Surviving seismic change: Winning a piece of the $5 trillion US health ecosystem
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The US health industry is undergoing seismic change generated by a collision of forces. Some of them, such as the shift to paying for value and not volume, are moving swiftly and are well-known. Others, such as consumerism, are just beginning to reshape the health landscape.

This shifting terrain is creating uneven opportunities in the New Health Economy, and will likely drive players new and established to reconsider their business models. Some will be driven to seek returns in new markets as their core revenues shrink. Others will find success creating value for other players, including consumers. Still others will thrive by building infrastructure for the emerging virtual health system. All organizations should consider re-evaluating their core capabilities, and invest in efforts to understand consumers, who sit at the center of the emerging ecosystem.

These shifts are occurring in an industry that has long been impervious to structural change. For decades, the US health industry was a business-to-business system of silos—hospitals, insurance companies, government institutions, pharmacies, drug makers, medical device makers, employers—bound by contracting models. Consumers interacted with the system as patients, playing more passive roles.

What is emerging in place of this siloed industry is a modular ecosystem that operates similarly to industries such as retail, technology and hospitality. This new health ecosystem is comprised of five multi-sector markets serving the consumer—care delivery; diagnostics and therapeutics; financing and payment; platforms and support; and wellness and health management. This modular ecosystem, in which consumers can choose care according to their wants, needs and wallet, is far more accessible to newer players, which can tackle discrete parts of the system without having to control, own or understand the whole. This ecosystem is more dynamic, responsive to consumers and fertile for innovation.

To understand how the US health ecosystem will develop over the next decade, and the speed at which this might happen, PwC’s Health Research Institute (HRI) identified five forces that are reshaping the industry. Three—the rise of the consumer, decentralization and technological advances—have already helped transform other industries. Two are unique to health—the drive, led by the federal government, to pay for value instead of volume, and a surging interest in wellness and health management.

HRI projected the impacts of these five forces on each part of the ecosystem over the coming decade, along with their individual velocities of change. HRI found that the markets in the ecosystem that are positioned to exploit the shift to value-based care—diagnostics and therapeutics, platforms and support, and wellness—will likely experience the most growth over the decade. Health’s largest market—care delivery—will experience a reduction in growth as traditional providers find themselves enduring “deaths by 1,000 cuts,” thanks to innovations and trends such as virtual health that siphon services, and revenue, away from them. Players in this market that are able to create these alternatives will find opportunity, though (see figure 1).
American consumers are gradually finding themselves in the middle of this vast ecosystem. In some ways, they are experiencing great change. They are managing higher deductibles and navigating narrower networks of providers. They are looking at reviews of their doctors and hospitals on the internet, where they also are researching symptoms, diseases and treatments.

Yet in other ways, little has changed for the American health consumer. Most don’t shop for care, ask about prices, email with their clinicians or use telehealth options. Most don’t send their physicians data from their activity trackers. Most remain skeptical of the value of electronic medical record systems despite their ubiquity in examination rooms.

This is especially true of the 201 million Americans who use the system most — those with one or more chronic conditions. Organizations operating in the health ecosystem have enormous opportunity to engage these customers, who spend more than $1.1 trillion on medical services each year. These changes already have attracted attention from outsiders. Since 2011, 75% of companies listed in the Fortune 50 have been in healthcare; half can be classified as new entrants and innovators. Venture capital funding in health has swelled from $1.9 billion in 1995 to $11.3 billion in 2015. An industry that has long resisted change is being shaken up. The effects will be experienced as a seismic shift that will likely leave the landscape utterly transformed. Surviving this event, and thriving throughout it, will require new strategies, new roles and a willingness to leave the status quo behind.
The forces shaping the health ecosystem

Five forces are driving this transformative change in the US health industry (see figure 2). Individually, not one is enough to move the entire $5 trillion health ecosystem. But acting together, over a decade, they can have significant impact.

