

### INTRODUCTION: AMAZON'S AMBITIONS IN HEALTHCARE

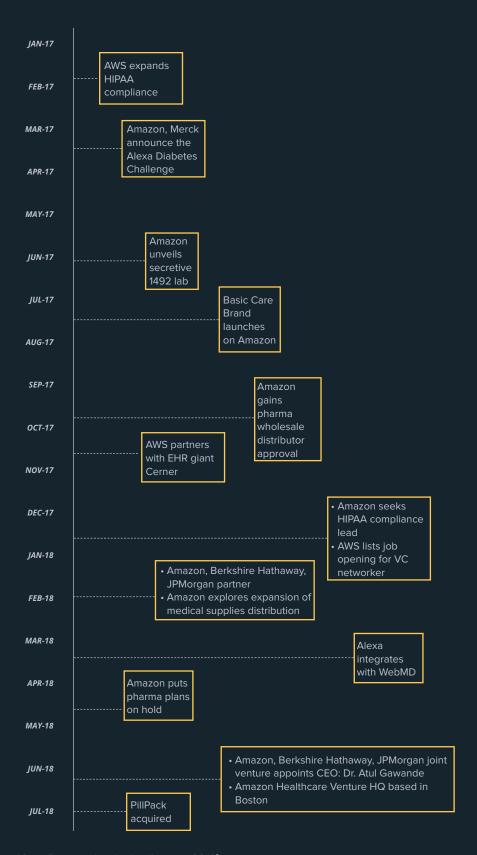
Amazon's e-commerce dominance is well documented, and 2018 has been a landmark year so far for the global tech giant. Amazon's stock has gained more than 70% in 2018. After passing the \$800B market cap in June, Amazon swiftly broke through the \$1 trillion mark in early September, maintaining its spot as the second most valued U.S. company behind Apple. Two thirds of all Americans have bought something on Amazon, representing 92% of all online shoppers.

Less clear, however, is Amazon's desired role and intent in the healthcare market. There have been several indicators of movement, with January 2018's health initiative announcement with Berkshire Hathaway and JPMorgan Chase being perhaps the most significant. The June appointment of Dr. Atul Gawande (a well-known surgeon and healthcare reform advocate based in Boston) as the new CEO of this joint venture has only heightened expectations.

Given Amazon's reputation for industry-scale acquisitions (as with 2017's Whole Foods buy), any move can shake stock prices and transform markets.<sup>4</sup> The pharmacy industry followed the same pattern: hours following Amazon's announcement of its acquisition of PillPack, CVS, Walgreens, and Rite-Aid collectively lost \$11 billion in market value.<sup>5</sup>

In light of this momentum, we conducted a pilot study with healthcare leaders to capture progressive perspectives and track changes in those outlooks over time. We decided to ask how business leaders in hospitals are thinking about Amazon and its role in healthcare. What other external innovators are they partnering with already? How prepared are they for Amazon and what does it mean for their business model? How will they evolve to participate and compete in the Amazon era of healthcare?

### **AMAZON HEALTHCARE TIMELINE**



Adapted from Business Insider Intelligence, 2018<sup>6</sup>

### THE 2018 RESEARCH STUDY

To find out how prepared healthcare leaders are for these innovative integrations, we conducted a study across 11 hospitals in the Boston area. Boston hosts one of the most active medical ecosystems in the world, inclusive of a high concentration of academic medical centers, a mature biotech community and a hotbed of digital healthcare start-ups and spinoffs. And all of that innovation attracts the tech giants who are looking for top medical partnerships.

"We have an in-house innovation group. We've got our own doctors who are doing crazy stuff. We had a group fly out to Apple because Apple wanted to meet with us. We have a doctor who is doing work with Samsung on the hospital room of the future. But part of the reason [the innovation group] exists is as an entry point for all these start-ups and tech companies because if not, there's no entry point for them. We've got all the people coming from MIT and just from Boston who are doing stuff so they're trying to get access to us." (Analytics, Acute, Academic Medical Center)

Our objective was to uncover the direct and indirect influence of these companies (Apple, Amazon, etc.) on healthcare today. And, gauge their anticipated level of impact in the future.

