

THE OLIVER WYMAN

HEALTH INNOVATION JOURNAL

INSIGHTS FROM THE CUTTING EDGE OF
AN INDUSTRY IN TRANSFORMATION

THE OLIVER WYMAN HEALTH INNOVATION JOURNAL

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INTRODUCTION

Welcome to the second edition of the Oliver Wyman Health Innovation Journal, which we're thrilled to release at this year's Oliver Wyman Health Innovation Summit in Dallas. This collection of articles reflects the latest insights from transformational executives across our Health & Life Sciences practice who are at the frontlines of industry-wide disruption. For this publication, we've collaborated with groundbreaking leaders outside of Oliver Wyman to share our collective industry perspectives in several co-authored pieces.



Research conducted at Oliver Wyman's Health Innovation Center (OWHIC) serves as a springboard for the ideas presented here. We strive to create a healthcare system with innovation at its core, where consumers' voices drive industry transformation, where companies deliver lasting value, and where healthcare focuses less on treatment and more on prevention.

By launching this new journal edition, we aim to create an insightful, passionate platform that represents Oliver Wyman's steadfast commitment to driving impactful healthcare discussions about challenging the status quo and, as our Summit theme says, breaking boundaries to build a better way.

This journal edition presents a vast range of topics – Amazon, pharma, blockchain, cybersecurity, actionable data, physician mindsets, and prescribing food as medicine, for instance. Meanwhile, it features key findings from the 2018 Oliver Wyman Health Consumer Survey. In the breadth of these pages, we aim to challenge your thinking and assumptions. I hope you enjoy this journal. I look forward to lighting the spark together.

Terry Stone

A handwritten signature in black ink that reads "T. A. Stone...". The signature is written in a cursive, flowing style.

Managing Partner, Health & Life Sciences Practice, Oliver Wyman

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THE SPARKS ARE FLYING

Lighting a Fire
Under Healthcare

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Imagine a different healthcare future. Medical advice we can follow, making a difference we can see. Clinical care delivered in the setting that's best for us. Affordable. Easy to navigate. Working for us, not against us.

Why can't we have it all? Maybe we can...

AN INDUSTRY MISALIGNED

We've typically defined the US healthcare industry around two core models: health systems and insurance companies.

Health systems were built around large, high fixed-cost, general purpose hospitals to treat diverse patient populations. These systems developed networks of affiliated local physicians to extend their reach into the community. This scale and density of local coverage promised, but didn't deliver, efficiency. Instead, scale has provided negotiating leverage over a shrinking pie.

On the payer side, the business model required investment in sophisticated administrative and distribution processes, which became fixed assets for administrative platforms and a sales infrastructure rewarding scale across millions of covered lives – another strong motivator for consolidation. (Ironically, the actual insurance process – actuarial pricing and risk management – can be competitively managed at smaller scale points, often with populations of 10,000 or 20,000.) Expensive fixed-cost processes are now being challenged by technology-enabled models.

The industry structure is designed around the economics of supply with a one-size-fits-all, general value proposition. Whether in the doctor's waiting room, the emergency department, the health plan design, or the benefit structure, this system is designed around clinicians and assets, not consumers. And it has been frustratingly slow to evolve and improve.

JUST ONE SPARK

Traditional roles are under increasing pressure. The combination of advancing technology, consumer activation, regulatory shifts, and business model innovation is challenging incumbents across the ecosystem. Market disruption follows patterns, like the laws of entropy in physics: if purposeful technology and business creativity can be combined in the right mixture, healthcare will be disrupted to deliver better outcomes, experiences, and economics. In industry after industry, sparks have appeared that burned down the underpinnings of old models. In healthcare, those emerging sparks are beginning to define the dimensions of a new healthcare industry:

ECONOMIC PRESSURE

For providers, health system costs are growing much faster than revenue. Nearly 20 percent¹ of US hospitals are either at or near insolvency. Cross-subsidization of commercial and government paid populations is unsustainable. Inefficiencies of care delivery networks are being exposed.

DATA ENABLEMENT

Digital medical records and the explosion of behavioral data consumers generate are an opportunity to think about how data is used. Relying on patient-physician exchange as the core of healthcare decision making is risky.

CONSUMER EXPECTATIONS

Healthcare's consumer experience and reputation is poor – Oliver Wyman research on consumer perceptions puts both core business models (health plans and hospitals) at the bottom of cross industry ratings. Problems are well documented. Consumers expect and experience seamless, convenient, transparent services in other aspects of their lives. They will gravitate toward companies that can meet those expectations in healthcare.

BUSINESS DESIGN INNOVATION

A new group of disruptors is making credible, aggressive moves. Both from inside the industry (such as significant new moves by Aetna, Cigna, UnitedHealth/Optum) and from outside (most notably, Amazon-Berkshire Hathaway-JPMorgan, Apple, and Google), innovators are targeting the failings of traditional models.

Each of these is a strong enough spark to drive real change. Together, they create the conditions to ignite the fire.

Across the broad front of innovation, we are seeing the emergence of five new roles capable of delivering value to the consumer and the funder. These roles are based on new business designs that have a compelling value proposition and an economic model that can change consumer behavior patterns and spark a new industry structure.



ROLE 1: ACCESS SPECIALISTS

By some estimates, three in four primary care encounters can either be resolved via virtual bots and self-care programs, or else be addressed by clinicians remotely or at home. New front door options are beginning to offer compelling alternative propositions:

1. Retail clinics are continuing to expand, diverting consumers away from emergency rooms and traditional primary care offices based on need and convenience.
2. Established retailers are converting their retail footprint toward healthcare options around pharmacists and nurse practitioners.

THE SPARKS BECOME A BLAZE: NEW ROLES TO DRIVE HEALTHCARE

REBUILDING THE INDUSTRY ON NEW DIMENSIONS

TODAY'S STRUCTURES
ARE BEING BROKEN APART...

HEALTH SYSTEM

- Primary care providers
- Hospitals
- Clinics
- Specialists



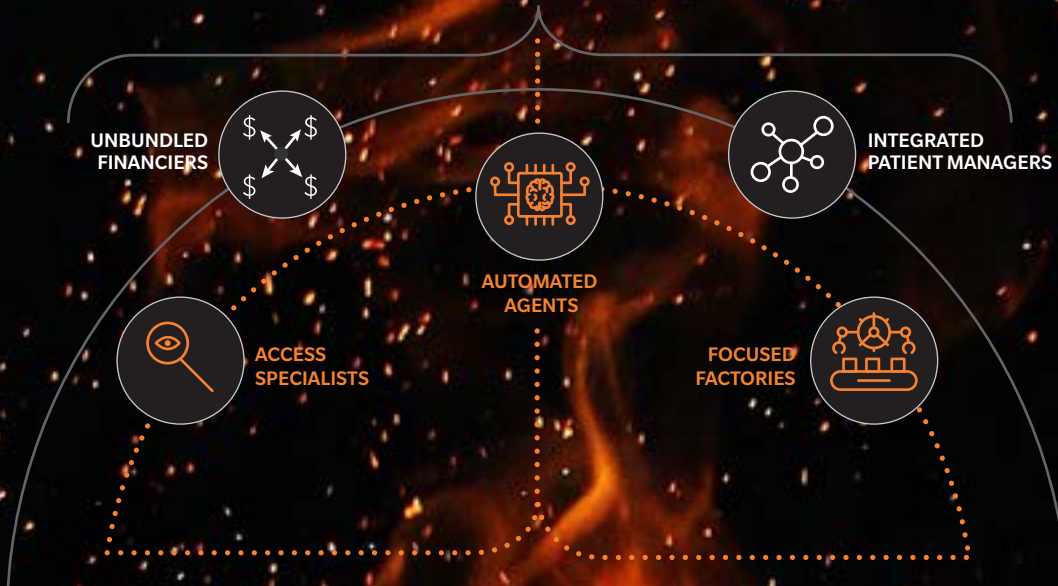
HEALTH PLAN

- Sales and distribution
- Network contracting
- Risk management
- Benefit design
- Member services

... AS THE INDUSTRY RACES TO
INNOVATE ON THE FUNCTIONAL PIECES...



... AND A NEW INDUSTRY STRUCTURE EMERGES



3. Telehealth is increasingly offered alongside physical locations by retailers (such as recent launches by both Walgreens and CVS). Leading health systems such as Cleveland Clinic are deploying virtual channels. Insurers, including the Centers for Medicare & Medicaid Services, are expanding coverage.
4. Home-based services are being targeted for innovative delivery models, with Comcast and AT&T building on their central role in customers' daily lives as a platform for accessing and managing care.
5. Automation to drive consumer self-service is progressing from theory to practice. Firms like Babylon and Ada are moving to automate parts of the diagnosis and triage process for major health systems.

The 2018 Oliver Wyman Consumer Survey confirmed rapid growth in the past three years in both the willingness to consider these options and a corresponding growth in consumers who have had direct experience in doing so. Those who have used these new access points have found them convenient and easy. Such consumers will use them again, over an increasingly broad set of services. Despite hurdles such as concerns about data continuity and portability, these models offer a compelling proposition of the easy, convenient access that consumers increasingly expect.

Health systems will see profound implications of this Access Specialist role. As transactional convenient care migrates to new delivery channels, visit volumes and Current Procedural Terminology (CPT) transactions will no longer drive the economics of primary care providers. The idea of "controlling" a patient for the benefit of capturing ongoing care delivery revenue or for the benefit of cost-effectively managing the continuum of care will become increasingly antiquated. This will be a battle of data and insight, not a battle of control.

For payers, the rise of convenient access points raises the possibility of greater consumption. Easy access will stimulate demand. How can they ensure these touchpoints will be beneficial, and help their members navigate a broad set of options, some of which will sit outside of contracted networks?



ROLE 2: AUTOMATED AGENTS

This second role has the potential to be our greatest breakthrough. Traditionally, responsibility for health and wellness has fallen to the individual, shared by family and caregivers. But human beings are fallible and notoriously bad at correcting behaviors, as evidenced, for instance, by the growing prevalence of lifestyle diseases such as heart disease and obesity.

Information accessibility and artificial intelligence offer promise in delegating impulse control to technology. Automated Agents will use the explosion in available consumer data to provide reminders and nudges toward healthy behaviors in a personalized, "right time, right place" kind of way. They will know we're getting sick – either physically or mentally – before we do. They will

account for our genetic profile and health status to plan, predict, and prevent. Despite a “Big Brother” stigma, we openly give our information to Alexa, Siri, and Google.

These Automated Agents could become widely and cheaply available, impacting social health determinants beyond providers’ current scope through continual monitoring and constant connectivity. This intelligent network’s knowledge may exceed human expertise, provided at zero marginal cost. Health systems will be disrupted as a new cycle of prevention diminishes primary care physician duties and mandating hospitals re-tool toward preventative procedures. Payers’ strategic control over member claims data may become significantly less important, as automated agents provide even richer data repositories.



ROLE 3: FOCUSED FACTORIES

The community hospital model is increasingly challenged to deliver value and operate with sustainable economics. Despite years of effort to streamline processes and manage costs, the inherent complexity of offering a wide “whatever walks through the door” set of services has left them inefficient, expensive, and ineffective. Delivering low volumes of a wide variety of services limits the ability to truly optimize on cost, quality, or outcomes. Hospitals thus represent the highest cost factor in the current delivery system.

This general hospital model will be undermined by the rise of the Focused Factory: a set of business models delivering a narrow set of services at dramatically better cost, quality, and experience – fulfilling the so-called “Triple Aim”. Although this is a longstanding concept, we’re not quite there yet. Nonetheless, procedure factories have already begun pulling apart the hospital model in some markets. Whether freestanding imaging models or ambulatory surgery centers, lower price points and a more consumer-friendly model make them compelling for many services.

As Focused Factory models extend in new directions, it is instructive to consider models where the funding of delivery businesses is direct from consumers. In India, for example, several effective “procedure factories” deliver a narrow set of inexpensive services with high-quality outcomes. From the Aravind Eye Hospitals’ focused factories for cataract surgery with high throughput and standardized clinical processes (and a \$25 price point) to Dr. Devi Shetty’s heart hospital where they deliver cardiac bypass surgery for \$2,400 (with better outcomes than any US hospital), models built around industrial principles are demonstrating the art (and science) of what’s possible. As Shetty puts it: “It’s about process innovation, not product innovation.” The potential of these models to affect the cost of delivering care is profound.

It’s likely these models will extend beyond procedural specialties. In fields like oncology, where the nature of diagnosis, therapy, and disease management is technology-intensive, the development of remote Center of Excellence models is brewing. World-class oncologists will work remotely, integrated into local infusion centers.

As specialized models pull apart hospitals' economics, choices will be required about the scope of services where general service models can remain competitive. These new models cannot simply redeploy the existing hospital/community care structure; gaps in skills/knowhow and culture/mindset make the "we'll just reinvent" hurdle for most systems too high.

For payers, these new models – often sitting outside traditional local/regional systems – will become part of contracted networks. Members and employers will gravitate toward these models because of both cost and experience. Early stages of these network redefinitions existed with Center of Excellence programs defining "best in class" destinations for selected procedures, often outside of local geographies. The "standard" network will need to look quite different.



ROLE 4: UNBUNDLED FINANCIERS

Consumers' desire for personalization, choice, and control doesn't stop with how they access doctors. The model of financing of care – the standard health plan – offers a monolithic product designed to be agnostic to varying consumer needs. The tension in this inefficiency creates opportunity. We can expect to see the rise of Unbundled Financiers, with products meeting diverse needs and purchasing behaviors. Healthcare financing will shift toward curated solutions. Insurance markets will begin to disaggregate, serving discrete consumer needs individually. Consumers will be able to insure themselves based on unique needs, seeking care, coverage, and support at specific "purchase occasions." Social platforms enable micro-segmentation. A proliferation of benefit designs and financial products will target population segments beneath the "catastrophic layer."

The Unbundled Financier faces headwinds in the regulatory environment. Most national and state regulation creates standard benefit requirements. Many policymakers have concerns about moving away from large group risk pools, potentially raising coverage costs for those with health risks. But the pressure of overall cost containment raises the possibility that a move toward the "consumerization" of healthcare finance becomes a viable alternative. The momentum behind "Medicare for everyone" could give way to a more affordable "catastrophic healthcare for everyone." As convenient care options proliferate, demand for full-benefit packages decreases. Consumers may well move toward high deductible or catastrophic plans supplemented by cheap primary care visits. Incumbent payers face disintermediation.

Most insurance incumbents operate via processes incapable of the required flexibility, segmentation, and personalization. Product launch timelines are measured in years. The scale assets they've built for today's model are not well aligned with future requirements. New entrants appear to be better positioned to respond to shifts. For provider systems, the advent of Unbundled Financiers raises challenging questions about contracting, price transparency, and how to ensure services are affordable.



ROLE 5: INTEGRATED PATIENT MANAGER

This last role is based on the logic and principles of population health management. Combining the incentives of managing total cost of care with the ability to manage the full continuum of care will power Integrated Patient Management models effective in managing a selected population. This role is broad in scope, requiring the ability to combine and integrate the other roles to effectively deliver value.

The early models of CareMore and Healthcare Partners demonstrated the power of a strong, complex primary care model combined with the ability to take full financial risk for the entire care needs of a member/patient. Kaiser has a track record of managing the cost of care with its combined health system/health plan model. The more recent moves of UnitedHealth building the Optum Health delivery business (Optum is now one of the largest employers of physicians in the country) and the pending CVS-Aetna merger (linking a comprehensive benefit structure with community care resources) signal the Integrated Patient Manager's significance going forward. Notably absent from these more recent moves? Care delivery assets in expensive hospital care settings.

Integrated Patient Managers will have strong incentives for investment in innovative programs to better prevent and manage care (see Automated Agents) to help systems manage the most complex patients. They will need to find ways to deliver care in more efficient deliver models (see Access Specialists and Focused Factories).

Not everyone will want to operate in the open access, convenient, and transparent consumer market of Unbundled Financiers. For some, especially those with more complex health needs, the idea of a highly curated, well managed, and integrated experience will be very appealing.

HOW DO WE GET THERE FROM HERE?

The five roles outlined above each represent a source of innovation and a source of value in the healthcare market going forward. Others may appear as the pace of disruption picks up. The advent of affordable genetic information and tailored treatment and pharmacy regimens will likely require roles nonexistent today. The visions of non-healthcare entrants likely will go in directions the healthcare industry has not yet fathomed. The boundaries are already blurring, as a new industry structure emerges.

For incumbents, built on traditional models and boundaries, this creates a crossroads that raises questions. Everyone will need to invest in new capabilities, but which ones will be most important? Everyone will face questions of pace: How long can my traditional model deliver value and returns on investment? How rapidly will my market evolve toward new roles? Everyone will face questions of talent and culture: How ready is my organization to be nimble and responsive? Do I have the right mix of talent?

Too many organizations aren't yet facing up to these questions, focused on serving their traditional model – more assets, patients, and members – without examining the benefits of that scale. Every dollar and hour invested in entrenching is a missed opportunity to become

competitive. For incumbent health insurers, their technological and operational infrastructure will not survive, as employer (and consumer) demand surges for cheap, personalized products tailored to employees' health and engagement needs.