HRI projects that the forces that will likely grow revenues in the system are, in general, slower-moving while the forces likely to dampen growth are moving more quickly. The bottom line: Some health organizations may have to weather shrinking revenues for years, thanks to forces that are high-velocity growth dampeners, before enjoying the fruits of revenue-producing change (see figure 3).

The high-velocity growth dampeners

Volume to value: The trend with the most immediate impact will likely be the shift from volume to value, which is being driven by the federal campaign to link 90% of Medicare payments to quality programs, and half to alternative payment models by 2018.5 This trend, which likely will send shock waves throughout the ecosystem, essentially flips the health industry’s economic model on its head. Today’s revenue could become tomorrow’s expense for healthcare providers, especially for-profit organizations with business models that rely on high utilization. Organizations are finding burdens related to these quality measures are multiplying. For example, physicians

Figure 2: The five forces shaping the US health ecosystem

Rise of consumerism
• Consumer access and ownership of health data
• Consumer cost-sharing
• Price transparency and shopping

Shift from volume to value
• Federal drive toward value-based purchasing
• Insurer push for value-based contracts
• Pharmaceutical and life sciences company push toward value-based contracts

March of technological advances and digitalization
• Use of electronic medical records and other health data
• 3D printing
• The emergence of blockchain technology
• Development of –omics
• Spread of machine learning and artificial intelligence

Decentralization
• Spread of virtual care and remote patient monitoring
• Embrace of alternate venues and resources for care
• Increased use of extenders
• Seamless sharing of data among stakeholders

Surge in interest in wellness
• Consumer interest in wellness
• Insurer incentives for wellness
• Employer interest in wellness

Source: PwC Health Research Institute
are putting in an estimated 785 hours per year into data collection through electronic medical records, according to one study.⁶

Yet, some companies may unearth new sources of revenue as they create ways to help organizations withstand this shift. Medical device companies are creating solutions for their customers—doctors and hospitals—to take on more risk in these new payment systems. For example, Stryker Performance Solutions, a division of the orthopedic device and equipment manufacturer Stryker, based in Kalamazoo, Mich., created a web-based tool to help care coordinators monitor joint replacement patients’ health before and after surgery.

GoodRx tackled the value question by addressing waste in the pharmaceutical sales system. The company offers consumers an online site and mobile app where they can compare prices for any FDA-approved prescription drug at more than 60,000 US pharmacies. “We are not healthcare people,” said GoodRx Co-CEO Doug Hirsch. “But we came to healthcare with two goals in mind: One, make healthcare more transparent and, two, reduce healthcare spend in an inefficient system. I think we have both—especially the former. We have provided important tools that empower patients.”

**Wellness and health management:** A renewed focus on wellness and health management has the power to siphon revenues out of the ecosystem by reducing utilization of treatments and services intended for sicker individuals. Many micro trends around wellness are converging, including the hiring of dietitians and nutritionists by grocery store chains and retailers, the popularity of wearable fitness trackers, a detectable shift in the American diet and a flurry of wellness-oriented incentives provided by employers, insurers and others.

Down the road, new diagnostics, sophisticated analytics and modeling should help consumers better manage their health before, during and after illness, reducing their need for more costly care and treatment. Organizations will learn new ways to determine how much consumers are willing to pay for these health-preserving services, and build new business models around them. Medical advancements, which have transformed many fatal illnesses into chronic or curable ones, and many chronic illnesses into preventable or curable ones, will likely continue to change the American population’s health needs even as it ages.
Case study: Motivate Co., the “accidental” wellness company

At first glance, Motivate appears to be a company on a mission to provide affordable public transportation options. With 12 bicycle-sharing systems across the US, Canada and Australia, the company provided 18 million bike trips in 2015, a total of 30 million miles. Its rapid growth has been bolstered by forging public and private partnerships with city governments across the country and companies such as Citi and Nike (see figure 4).

