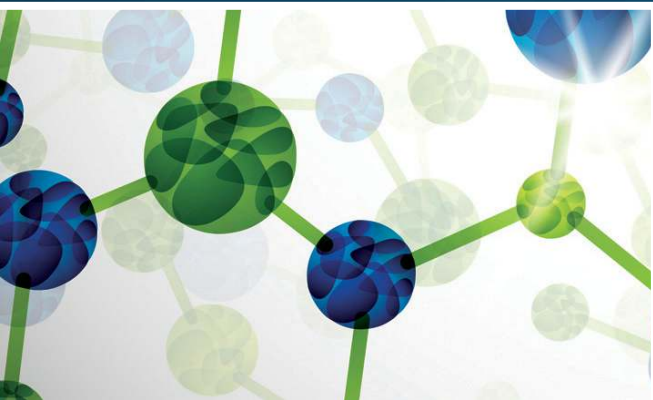


***Making Massachusetts  
A Leading Global  
Destination For***

# **Digital Health**

***February 2019***



**MassBio<sup>®</sup>**

MASSACHUSETTS BIOTECHNOLOGY COUNCIL



# 1 Introduction

Across Massachusetts, digital health is positively transforming the life sciences from drug discovery to medical devices to diagnostics. In turn, new treatments are reaching patients faster, are more personalized, and are creating better health outcomes. Yet, the full potential of digital health to the Massachusetts' life sciences industry, and the subsequent benefit to patients, cannot be realized until a foundational digital health ecosystem is strengthened and embedded across the state.

In the fall of 2018, MassBio commissioned a study by Deloitte to examine the current state of the digital health industry in Massachusetts, the challenges facing its growth here, and the opportunities for Massachusetts to lead. The subsequent report laid out a roadmap for MassBio to follow, with the support of other digital health stakeholders, to enable digital health companies and their technologies to converge with life sciences companies in Massachusetts; and ultimately, to make Massachusetts the best place in the country for digital health. The study was conducted through interviews and consultations with government, academic, and industry leaders.

The study's findings are clear: Massachusetts already has the core components of a leading digital health cluster – talent, capital, and data – along with a leadership commitment from government and other prominent stakeholders, but there are missing pieces and structural problems that prevent it from being fully formed. Still, Massachusetts has a unique opportunity to become the leading hub for digital health nationally and to overtake California, New York, and nascent regions like Austin, Nashville, and Seattle.

Below, we lay out the study's recommendations in two pieces: 1) what MassBio as a trade association for the life sciences can do directly to support digital health's convergence with the life sciences and what we can support indirectly through advocacy – what we're calling MassBio.DH; and 2) ideas for other digital health stakeholders – government, providers, payers, academia, entrepreneurs, investors, and people – to help focus existing efforts and make further concrete progress in the coming years.

**To summarize:** to be the best place in the country for digital health, Massachusetts must focus on fostering better access to patients and data, developing a workforce that is able to tackle healthcare challenges through digital technologies, and better coordinating the digital health entrepreneurial and investor ecosystems. Done right, we believe this collective plan will reinforce Massachusetts' global leadership position in the life sciences and benefit patients worldwide, while creating new opportunities statewide centered around the power of data and digital technologies.

## Stakeholders Engaged

**20** C-level Executives in the Boston Ecosystem  
Including payers, providers, digital health, life sciences and academia