Incumbent health systems will continue to erode as well-reimbursed commercial patients seek acute care at Focused Factory Centers Of Excellence beyond local communities. As consumers opt for a broader set of care settings, the certainty of volumes and margin will erode. For all incumbents, the question of how aggressively they need to move toward reinvention will be central. Temptation to stick to current models will be strong.

Moving toward new roles is hard, but not impossible. In 2016, Mount Sinai in New York announced² the plan to replace its 400+ bed Beth Israel hospital with a more focused 70-bed facility, to transform its ambulatory care center to an urgent care and specialty center, to launch aggressive home health and hospital at home programs, and to add a women's health center. That move took leadership and courage. And a different view of roles the health system should play. Like Mount Sinai, incumbents should ask: **When's the right time to change?**

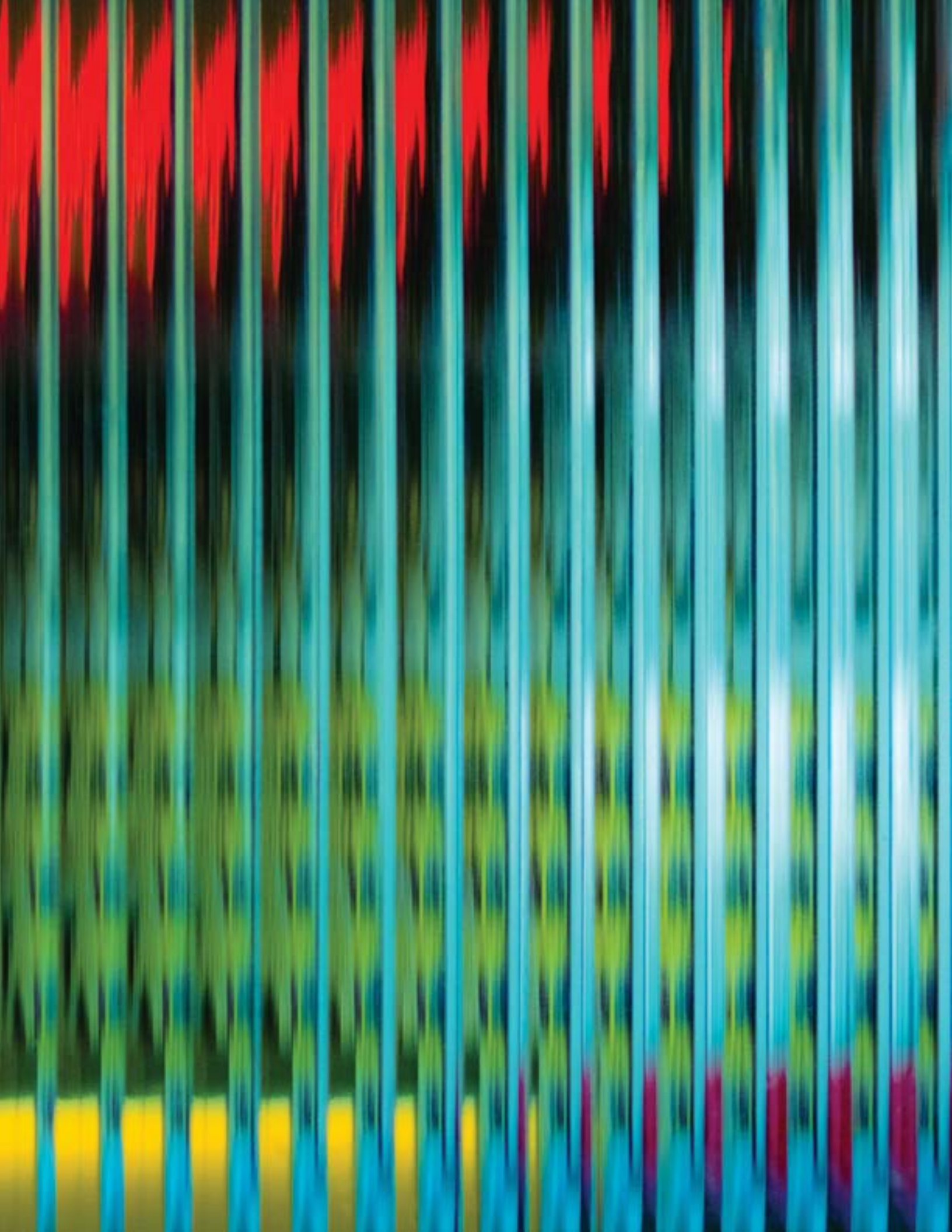
We know standard answers don't exist. But we also know these five roles are both threats and opportunities, offering the promise of a better system where today's spark sets tomorrow ablaze.

KEY TAKEAWAYS

- Across the broad front of innovation, five new roles capable of delivering value to the consumer and the funder are emerging. These roles are based on new business designs that have a compelling value proposition and an economic model that can change consumer behavior patterns and spark a new industry structure.
- Health Systems will face challenges in how to move their high fixed cost, asset intensive, general purpose model toward new, very different roles in delivering care in their communities.
- Health Plans will face questions about whether and how they develop new roles in delivery while building much more flexible and nimble product processes.

The background of the image is an abstract composition of vertical, blurred streaks. The top half features a gradient from dark teal to bright red, with the red being most prominent. The bottom half is dominated by a bright yellow and orange glow, which fades into the teal streaks above. The overall effect is one of motion and color blending.

BLURRING BOUNDARIES



BANGING DOWN THE NEW FRONT DOOR

REDEFINING HEALTHCARE'S FRONT END

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Accessing the healthcare system has traditionally meant either heading to a doctor's office or straight to the emergency room, with little in between. Until now, that is. The corner retail store, our phones, and our homes are now gateways to more convenient, affordable care. Consumers using these care alternatives really like them. According to Oliver Wyman's 2018 Consumer Survey, over a third of consumers – 35 percent – who used a retail clinic in the past year preferred this experience over a traditional doctor's office visit. Yet, traditional primary care is still far and away healthcare's prevailing front door, as consumer awareness of these new options and capabilities is inconsistent at best. From a benefit design perspective, insurance products still revolve around traditional provider networks, and reimbursement and legislation to catalyze adoption are lagging in areas like virtual medicine. What emerges from this picture? We see an industry where care alternatives have proliferated, but healthcare's front door has not (yet) been fundamentally altered, and where solutions do not connect the dots for consumers in compelling ways.



WHAT'S NEXT? PREPARE FOR A REINVENTED FRONT DOOR

Over the next decade, will innovation keep nibbling at the edges of the market, or will there be significant demand shifts? How can industry leaders navigate such uncertainty? Other regulated industries – including banking, retail, and transportation – have experienced dramatic changes driven by consumers and technology. Yet healthcare remains a stubborn outlier, despite unaffordable costs and widespread consumer frustration. The good news is major vertical integration gambits from the past 12 months offer glimpses into bigger shifts on the horizon. We predict these shifts will occur across four dimensions.

THE FIRST DIMENSION: CLOSED LOOP ECOSYSTEMS

While more front end care options exist, the consumer experience remains disjointed. For example, an urgent care facility often operates in isolation from a primary care physician. The first, more modest evolution likely to emerge is front end choice integration – a multi-modal constellation of physical and digital care that lets consumers seamlessly shift between settings. The second larger shift is the advent of “closed loop” ecosystems that collapse traditional value chain boundaries – including members, patients, consumers, payers, providers, and retailers. Organizations like Kaiser and Geisinger have operated integrated models for decades. Now we will see new companies vying to catch and create exclusive, preferred front end networks with much higher service levels – integrating triage, diagnostics, pharmacy, payment, and even handoffs, to preferred downstream care partners (such as specialists and acute care providers) without ever “dropping the consumer.” This makes the CVS-Aetna merger prospect fascinating, given its more than 10,000 access points and an Aetna membership chassis.

Closed loop models are beginning to emerge in chronic care where companies such as Onduo and Livongo are creating ecosystems for diabetes management. The “front end” is constituted in these organizations' constant health-status monitoring, algorithm-driven alerts, health coaching, real-time dosing adjustments, and in the case of Onduo, endocrinologists to direct care. New ecosystems are primed to form around consumer segments (such as demographic, psychographic, and health status) that operate differently than “single chain” players.

THE SECOND DIMENSION: NEW HEALTH HUBS

With extraordinary pressure on provider economics and reimbursement, there's greater emphasis on lower cost settings such as ambulatory surgery centers, retail-based imaging, and comprehensive ambulatory centers. One-stop-shop ambulatory offerings appear poised for significant growth. But this presumes the provision of care's front door is on provider terms and that they move fast enough, given the mixed incentives of hospital-based billing as a major profit engine. In the background, three other health hubs are primed to rise:

THREE HEALTH HUBS PRIMED TO RISE

THE RETAIL HUB	THE HOME HUB	THE CONSUMER AS HUB
Changing focal points	Alexa, how's my health?	Empowered by technology
Advancing into low cost primary care, provision of chronic care management, comprehensive diagnostics, disease bundles, and new distribution/relationship management models.	With subscriptions to access services in the home (imagine Amazon Prime Health), virtual care, rapid delivery of home-based diagnostics and labs, same-day prescription delivery, and Alexa-based guidance for health content, products, and incentives.	Advances in artificial intelligence and blockchain increase consumers' control of their personal health data, so they can direct and easily control their own healthcare choices.

Societally, we have spent decades reinforcing healthcare's core vision, with absolute trust in physicians, services delivered on the system's terms, and acceptance of limited, inflexible models, and opaque systems. Yet new models are changing these rules and placing choice and control into patients' hands.

THE THIRD DIMENSION: THE FRONT DOOR MOVES UPSTREAM

Consumers are still navigating the confounding, expensive maze of healthcare largely alone. The industry remains geared around response care. Helping consumers become educated advocates along their care journey is the *raison d'être* of emerging players. Companies like Zocdoc and Walgreens (through Find Care Now) are guiding individuals to available supply. WebMD – with 199 million³ active users and its recent acquisitions of Vitals.com and MediQuality.com – is primed to become more of a system conductor. Consumers barely bat an eye before hopping online to WebMD to type in a list of symptoms as opposed to first calling their primary care physicians (or an ambulance, for that matter). Others, such as Accolade and Welltok, are innovating with proprietary engagement, navigation, and health optimization platforms to connect with individuals as people, not just patients.

Companies like these understand the potential to reshape consumer health relationships. Not just when someone experiences an "episode," but on a durable, continuous, and proactive basis. But we have yet to see platform players that can:

1. Create a shopping marketplace for healthcare services, breaking the traditional local network model.
2. Reverse the waterways of the healthcare relationship/interaction model and become a trusted adviser on the consumer's side for a gamut of needs (imagine a healthcare and wellness concierge that helps consumers make informed decisions).
3. Integrate deep understanding of consumer habits, motivation, and history to "activate" consumers to live healthy lives. There's a market void for players to jump in and function as a "GPS for health."

THE FOURTH DIMENSION: LET'S NOT FORGET ABOUT DRUGS

The framework that underpins US healthcare access is oriented around managing medical expenses. The largest area of spend growth, however, currently resides on the pharmacy side. Here, US drug spend is highly concentrated – 0.3 percent of people drive over 20 percent of pharmacy spend in areas like immunology, oncology, and hematology. The nature and complexity of related diseases requires a different approach than what has proven to be successful in managing lifestyle conditions like diabetes and heart failure. Who will be tomorrow's emerging leaders in managing the pharmacy value chain and associated drug costs? The answers are unclear. However, bets are being made. The CVS-Aetna merger prospect joins a strong, consumer-smart pharmacy business with a focus on fostering intimate connections. Other bets involve a payer-enabled actuarial view with pharmacy benefit manager assets supporting their moves, such as the Cigna and Express Scripts merger. Precision medicine companies such as Envision Genomics aim to create care models for specialized populations and rare diseases costing the system billions in drug spend. Even health systems are participating. Intermountain Healthcare is launching a not-for-profit generic drug company with Ascension, SSM Health, and Trinity Health to reduce unjustified shortages and high prices for life-saving generic medications. Soon, those managing the steepening "drug spend pyramid" will have a distinct advantage.

IN WHICH LANES WILL YOU COMPETE?

Where should your organization be focused next as the front end of healthcare hurtles through this period of change? Convenience? Experience? Price? Journey integration? Consumer understanding and intimacy? Or should you aim for all of the aforementioned, and more? Whatever your answer, here are several key considerations:

- Access will become table stakes. Differentiation will come from a highly choreographed care journey that fosters consumer intimacy.
- The race for consumer data is on. While electronic medical records generate volumes of clinical data, this data needs to be enriched with consumer intelligence to drive innovation onward.
- Ecosystems will emerge, and it's unlikely any single player can amass the capabilities necessary to meet consumer expectations. Execution will require a constellation of solutions, where flawless operational integration will make (or break) their success.

Whatever lanes you compete in, delivering reliably on tailored value propositions tied to the desires and needs of your target population will propel you. In the next decade, incumbents and innovators vying for a different relationship with consumers will shape healthcare's front end. Place your bets now on whether this means modest change is on the way – or whether we face a seismic redefinition of healthcare as we know it.

KEY TAKEAWAYS

- New ecosystems are primed to form around consumer segments (such as demographic, psychographic, and health status) that operate differently than “single chain” players.
- Significant proliferation of access points and new modalities has not yet addressed the disjointed consumer experience.
- There is a race to move upstream and redefine the front door of healthcare beyond the clinical visit that fundamentally changes the relationship between the supply side and consumers.

INSURERS AND HEALTHCARE PROVIDERS DON'T NEED TO COPY AMAZON

THEY JUST HAVE TO PERSUADE CONSUMERS TO LIKE THEM

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Health consumers see the healthcare world around them changing, but they aren't always sure if it's good for them or not. They're concerned with rising costs, but they're also concerned with getting a good night's sleep. They love Amazon, yet say they haven't yet grown completely comfortable seeking health services from tech giants or other organizations outside the traditional healthcare space. They want cheaper, more intuitive healthcare that not only cures or prevents illness, but also improves their well-being, regardless of how sick or well they are. Consumers, generally unsatisfied with healthcare incumbents, favor technology and retail companies to insurers and providers. They typically trust their physicians to help manage their medical records, but don't quite trust them to provide apps or tools for independent health management. For traditional healthcare insurers and providers, this isn't welcome news. Oliver Wyman's recent consumer survey sheds new light on how healthcare insurers and providers can improve their positioning with consumers.





CONSUMERS' HEALTHCARE OPINIONS REMAIN COMPLEX AND CONTRADICTORY

Healthcare insurers and providers, compared to their technology and retail competitors, don't fare well on critical consumer loyalty measures. When we asked consumers whether they were likely to recommend organizations they had experience with to their friends or family, consumers were far less likely to say they would recommend healthcare organizations (health insurance companies, hospitals, and retail pharmacies) than general retailers (like Walmart and Target) or technology companies (like Apple and Google).

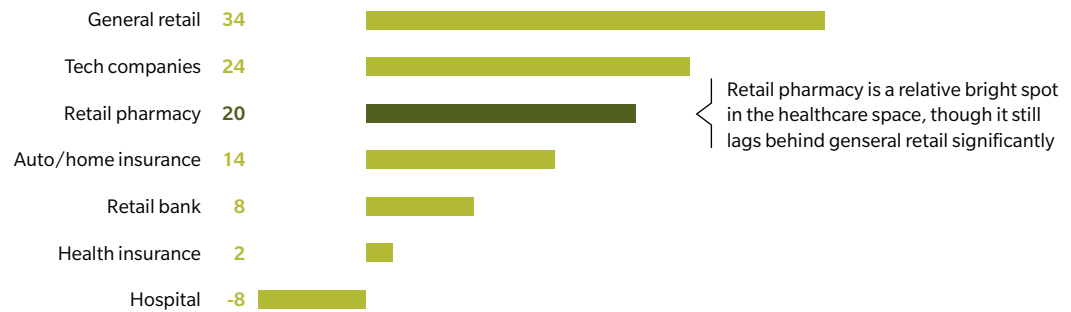
THE 2018 OLIVER WYMAN HEALTH CONSUMER SURVEY

HOW LIKELY ARE CONSUMERS TO RECOMMEND HEALTHCARE ORGANIZATIONS OVER RETAILERS?

- Health insurance companies were rated 30 points lower than retailers, and 20 points lower than tech companies.
- Hospitals scored over 40 points below retailers and 30 points below technology companies.
- Retail pharmacies fared better than other healthcare insurers and providers, scoring 15 points below retailers and 5 points below technology companies. This more positive performance likely reflects that retail pharmacies are hybrids between healthcare and retailers, and have already been working to find ways to serve health needs in consumer-friendly ways.

EXHIBIT 1: HOW LIKELY ARE CONSUMERS TO RECOMMEND HEALTHCARE ORGANIZATIONS OVER RETAILERS?

