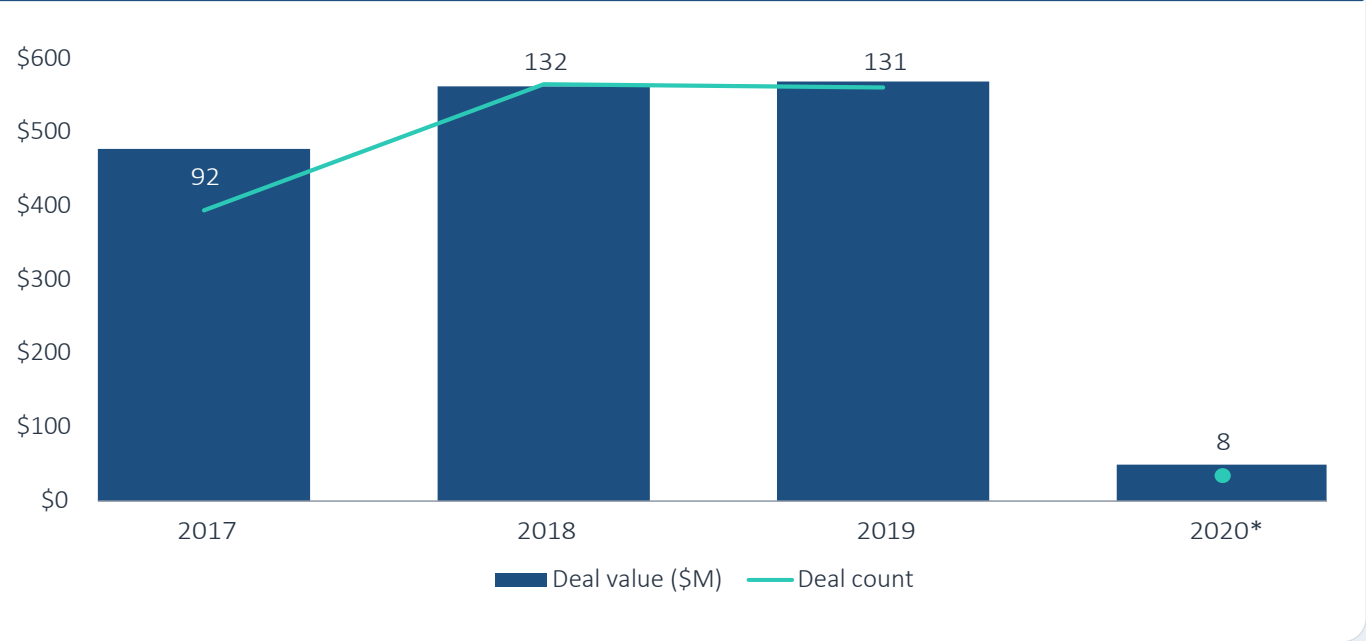
DIETARY SUPPLEMENTS

which compels some individuals to turn to supplements. At the same time, these factors also lead to increased health awareness, which drives the market.

VC activity

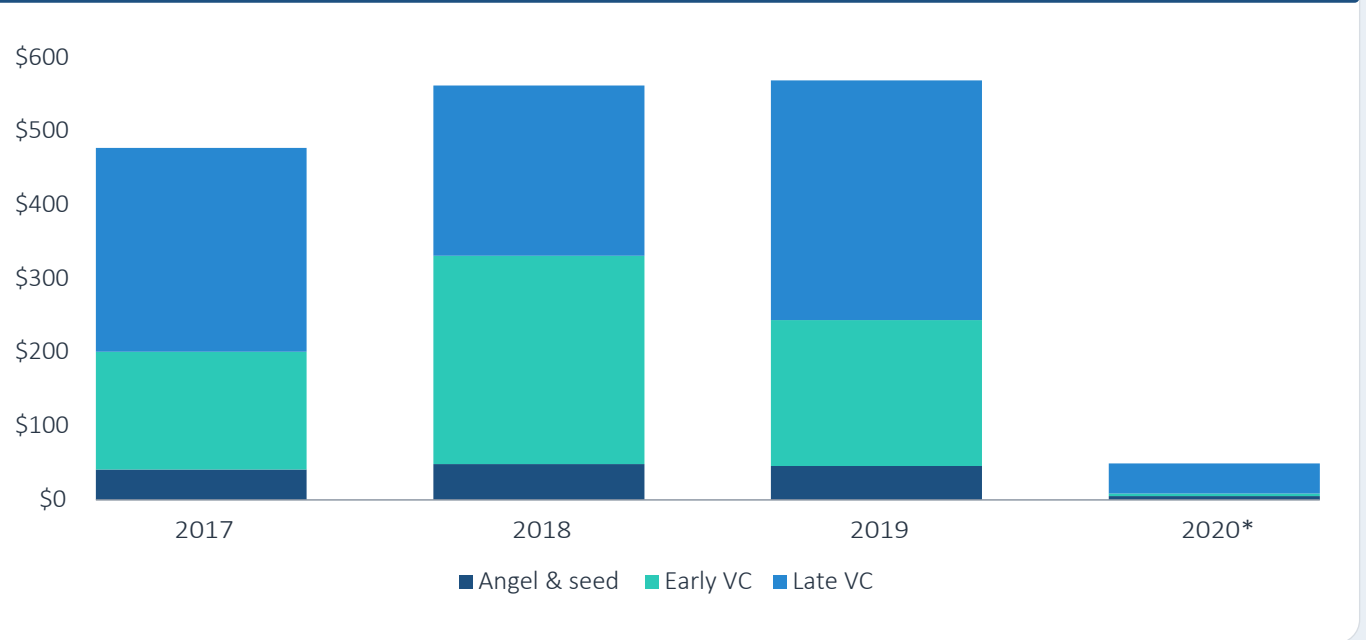
Companies tracked in this segment raised roughly \$50 million in venture funding in the first quarter of 2020, down from \$150 million in Q1 2019. Just eight deals closed in Q1 2020: one at the late stage, three at the early stage and four at the angel & seed stage. **Care/of**, the late-stage deal, brought in \$40 million while the rest of the deals to close in the quarter were each under \$4 million. **Care/of**'s online platform enables users to develop a personalized supplement plan and order recommended supplements through a monthly subscription plan. Its mobile application enables users to track their supplements, learn how they work and receive new recommendations as their health changes.

Figure 36. DIETARY SUPPLEMENTS VC DEAL ACTIVITY



Source: PitchBook | Geography: Global
*As of March 31, 2020

Figure 37. DIETARY SUPPLEMENTS VC DEALS (\$M) BY STAGE

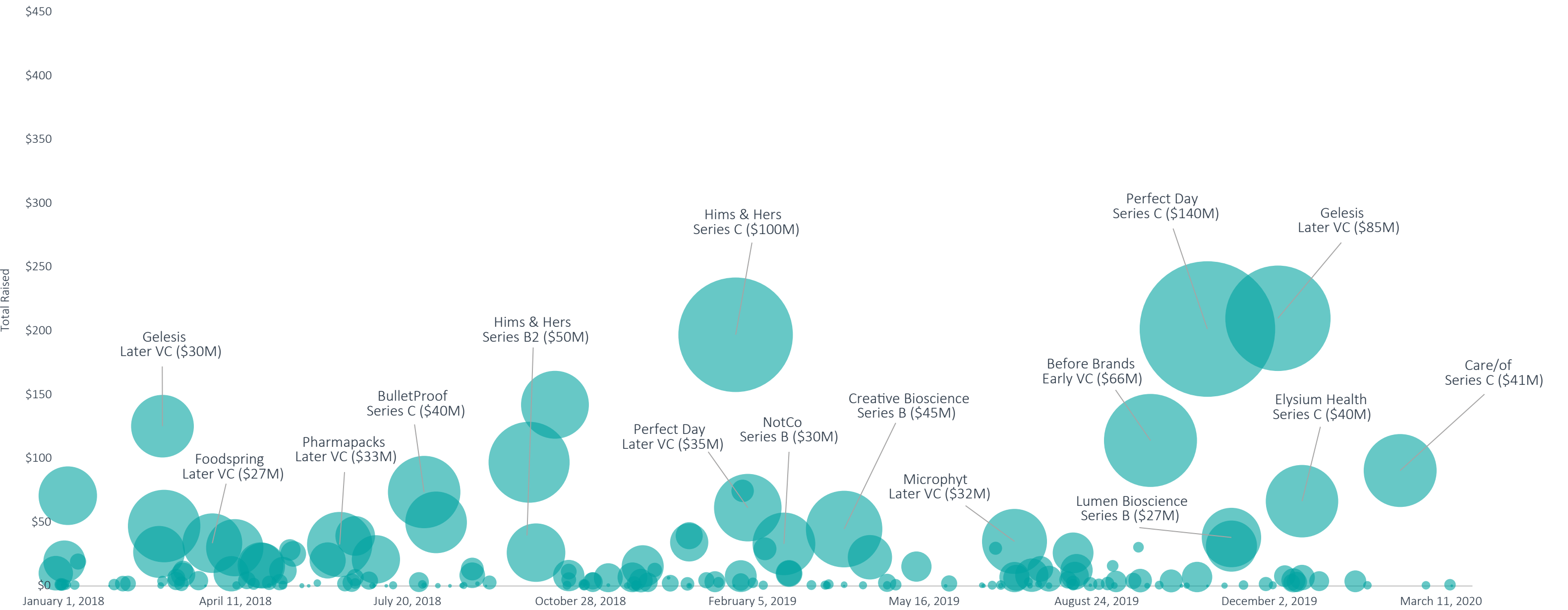


Source: PitchBook | Geography: Global
*As of March 31, 2020



DIETARY SUPPLEMENTS

Figure 38.
Current dietary supplements VC landscape (\$M)



Source: PitchBook
Note: The left axis indicates total VC raised as of deal date. Bubbles indicate amount raised.