#### About the survey

Captains Research interviewed 13 business leaders (director level and above) across 11 hospitals in May, 2018. These 11 hospitals collectively generated \$11 billion in annual operating revenue in 2016.\* The profile of hospitals represented within the sample includes:

- 10 Non-profit hospitals
- 8 Acute care hospitals
- 4 Academic Medical Centers (AMCs)
- 4 Teaching hospitals

- 3 Non-acute hospitals (Rehabilitation, Psychiatric, Veterans)
- 2 Community hospitals
- 1 Children's hospital

Individuals interviewed were director-level and above from the following departments: IT, Finance, Analytics, Innovation, HR, Administration, and Operations/Compliance.

\*Hospital classification and financial data for FY 2016 provided by CHIA: Center for Health Information and Analysis, Massachusetts Hospital Profiles, 2018.

### **KEY FINDINGS**

### 1. The Mindset: Complicated but not insurmountable

Hospital business leaders (director level and above) may be realistic about challenges, but they are equally open and optimistic about innovations from non-traditional sources, including tech players non-native to healthcare.

### 2. The Landscape: The impact of big tech players is shifting

The levels of non-native tech company integration in hospitals today does not necessarily align with where hospital leaders expect transformative change to come from tomorrow.

### 3. The Expectations for Amazon: Separating market entry from impact

There is a gap between where hospitals expect Amazon's debut in the next 12 months, and the areas in which hospitals truly desire innovation from external partners like Amazon.

### 4. The Evolution: Tracking the transition to Amazon era healthcare

While present technology investments are largely concentrated around EHR upgrades, the growing commercial applications and decentralized nature of telemedicine is representative of a market shift towards Amazon era healthcare.

### 1. THE MINDSET: COMPLICATED BUT NOT INSURMOUNTABLE

The idea that healthcare is too complex, too regulated, and too challenging for external entities like Apple, Amazon, or Uber to influence is a common narrative. But it's not a narrative that those living at the center of the healthcare innovation and technology ecosystem care to keep hearing. Inside Boston's academic hospitals, innovation leaders are practical about the challenges but highly disciplined with internal processes that vet viability and measure the impact of digital innovation within the hospital.

"Yes it's complicated, but it's not insurmountable. You have to remember that innovation is not something new. Fundamentally, digital innovation is about problem solving." (Innovation, Acute, Academic Medical Center)

In IT specifically, none of the leaders with whom we spoke disputed the operational barriers to adopting or integrating new technologies and digital approaches. But as one expert pointed out, organizations should stop dwelling on the extra effort required to implement, and just focus on the benefits of innovation when it comes to the patient experience.

"Guess what—there are a lot of things in the background for [new technology adoption] to actually occur, and might even be an additional operational cost for organizations. But you don't really need to know how hard it is for me to make it easier for you. It's going to be hard for me, but we should be doing it." (Information Technology, Acute, Community Hospital)

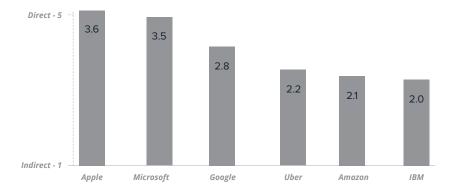
## Yes it's complicated, but it's not insurmountable. Fundamentally, digital innovation is about problem solving - Innovation, Acute, Academic **Medical Center**

Indeed, the broader business-medical community beyond those featured in our study has signaled interest and readiness to collaborate with external innovators. The 500+ participants in a 2017 New England Journal of Medicine Catalyst Insights Council Survey made it "abundantly clear they believe innovation will come from beyond traditional healthcare organizations" according to the Insights Report. "Though executives, clinical leaders, and clinicians all are pinning their hopes for disruptive innovation in healthcare on outside forces, the reality is that innovation has to integrate with existing models. In other words, outsiders might build it, but insiders have to accept innovation for real, sustainable change to

### 2. THE LANDSCAPE: THE IMPACT OF BIG TECH PLAYERS IS SHIFTING

Today, Apple and Microsoft have the most traceable footprint inside hospitals. Apple's impact is high due to their hardware (e.g. iPhones, iPads) being used throughout many hospitals for network security reasons. Microsoft Windows is highly integrated on the enterprise software side, commonly employed across operations.