Yet Motivate is more than a transportation company. It’s a newcomer to the health ecosystem, too. “Bike sharing has become a transformational part of the urban culture,” said Jay Walder, Motivate’s president and CEO. The company is finding healthcare companies are eager partners, seeing benefits for their brands and for promoting healthy activities.

As the US healthcare system becomes more consumer-driven, individuals’ orientation toward wellness will likely increase. Health companies have begun to notice. In 2014, Blue Cross and Blue Shield of Illinois announced a five-year, $12.5 million agreement to support the popular Divvy bike-share program in Chicago. According to Walder, Motivate has been approached by healthcare providers and insurers interested in sponsorships or subsidizing memberships as part of their wellness benefits packages.

Health players such as Motivate can build on success in other arenas while exploring partnerships with traditional health organizations. Whether asking consumers to walk to catch Pokémon, tracking steps and heart rates on a smartwatch, or bicycling to work rather than getting into a car, these services have a fitness byproduct.

Figure 4: Motivate Co., the accidental wellness company

Bike sharing company Motivate Co., considers itself a transportation company, but its growth has made it an attractive partner for healthcare companies.

Source: Analysis of data provided by Motivate Co.
**The low-velocity growth dampener**

**Decentralization:** The decentralization of care will help encourage consumers to obtain care anytime, anywhere, thanks to the spread of virtual care and remote patient monitoring, the embracing of alternate venues for care, the increased use of clinician extenders and the seamless sharing of data among stakeholders. This shift remains slow-moving, though evidence of it already can be found throughout the ecosystem. For example, in diagnostics, companies such as Medtronic offer connected medical devices that allow consumers to send data to their clinicians and to monitoring services from their homes, their cars or their grocery stores. This force likely will, on the whole, drive revenue out of the ecosystem as it makes care more efficient, HRI projects.

Retail clinics’ popularity underscores consumer interest in convenient solutions (see figure 5). In 2006, fewer than 10% of consumers surveyed by HRI said they had ever been to one. This year, 42% of consumers said they had, according to an HRI survey. Satisfaction remains high with the care received in the clinics—which offer everything from strep tests to sports physicals to, at one clinic provider, eyelash extension consultations, the survey found. The success of these clinics revolves around their convenience, transparent menu-board pricing and other consumer-oriented touches, such as expanded operating hours.

**Figure 5: US consumers are using retail clinics more than ever**

Satisfaction with care, while very high, has dipped slightly over the past year.

How often do you (or someone in your household) seek medical care at a retail clinic and how satisfied are you?

![Figure 5: US consumers are using retail clinics more than ever](chart)

What type of healthcare services did you seek in a retail medical clinic?

- 54% School, sports or camp physicals
- 26% Primary care treatments
- 13% Chronic disease management
- 6% Preventative treatments such as immunizations
- 10% Telehealth services
- 10% Treatments for injuries such as cuts and broken bones
- 6% Other

Source: PwC Health Research Institute consumer survey, 2016
The low-velocity growth producers

Technological advances and digitalization: Technological advances and digitalization is a looming tidal wave, visible on the horizon as little more than a swell. HRI projects the cumulative effect of four major technological advances—machine learning and artificial intelligence, 3D printing, the rise of—omics and the use of digital health data—likely will grow the diagnostics and therapeutics, platforms and support, and wellness markets in the long term.

The overall impact of these advances may render the health ecosystem more efficient, effective and automated. Researchers are exploring the use of machine learning to detect healthcare fraud, accelerate—omic research, improve care in intensive care units, identify women at risk of pre-term births and more.8 Machine learning, in an age of data, can, as Larry Smarr, the founding director of the California Institute for Telecommunications and Information Technology, put it, “bring patterns out of the sea of numbers.”9

Slowly, these technologies are making their way into the health ecosystem. Consumers can tap online algorithm-driven symptom checkers that can help them decide what to do next—wait, head to the ER or call the doctor in the morning. Models that can simulate the way the human body works, and predict the impacts of various behaviors and activities, can shortcut development of new products and services, hone business models or help consumers make more cost-effective choices about their health.