NET SENTIMENT BY INDUSTRY (RESPONDENTS RATED THE COMPANY THEY WERE A CUSTOMER OF, OR HAD THE MOST EXPERIENCE WITH IN EACH INDUSTRY)



Source: The 2018 Oliver Wyman Health Consumer Survey

The message for healthcare organizations is sobering: technology and general retailers are emerging even as their new competitors already have consumer loyalty in ways healthcare organizations do not. However, there are headwinds for disruptors as well. Despite consumers' generally rosy view of retail and technology organizations, they remain skeptical about retail and tech companies entering the healthcare field. When we asked consumers who they'd prefer to buy healthcare services from, or who they were comfortable giving their personal health information to, healthcare providers and insurance companies still topped the list.

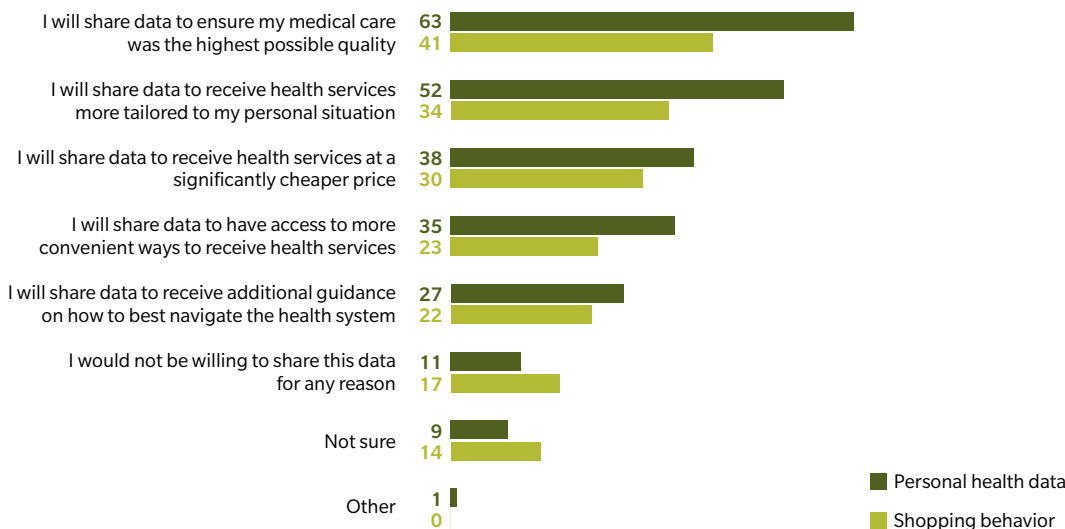
Eighty-two percent of survey respondents would share personal health information with their primary care physicians, 46 percent would share it with their hospitals or health systems, and 30 percent with their health insurers. Far fewer respondents would share this information with non-traditional players: only 5 percent with a mobile app and 3 percent with an online retailer.

Thirty-nine percent would manage their health with an app or online tool from their primary care physician, compared to 13 percent from a hospital, and 9 percent from a health insurance company. Only 1 percent would do so from an online retailer.

This data suggests players leading healthcare's value chain consolidation (such as CVS-Aetna and Walmart-Humana) recognize data as a foundation of economic value. Nonetheless, these results highlight several key concepts:

EXHIBIT 2: CONSUMERS ARE MORE WILLING TO SHARE DATA (FOR THE RIGHT REASONS)...

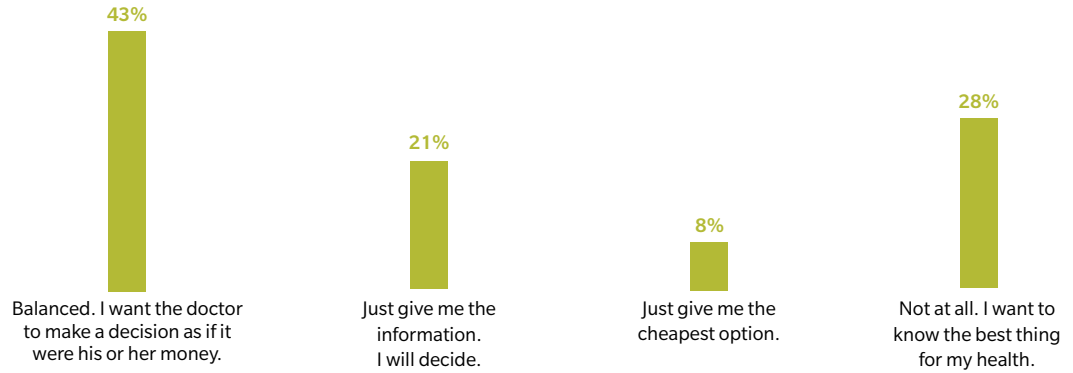
...AND ARE MORE WILLING TO SHARE PERSONAL HEALTH DATA THAN SHOPPING BEHAVIOR. BUT THEY ARE MOST LIKELY TO SHARE DATA IF IT CAN IMPROVE THEIR PERSONAL HEALTH OUTCOMES. CONSUMERS SAY...



Source: The 2018 Oliver Wyman Health Consumer Survey

EXHIBIT 3: CONSUMERS WANT THEIR DOCTORS TO MAKE DECISIONS WITH FINANCES IN MIND

WHEN YOU MAKE A MEDICAL DECISION, HOW DO YOU WANT YOUR DOCTOR TO INCLUDE THE COST OF THAT DECISION IN HIS OR HER RECOMMENDATION?



Source: The 2018 Oliver Wyman Health Consumer Survey

1. Data will be a key point of strategic control in the healthcare landscape, and consumers still express more confidence in sharing data with healthcare providers and insurers than with emerging tech and retail competitors.
2. Consumer relationships are another critical point of strategic control. Retail and technology organizations have those relationships, on one level, but they don't yet have full consumer trust when it comes to healthcare applications of those relationships.
3. The recent vertical consolidation we see across the industry (such as CVS-Aetna and Walmart-Humana) reflects the value of these strategic control points and of associating more traditional healthcare brands with retailers as a way to secure those points.

Consumers don't like their healthcare services options, but they don't seem to trust anyone but healthcare insurers and providers to do the job. One way to view this is as a contest between incumbents and new entrants (often with significant capital and funding behind them). Will healthcare insurers and providers build more magnetic, consumer-friendly offers and service models? Or will new entrants build necessary trust and credibility with consumers? Another way to view this is as an argument for various forms of engagement between traditional healthcare insurers, providers, and new entrants. For instance, although healthcare consumers generally don't trust healthcare institutions, they do trust their physicians. Eighty-three percent of consumers say they either completely trust their doctors' opinions without question, or are fairly confident in their recommendations (41 percent say the latter). This trust factor is a point traditional healthcare insurers and providers must take advantage of.

CONSUMER PREFERENCES DEPEND (SOMEWHAT) ON GENERATION

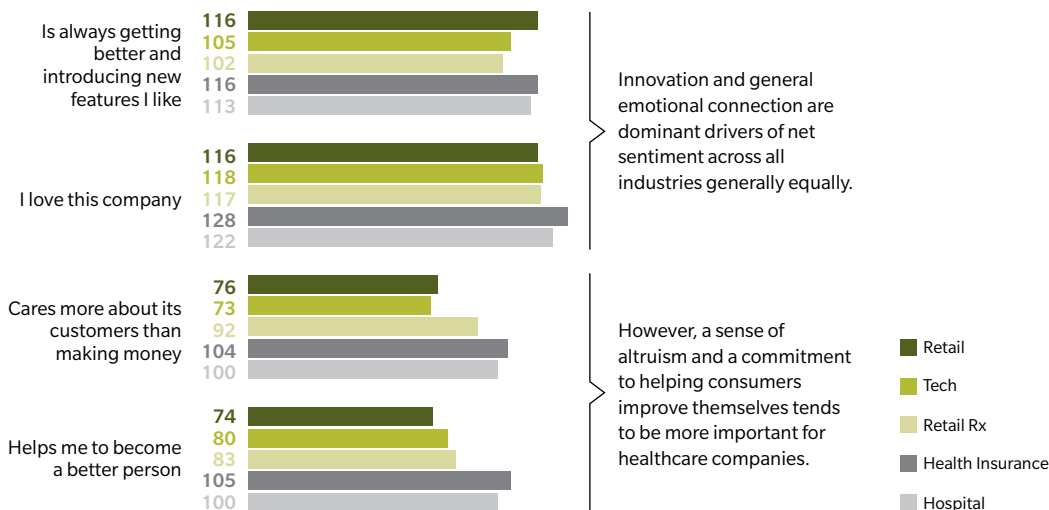
While your birthday doesn't dictate your healthcare preferences, let's explore what we learned about how your birth year (really, birth decade) determines what you value along your health journey. Let's take millennials – often perceived negatively – as avocado toast loving, social media obsessed – but also positively – as pushing innovation, driving social and political change, and thinking and acting globally. A more realistic view is they are well into their adulthoods (some are approaching 40), saving for college tuition for their children, caring for elderly parents, and managing their own growing aches and pains. Millennial attitudes are the future of healthcare.

Millennials tend to perceive technology companies more favorably than baby boomers do. Regarding net sentiment, millennials rated health insurance companies 20 points lower, hospitals 22 points lower, and pharmacies 17 points lower than did boomers. While both generations tend to view retail companies similarly, millennials rated technology companies 15 points higher. Our data suggests pharmacies' retail positioning has made them more consumer friendly, but they're still viewed as part of the legacy healthcare world.

If millennial views like these represent healthcare's future, there is cause for concern among healthcare insurers and providers. The more millennials take the reins on healthcare decision making, the more traditional healthcare insurers and providers will be disfavored for the innovation disruptors promise. It's a mistake for healthcare insurers and providers to think they can milk (more conservative) baby boomers, as boomers often follow trends started by younger generations. (Your mom probably has a smartphone.)

EXHIBIT 4: CONSUMERS EXPECT DIFFERENT THINGS FROM DIFFERENT INDUSTRIES, WHICH MAY PROVIDE BARRIERS TO EMERGING COMPETITORS

DIFFERENCE IN NET SENTIMENT FOR COMPANIES IN THIS INDUSTRY FOR WHICH RESPONDENTS AGREE VERSUS DISAGREE WITH THE STATEMENT:



Source: The 2018 Oliver Wyman Health Consumer Survey

CONSUMER LOYALTY IS NOT CREATED EQUAL

Another worrying sign for traditional healthcare insurers and providers: Consumer loyalty toward incumbent healthcare organizations often depends on out-of-pocket medical costs. For example, those with high deductible plans perceived both health insurers and hospitals in significantly lower regard compared to industries like retail, technology, and retail pharmacy – two times more negatively than general retail, for example. But all categories of consumers trust their personal doctor more than any other entity to provide a variety of healthcare services, everything from monitoring health through a wearable device to providing access to a health guide who would help them make healthcare decisions.

We asked survey respondents whether they agreed with a variety of positive statements about the companies to which they pledged loyalty, such as “I love this company,” “This company is clearly better than its competitors,” “This company cares more about its customers than making money,” or “This company makes me a better person.” Predictably, agreement with positive statements drove higher net sentiment across all industries. Individuals who said, “I love this company,” about an organization were far more likely to recommend it than those who did not, regardless of what industry that company was in. However, certain attributes drove loyalty more strongly in healthcare than in other industries. In particular, when consumers gave healthcare companies attributes associated with altruism (“This company cares more about its customers than making money” or “This company helps me become a better person”), they expressed far higher net sentiment. When consumers assigned those attributes to companies in tech and retail, the net likelihood effect to recommend was less dramatic. Put another way, loyalty drivers are different inside the healthcare industry. An expectation of selflessness and commitment to the greater good exists there that does not exist as strongly in retail or technology industries. As disruptors move into the healthcare space, that cultural difference will be critical.

TODAY’S CARE DELIVERY MODEL: OUTWARDLY TRADITIONAL, YET RIPE FOR DISRUPTION

Traditional healthcare insurers and providers can enhance their reputations as altruistic community members and create services to satisfy exasperated consumers. Traditional healthcare insurers and providers don’t have to become Amazon. But they must make consumer interaction easier. The trick is in how. It has to feel genuine and authentic. (Healthcare insurers and providers today often sponsor community activities and charitable events, yet consumers can feel like incumbents have ulterior motives.) This means redesigning service models and products, and expanding their reach so consumers achieve greater well-being daily. This includes creating new channels – digital and otherwise – for consumers to access healthcare, including those that come right to the home. Indeed, we know consumers are even growing more comfortable with home-based care. For instance, 33 percent of respondents said they’d consider having a doctor or nurse visit their home to perform an annual physical, and 30 percent would be open to minor medical events being addressed in the home.

For innovators, moving into core healthcare services may be tough, but many services are adjacent to core healthcare/health insurance. Those include physical fitness and mental well-being, which emerging players may have permission to enter. These adjacent services are often on consumers' minds daily, in contrast to core healthcare services. Disruptors have an opportunity to engage consumers around their health more consistently and holistically than traditional healthcare players can. As consumers seek solutions not just to their acute problems, but also to broader issues (How do I get enough sleep, anyway?), the organizations that can provide those solutions will win consumer loyalty.

KEY TAKEAWAYS

- Despite consumers' generally rosy view of retail and technology organizations, they remain skeptical about these types of companies dipping their toes into the healthcare industry.
- Although pharmacies' retail positioning has made them more consumer friendly, pharmacies are still widely viewed as part of the legacy healthcare world.
- Although the proliferation of high deductible plans is thought of as a health insurance issue, in truth it affects all types of healthcare incumbents.





THE BETTER BENEFIT STACK

EMPLOYEES ARE NOT
HAPPY WITH THEIR
HEALTH BENEFITS, AND
FOR GOOD REASON

Howard Lapsley

Partner, Health & Life Sciences,
Oliver Wyman

Employees are not happy with their health benefits, and for good reason. Over the past decade, premiums have spiked by 80 percent. And for the past five years, average medical costs jumped anywhere from 5 to 15 percent annually, depending on employer size. Recently, employees have seen their benefits shrink, deductibles skyrocket, and care options contract via consumer-directed health plans (CDHPs), which are now offered by 90 percent of employers. Those costs, and the employee burden, will continue to rise.

GETTING LESS COSTS MORE

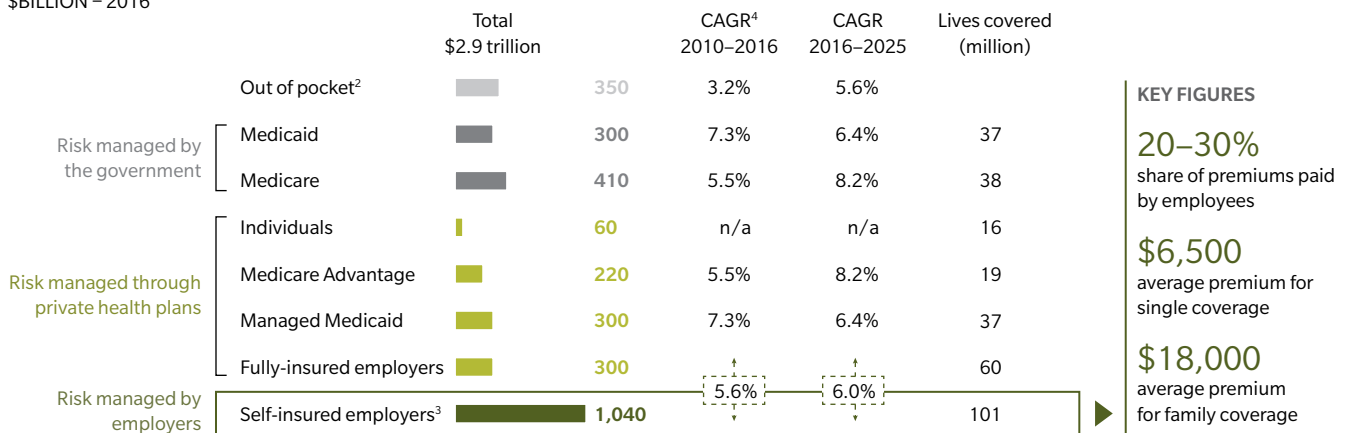
Employees do not see an increase in relevance, value, convenience, or simplicity tied to higher healthcare costs – in their experience, they’re simply paying more and getting less.

And the majority of employees can’t afford to fund Health Savings Accounts (HSAs) (paired with qualified CDHPs, which many people choose because they’re a low-premium option), in spite of its “triple tax advantage” (for those who even understand this) and have failed to reap any long-term savings benefit. HSA balances are in decline. Thirty-one percent of employees are unable to pay more than \$500 out of pocket for a sudden medical bill.

This is not just an issue for employee sponsored care. A recent survey of insured adults (spanning employer coverage, the Affordable Care Act (ACA), Medicare, and Medicaid) found that 22 percent of respondents opted not to receive necessary medical care because of costs, while 77 percent said cost worries had led them to avoid care.