#### **DEGREE OF IMPACT ON HOSPITALS 2018**



Despite Amazon's limited impact on hospitals today, the healthcare leaders in our study ranked it as the company most capable of bringing the greatest impact to healthcare. "Although I have a belief that Amazon's future state will have high impact, the impact on my organization today is low." (Information Technology, Acute, Community Hospital)

Trailing Amazon in the #2 spot was Apple. "I think it's a toss up between Apple and Amazon. I just found out that Amazon had their best quarter ever. But I feel like people resonate a little bit more with technology with Apple." (Information Technology, Acute, Community Hospital)

#### More Healthcare Ambitions from Big Tech

Amazon is by no means the only tech giant, non-native to healthcare, that has proclaimed intent or developed divisions devoted to healthcare. Apple announced Health Records for iPhone in a Beta program with 13 hospitals, including Johns Hopkins in January 2018.8 Their "consumer-friendly approach" securely centralizes patient accesses to EHR data, an existing issue that continues to plague the entire healthcare ecosystem. In a five-day span in March 2018, UBER, then LYFT, announced their formal programs and partnerships with providers.9 When you consider the total cost of missed healthcare appointments in the United States every year is \$150 billion and no-show rates are as high as 30% nationwide it's understandable how these targeted technology based solutions can alleviate some of the stressors in the system.<sup>10</sup>



One of the things that we are concerned about is that if Amazon were able to achieve the model they currently have. What would that mean for healthcare providers?"

- Finance, Non-Acute, Teaching Hospital

Other experts have argued that the ecosystem Apple is building through its partnerships isn't getting the attention it deserves. 11 However, none of the 13 hospitals implementing Apple's beta program were in the Boston area at the time of the study, which may explain why it fell a little lower on the radar for the respondents. Apple has since increased its reach to 39 hospital systems, including Partners Healthcare in Boston.<sup>12</sup>

Overall, respondents' confidence in Amazon has little to do with the retailer's current healthcare offerings, and much more to do with their track record in other markets. "I think they have the potential ability to disrupt the healthcare industry just like they have with all of their other [businesses]. They're aggressive. They're not stopping." (Information Technology, Acute, Community Hospital)

"Amazon is trying to get into the health field. I mean it's boundless for me. I mean we don't know where it's going to end." (Administration, Non-Acute, Teaching Hospital)

All of which is to say that the leaders with whom we spoke at some of the most progressive hospitals in the country agree that Amazon is generating a sizable amount of buzz inside their organization. As one CFO shared: "So among my colleagues, we mostly talk about Amazon." (Finance, Non-Acute, Teaching Hospital) These hospital leaders are strategically considering what a dedicated presence from Amazon could mean for the healthcare industry, and healthcare providers specifically: "One of the things that we are concerned about with the Amazon model is that if Amazon were able to achieve the model they currently have in terms of what Amazon does [in other industries]. What would that mean for healthcare providers?" (Finance, Non-Acute, Teaching Hospital)

Agree Amazon is generating the most attention about their potential to impact healthcare.



Amazon ranked the #1 company most capable of bringing transformative change to healthcare in next three years.

### 3. THE EXPECTATIONS FOR AMAZON: **SEPARATING MARKET ENTRY FROM IMPACT**

To begin to answer the question: what would that mean for healthcare providers? it helps to explore where Amazon could play.