DIETARY SUPPLEMENTS

Figure 39.
Notable dietary supplements VC deals

COMPANY NAME	CLOSE DATE	SUBSEGMENT	DEAL SIZE (\$M)	DEAL TYPE	LEAD INVESTOR(S)	VALUATION STEP-UP
 care/of	February 18, 2020	Vitamins & supplements	\$41	Series C	N/A	1.37x
 emerald health products	March 19, 2020	Vitamins & supplements	\$0.1	Angel	N/A	N/A
 POWER GUMMIES	January 15, 2020	Vitamins & supplements	N/A	Early-stage VC	DSG Consumer Partners	N/A

Source: PitchBook

Figure 40.
Notable dietary supplements VC exits

COMPANY NAME	CLOSE DATE	SUBSEGMENT	EXIT SIZE (\$M)	EXIT TYPE	ACQUIRER OR TICKER	VALUATION STEP-UP
 fitvia	June 6, 2019	Vitamins & supplements	N/A	M&A	Dermapharm	N/A
 CREMAR	August 22, 2019	Vitamins & supplements	N/A	IPO	Korea Stock Exchange	N/A
 foodspring	June 28, 2019	Sports supplements	N/A	M&A	Mars	N/A
 OmegaTri	April 5, 2019	Vitamins & supplements	N/A	M&A	golden omega s.a.	N/A

Source: PitchBook



DIETARY SUPPLEMENTS

Figure 41.
Key VC-backed dietary supplements companies


COMPANY	VC RAISED TO DATE (\$M)	SUBSEGMENT	KEY PRODUCTS	PRODUCT DIFFERENTIATION
	\$197	Vitamin & supplements	Vitamins, primary care and behavioral health teletherapy	Skin, sex, hair and well-being focused
	\$144	Sports supplements	Athlete-focused supplements	Patented formulas backed by science
	\$114	Vitamin & supplements	Food allergy prevention products	Products designed for children to decrease food allergy risk
	\$91	Vitamin & supplements	Personalized vitamin	Vitamins delivered to doorsteps; vitamin-tracking application
	\$75	Vitamin & supplements	Plant-based protein drinks, bars and powders	Uses minimally processed, sustainably sourced ingredients

Source: PitchBook



DIETARY SUPPLEMENTS

Figure 42.
Key dietary supplements incumbents

COMPANY	HOLDING STATUS	SUBSEGMENT	ENTERPRISE VALUE (\$M)
	Public	Sports supplements	\$1,444
	PE-backed	Vitamins & supplements	N/A
	Corporation	Vitamins & supplements	N/A
	Public	Vitamins & supplements	N/A

Source: PitchBook



DIETARY SUPPLEMENTS

Opportunities

Targeted supplements: While most established companies sell a range of supplements, early-stage startups often target specific niches. We see strong revenue, acquisition and fundraising opportunities for startups that specialize in providing the following types of supplements:

- **Pregnancy:** Ingredients such as folate, vitamin D3 and magnesium are widely used in prenatal supplements, an industry we expect to grow in the high single digits over the mid-term. VC-backed companies targeting this market include **Mumkind**, which provides nutraceutical food products intended to be used by pregnant women, and **Mommi**, which produces a protein shake enriched with prenatal nutrition.
- **Botanical:** Herbal supplements focused on the prevention of mental and physical illnesses have experienced increased demand. Consumers have come to view them as potentially safer alternatives to conventional medicines. **Feel Holdings** manufactures multivitamins using only natural ingredients such as turmeric and citrus bioflavonoids. The company sells monthly subscription packages.
- **Protein:** New research regarding protein's role in maintaining muscle mass and sustaining optimum nutrition levels has created a surge in demand for protein supplements among middle-aged adults in developed countries. Increased strength training among women has also increased protein-fortified food consumption. **Fitbody** produces and distributes protein supplements that target female sport enthusiasts.

- **Vegan:** Cardiovascular hazards associated with animal-based food products have raised concerns that could drive more investment in vegan protein alternatives. **Supernaturals** produces natural and vegan food supplements intended to cover the daily vitamin requirement of the human body. **Ladder** was founded in 2018 to provide 100% vegan nutritional food supplements that can be customized.
- **Elderly:** There are over 50 million Americans over the age of 65, representing about 16% of the total US population.²⁹ According to a survey conducted by the Council for Responsible Nutrition, 79% of adults over the age of 55 took dietary supplements on a regular basis, in contrast to a national average of 77% of consumers.³⁰

Breast milk providers: Researchers calculate that 800,000 formula-fed infants who die worldwide yearly could have been saved by breastfeeding.³¹ **Prolacta Bioscience** and **Medolac Laboratories** are working to provide breast milk to preterm babies.

Considerations

Faddish nature of industry drives volatility: Widely recognized media celebrities and influencers such as Dr. Oz, Deepak Chopra and Jillian Michaels can have a significant impact on vitamin and supplement sales via the products they promote. While we expect aggregate industry revenues will remain stable, single-product providers are likely to experience more volatility driven by the ebbs and flows of short-term consumer fads. They must also consider how to run an effective social strategy as they compete with influencers and other celebrities for consumers' attention.

29: "Age and Sex: American Community," U.S. Census Bureau, 2018 (accessed May 13, 2020)

30: 2019 CRN Consumer Survey on Dietary Supplements, Council for Responsible Nutrition, 2019

31: "Breastfeeding in the 21st Century: Epidemiology, Mechanisms, and Lifelong Effect," The Lancet, Vol. 387, Issue 10017, Cesar G. Victora, et. al., January 30, 2016



DIETARY SUPPLEMENTS

Increasing regulatory scrutiny: Between 2004 and 2012, over 50% of all Class 1 recalls by the FDA were dietary supplements.³² Sexual enhancement, bodybuilding and weight loss products were the top three problem categories. As a result, there has been a noted increase in FDA enforcement actions pertaining to violations in labeling food and dietary supplements. There has also been a heightened focus on potential FDA bans of certain vitamins and supplements that may be harmful, such as a form of vitamin B6 and certain energy supplements. An increasing number of clinical research trials are testing the efficacy and long-term health benefits of taking vitamins. Some have suggested that large doses of certain vitamins may increase the risk of cardiac events in elderly people or those with heart disease. While tighter regulations add complexity for manufacturers, they can also help improve business for providers that meet stricter requirements.

Consumer trust in safety: 52% of consumers stated that they are concerned about that dietary supplements are “harmful to you/your family,” according to a National Science Foundation survey.³³

Consumer packaged goods (CPG) expansion into vitamin and supplements: We have seen several CPG companies enter the dietary supplement space either through acquisition or major investments. This may pose a threat to startups as CPG companies bring marketing expertise, category management best practices and deep consumer insights that can help them align products with consumer demand and develop innovative delivery and packaging methods. Recent activity includes **Proctor & Gamble**’s \$4.2 billion purchase of **Merck**’s Consumer Health Unit, **Johnson & Johnson**’s acquisition of **Zarbee**’s

Natural, for an undisclosed amount, **General Mill**’s \$12 million investment in **GoodBelly** and **The Clorox Company**’s acquisition of **Nutranext** for \$700 million.

Outlook

AI in supplements: Providers are increasingly using AI to help formulate vitamins. **Life Extension** claims AI will be the future of dietary supplement creation, helping companies not only formulate products and bring them to market more quickly, but also determine which ingredients to study and how to study them. In January 2017, **BASF**, in partnership with **Nuritas**, a VC-backed startup, launched PeptAlde, a sports nutrition ingredient containing a unique set of plant-based peptides identified using AI.

Loyalty- and subscription-based revenue models to dominate market: Loyalty and membership strategies can help increase sales and ensure recurring purchases. GNC claims its loyalty program captures 80% of sales and its Tier 2 loyalty members spend 3.5x as much per year compared to a typical shopper.³⁴ **Care/of** helps consumers create a personalized health plan via its app and ships supplements monthly. The growth of subscription box enablement services, such as **Bulu Box**, enables vitamin and supplement providers to outsource subscription box fulfillments and easily offer this option to consumers.

Increasing demand for personalized vitamins: As DNA and microbiome testing technology grows, we expect to see more companies offering “personalized” vitamins

32: “The Frequency and Characteristics of Dietary Supplement Recalls in the United States,” Journal of the American Medical Association, Volume 173, Issue 10, Ziv Harel, Shai Harel, Ron Wald, Muhammad Mamdani and Chaim M. Bell, May 27, 2013

33: NSF International Consumer Product Concerns Survey, NSF International, April 2019

34: GNC Company Update, July 2019



DIETARY SUPPLEMENTS

and supplements based off of one's genomics, microbiomics or other biomarker and vital indicators. **ViTL** offers supplements tailored according to a consumer's answers to an online survey. For \$119, consumers can take a DNA nutrition test that returns a report on 46 genes alongside personalized dietary and lifestyle recommendations.

Biohacking will be hard to scale: Biohacking is the process of employing various techniques to alter the body's chemistry and physiology to achieve desired health-related outcomes. Examples include diet regimens, light therapy and cryogenic therapy. This space is also where various antiaging technologies can be found. While we expect the number of biohacking providers to increase, we believe barriers to entry for related services are relatively low and fad-risk is particularly high. Biohacking startups include **Zero Fasting**, which helps people select fasting methods and track fasting activity; **Bulletproof Labs**, which offers biohacking equipment such as REDcharger (i.e. light therapy) and virtual float tanks; and **Elevian**, which designs therapeutics that incorporate blood transfusions to restore regenerative capacity.

Incumbents to more aggressively pursue online distribution: We expect to see more companies create an omnichannel experience for their clients. **GNC**, a traditional brick-n-mortar store, now offers "auto deliver and save (ADAS)" and "**GNC** delivers." The company claims ADAS drives higher than average EBITDA margins and expects subscriptions to rise from 285,000 in 2019 to 500,000 in 2020, though this may have changed due to the COVID-19 epidemic.

SEGMENT DEEP DIVE

Personalized medicine & testing



PERSONALIZED MEDICINE & TESTING

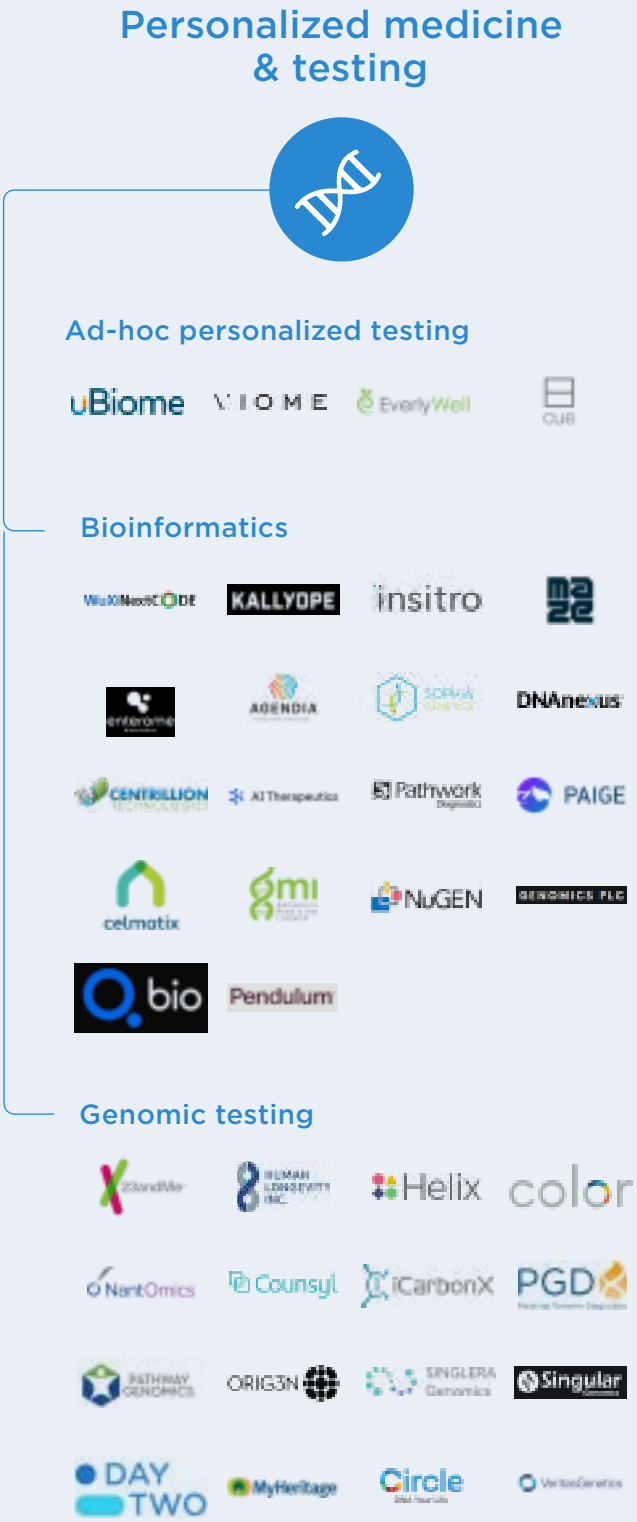
Overview

Personalized medicine is an approach to patient care that allows doctors to select treatments that are most likely to help patients based on a genetic understanding of their disease. Startups in this segment provide personalized recommendations or treatments based on genomics, microbiomics or other biomarkers and vital indicators, using proprietary biological data analysis platforms to devise new diagnostic and medication methodologies. Product categories include:

- Genomic testing:** The collection and/or interpretation of DNA samples to determine health implications.
- Bioinformatics:** The analysis of biological information in order to devise new diagnostic and medication methodologies for patients. Companies in this space focus on analyzing genotypic and phenotypic data to determine the potential effectiveness of medications and prevent adverse drug reactions. Biotechnology companies focused on using genetic data to create new medicines, primarily for cancer, are also included in this category.
- Ad-hoc personalized testing:** Providing personalized health recommendation through testing and analyzing biomarkers, the microbiome and vital indicators (e.g. blood sugar levels). Microbiome samples can be collected from an individual’s gut, skin, blood or other places.

