PitchBook

EMERGING TECH RESEARCH

Healthtech

Q4 2019

Contents

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This Emerging Technology Research report is updated on a quarterly basis to reflect changes in venture capital deal activity and other market related updates deemed valuable by the research analyst. The previous quarterly report can be accessed **here.**

Q4 highlights & updates: Healthtech

VC ACTIVITY

- 2019 healthtech deal value down 14.1% YoY to $14.7 billion
- 2019 healthtech deal count down 9.7% YoY to 1,301 deals
- 2019 mobile & digital health deal value up 62.4% YoY, landing at $501.3 million
- Annual proportion of healthtech angel & seed deals by count declines to 28.3% from 42.6% in 2013 as investors shift focus to the later stages

Q4 2019 DEALS

GenapSys raised a **$90M Series C** led by Foresite Capital Management on November 20	**Kyruus** raised **$42.4M** in Series D funding from led by Highland Capital Partners and Venrock on December 23
Whoop raised a **$55M ($37.4M equity and $17.6M debt) Series D** led by Foundry Group on November 12	**Viome** raised a **$36.5M Series B** with participation from Khosla Venture, Bold Capital Partners, among others on November 27
Clarify Health Solutions raised **$45M** in early-stage funding from undisclosed investors on November 18	**HealthReveal** raised **$26.6 million of Series A** funding in a deal led by GE Ventures on December 23

NEWS

- Amazon rebranded PillPack as part of Amazon Pharmacy, signaling its commitment to become a major player in healthcare services.
- The Trump administration issued a price transparency requirement, leading to backlash from hospital groups.
- Walmart and Veterans Affairs launched a public-private partnership with telehealth.

TRENDS & OBSERVATIONS

- **Artificial intelligence is increasingly used to empower healthcare activities.** Solutions such as chatbots are invading healthtech, empowered by AI and utilized in a variety of patient interactions, from customer service to basic healthcare diagnostics and consultations.
- **Cybersecurity has become a core component of digital health as software shifts to the cloud.** The barrage of ransomware attacks in 2016 and 2017 provided a wakeup call to the implications of cybercrime on the healthcare system. Continued digital transformation including storage of user health data on the cloud is putting more patient data at risk. Healthcare systems and healthtech companies are taking note and pursuing cybersecurity solutions.

Executive summary

The US healthcare industry represents some $3.5 trillion[1] in annual spend and consists of numerous stakeholders across a sprawling ecosystem of care and service providers catering to the widespread demand for sustainable, high-quality healthcare.[2] This complexity and market opportunity have attracted myriad startups and other new entrants that are helping to shape the future of the healthtech industry. This report provides an overview of the technologies having an impact on consumer-driven healthcare and highlights emerging opportunities for growth.

We define healthtech as technology-enabled healthcare products and services that are primarily delivered and/or consumed outside of the hospital or physician's office, one exception being hospital and practice management software. Although the distinction can sometimes be blurry, healthtech differs from medical technology (medtech), which is more focused on therapeutic technologies and medical devices intended to treat medical issues as well as diagnostic technologies used to detect medical conditions (i.e. in-hospital care). Healthtech includes a wide-ranging suite of both B2C and B2B offerings, including preventative and monitoring tools for consumers as well as analytic and administrative tools for healthcare administrators and commercial healthcare organizations. It also includes products that are enabling the burgeoning "healthcare at home" movement, which allows patients more flexibility and convenience in how they manage personal care. These in-home healthcare services include telemedicine, blood testing and genomics.

At the heart of the expanding healthtech industry is increasing recognition among consumers and industry participants that traditional provider-based medicine is not keeping up with evolving demands for health and well-being services. This recognition is evidenced in the rising cost of healthcare and the persistence of mediocre health outcomes. The looming tsunami of baby boomers entering retirement is expected to tax the system even further. These pressures have given rise to a new era of consumer-led healthcare, where individuals are incentivized to accept greater responsibility for their own health and to find ways to reduce personal healthcare expenses.

Further disrupting the status quo is the entrance of nontraditional providers to the healthcare market. This includes convenience stores such as Walmart, CVS, Walgreens and Target that are providing in-store clinics and healthtech tools that often provide cheaper and more convenient care. Others such as Amazon, Apple, AT&T and Verizon are relying on technology to devise new platforms for healthcare delivery that promise to alter the customer experience. This includes a recently announced joint venture by Amazon, Berkshire Hathaway and JPMorgan Chase to fundamentally change how healthcare is structured, paid for and provided. Lastly, a growing focus on the merits of universal healthcare and other regulatory mandates such as the Affordable Care Act present unique challenges and opportunity within the current system.

Today, the VC ecosystem is a vital incubator for healthcare technologies with many VC-backed firms developing tools and services to address the changing demands of the industry. In 2019, VC funding totaled $14.7 billion across 1,301 healthtech deals. As the healthcare industry continues to evolve, we expect healthtech will remain a robust segment of the market with a long runway of growth ahead of it.

1: "2019 US and Global Health Care Industry Outlook: Shaping the Future," Deloitte, Steve Burrill & Doug Beaudoin, 2019
2: We use "practitioner" to refer to physicians and credentialed individuals. "Providers" include all clinics, physician groups, health maintenance organizations, hospitals, or other discreet healthcare services, such as telehealth.

EXECUTIVE SUMMARY

We outline industry drivers as follows:

- **Regulation focused on value-based care requires providers to tie costs to outcomes:** The Patient Protection and Affordable Care Act (ACA or Obamacare, 2010) supports innovative approaches to care that can lower the costs. This includes policy that incentivizes value-based care, where practitioners and providers are paid based on patient health outcomes, rather than on the volume of cases. This has driven demand for new technologies that can help improve outcomes across the healthcare system.
- **Legislation that incentivizes adoption of technology:** The CHRONIC Care Act (2017) allows Medicare to reimburse telehealth use for chronic health conditions, such as remote patient monitoring for diabetes, cancer and heart failure. The HITECH Act (2009) was passed to encourage the implementation of electronic health records (EHR).
- **Mobile technology enabling consumers to track personal health data:** The mass adoption of mobile devices such as smart phones and wearables allows personal health data to be monitored in real time and can provide consumers (and practitioners) with actionable insight.
- **Increased consumer health awareness:** A broad trend toward consumer interest in health and wellness has increased demand for healthcare-focused consumer technologies.
- **Advancements in artificial intelligence (AI) and Big Data:** New technologies such as AI are helping to drive new insights and opportunities for providers of health and wellbeing services by predicting outcomes, identifying patterns, among other use cases. These data tools are enabling startups to add value in ways traditional care providers have not.
- **Rising cost of healthcare and failures of current health system:** In the US, company-sponsored private health insurance allowed for a significant escalation in cost of care. Additionally, a global rise in chronic illnesses, which are costly to treat, has come at an immense expense. With healthcare becoming exponentially more expensive in the final years of life, an aging population will only exacerbate the cost. Technology is perceived by many stakeholders as a solution to help control escalating healthcare costs through process automation, improvements to population health, solutions that improve access to care, among other benefits.

Key takeaways

Healthtech information tools startups pacing for record VC activity: The health information tools segment includes companies that provide software and services to help hospitals attract new patients and facilitate communications among patients and stakeholders. This category has seen a rise in investment activity due to heightened demand from consumers and providers alike. Consumers are taking a more active role in managing healthcare, and software in this category facilitates this behavior. Likewise, providers are increasingly acknowledging the importance of communication tools to inform patients. Startups in the health information tools segment have raised $1.2 billion across 26 deals in 2019, and we expect deal value will continue to grow in 2020.

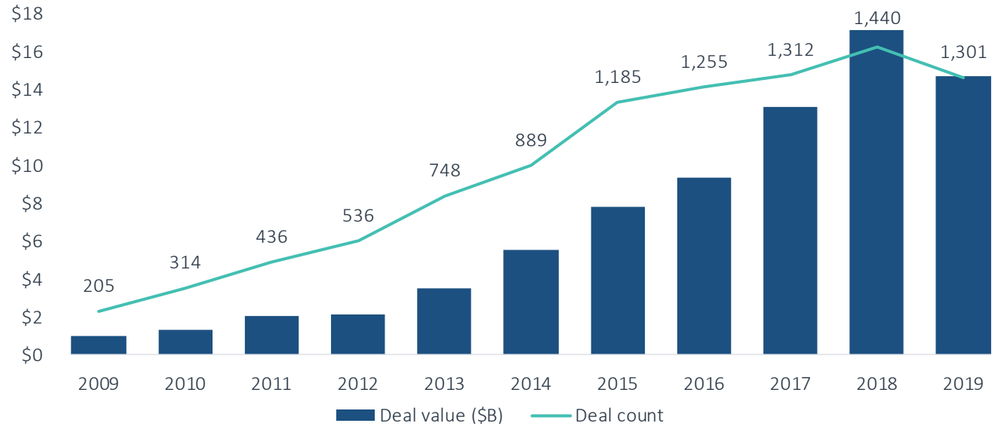
Virtual health key to future of healthcare: We view virtual health technologies as a transformative technology that will play an increasingly important role in our comprehensive healthcare in the long-term. Healthcare costs have spiraled out of control, and virtual health tools present a viable solution to address many everyday health concerns, from diagnosis to chronic-disease monitoring. Employers in the US are responsible for subsidizing employee healthcare costs, an expense that costs nearly $15,000 per employee in 2019. Companies such as Amazon are piloting telehealth solutions such as Amazon Care to test employee interest for this tool. Lastly, the emergence of virtual assistants and smart home hubs has led to millions of Americans adopting tools that are now or will soon be well suited for virtual health functionality, and smart mobile devices are already a convenient tool for virtual health connectivity.

VC activity

Healthtech companies debut on public markets after three-year drought: Following three years of minimal IPO activity, 2019 was the year of listings, with 15 healthtech companies going public. The slow pace of tech IPO listings over the past several years allowed the demand for these companies to grow, leading to an IPO window in 2019. IPOs produced $7.7 billion of the cumulative $14.7 billion in healthtech VC exit value. The surge in healthtech exit activity mirrors the brisk VC exit activity seen in the US, wherein exit value nearly doubled YoY, reaching $256.4 billion for the first time on record. 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, which could dissuade healthtech companies from pursuing an exit via IPO in 2020.

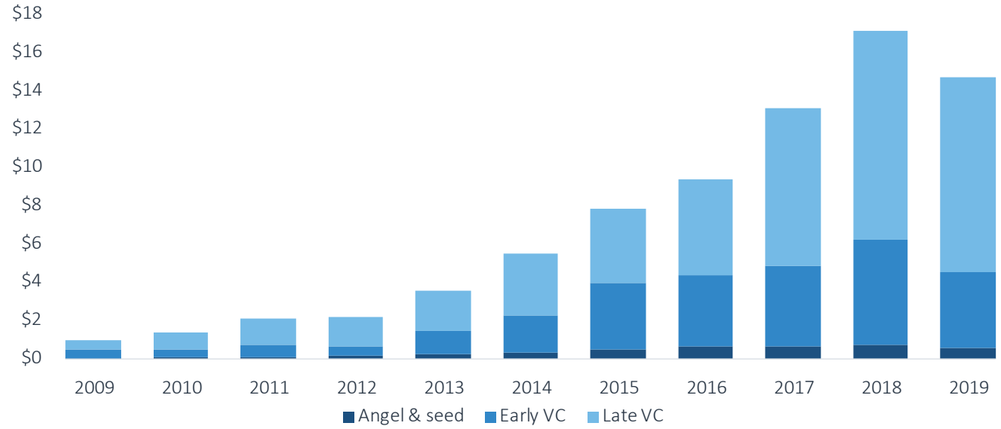
Median Series B deal size matches historical late-stage showings: Median healthtech early-stage deal sizes continue to climb as investors pour masses of capital into the stage. By the end of 2019, investors had funneled $3.9 billion into 501 early-stage healthtech deals. The median Series B deal size of healthtech companies climbed 37.9% in 2019 as a result, landing at $20.0 million. Likewise, the median pre-money valuation of healthtech companies at Series B reached $50.0 million in 2019, up from $40.0 million in 2018. Conversely, angel & seed deal sizes of healthtech companies have retracted in 2019, while the median pre-money valuation at the angel & seed stage has increased to $6.5 million, up 14.0% from 2018. The bifurcation between rising valuations and declining deal sizes could indicate that investors are taking smaller stakes at this stage. This is not to say that investor interest at these stages has stalled, but rather that investment strategies appear to be shifting. Despite the retraction, the long-term trajectory of deal sizes and valuations has shifted upward across stages. We expect that enduring investor interest in healthtech will continue to place an upward pressure on these metrics.

Figure 1. HEALTHTECH VC DEAL ACTIVITY



Source: PitchBook | Geography: Global

Figure 2. HEALTHTECH VC DEALS ($) BY STAGE



Source: PitchBook | Geography: Global

Healthtech market map

Virtual health

Telehealth

SimpleContacts, QARE, MindCare, Parsley Health, Carbon Health, dialogue, PipelineRx, AbleTo, Min Doktor, the pill club, LYRA, talkspace, InTouch Health, MDLIVE, dr. on demand, roman, KRY, American Well

Remote patient monitoring (RPM) tools

bewell connect, higi, Medically Home, LetsGet Checked, EverlyWell, tytocare, cue, FIRE1, bioIQ, NURX, virta, omada

Biometrics & wearables

Wearables

INVICTA MEDICAL, Thync, ŌURA, theranica, biofourmis, PIVOT, AVA, Owlet, BIOSERENITY, WHOOP, VitalConnect, 咕咚 codoon.com, mc10, GOQII, EARGO, NORTH

Disease & biometric monitoring

sano, nanit, VALENCELL, ELEMENT SCIENCE, PEERBRIDGE, BardyDx, EIGHT SLEEP, INFOBIONIC, AliveCor, bigfoot BIOMEDICAL, Breathe

Omics & personalized medicine

Microbiomics

DAY TWO, VIOME, DNAnexus, Kaleido BIOSCIENCES

Genomics & personalized medicine

拓普基因, FABRIC GENOMICS, genome MEDICAL, ClinicalGenomics, Lineagen, celmatix, SINGLERA Genomics, ORIG3N, CENTRILLION TECHNOLOGIES, PGDx, GenapSys, Helix, 23andMe

Operations & care management

Clinical trial management

HEALTHMYNE, antidote, PSI, medrio, DATAVANT, teckro, FMD 方恩医药发展有限公司, comprehend, Science 37

Healthcare analytics & Big Data

NextHealth TECHNOLOGIES, HealthReveal, lumiata, PROTENUS, springbuk, Vineti, Steep Hill, komodohealth, GNS HEALTHCARE, apervita, artemis HEALTH, Clarify

Operational administration & back-end

myhealthdirect, LifeImage, ZnanyLekarz, honor, AIRSTRIP, kareo, practo, 平安医保科技 (Ping An Medical and Healthcare Management)

Decision support tools

AKTANA, syapse, VillageMD

Patient management & EMR

dr chrono, PicnicHealth, REDOX, UNITE US, eso, CareCloud, eghc

Mobile & digital health

Personal health tools & tracking

elvie, noom, (Weimai Healthcare), 掌上糖医 (Zhangshang Tangyi), FORWARD, Med-gu

Digital therapeutics

AppliedVR, AKILI, PEAR THERAPEUTICS, CLICK THERAPEUTICS

Healthcare information tools

Engagement & communication tools

caremerge, lumahealth, myHealthTeams, SENSELY, mPulse, lifen, Wellframe, 丁香园 WWW.DXY.CN (DXY), Medlinker, 医仁 (Tencent Trusted Doctors), Welltok

Search services & scheduling

HealthCare.com, docdoc, SOLERA, heal, KYRUUS, GRAND ROUNDS, Zocdoc, Doctolib

Healthcare marketing

Purple Clinic, evariant, Accolade

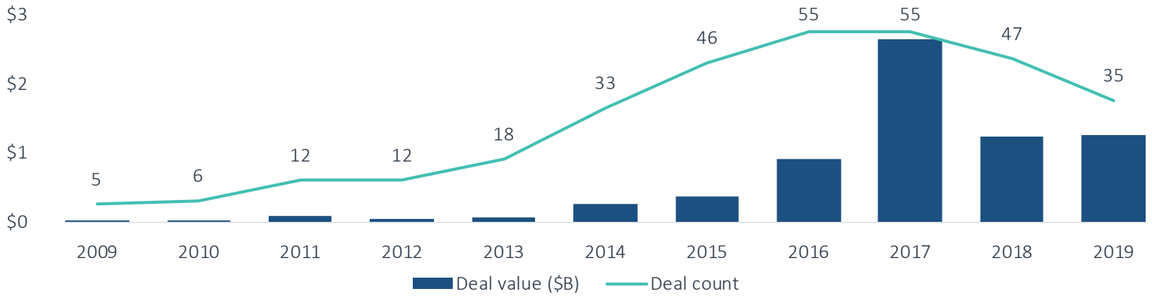
Companies included are VC-backed, segmented by primary use case and sorted by total capital raised.

SEGMENT DEEP DIVE

Virtual health

Figure 3.

Virtual health VC deal activity



Source: PitchBook | Geography: Global

Overview

The virtual health (or telehealth) category contains companies involved in the distribution of health services via video over web or mobile. Companies provide services in a variety of capacities, from visits with general practitioners to specialists such as psychiatrists. This category also contains companies focused on helping consumers interpret and derive insights from health data. The current segments within this category include:

- **Telehealth:** Telehealth connects patients and healthcare providers via computers, mobile devices and A/V systems to deliver healthcare services remotely.
- **Remote patient monitoring (RPM):** RPM tools help consumers manage an increasingly wide range of health needs without a visit to a healthcare provider by utilizing at-home diagnostic tests.