EXHIBIT 1: HEALTH INSURANCE MARKET OVERVIEW

DISTRIBUTION OF HEALTH EXPENDITURES¹
\$BILLION – 2016



1 Excludes administration, research, construction and other similar government expenditures

2 Includes employee and individual contributions to health plans

3 A percentage of flows also goes toward health plans in administration fees, not illustrated

4 Growth figures for Medicare include Medicare Advantage, and figures for Medicaid include Medicaid Advantage

Source: Centers for Medicare and Medicaid Services; EBRI; Kaiser Family Foundation

WHY DOES THE SYSTEM CONTINUE TO FAIL?

The current wave of “transparency innovations” provides consumers with more information about how different costs are associated with different care options, making available the exact amount owed. Many transparency efforts, however, do not generally give information about value and quality, creating consumer confusion and frustration.

According to new research⁴ by the National Institute for Health Care Management Foundation, consumers offered cheaper, more conveniently located MRI options generally ignored this information and went instead to wherever their physician had referred them. On average, patients turned down six cheaper conveniently located options in favor of the physician-recommended doctor.

Even sites that supposedly showcase consumer feedback tend to fall short. A recent study⁵ from ConsumerMedical stated while consumers were more frequently using sites like Yelp and Healthgrades to find “high quality” specialists, only 2 percent of physicians listed within the top 10 were also rated highly regarding performance and quality metrics.

STATUS QUO PROTECTORS

There has been little innovation from a product, network, and distribution perspective to drive change, especially for employer-sponsored insurance. The entrenched broker establishment is protective of the status quo, and the initial wave of consultant-led private exchanges didn’t deliver, largely because the “product” on the shelf was unsatisfactory – it was more “do no harm” than any real innovation. Health carriers’ attempts to innovate and differentiate (including Accountable Care Organizations, value-based arrangements, medical management programs, and consumer engagement incentives) have either met resistance from the fee-for-service protectors, are mired in complexity or opaque financials, or have not yet created a tangible value proposition for employers and their employees to drive change in how healthcare is purchased, structured, and delivered.

EXHIBIT 2: DIP IN HSA CONTRIBUTIONS 2015-2017

AVERAGE AMOUNT SAVED IN AN INDEPENDANT HSA
(FOR THOSE MAKING A CONTRIBUTION)



Source: Devenir Research

MAKING IT EASIER TO DO THE RIGHT THING

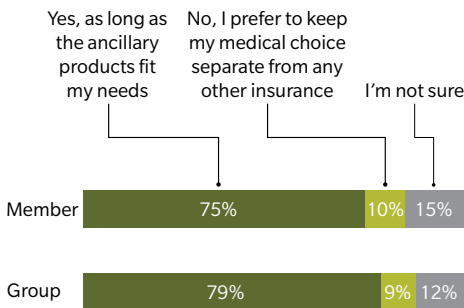
Some influential industry players are looking to shake up the status quo. For example, take Atul Gawande, new head of the JP Morgan-Amazon-Berkshire Hathaway nonprofit. Atul’s goal is to help professionals “make it simpler to do the right thing” in delivering care to patients. According to a PBS interview he conducted last summer, some people he grew up with in Ohio spend half their incomes on taxes and healthcare premiums. They’re going bankrupt because of healthcare costs. “When workers have deductibles that are multiples larger than their bank accounts, they stop treating their chronic conditions,” said Atul. “And it has enormous harm for the future.”

Many industry pioneers are taking action to generate the kinds of higher quality consumer experiences and outcomes Atul (and countless others) envision, while also lowering total cost of care. Some are tackling the network and FFS system head-on, attacking “the belly of the beast” as Ashok Subramanian, founder of TPA startup Centivo, states. Centivo is building targeted, value-based networks from scratch on a market-by-market basis. They are focused on selecting primary care physicians (PCPs) who embrace value-based care – and are aligned with Centivo’s employer customers’ total cost of care goals – and are incentivizing them accordingly.

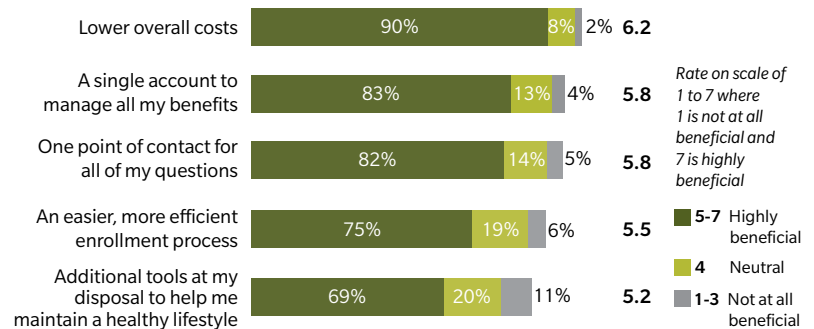
And Salt Lake City-based startup, Imagine Health, designs⁷ its networks around creating a high-quality care delivery experience. Imagine Health’s markets – around 25 to 20 percent of available market providers, compared to a large carrier’s 92 to 98 percent – prioritize quality, allowing for the negotiation of much greater savings compared to what’s commercially available.

EXHIBIT 3: VALUE OF SINGLE CARRIER INTEGRATION

INTEREST IN INTEGRATION¹



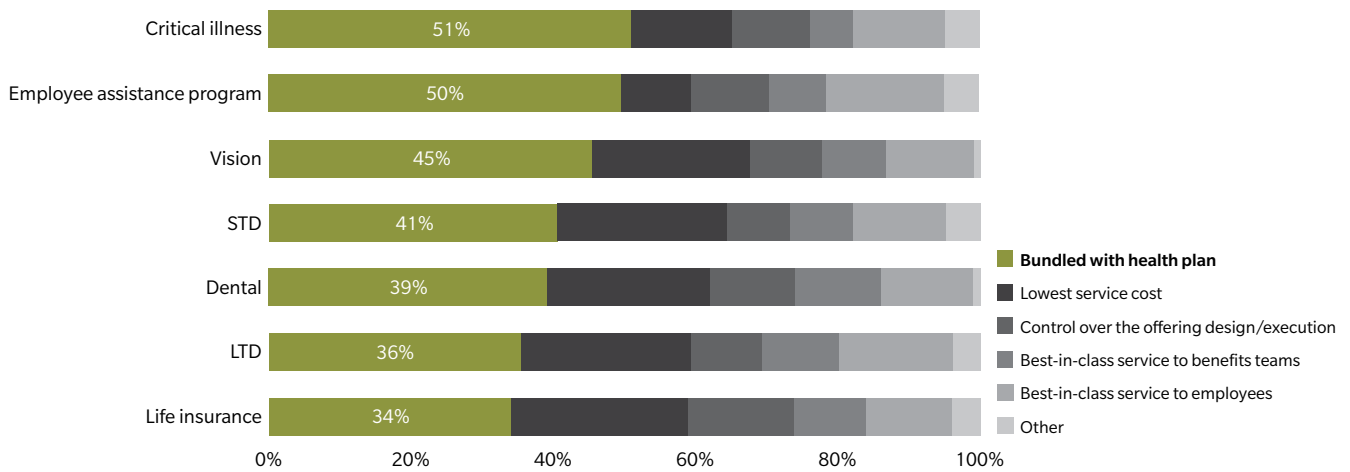
PERCEIVED VALUE OF INTEGRATION²



*1 If you could combine your medical coverage with one or more ancillary products – all from the same insurer, would that be of interest to you?

*2 If purchasing core medical insurance products and other ancillary benefits from the same company had advantages, which of the following advantages would you find beneficial?

Source: Oliver Wyman Consumer Ancillary Benefits Survey (April 2017)

EXHIBIT 4: REASON FOR SELECTING A CARRIER BY PRODUCT TYPE, ALL EMPLOYER SIZES

Source: Oliver Wyman research: Responses to "Please select the primary reason for your selection of the carrier you chose for each health and protection listed."

CONSUMERS WILL BUY ON VALUE, AND FROM A SINGLE SOURCE

Beyond network and value-based innovations – table stakes for the core health benefit stack – Oliver Wyman research demonstrates consumers will buy bundles of new and core products/services that span health and ancillary (employer-sponsored or voluntary) if they can see the value. Employees would even expand their wallet (increase or redirect out-of-pocket spend) for the right total risk protection package relevant and valuable to them, at their specific life stage.

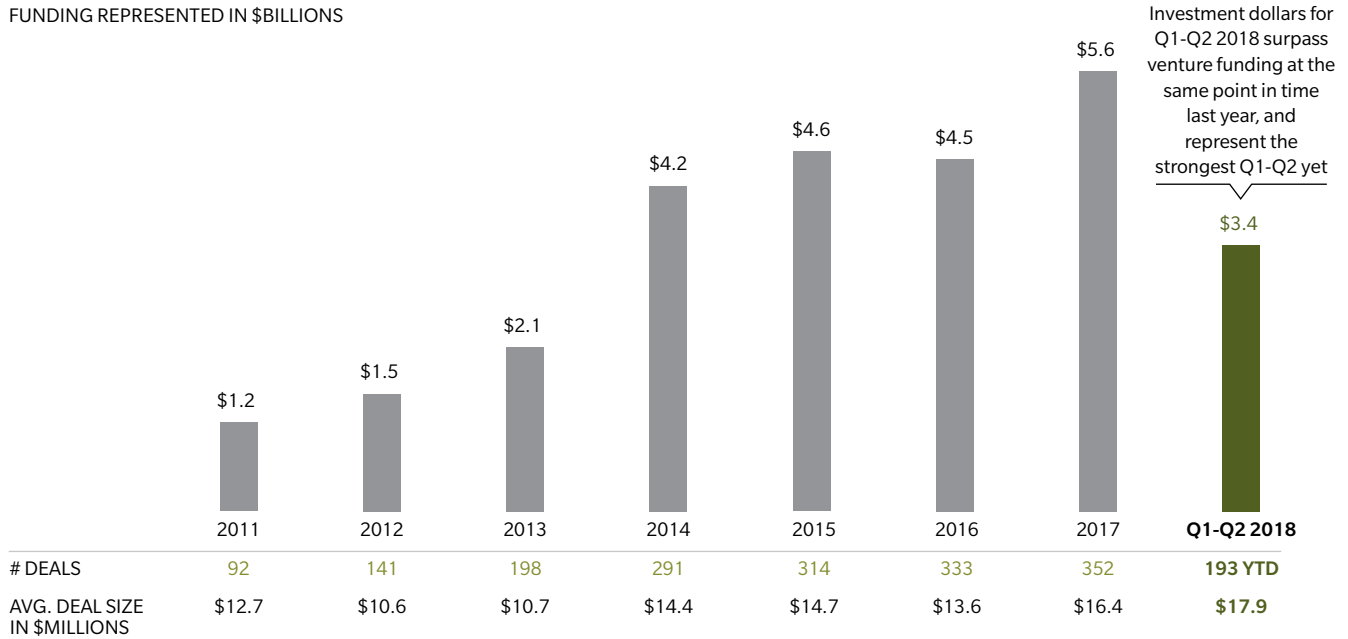
Our research shows employers, irrespective of group size, prefer single-carrier integration if ancillary benefits fit their needs and they can accomplish administrative ease and lower overall costs.

Furthermore, our research shows the single greatest influencer of carrier choice for ancillary benefits is whether that benefit is bundled with the health plan.

This is a great opportunity for health plans to deliver an integrated value proposition that addresses not just the network and cost issue, but also the holistic total risk protection needs of the employee (linked-financial wellness is the next frontier). Yet many plans have either shed ancillary products (such as Aetna's recent sale to The Hartford) or deprioritized them to focus on the core product set.

EXHIBIT 5: DIGITAL HEALTH FUNDING 2011-2018

FUNDING REPRESENTED IN \$BILLIONS



Source: Rock Health

Health plans cannot stand pat, as “pure play” group benefits carriers are making moves via expansion of product set (gap coverage, stop loss, wellness, and other voluntary “subscriptions”) or are deepening their digital and distribution footprint to enable greater customer control. Exhibit 5 highlights the growth of digital health investments.

WINNING TOMORROW’S CUSTOMER BATTLE...

...TO DELIVER A DIFFERENTIATED AND BETTER BENEFIT STACK COMES DOWN TO FIVE CRITICAL COMPONENTS:

1. The underlying network has to be designed by highest impact target segments, be value-based, and have predictable co-pays and lower out-of-pocket costs, without being viewed as “narrow, constricting, and cost shifting.”
2. The bundle has to be relevant to one’s life stage, holistic (covering total risk protection), engaging (services to change behavior), and demonstrate value so the employee/consumer will invest in the bundle and possibly expand share of wallet.
3. Digital platforms to enable packaged products have to be curated in meaningful bundles and developed with behavioral economics in mind, but also have to be supported effectively by tools and personal touch to drive longitudinal engagement (such as “clicks” and call/telehealth support).

4. It has to be convenient and simple for employers to administer and employees to utilize throughout the year.
5. Brokers see bundles and platforms as a differentiator to be rewarded with, one that helps productivity and enables them to sell a greater variety of offerings.

The holy grail for employer sponsored and voluntary benefits is delivery via an integrated value proposition of relevant products that meets life-stage needs, is easy for the employee to enroll in and for the employer to administer, and creates ongoing employee engagement.

KEY TAKEAWAYS

- Employees do not see an increase in relevance, value, convenience, or simplicity tied to higher healthcare costs – in their experience, they're simply paying more and getting less.
- A key influencer of carrier choice for ancillary benefits is whether that benefit is bundled with the health plan.
- The holy grail for employer sponsored and voluntary benefits is delivery via an integrated value proposition of relevant bundled products that meets life-stage needs, is easy for the employee to enroll in and for the employer to administer, and creates ongoing employee engagement.

The background is a complex, layered collage of torn paper. It features various colors like white, pink, yellow, and black. There are numerous fragments of text and graphics scattered throughout. Some legible words include 'LIE', 'ET (LI', 'ICH', 'CAN', 'RA', 'AM', 'JLY', 'CONST', 'MUL', 'AND THE', 'MOGR', 'VAU', 'AC - LAURENT', 'EBAULT QU', 'ts-de-seine', 'ARTEMENT', 'THE', 'K SIDE', 'IGNON', 'MBONG', 'ALLE', and 'cfenseja'. The overall effect is one of chaotic, overlapping information.

HEALTHCARE AS AN INFORMATION BUSINESS



FESTIVAL
CHILOMBIANA

SA
30
20

es ambassadeurs
de la Cumbia
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PUTTING THE HEALTH DATA GRAPH TO USE

MARRYING TRUST WITH DATA OWNERSHIP

Chris Schrader

Principal, Health & Life Sciences, Oliver Wyman

Helen Leis

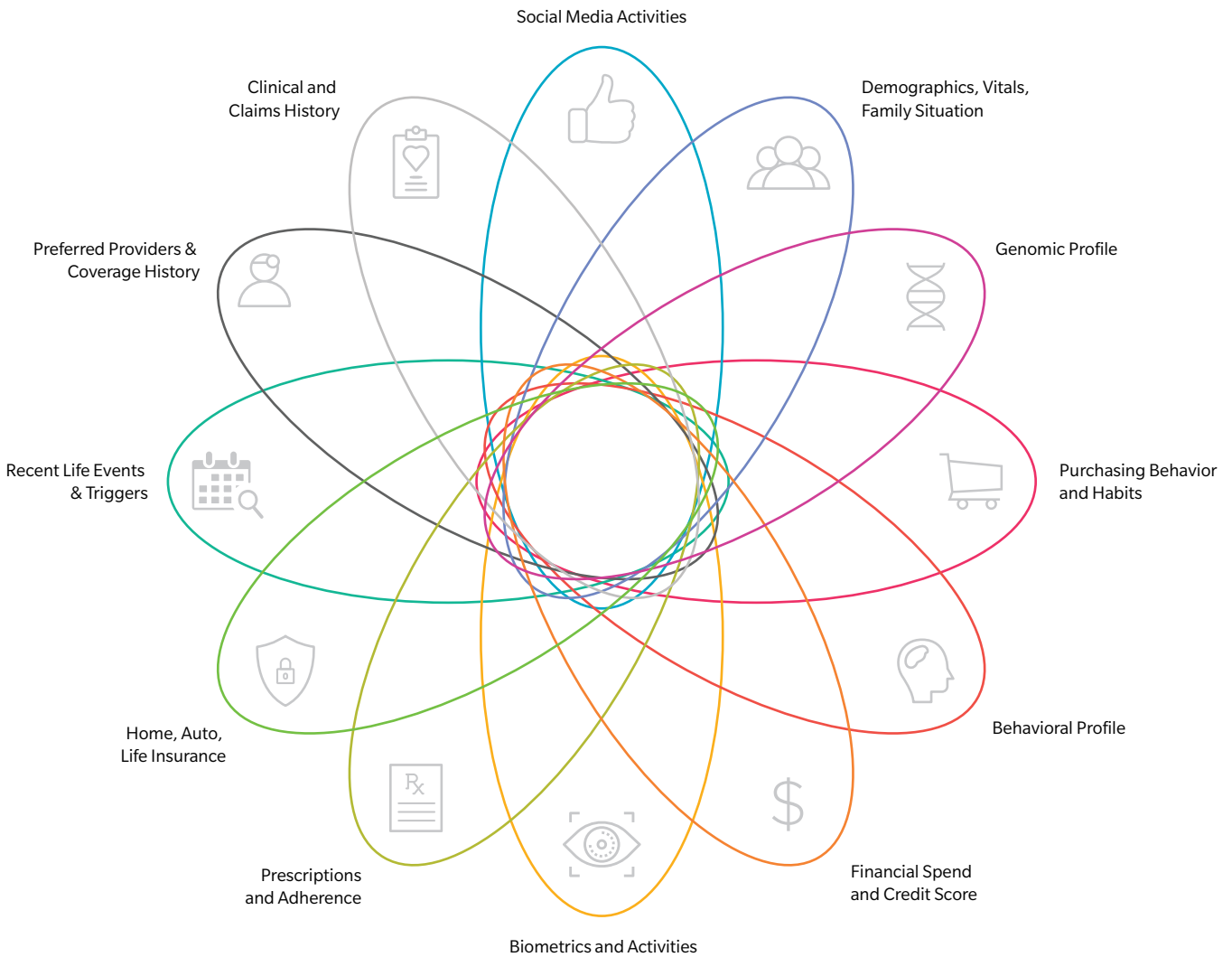
Partner, Health & Life Sciences, Oliver Wyman

Data has become one of healthcare's most valuable resources. In healthcare, data is the currency that will enable "right place, right time" behavioral changes at an individual level. And while we are sitting on vast (and exponentially increasing) data about individuals, not enough is being done to understand how individual consumers behave, what motivates them, and what stops them from living healthier, more productive, and longer lives.