Business model

Providers in this space seek to obtain the molecular data of customers or other individuals in order to derive health solutions. Some providers offer individual analysis for consumers, and others maintain data platforms intended to provide genomic data insights for therapeutic discovery and treatment. Revenue is derived through the sale of D2C analysis services and the





PERSONALIZED MEDICINE & TESTING

sale of aggregated data to third parties such as pharmaceutical companies, healthcare providers and consumer-packaged goods providers for the development of personalized products and holistic health planning services (SAAS or fee for service).

Market size

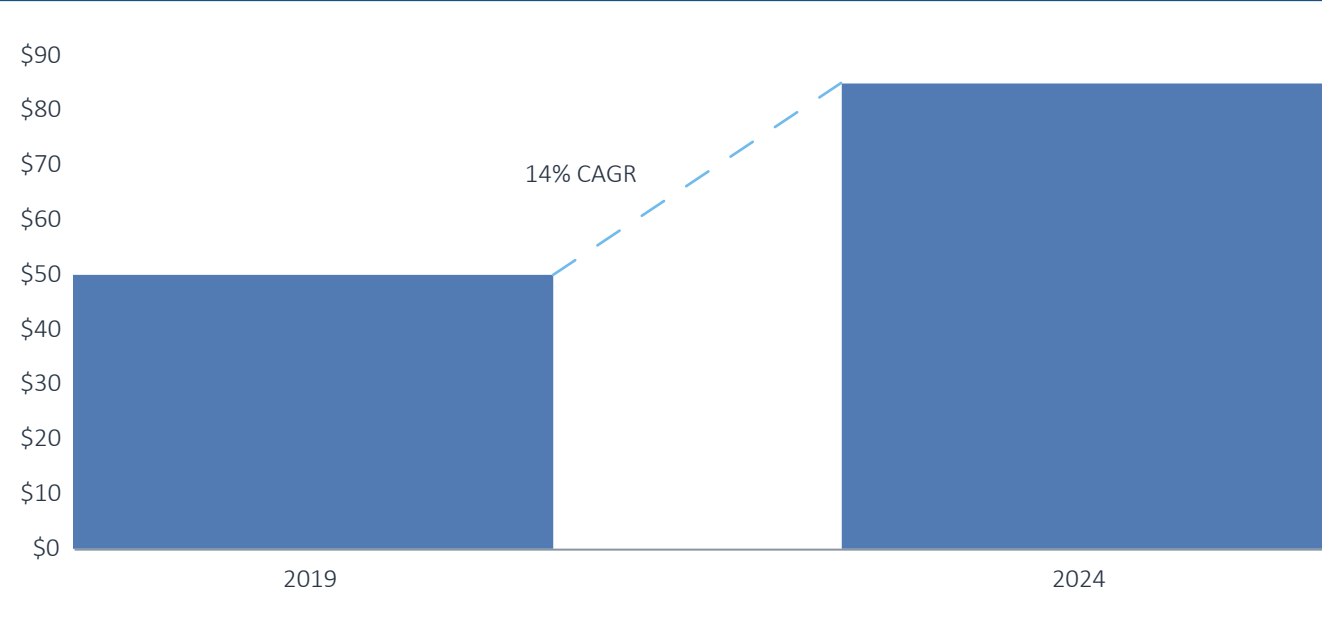
The personalized medicine & testing market is expected to grow at a CAGR of about 11% from \$50.0 billion in 2019 to \$85.0 billion in 2024.

Bioinformatics: The bioinformatics category, which can be segmented into knowledge management tools, bioinformatics platforms and services, is expected to grow to about \$20 billion in 2024. We expect bioinformatics platforms to grow the fastest owing to increased usage related to genomics, proteomics and drug discovery.

Microbiome: North America dominates the global human microbiome market due to high funding and R&D activity by companies and research institutes. Asia-Pacific is anticipated to be the fastest-growing region for microbiome-related products, driven by increased government funding for personalized medicine and numerous initiatives to develop human microbiome products in countries such as China and Japan. These initiatives aim to create standardized methods for assessing what impact the gut microbiome has on human health. Currently, global investment concentrates in US (70%) and Europe (25%).

D2C genetic tests: The global direct-to-consumer genetic test market comprises more than 400 products from approximately 300 companies and includes substantial investments made by conglomerates and small-medium enterprises. Online sales are expected to be a major driver of growth, fueling low 20% industry growth over the next several years.

Figure 43. PERSONALIZED MEDICINE & TESTING MARKET SIZE (\$B)



Source: PitchBook estimates | Geography: Global

COMMON INDUSTRY KPIS

- Lifetime value
- Customer acquisition cost
- Revenue or profit per customer
- Revenue generation methods
- Growth rate
- Volume: Size of dataset per customer
- Number of genomes sequenced
- Cost of conducting test/ gathering specimen



PERSONALIZED MEDICINE & TESTING

Industry drivers

Coronavirus and future pandemics drive need for testing: Major testing delays and shortages of testing supplies have hindered the US's ability to track the pandemic. Startups focused on testing services (e.g. DNA and HIV testing), quickly pivoted toward the coronavirus. However, the opportunity has largely been put on hold as the FDA has sought to regulate these testing services given safety and accuracy concerns. We expect some providers will eventually gain FDA approval, causing a spike in demand as the need for testing could extend for several months, if not years. Longer term, at-home testing could emerge as a more normalized consumer activity, especially for the uninsured, causing significant market expansion.

Growing acceptance and awareness of genetic tests: D2C genetic tests provide a new window into individual health. 80% of consumers cited curiosity as their primary purchase motivator.³⁵ This trend heavily influences marketing strategies as providers seek to leverage emotional appeal and growing public awareness of their products.³⁶

Technological advancements reduce gene decoding lead time and cost: The decreasing cost to perform genetic tests makes the product more widely accessible to consumers. According to one study, costs per genome have decreased rapidly as the technology has improved (see Figure 44).³⁷ Common D2C genetic tests use genotyping, not sequencing, to analyze DNA because sequencing technology has not yet progressed to the point where it can be done quickly and at a cost low enough for general consumption.

35: Internet-Based Direct-to-Consumer Genetic Testing: A Systematic Review," Journal of Medical Internet Research, Loredana Covolo, Sara Rubinelli, Elisabetta Ceretti, and Umberto Gelatti, December 14, 2015

36: "Direct-to-Consumer Marketing of Predictive Medical Genetic Tests: Assessment of Current Practices and Policy Recommendations, Journal of Public Policy & Marketing," Journal of Public Policy & Marketing, Volume 27, Issue 2, Yuping Liu-Thompkins and Yvette E. Pearson, November 2008

37: "DNA Sequencing Costs: Data," National Human Genome Research Institute, n.d.

Growth of Big Data technology: The ability to analyze large quantities of data has been critical to the evolution of genetic analysis. Analytical techniques that include AI and neural networks can incorporate a broad range of human genetic and molecular data to help understand the potential impacts of certain treatments and medications.

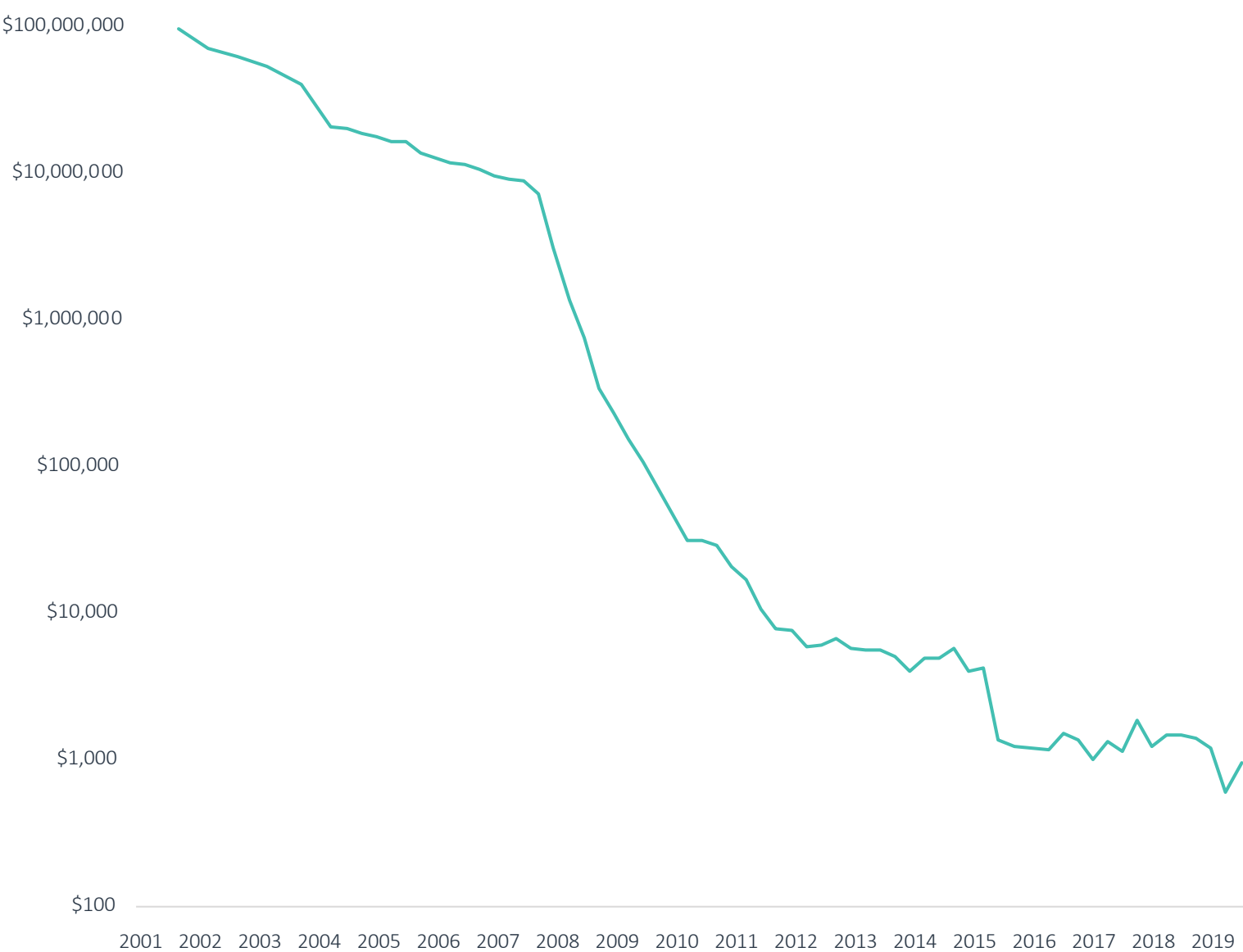
Government support for research: In 2015, President Obama launched the Precision Medicine Initiative (PMI). This long-term research endeavor involves the National Institutes of Health (NIH) and multiple other research centers and focuses on developing novel solutions for chronic diseases, such as cancer, based on genetics, environment and lifestyle. This initiative has increased funding toward precision medicine, driving research and industry growth. Furthermore, the government seeks to make bioinformation research and development profitable by offering incentives, including tax exemptions and grants. The National Human Genome Institute, ran by the NIH, supports research to advance the field of genomics and improve human health. The Small Business Innovation Research (SBRIR) and Small Business Technology Transfer (STTR) funds allow small businesses owned and operated in the US to engage in federal R&D that has a potential for commercialization.