The 3D printing industry, also known as additive manufacturing, remains relatively small. Estimates range from $400 million in revenues a year to as high as $1.3 billion.10 Yet 3D printing has a toehold in the dental industry, and is starting to make its way into pharmaceuticals. This spring, Aprecia Pharmaceuticals began selling Spritam, a printed treatment for patients with some forms of seizures and the first FDA-approved 3D printed medication. The treatment is designed to quickly disintegrate in a patient’s mouth with a drink, making it easier for some patients to take the medication.11

Companies developing—omics technologies already are discovering new business models (see figure 6). In 2015, 23andMe, a company known for direct-to-consumer genetic testing, announced a partnership with Pfizer Inc., the pharmaceutical company. The partnership grants Pfizer access to 23andMe’s research platform, built off the company’s genomic database of more than 1,000,000, 80% of whom consented to participate in research, according to the company.12

![Figure 6: Genomic sequencing costs have dropped dramatically since 2001](image-url)

Source: National Human Genome Research Institute
As with most trends, these advances are intertwined with others. “Digital enables the ability to shift the model from volume to value,” said Andrew Thompson, President and CEO of Proteus Digital Health, a company that developed tiny biosensors that can be encapsulated within solid-dose medications, signaling when the treatment has been ingested. Proteus Digital Health also developed a software platform to handle the information, sending it to the patient, and with permission, their caregivers and clinicians. “It will take a decade to make this shift the industry norm,” Thompson said.

It’s not enough to have great technology, he said. Companies need a strong value proposition for their ecosystem customers and the consumers they serve. “You need to have a product that fits beautifully into the patient’s life flow,” he said. “They have to want it and love it.”

**Consumerism:** In the long-term, consumerism likely will help grow the market for platforms and support as well as wellness by driving consumers to options that are cheaper, more efficient and convenient, with the added bonus of helping them get and stay healthier longer. Companies building systems that can handle and analyze these consumer data, and protect them, while offering consumers ways to shop for care and make better health decisions, likely will find fertile markets (see figure 7).

Consumers already have high hopes for technology’s ability to reduce their costs, extend their lives and make them better athletes, a 2016 consumer survey found. One in five American consumers owns a wearable. They are finding new ways to track their fitness, including receiving benefits such as points to spend in stores in exchange for sending in their steps.

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**Figure 7: 2016 PwC consumer survey results**

| Percentage of US consumers interested in using telemedicine services in exchange for lower insurance costs | 45% |
| --- |
| Just 1% of consumers said they had interacted with their primary care doctors via video visit |

| Percentage of US consumers who said they would consider purchasing insurance from a startup | 28% |
| --- |
| 22% of consumers said they would consider buying insurance from a startup |

| Percentage of US consumers who used online resources to research healthcare or post about it | 36% |
| --- |
| 52% of US consumers living in households with healthy children reported using social media or online resources to research care and conditions |

Source: PwC Health Research Institute consumer survey, 2016
Seismic changes

Over the next 10 years, organizations involved in consumer decision-making, platforms and support, wellness, and managing value-based care will likely grow, HRI found. While still big parts of the ecosystem, traditional care delivery and financing and payment may experience churn with established players and new entrants trading market share.

One of the hallmarks of the health ecosystem is the development of a virtual system of care, powered by data. Because of this, the $93 billion platforms and support market, which supplies and maintains the digital infrastructure for the rest of the ecosystem, likely will undergo slow-moving but dramatic growth as companies build and support a virtual health system, and create the digital ties to bind ecosystem participants to each other and to other industries. The rise of consumerism, the decentralization of care and technological advances from 3D printing to blockchain technology will fuel the growth.