Healthcare companies need to do more. Firms that effectively recognize patterns across disparate data sets, discerning differences between consumer segments and behaviors to engage people differently, stand to create and capture tremendous future value. This means being deliberate about data acquisition (and consumer trust), having the right set of science and analytics to give data meaning, and meeting consumers where they are, based on their personal needs.

EXHIBIT 1: POTENTIAL HEALTH DATA GRAPH COMPONENTS



STEP 1: EXPANDING THE HEALTH DATA GRAPH

Traditional health data is highly siloed and transaction oriented, providing insight into only a limited portion of consumers' overall health situation and needs through clinical and claims data. A data graph, however, is not a traditional "graph" per se. Rather it's a structure that captures multiple relationships between different entities and data points. Think Facebook and the social graph. LinkedIn and the professional graph. Pinterest and the interest graph.

Tomorrow's health data graph will incorporate a combination of traditional clinical and claims data, new health monitoring (such as activity and biometrics), behavioral observations (such as social media, geolocation, and financial activity), and more. Available data will become broader (within and beyond health), more granular, and more real-time.

There is movement beyond traditional data silos today. New devices readily available on the consumer market are potential springboards for better awareness and prevention, using data to foster deeper patient-provider relationships. For instance, Apple recently announced its Apple Watch Series 4, with a Food and Drug Administration-approved electrocardiogram that communicates patients' live heart rate data to their physicians. The watch can also share any health information a patient enters directly into his or her phone (such as any recent symptoms, heart or fitness data, and information about sleep, wellness, and diet) with a physician to encourage informed, ongoing conversations.

The startup Tempus is investing in using clinical and genetic data to advance cancer treatments. Last January, Tempus announced⁸ a partnership with the NYU School of Medicine where an analysis of genomic sequencing data will help physicians develop personalized pancreatic cancer treatments. Tempus will organize and review data from nearly 500 pancreatic cancer patients to improve prognoses of patients' responses to treatment.

Socially Determined, another medical innovator, uses massive amounts of publicly available contextual consumer data (from census, housing and real estate reports, and more) to build holistic models around people, their communities, and their healthcare system interactions. and is tying its financial success to financial and clinical client outcomes.

Examples like these are the outliers. In practice, most incumbents have seen minimal movement beyond traditional data silos, and are largely operating with structured claims and clinical data. To get to where we want to go – robust, real-time, situational understanding – we need to close the gap. Incumbents must incorporate more relevant real-time data, meaningful to the problems being solved.

KEY CONSIDERATIONS: TRUST AND DATA OWNERSHIP GO HAND IN HAND

Privacy regulation will increase. Beyond HIPAA, GDPR is already having an impact on businesses globally and is likely to influence future US policy decisions. These regulations require transparency in how information is used and give consumers more control over their data.

Cyber risk is real. A data breach is more expensive in healthcare than any other industry – almost triple cross-industry average. Using data from multiple disparate sources increases the surfaces of attack. Not having a robust cyber risk-management strategy could cost millions of dollars, and infinitely more in consumer trust.

New tech will shape data ownership. Many technologies (like Apple’s health app) are starting to give consumers ownership of their data and aggregate distributed data in a shareable, secure way. Blockchain-based solutions could take this to the extreme, giving data ownership back to users through the use of encryption keys, allowing them to determine who to share it with.

STEP 2: DRIVING ACTION THROUGH INSIGHTS (DATA IS NOT ENOUGH)

Data in search of strategy is not where you want to be. Winners will effectively put data to use by recognizing patterns across disparate data sets and use those insights to drive differentiated consumer recommendations. Meeting consumers at the right time and right place to drive action requires “knowing them better than they know themselves.” Creating correlations between consumers’ profiles, who consumers are – and what that implies about their motivations – **is a combination of data, data science, behavioral science, and psychology.** This idea is trifold:

1. Behavioral psychology must differentiate between motivational and personality-driven characteristics (such as risk tolerance and impulsivity).
2. Data science must extract meaningful relationships between consumer profile and action.
3. Experiments must be run to understand behavioral engagement drivers and test hypotheses about individuals’ motivations and behaviors.

The goal is purposeful intervention that aligns with unique motivations. This comes through increased relevance, quality, and frequency of touches. This way, curated solutions come at the right time, right place, and right context.

AN EXAMPLE: WHAT DOES THE EMPLOYER HEALTH DATA GRAPH LOOK LIKE IN ACTION?

Employers have more data on hand than they realize, likely more than most healthcare companies have. There’s the obvious employment history, benefits selections, and health assessments, but also less obvious information about financial habits, savings profile, and consumption patterns. Further, employers are sitting on a vast amount of data about people’s

motivations in the form of both personality profiles (like Myers-Briggs) and direct observations that garner information on the reasons behind someone's impulses and desires. For example, when someone is prompted to complete a training or survey, his or her employer likely knows if it was completed upon first notice, before or after a deadline, or not at all – and what stimuli perhaps got the person to complete it. This, combined with the more obvious data above, can help create a motivational profile that enables employers to serve health recommendations to employees differentially.

We know consumers are willing to share their data for the right reasons. According to the most recent Oliver Wyman consumer survey, almost 90 percent of consumers were willing to share personal health data, and nearly 85 percent were willing to share shopping behaviors **when there was some kind of return.**

The impetus is on us. Success is not obvious and will require deeper consumer understanding, robust data science, and a willingness to experiment, pilot, and learn quickly to de-risk disruptive options. But, like employers, most incumbents have more data on hand than they realize and need to create more data-centric business and engagement models.

KEY TAKEAWAYS

- We are sitting on vast (exponentially increasing) data that can be used to help better understand and engage consumers and help them live healthier, more productive longer lives.
- Data is not enough – winners will effectively put data to use by recognizing patterns across disparate data sets to drive differentiated consumer recommendations.
- Success will require a willingness to experiment, pilot, and learn quickly to de-risk disruptive options.

IS BLOCKCHAIN READY TO UNLEASH INNOVATION IN HEALTHCARE?

John D. Halamka, MD

CIO, Beth Israel Deaconess Healthcare System,
International Healthcare Innovation Professor,
Harvard Medical School

Charlie Hoban

Partner, Health & Life Sciences, Oliver Wyman



Technologies – such as artificial intelligence, machine learning, and blockchain, which dominate today’s headlines – hold tremendous potential to help providers improve the quality and efficiency of their work and share electronic medical records seamlessly and securely. But is this something health systems and payers should be focusing on now... or later?

In this Q&A, Charlie Hoban, Partner in Oliver Wyman’s Health & Life Sciences Practice, chats with John Halamka, MD, MS, Chief Information Officer of Beth Israel Deaconess Healthcare System, and a professor at Harvard Medical School. John was instrumental in creating Beth Israel Deaconess’ first electronic medical record, and on the national level, helped shape the Meaningful Use program. John’s also editor of a new peer-reviewed journal, *Blockchain in Healthcare Today*.

Charlie Hoban (CH): With the massive funding fueling health information technology (IT) innovation, who will drive innovation? Are we shifting toward more of an open innovation model?

John Halamka (JH): So, I travel the world. About 400,000 miles of travel a year. Not fun, but very educational. What have I learned as I look at every society? Innovation is happening by 26-year-olds in their garages. They may not have healthcare domain experience, but they partner with people who understand healthcare workflow. They create apps that make a substantial difference.

And so with Epic, Cerner, Meditech, eClinicalWorks, and Athena, their job will be to get bills out, keep us compliant with every changing regulation, but leave innovation to this ecosystem of developers who will create cloud-hosted services and apps that will layer on top of those existent incumbent transactional systems.

CH: The healthcare market has been difficult for new players to break into. How will the pivot to an open innovation model occur?

JH: I’m starting to see niche applications that fundamentally change the workflow for physicians. They think, “Wow, you mean I’ll be twice as productive, I’ll get home and have dinner with my spouse for the first time in three years, and my quality scores will go up? I can tolerate the risk of adopting that new app.”

At Beth Israel Deaconess, we have already deployed about a dozen apps in our curated app store. They address issues in the surgical workflow, the medical workflow, or the ambulatory workflow. For example, a group of surgeons said to us: “You know how hard it is to book an operating room slot while I’m on vacation or sitting at a restaurant?” And we thought: “Why don’t we create Open Table for the operating room? I’d like an appendectomy for two, 7:30, near a window.” They book an operating room time slot in literally five seconds on their phone.

That’s the kind of thing that a surgeon is going to say, “This is so darn convenient. It addresses all of my needs and saves me time. It has very little risk. I will use it.”

CH: Health systems and payers wrestle with where and when to invest their finite IT budgets. Should the industry invest in artificial intelligence and machine learning now, or wait until these advanced analytical approaches are more mature?

JH: In 2018, machine learning and deep learning are real, and are changing workflow in positive ways. Suppose you need your appendix out, but you're a young, thin, healthy guy with no comorbidities. How much time do you need in the operating room? You get two hours. Why? Because since 1850, everybody who's needed an appendectomy gets two hours. It's just a block.

What do we do next? Well, Beth Israel Deaconess has a strategy to focus on machine learning approaches rather than traditional analytic approaches. We recently moved the hosting of many clinical applications to Amazon Web Services, which enables us to use cloud-hosted machine learning applications with our data. We trained the system with 2 million patient surgical experiences, then asked the system to predict operating room (OR) times for new patients. By delivering the right care at the right time in the right setting for the right duration, we can free up 30 percent of the OR schedule.

CH: Do you see blockchain solving some of the big problems in healthcare, like electronic health record interoperability?

JH: So, I hear pitches from blockchain startup companies every day. I've learned to recognize certain red flags. Blockchain is a public ledger not run by a corporation or a government. Blockchain is decentralized, operated by thousands of independent actors, and cannot really be falsified or changed, because there are certain cryptographic mechanisms used to ensure data integrity. What are the possibilities of a public ledger that you write to once, could never erase, and is pretty much guaranteed to be accurate? Well, the United States has 50 states and, therefore, 50 different sets of privacy laws and 50 different consent policies, at least because state laws preempt HIPAA.

So, what if I wanted to get your medical record? What do you consent for the purpose of my using it for treatment, payment, operations, clinical trials, or clinical research? As part of a pharmaceutical post market surveillance, what's your preference?

Well, imagine you put up a public ledger, viewable by all, that said, "Here are my consent preferences." Then anyone who wanted to exchange your data would reference your preferences on the blockchain and respect your preferences. That's potentially, a good case.

But regarding another kind of case, what if there is such an assertion where a plaintiff attorney says, "I need the entire medical record of this person's lifetime going back 18 years." You say, "Beautiful. Here it is." And the plaintiff attorney says, "Oh, no. This is fake. It's been altered. Things have been deleted or changed. The doctors went in and did something to protect them from future litigation."

Well, blockchain remembers a public ledger. I'm not going to put a medical record in that public ledger in this particular use case. What I would do is use a cryptographic technique called a hash where I could take the entire medical record of a person and do a mathematical transformation of it and reduce it to a series of letters and numbers that's totally unique. What does that mean? Well, if the medical record were ever deleted or changed in any way, the hash value would be different. What if every time a doctor signs off on a whole medical record, we do this mathematical transformation and digest and post the hash to the blockchain?

Then, 20 years go by. Somebody asks, "Was the medical record changed?" We say, "Look, the hash we did 20 years ago matches the hash of today, proving it could not have been altered along the way."

And I've used this in multiple production systems. I've been doing working with the Bill & Melinda Gates Foundation in South Africa to track HIV test results and to keep patients and families informed. We use blockchain in a very similar way to make sure that the data isn't altered or deleted in any way, and patients can trust it.

CH: Are there other applications where we might see blockchain as a repository for clinical data?

JH: The MedRec pilot project, which Harvard and MIT did at Beth Israel Deaconess, does something like this. We'll put medical data in the blockchain, but we've put pointers to the medical data. What does that mean? If you have a doctor's office visit or a hospital visit, we put a pointer in the blockchain that says you had a visit. We don't say what it's for or what it's about. Therefore, blockchain could be a mechanism for unifying your lifetime medical record by simply keeping a directory of where you've been.

MedRec also used a smart contract, which allows you to decide who can access that directory. Maybe the answer is the three doctors who are caring for you, or your children, or some other person in your family who does care navigation. But not the public. So, blockchain has potential as a pointer system, with contracts for deciding who can look at those pointers.

CH: Do you see blockchain as a high priority for your organization? Should health systems and payers focus on it now, or later?

JH: In any IT plan, you have to separate out what you need to do today for operational requirements versus what you need to do long-term, such as what to implement in the next six quarters because of, say, a regulatory requirement or a unique business requirement, versus

what's more speculative. So, I would put blockchain in the category of: no, it's not an operational imperative for the next six quarters. But it's absolutely something to learn about and keep on exploring.

KEY TAKEAWAYS

- We are going to reward innovators who can solve real problems in simple, compelling ways. This opens the field to a broad community of innovators.
- Blockchain is a public ledger not run by a corporation or a government. Blockchain is decentralized, operated by thousands of independent actors, and cannot really be falsified or changed, because there are certain cryptographic mechanisms used to ensure data integrity.
- Blockchain can play a big role in interoperability, but not as a repository. We won't put medical records in the blockchain, but we can use pointers and hashes as mechanisms to create linkage and permission management.



Listen to our full conversation with John Halamka on the Oliver Wyman Health Podcast, now available on iTunes, Soundcloud, Spotify, Stitcher, iHeartRadio, TuneIn, and Google Play Music.

HOLDING HEALTHCARE RANSOM

INDUSTRY PERSPECTIVES
ON CYBER RISKS

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Editor's Note: This article is excerpted from Marsh & McLennan Companies' Global Risk Center, Holding Healthcare to Ransom – Industry Perspectives on Cyber Risks report⁹.



There was an average of at least one¹⁰ cyberattack every single day over the entire course of 2017. High stakes – human lives, big money, and sensitive data – make healthcare a pretty perfect cybercrime target – and an expensive one, at that. For eight consecutive years, healthcare organizations’ data breach costs have been the most expensive – costing \$408 per lost or stolen record, almost triple the \$148 cross-industry average.

BUSINESS INTERRUPTION

is the primary cyber risk concern in healthcare. Last year’s WannaCry made many people want to cry, temporarily shutting down hospitals, diverting ambulances, and canceling critical medical appointments. Cyence, a Silicon Valley-based cyber-risk analytics and modeling firm, estimated the financial impact of this attack could reach \$4 billion. In more life-threatening cases, cyberattackers could compromise medical devices, such as health-networked MRI machines as entry points into unsecured Wi-Fi networks, causing critical medical devices to malfunction. With key equipment out of commission for days, it would cut into healthcare organizations’ bottom lines, easily resulting in a daily revenue loss of \$1 million¹¹ for one machine.

BREACH OF CUSTOMER INFORMATION

is, however, a more daunting scenario in healthcare compared to other industries. For example, when a medical record with information like your address, Social Security number, date of birth, and medical information, is compromised, it cannot be swiftly reissued or instantaneously suspended like a stolen credit card where you check your statement for erroneous charges, open an app and claim card fraud, have a new card swiftly delivered, and continue onward – soon to forget it even happened at all. Healthcare data is very different. For one thing, the black market is hungry – starving, you could say – for patient medical records, which hold great amounts of power. One copy of an electronic medical health record can be priced up to thousands of dollars on the black market, compared to a credit card number worth a quarter, or a Social Security number worth a dime.