Ongoing emergence of rare disease: Over 300 million people globally live with a rare disease. To motivate pharmaceutical development several federal incentives such as tax exemptions, grants for accelerating and testing potential therapies, and an exclusivity period of seven years to enhance marketing have been deployed. Bioinformatics can help process the large amount of data analytics required for diagnosis and medication creation.



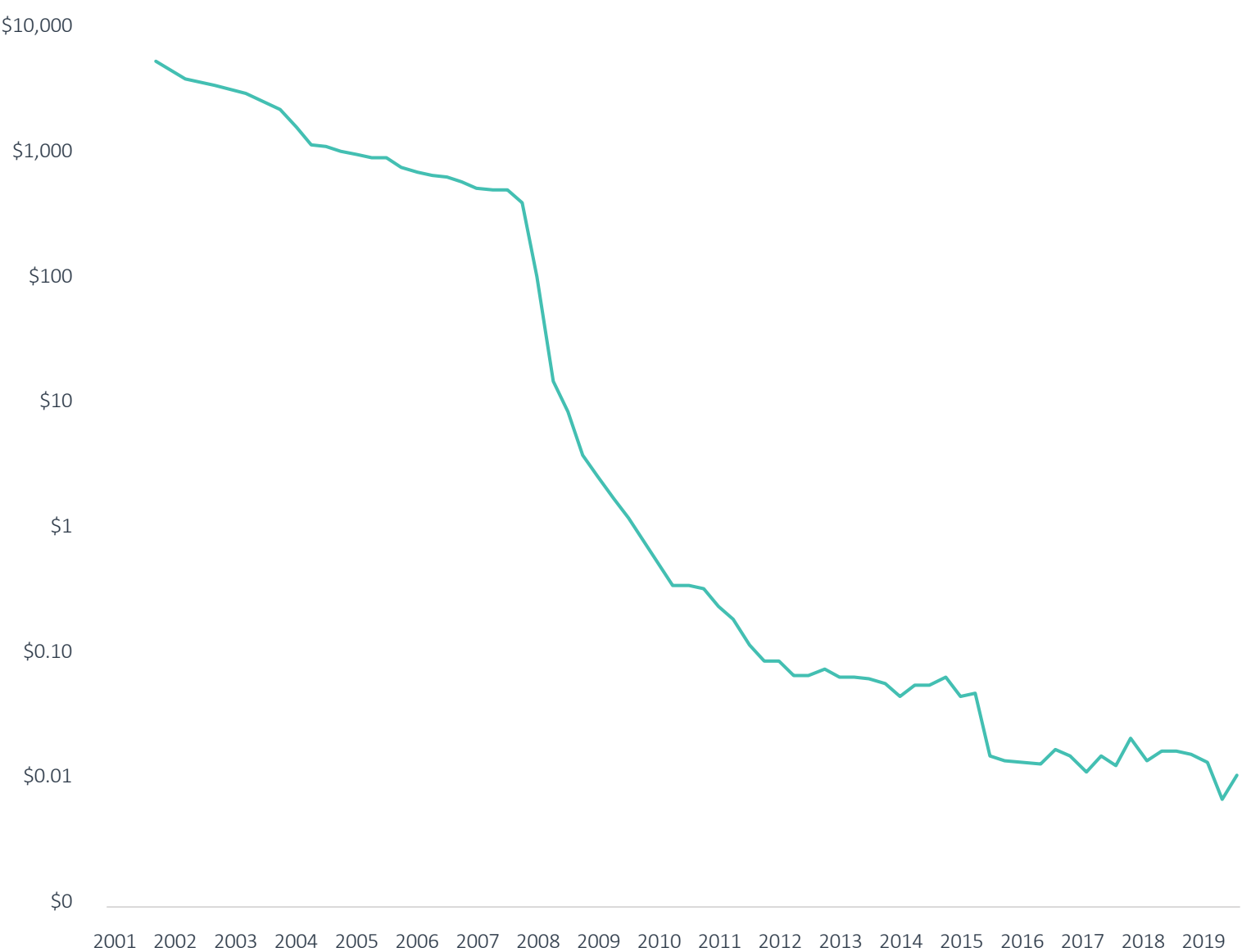
PERSONALIZED MEDICINE & TESTING

Figure 44.
Cost per human genome



Source: Wetterstrand KA. DNA Sequencing Costs: Data from the NHGRI Genome Sequencing Program (GSP)
Available at: www.genome.gov/sequencingcostsdata. Accessed March 10, 2020.

Figure 45.
Cost per raw megabase of DNA sequence



Source: Wetterstrand KA. DNA Sequencing Costs: Data from the NHGRI Genome Sequencing Program (GSP)
Available at: www.genome.gov/sequencingcostsdata. Accessed March 10, 2020.

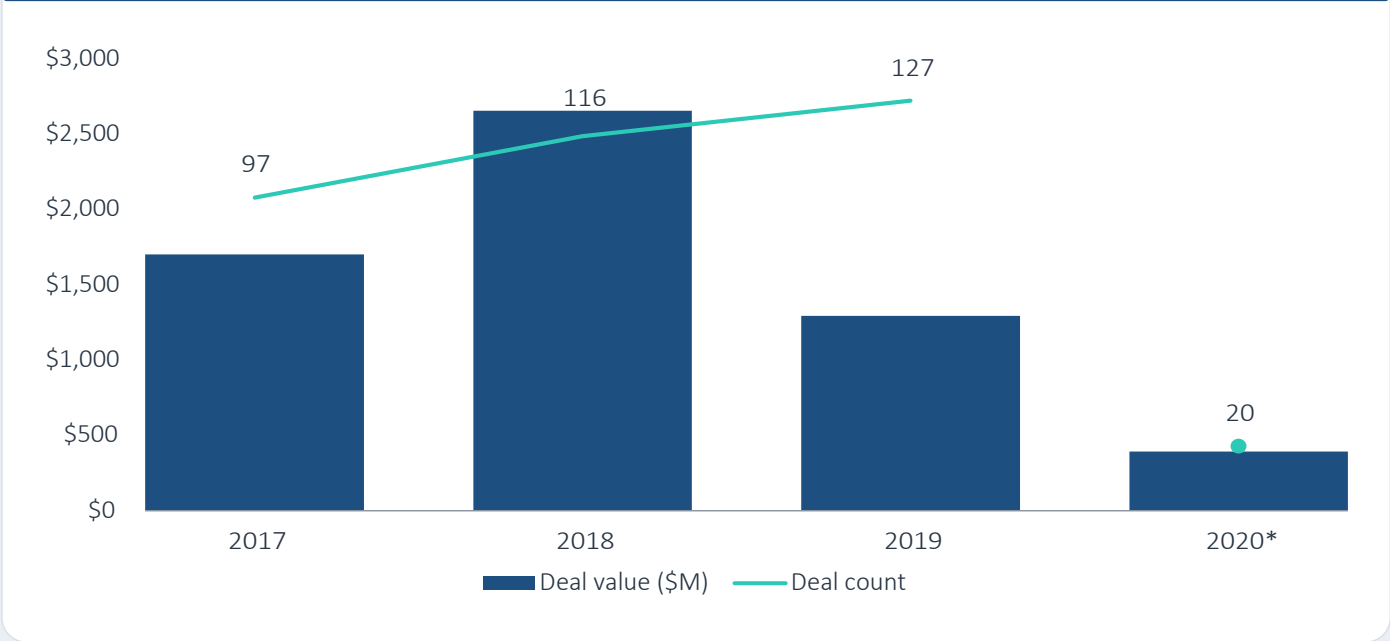


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VC activity

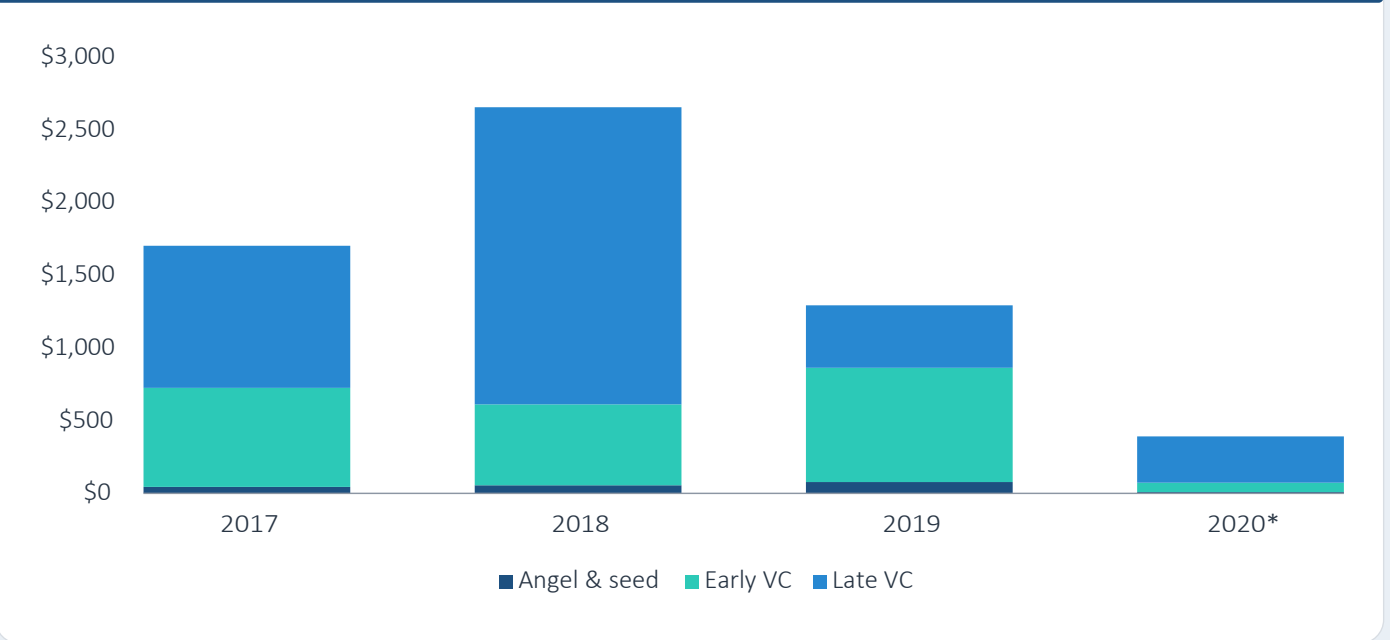
Companies tracked in this segment raised \$393 million in venture funding in the first quarter of 2020, down from \$575 million in Q1 2019. Fourteen late-stage VC deals accounted for 81.0% of the quarter’s total deal value, signaling industry maturity. Angel & seed activity has been stable in recent years, hovering at around \$19 million in both 2018 and 2019. Notable raises include **Karius**’ \$165 Series B and **Kallyope**’s \$112 Series C. **Karius** raised the money to support its liquid biopsy technology aimed at identifying infectious diseases through a blood test. Liquid biopsy technology is widely embraced in cancer treatments to identify which therapy may work best on a per-patient basis. **Karius** can provide disease tracking benefits as well and help identify novel viruses before they become an outbreak such as COVID-19. **Kallyope**’s platform uses bioinformatics to create a comprehensive map of the gut-brain circuit to identify therapeutic targets to treat gut area diseases.