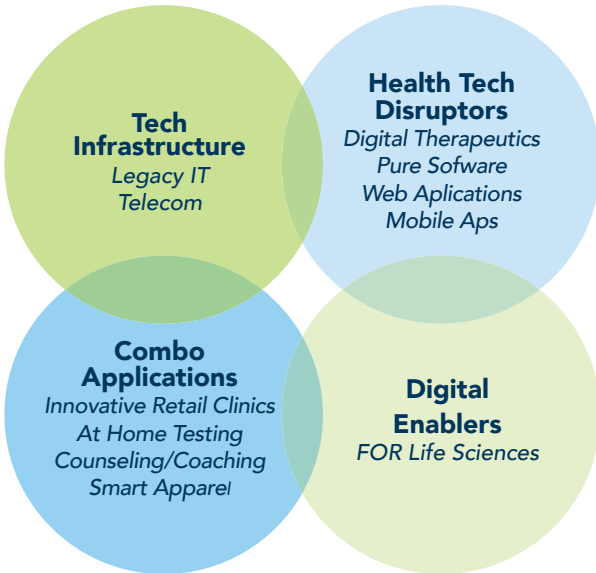
**10** Deloitte Experts in Digital Health/Data  
Including health informatics, cybersecurity, provider and payer experts

**254** Observations from Digital Health Experts  
Through virtual panel to vet recommendations for the Commonwealth and MassBio





## 2 How We Are Defining Digital Health



At its core, digital technologies are increasingly critical in enabling the growth of life sciences companies – from the development of better research and development insight engines, to the commercialization of next generation therapies via digital channels.

However, adopting such a definition of digital health in the context of spurring the growth of the life sciences ecosystem across Massachusetts is too narrow. It risks missing the development of transformative technologies and novel business models centered on broader applications of data, software, and digital capabilities that stand to benefit life sciences, patients, and beyond.

For this study, we have deliberately adopted a broad definition of digital health – one that encompasses capabilities and companies beyond core life sciences

applications, including organizations combining digital tools with brick and mortar applications (such as innovative retail clinics, telehealth diagnostics, and at-home testing), and organizations that are fully digital-based – such as digital therapeutics, pure software aimed at healthcare applications, web-based applications targeting the health sector, and mobile health-related apps. Finally, it’s also important to include the companies and players that provide the core of the healthcare technology infrastructure: legacy IT players and telecom providers.

Under that definition of digital health, let us explore some of the key insights about Massachusetts’ current digital health ecosystem and the opportunities for growth.

## 3 Key Insights Into The Current Digital Health Ecosystem In Massachusetts

Like any other industry cluster, the digital health ecosystem requires a set of key input factors (talent, capital, data), a strong network of supporting industries, a network of digital health companies, anchor firms, sophisticated customers, as well as supportive government agencies. We reviewed the performance of the ecosystem across these areas, leveraging data from extensive interviews, as well as supplementary research to support our findings.

*“We are a unique region in the U.S., combining medical and technology expertise along with an entrepreneurial spirit like no other place in the country... It’s all about Boston.”*

—John Halamka, CIO, Beth Israel Deaconess Medical Center





## Talent & Academia

Massachusetts offers top-notch educational assets important to digital health, attracting leading talent in medicine, business, and engineering. In combination with its many medical schools, the region offers a rich pool of talent to draw from to support the growth of digital technologies. However, our review found this talent to have some critical gaps:

- *The digital health talent drain seems pronounced as those in the field leave to work in other states*
- *Knowledge of clinical workflow (i.e., the knowledge of how healthcare works in practice) is often lacking in those building digital health capabilities*
- *The talent pool of digital health executives and those with 'dual-major' degrees (PhD/MBA) who both understand digital technologies and healthcare or life sciences and who are well suited to lead in the digital health sector is smaller than ideal*

## Data Access

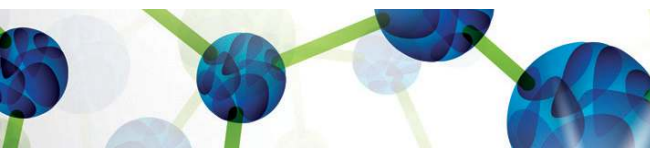
The current infrastructure platforms hosting the enormous amounts of valuable health-related data is archaic and difficult to access. These constraints, in addition to different data standards and hierarchies, make it difficult to provide optimal data analyses beyond a hospital-by-hospital or payer-by-payer approach. Initiatives such as the Verily-Broad Institute collaboration, or other similar collaborations in the UK related to access to high-fidelity, curated data that provides a possible blueprint for what the Commonwealth could aim to achieve, and the value that availing integrated data could yield across the continuum of care and for specific use cases.