Once this valuable medical information is in their hands, cybercriminals have used and even manipulated this highly permanent, personalized data to damage¹² a patient’s reputation (such as committing intellectual theft or blackmail, opening bank accounts, or filing tax returns to collect rebates), compromising their corporate accounts or monetizing stolen data. Quite different than a credit card hack, to say the least.

PHYSICAL HARM

and the possibility of death are other potential impacts of a cyberattack. Medical technology and devices, for instance, are particularly vulnerable. The Food and Drug Administration has recently doubled-down to enhance cybersecurity there, albeit not always aligned with rising security concerns, such as malware or utilizing unsecured wireless devices. Yet, imagine when critical operating equipment or devices (such as anesthesia, ventilation, or pacemakers) suddenly stop working, without a shred of warning. For instance, former Vice President Cheney

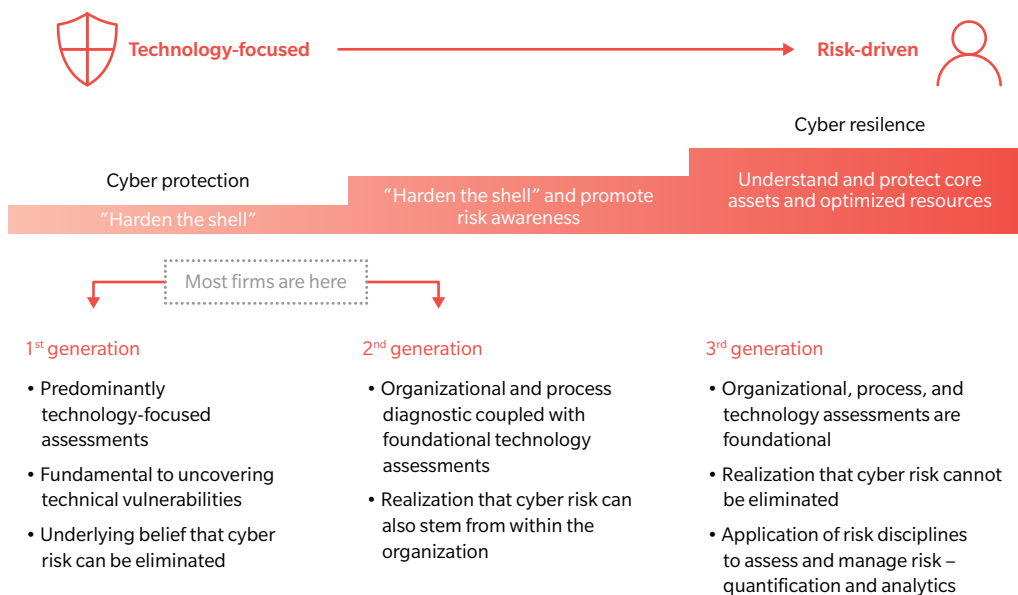
(who has survived five heart attacks and quadruple bypass surgery, for starters) had the wireless capability of his pacemaker disabled. Cheney later described this incident as a possible assassination attempt.

ROOM FOR IMPROVEMENT: CYBER RISK MANAGEMENT CHALLENGES DEMAND AN ENTERPRISE-WIDE VIEW

Responsibility for cyber risk sits mainly in technology in the minds of most. Cyber risk management in the healthcare industry is still perceived to be driven solely by the IT department. Indeed, 83 percent of healthcare respondents to the Marsh-Microsoft Global Cyber Risk Perception Survey viewed technology as the primary owners and decision-makers for managing cyber risks, compared to the 70 percent cross-industry average.

Balance is key. While the healthcare industry understands the key role of risk management teams better than other industries, it is still crucial to appropriately distribute the management of cyber risk to a responsibility across the organization. The next stage of focus for these companies is to transition cyber risk from being “technology focused” to “risk driven”, making it a top-down company-wide responsibility that cuts across department horizontals. For instance, risk teams and senior management must work with IT to define cyber risk-related metrics within an organization’s risk appetite. Roles such as Human Resources and Public Relations also have an integral part to play in processes and communications of cyber risk management.

EXHIBIT 1: SHIFT IN FOCUS FOR CYBER RISK MANAGEMENT

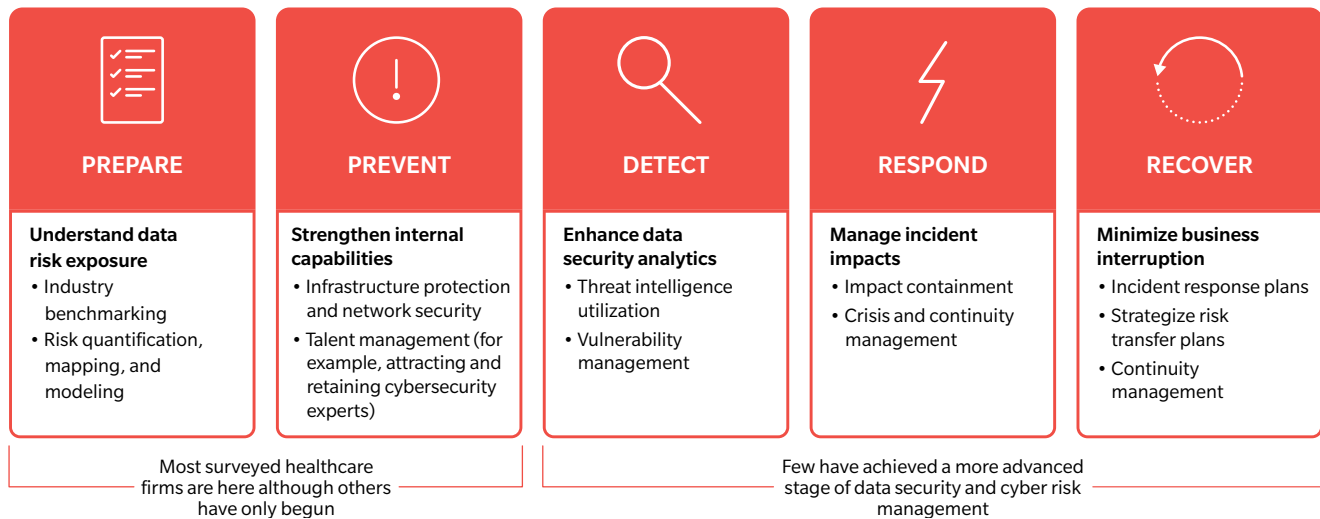


SAFETY FIRST: GETTING CYBERSECURITY ON MORE ORGANIZATIONS' RADARS

Most healthcare organizations still focus more on prevention or preparedness, instead of detection and response. On the one hand, while some proactive measures are being taken to reduce cyber risk, these are largely centered on basic preparation and prevention, like cybersecurity gap assessment, phishing awareness employee training, improved vulnerability and patch management, and encryption of company computers. On the other hand, significantly fewer organizations have a cyber incident response plan in place or have invested in improving cyber event detection.

It's important to prioritize the right skill sets within healthcare organizations to ensure technologies and securities continually improve. Most importantly, there must be a mindset and behavioral shift, through education or campaigns, to instill a culture of cyber awareness among all stakeholders – the public, patients, and the healthcare workforce, who will have greater access to medical records on increasingly more devices and platforms.

EXHIBIT 2: FIVE KEY ACTIVITIES OF THE CYBERSECURITY FRAMEWORK AND RECOMMENDED ACTIONS



AN ALL-ENCOMPASSING DATA AND CYBER RISK STRATEGY IS FOUNDED UPON ASSESSMENT, APPETITE, REPORTING, AND EXPOSURE QUANTIFICATION.

The risk management strategy then drives the right governance, identifies threats and corrective actions, and quantifies the amount of investment necessary to close gaps and vulnerabilities. As part of expectations from management, shareholders, regulators, and rating agencies (such as Standard & Poor's), industry-specific mechanisms should be designed to safeguard against incidents, as well as implement an up-to-date proven cyber incident playbook in case of breaches. Actions like these will make the next cybercrime target anyone but you.

KEY TAKEAWAYS

- Every healthcare organization needs to purposely invest in a cyber resiliency program across the lifecycle, from preparation through recovery.
- Organizations must instill a culture of cyber awareness among all stakeholders – the public, patients, and the healthcare workforce, who increasingly have greater access to medical records on more devices and platforms.
- Healthcare is a highly valuable and vulnerable industry. One copy of an electronic medical health record can be priced up to thousands of dollars on the black market, compared to a credit card number worth a quarter, or a Social Security number worth a dime.



THE BIGGEST BREAKTHROUGH IN APPROPRIATE CARE: LESS IS MORE

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Physicians estimate¹³ that over 20 percent of healthcare delivered in the United States is unnecessary. And this wasteful care comes with incredible financial consequences. Every year, a staggering \$265 billion is wasted nationwide on unneeded care – more than twice the annual federal government’s infrastructure budget. It is easy for physicians, health plans, and patients to point fingers and assign blame. We believe, however, that physicians are best positioned to curtail overuse, given their roles as trusted patient advocates.

Countless measures – such as readmission rates and episodic costs associated with surgery – exist to assess physician performance after medical decisions are made. There are few measures, however, that assess whether care was needed in the first place. As a result, the appropriateness of care has a blind spot in medical quality science.

Historically, health plans – not physicians – have managed utilization through approaches like pre-authorization which use static rules to assess medical necessity on a case-by-case basis. Limited in their ability to address overuse, these approaches often foster adversarial relationships between health plans and physicians by increasing overworked physicians’ administrative burden (over 90 percent of cases are approved) and reducing their decision-making autonomy. As health plans continue to work toward reducing wasteful care, physicians could face further increases in administrative burdens and limitations to autonomy, thereby restricting their ability to provide individualized care to patients.

PHYSICIAN SOCIETIES SEEK A LEADING ROLE IN COMBATING OVERUSE

Some medical societies have recognized the importance of assuming a leading role in helping physicians adopt best practices and self-regulate care to avoid the imposition of third-party restrictions on their decisions. Professional societies like the American College of Cardiology have aggressively developed Appropriate Use Criteria (AUC) to support their members’ clinical decision making. While AUCs represent an important step in educating physicians on best practices to curtail overuse, they are often broad and adherence is difficult to measure. So, while AUCs are critical to defining appropriate practice, they are insufficient to driving change in physician decision making.

EXHIBIT 1: TOP DRIVERS OF UNNECESSARY CARE

1

Physicians may be unaware of best practices

2

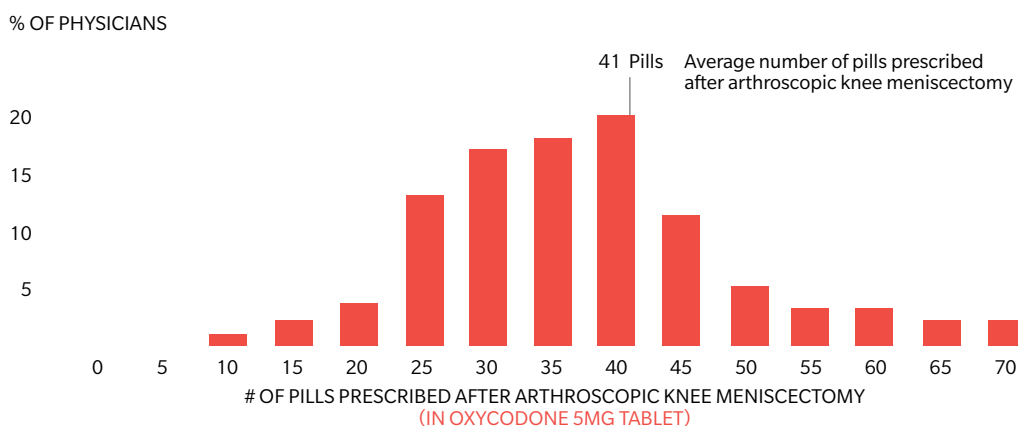
Physicians aware of best practices “say yes when evidence says no”

3

Fee-for-service incentives push for more (not less) care

4

Physicians are pressured by patients for diagnostic testing or treatments

EXHIBIT 2: OPIOID PRESCRIPTION AFTER ARTHROSCOPIC KNEE MENISCECTOMY

Physicians who exhibit outlier patterns of overtreatment but are without reliable data may not think of themselves as outliers – or they may believe their practice falls within clinical guidelines because their patient panel comprises “sicker” patients compared to those for whom guidelines were developed.

GREAT MINDS THINK ALIKE

One solution is to embrace expected variation in medicine – each patient will have a unique presentation – but accept there are limitations to medically justified variation. Calculating the degree of variation in how physicians practice relative to their peers helps define the bounds of appropriate variation. Sharing the results with physicians who fall outside best practice boundaries – as defined by guidelines, clinical literature, and peer consensus – can generate a powerful Hawthorne Effect¹⁴ and motivate self-correction. This approach harnesses the power of peer-to-peer comparison to drive improvement.

In a recent clinical trial, researchers examined the effect of peer comparison letters on high-volume primary care prescribers of the drug, Seroquel. Physicians nationwide received “Dear Doctor” letters from the Centers for Medicare and Medicaid Services showing how often the physicians prescribed the high-risk medication to older patients, as well as how these rates compared to those of other physicians in their states. Researchers found these outlier physicians adjusted and cut prescribing rates by approximately 16 percent over the study’s two-year period. Such results indicate physicians will respond to being out of step with their peers – but only if they are made aware of the fact.

Another example comes from Practicing Wisely^{®15} – a program developed by Oliver Wyman – that codifies AUC into Appropriate Use Measures (AUMs). One Practicing Wisely[®] Appropriate Use Measure looks at the average number of opioid pills prescribed after a knee meniscectomy. The degree of variation in prescribing practice after this standard procedure is both astonishing and concerning, given the highly addictive nature of opioids (Exhibit 2). Although guidelines indicate

fewer than 15 pills are necessary, many orthopedic surgeons prescribe an average of 40 pills to patients in their practice.

When prescribing pattern data was shown to physicians, one doctor said he would immediately change how he practiced medicine. Instead of prescribing 30 pills after the surgery, he would reduce the number of pills in his default script to be consistent with the guideline.

GETTING PHYSICIANS COMFORTABLE WITH THE IDEA OF BEING MEASURED

When physicians are shown a measure whereby they are marked as an outlier, their initial reaction is often that the data is wrong or the analysis unfair. While most physicians acknowledge patients are receiving wasteful care, few believe they themselves are the ones providing it.

Rigorous measure development processes that incorporate existing AUCs, clinical literature, extensive physician feedback, and statistical support address most physician concerns. Additionally, adopting best practices from behavioral economics (peer-to-peer comparison and behavioral nudges) can address cultural challenges associated with measuring physician performance.

WHERE DO WE GO FROM HERE?

Appropriate Use Measures developed and endorsed by physicians are a powerful tool in the collaborative effort to deliver higher-quality care and lower costs. More AUMs are needed to evaluate performance of specialists, who operate with few relevant measures on which to evaluate and improve their performance. Further, the success of value-based contracts is similarly dependent on better visibility into care decisions. The power of peer comparison enabled by AUMs is still in its infancy, but is rapidly growing as stakeholders across healthcare look for ways to manage the upstream decisions of what care to deliver. Early results suggest AUMs, deployed in a collaborative way with providers, are making a meaningful dent in rising healthcare costs while simultaneously boosting patient safety.

KEY TAKEAWAYS

- While Appropriate Use Criteria represent an important step in educating physicians on best practices to curtail overuse, they are often broad and adherence is difficult to measure. So, while AUCs are critical to defining appropriate practice, they are insufficient to driving change in physician decision making.
- Physicians who exhibit outlier patterns of overtreatment but are without reliable data may not think of themselves as outliers – or they may believe their practice falls within clinical guidelines because their patient panel comprises “sicker” patients compared to those for whom guidelines were developed.
- When physicians are shown a measure whereby they are marked as an outlier, their initial reaction is often that the data is wrong or the analysis unfair. While most physicians acknowledge patients are receiving wasteful care, few believe they themselves are the ones providing it.



WHAT'S NEXT



PHARMA'S ROLE IN EMERGING HEALTH ECOSYSTEMS

FROM DRUG, TO CURE

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The onslaught of disruptive trends and the emergence of new health ecosystems are jeopardizing some of the pharmaceutical industry's most historically profitable businesses. There must be a greater focus on prevention, treatment, and/or disease management for areas like rheumatology, oncology, cardiovascular disease, and diabetes.

THREE WELL-ESTABLISHED TRENDS SPELL DISRUPTION FOR PHARMA

1. ONGOING HEALTHCARE COST CRISIS

Government and private payers around the globe are concerned with rising healthcare costs. And patients across the US share this concern, as payers continually offload risk onto consumers through high deductible plans and health savings accounts. Despite this cost crisis, pharmaceutical companies have maintained¹⁶ margins that range between 15 to 20 percent. Prices of innovative drugs are increasingly being challenged, resulting in demands for risk share or access and reimbursement restrictions.

2. TECHNOLOGY INNOVATION BECOMES MAINSTREAM

Many innovations are creating new touchpoints, threatening established engagement paradigms. Some of these innovations include telehealth, virtual care, patient monitoring, patient engagement, personalized medicine, or large-scale population health data analysis. Some of these complement pharma, while others compete directly with pharma's value proposition.