Figure 46. PERSONALIZED MEDICINE & TESTING VC DEAL ACTIVITY



Source: PitchBook | Geography: Global
*As of March 31, 2020

Figure 47. PERSONALIZED MEDICINE & TESTING VC DEALS (\$M) BY STAGE

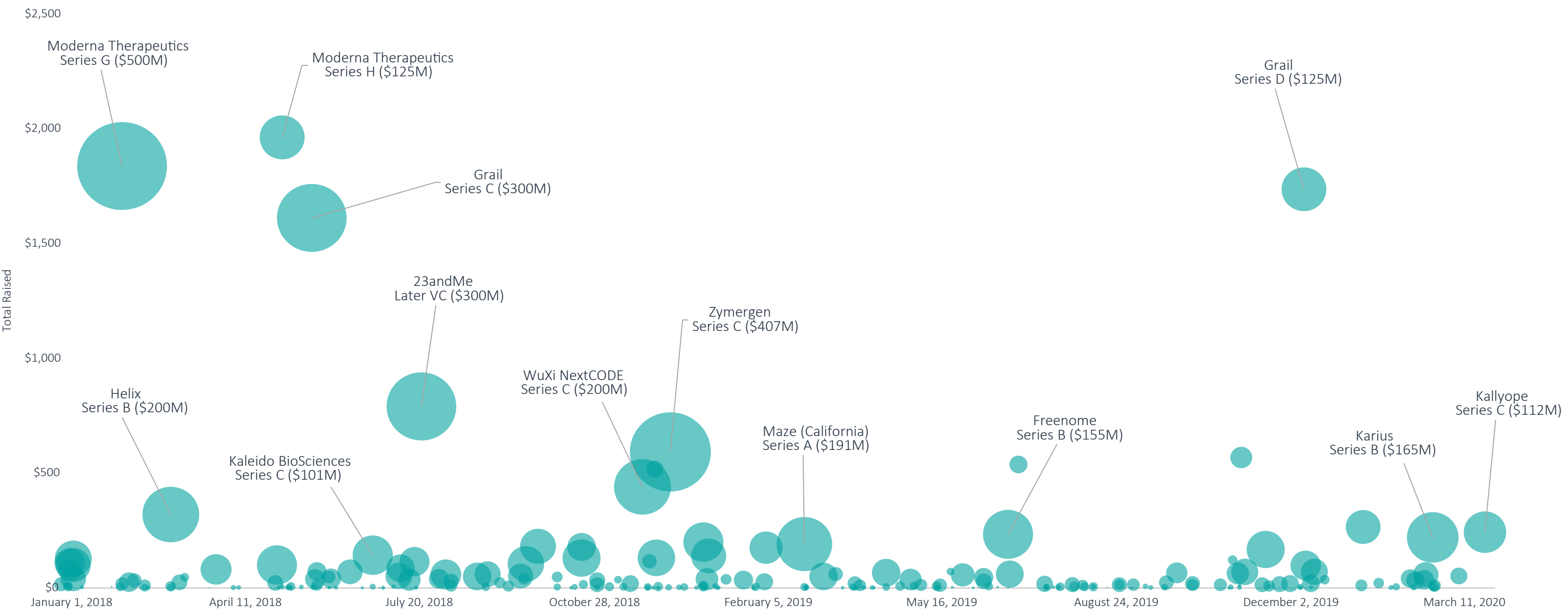


Source: PitchBook | Geography: Global
*As of March 31, 2020



PERSONALIZED MEDICINE & TESTING

Figure 48.
Current personalized medicine & testing VC landscape (\$M)



Source: PitchBook
Note: The left axis indicates total VC raised as of deal date. Bubbles indicate amount raised.



PERSONALIZED MEDICINE & TESTING

Figure 49.
Notable personalized medicine & testing VC deals

COMPANY NAME	CLOSE DATE	SUBSEGMENT	DEAL SIZE (\$M)	DEAL TYPE	LEAD INVESTOR(S)	VALUATION STEP-UP
	March 25, 2020	Bioinformatics	\$112	Series C	N/A	N/A
	January 15, 2020	Genomic testing	\$75	Series D	T. Rowe Price, Viking Global Investors	N/A
	February 20, 2020	Bioinformatics	\$40	Series B	Andreessen Horowitz	2.44x
	January 16, 2020	Genomic testing	\$36	Series B	Seraph Group	2.10x
	February 19, 2020	Bioinformatics	\$25	Series B	Northpond Ventures	2.39x

Source: PitchBook

Figure 50.
Notable personalized medicine & testing VC exits



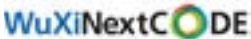


COMPANY NAME	CLOSE DATE	SUBSEGMENT	EXIT SIZE (\$M)	EXIT TYPE	ACQUIRER OR TICKER	VALUATION STEP-UP
	February 5, 2020	Genomic testing	\$276	IPO	N/A	N/A
	October 28, 2019	Bioinformatics	\$222	IPO	NASDAQ	0.95x
	December 26, 2019	Ad-hoc personalized testing	\$115	IPO	Korea Stock Exchange	N/A
	July 16, 2019	Bioinformatics	\$70	M&A	Invitae	N/A
	November 8, 2019	Bioinformatics	\$12	M&A	Orasure Technologies	N/A

Source: PitchBook



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Figure 51.
Key VC-backed personalized medicine & testing companies





COMPANY	VC RAISED TO DATE (\$M)	SUBSEGMENT	KEY PRODUCTS	PRODUCT DIFFERENTIATION
	\$791	Genomic testing	DNA test	Only DNA tests to meet FDA standards
	\$568	Genomic testing	Whole genome sequencing	Aims to build a large database of sequences genomes and phenotypic data in hopes of uncovering unprecedented preventative health insights
	\$440	Bioinformatics	Population genomics platform	Platform for storing, sharing and interpreting massive sets of genomic data
	\$320	Genomic testing	DNA test	Population health solutions; ancestry and health insights
	\$220	Ad-hoc personalized testing	Platform to harness the gut-brain axis	Platform identifies circuits involved in physiology and disease and develop gut-restricted molecules to target circuits

Source: PitchBook



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Figure 52.
Key personalized medicine & testing incumbents

COMPANY	HOLDING STATUS	SUBSEGMENT	ENTERPRISE VALUE (\$M)
 ancestry	PE-backed	DNA test	\$25,349
	Corporation	Bioinformatics	N/A
 EasyDNA	Public	DNA test	N/A
 BIOVIA	Acquired	Bioinformatics	N/A

Source: PitchBook



PERSONALIZED MEDICINE & TESTING

Opportunities

Creating a large genome sequencing database: Genome sequencing is still in its early days, and the ability to provide better insights depends on expanding the dataset over time. Some startups incentivize consumers to share their genetic data with industry researchers by offering a share in any profits generated through monetization. For example, **LunaDNA** awards shares to data contributors with dividends tied to revenue generated from selling access to its database. **Nebula Genomics** gives users credits (i.e. “rewards”) that can be exchanged for other **Nebula** products, such as genome-related information. Both companies had proposed to integrate crypto payments into their platforms, but these efforts appear to have fizzled.

Personalized treatment platforms: Startups are developing treatment platforms and modalities that are flexible and adapt to the unique needs of a patient. **GenomiCare** has developed a precision cancer medicine service that provides personalized clinical solutions. The company’s platform integrates world-class technologies to provide personalized precision medicine solutions and global medical resources for cancer patients and doctors. **Scipher Medicine** has developed a suite of products that can determine which drug will work best for patients diagnosed with autoimmune diseases.

Genetic counseling and analytic services: Genetic counseling has traditionally focused on helping families understand risks for inheriting hereditary medical conditions. The expansion of genetic testing will create more opportunities for experts and analytic software providers to help interpret genetic data and provide consultations for patients. Consumers can pursue these counseling services through independent genetic counselors or companies offering DNA sampling, sequencing and storage services; healthcare

providers; and/or insurers. Emerging providers that offer genetic testing management and consumer consulting services include InformedDNA, which has raised \$19 million, and **Clear Genetics**, which, after raising \$2.5 million in seed funding, announced in November 2019 that it would be acquired by **Invitae** (NYSE: NVTX) for \$50 million.

Continual testing services: Genetic testing companies currently operate on a one-and-done business model, limiting the ability to derive ongoing revenue from existing customers. Several startups are seeking models that allow them to continually sell into their existing customer base. **GoodCell** combines genetics and health test offering with continual testing and biobanking. The company charges \$14.99 a month to store a customer’s blood and perform continual tests on it, which may provide insights as new tests and cell therapies become available.

Genomic medicine could drive improved health outcomes: Genomic testing and personalized medicine have the potential to revolutionize healthcare by providing patients with detailed information about health and risk factors. For this reason, we expect genetics to become an integral component of medical diagnostics and therapeutics, driving growth opportunities among ancillary service providers. While there are many questions related to the value of genomic analysis, the science could unlock new ways to treat illness and improve wellness.

Considerations

Pandemic funding could divert funding from genomic research: In the near term, we believe government organizations and NGOs will be most interested in funding biopharma companies with coronavirus-focused solutions. This may deter funding from genome-focused research. Heightened awareness surrounding the importance of continued



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epidemiology-focused biopharma innovation (i.e. virus-focused) may divert future public investment activity from genome- and oncology-focused research.

Limited validity of predictive genetic tests: Many healthcare providers do not recommend using genetic tests to detect potential diseases as the validity rates of these tests are often too low to provide real insights. Genetic tests look for single nucleotide polymorphisms (SNPs) to detect an individual's risk of disease. However, having a disease-associated SNP is not a diagnosis, and certain SNP variants could lead to false positives. Furthermore, DNA information on several populations is limited.

Privacy and security of genetic tests: Consumer hesitancy toward at-home testing services stems from the view that data may be shared with third parties such as consumer health, pharmaceutical and insurance companies. As genetic test providers, such as **23andMe**, are not legally considered medical providers, these companies are not subject to the same regulations and privacy policies regarding DNA profiles, and this could prevent mass adoption. For example, the Pentagon has warned armed forces members that taking DNA tests could potentially expose sensitive genetic information to outside parties that could pose personal and operational risks to service members.

Big Food entering nutrigenomics: Nutrigenomic startups, which focus on the scientific relationship between genomes, nutrition and health, will face increased competition from Big Food. Nestle piloted a “wellness ambassador” program in Japan in September 2018. The program combined AI, DNA testing and meal analysis to collect consumer health data and provide personally formulated beverage capsules. In 2016, **Campbell** invested in **Habit**, a DNA-based nutrition startup. However, after failing to gain traction, **Habit** was sold to **Viome** in February 2019.

D2C genomic test market saturation coupled with one-and-done business model: The market for at-home DNA testing may be saturated. While only 30 million people globally have taken an at-home DNA test according to public statements, **23andMe** and **Ancestry.com** appear to be facing growth headwinds and recently announced they will lay off 14% and 6% of their staff, respectively. We believe providers struggle to convey to users the value of the test beyond purely satisfying curiosity, thus limiting the growth potential, given the \$100+ cost.