The $276 billion wellness market likely will swell significantly too, as companies find ways to engage consumers’ interest in staying healthy and exploit other players’ desires to be associated with those healthy activities. Companies able to show true returns-on-investment to consumers and stakeholders such as employers also may succeed. Consumerism and a societal focus on wellness, including the spread of incentives and penalties by employers, are helping to drive the growth, as are technological advances that likely will make wellness offerings smarter, and more tightly integrated, into the rest of the ecosystem.

The $1.6 trillion diagnostics and therapeutics market also likely will experience expanded growth. New revenues from technologies such as machine learning, artificial intelligence and 3D printing may offset revenue reductions stemming from the shift from volume to value and the focus on wellness. The devices are getting smaller, cheaper, faster. The migration of diagnostics from central labs to point-of-care and home use likely will expand the market. The market also likely will expand as therapies are linked to diagnostics to determine an individual’s likelihood of responding to therapy.

Life sciences companies should consider how they will play in this market. Will they be a breakthrough developer of novel technologies or platforms? An innovator in disease outcomes? A master of commercial and operational efficiencies, or a disciplined portfolio manager? These companies will need to develop the capabilities to execute these strategies, or they will need to partner or acquire companies to gain these capabilities as the ecosystem develops.16

Two markets—care delivery and financing and payment—likely will face slowed growth over the next decade. The $2 trillion care delivery market, the realm of organizations such as hospitals, physician practices, home health companies, retailers and other care providers, is expected to endure a swarm of small revenue cuts over the next 10 years. Nearly every trend identified by HRI will land a blow on care delivery. This is particularly true of the decentralization of care and the shift from volume to value. Both likely will dampen utilization by diverting this market’s customers. Growth in the $1 trillion financing and payment market likely will slow slightly, thanks to the shift from volume to value.
The American health consumer

Consumers sit in the center of the US health ecosystem. The traditional gatekeepers of care—insurance companies, government payers, healthcare providers—have been shifting decisions and risk to them. Cost-sharing has grown. More consumers go to retail clinics for care. Many strap on activity trackers and try to get 10,000 steps in before going to bed. And yet, in many ways, the way consumers access care has not changed very much, a review of past and present HRI consumer surveys found.

One in four consumers has emailed a clinician, according to a 2016 HRI survey. One in 10 has texted with a clinician. Fewer have communicated with a clinician using a web portal or an online chat. Few consumers price shop, HRI found. Few use the digital tools provided by their insurance companies or physicians. In the last three years, the percentage of consumers who say they have had a conversation with a clinician about the price of a drug or treatment has barely budged.

In 2005, consumers surveyed by HRI were asked whether they believed an electronic medical record would improve their care. At the time, few consumers would have even seen one, but 34% said yes. This year, after billions had been spent installing EMRs in virtually every doctors’ office and hospital, HRI asked consumers the same question. The percentage of consumers who felt EMRs would improve their care increased, just slightly, to 46%. Most remain undecided or flatly do not believe this technology improves care. Whether this is due to lack of awareness or a lack of clear benefits is unclear.

The system’s heaviest users—consumers with one or more chronic conditions—are among the least interested and least engaged with these new ways of accessing care, HRI’s 2016 survey of consumers found. These consumers also are more skeptical about the value of electronic medical records and less likely to have engaged a clinician in any way besides a face-to-face office visit (see figure 9).

Figure 8: EHR adoption has increased significantly since 2008 for both hospitals and physician practices

Source: The Office of the National Coordinator for Health Information Technology
And yet, other consumer-oriented trends are moving quickly. Lightly-regulated wellness options, married to fun trifles, can catch fire. The Pokémon Go app, marketed as an augmented reality game, embodies the way in which creative use of technology can drive consumer excitement. Niantic, the game’s developer, didn’t focus on exercise and wellness, but touched on it enough to demonstrate how similar technology could move in that direction. These “accidental” wellness companies likely will grow, and diversify, the wellness market.