3. THE PATIENT TO CONSUMER REVOLUTION PRESSES ONWARD

Consumers' healthcare expectations have been upended by their seamless experiences with service industries like e-commerce, mobile banking, and online travel planning. Consumers have more money at risk in their healthcare purchases, and more opportunity to access patient support groups. They have an unprecedented ability to compare treatments and to share ideas in areas where manufacturers used to hold an information monopoly. As evidenced by low industry-wide net sentiment, consumers are dissatisfied with the level of service they get from healthcare stakeholders, and are taking on greater power, responsibility, and advocacy over their health decisions. Drug choice will not be spared from consumer decisions.

A FRAMEWORK FOR ANALYZING RISK OF DISRUPTION FOR SPECIFIC THERAPEUTIC AREAS

Three factors determine disruption risk levels specific to therapeutic areas in this changing healthcare environment:

1. Market size. The bigger the market, the more attractive it is to challengers.

2. Substitution risk. Innovators recognize and are addressing that consumers with diverse medical needs have unique (yet, also broadly defined) challenges and needs. In response, innovators are bringing prevention, wellness, information, and advice to the mainstream market to capture new value across the care delivery spectrum. Some of these offerings represent a direct competition to current healthcare players. When a variety of offerings and treatment options

exists for consumers to choose from, such as various therapeutic agents, non-pharmaceutical approaches like surgery, radiation, medical devices, or lifestyle changes, the disruption risk for incumbents gets even greater.

3. Complementary opportunity. If a particular therapeutic area entails unmet patient needs beyond the immediate treatment – for example, helping a patient deal with treatment side effects – challengers that address critical patient needs beyond treatment will become a significant threat to those incumbents only treating a single medical need.

When applying the above framework to the therapeutic categories, our analysis demonstrates some of the most affected areas include rheumatology, oncology, cardiovascular disease, and diabetes.

PHARMA'S TOOLKIT FOR CHANGE

To face this new competitive paradigm, the industry needs to evolve its value proposition, with bold investments in new approaches. It has valuable assets at its disposal, including:

- **The capability to demonstrate outcomes**, both during clinical trials and in real-world settings
- **Strong medical expertise**, both within organizations and by accessing its base of prescribing clinicians
- **Strong relationships with key healthcare stakeholders**, including payers, providers, and regulators
- **An enormous amount of clinical data**, with the capability to generate more, and analytics that can make data actionable
- **Large-scale operations**, both geographically and in functional depth
- **Financial strength** to make investments that complement and expand existing activities

Creating new value in health. We have chosen two examples of therapeutic areas in order to illustrate how the pharmaceutical industry can leverage its capabilities in this new competitive paradigm.

Creating new value in cancer treatment. In **oncology**, there has been a strong focus on efficacy, improving survival for patients. However, there are other unmet needs beyond efficacy that are far from being completely addressed and that are primed to drive further disruption. Consequently, opportunities to create value in oncology may lie outside the traditional pathway of drug manufacturing. These may include using big data resources to identify the best treatment paths, creating tools to improve care coordination among multiple providers, and improving diagnostics using developments in areas like genomics, proteomics, and metabolomics, which generate large amounts of data. Pharmaceutical companies may also find a role in helping patients maintain and improve their quality of life during treatment through adopting better nutrition habits or in providing support for caregivers and families.

Creating new value in chronic diseases. For decades, many pharmaceutical companies have derived an overwhelming share of revenues and profits from treating **diabetes** or **cardiovascular disease**. Payers and patients are looking hard at the value of specific interventions for managing chronic conditions, and are searching for strategies to postpone their progression or prevent them entirely. Condition management innovators draw on patient monitoring and engagement, powered by advanced analytics for behavior modification that drives outcomes. This is enabling new players to address chronic disease prevention, mitigation, and management differently. New generations of smartphone and other groundbreaking technological developments are finding applications in this space.

Several pharmaceutical companies have started to form partnerships with and invest in these innovators. For example, Sanofi is partnering with and investing in the condition health company Omada, and Roche has acquired the oncology data company, Flatiron Health.

Pharmaceutical companies can choose to compete in the new paradigm – or they can find ways to participate by partnering and leveraging their capabilities. Companies that put all their eggs in the drug manufacturing basket risk being excluded from valuable profit pools. To survive and thrive in a rapidly changing health ecosystem, pharma companies will need to focus on those therapeutic areas they can best serve, identify unmet needs, and discover new and innovative ways of addressing them.

KEY TAKEAWAYS

- Consumers are dissatisfied with the level of service they get from healthcare stakeholders, and are taking on greater power, responsibility, and advocacy over their health decisions. Drug choice will not be spared from consumer decisions.
- Those challengers that address critical patient needs beyond traditional treatment needs will become a significant threat to incumbents.
- Opportunities to create value in oncology, diabetes, and cardiovascular disease may lie beyond the confines of traditional drug manufacturing alone.

AROUND THE GLOBE

THREE MODELS
OF INNOVATION
TO EMULATE

Adeel Kheiri

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Healthcare has historically focused on science and clinical innovations that enabled the discovery of new drugs, development of new devices, and design of new treatment approaches. What has often been overlooked are commercial and service innovations that enable systems to “do more with less” – or at least “do more with the same.”

Global healthcare spending is expected to increase from \$7.2 trillion¹⁷ in 2015 (10 percent of global GDP¹⁸) to \$18.3 trillion¹⁹ in 2040 (12 percent of estimated global GDP). With rapid growth, the age-old health challenges²⁰ of balancing access, quality, and cost of care are more relevant than ever in both developed and developing global markets. This is evidenced by the continuing gap between the demand and existing supply for care, rising national health budget deficits, medical inflation outpacing overall economic growth, and large variations in clinical outcomes.

By definition, the status quo is not sustainable. Innovation is not only practical, but necessary across all fronts, from policy to care delivery to financing. With healthcare systems globally facing financial and operational pressures, commercial and service delivery innovations are increasingly being used to rethink the “lines” and current operating constructs.

EXHIBIT 1: THREE ARCHETYPES OF INNOVATION ENABLING INTERNATIONAL HEALTH SYSTEMS TO REAP MORE VALUE

1

“BRICKS AND CLICKS” PLATFORM PLAY

New ecosystems that combine brick and mortar and digital components are beginning to address quality, access, and disintermediation across ecosystem subsectors.

EXAMPLE:

- Ping An-Good Doctor

2

PUBLIC-PRIVATE PARTNERSHIP 2.0

The expansion of public-private partnerships constructs beyond hospitals and infrastructure, unlocking new sources of value.

EXAMPLES:

- UK NHS-GSK
- Rwanda Govt.-
Babylon Health

3

FRUGAL INNOVATION

New business models are being developed that take existing services and products and strip away “luxury” features to enable more consumers access to affordable, high quality care.

EXAMPLES:

- Right Health
- General Electric
(Discover IQ PET/CT)

GETTING MORE BANG FOR THE BUCK

In particular, we see three archetypes of commercial and service innovation enabling international health systems to extract more value from their health spending.

1. “BRICKS AND CLICKS” PLATFORM PLAY

Could the future be a model that combines both “bricks and clicks” to address the dual global challenges of quality access and widespread disintermediation within and amongst subsectors in the ecosystem? The Amazon-JPMorgan-Berkshire Hathaway venture certainly has a flavor of this in the US. On the other side of the pond in China, Ping An has been building out businesses for many years with similar principles.

Ping An has also invested heavily in healthcare, with assets in health insurance (Ping An Insurance), health data (Ping An Health Cloud), and care delivery (such as Good Doctor and WanJia). The differentiation in this healthcare focus and strategy is clear – Good Doctor debuted on the Hong Kong Stock Exchange (HKSE) earlier this year not as tele or virtual doctors, but with an equity story to be the world’s largest health ecosystem. Indeed, while its 193 million registered users have access to virtual consults, it also incorporates Rx delivery and offline network coverage of 3,100 hospitals, 1,100 health check-up centers, and 7,500 pharmacies, and draws on Ping An insurance.

2. PUBLIC-PRIVATE PARTNERSHIP 2.0

The concept of decades-old public-private partnerships (PPP), traditionally focused on infrastructure build-outs with common frameworks around financing, finance-build-operate-transfer, or operating contracts such as concessions. Although these are expected to remain a source of health sector development in many growth markets, the expansion of PPP constructs beyond hospitals and infrastructure is unlocking new sources of value.

For example, big pharma’s shift away from traditional short-term sales maximization to partnerships with government payers could lead the way. The United Kingdom’s National Health Services (NHS) is engaging with select pharma players in new risk sharing, value-for-money arrangements for specific therapies. British pharmaceutical company GlaxoSmithKline (GSK) recently announced a partnership targeted at chronic obstructive pulmonary disease (COPD) with Manchester’s health system, which is enabling faster access to drugs and is building a foundation to redefine clinical guidelines and reimbursement approaches for new therapies and drugs.

Another example of PPP 2.0 is the Rwandan government partnership with UK-based Babylon Health to launch Babyl, a digital health platform that is accessible as part of Rwanda’s Universal Health Coverage Scheme. Rwanda, a nation where almost 70 percent of the population lives in a rural setting, is plagued by doctor shortages;²¹ the platform enables registered users to use their mobile phones to book medical appointments, receive prescriptions, and access their medical

records. As of May 2018, 2 million Rwandans (or about 16 percent of its 12 million population) signed up for the program. These 2 million people represent the highest penetration of digital delivery of healthcare in the world.

3. FRUGAL INNOVATION

Innovation in healthcare is often synonymous with greater sophistication and better quality, albeit at a higher cost. But given that most nations outside of the Organization for Economic Co-operation and Development (OECD members) are challenged by affordability and access to care, cost containment remains a priority. The concept of “frugal innovation” is more relevant than ever.

Frugal innovation is taking existing products and stripping away non-essential or “luxury” features to enable products to reach more users faster and more economically. While this is common in other industries (such as mobile phones), there is certainly room to apply this more broadly in healthcare. This type of innovation can take the form of smaller pack sizes for pharma, to simpler, more rapid diagnostics – or to rethinking care delivery requirements.

Right Health, a United Arab Emirates-based primary care provider, has developed a business model focused on provision of low cost, high quality primary care for blue-collar workers. Its model is simple: rapidly achieve economies of scale to enable a “no frills” low capex model, that focuses on investments into clinical expertise, technology, and data analytics to improve quality of care. GE Healthcare famously adopted this frugal innovation approach in emerging markets, with more than two dozen such innovations already developed. For example, in 2014, GE launched the Discover IQ Positron Emission Tomography-Computed Tomography (PET/CT) in India that is 40 percent cheaper, provides up to two times improvement in PET quantitative accuracy, and offers two times the improvement in image quality.

GREATER IMPLICATIONS

Innovation has always been central to healthcare, but today’s industry challenges are not only medical. They are also now about value, affordability, and access. Expanding the frames of innovation to include commercial and service innovations, and taking a page from untraditional places, is necessary to disrupt an industry that so badly needs it. However, disruption won’t come in the form of a silver bullet technology solution or a shiny new government regulation. It requires collaboration between the public and private sector, plus a blend of both traditional and non-traditional models. Without innovative and forward-thinking approaches, health markets globally will struggle to keep pace with the care delivery requirements of an aging population that is increasingly plagued with non-communicable diseases, and funding growing health spend that continues to outpace economic growth.

KEY TAKEAWAYS

- Innovation in healthcare is often synonymous with greater sophistication and better quality, but often with incremental costs for health systems. Given affordability and/or access challenges across the globe, cost efficiency needs to remain a key part of the value proposition.
- Disruption of the status quo in healthcare will not come in the form of a silver bullet technology solution or a shiny new government regulation. It requires collaboration between the public and private sector, plus a blend of both traditional and non-traditional models.
- There is no one-size-fits-all model for commercial and service innovations, but rather a range of models that can be customized to health system structures and requirements.



DEFINING HEALTHCARE'S WORKFORCE FOR THE FUTURE

SHIFTING DEMAND WILL CHANGE THE NATURE OF WORK IN HEALTHCARE

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Digitization and automation directly impact up to 45 percent of jobs across industries. As healthcare embraces technology, moves out of the office, and marches toward value, there will be an inevitable need for new roles, smarter skills, and deeper relationships across the workforce. Companies must be deliberate in defining their future workforce's size and shape. Companies struggle with questions like:

- What changes are impacting my workforce?
- What will my future workforce look like?
- What strategies are needed to bridge from the present to the future?

THE TYPICAL HEALTHCARE CONVERSATION: A SUPPLY SHORTAGE

It's a familiar complaint echoed across health system C-suites nationwide. Physician dissatisfaction, combined with a dwindling clinical education supply, means an inevitable gap in the ability to deliver care safely and scale businesses.

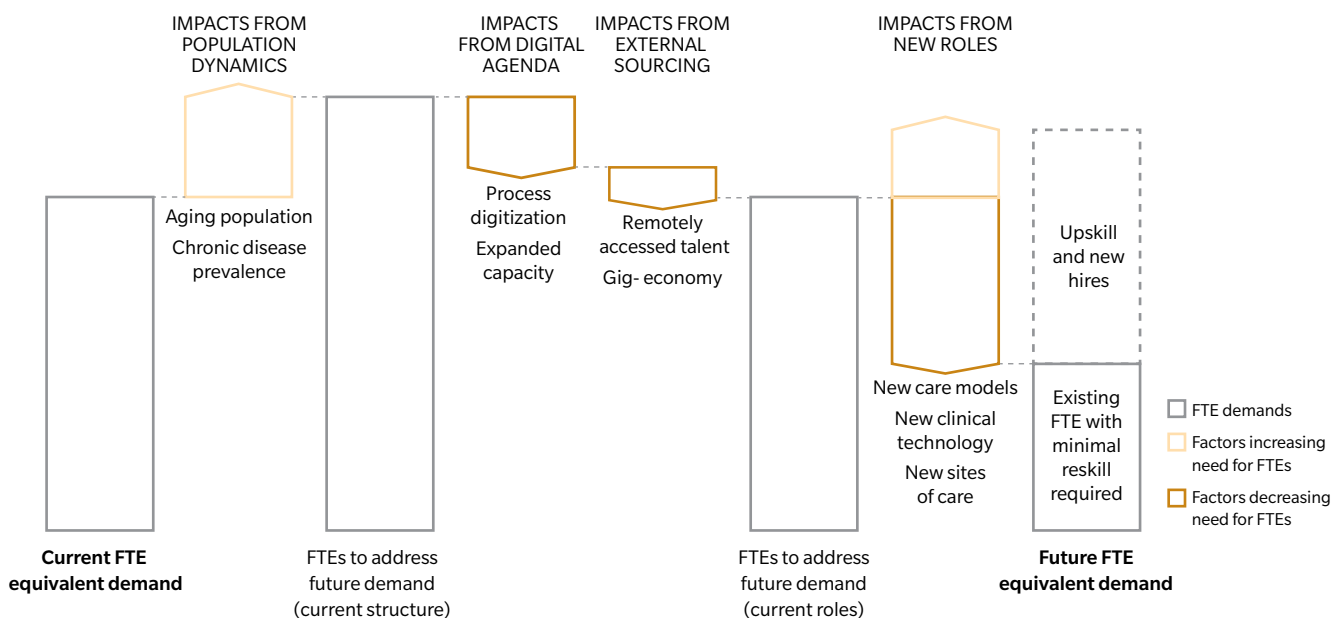
The numbers support this, with expected shortages of 100,000 physicians by 2030, and shortages for other clinical and non-clinical professions potentially even worse. (Expect a shortage of over 100,000 nurse practitioners and nurse assistants and a dearth of more than 400,000 home health aides by 2025.) While the gaps will differ by state, and even by town, hospital and health system administrators will struggle over the next decade to staff key positions in an environment of cost constraints.

A BROADER HEALTHCARE DIALOGUE: MEETING SHIFTING DEMAND

An aging population, rapidly changing consumer expectations, and the shift toward value-based care demand new skills, new roles, and new interactions between talent. New ways to work, driving innovation and experimentation, will permeate clinical and non-clinical staff. Here are four examples of trends that imply a workforce in healthcare very different from today’s:

- 1. A move out of the office**, driven by convenience for consumers and a move toward less costly sites of service, requires an entirely new set of skills to deliver care across different settings. Health providers will need to operate in non-traditional locations and use technology to access and integrate care, engaging patients in unique ways as consumer expectations evolve.
- 2. The shift to value and new models of care** requires a more holistic view of consumers and patients. It also demands new roles. Care teams require social workers, population health managers, and many other roles and skills (such as nutritionists and behavioral health) that aren’t common across the healthcare landscape. Further, coordination of care requires differently structured, technology-enabled, and executed relationships between clinicians, managed-care organizations, and community organizations that remain weak as a whole today.