Industry drivers

- Consumer and provider demand for more convenient and accessible models of care
- Rising healthcare costs and the push for value-based care driving telemedicine, which is often cheaper because fewer resources are required
- Aging population and increase in number of patients with chronic conditions increasing the need for ongoing monitoring and medical care

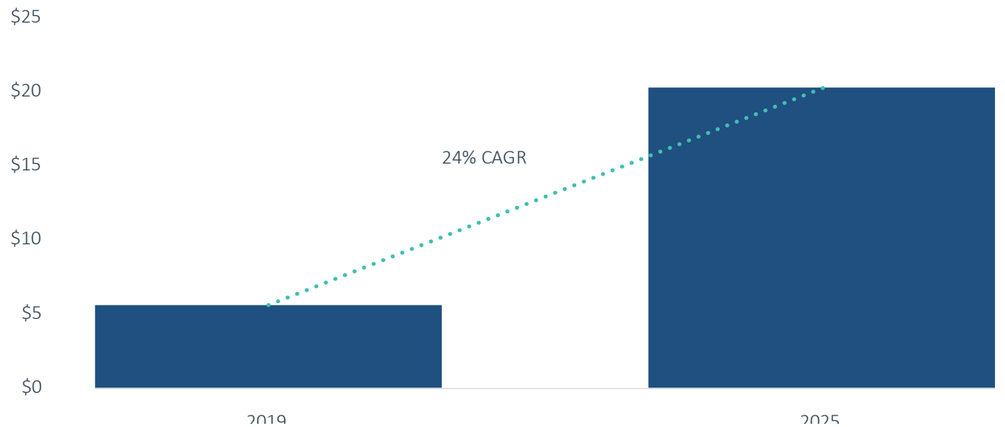
Market size

We estimate the global telehealth market to be $5.6 billion in 2019. We forecast telehealth to grow at a 24% CAGR between 2019 and 2025, slightly slower than the pace of the global digital health market, which is projected to grow at a CAGR of 29.6% over the same timeframe. Virtual health is one of the older digital health technologies and has struggled to gain adoption over the past decades; however, a variety of factors lead us to believe that this will be a high-growth segment over the next five years.

Business model

Telehealth companies connect patients with healthcare providers such as physicians and therapists. While most providers focus on software, some companies develop hardware for specific use cases (e.g. video devices for hospital exam rooms when doctors are remote). These companies monetize by selling their products and services to healthcare providers (through B2B or B2B2C models) or direct to consumers. Software is typically sold through a SaaS model or per visit.

Figure 4. TELEHEALTH MARKET SIZE ($B)



Source: Transparency Market Research, ResearchandMarkets, PitchBook estimates | Geography: Global

COMMON INDUSTRY KPIS

Software

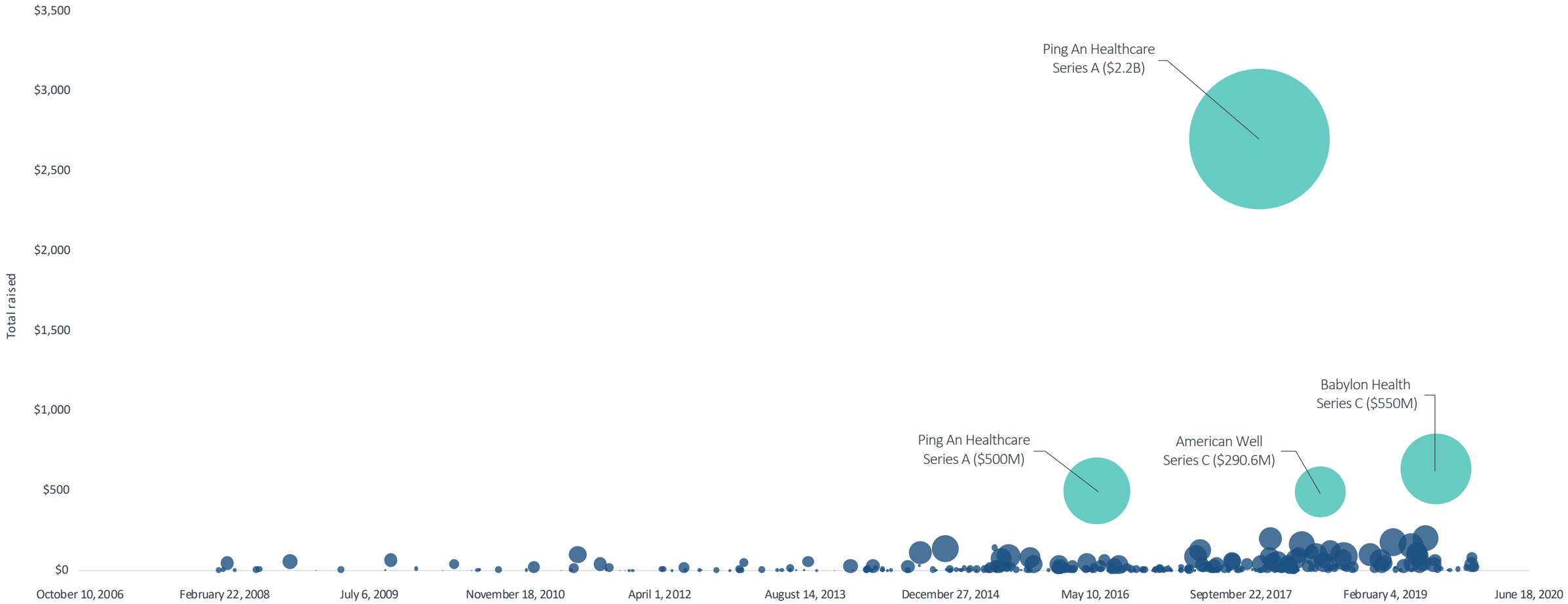
- Lifetime value (LTV)
- Customer acquisition costs (CAC)
- CAC/LTV ratio
- Monthly recurring revenue
- Customer churn & revenue churn

Hardware

- Per-unit manufacturing cost
- Gross profit margin
- COGS/unit sales

Figure 5.

Recent deal sizes of VC-backed virtual health companies by total capital raised ($M)



Source: PitchBook

Figure 6.

Notable virtual health VC deals

COMPANY	CLOSE DATE	SUBSEGMENT	STAGE	DEAL SIZE ($M)	LEAD INVESTOR(S)
bioIQ	December 4, 2019	Remote patient monitoring tools	Series H	$14.0	Undisclosed
Medically Home	December 2, 2019	Remote patient monitoring tools	Series B	$22.8	Cardinal Health
omada	October 11, 2019	Remote patient monitoring tools	Late-stage VC	Undisclosed	Intermountain Ventures
current health	December 10, 2019	Remote patient monitoring tools	Series A	$11.7	Legal & General Group UK Pension and Assurance Fund, MMC Ventures
iris Plans	October 16, 2019	Telehealth	Series A	$3.8	Undisclosed
regroup	November 14, 2019	Telehealth	Series A2	$4.7	Undisclosed

Source: PitchBook

Figure 7.

Notable virtual health VC exits

COMPANY	CLOSE DATE	SUBSEGMENT	EXIT SIZE ($M)	ACQUIRER/INDEX	VALUATION STEP-UP
CHIRON HEALTH	January 03, 2019	Telehealth	Undisclosed	Medici (Application Software)	Undisclosed
sherpaa	February 07, 2019	Telehealth	Undisclosed	Crossover Health	Undisclosed
GENEVA HEALTH SOLUTIONS	March 01, 2019	Remote patient monitoring (RPM) tools	$65.9	BioTelemetry	6.64x
AKIRA	July 31, 2019	Telehealth	Undisclosed	Telus Health	Undisclosed
vivifyhealth	November 01, 2019	Remote patient monitoring (RPM) tools	Undisclosed	Optum	Undisclosed
regroup	December 10, 2019	Telehealth	Undisclosed	InSight Telepsychiatry	Undisclosed
SnapMD	December 12, 2019	Telehealth	Undisclosed	Virtrial	Undisclosed

Source: PitchBook

Opportunities

Businesses are increasingly incorporating telehealth services into benefits packages: With employer-sponsored healthcare benefits approaching $15,000 per employee, healthcare benefits constitute a significant and growing expense for employers.[3] Many companies are taking steps to reduce the continued rise of healthcare costs with telehealth services seen as a cost-effective option to aid in this effort. Many 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 in 2019.[4] As employers expand telehealth offerings and as employees become increasingly accustomed to digital health tools, we expect utilization rates to increase. Companies may also view telehealth as an effective means to offer new kinds of treatments. For example, according to the National Business Group on Health's survey, 13% of large employers will 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.[5]

Mounting US policy support for expanded coverage of telehealth: While US policy is very restrictive regarding Telehealth regulations and reimbursement, both state and federal regulators are increasingly recognizing the value proposition that telehealth provides. Currently Medicare will only reimburse for telehealth services under very narrow circumstances, but we believe the loosening of those constraints is already underway. For example, the Centers for Medicare and Medicaid Services (CMS), the federal agency that administers Medicare, has been granting telehealth waivers to a group of Medicare Accountable Care Organizations (Next Gen ACOs). Regarding private insurance in the US, 26 states have adopted laws requiring insurers to reimburse telehealth visits, and more states are considering legislation. Additionally, dozens of state and federal bills addressing telehealth were introduced in 2018, a signal of expanding interest. Going forward, we expect to see a continued loosening of regulations and expansion of Medicare reimbursement as telehealth is further embraced by politicians and consumers.

Considerations

Telehealth looks good on paper, yet adoption hurdles remain: For an industry characterized by decades of regulation, complex stakeholder relationships and ingrained legacy processes and procedures, we believe telehealth represents a significant paradigm shift. For example, telehealth startup Lemonaid Health has struggled to overcome barriers such as licensing doctors with multiple local medical boards, seeking business licenses from multiple Secretaries of State, and deciphering and complying with each state's complex regulations. For this reason, its acceptance will require stakeholders to work together to redefine regulations, relationships and payment structures, and consumers' will have to develop more trust in and comfort with virtual interactions. We expect demographics will play a large role in this shift as younger, digital-native generations adopt these technologies more quickly than older generations. Longer term, AI could pose as much of a threat as a benefit, as technologies evolve from pattern recognition and diagnoses assistance to take on increasingly complex telehealth services, with virtual doctors potentially able to replace the need for actual physicians over time.

3: "2020 Large Employers' Health Care Strategy and Plan Design Survey," National Business Group on Health, 2019
4: Ibid.
5: Ibid.

Increasing digital health competition: Telehealth faces competitive threats from fully digital alternatives as well as efforts among traditional providers to improve patient throughput and satisfaction rates. Digital health alternatives to telehealth include behavioral health apps Calm and Aurora, home medical exams such as TytoCare and patient communications & consultation software such as Babylon Health.

Outlook

Consolidation of niche specialties to provide one-stop shops: While many of today's telehealth companies focus on niche care (e.g. diabetes management), there have been 9 M&A deals in this space since 2019 as providers seek to broaden their specialties and areas of focus. As the industry remains fragmented, we expect to see continued industry consolidation as companies look to become more competitive, grow market share and appeal to a larger audience.

Partnerships to drive new distribution: To date, most telehealth companies have employed business models that focus on B2B offerings through employee-benefit plans or direct-to-consumer models. However, emerging models and partnerships could improve the telehealth value proposition by expanding services and adding new distribution channels. For example, MDLive recently partnered with Walgreens to offer telehealth services in 25 states through the Walgreens app.[6] Companies are also adding new services to create holistic offerings. For example, subscription health service provider Babylon Health's app includes a virtual assistant, health-mapping tools, as well as text and video consultations with doctors. We expect telehealth startups will continue to find ways to enhance and augment services to drive new adoption and market penetration.

Industry growth: Although virtual health has existed for decades without mass adoption, advancements in technology and shifting consumer demand signal strong growth outlook. Estimates place this industry at roughly $5.6 billion globally, with expected growth rates in the 24% range between 2019 and 2025.[7] Given the continued focus on consumer-led healthcare and the need for corporates to reduce employee-healthcare spend, we believe this industry should be able to sustain these growth rates for the foreseeable future.

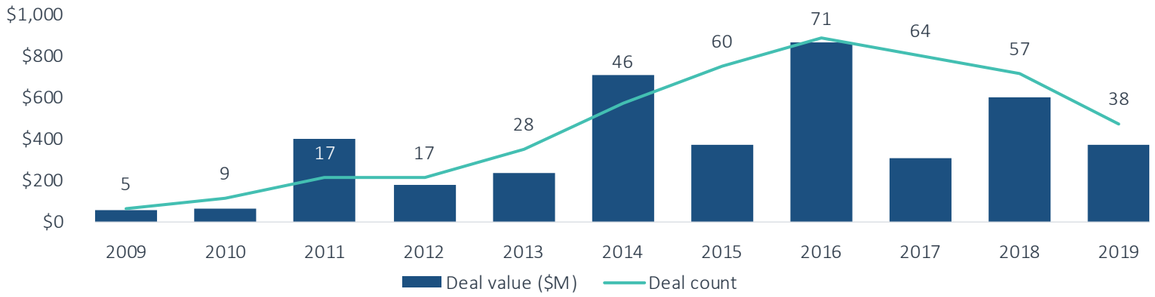
6: "Walgreens Announces New Digital Health Initiatives; Expands Access to Enhanced MDLIVE Live Doctor Consultation Offering to 20 Additional States, Now Totaling 25," MDLIVE, November 10, 2015
7: "Telehealth Market – Global Industry Analysis, Size, Share, Growth, Trends, and Forecast, 2017-2025," Transparency Market Research, March 2018

SEGMENT DEEP DIVE

Biometrics & wearables

Figure 8.

Biometrics & wearables VC deal activity

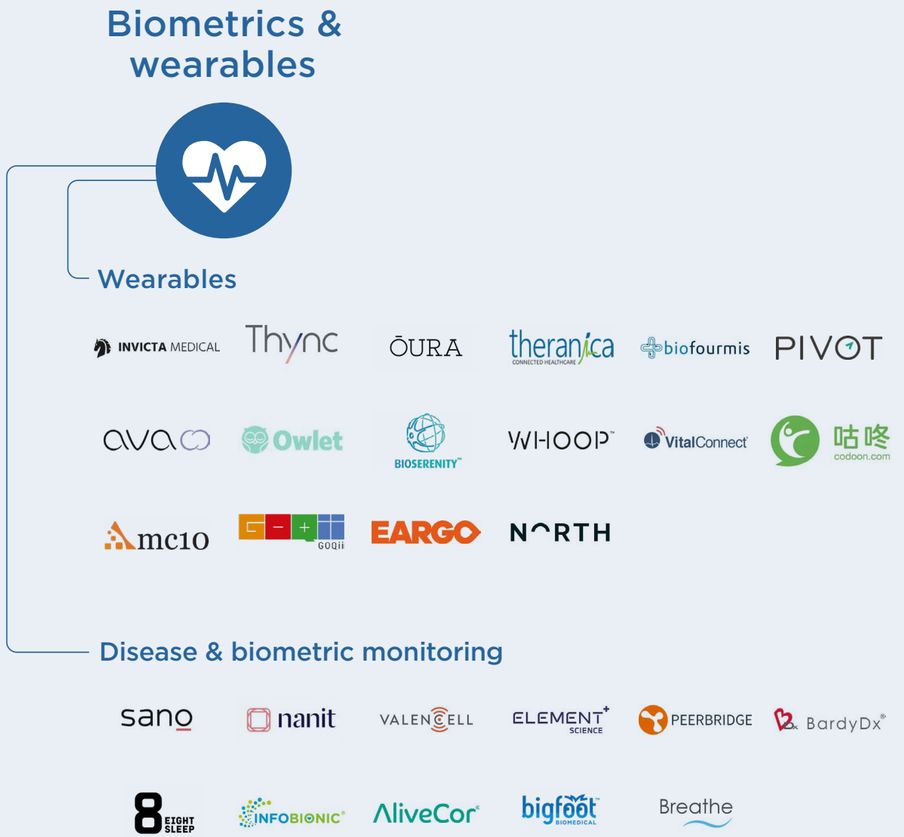


Source: PitchBook | Geography: Global

Overview

The biometrics & wearables category includes companies that are integrating biometric technology into wearable devices that can monitor and/or improve user health. Wearables include hardware worn by users that can continuously monitor a multitude of data points including biometric indicators, physical activity or location. 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 and wellness indicators such as heart rate, fertility, blood sugar and more. The current segments within this category include:

- **Wearables:** Health-focused devices that are worn and monitor health data or perform a specific function (e.g. improve circulation)
- **Disease & biometric monitoring:** Devices (wearable or not) designed to monitor or manage diseases



Industry drivers

- The “Quantified Self” movement encouraging consumers to use wearable devices to track personal fitness and health data for overall wellness
- Improving functionality, popularity and performance of smart watches boosting adoption
- The growing segment of the population with diabetes or cardiovascular disease increasing the market for wearable glucose and ECG monitors
- The global continuous glucose monitoring (CGM) device market expected to rise to $1.0 billion by 2024, with a CAGR of 13.7%

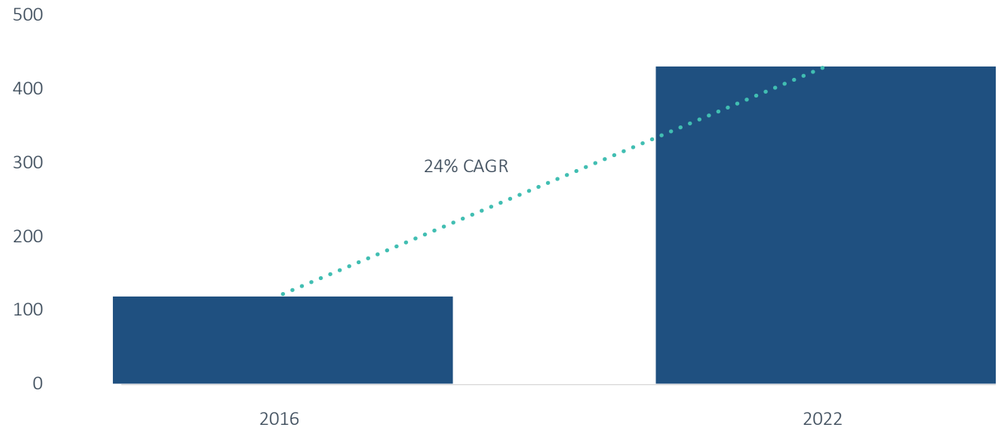
Market size

The global wearable technology market is expected to grow 430 million units annually by 2022 at a CAGR of 24% from 118 million units in 2016. This estimate includes applications outside of healthcare.