Respondents in our study pointed to the supply chain and retail side of healthcare as the most accessible entry point for Amazon in the next 12 months. "[Supply is] the place where they could immediately make a big impact because we are constantly negotiating with different vendors." (Finance, Non-Acute, Teaching Hospital) This sightline was echoed by Reaction Data, which found that three quarters of U.S. healthcare executives expect Amazon will disrupt the traditional healthcare supply market.<sup>13</sup>

This view makes particular sense not just for Amazon, but also for the healthcare industry where supply costs are second only to labor costs. On average, supply costs make up 15% of total hospital expenses but can jump as high as 30% or 40% in hospitals with a high case mix index, such as surgery-intensive hospitals.<sup>14</sup>

As one executive in our study explained: "We declare victory when we can get the big surgical services to agree on ten devices that do the same thing because every clinician wants something that they were trained on. But logically everybody could use one or two, not ten. And that has been a huge cost savings for us to be able to do that. So Amazon could probably do that very rapidly." (Finance, Non-Acute, Teaching Hospital)

Given Amazon's sizable command of the logistics business, it becomes an even more attractive target since the global healthcare supply chain management market is projected to reach \$2.31 billion by 2022 from an estimated \$1.41 billion in 2016. This puts established vendors like Cardinal Health and McKesson under significant pressure.

"Because of their volume, because of their buying power, and because of their ability to deliver quickly, Amazon can turn the supply chain management in hospitals upside down." (Information Technology, Non-Acute, Teaching Hospital)

**85**%

Consider supply chain and retail side of healthcare the most likely entry point for Amazon in next 12 months. When pressed about the type of integration or involvement from Amazon that would be most meaningful to hospitals, the majority of respondents pointed to Healthcare IT—not supply chain and retail—as the area in most need of transformation.



I believe that [Amazon will] have a role in providing services for the well-being of the patient when they're not in a hospital or ambulatory setting."

- Information Technology, Acute, Community Hospital

Looking beyond the next 12 months, respondents would like to see Amazon provide solutions to their greatest IT challenges, both on the B2B end (e.g. EMR, clinical decision support) and the consumer-facing end (e.g. scheduling, virtual care). "I believe that [Amazon will] have a role in providing services for the well-being of the patient when they're not in a hospital or ambulatory setting." (Information Technology, Acute, Community Hospital)

This area aligns more naturally with Amazon's strategic orientation—and to date, a dominant force in consumer/patient-facing technologies has not emerged.

### **HOSPITALS' EXPECTATIONS FOR AMAZON**

### **Next 12 months** Pharmacy/Retailers

Suppliers/Distributors

Pharmacutical

#### **Future**

Healthcare IT (Consumer Based Technologies)

Healthcare IT (Vendor Technologies, EMR)

**Group Purchasing Organizations** (GPOS)

#### The Patient Experience Paradox

Hospitals know that greater patient engagement, such as minimizing missed appointments, leads to better patient outcomes and lower costs. Hospital readmissions comprise nearly a third of US healthcare expenditures. About 15-20% of this spending is considered to be potentially preventable. A team of researchers at Mass General looked at the relationship between patient satisfaction scores and readmission rates, and found patients reporting high satisfaction and good provider communication were less likely to be readmitted.<sup>16</sup>

But hospitals continue to fall short in the patient experience category. They are well aware that even the scheduling and reminder process that is commonplace in restaurants, gym classes and hair salons, is still a reach. Not to mention the 'white space' type offerings that allow doctors to fill available openings last minute. That patient-driven demand, and the risk of losing patients to a competitor who provides a better experience, is motivation.

### 4. THE EVOLUTION: TRACKING THE TRANSITION TO AMAZON ERA HEALTHCARE

Providing services for the well being of patients when they're not in a hospital is precisely what healthcare in the Amazon era is about. The technology that principally enables this gateway is telehealth. Three quarters of respondents rated telemedicine as the technology capable of creating the greatest transformative change in healthcare in the next three years.