## Leadership in the Life Sciences & Dense Customer Network

Massachusetts benefits from a broad and deep customer base for digital health to thrive, including leading payers, academic medical centers, renown hospitals, and sophisticated life sciences companies. Beyond that, the ecosystem of data providers, consumer health companies, and even apparel manufacturers who are increasingly integrating health and wellness into their products, offers rich convergence opportunities.

Even though there is ample evidence of these digital health assets in the Commonwealth, it remains difficult and sometimes costly to learn from and partner with some of the leading providers. Interviewees consistently noted that the prevailing culture at leading providers is one of trying to develop digital health solutions in-house. They highlighted that creating easy touchpoints for external innovation to occur not only hampers cross sector innovation, but also impedes growing digital health companies and entrepreneurs. Ultimately, this siloing or protection of digital health resources, like data and patients, is a negative differentiator between Massachusetts and other states who have addressed these issues.

However, interviewees also noted that providers have greater incentives to adopt digital health technologies and drive savings in care delivery when they assume financial risk on that population through value-based care models, such as ACOs. Interviewees are hopeful that further adoption of these value-based care models will continue to drive adoption and change at providers.





## Entrepreneurship & Anchor Firms

Massachusetts benefits from a rich entrepreneurial ecosystem, including in digital health. Diversity in experiences, cultures, backgrounds, all brought together by skill, talent, and a knack for envisioning something greater converges to make Massachusetts a strong breeding ground for the next wave of digital health. There is already a large number of companies in the digital health cluster, and many more are being formed. However, many of these companies are in their infancy and struggle to pass the initial stages of growth. They will require a strong support system to properly flourish. While there are some digital health anchor firms (e.g., Pear Therapeutics, AthenaHealth) there are relatively few companies that can help spawn the next generation of digital health start-ups.

## Firm Ecosystem & Digital Health Community

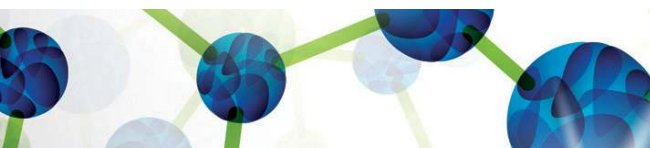
Hand in hand with the aforementioned factors is the need for mentorship, robust incubators, and a thriving community for digital health startups and their counterparts to share knowledge and continuously interact and innovate. Likewise, the dearth of incubator space for digital health startups, combined with an expensive infrastructure in Cambridge/Boston also make establishing a startup in the area more difficult.

## Government

A supportive and active government is critical to the statewide success and growth of a digital health cluster. In many areas, Massachusetts is well along with the 2016 launch of the Digital Health Initiative supported by the Digital Health Council. This public/private partnership has committed government resources toward embedding and strengthening the digital health cluster across the state. The challenge going forward is ensuring digital health remains a priority of state government and that appropriate attention and resources are paid to priority areas from directly inside government and from government encouraging the private sector to take certain actions.

# 4 MassBio.DH – Coordinating the Digital Health Cluster in Massachusetts

As a trade association for the life sciences, MassBio's digital health activities will fall into two areas: launching new MassBio run initiatives such as MassCONNECT.DH to support digital health entrepreneurs, and advocacy in support of broader government and private initiatives seeking to make Massachusetts the leader in digital health. Given all that is already happening in Massachusetts through the Digital Health Council and other leading digital health stakeholders, MassBio.DH will focus throughout on what we can do to enable convergence between the life sciences and digital health.