Business model

Biometrics & wearable companies manufacture hardware to monitor and/or improve user health. Wearables include hardware worn by users to continuously monitor a multitude of biometric indicators, including activity and location. These companies monetize by selling their products and services to healthcare providers and payers (through a B2B2C model) or direct to consumers. Both hardware and software could be sold through a one-time purchase or through a SaaS model.

Figure 9. WEARABLE TECHNOLOGY MARKET SIZE (UNITS, M)



Source: Tractica, PitchBook estimates | Geography: Global

COMMON INDUSTRY KPIS

Software

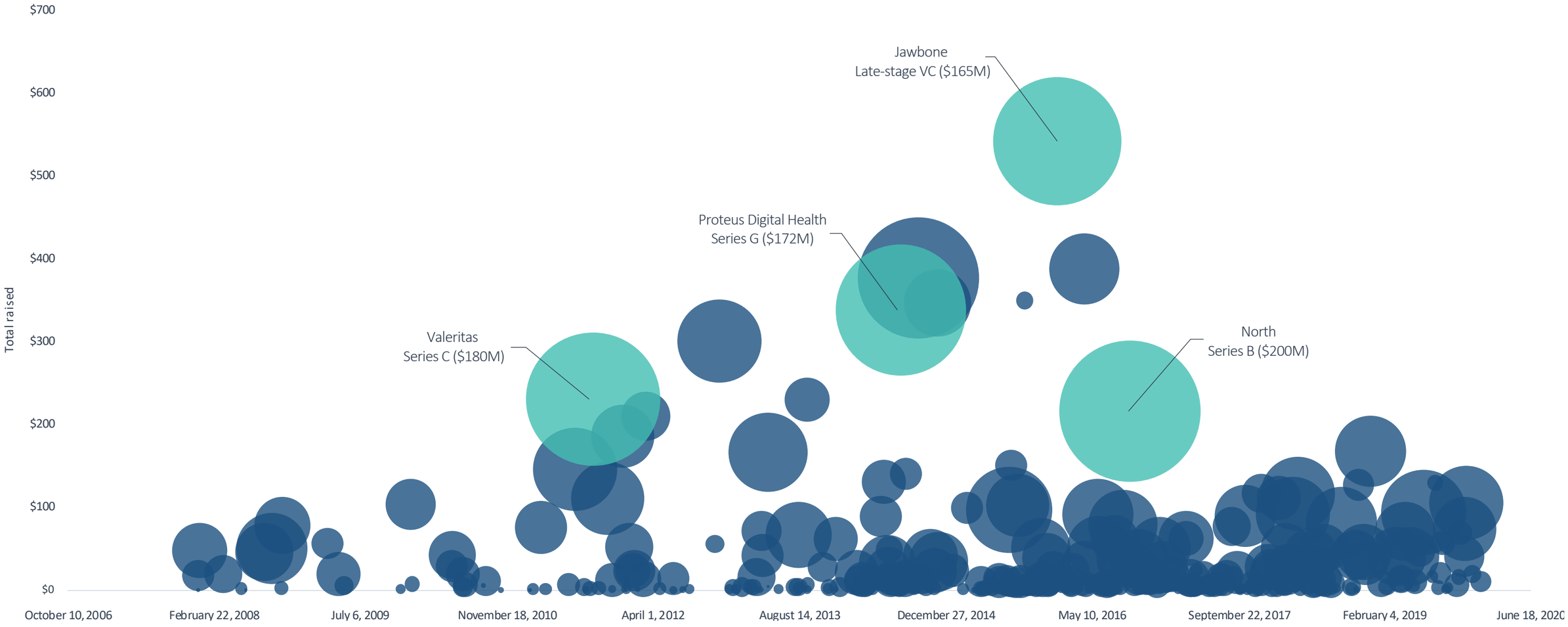
- Revenue growth
- Customer acquisition cost (CAC)
- Volume: Size of dataset per customer (e.g. 5 GB)
- Variety: Number of data sources
- Velocity: Data volume analyzed/ generated per period

Hardware

- Per unit manufacturing cost
- Gross profit margin
- COGS/unit sales

Figure 10.

Recent deal sizes of VC-backed biometrics & wearables companies by total capital raised ($M)



Source: PitchBook

Figure 11.

Notable biometrics & wearables VC deals

COMPANY	CLOSE DATE	SUBSEGMENT	STAGE	DEAL SIZE ($M)	LEAD INVESTOR(S)
icentia	December 9, 2019	Disease & biometric monitoring	Late-stage VC	Undisclosed	Crédit Mutuel Equity
somatix	December 31, 2019	Wearables	Early-stage VC	$4.5	Digitalis Ventures
feel	October 10, 2019	Wearables	Seed	$6.1	Felicis Ventures
EIGHT SLEEP	November 6, 2019	Disease & biometric monitoring	Series B2	$40.8	Founders Fund
WHOOP	November 12, 2019	Wearables	Series D	$55.0	Foundry Group
BIOSERENITY	November 5, 2019	Wearables	Corporate	Undisclosed	SCOR Global Life
Eccrine Systems, Inc. SWEATRONICS	October 17, 2019	Wearables	Late-stage VC	$2.5	Undisclosed
physIQ	December 2, 2019	Wearables	Late-stage VC	$3.3	GF Securities and Quark Venture
AliveCor	October 21, 2019	Disease & biometric monitoring	Angel (individual)	$5.8	Undisclosed

Source: PitchBook

Figure 12.

Notable biometrics & wearables VC exits

COMPANY	CLOSE DATE	SUBSEGMENT	EXIT SIZE ($M)	ACQUIRER/INDEX	VALUATION STEP UP
huami	February 8, 2018	Disease & biometric monitoring	$543.8	New York Stock Exchange	1.81x
kiwi wearable tech	April 26, 2018	Wearables	Undisclosed	Sentiance	Undisclosed
RAYTELLIGENCE	December 20, 2018	Disease & biometric monitoring	$5.5	NGM Stock Exchange	Undisclosed
Breathe TECHNOLOGIES	September 3, 2019	Disease & biometric monitoring	$130.0	Hill-Rom Holdings	Undisclosed

Source: PitchBook

Opportunities

Technology miniaturization: Advancements in technology have facilitated the miniaturization of large medical devices that have traditionally been confined to healthcare facilities. For example, professional electrocardiogram (ECG) machines found in hospitals have traditionally been large devices that can have the appearance of bulky laptops. Today's ECGs can be miniaturized and applied to consumer wearable applications such as smartwatches and smart apparel to monitor cardiac health. Miniaturization of other medical technologies will allow for mobile monitoring and management of many other health conditions, leading to further consumer applications.

Making use of "digital exhaust": Wearable devices include many sensors collecting large datasets that are sometimes ignored or underutilized. For example, a smart watch with a heart-rate monitor may simply store the heart-rate data without providing the users with any actionable alerts or insights. Much of this raw data has come to be known as "digital exhaust," and it can be problematic when it comes to storage and security. However, we believe emerging database software focused on the "digital exhaust" problem could provide opportunities for healthcare-focused firms seeking to monetize this data or make it more useful for consumers. For example, Seqster is a healthtech software company that is aggregating patient health data from healthcare providers, wearable fitness devices and consumer gnomic businesses to provide a comprehensive view of patient health and derive trends and actionable insights.

The insurance opportunity: Insurers are increasingly experimenting with health-tracking wearables to incentivize certain customer behavior and to gather population data. Insurer John Hancock introduced its first wearable-based life insurance policy in 2015 and recently announced that all future policies will be interactive (i.e. requiring the use of a wearable or mobile device to track activity). To the extent wearables prove an effective tool for insurers to monitor and encourage certain customer behaviors, we believe health insurers and employers are likely to do the same.

Considerations

Hardware commoditization puts focus on software: Wearable hardware can quickly become commoditized, specifically in the smartwatch space, which now has a multitude of indistinguishable players. This puts pressure on providers to create unique and differentiated software applications to attract consumers. While a large and sticky user base can drive positive network effects, this is a difficult task when competitive moats are low.

Battery limitations: We see the current state of battery technology as a key limitation for wearables. Wearable devices require small batteries, and constant user monitoring leads to quick battery drain. This can be a significant impediment to adoption for users that wish to monitor serious conditions.

Wearables alone may not be enough to help consumers: While wearables can track patterns and provide instant feedback, this type of digital monitoring alone may not be enough to help consumers attain their specific health targets. These devices are likely more effective when paired with other resources, such as health providers, wellness coaches and training programs, etc. This need for ancillary services could slow adoption.

Outlook

Ease of adoption should drive steady demand: We believe wearable technology offers promising benefits to many stakeholders across the healthcare ecosystem including patients, insurers and healthcare providers. Benefits including affordability, portability and convenience should help drive consumer adoption. Additionally, we expect that as the technology improves and new use cases are uncovered, wearable technology will become more refined and integrated into everyday life.

Device use to become a more seamless experience: Technological innovations are pushing wearables toward better integration into daily life. From the incorporation of biometric sensors into cellphones to ECG sensors in t-shirts, companies are finding new ways to make wearable technologies less intrusive. For example, healthtech company Withings recently announced a new smartwatch that performs on-demand ECG readings and costs less than half the price of the Apple Watch at $130.

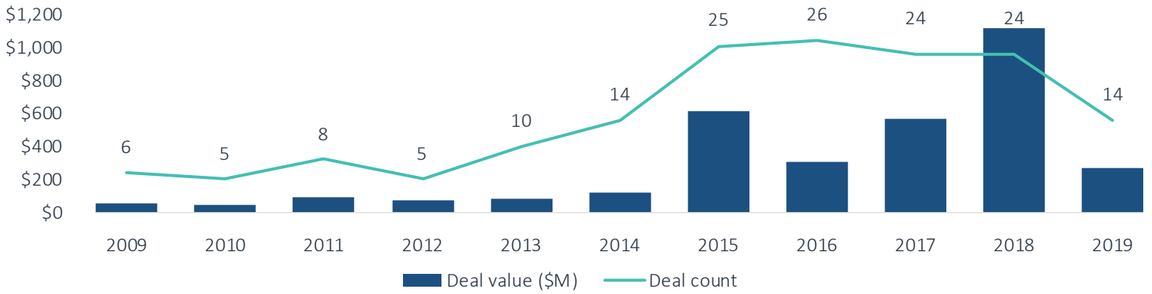
Vertical consolidation likely: The wearable & quantified self vertical saw 14 M&A deals in 2019, and we expect consolidation to continue. Specifically, the growing need for hospitals to reduce costs and pursue value-based care strategies is likely to drive vertical consolidation as providers seek to add wearable technology capabilities. The largest transaction in the last two years was Best Buy's $800 million acquisition of wearable healthtech company GreatCall. The deal was part of Best Buy's strategy to expand into healthcare and to target a growing age population.

SEGMENT DEEP DIVE

Omics & personalized medicine

Figure 13.

Omics & personalized medicine VC deal activity

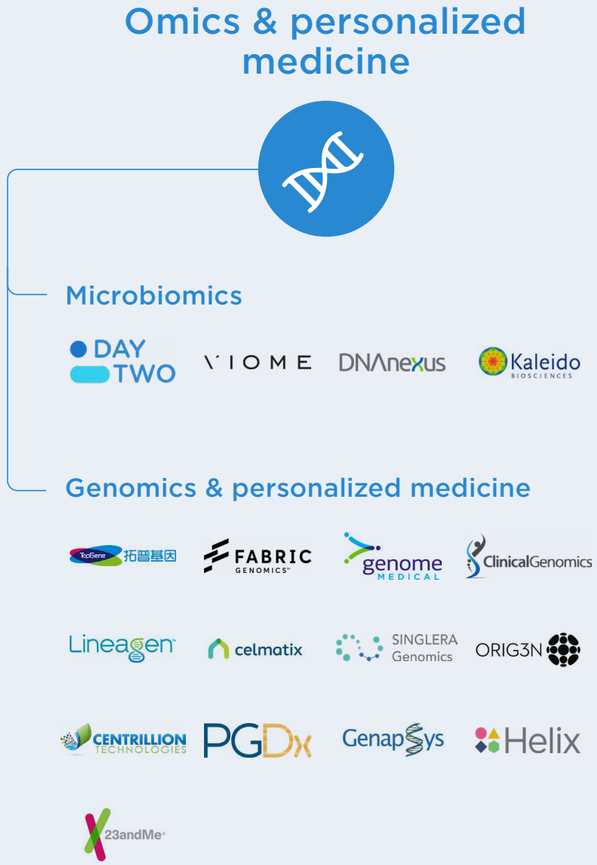


Source: PitchBook | Geography: Global

Overview

Microbiomics and genomics & personalized medicine companies are focused on capturing and interpreting DNA and microbiome data. Services include providing personalized recommendations or treatments based on genomic or microbiomics indicators. The current segments within this category include:

- **Genomics & personalized medicine:** Services that collect DNA samples and/or interpret the health implications of the results
- **Microbiomics:** Similar to genomics, microbiomics services collect and interpret microbiota, which are the microorganisms that exist in and on all living things. Samples can be taken from the gut, skin or other places



Industry drivers

- Consumer demand for health, ancestry and other personalized information derived from genetics.
- Advances in genetic testing leading to ongoing cost reduction of whole-genome sequencing (WGS), making it more accessible to the general population.
- Ongoing scientific research continually unlocking new insights from genetic code, increasing value of testing.

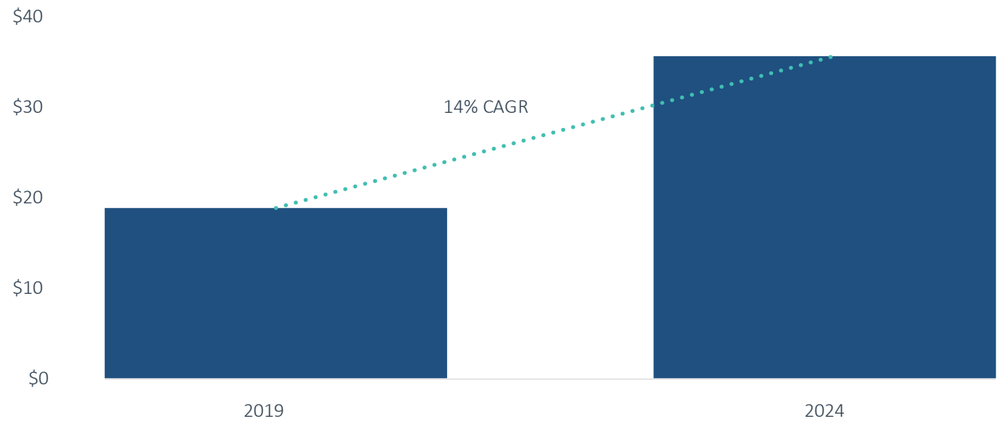
Market size

We estimate the genomics market at $18.9 billion as of 2019 with growth projected to be 13.5% CAGR through 2024. Growth in genomics products, increasing applications for use, and government support are factors contributing to the growth.

Business model

Genomic-testing companies provide services that monitor consumers' genomic data in order to track potential health issues, metabolic information and drug sensitivity. Genomic testing can help providers develop personalized medicines, foods and consumer products (e.g. soaps or makeup). Genetic testing companies also sell user data to third parties such as pharmaceutical companies, healthcare providers and consumer packaged goods providers seeking to develop more personalized products.

Figure 14. GENOMICS MARKET SIZE ($B)



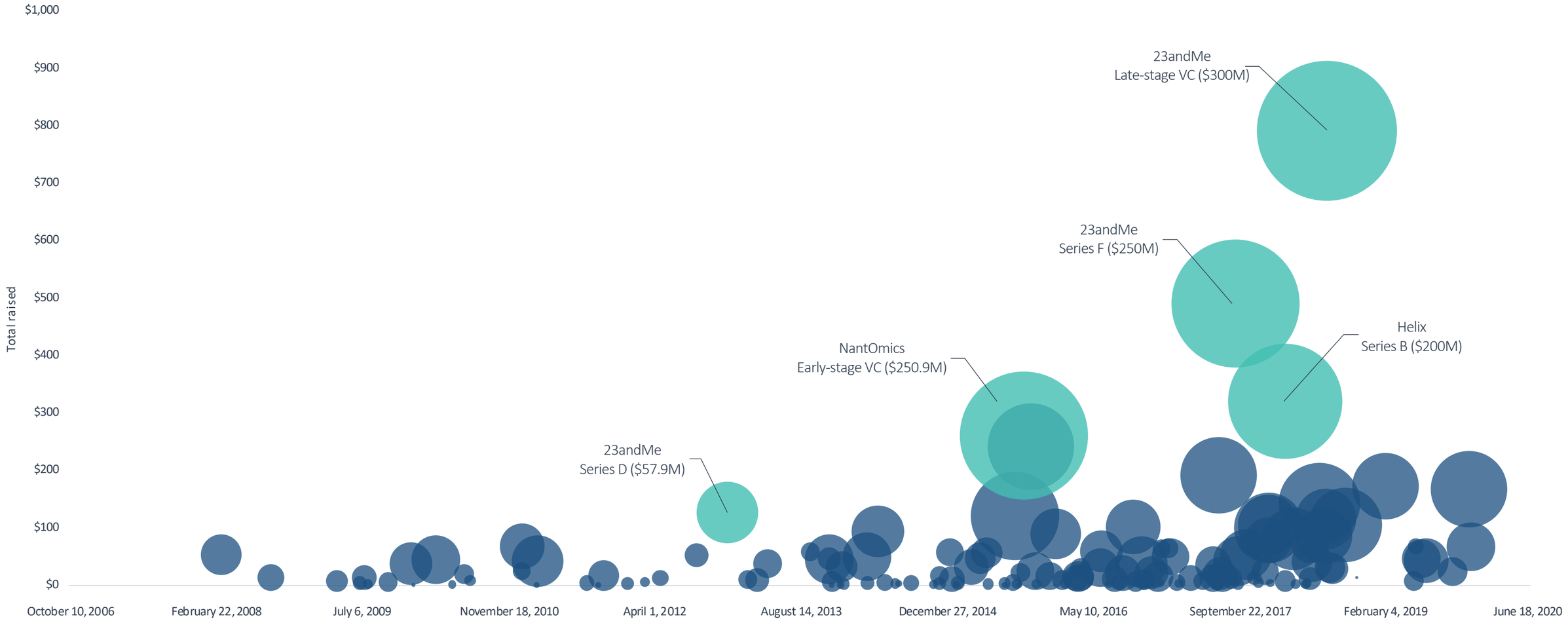
Source: MarketandMarkets, PitchBook estimates | Geography: Global

COMMON INDUSTRY KPIS

- Lifetime value (LTV)
- Customer acquisition costs (CAC)
- Revenue or profit/customer
- Growth rate
- Volume: Size of dataset per customer (e.g. 5 GB)

Figure 15.