"So I think in the next five years I may myself not recognize medicine. It's going to be vastly different." (Finance, Acute, Academic Medical Center)

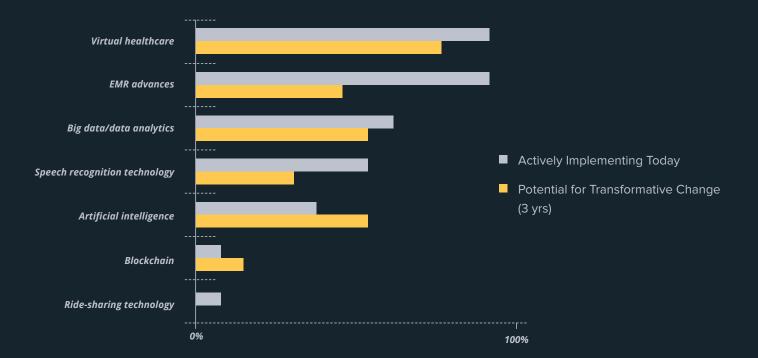
That's largely because hospitals today are asset heavy, focused on consolidation and centralization of resources, and utilize outdated supply chains. For most, the evolution to Amazon era healthcare is far away. Yet over 90% of the hospitals in our study are actively implementing telemedicine solutions. This signal provides an early glimpse into the extent that they are modernizing or pivoting into Amazon era organizations.

"We have a whole telemedicine department now. Our doctors consult with people across the globe about treating people." (Compliance/Operations, Acute, Teaching Hospital)

Telemedicine presents a tremendous opportunity not only with virtual diagnosis that may keep patients out of the hospital, but by enabling better care and monitoring as an at-home extension of recovery and rehabilitation. This type of home-based care was particularly important to the institutions providing rehabilitation-focused services, as well as those serving populations with limited mobility or access challenges (e.g. rural locations, geriatric populations, etc.)

The other area where hospitals are heavily investing is in EMR upgrades. Over 90% of the hospitals in our study were actively undergoing a transition or upgrade. However, unlike an investment in telemedicine, hospital leaders consider EMR investments to be a requirement for doing business rather than a source of transformative change. "I've seen advances but I don't see it as anything bigger." (Information Technology, Acute, Community Hospital)

#### **TECHNOLOGY ADOPTION AND FUTURE IMPACT IN HOSPITALS**



Artificial intelligence and big data also emerged as potentially transformational influences in the next three years. Many respondents felt Al's impact would be further out on the continuum, given that the clinical impact is still minimal. "I do think artificial intelligence is huge in terms of what machine learning can do. I really believe artificial intelligence hasn't even broke ground yet." (Information Technology, Acute, Community Hospital)

Some of the more future-minded respondents in this study envisioned Amazon as a key player in healthcare delivery, on a telehealth platform. They reasoned that since it is decentralized by design, it's a natural fit in Amazon's wheelhouse

"Amazon should buy a primary care or specialty care because insurance companies are buying practices today." (Information Technology, Acute, Community Hospital)

"I don't see Amazon figuring out hospitals or health systems in the next 12 months but they could if they could start to figure out primary care through telehealth." (Analytics, Acute, Academic Medical Center)

The most actionable takeaway is that any organization—established hospital system or newcomer—can participate in Amazon era healthcare. But, it will require the adoption of an Amazonian mindset and strategy to meaningfully compete.

### Artificial Intelligence in Clinical Practice

Even though AI has not widely impacted the clinical setting yet, analysts predict that AI is going to influence the US healthcare market in the next few years. <sup>17</sup> According to Research and Markets, the worldwide Healthcare AI Market will exceed \$5.5 Billion by 2022. <sup>18</sup> Other chief indicators include the number of clinical trials involving AI and the FDA's growing interest in products that use AI. <sup>19</sup>

Some are seeing the impact in radiology to help streamline reading of images and identifying anomalies for physicians. EPIC is Al enabled to identify dosage and co-interactions, and pharmacists see less room for human error in the filling of scripts. Microsoft Azure, EPIC, and Ochsner hospital system made headlines about their machine-learning platform that notifies staff of a cardiac arrest before it happens.<sup>20</sup>

### CASE STUDY: EARLY ADOPTER OF AMAZON ERA HEALTHCARE

To better understand what a decentralized health delivery model in the Amazon era looks like, we met with Richard Rakowski, the CEO of Medically Home. Just as Amazon has reimagined retail and defined modern e-commerce, Medically Home is tearing a page from Bezos's playbook with ambitions to replace the healthcare system as we currently know it.