Bioinformatics data management is complicated: Bioinformatics research derives genetic information, which results in massive data quantities; bioinformatics data management providers efficiently store this data in ways that allow for quick access and analysis when necessary. This extends processing time and results in lengthy research times that have a negative impact on the business case.

Outlook

Increased partnerships with employers and genetic testing providers: As consumers come to understand the benefits of genomic sequencing tests, we expect employers to offer them as part of their health benefits packages. **Genome Medical** offers customizable and scalable programs designed to help employees make use of genetic information.

Microbiome testing and tracking to become common medical approach: New studies show that ongoing microbiome tracking can help indicate potential illnesses. Three BIH funded studies tracked microbiome related health conditions to discover the relationship between microbiome and certain illnesses. For example, researchers discovered that women who delivered preterm tended to have lower than normal levels of a type of



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Lactobacillus bacteria as early as the first trimester.³⁸ We anticipate the microbiome-testing industry to become a more prominent tool used in hospitals for ill and at-risk patients.

Traditional D2C testing providers to conduct research and develop drugs: Many firms traditionally focused on selling omics and vital tests D2C are expected to increase their research and drug development efforts. D2C testing providers had accumulated a large repository of genetic information. Furthermore, many testing providers ask their customers to answer a health questionnaire. Analyzing genetics alongside data on individual's overall health provides clues on the interplay between genetics and ailments, creating advantageous routes to drug discovery. **Nightingale**'s blood test and app provide a three-tier view of customers' health, helping them find a lifestyle that promotes lifelong health. **Nightingale** sells this data to research companies, as it can be used to discover novel associations between different areas of health, as well as evaluate the effects of drug and lifestyle interventions. **23andMe** has launched its own drug development processes and licensed the rights to its first in-house developed drug to **Almirall**, a pharmaceutical company based in Spain.

Growth of pharmacogenomics: Pharmacogenomics is the study of how genes affect a person's response to drugs. This relatively new field combines pharmacology and genomics to develop effective, safe medications and doses that will be tailored to a person's genetic makeup. While more research is still needed before pharmacogenetics can be integrated into primary healthcare practices, we anticipate pharmacogenomics will eventually be used by pharmaceutical companies to develop personalized medications.

Genetic testing providers could partner with researchers and pharmaceutical companies to help grow this field.

38: "The Vaginal Microbiome and Preterm Birth," Nature Medicine, Volume 25, Issue 6, Jennifer M. Fettweis, Myrna Serrano, J. Paul Brooks, May 29, 2019

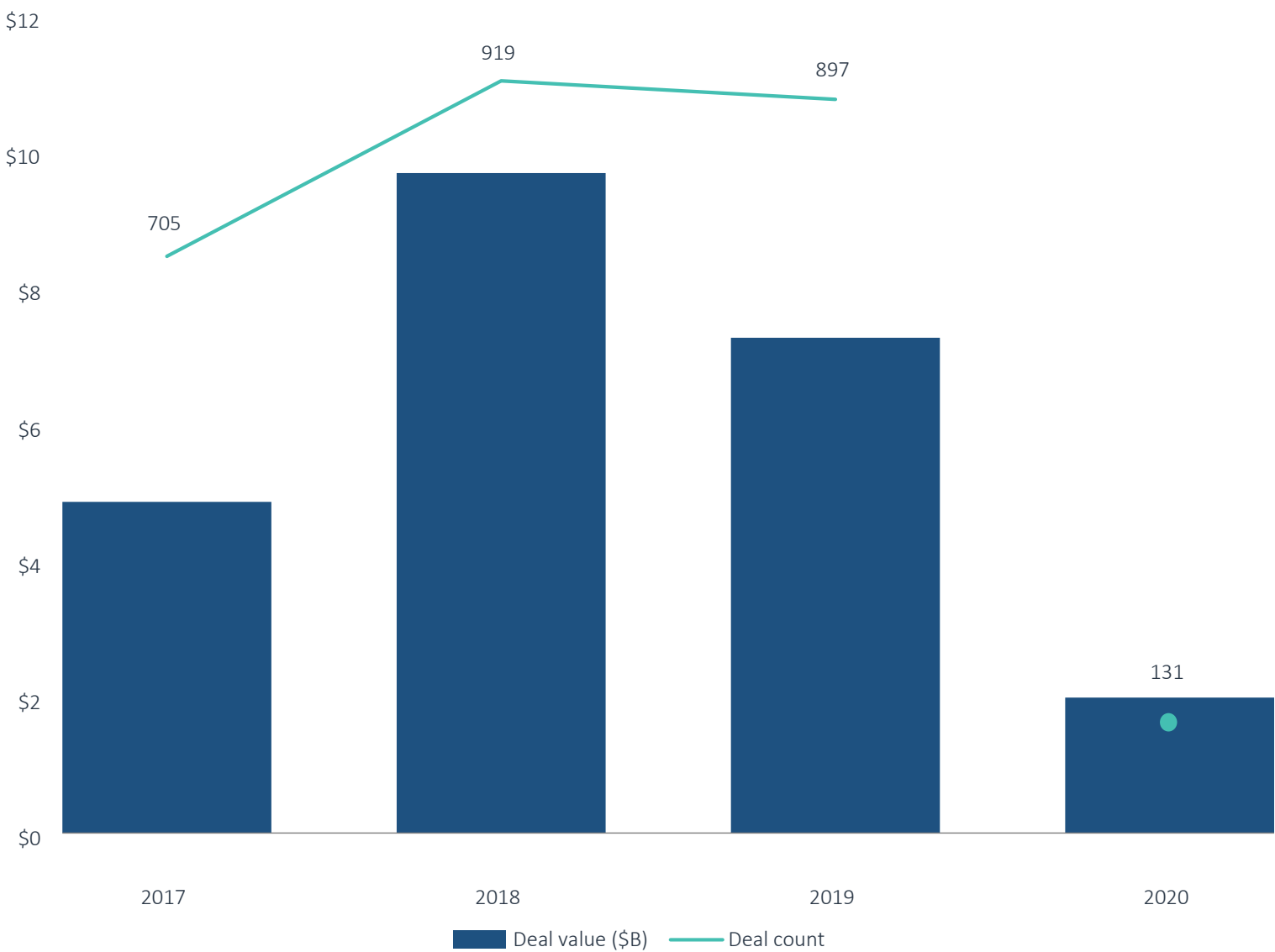
Supplemental materials



SUPPLEMENTAL MATERIALS

Additional VC data

Figure 53.
Retail health & wellness tech VC deal activity



Source: PitchBook | Geography: Global
*As of March 31, 2020

Figure 54.
Top 10 retail health & wellness tech VC deals in Q1 2020

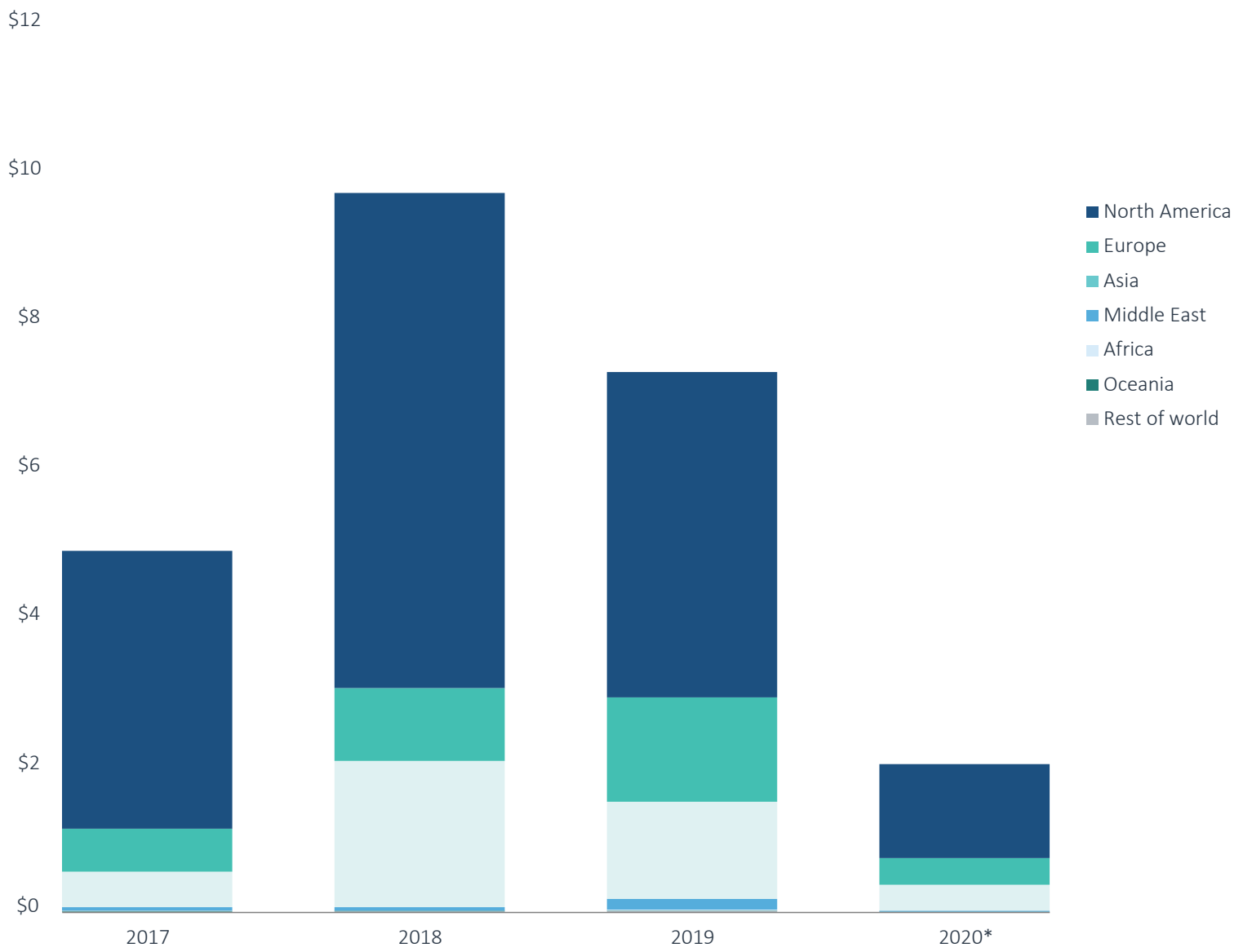
COMPANY	CLOSE DATE	DEAL SIZE (\$M)	POST-MONEY VALUE (\$M)
KRY	January 7, 2020	\$156	N/A
Element Science	March 3, 2020	\$146	N/A
Zhangshang Tangyi	January 8, 2020	\$143	N/A
Kallyope	March 25, 2020	\$112	N/A
Virta Health	January 10, 2020	\$93	\$538
Headspace	February 12, 2020	\$93	N/A
Hinge Health	February 4, 2020	\$90	\$406
Lyra Health	February 21, 2020	\$75	\$557
Color Genomics	January 15, 2020	\$75	N/A
Amwell	March 13, 2020	\$60	N/A