Recent deal sizes of VC-backed omics & personalized medicine companies by total capital raised ($M)



Source: PitchBook

Figure 16.

Notable omics & personalized medicine VC deals

COMPANY	CLOSE DATE	SUBSEGMENT	STAGE	DEAL SIZE ($M)	LEAD INVESTOR(S)
VIOME	November 27, 2019	Microbiomics	Series B	$36.5	Undisclosed
GenapSys	November 20, 2019	Genomics & personalized medicine	Series C	$90.0	Foresite Capital Management

Source: PitchBook

Figure 17.

Notable omics & personalized medicine VC exits

COMPANY	CLOSE DATE	SUBSEGMENT	EXIT SIZE ($M)	ACQUIRER/INDEX	VALUATION STEP-UP
Counsyl	July 31, 2018	Genomics & personalized medicine	$405.9	Myriad Genetics	1.80x
gmi genomics medicine ireland	November 27, 2018	Genomics & personalized medicine	Undisclosed	WuXi NextCODE	Undisclosed
LABCYTE	January 30, 2019	Genomics & personalized medicine	Undisclosed	Beckman Coulter	Undisclosed
Kaleido BIOSCIENCES	February 27, 2019	Microbiomics	$369.5	NASDAQ	0.57x

Source: PitchBook

Opportunities

New health insights: Technological innovations are allowing consumers to learn more about their genetic code for less money. WGS is now available for under $1,000 achieved first by Veritas Genetics, and current and future insights hold incredible implications for preventative health management. Genes are effective for identifying increased risks for health conditions. Although research has already unveiled many useful insights, further scientific exploration of the human genome promises to unlock a wealth of information that will help people take preventative measures and better manage their health.

Transformation of personalized medicine: Unlocking genetic information will empower practitioners to identify and treat conditions more quickly and accurately and will allow pharmaceutical companies and healthcare providers to develop much more precise therapies for patients. The ability to identify and pinpoint how consumers will react to certain drugs could help eliminate negative or unintended side effects, while physicians should be able to make much more exact prescription recommendations based on the patient.

Gene-editing commercialization: In the same way that DNA testing (e.g. Ancestry) has become a significant industry, we believe that gene-editing techniques (such as CRISPR) will also eventually become viable businesses. WGS can allow new ways of analyzing health issues and risks and provide new treatment options for consumers, unlocking new products and services. In the long term, as genetic diseases become better understood, advances in gene editing could allow geneticists to edit mutations, reversing diseases.

Genetic counseling and analytic services gain: Genetic counseling has traditionally focused on helping families understand risks for inheriting hereditary medical conditions. The expansion of genetic testing will increase the opportunity for experts and analytic software providers to help interpret genetic data and provide consultations for patients. These counseling services may be provided by DNA sampling, sequencing and storage firms, healthcare providers and/or insurers. They may also be obtained independently by consumers.

Considerations

Regulatory and legal hurdles could slow growth: Many genetic tests today are not regulated and do not undergo independent analysis to verify results. As genetic testing becomes more mainstream and is increasingly used for medical treatments and procedures, we expect regulatory bodies will establish clearer frameworks and requirements. Currently, three federal agencies have the authority to regulate genetic tests; the Food and Drug Administration (FDA), the Centers for Medicare and Medicaid Services (CMS) and the Federal Trade Commission (FTC). The FDA has historically provided minimal oversight of genetic-testing companies owing primarily to the fact that the industry remains very small. However, growth in the space has raised concern among FDA leaders that a lack of regulation could pose a public health threat. In response, the agency has drafted new guidance regarding future regulation and validation of genetic tests.

High costs of WGS testing: The cost to perform WGS testing has been reduced drastically over the past decade and is currently around $1,000. While we expect this cost will

continue to decline, the costs of auxiliary services such as counseling and storage may place genome testing out of reach for many. Veritas Genetics sells comprehensive genetic counseling for $299.00 an hour.

Public acceptance and ethics concerns: DNA testing raises many questions related to ancestry, health risks and personalized medicine. Despite the many benefits of the science, ethical concerns related to ownership of the data and how it is used, as well as the potential for genetic discrimination, remain unresolved and will likely become more controversial as the science expands. Manipulation of genetic code (through CRISPR technology, among others) continues to be a hot-button issue that could create waves throughout the omics sector.

Outlook

Genomic medicine could drive improved health outcomes: While there are many questions related to the value of genomic analysis, the science holds great potential and could unlock very effective ways to treat illness and improve wellness. Genomic testing and personalized medicine offer an incredible value proposition and a promise to revolutionize healthcare by providing patients with detailed information about health and risk factors. We expect genetics to become an integral component of medical diagnostics and therapeutics and a healthy opportunity for growth among ancillary service providers.

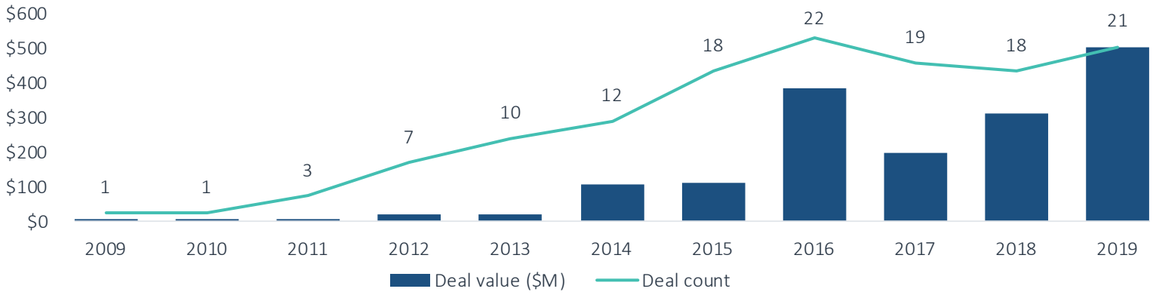
Increased partnerships with employers and healthcare providers: As the benefits of genomics become better understood, we expect the traditional care industry to find new ways to integrate genetic-testing services into core health offerings. One provider, NorthShore University HealthSystem, is currently conducting a pilot that will provide 10,000 primary care patients with free genetic testing through startup Color along with annual checkup exams. Additionally, an increasing number of employers are offering genetic testing as part of their health benefits packages. We expect to see more such partnerships as employers and providers seek to reduce costs by providing more robust preventative care services.

SEGMENT DEEP DIVE

Mobile & digital health

Figure 18.

Mobile & digital health VC deal activity



Source: PitchBook | Geography: Global

Overview

Mobile & digital health firms help healthcare administrators and/or patients treat, monitor and manage their health needs through hardware and software applications. The current segments within this category include:

- **Personal health tools & tracking:** Software tools to help consumes monitor and manage health concerns
- **Fitness & wellness:** Products focused on empowering users to improve contributing health factors such as sleep, diet and fitness
- **Digital therapies:** Software solutions with therapeutic objectives designed to treat medical conditions and are often prescribed. Digital therapies such as Akili Interactive's AKL-T01 are increasingly being used in place of or in tandem with pharmaceutical therapies.

Industry drivers

- Rising cost of healthcare leading consumers to seek out more affordable alternative digital solutions.
- Mobile adoption expanding the userbase for health apps.
- Growing acceptance of mobile care (for example, WebMD).
- Desire to incorporate wellness lifestyle and behavior into everyday life.

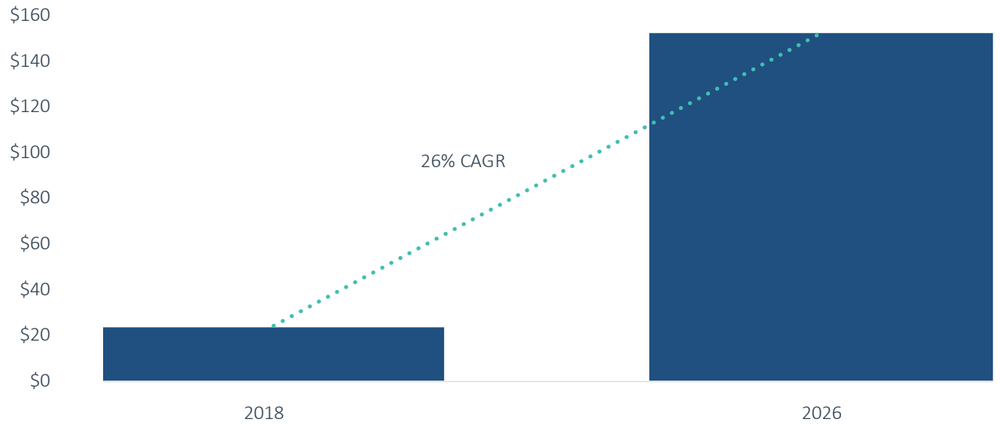
Market size

The global mobile health market is estimated to reach $152 billion by 2026 propelled by a 26.1% CAGR from a market size of approximately $24 billion in 2018.

Business model

Mobile & digital health companies provide software and services enabling users to better monitor and improve their health. Segments include personal health tools & tracking, fitness & wellness and digital therapeutics. The format is typically desktop software or mobile apps, although hardware solutions are common in the fitness & wellness segment.

Figure 19. MOBILE HEALTH MARKET SIZE ($B)



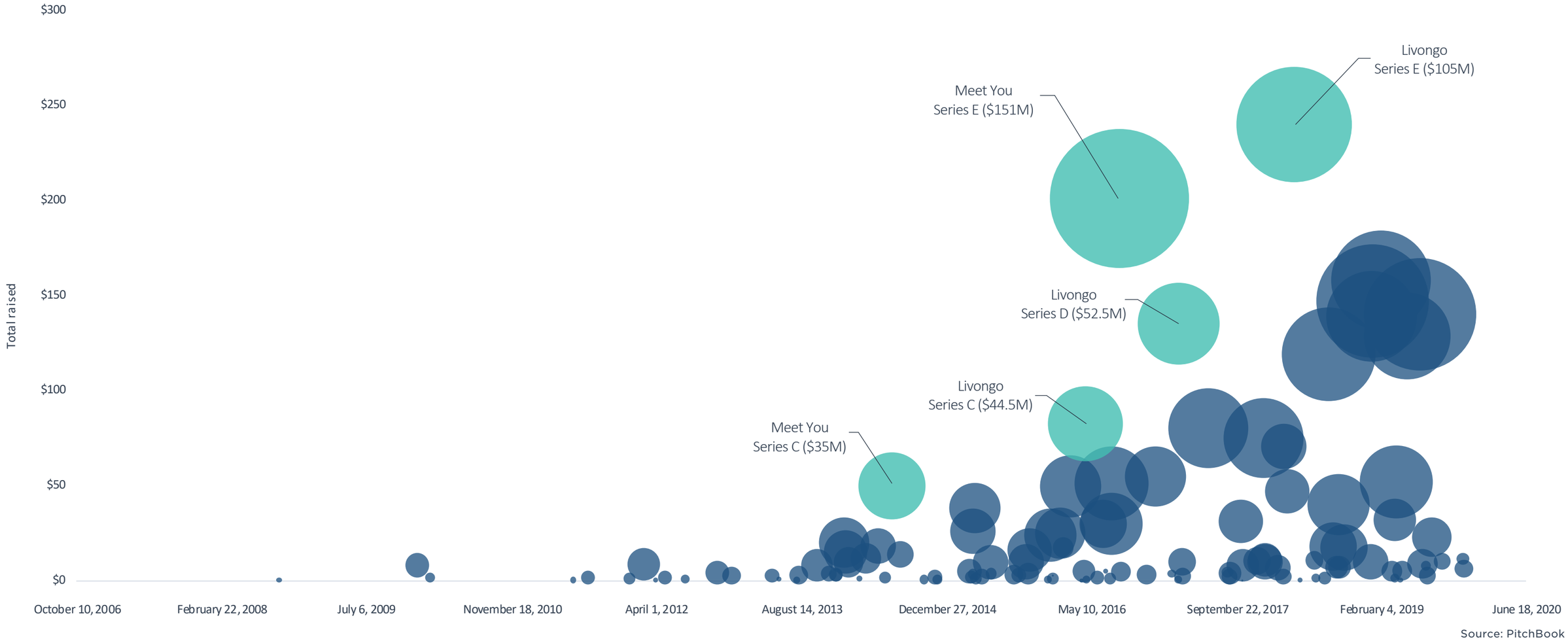
Source: Acumen Research and Consulting, PitchBook estimates | Geography: Global

COMMON INDUSTRY KPIS

- Customer retention
- Customer penetration
- Monthly recurring revenue (MRR)
- Churn rate
- Customer acquisition costs (CAC)
- Viability ratio (LTV/CAC)

Figure 20.

Recent deal sizes of VC-backed mobile & digital health companies by total capital raised ($M)



Source: PitchBook

Figure 21.

Notable mobile & digital health VC deals

COMPANY	CLOSE DATE	SUBSEGMENT	STAGE	DEAL SIZE ($M)	LEAD INVESTOR(S)
cecelia HEALTH	November 15, 2019	Personal health tools and tracking	Late-stage VC	$1.2	Undisclosed
HYGIEIA A BETTER WAY TO USE INSULIN	November 18, 2019	Personal health tools and tracking	Late-stage VC	$2.6	Undisclosed

Source: PitchBook

Figure 22.

Notable mobile & digital health VC exit

COMPANY	CLOSE DATE	SUBSEGMENT	EXIT SIZE ($M)	ACQUIRER/INDEX	VALUATION STEP-UP
Livongo	July 25, 2019	Digital Therapeutics	$2,190.5	NASDAQ	2.72x

Source: PitchBook

Opportunities

Caring for the aging population more efficiently: According to the UN, the global population aged 60 and over is expected to double to nearly 2.1 billion by 2050.[8] This is expected to add significant stress to the healthcare system, driving strong demand for care solutions that can scale to meet the needs of an aging population. We believe designing apps that cater specifically to the needs of older populations who may have existing conditions or who are not digital-native could prove to be a compelling growth opportunity. Companies such as CareMessage, Hometeam and CarePredict are just a few examples of startups bringing aging populations into the digital age of healthcare.

Monitoring noncommunicable diseases (NCDs): NCDs are environmental and inherited illnesses such as cancer, heart disease and diabetes. These diseases are prevalent in wealthy countries and are on the rise in developing countries as well. We believe the primary risk factors for these diseases, which include tobacco and alcohol use, obesity, poor diet and inactivity, are prime candidates for digital monitoring and could prove a significant growth opportunity for related technologies. Mobile and digital health technologies provide patients with NCDs the ability to monitor and potentially reverse symptoms.

Extending care to underserved populations and developing regions: There are significant portions of the global population that have limited access to healthcare services owing to geographic limitations for care delivery. We believe digital health technologies have the potential to close gaps where healthcare infrastructure and engagement are weakest.

8: "2017 World Population Ageing," United Nations, 2017

Considerations

Security and privacy protection: Healthcare data can include everything from medical records to other communications such as physician emails and handwritten notes. Ensuring the privacy and security of this is a key area of regulatory focus and can lead to significant penalties for companies that lack necessary protections. In 2018, the Office for Civil Rights (OCR) issued a record of $28.7 million in fines across 10 HIPAA compliance violations, according to its press release. Cybercrime is another area of concern as more data is kept online and shared among different organizations. Stolen EHRs can reportedly be sold for hundreds to thousands of dollars, with data used to open lines of credit or fraudulently obtain medical care or even for extortion and blackmail.

Data accuracy and fraudulent science: While digital tools have the potential to improve the healthcare industry, it is not always clear if the scientific claims made by some startups are accurate. Theranos is the poster child for fraud as the company 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.

Outlook

M&A driven by vertical and horizontal integration: We expect an increase in M&A activity to be driven by traditional healthcare providers looking to add digital offerings and technological capabilities and as large tech players look for ways to enter the healthcare

market. For example, in a clear vertical integration play, legacy medical technology company Medtronic acquired health-tracking software company Nutrino in 2018. On the other hand, Apple's 2016 acquisition of Gliimpse—a consumer platform for managing chronic conditions—was more of a horizontal play for the maker of consumer tech products.

Personalization and convenience drive consumer demand for fitness & wellness innovation: We believe digital health tools are well positioned to benefit from the rising consumer demand for personalized health. These include biometric sensors, genetic testing and other data-collection technologies that digital health startups are using to create custom 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 as they could prove more effective than one-size-fits-all products.

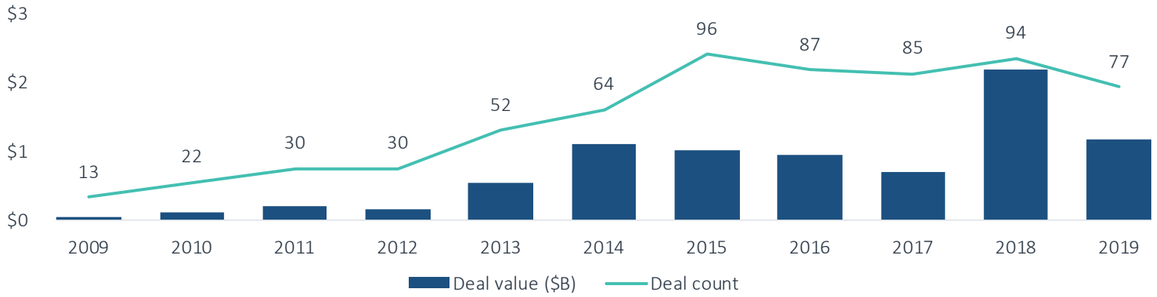
Increased data sharing among providers: Increasingly, we believe consumers and healthcare startups are realizing the value of sharing data in order to drive better health outcomes. Still, data remains largely siloed across the industry, a result of competitive decisions as well as regulatory and technological limitations. Yet we believe new shared data models are challenging this status quo, forcing incumbents to break down siloes and regulators to find ways to adopt rules that allow for more data exchange. We view this as positive for the ecosystem, as it could provide new ways for startups to capitalize on data intelligence.