"It's the uncoupling of large fixed costs to deliver on a mission and instead focusing on service, speed, and reliability. That's it. That's the era of Amazon in healthcare." Rakowski explained. "We've always made the patient come to the clinic or the office or the hospital. Well, it's not efficient."



It's the uncoupling of large fixed costs to deliver on a mission and instead focusing on service, speed and reliability. That's it. That's the era of Amazon in health care."

- Richard Rakowski, CEO of Medically Home

Medically Home is among the first to pioneer the concept of virtual hospital beds, an increasingly viable option for hospitals with populations with high readmission patterns or facilities that need to flex outside their physical footprint to accommodate unexpected surges of patients (think flu season) to make room for acute cases. Patients who qualify are setup at home with a 24/7 connection utilizing voice technology, wearable sensors, and an iPad that links them to their physician and nursing staff. But that's only one small side of the decentralized model, we learned. The other element of the model that Rakowski and his team developed is ondemand access to an urgent medical supply chain.

As Rakowski explained: "The problem right now is when the patient needs something, how do we get it to them as fast if not faster than when the hospital in the same building?" Take the example of an x-ray. Today, most of us go to a facility for the imaging to be taken, and then we go about our day and wait for a call to come in with our results. In the background, that image is usually sent to a physician to be read, regardless if they are on-site or not.

# The Amazon model is you distribute the care rather than centralize it. - Richard Rakowski, CEO of Medically Home

Medically Home has reimagined and reengineered the fixed costs out of the equation by focusing on strategic logistics and the delivery business. The team has tested how to bring the x-ray machine (and 18 other services) to the home at greater convenience to the patient, at lower cost and faster turn-around time. The urgent medical supply chain includes labs, durable medical equipment, oxygen, medication and meals as well as visits from nurses, nutritionists, home health aids and physical therapists.

"The Amazon model is you distribute the care rather than centralize it." Rakowski emphasized. "Eventually, virtual hospitals will replace hospitals as we know them."

More than a market-shift, this evolution represents a mindset shift as well. Change today is being driven and accelerated by consumer-behavior and technological advances. In healthcare, business leaders who are attuned to these underlying dynamics will enter the Amazon era of healthcare poised for opportunity, instead of bracing for obsolescence.

### STRATEGIC THOUGHT STARTERS: HOW HOSPITALS CAN THRIVE IN AMAZON ERA HEALTHCARE

For hospitals to participate and grow in the Amazon era, most need to consider some core strategic questions. Addressing these—first theoretically, and then practically—will enable forward-looking players to define and shape the new healthcare landscape.

### 1. How do you evolve to be more decentralized?

As healthcare continues to move outside hospital walls, into the cloud, into wearable technologies, into patients' homes and everyday lives, hospitals' roles and delivery models will require adaptation in order to best serve their key customers. The Hospital at Home [HaH] model that is becoming more widely implemented is just one example of how institutions are evolving to provide care. Where does the adaptation begin for your institution?

"As the health system shifts to value-based care, HaH will challenge the traditional, facility-based model. [...] And technological advances, such as biometrically enhanced telehealth modalities, will make HaH more viable." Bruce Leff, MD, Johns Hopkins University School of Medicine<sup>21</sup>

"When you're too full and you're trying to rapidly get patients out of a hospital to make room for new patients, that's when you need a temporary virtual hospital unit at home." (Richard Rakowski, CEO of Medically Home)

### 2. What is your unique value in your market?

Hospitals have traditionally focused on quality of care. But convenience, speed, affordability, access, and control are increasingly strong drivers for modern patient satisfaction. As market dynamics continue to shift towards consumers, how will you evolve your delivery model to balance what patients want and what your institution does best?