EXHIBIT 1: INTEGRATED PLANNING MODEL: POTENTIAL DYNAMICS IMPACTING THE FUTURE WORKFORCE



3. **Scientific advances** in fields such as genomics and behavioral science create significant unknowns, for which there is no workforce supply model as of yet. As we shift from reactive to preventive interventions, new roles such as epigenetic counselors will become mainstream. An entirely different set of skills – skills that, at the moment, do not exist, except conceptually – will be necessary to interpret and integrate these new technologies.
4. **The need to innovate quickly.** As new entrants appear in the healthcare space with increasing frequency and intentionality, current business models are increasingly threatened. Experimentation and co-creation need to happen in more rapid cycles, with new skills stemming from being able to anticipate what's next. Workers will require a bias to act (in stark contrast to today's bias for long planning cycles) and will need a framework and culture to deal more comfortably with ambiguity and risk.

Given the need for new roles and new skills, we estimate **over 50 percent** of the workforce could have roles that are significantly modified from today.

WANT TO STAY AHEAD OF THE CURVE? EMBRACE A “NO REGRETS” POSTURE.

Keeping a finger on the pulse of technological, industry, and sociological trends impacting the workforce is critical to define the size and shape of an organization's workforce for the future. Technology can be a catalyst to increase capacity, reduce administrative burden, and augment and enhance human capabilities. Here are five ways to stay ahead of the curve.

EXHIBIT 2: FIVE WAYS HEALTHCARE PROVIDERS AND PAYERS CAN BUILD A HEALTHCARE WORKFORCE FOR THE FUTURE

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| <p>1</p> <p>Use the data you have. Understand supply and demand gaps across the breadth of clinical activities and how these gaps will influence care models.</p> | <p>2</p> <p>Lean into technology. Find ways to welcome artificial intelligence and self-service that addresses workforce gaps.</p> | <p>3</p> <p>Optimize for efficiency. Digitize your workforce. Raise productivity through process design, standardization, and specialization.</p> | <p>4</p> <p>Be deliberate about the shape of your future workforce. Define your posture toward new models of care. Explicitly hire and train for new roles.</p> | <p>5</p> <p>Invest to attract key digital talent. Don't ignore digital skills. Invest to attract and retain talent. Segment the workforce to identify key technology worth competing for.</p> |
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KEY TAKEAWAYS

- The typical conversation about clinician shortages needs to expand as shifting models of care and the need to innovate change the nature of work in healthcare.
- Companies need to be deliberate in defining the size and shape of their workforce.
- A “no-regrets” posture – embracing technology and investing in talent – can pave the way to healthcare's workforce for the future.

PRESCRIBING FOOD AS MEDICINE

Q&A WITH THE ACADEMY OF
NUTRITION AND DIETETICS
ON MALNUTRITION'S
GREATEST CHALLENGES
AND OPPORTUNITIES

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Oliver Wyman's Health & Life Sciences division is devoted to increasing industry-wide awareness of the "Food as Medicine"²² movement as part of our mission to drive nutrition's holistic impact on health and well-being. We hope this interview sparks new conversations about how care decisions focused on the intersection of diet and medicine will dramatically drive healthier decisions and healthier lives.



Shivani Shah (SS): How significant is the malnutrition problem? What is its impact on the broader healthcare environment?

Alison L. Steiber (ALS): Let’s start with what malnutrition is, given that it’s often misunderstood. Malnutrition is largely about having an imbalanced intake in nutrition – either too much (obese) or too little (undernourished) – that then contributes to chronic diseases, acute diseases, and everyday illnesses and infections.

Within the United States, there’s an enormous problem with food insecurity – considered a major driver of malnutrition. Nearly 40 million people – an estimated 12.3 percent of American households – are food insecure, according to *The 2017 Economic Research Report*.²³ This 12.3 percent increases to 17.3 percent when examining an elderly community-based population. The burden of malnutrition and food insecurity increases a person’s likelihood of mental health problems, diabetes, risk of hypertension and hyperlipidemia, and decreases key nutrients the body needs most, like iron, potassium, and calcium.

These figures, which represent a staggering number of individuals, are indicative of a system failing to prevent and treat malnutrition across many different environments, including our homes, schools, workplaces, and doctor’s offices.

SS: What’s the biggest challenge in addressing malnutrition?

ALS: It’s twofold. First, you need to be able to recognize it. Between one-third and one-half of hospitalized adults are malnourished, but only 7 percent are diagnosed with malnutrition.

EXHIBIT 1: BETTER INTEGRATION OF MALNUTRITION CARE INTO TRANSITIONS IS NECESSARY

NUTRITION HEALTH OF US POPULATION

Malnutrition, defined as a nutrition imbalance including under-nutrition and over-nutrition, is a pervasive, but often under-diagnosed, condition in the United States. This prevalence is exacerbated among those who are already ill: chronic diseases such as diabetes, cancer, and gastrointestinal, pulmonary, heart, and chronic kidney disease and their treatments can result in changes in nutrient intake and ability to use nutrients, which can lead to malnutrition.

MALNUTRITION PREVALENCE ACROSS CARE SETTINGS



More than **40%** of patients age 50+ are not getting the right amount of protein each day⁵

70% of adults are overweight or obese⁶

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 2. National Resource Center on Nutrition Physical Activity and Aging. Malnutrition and Older Americans
 3. Guigoz Y. The Mini Nutritional Assessment (MNA) review of the literature – What does it tell us? *J Nutr Health Aging*. 2006;10:466-487
 4. Snider JT, Linthicum MT, Wu Y, et al. Economic burden of community-based disease-associated malnutrition in the United States. *JPEN J Parenter Enteral Nutr*. 2014;38(2 Suppl):77S-85S
 5. Estimated (Age-Adjusted) Percentage of US Adults with Overweight and Obesity by Sex. 2013-2014 NHANES data
 6. NHANES data from 2007-2008.

This gap is a major care quality issue. Next, you need to be able to treat it in real time. Up to 31 percent of malnourished patients, and even 38 percent of well-nourished patients, reportedly experience nutritional decline during their hospital stay.

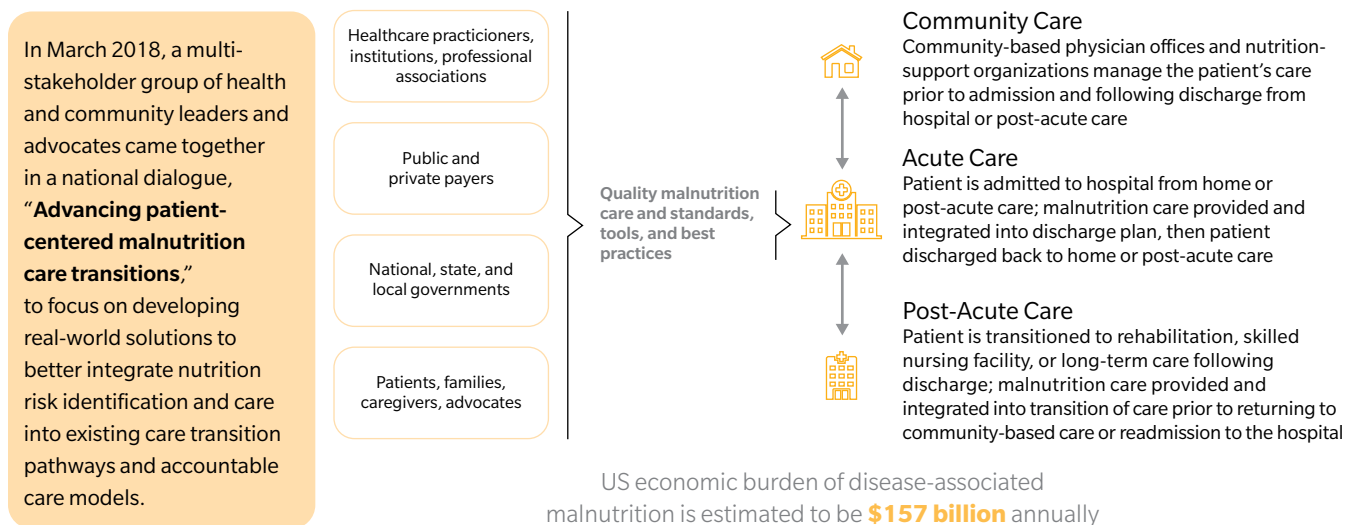
SS: What are the costs of malnutrition?

ALS: It is difficult to quantify tangible and intangible malnutrition costs, as costs range from decreased work productivity to increased healthcare costs when malnourished patients have extended hospital stays. In a hospital setting, costs are determined through diagnostic related group (DRG) codes. In a recent Academy study, malnutrition diagnoses were reported to increase when patients were properly diagnosed through a Nutrition Focused Physical Exam (NFPE) technique where registered dietitian nutritionists (RDNs) used a physical exam to determine the presence of malnutrition. The number of DRGs was assessed 12 months prior to the RDNs receiving NFPE training, and 12 months after. Malnutrition as a major comorbid condition nearly tripled after the training. This allowed these patients to be properly treated – avoiding sizable downstream costs. And, it meant the hospital was reimbursed for necessary care upstream.

SS: What barriers are there in treating malnutrition?

ALS: The first is a lack of awareness across many hospitals and clinics. Many healthcare professionals aren't attuned to thinking about malnutrition. A second barrier is lack of quality training for practitioners in proper malnutrition screening and diagnosis. There isn't a simple

EXHIBIT 2: RECOMMENDATIONS TO INTEGRATE MALNUTRITION CARE INTO CARE TRANSITIONS



procedure or biochemical test. Rather, it’s a time-consuming combination of physical, clinical, and dietary assessments to determine whether malnutrition exists. Adding to this problem? Hospital staff shortages. It is even more difficult to have trained staff and proper access to individuals at risk for malnutrition in clinics and community settings. Increased awareness, validated screening, and assessment tools are needed to ensure that malnutrition is being addressed, regardless of setting.

SS: What is the Academy of Nutrition and Dietetics doing to address malnutrition?

ALS: The Academy has many programs, resources, and research projects to address malnutrition, such as the previously mentioned NFPE training workshop, which provides hands-on training to increase knowledge and skills in the diagnosis of malnutrition for both pediatric and adult populations. The workshop, performed nationally, is now being conducted both domestically and globally.

A second major initiative the Academy has spearheaded is the development and testing of eMeasures (an electronic indicator of quality) for malnutrition in hospitals. The goal is to address malnutrition quality of care for hospitalized older adults by focusing on screening, assessment, diagnosis of malnutrition, and treatment care plans. For this project, we partnered with Avalere Health and Abbott Nutrition to launch the Malnutrition Quality Improvement Initiative (MQii) that provides hospitals with tools and processes to screen, diagnose, and treat malnutrition. Within the last four years, 56 unique facilities across 23 hospital systems have embraced MQii tools and resources. The Academy is also spearheading the submission of value sets (bundles) of electronically available terminology to be readily used in documenting malnutrition. Documentation is essential in assessing prevalence and addressing the problem.

EXHIBIT 3: BETTER INTEGRATION OF MALNUTRITION INTO CARE TRANSITIONS IS NECESSARY

Data collected from Learning Collaborative sites shows that implementation of the MQii Toolkit and eQCMs* leads to better care throughout a patient’s hospital stay

Quality Measures/Indicators	Change Following Quality Implementation
Patients ages 65+ identified as at-risk based on a nutrition screening on admission	↑ 10%
Completion of a nutrition assessment for patients identified as at-risk for malnutrition within 24 hours of a malnutrition screening	↑ 21%
Provider medical diagnosis of malnutrition for patients identified as malnourished after a nutrition assessment	↑ 20%
Nutrition care plan for patients identified as at-risk following nutrition screening	↑ 27%

*2016 MQii publication showed reductions in hospital LOS and readmissions. The four individual eQCMs, as well as a composite measure reflecting nutrition care across the inpatient stay, have been submitted to CMS for consideration for inclusion in the Hospital Inpatient Quality Reporting Program.

SS: What does “food as medicine” mean, especially as a way of addressing malnutrition?

ALS: Considering food as medicine is truly innovative. It raises nutrition to a higher community and health system level by having physicians and RDNs give patients **food prescriptions**. Patients who take seriously what their physicians say are likely to follow tangible directions. Imagine a physician writes a food prescription that includes consultation with a RDN, who then works with the patient, client, or consumer in places like the clinic and the grocery store to translate nutrient needs and preferences into food purchases that improve health.

SS: How do “food prescriptions” relate to MQii?

ALS: “Food as medicine” could incorporate the tools and resources for those patients either at risk or diagnosed with malnutrition. Healthcare providers in the community would use validated screening tools to determine people at risk for malnutrition. Those identified would receive a prescription for appropriate foods to address the malnutrition. This could be done across senior centers, food pantries, food banks, and outpatient clinics.

SS: What’s the most urgent next step in addressing malnutrition?

ALS: There is an urgent need for **interoperability**: seamlessly transferring valid, reliable malnutrition data throughout the healthcare system. Having the ecosystem invest in and adopt a comprehensive, long-term solution to the issue of interoperability in healthcare information related to the diagnosis and treatment of malnutrition would represent a significant step.

The Academy has developed nutrition-focused standards available at HL7 (a major organization that set guidelines for how electronic health records could and should work) so that documented nutrition data will follow the patient wherever they go: from hospital to outpatient or long-term care facilities. The push for action at the public health level is urgent. The Academy has worked to pilot technology tools (Nutrition Care Process Terminology and an informatics web-based platform) in collaboration with food banks and other stakeholders to monitor and intervene against malnutrition and food insecurity.

KEY TAKEAWAYS

- Over 40 million Americans are food insecure, leading to large incidents of malnutrition – most of which are not addressed. There is a need to educate and train the healthcare workforce, and standardize processes and measures related to malnutrition.
- It is imperative to embed malnutrition assessment, and diet and nutrition support, into the traditional care model. The adoption of food prescribing can drive substantial impact to health outcomes.
- Interoperability is critical to sharing an individual's pertinent diet and nutrition information across constituents and ensuring continued support and monitoring of health status.

CITATIONS

THE SPARKS ARE FLYING: LIGHTING A FIRE UNDER HEALTHCARE

- 1 <https://www.businessinsider.com/almost-20-of-hospitals-in-the-us-are-in-bad-shape-according-to-morgan-stanley-2018-8>
- 2 http://www.crainsnewyork.com/article/20161011/HEALTH_CARE/161019968/president-of-mount-sinai-beth-israel-susan-somerville-announces-departure-amid-hospital-downsizing

BANGING DOWN THE NEW FRONT DOOR: REINVENTING HEALTHCARE'S FRONT END

- 3 <https://www.sramanamitra.com/2016/10/13/webmd-not-ready-for-a-sale/>

THE BETTER BENEFIT STACK

- 4 <https://www.nihcm.org/categories/is-health-care-shoppable>
- 5 <https://www.prnewswire.com/news-releases/new-research-finds-popular-online-doctor-review-sites-dont-help-patients-find-high-quality-doctors-300469969.html>
- 6 <https://www.npr.org/sections/health-shots/2018/06/26/623525386/atul-gawandes-aim-for-health-care-make-it-simpler-to-do-the-right-thing>
- 7 https://health.oliverwyman.com/archive/2017/11/blueprint_for_disrup.html

PUTTING THE HEALTH DATA GRAPH TO USE

- 8 <https://globenewswire.com/news-release/2018/01/25/1305113/0/en/Tempus-and-NYU-School-of-Medicine-Announce-New-Initiative-to-Help-Improve-Outcomes-for-Pancreatic-Cancer-Patients.html>

HOLDING HEALTHCARE RANSOM: INDUSTRY PERSPECTIVES ON CYBER RISK

- 9 <https://www.oliverwyman.com/our-expertise/insights/2018/jul/holding-healthcare-to-ransom-industry-perspectives-on-cyber-risks.html>
- 10 <https://www.protenus.com/press/press-release/56m-patient-records-breached-in-2017-as-healthcare-struggles-to-proactively-protect-health-data>
- 11 <http://www.modernhealthcare.com/article/20180120/NEWS/180129999>
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THE BIGGEST BREAKTHROUGH IN APPROPRIATE CARE: LESS IS MORE

- 13 <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0181970>
- 14 A concept from psychology that people will change their behavior when aware they are being observed
- 15 <http://www.practicingwisely.com/>

PHARMA'S ROLE IN EMERGING HEALTH ECOSYSTEMS: FROM DRUG, TO CURE

- 16 https://health.oliverwyman.com/archive/2018/02/true_value_chainpha.html

AROUND THE GLOBE: THREE MODELS OF INNOVATION TO EMULATE

- 17 http://www.who.int/gho/health_financing/health_expenditure/en/
- 18 <https://data.oecd.org/gdp/gdp-long-term-forecast.htm>
- 19 [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(16\)30167-2/abstract](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(16)30167-2/abstract)
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- 21 <https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=RW>

PRESCRIBING FOOD AS MEDICINE: Q&A WITH THE ACADEMY OF NUTRITION AND DIETETICS ON MALNUTRITION'S GREATEST CHALLENGES AND OPPORTUNITIES

- 22 https://health.oliverwyman.com/archive/2018/06/food_as_medicinehe.html
- 23 <https://www.ers.usda.gov/webdocs/publications/90023/err-256.pdf?v=0>

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