## 1 MassBio.DH— coordinate the digital health cluster in MA

- 1 **Launch MassConnect.DH**  
(Executive matching program for digital health, DH CEO Roundtable)
- 2 Stand up link to **Israel Digital Health cluster** (digital health “sister city”)
- 3 Convene corporate **investor working group**
- 4 **Launch MassBioEd.DH** offering (interdisciplinary curriculum development at target programs)
- 5 Partner with the Digital Health Initiative, MeHI, to **attract signature digital health conference** (e.g., HLTH)

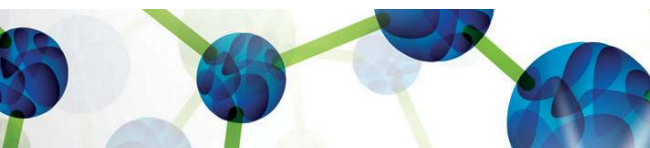
## 2 Encourage legislative action to support MA digital health cluster

- 1 Support creation and passing of **legislative package for the promotion of digital health cluster** in MA, including:
  - a) Identification/Creation of a **digital health point agency in government**
  - b) Mobilization of new **funds at state level for digital health cluster growth**, including MassPRIM
  - c) Enabling **MassHealth to become leading adopter and pilot** of digital health initiatives
  - d) **Job creation incentives** for digital health investors and startups

## 3 Advocate to differentiate MA through data liquidity and regulatory leadership

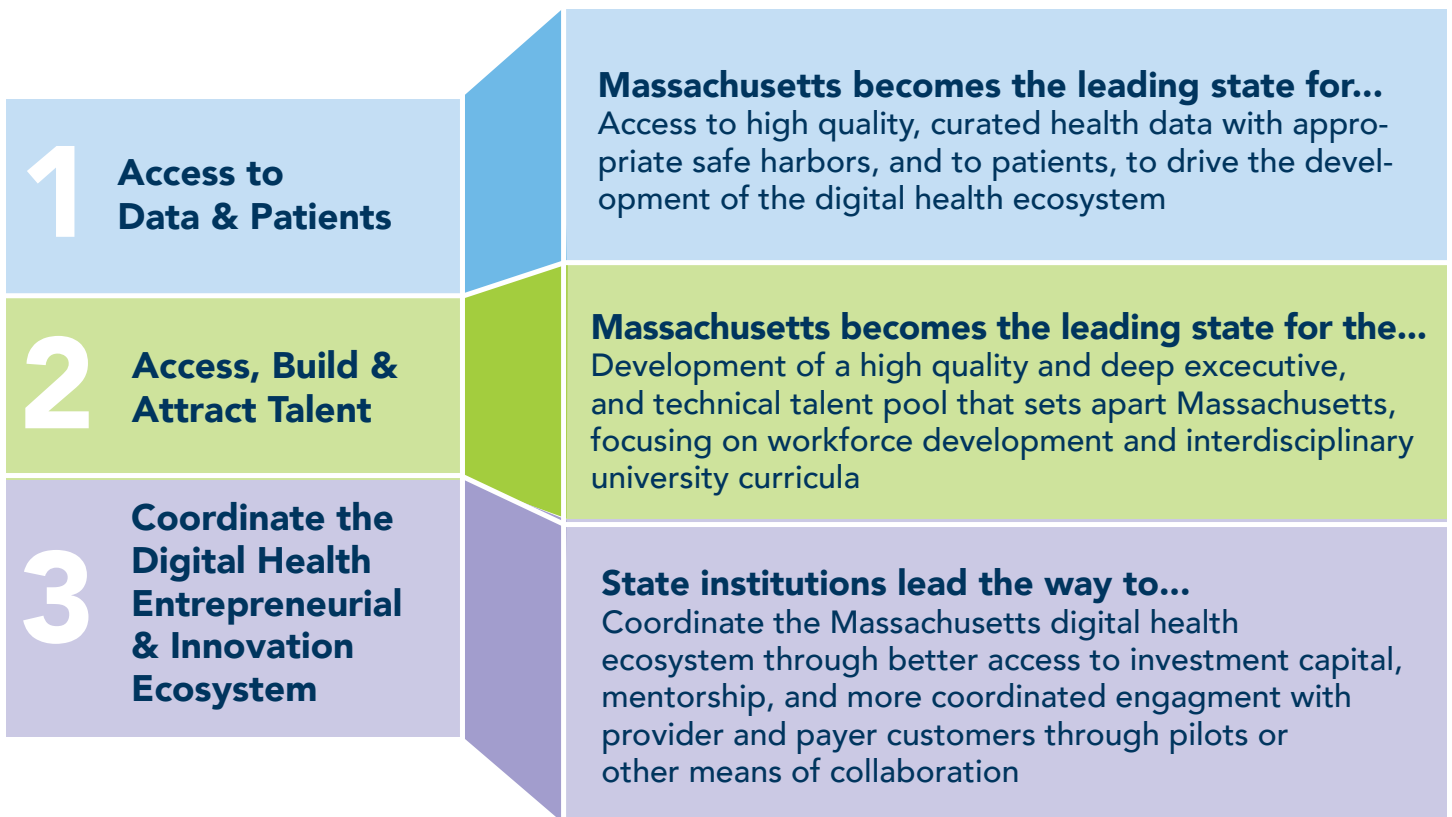
- 1 **Align with MeHI, Digital Health Initiative, to support advocacy and legislative efforts** around:
  - a) Enabling better access to customers and innovations (e.g., Hacker hospitals to serve as a better sandbox for testing innovations)
  - b) Creation of a MA distributed healthcare data framework, of a uniform data use agreements
- 2 **Support identification of membership needs** regarding key digital health regulatory topics
  - a) Data privacy, cyber security and interoperability