SEGMENT DEEP DIVE

Operations & care management

Figure 23.

Operations & care management VC deal activity

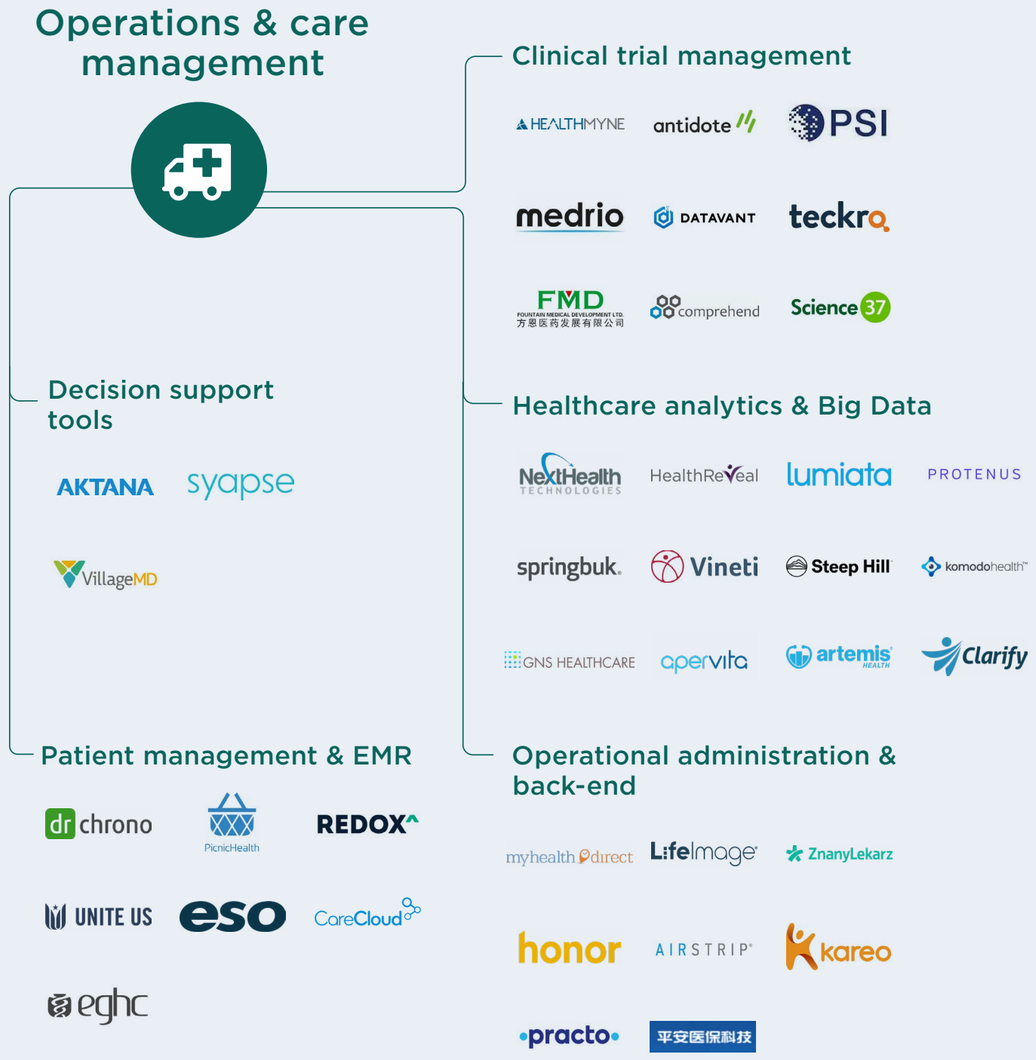


Source: PitchBook | Geography: Global

Overview

Operations & care management is a critical area within healthcare operations and encompasses several workflows including scheduling, billing, compliance and patient-records management. In large healthcare organizations, many of these processes were originally set up using task-specific software that is outdated and not well integrated across different areas of the organization. These functions are further complicated by the need to ensure compliance with regulatory restrictions and governance processes.

While the operations & care management space has attracted much investment, electronic health records (EHR) have emerged as a primary focus for investors in this space as many startups are working to improve data exchange and records management. EHRs are digital patient health records, and they help to inform healthcare providers of all relevant information as the patient moves through the continuum of care. While this is not a new concept, significant challenges remain regarding integration of data from providers



employing competing EHR technologies. We believe data interoperability is essential to patient care coordination and could lead to reduced costs, improved health outcomes and increased administrative efficiencies.

Industry drivers

- Outdated and inefficient administrative processes and tools driving demand for new solutions.
- Opportunity to improve patient outcomes via better administration of care services.
- Large incumbents (Epic Systems, Cerner, etc.) have already launched EHRs in many healthcare systems, although interoperability and other challenges remain.

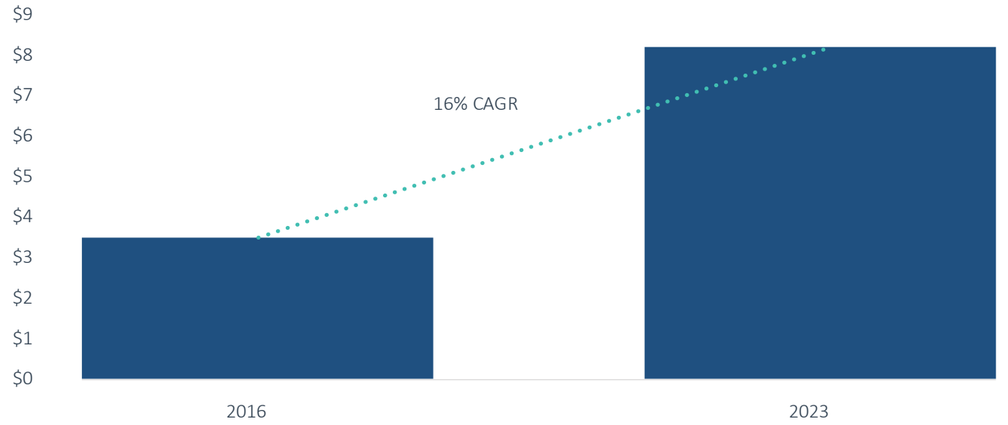
Market size

As a proxy to operations and care management, the global healthcare enterprise software market was estimated to be $3.5 billion in 2016 and is projected to rise at a 15.7% CAGR to $8.2 billion by 2023.

Business model

Businesses in the space sell enterprise software focused on administrative/operations management including scheduling, bill pay, compliance, patient management, clinical workflow and healthcare analytics. New to the Q4 update, we are now including decision support tools and clinical trial management into this segment. Attractive characteristics of the space include high demand, high switching costs and government regulations requiring or incentivizing digitization of medical data. Companies generate revenues via installation and subscription fees, consulting and support.

Figure 24. HEALTHCARE ENTERPRISE SOFTWARE MARKET SIZE ($B)



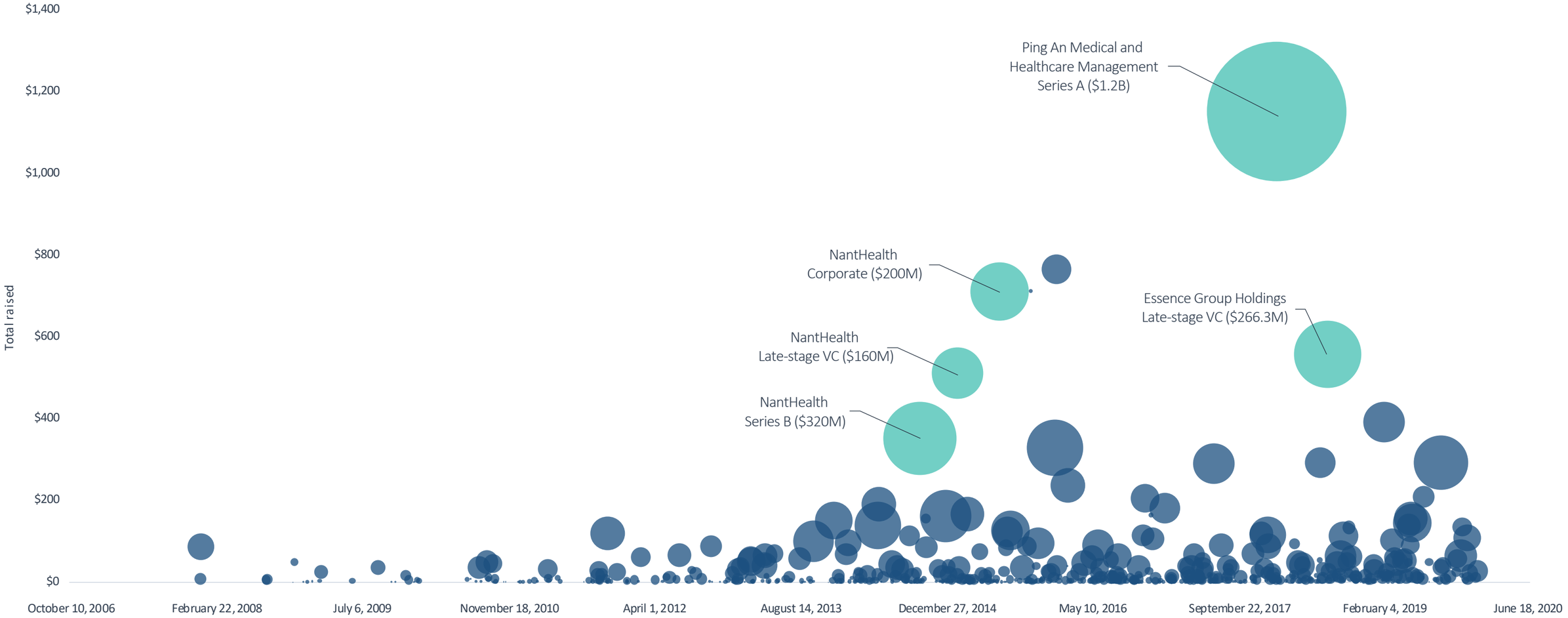
Source: Market Research Future, PitchBook estimates | Geography: Global

COMMON INDUSTRY KPIS

- Records managed
- Revenue growth
- Customer acquisition cost (CAC)
- Users under license
- Market penetration proportion

Figure 25.

Recent deal sizes of VC-backed operations and care management companies by total capital raised ($M)



Source: PitchBook

Figure 26.

Notable operations & care management VC deals

COMPANY	CLOSE DATE	SUBSEGMENT	STAGE	DEAL SIZE ($M)	LEAD INVESTOR(S)
Mindshare MEDICAL	November 2, 2019	Decision support tools	Late-stage VC	$0.1	Life Science Angels
healtheo360®	November 19, 2019	Clinical trial management	Angel (individual)	$0.2	Undisclosed
CIRCUIT CLINICAL™	December 10, 2019	Clinical trial management	Angel (individual)	$1.3	Undisclosed
ArborMetrix	October 29, 2019	Healthcare analytics & Big Data	Series B3	$1.6	Invest Detroit Ventures
UPFRONT HEALTHCARE SERVICES	November 25, 2019	Healthcare analytics & Big Data	Early-stage VC	$2.4	Undisclosed
elektralabs	November 12, 2019	Clinical trial management	Seed	$2.9	Maverick Ventures
innovu Empowering the Data Driven Organization	October 10, 2019	Healthcare analytics & Big Data	Late-stage VC	$5.7	Undisclosed
NEUROFLOW®	December 3, 2019	Patient managment and EMR	Series A	$7.5	Builders VC
Astarte Medical	December 1, 2019	Decision support tools	Series A	$8.5	Keiretsu Forum
DEEP 6 AI	November 25, 2019	Clinical trial management	Series A	$17.0	Point72 Ventures

Source: PitchBook

Figure 27.

Notable operations & care management VC exits

COMPANY	CLOSE DATE	SUBSEGMENT	EXIT SIZE ($M)	ACQUIRER/INDEX	VALUATION-STEP UP
flatiron	April 6, 2018	Healthcare analytics & Big Data	$1,900.0	F. Hoffmann-La Roche	1.84x
SHYFT a Medidata company	June 30, 2018	Healthcare analytics & Big Data	$196.3	Medidata Solutions	1.96x
n of one	January 07, 2019	Clinical trial management	Undisclosed	QIAGEN	Undisclosed
SANSORO HEALTH	June 26, 2019	Operational administration & backend	Undisclosed	Datica	Undisclosed
Phreesia	July 18, 2019	Operational administration & backend	Undisclosed	New York Stock Exchange	Undisclosed
HealthCatalyst	July 25, 2019	Healthcare analytics & Big Data	$730.0	NASDAQ	0.73x
WebPT	August 28, 2019	Patient managment and EMR	Undisclosed	Warburg Pincus	Undisclosed

Source: PitchBook

Opportunities

Improving data technologies within healthcare operations: We believe current healthcare data infrastructure is outdated and consists of legacy systems that are not well integrated. We see tremendous opportunity in improving the ability of healthcare organizations to make data more accessible and useful. Companies such as Health Catalyst are helping healthcare organizations manage increasingly complex and data-intensive care initiatives such as population health management and value-based care that require sophisticated data management tools to achieve reimbursement. These companies integrate data from EHRs, wearables, genomics and other sources to develop insights and support decision making.

Population health management: Population health management is a subsector of operations & care management that aggregates group data to identify actionable insights for individuals. The rising senior population around the world is viewed as a key application for population health management, as health providers work to better understand the rise of chronic diseases such as diabetes and cancer. Startups in this space such as oncology-focused software company Syapse can help practitioners coordinate care, take preventative measures and better understand the diseases being treated.

Post-care systems: Adherence to healthcare treatment is a major cause of hospital readmittance and adds significant costs to providers and payers. While it is easy to monitor care while the patient is in the hospital, post-care treatment is more difficult, and hospitals generally lack the kinds of seamless systems needed to make this easier. New care management software systems could improve providers' ability to care for and monitor patients both in and out of the hospital.

Considerations

Cost to implement enterprise software: Implementing enterprise software can be a complex and expensive endeavor. It can also be very disruptive, which can have an immediate impact on care outcomes. While cloud-based services can improve the implementation process, shifting to cloud infrastructure can also be challenging and costly, requiring hospitals to add IT staff, train existing staff and configure new systems. These headwinds can lead some hospitals to avoid upgrading to new systems altogether.

Finding the right solution: Finding the right system that both meets the strategic needs of the provider and is viable in the market can be complicated. Many small providers focus on niche markets, and it is often difficult to determine which may be the best fit for a specific provider.

Competition: Startups in this space face a competitive market that includes many companies focusing on niche health specialties with differentiation often hard to find. While legacy enterprise software companies, such as Microsoft and Oracle, may not focus as intensely on the healthcare space, they nonetheless have competitive offerings that are often capable of meeting the needs of providers. Further challenges include high upfront costs to develop compliant care-management software and the lengthy time it takes to build significant scale.

Outlook

Strong customer demand for EHR innovation: Thanks to a significant push from lawmakers, as of 2017, 85.9% of US office-based physicians utilized an EHR system.[9] Despite the encouraging adoption rates, most physicians are unhappy with their EHR software, with 10% saying they were happy with the software in a 2018 Deloitte survey.[10] Significant demand for improvements from practitioners, providers and lawmakers leads us to believe that continued innovation in patient data is on the horizon. Companies such as Syapse are working toward allowing consumers to manage their own health records, while Redox is solving for data standardization and interoperability.

VC investment trends to continue: VC investments in this category have climbed higher over the past eight years, reaching $1.2 billion in total capital raised across 77 deals in 2019, up from $170 million across 30 deals in 2012. The majority of these investments were from institutional VC funds, although corporates and CVC arms have a significant role in funding early-stage firms. We expect VC in this category to continue to climb over the long-term as interest in the space grows.

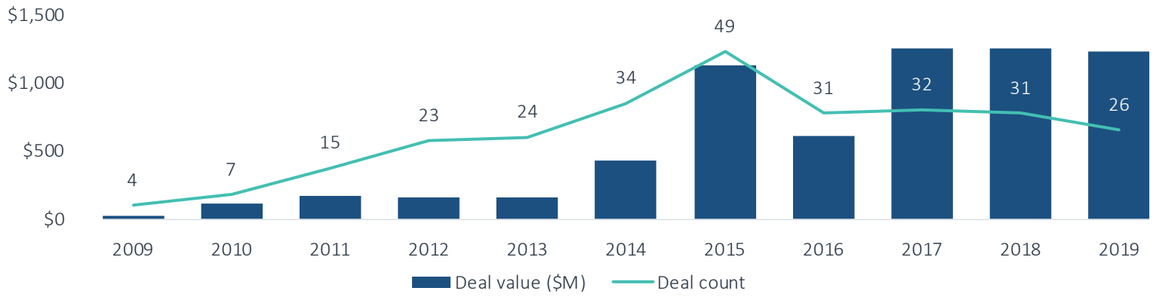
9: “Office-based Physician Electronic Health Record Adoption,” Office of the National Coordinator for Health Information Technology, January 2019
10: “Deloitte 2018 Survey of US Physicians,” Deloitte, Ken Abrams, Steve Burrill & Natasha Elsner, 2018

SEGMENT DEEP DIVE

Health information tools

Figure 28.