Source: PitchBook



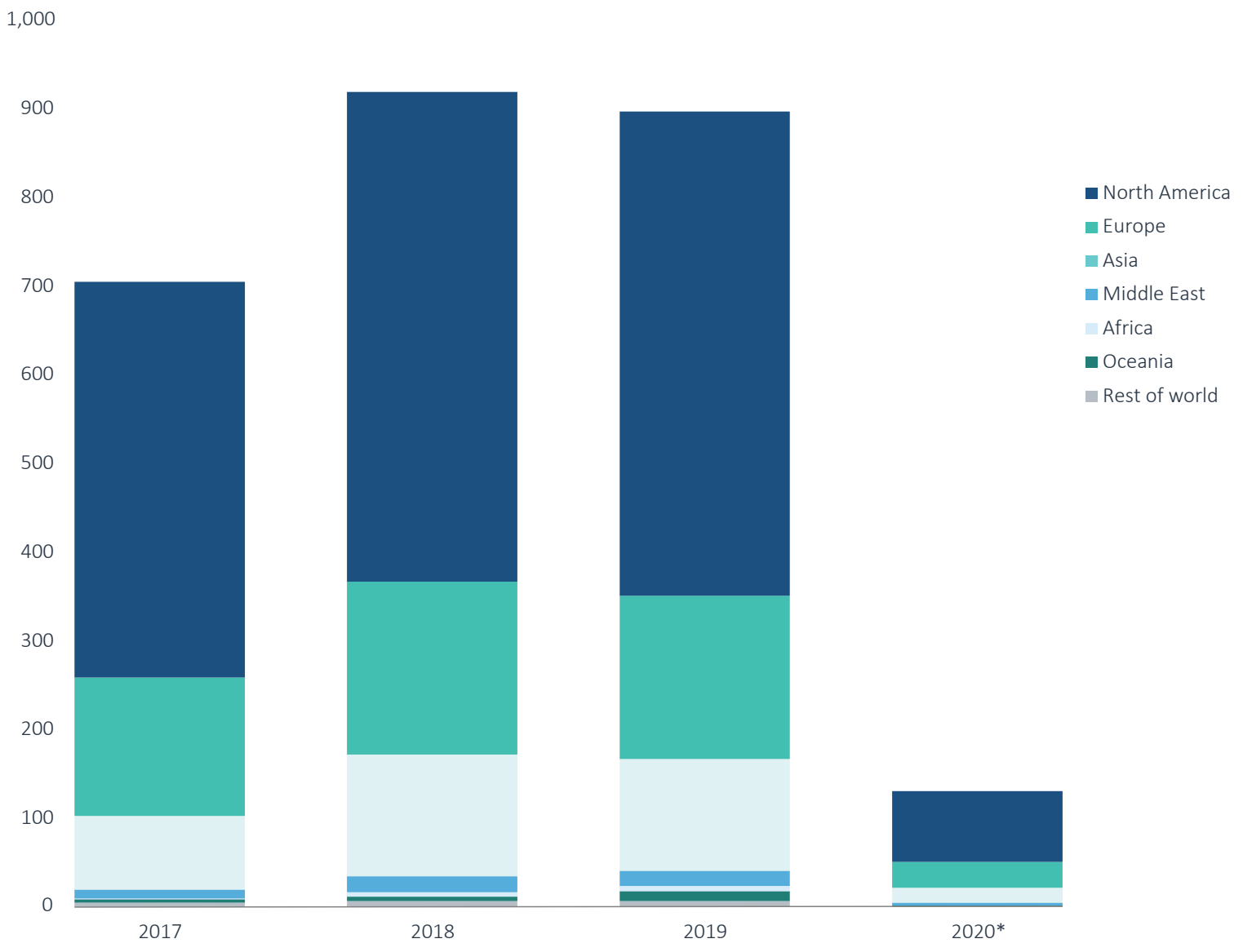
SUPPLEMENTAL MATERIALS

Figure 55.
Retail health & wellness tech VC deals (\$B) by region



Source: PitchBook | Geography: Global
*As of March 31, 2020

Figure 56.
Retail health & wellness tech VC deals (#) by region

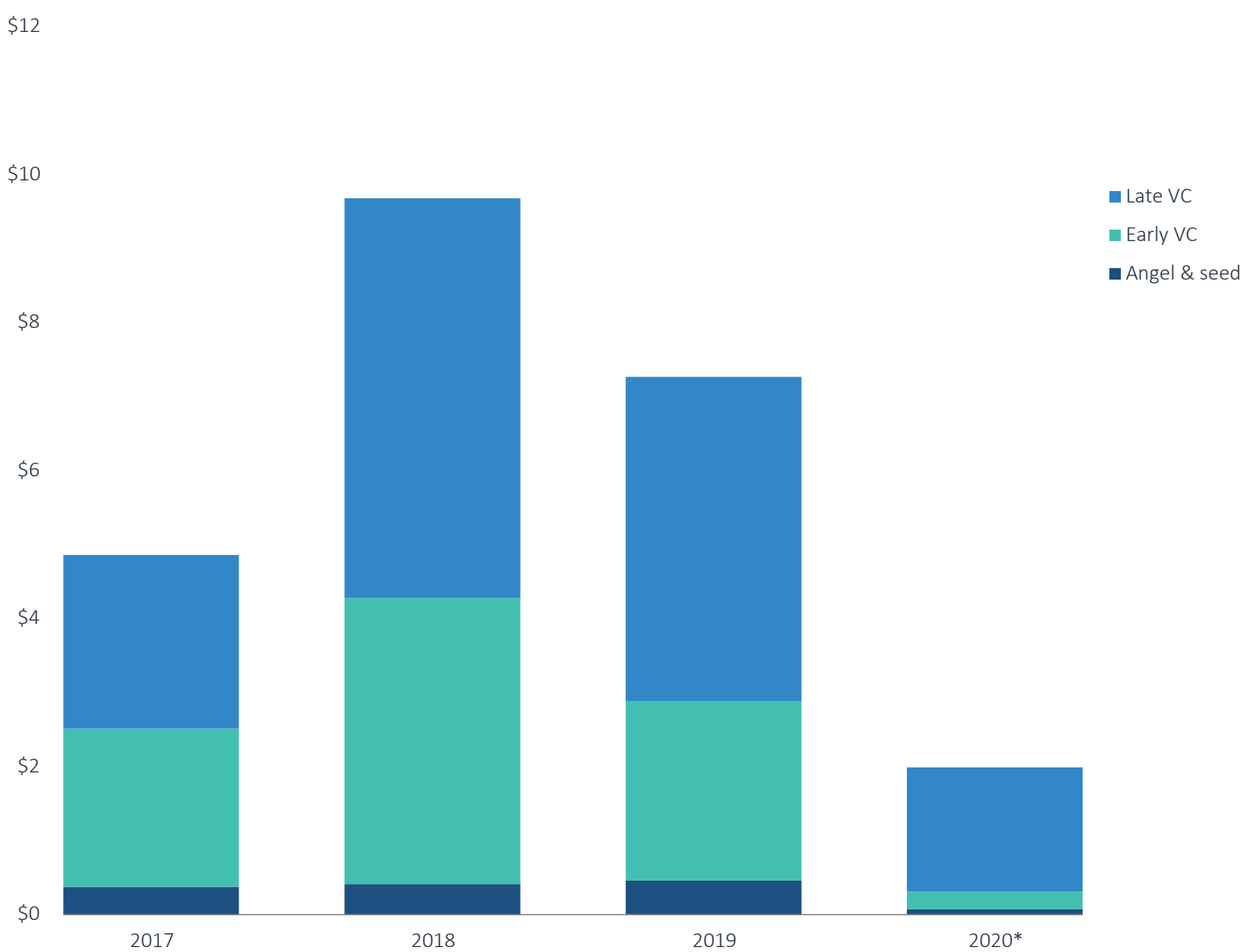


Source: PitchBook | Geography: Global
*As of March 31, 2020



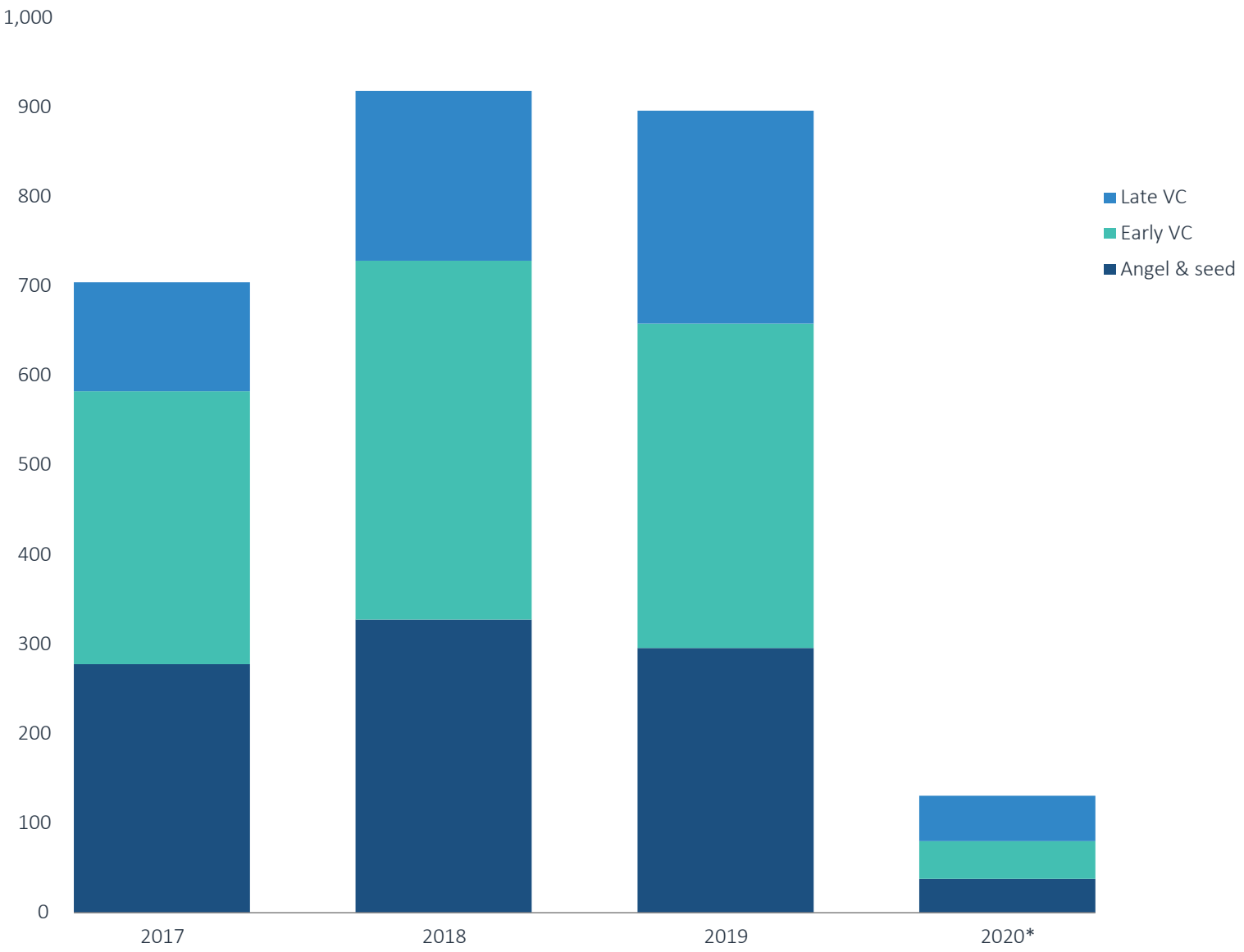
SUPPLEMENTAL MATERIALS

Figure 57.
Retail health & wellness tech VC deals (\$B) by stage



Source: PitchBook | Geography: Global
*As of March 31, 2020

Figure 58.
Retail health & wellness tech VC deals (#) by stage

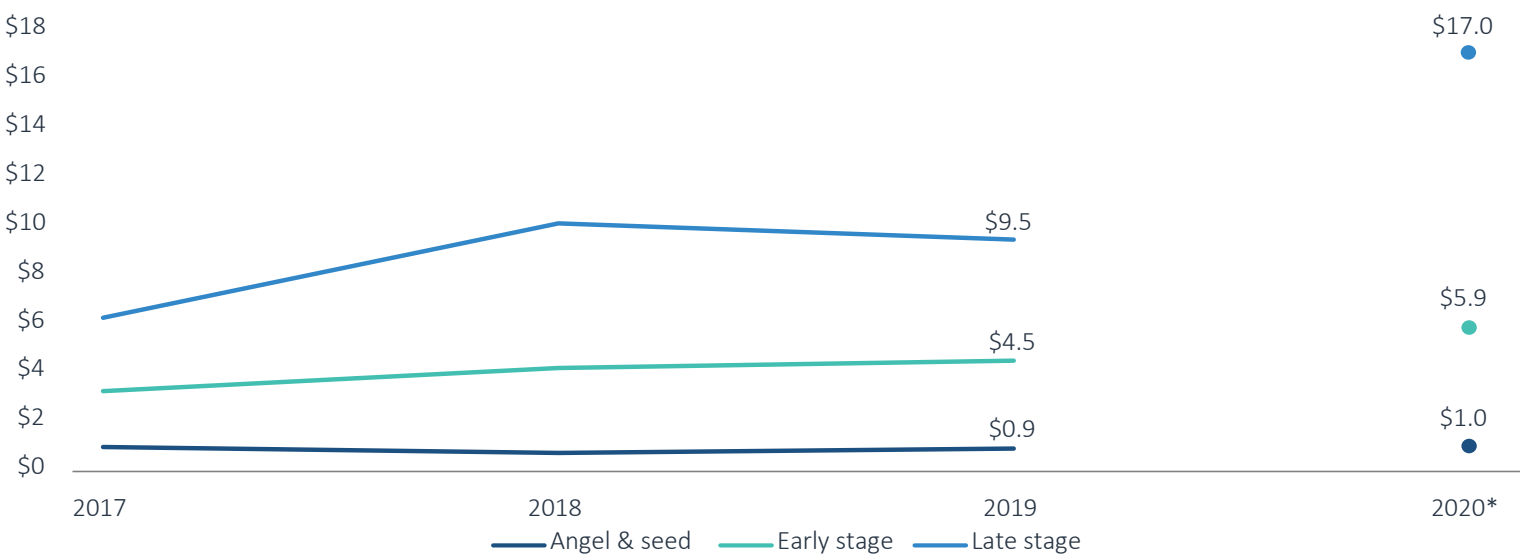


Source: PitchBook | Geography: Global
*As of March 31, 2020



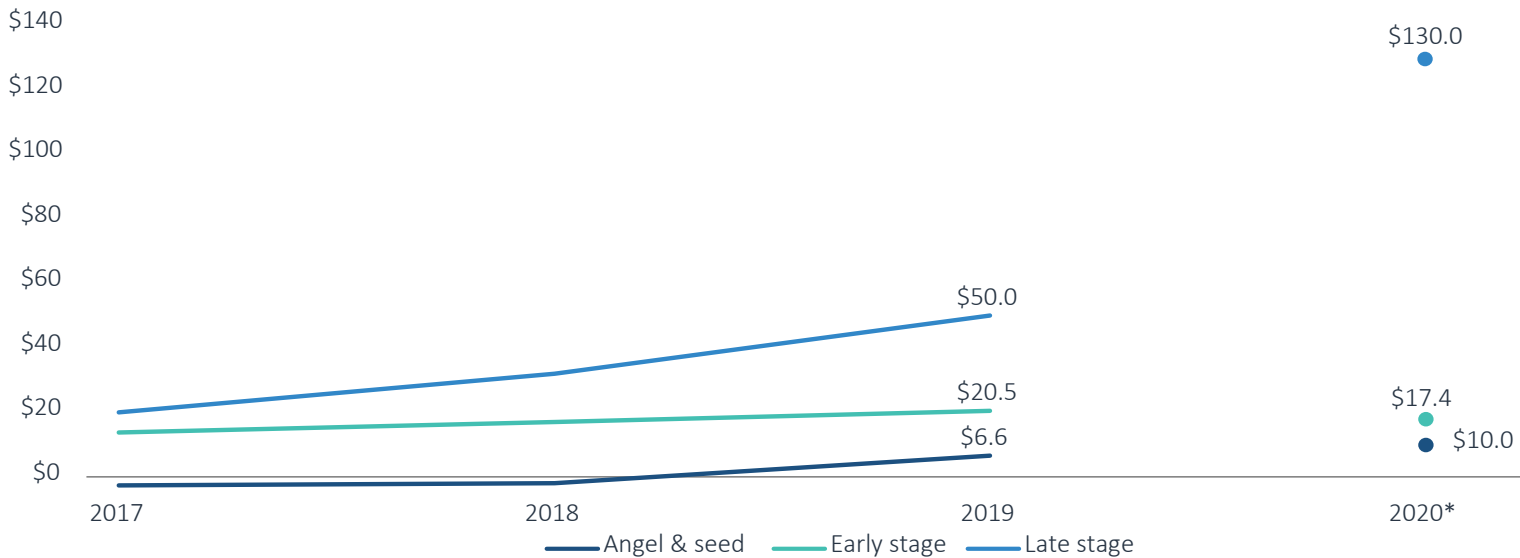
SUPPLEMENTAL MATERIALS

Figure 59.
Median retail health & wellness tech VC deal size (\$M) by stage



Source: PitchBook | Geography: Global
*As of March 31, 2020

Figure 40.
Median retail health & wellness tech VC pre-money valuation (\$M) by stage



Source: PitchBook | Geography: Global
*As of March 31, 2020



SUPPLEMENTAL MATERIALS

Figure 61.
Top 10 VC investors in retail health & wellness tech by deal count

INVESTOR	DEAL COUNT
SOSV	45
Khosla Ventures	24
StartUp Health	23
Alumni Ventures Group	20
Social Starts	16
Keiretsu Forum	16
Founders Fund	13
Connecticut Innovations	13
BoxGroup	12
Lerer Hippeau	12
True Ventures	12

Source: PitchBook | Geography: Global
Note: This includes investors who made investments from 2018 through Q1 2020.

Figure 62.