As we launch MassBio.DH, the plan is to prioritize and stagger the unveiling of new initiatives. Starting in 2019, we'll launch MassConnect.DH to create a program to support early stage digital health companies through mentorship - similar to what we already do with MassCONNECT and early stage biotech and med device companies. We'll also look to launch a digital health corporate investor working group to convene leading digital health investors, share best practices, and discuss how they can help Massachusetts become the leader in digital health. We'll also start working with government and other stakeholders to advocate for increased data access. These will continue as we tackle other MassBio.DH objectives into 2020, 2021, and beyond.



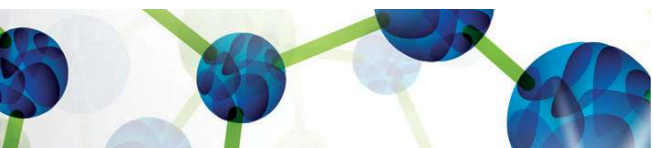


## 5 Three Opportunities for Massachusetts to Further Catalyze Digital Health



### Outside of MassBio.DH,

the study identified at least **three key opportunities** where Massachusetts stakeholders could invest time and resources to drive growth and differentiation of its digital health ecosystem.





### Opportunity 1 *Access to data and patients*

Massachusetts can become the leading region for access to high quality, curated health data that can be easily accessible with the right safe harbors in place. Though challenging to complete, establishing a common, integrated platform to utilize the immense current and future pools of high-fidelity health-related data would be a differentiated capability that would deliver high value to digital health companies. Likewise, the opportunity to support research and development efforts for digital health through better access to patients (e.g., via “hacking hospitals” efforts), will be critical to improve the viability of the of digital health startup ecosystem.

### Opportunity 2 *Talent*

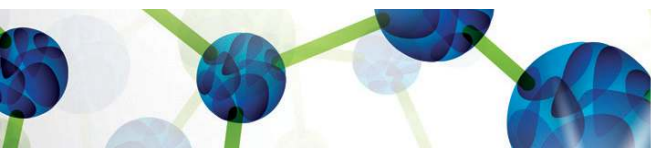
Developing a differentiated pool of talent is an equally important strategic pillar for the Commonwealth to address as it curates a world-class digital health ecosystem. Efforts here would include the development of critical interdisciplinary skills useful to the digital health ecosystem (e.g., skills and training in behavioral science, AI-machine learning, voice-activation technologies, clinical workflow assessments) to train and develop a workforce and executive leadership talent pool that understands both healthcare and digital technologies. Additionally, the attraction of digital health conferences will be critical in further shining a spotlight on the state’s capabilities and appetite for digital health.