"Patients are asking for it. And that's where there's the pivot. That's where there's this shift. If they're asking and they view you as their primary service area, but they find out they can get that somewhere else then they might choose differently." (Information Technology, Acute, Community Hospital)

"The access vs. ownership debate is an active industry-wide battleground. Ultimately, at the hospital system board level we voted to participate in an Apple partnership because we believe access is the progressive option that our patients should have." (Information Technology, Acute, Academic Medical Center)

### 3. Are you positioned to maintain autonomy or could you become a vendor to Amazon?

Geography, volume, populations served, and specialty/ service lines offered are all key parts of Amazon's strategic considerations when it comes to their healthcare investments. Opening the aperture to consider how an entity like Amazon would view your hospital system is an important exercise to enable you to prepare today for a relevant, valuable future.

"Our feeling is Amazon would like us to be vendors. They would like to create a market just like they have everywhere else where we are a vendor and you log on and you go to your vendor. That's not the model that we are interested in. We don't want to be just a vendor." (Finance, Non-acute, Teaching Hospital)

"I just think that the market forces in the Northeast are so hard because we are so progressive and try to be on the cutting edge." (Information Technology, Acute, Community Hospital)

### A CLINICAL VANTAGE POINT:

### AFTERWORD BY DR. DAVID Y. TING

I am personally very enthusiastic about the potential changes to healthcare in the Amazon era. The idea of being able to distribute healthcare broadly, quickly and timely—when the patient wants it—is exciting for clinicians and business leaders alike. It is evident that visionaries in positions across the industry eagerly anticipate the positive advancement that big tech companies like Amazon, Apple, and Google can introduce to the space and impact the way we conduct business and deliver care.

As exciting as these breakthroughs are, they also pose a philosophical, societal, cultural challenge to all of us. In our go-go-go pace of life, it's difficult to calibrate to the bigger question: what type of society do we want to foster?

As a practicing clinician and a CMIO, there are specific issues that I want to make sure that we who are shaping the era of digital healthcare—the decision makers, entrepreneurs, technologists and investors—are mindfully considering.

- Safety and Privacy: In an age when privacy is more and more elusive, who should have access to patient data and when? How can these data exchanges be regulated for the safety of patients and physicians?
- Accessibility and Equitability: Tech companies are successful because their business model locks users into their ecosystem, but this also locks people out. What might an alternative business model that encourages free access for all look like?
- Sustainability and Scalability: As telehealth, mobile tech, AI, and machine learning continue to grow, what is the appropriate balance between becoming a doctor-as-a-service society and revitalizing the personal relationships between physician and patient?

These topics have nuanced and simultaneously massive implications for three key groups: patients, providers, and society. Each warrants our dedicated focus and requires ongoing reflection.

In this incredible moment for medicine, data, and technology, I think we're going to find that there will be roadblocks and many more questions along the way that we must answer together. Entering the Amazon era of healthcare may be inevitable, but building one that is safe, accessible, and sustainable will be the most rewarding path we can take.

### David Y. Ting, MD, FACP, FAAP

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The opinions expressed by Dr. Ting are his own and do not represent Massachusetts General Hospital (MGH) or Partners Healthcare.

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Lauren Prentiss is a strategist, researcher and marketer, but first and foremost, a listener. As Strategy Director at Captains, her focus is uncovering the patterns, tensions and insights that give organizations a meaningful edge. Lauren and her team build foundational, research-driven insights for our clients and are responsible for inspiring and codifying big ideas. Since joining Captains, Lauren has helped clients across Healthcare, Energy, and Higher-Ed achieve customer-led innovation, vision-driven brand strategy and industry-defining positioning.

# CAPTAINS research

### **About Captains Research**

Captains Research conducts ongoing research on the market dynamics and global trends impacting sectors undergoing profound change: Healthcare, Higher-Ed, and Energy. We are also experts in understanding elusive populations, such as the C-suite. This research contributes to our growing knowledge base that is used to support some of the world's most progressive challenger brands.

To learn more or participate in our ongoing research efforts, please visit https://www.captainsofindustry.com/amazon-healthcare-study