Still, while HRI’s data suggest many consumers are interested in new ways of accessing care, they either don’t understand their options, or the options are not engaging them. Organizations have the opportunity to bridge this gap through consumer education, and more consumer-centered design of services and products. These strategies may lead to better outcomes. Take medication adherence. Between 20% and 30% of prescriptions are ignored; between 25% and 50% of Americans treated for hypertension stop taking statins within a year of filling their first prescription. The health system pays for these consumers’ poorly-managed disease. Poorly-managed disease has been blamed for an average of $2,000 in unnecessary doctor visits annually per patient, according to one study. History shows that consumers will try new options that make their lives easier, less complicated and more affordable. Take InstyMeds, a company that operates machines that dispense prescription medications at the point-of-care. The company operates 200 dispensers in 20 states. Roughly 60% to 70% of the dispensers are set up in hospital emergency departments, with the rest located in healthcare providers such as urgent care centers, same-day surgery centers and employer health clinics, said Julie Geason, vice president of pharmacy services.

Part of InstyMeds’ pitch to customers—which are charged a monthly fee to have the dispensers in their clinics—addresses the shift from volume to value. The company argues, in part, that the ease of obtaining prescriptions will lead to more consumers actually filling them, resulting in better outcomes. But the other part of the argument is about consumers, who appreciate the time saved by the dispensers, Geason said. “They didn’t have to drive 50 miles to the nearest pharmacy where they usually have to wait at least 30 minutes to have a prescription filled. They didn’t have to drag their sick kids out on another excursion to the pharmacy,” she said. “They love the technology.”
Recommendations

• **Seize the marketspace.** The US health ecosystem has very few “marketspaces,” which are, essentially, virtual marketplaces. In these marketspaces, buyers and sellers come together virtually to engage in transactions involving information that represents physical things or services.\(^{21}\) Outside of healthcare, these are well-known. Consider companies that allow fans to buy and sell sporting event tickets to each other online. Or companies that host virtual classified ads, giving buyers and sellers a way to find each other and engage in commerce. So far, these marketspaces have generated enormous value for their industries. Yet healthcare marketspaces are scarce, signaling enormous potential for growth as companies create virtual spaces to bring buyers, such as consumers, vendors or other healthcare organizations, and sellers together. Organizations already may have the raw materials to develop marketspaces, through direct connections to either potential buyers, such as consumers, or sellers. “I get an Amazon box a day and at the moment I don’t get any prescriptions by mail. Why is healthcare running the other direction?” said GoodRx’s Hirsch.

• **Consumer segmenting is critical.** HRI found wide variation in behaviors reported by consumer groups. Some, such as Hispanic consumers, were actively engaged with new tools, venues and ways of engaging with the health system (see figure 10).\(^{22}\) These consumers are ready for the new ecosystem. Others, such as consumers with chronic conditions, are less so. Understanding what motivates each consumer group, and how to connect with individual segments, will be key to getting the most out of the virtual health system. Many newcomers to the health ecosystem, such as

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**Figure 10: Ten signs that Hispanic consumers are the leading edge of the New Health Economy**

The US’s 55 million+ Hispanic consumers are more likely than other cohorts to:

1. Be satisfied with the care at a retail clinic
2. Use alternative venues, such as retail clinics, for care
3. Have communicated with a clinician via email or other digital means
4. Be open to new ways to access care, from using an at-home strep test to getting an MRI in a retail setting
5. Want help managing their care
6. Be open to buying insurance from a retailer or startup
7. Be interested in using telehealth in exchange for a break on insurance costs
8. Have used a mobile device to look up lab results or communicate with a nurse
9. To be optimistic about the value of an electronic medical record
10. Use social media to seek health information and reviews

Source: PwC Health Research Institute consumer survey, 2016; PwC Health Research Institute, Hispanics: A growing force in the New Health Economy, 2014
retailers, have sophisticated strategies built around customer segmentation, and can become key partners for stakeholders lacking those capabilities. These consumer-centered companies develop products and services two steps ahead of their customers, surprising and delighting them by anticipating their needs.