#### *Example Options to Consider*

- **Federated data sharing platform** to allow access to provider, payer, genomics, biopharma data across the state, for specific use cases and R&D purposes
- **Test bed hospitals** to enable better access to care environments to test and refine digital health solutions
- **Patient communities** to drive better engagement of patients into clinical development and ‘biohacking’

#### *Example Options to Consider*

- **Partner with leading universities (e.g., MIT, WPI, Northeastern) to review university curriculums** to drive better alignment with the interdisciplinary nature of education required to drive the digital health ecosystem forward
- **Workforce development courses and internship programs** anchored around specific needs for digital health, such as cybersecurity, or clinical workflow understanding
- **Attract digital health conferences**, such as HLTH to hold their annual event in Massachusetts
- **Create digital health sister city/state agreements** with leading foreign ecosystems, such as Israel







### Opportunity 3 *Digital Health Entrepreneurial & Innovation Ecosystem*

Coordinating the digital health ecosystem will be another critical effort in driving growth for digital health companies. Initiatives such as the development of executive mentorship programs, dedicated startups spaces, the mobilization of investment capital specifically for digital health (through corporate venture funds or new state funds) and creating a framework to make the state (e.g., MassHealth) the first pilot and adopter of digital health technologies will further reinforce the ecosystem and the viability of its companies.

#### *Example Options to Consider*

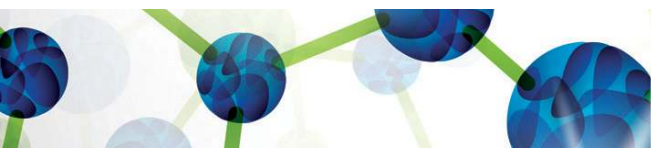
- **Executive matching/mentoring program** to drive development of an executive cadre
- **Leverage funding from corporate venture funds and government** (MassPRIM) to fund the development of digital health startups located in the state
- **Job creation incentives** to drive the growth of startups from series A to growth phase
- **Framework and investments** to ensure MassHealth can lead adoption and piloting of digital health technologies
- **Identification of one government** point of contact in charge of leading the development of the ecosystem

## 6 Conclusion

The Commonwealth of Massachusetts has a unique opportunity to drive further development of its digital health ecosystem, especially given the inherent lead enjoyed in the life sciences. This will create many new opportunities for the Commonwealth's workforce and will likely result in the emergence of new, innovative digital health companies that will have the power to transform healthcare.

Achieving this ambition will take the dedicated effort of MassBio, its members, the public sector and Administration, educational institutions, and related and supporting industries. Through this collaboration, Massachusetts' companies involved in digital health will continue to foster better access to patients and their health data, develop a talent pool that can tackle healthcare challenges through digital technologies, and create and coordinate a unique entrepreneurial ecosystem targeting digital health capabilities.

As for MassBio's piece, MassBio.DH provides an initial template outlining MassBio's strategy as the organization helps reinforce the state's global leadership position in the life sciences and create new opportunities centered around the power of data and digital technologies. This strategy draws several threads of activities via a multi-year agenda to support the growth of the digital health ecosystem, support the Commonwealth's ambitions in digital health and create new opportunities for investment in this critical piece of the life sciences and healthcare puzzle.





## MassBio Digital Health Working Group

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## About Us.

MassBio's mission is to advance Massachusetts' leadership in the life sciences to grow the industry, add value to the healthcare system and improve patient lives.

We represent 1,100+ organizations in the life sciences industry, including biopharma, medical device, combination product, digital health companies, along with academic institutions, research hospitals, disease foundations and service providers.



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