Current VC-backed retail health & wellness tech companies by VC raised

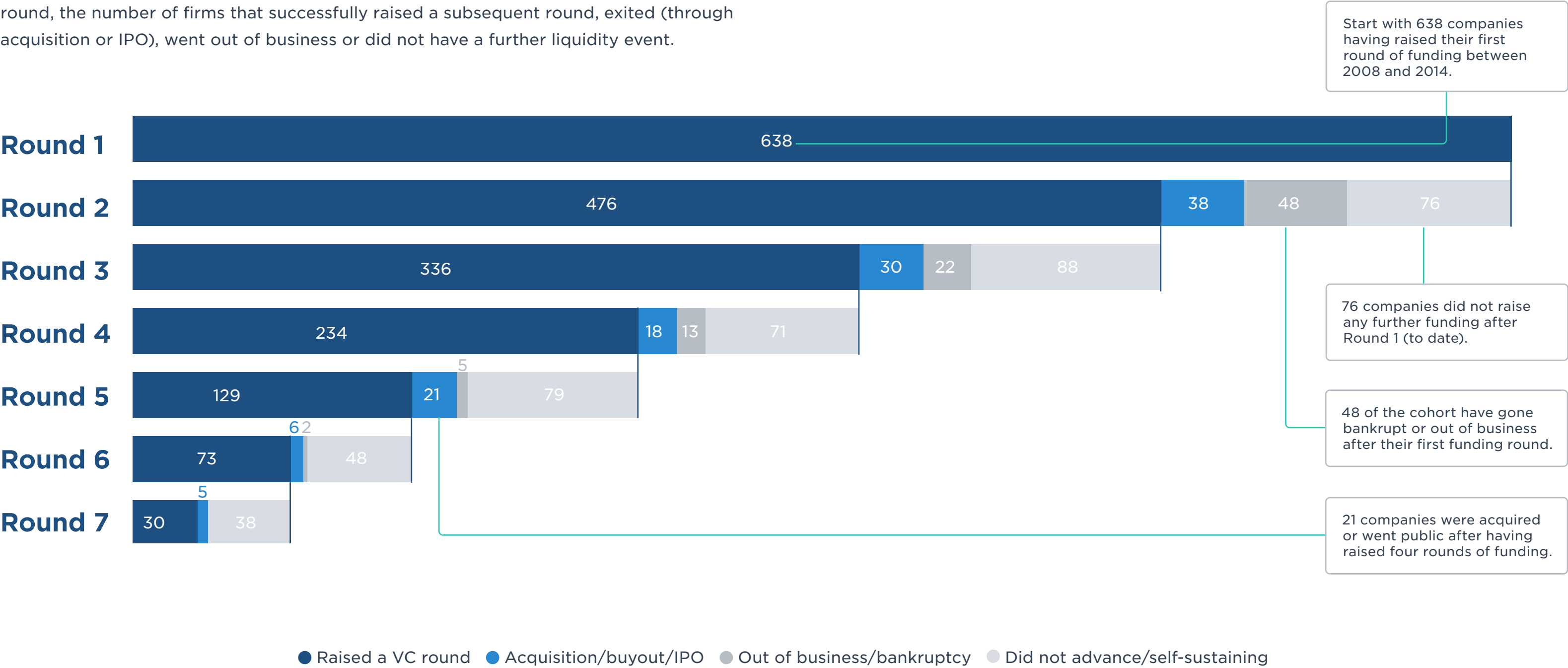
COMPANY	VC RAISED (\$M)
Ping An Medical and Healthcare Management	\$1,150
23andMe	\$791
Amwell	\$659
Babylon Health	\$635
Human Longevity	\$568
WuXi NextCODE	\$440
Just	\$367
CureFit	\$331
Helix	\$320
Zhangshang Tangyi	\$291

Source: PitchBook | Geography: Global



Retail health & wellness tech VC funnel

This VC funnel uses PitchBook data to analyze the VC funding life cycle by highlighting, by round, the number of firms that successfully raised a subsequent round, exited (through acquisition or IPO), went out of business or did not have a further liquidity event.





SUPPLEMENTAL MATERIALS

Buyers list

Figure 63.
Strategic buyers (corporations, holding companies & private companies)

STRATEGIC BUYERS	DEAL COUNT (2010-2020*)
Teladoc Health	4
Connect America	3
QIAGEN	3
Mars	3
PerkinElmer	3
SYNLAB International	3
Thermo Fisher Scientific	3
InTouch Health	3
Cancer Genetics	3
Eurofins Scientific	3
DNA Diagnostics Center	3
General Genetics	3

Source: PitchBook | Geography: Global
*As of March 31, 2020

Figure 64.
Financial buyers (PE groups)

STRATEGIC BUYERS	DEAL COUNT (2010-2020*)
Falcon Investment Advisors	6
Warburg Pincus	5
Vitruvian Partners	4
Rockbridge Growth Equity	4
Ampersand Capital Partners	3
Sole Realisation Company	3
BelHealth Investment Partners	3
Cinven	3
HarbourVest Partners	3
GHO Capital	3

Source: PitchBook | Geography: Global
*As of March 31, 2020



About PitchBook Emerging Tech Research

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