• **Think about wellness as more than Pilates and weight loss programs.** While the wellness market is projected to grow considerably over the next 10 years, that doesn't mean millions more will suddenly take to the gyms. Many wellness programs historically have suffered from poorly aligned incentives and timelines. As analytics grow more sophisticated, companies will be able to offer consumers more effective ways to avoid expensive medical issues and manage their own health. These may come in the form of gamified apps that run sophisticated modeling software to nudge consumers toward healthier behaviors, or sensors and other technologies that can detect problems before they become serious, costly issues. Organizations looking to play in the wellness market should consider their analytical capabilities, and be ready to partner, collaborate or purchase those assets if they are lacking. Traditional healthcare companies should identify these companies and develop processes to identify ideal partners.

• **Culture may be the biggest barrier for many traditional organizations.** Many of the changes on the horizon will require significant cultural shifts for organization employees. Technological advances in machine learning and robotics could transform the roles of professions such as specialty surgeons. Consolidation will continue to reshape insurers and healthcare providers. Many clinicians will have new roles, from advanced practice nurses gaining broader scopes of practice to primary care physicians taking on more care-coordination duties.

Delivering care in a world of unified standardized care plans requires a mental shift on the part of clinicians, most of whom are used to developing their own plans for their patients. “The good thing is, for many patients and conditions, the science exists. There are so many high-quality, evidence-based guidelines and protocols available now. We are able to come up with care plans specific for patients’ co-morbidities,” said Dr. Daniel Stein, chief medical officer of Walmart Care Clinics. “The bigger problem is, providers are not accustomed to practicing that way.”

Medical technology companies with long histories making devices or medications may find it difficult to shift to developing services. For example, teams of engineers used to perfecting high-cost imaging machines for hospitals may find it difficult to pivot to designing “good enough” technology for larger markets and smaller budgets. In the New Health Economy, organizations should carefully consider the effects of these seismic changes on their employees, and on their overall climates, to ensure they can make the leap to a more nimble, collaborative, connected future.

• **Plan for the day that data inform and power the ecosystem.** Data collection, analysis and sharing are the constants across the emerging health ecosystem. Organizations must consider how fast the data flow, their variety and accuracy and their integration into feedback loops that help achieve goals, such as adjusting insulin in real-time based on continuous patient health information.

Continued standardization of health data will be key to this flow of information. Healthcare providers should continue to unify their data systems, including their electronic medical records systems, within their organizations. They also should work with health information exchanges and other groups to securely and privately share health data, research and other information. These data may come from electronic medical records, and other sources too, such as wearables, biosensors embedded in medication, implantable devices, apps, retailers, genomic testing and social media.
Endnotes

3. PwC Health Research Institute, *The new gold rush: Prospectors are hoping to mine opportunities from the health industry*, 2011; PwC Health Research Institute analysis of 2016 Fortune 50 companies.
4. PwC Health Research Institute analysis of PwC MoneyTree data.
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About this research

This report is based on research conducted between June 2015 and August 2016. Besides interviewing industry executives, HRI conducted a market sizing analysis based on 2015 revenues of subindustries involved with the health ecosystem, categorizing them according to their markets in the US ecosystem. HRI also identified five forces and more than a dozen sub-forces associated with reshaping the ecosystem, calculating their estimated impacts on each market over the next 10 years. Each force also was assigned a velocity of change based on available data, including public and private databases and sources.
About Health Research Institute

PwC’s Health Research Institute (HRI) provides new intelligence, perspectives, and analysis on trends affecting all health-related industries. The HRI helps executive decision makers navigate change through primary research and collaborative exchange. Our views are shaped by a network of professionals with executive and day-to-day experience in the health industry. HRI research is independent and not sponsored by businesses, government or other institutions.

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