Health information tools VC deal activity

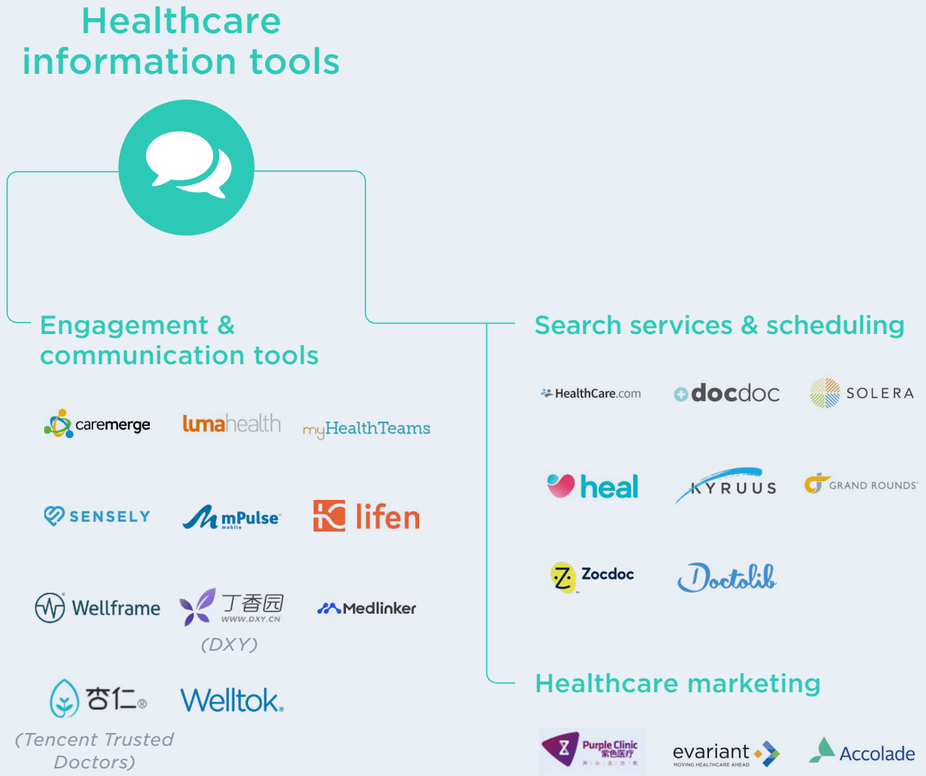


Source: PitchBook | Geography: Global

Overview

The health information tools segment includes companies that provide software and services to help hospitals attract new patients and facilitate communications among patients and stakeholders. Specific services include:

- **Healthcare marketing:** Marketing services for hospital systems and organizations
- **Search services & scheduling:** Software that enables patients to search for services and/or schedule healthcare appointments online.
- **Engagement & communication tools:** Software that drives patient engagement and facilitates patient-provider communication across web, phone and in-person services



Industry drivers

- Mobile adoption: Social media and expectations for quick and easy communications between doctors, patients and other stakeholders.
- Consumers increasingly utilize online reviews to evaluate healthcare.

Market size

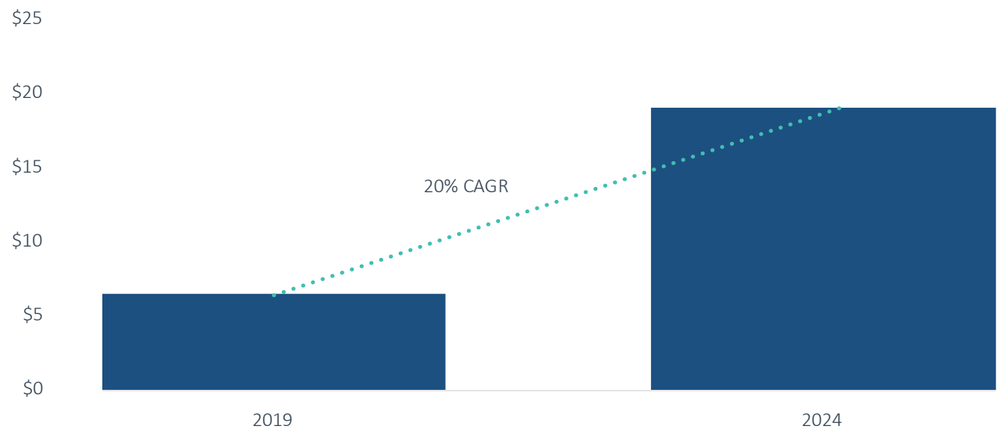
The global patient engagement software market is projected to reach $19.1 billion by 2024, up from an estimated $6.5 billion in 2019. Growth rate is estimated to be 19.8% CAGR over this timeframe.

Business model

Attractive characteristics of the space include the growing demand for new technology-focused patient communications, such as social media, that keep patients informed and actively involved in their healthcare plans. Business models in this space include:

- SAAS businesses
- Transaction fees
- Ad revenues

Figure 29. PATIENT ENGAGEMENT SOFTWARE MARKET SIZE ($B)



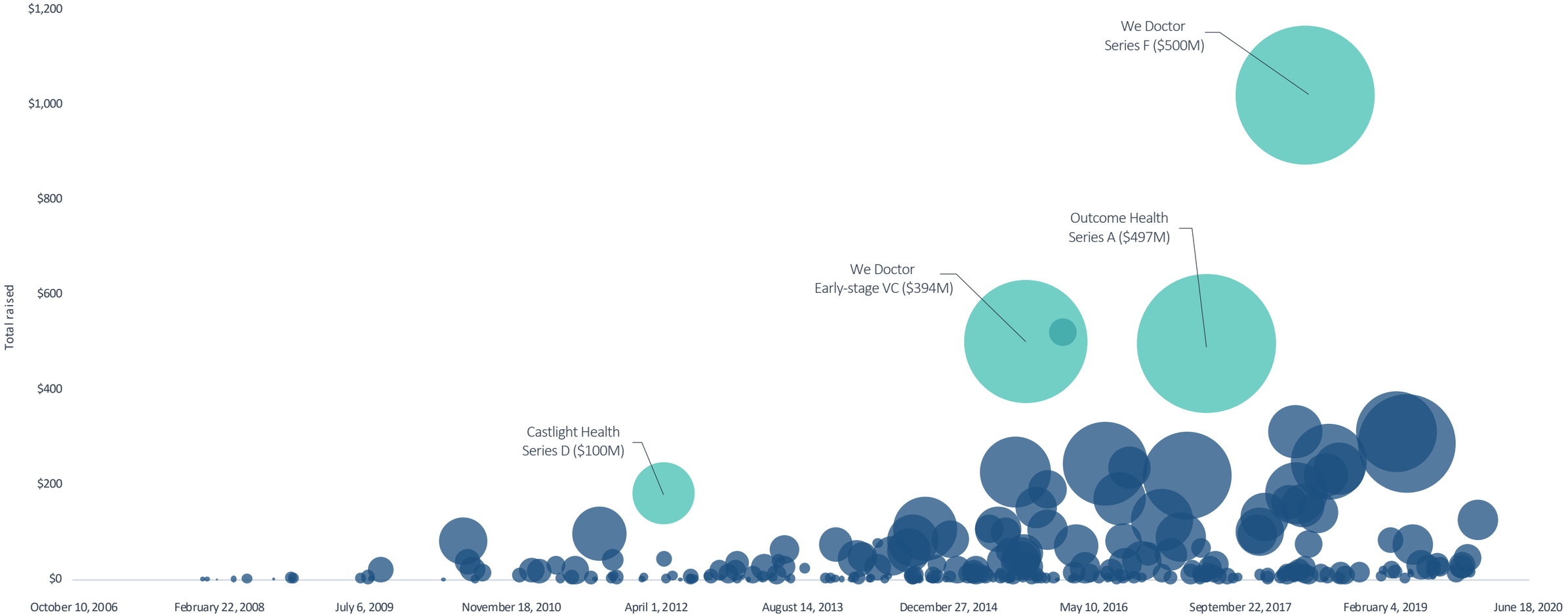
Source: Market Study Report LLC, PitchBook estimates | Geography: Global
Note: This represents an estimate for global healthcare marketing revenue growth.

COMMON INDUSTRY KPIS

- MRR & growth
- Monthly active users
- Customer acquisition costs (CAC) & CAC/lifetime value (CAC/LTV)
- Net promotor score
- Conversion rate (free/freemium to paid)

Figure 30.

Recent deal sizes of VC-backed health information tools companies by total capital raised ($M)



Source: PitchBook

Figure 31.

Notable health information tools VC deals

COMPANY	CLOSE DATE	SUBSEGMENT	STAGE	DEAL SIZE ($M)	LEAD INVESTOR(S)
SENSELY	October 28, 2019	Engagement & communication tools	Series C1	$15.0	Aflac Ventures
SEngine Precision Medicine	October 9, 2019	Search services & scheduling	Series A	$8.6	Bangarang Group
Wellframe	November 19, 2019	Engagement & communication tools	Series C	$20.0	BlueCross BlueShield Venture Partners
HealthCare.com™	October 30, 2019	Search services & scheduling	Series B	$18.0	Second Alpha Partners
Wellist	November 26, 2019	Search services & scheduling	Late-stage VC	$3.5	Undisclosed
KYRUUS	December 23, 2019	Search services & scheduling	Late-stage VC	$42.3	Highland Capital Partners and Venrock

Source: PitchBook

Figure 32.

Notable health information tools VC exits

COMPANY	CLOSE DATE	SUBSEGMENT	EXIT SIZE ($M)	ACQUIRER/INDEX	VALUATION STEP UP
Lua	February 14, 2019	Engagement & Communication Tools	Undisclosed	Life Biosciences	Undisclosed
DIGITAL PHARMACIST	March 11, 2019	Engagement & Communication Tools	$125.0	K1 Investment Management	Undisclosed
voalté	April 01, 2019	Engagement & Communication Tools	$196.0	Hill-Rom Holdings	1.90x
SoYoung	May 02, 2019	Search Services & Scheduling	$1,204.0	NASDAQ	Undisclosed
patientslikeme	June 19, 2019	Search Services & Scheduling	Undisclosed	UnitedHealth Group	Undisclosed
RELATIENT	November 18, 2019	Engagement & Communication Tools	Undisclosed	Brighton Park Capital	Undisclosed

Source: PitchBook

Opportunities

Incorporating new technologies into search tools: Emerging technologies such as AI, machine learning (ML), and Big Data are finding several applications in the healthcare space. This includes AI-powered chatbots that can automate routine customer-support tasks and Big Data analytics that can help providers target specific customers.

Consumer shift to health search engines: As healthcare search engines have become more widely adopted, this has driven demand for services that can help healthcare providers optimize their online presence through SEO and other digital marketing.

Considerations

Cyber threats: As hospitals adopt more digitally focused communications techniques, this increases the threat of data theft or other online hacks that could compromise patient data. A series of ransomware attacks in 2016 and 2017 severely affected hospital operations, leading to increased awareness of the impact of cyber threats.

Incumbent competitive advantage: As many healthcare providers have existing channels for patient outreach and communications, new entrants will be challenged to differentiate from legacy systems.

Outlook

Consumer-led care to driving shift in how hospitals market themselves: The rise of nontraditional care that is more consumer driven will require care providers to think differently about how they engage with patients and other potential customers. This is likely to necessitate greater investment in web-based search services, booking platforms and communications & engagement tools that can empower customers to make more informed decisions about their care.

Out-patient care and communications to improve and evolve: Hospitals seeking to reduce costs and consumers beginning to dictate more of their care will likely drive demand for systems that can improve care providers ability to engage with patients remotely. Remote services will not only include advertising and marketing, but preventative care communications and post-treatment care monitoring. We believe these services can be integrated into broader communications platforms to provide more seamless care services.

Supplemental materials

Select company analysis

American Well

Business overview

American Well is a telehealth service provider that connects patients to board-certified healthcare professionals. The firm utilizes B2B and B2B2C models to provide patient-to-doctor solutions in a variety of markets. It also offers a “provider-to-provider” model to facilitate access to specialists.

180+ employees

Leadership

Chairman & CEO: Ido Schoenberg

President & CEO: Roy Schoenberg

CFO: Keith Anderson

Chief Medical Officer: Peter Antall

Competitors

Teladoc Health, Doctor On Demand, MDLive and others

Financing history

Raised to date: $485.9M over six deals

Most recent round: $290.6M led by Philips and Allianz X (June 2018)

Post-money valuation: $971.8M

First institutional round: $31.8M (February 2007)

Ownership

Cito Ventures, Echo Health Ventures, Hanaco Venture Capital, MartinVentures, Philips, Allianz X, Teva Pharmaceutical Industries, Anthem, InVenture Partners, McKesson Ventures, ADIP, Waterline Ventures

celmatix

Business overview

Celmatix sells women’s health software and genomic testing packages to help patients and healthcare practitioners utilize data analytics and genomics to manage and better understand reproductive health. The firm has developed three products including a predictive analytics platform sold into healthcare providers, an at home fertility genetic screening kit and free fertility reporting software for consumers.

100 employees

Leadership

Co-founder & CEO: Piraye Beim PhD

CFO & COO: Richard Hofbrauer

Sr. VP Business Development: Ali Siam

Competitors

NextGen Jane, Future Family, Prelude Fertility and others

Financing history

Raised to date: $71.9M over 12 deals

Most recent round: $22.5 million late-stage VC (May 2018)

Last known post-money valuation: $70M

First institutional round: $0.55M Series A (February 2011)

Ownership

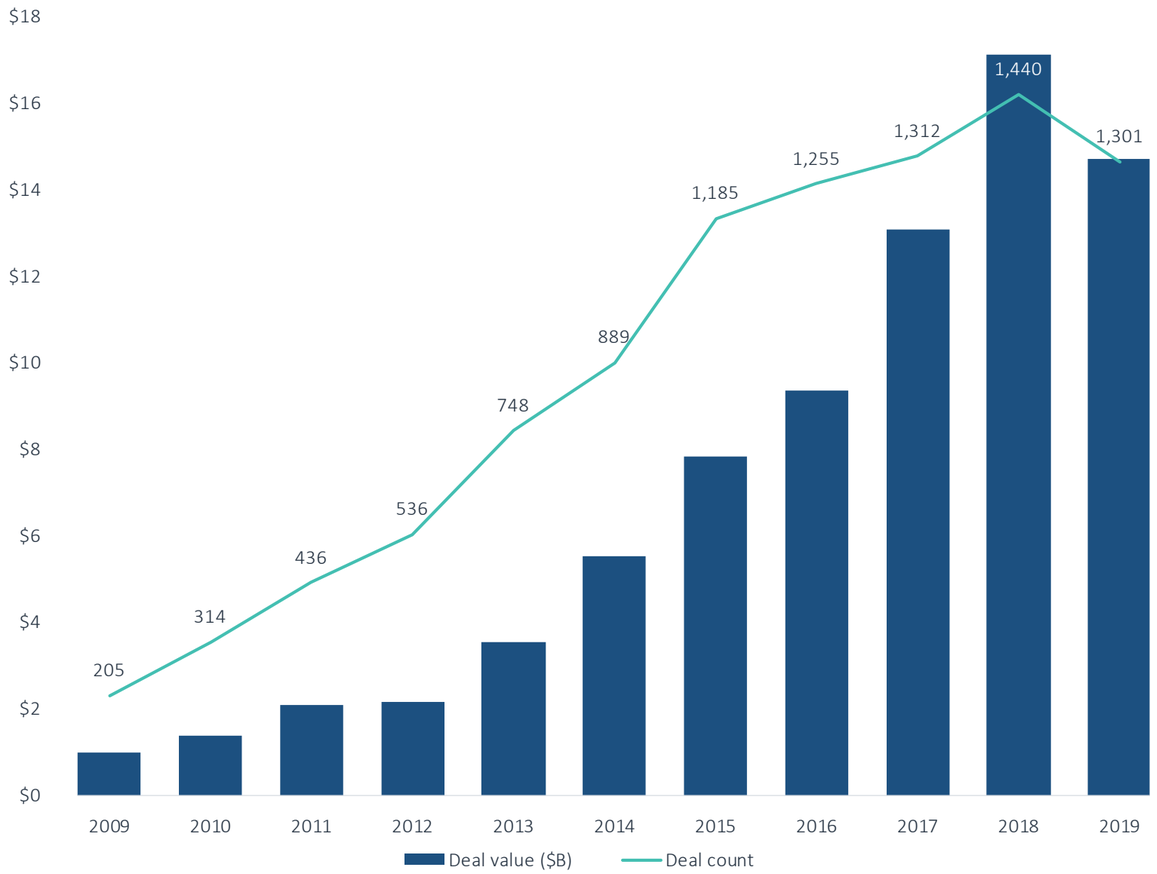
Partnership for New York City, Topspin Partners, among others

SUPPLEMENTAL MATERIALS

Additional VC data

Figure 33.

Healthtech VC deal activity



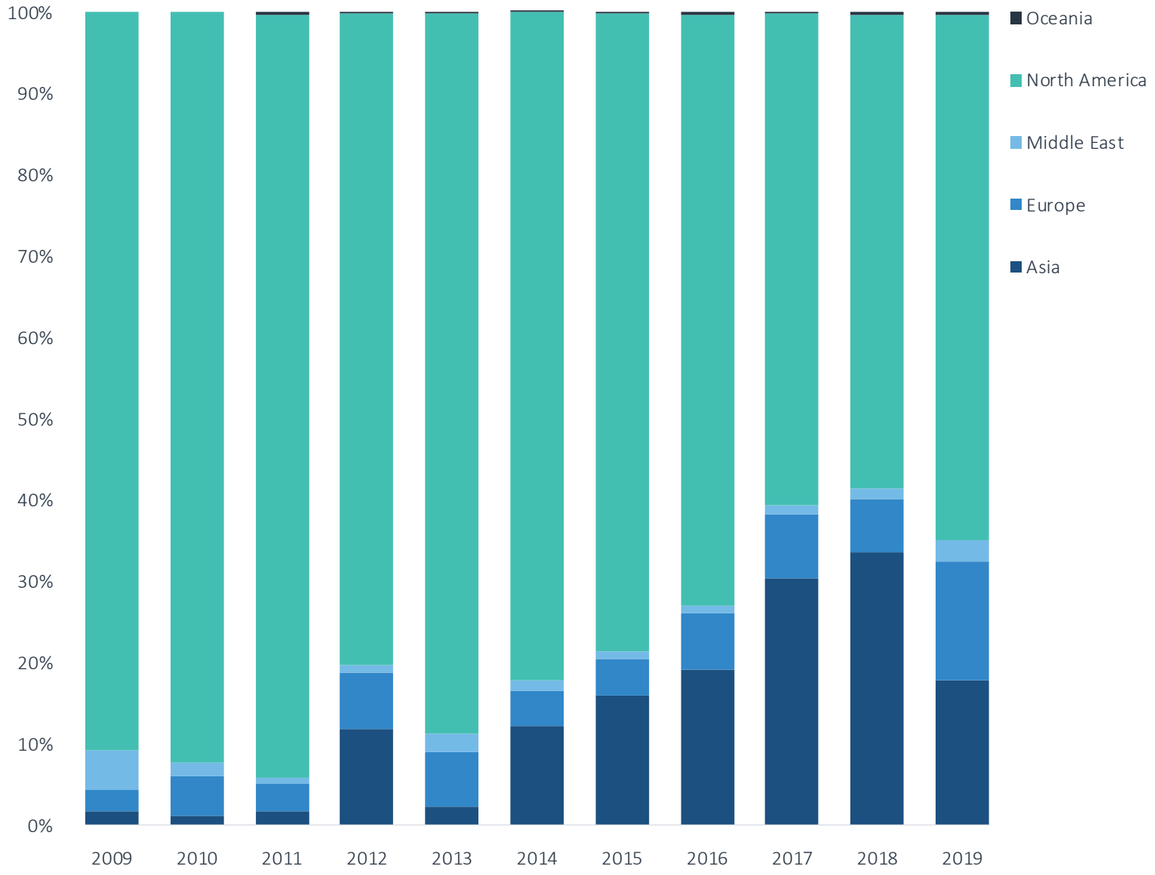
Source: PitchBook | Geography: Global

Figure 34. NOTABLE HEALTHTECH VC DEALS

GenapSys November 20, 2019 **$90M Series C** Lead investor(s): Foresite Capital Management	FMD FOUNTAIN MEDICAL DEVELOPMENT LTD. 方恩医药发展有限公司 October 25, 2019 **$62M Series D** Lead investor(s): Goldman Sachs Asset Management
WHOOP™ November 12, 2019 **$55M Series D** Lead investor(s): Foundry Group	8 EIGHT SLEEP November 6, 2019 **$40.8M Series B2** Lead investor(s): Founders Fund
VIOME November 27, 2019 **$36.5M Series B** Lead investor(s): Bold Capital Partners, CerraCap Ventures, Khosla Ventures, Marc Benioff, Matthew Harris, Physician Partners, WR Hambrecht + Co.	HealthReveal December 23, 2019 **$27M Series A** Investors: GE Ventures

Figure 35.

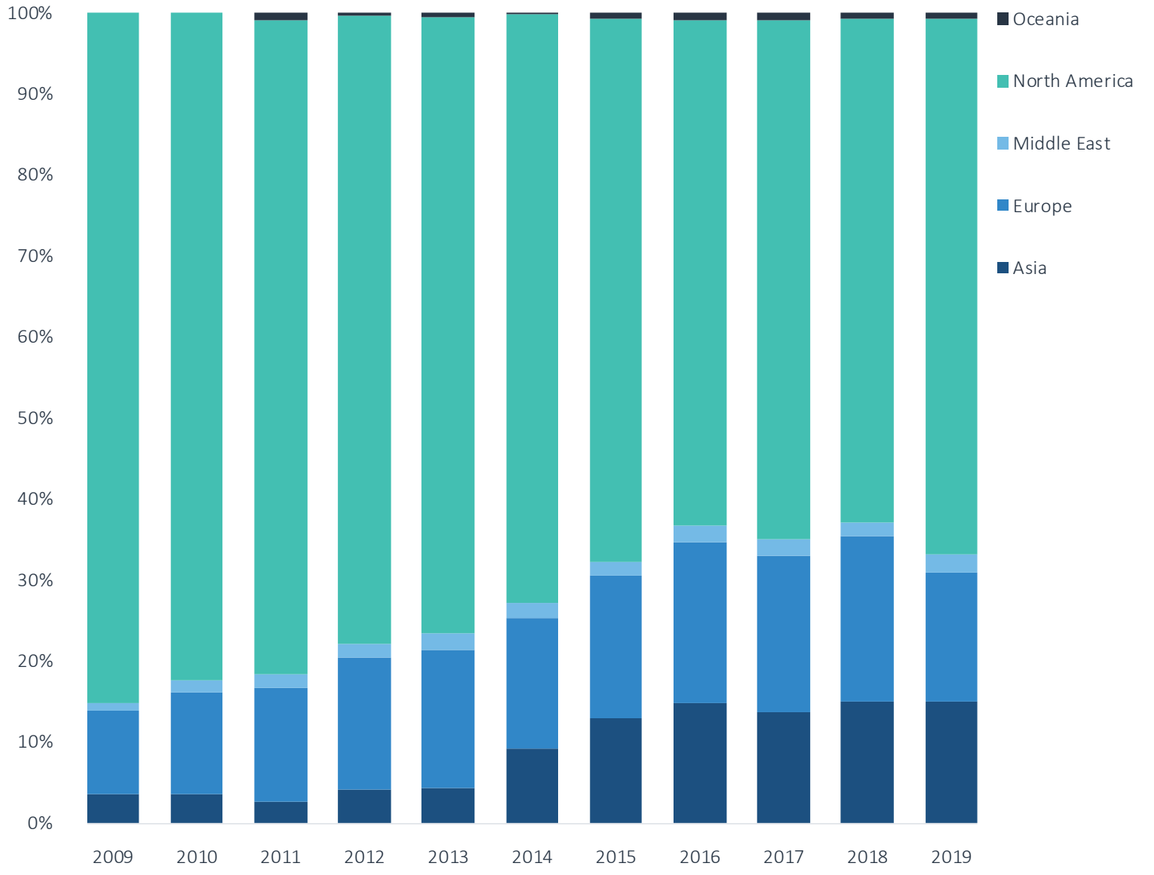
Healthtech VC deals ($) by region



Source: PitchBook | Geography: Global

Figure 36.

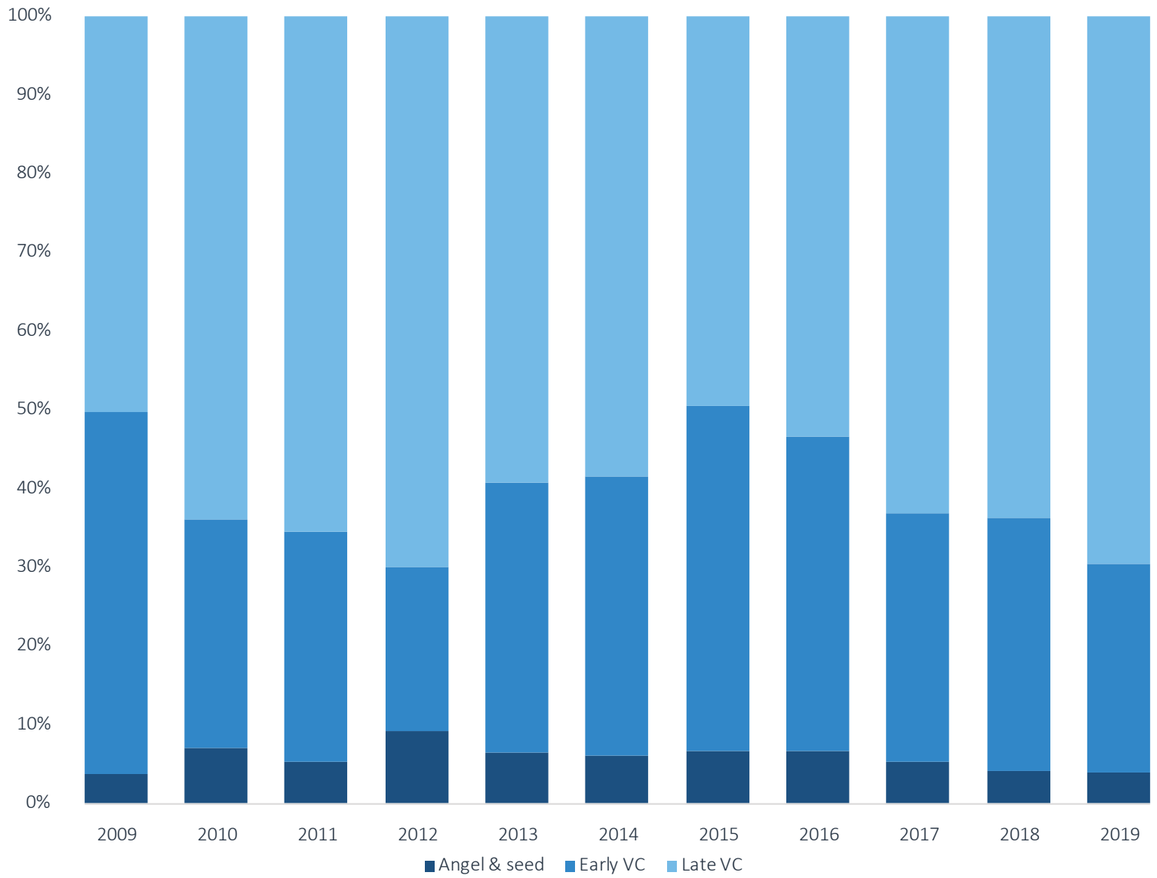
Healthtech VC deals (#) by region



Source: PitchBook | Geography: Global

Figure 37.

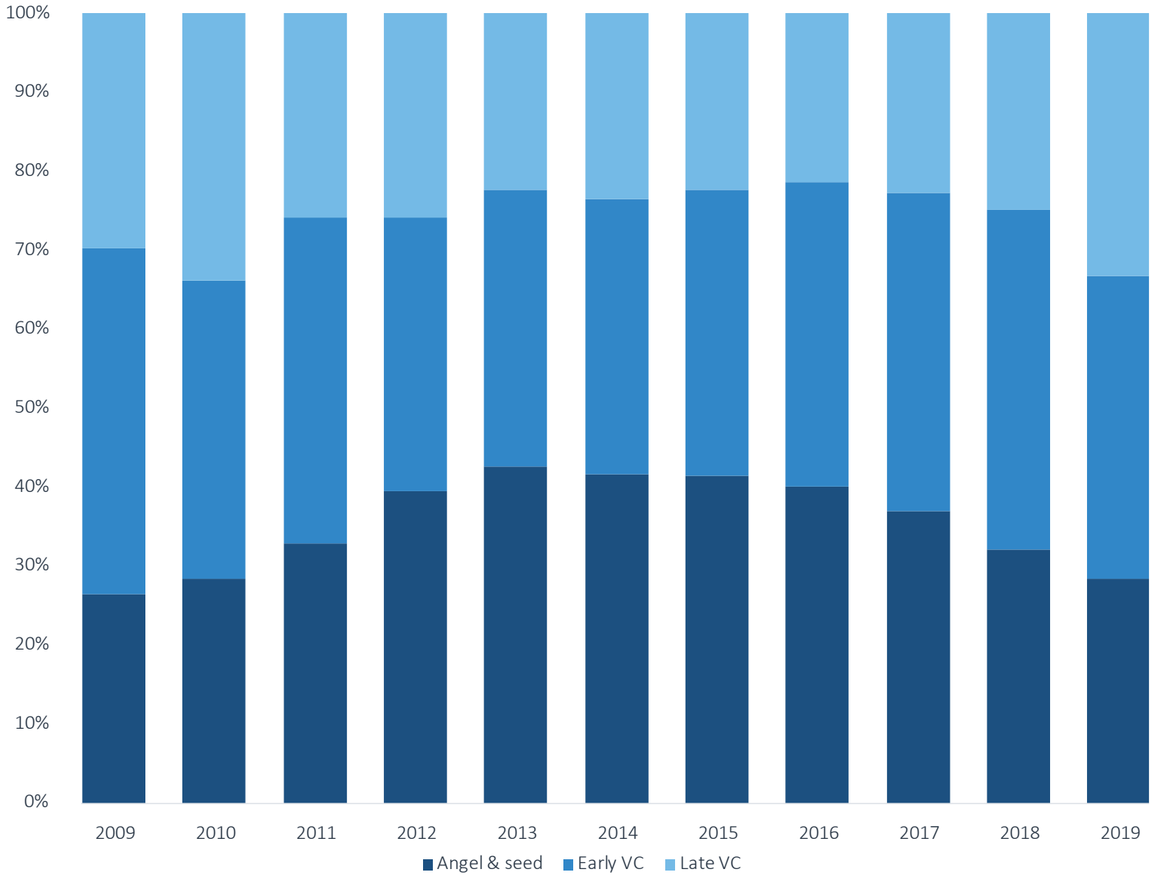
Healthtech VC deals ($B) by stage



Source: PitchBook | Geography: Global

Figure 38.

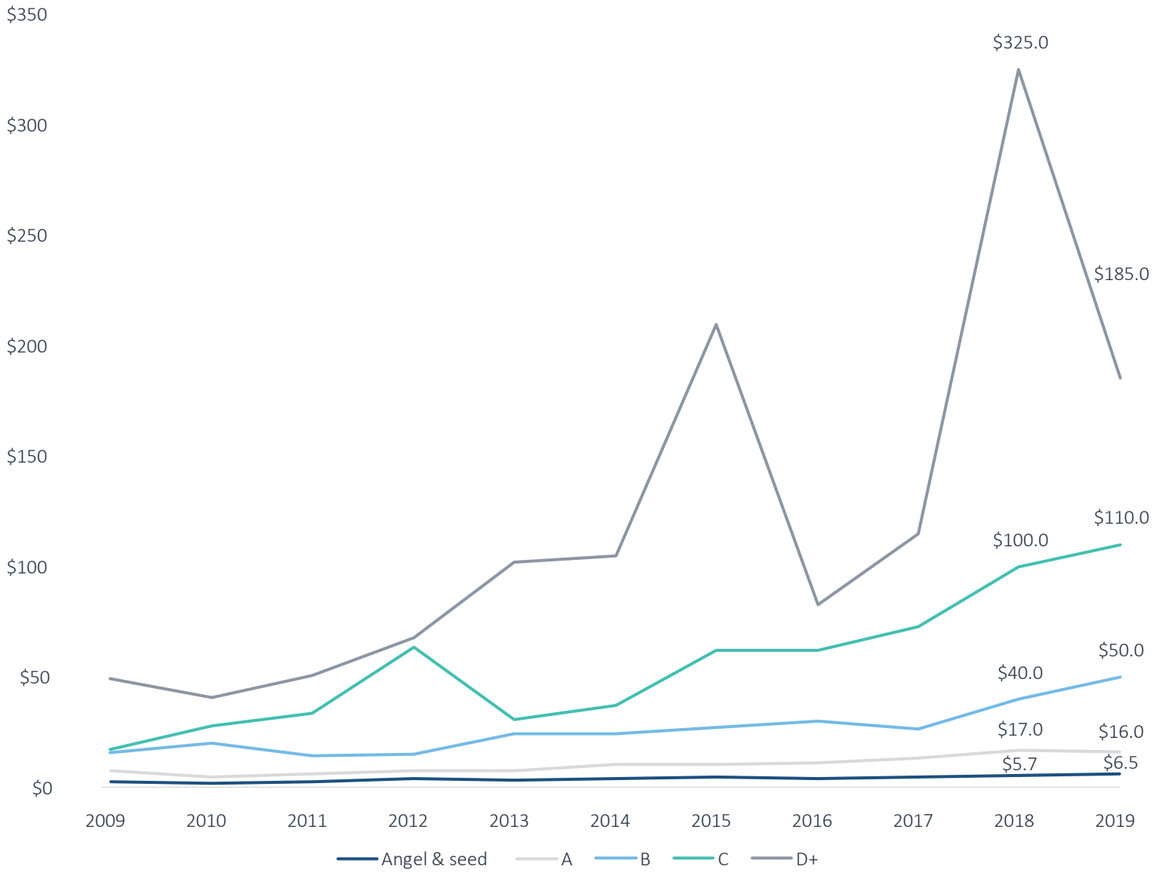
Healthtech VC deals (#) by stage



Source: PitchBook | Geography: Global

Figure 39.

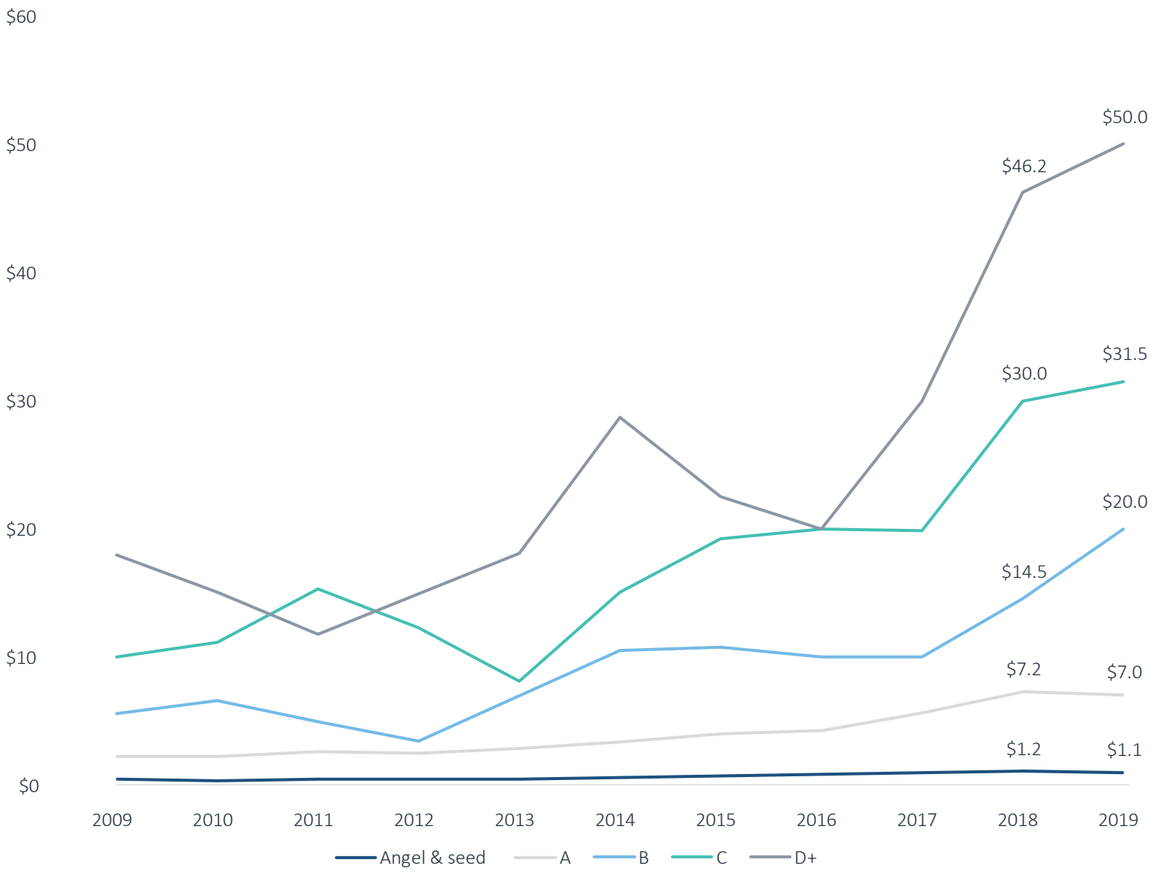
Median healthtech VC pre-money valuations ($M) by series



Source: PitchBook | Geography: Global

Figure 40.

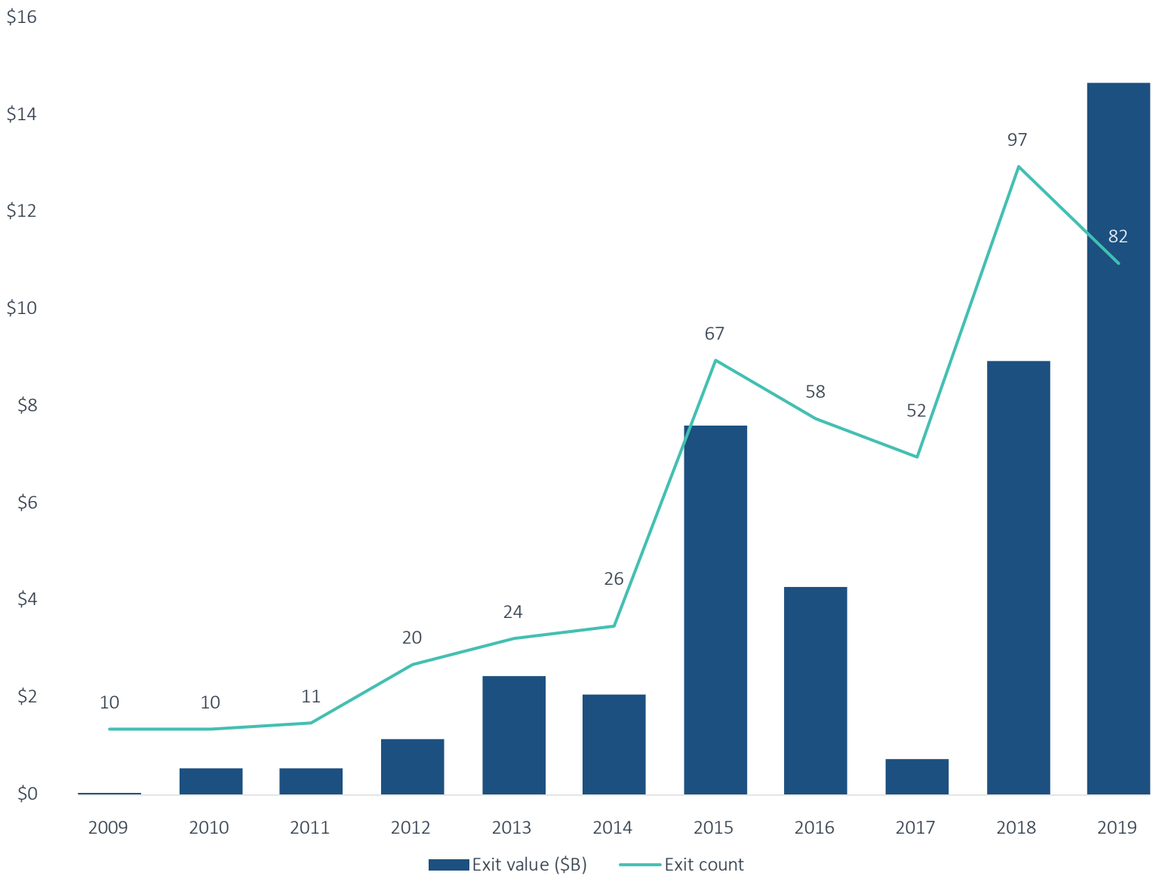
Median healthtech VC deal sizes ($M) by series



Source: PitchBook | Geography: Global

Figure 41.

Healthtech VC exit activity



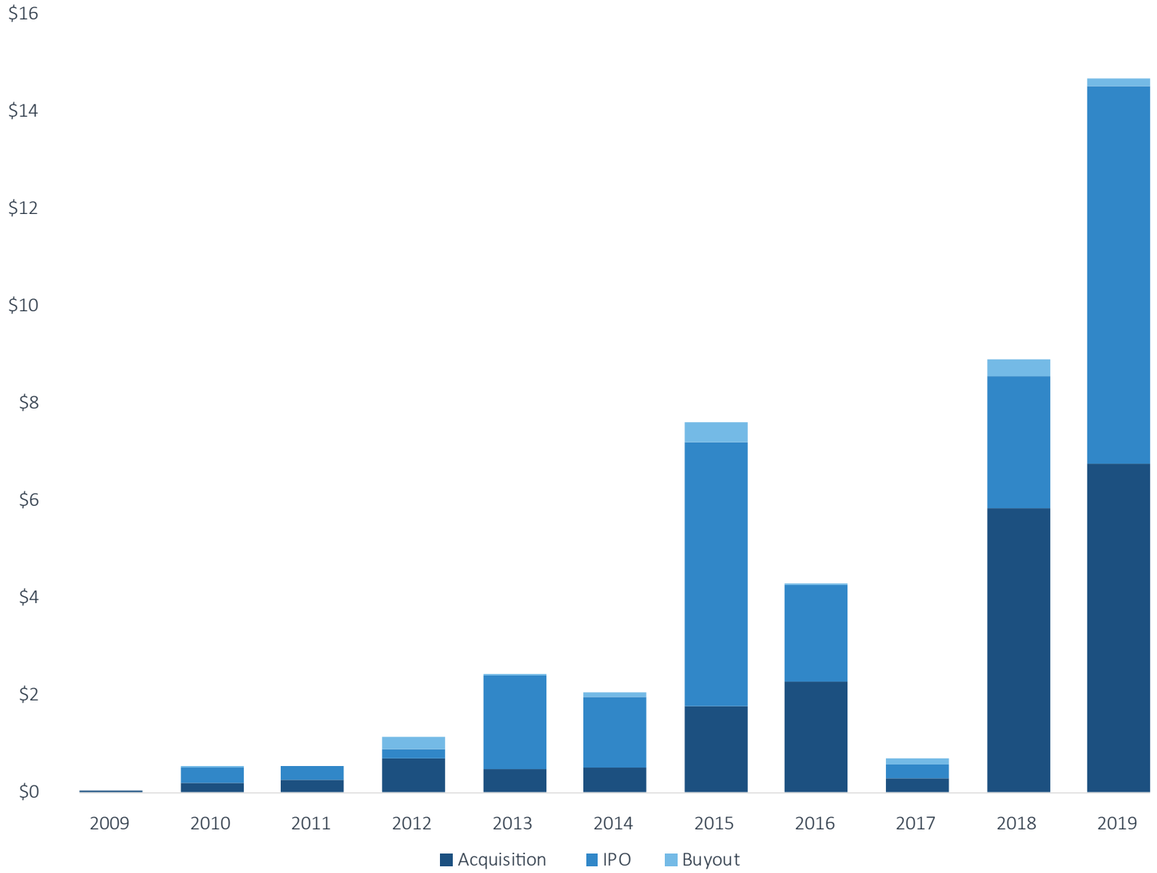
Source: PitchBook | Geography: Global

Figure 42. NOTABLE HEALTHTECH VC EXITS

Livongo July 25, 2019 **$2.2B IPO**	SoYoung May 2, 2019 **$1.2B IPO**
HealthCatalyst July 25, 2019 **$730.0M IPO**	Kaleido Biosciences February 27, 2019 **$369.5M IPO**
voalté April 1, 2019 **$196.0M M&A** Acquired by: Hill-Rom Holdings	Breathe Technologies September 3, 2019 **$130.0M M&A** Acquired by: Hill-Rom Holdings

Figure 43.

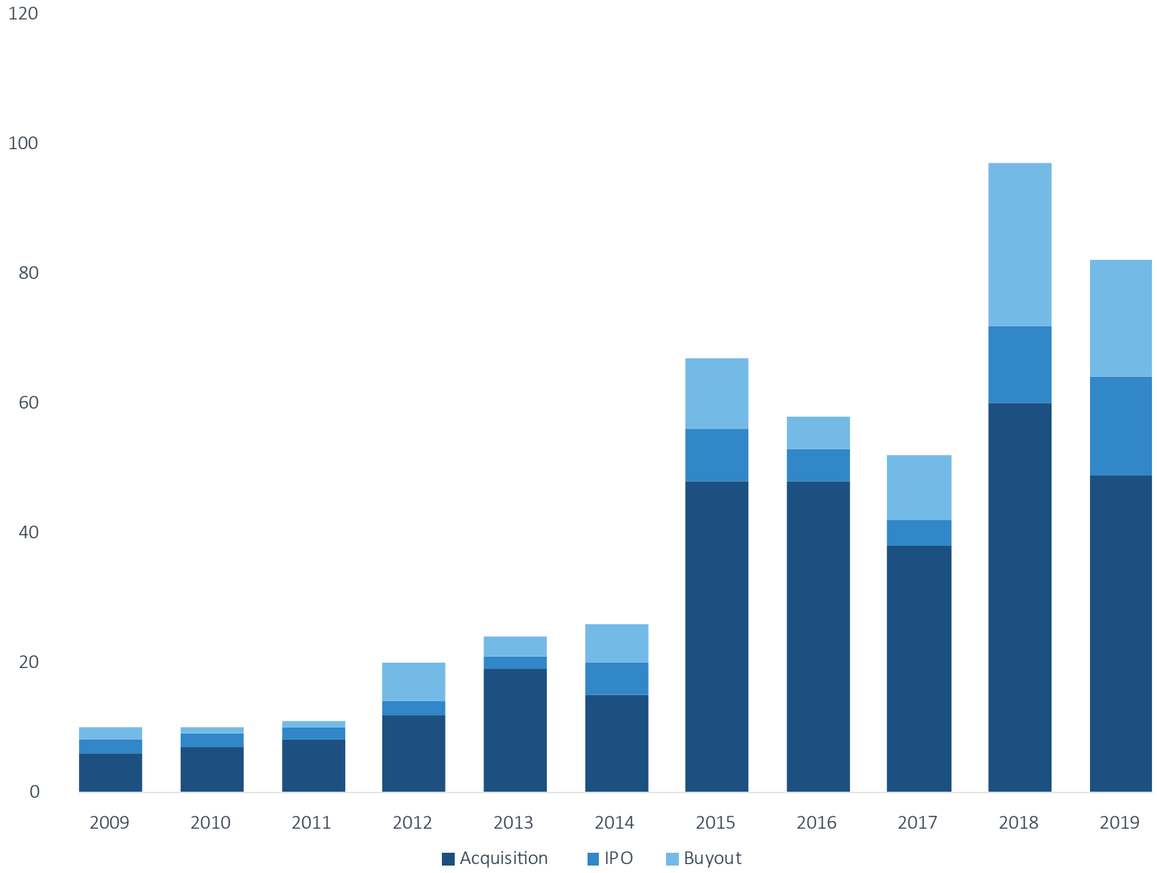
Healthtech VC exits ($B) by type



Source: PitchBook | Geography: Global

Figure 44.

Healthtech VC exits (#) by type



Source: PitchBook | Geography: Global

Figure 45.

Top investors in healthtech by deal value

INVESTOR NAME	DEAL VALUE ($M)
SoftBank Investment Advisers	$3,756.0
IDG Capital	$3,298.6
Sequoia Capital	$2,446.4
SBI Holdings	$2,200.0
New Enterprise Associates	$1,994.0
Tencent Holdings	$1,967.4
Khosla Ventures	$1,877.1
Viking Global Investors	$1,662.2
Temasek Holdings	$1,662.1
Baillie Gifford	$1,580.1

Source: PitchBook | Geography: Global
Note: This includes investors who have made an investment since 2015.

Figure 46.

Top investors in healthtech by VC deal count

INVESTOR NAME	DEAL COUNT
Plug and Play Tech Center	61
F-Prime Capital Partners	53
Khosla Ventures	53
SOSV	49
StartUp Health	48
Ben Franklin Technology Partner of Southeastern Pennsylvania	47
New Enterprise Associates	45
Keiretsu Forum	39
Y Combinator	39

Source: PitchBook | Geography: Global
Note: This includes investors who have made an investment since 2015.

Figure 47.

Top 10 VC-backed healthtech companies by post-money valuation

COMPANY NAME	VC RAISED TO DATE ($M)	POST-MONEY VALUATION ($B)	LAST FINANCING DATE
Ping An Medical and Healthcare Management	$1,150	$8.8	February 2, 2018
SenseTime	$2,866.6	$7.6	September 10, 2018
WeDoctor	$1,020.5	$5.5	May 9, 2018
Ginkgo Bioworks	$727.3	$4	September 19, 2019
Oscar	$903.9	$3.2	March 27, 2018
Tempus	$470	$3.1	May 30, 2019
23andMe	$790.7	$2.5	July 23, 2018
Babylon Health	$635	$2	August 1, 2019
Essence Group Holdings	$556	$1.9	July 27, 2018

Source: PitchBook | Geography: Global

Figure 48.

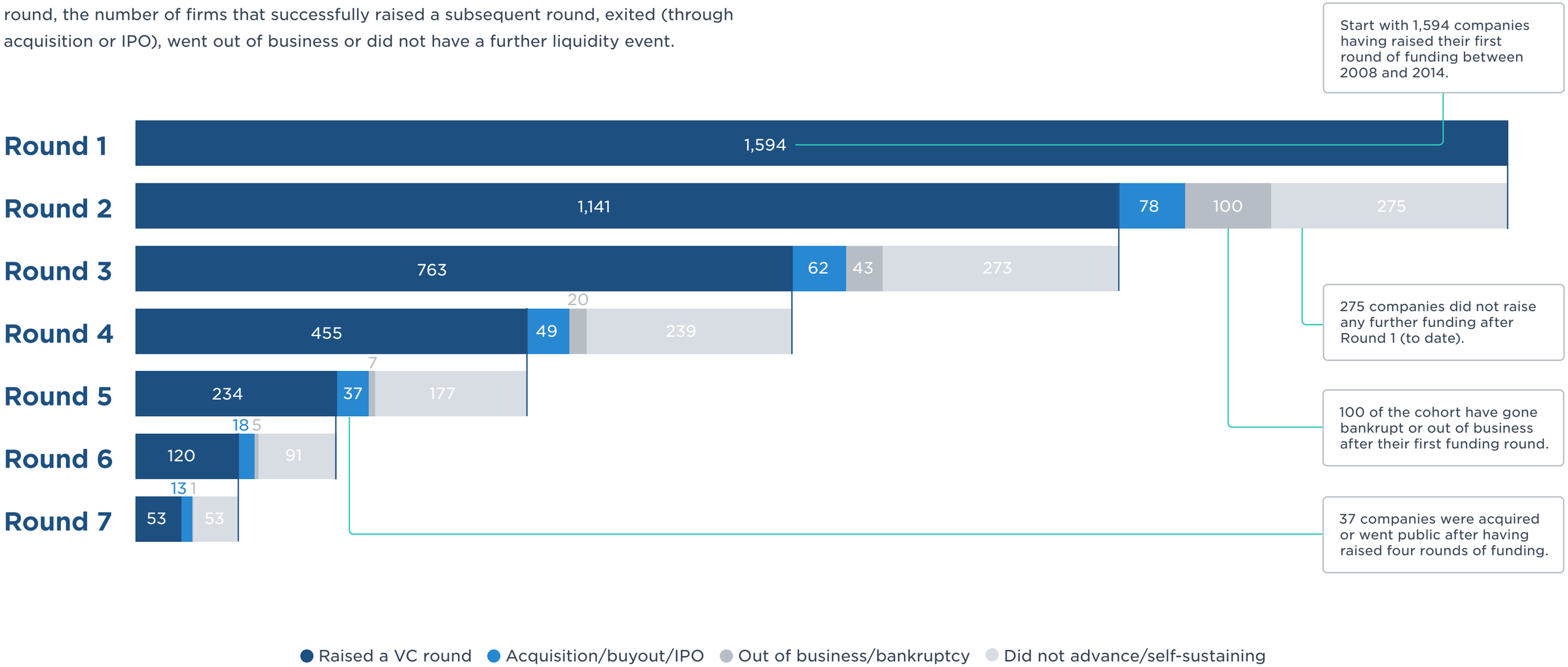
Top 10 VC-backed healthtech companies by VC raised to date

COMPANY NAME	VC RAISED TO DATE ($M)	POST-MONEY VALUATION ($B)	CLOSE DATE
SenseTime	$2,866.6	$7.6	September 10, 2018
Oscar	$1,278.9	--	August 14, 2018
Ping An Medical and Healthcare Management	$1,150	$8.8	February 2, 2018
WeDoctor	$1,020.5	$5.5	May 9, 2018
Clover Health	$925	--	January 29, 2019
23andMe	$790.7	--	March 31, 2019
Ginkgo Bioworks	$727.3	$4	September 19, 2019
Babylon Health	$635	$2	August 1, 2019
Human Longevity	$568.1	--	November 6, 2019
Essence Group Holdings	$556	$1.9	July 27, 2018

Source: PitchBook | Geography: Global

Healthtech 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.



Buyers list

Figure 49.

Strategic buyers (corporations, holding companies & private companies)

Strategic buyers are most likely to be large public incumbent healthcare firms such as Philips and Medtronic.

STRATEGIC BUYERS	DEAL COUNT (2015-2019)
Philips	12
N. Harris Computer	7
Allscripts Healthcare Solutions	6
Teladoc	5
NextGen Healthcare	4
BioTelemetry	4
Medtronic	4
Stryker	4

Source: PitchBook | Geography: Global

Figure 50.

Financial buyers (PE groups)

The most active financial buyers have stated a preference for healthcare firms and often invest around existing portfolio competencies (e.g. some firms have three to four portfolio companies focused around the same business such as electronic health records).

STRATEGIC BUYERS	DEAL COUNT (2015-2019)
Marlin Equity Partners	7
ABRY Partners	6
Francisco Partners	6
TPG Capital	6
GI Partners	6

Source: PitchBook | Geography: Global

About PitchBook Emerging Tech Research

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