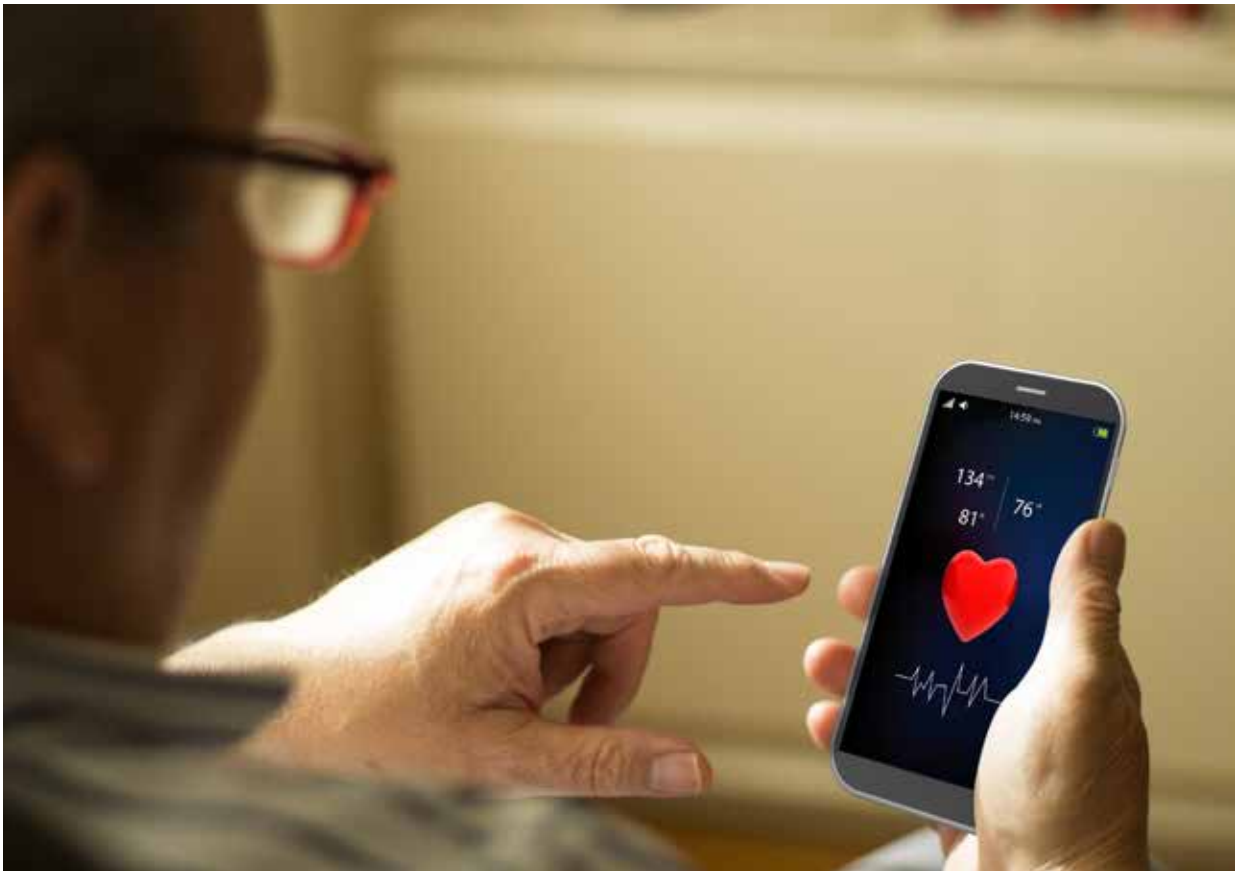
Healthcare Systems and Services Practice

How tech-enabled consumers are reordering the healthcare landscape

Venkat Atluri, Jenny Cordina, Paul Mango, Satya Rao, and Sri Velamoor



How tech-enabled consumers are reordering the healthcare landscape

Consumers' accountability for healthcare spending is increasing, and more than a thousand companies are developing new digital/mobile technologies that should allow consumers to take greater control over their healthcare choices. This combination may disrupt the industry's migration toward larger, more integrated systems and put almost $300 billion—primarily, incumbent revenues—into play.

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Four convergent forces are reordering the healthcare landscape in the United States. Largely in response to two of them—reform and the reallocation of financial risk between providers and health insurers—the industry has been consolidating at record pace (80+ deals in each of the past four years). However, two other forces—rising consumerism and the spread of digital/mobile technologies—could lead the industry in a different direction.

Consumers are paying a growing portion of their healthcare costs out of pocket, and they are well aware of the convenience and simplicity provided by online banking, shopping, and travel reservations. As a consequence, they are starting to alter their attitudes about healthcare costs, choices, and accessibility, as well as who should control their clinical information and how much administrative complexity they should endure. These changes will likely accelerate as consumers' financial accountability for healthcare costs continues to increase.

Technology companies—many of whom are new entrants to the healthcare sector—are hastening the changes by offering consumers a growing array of health-related applications, programs, monitors, and devices. Although these technologies currently pose little risk to incumbents, they could create considerable disruption in the not-distant future.

Our research suggests a growing divergence between how providers and insurers are integrating and reconstituting their organizations and how tech-enabled, financially accountable consumers want to interact with them. Consumers may increasingly resist incumbent-imposed restrictions precluding them from deciding where, when, how, and from whom to seek care. Consider a world in which:

- Pricing transparency applications and online scheduling tools permit consumers to identify and use discrete, best-in-breed health services from a range of providers (some of whom are consulted remotely via mobile e-visits), rather than accept the limitations in benefits or access restrictions imposed by narrow networks, health maintenance organizations, or integrated provider systems.

- By enabling people to own, and control access to, their health data, digital/mobile health technologies eliminate the information asymmetry that has long benefited healthcare system incumbents and inhibited the creation of an informed healthcare consumer.

- Consumers can create their own personal health management "ecosystems," quite literally in the palms of their hands, based on individual preferences for how they wish

to monitor and manage their health and healthcare, as well as how they choose to manage their health benefits and payments. (Admittedly, this last scenario requires development of an IT platform that would allow data from different technologies to connect, but such a platform is likely to be built within five to ten years.)

We cannot yet predict the rate at which these developments will occur. Evidence verifying the effectiveness of some of the technologies has not yet emerged. Furthermore, the healthcare sector has confounded many prior predictions of technological evolution (in part because of the typically inverse relationship between age and need—younger people tend to adopt new technologies more rapidly, but older people usually have greater healthcare needs). Nevertheless, the pace of change has often been extremely rapid when digital/mobile technologies are involved (think BlackBerry versus iPhone, or CD versus MP3). If the changes become widespread, up to about $270 billion of incumbents' current revenue and another $13 billion to $24 billion in new revenues could be contested due to price compression and shifting demand and supply dynamics. Furthermore, the conventional wisdom—that vertical and horizontal integration, and the risk management and information advantages resulting from them, are preconditions for competitive success in healthcare—may become invalid or will apply only to those market segments forced or willing to trade personal choice and access for very low cost.

In short, the rise of financially accountable, technology-enabled consumers could splinter today's healthcare value chain. Incumbents must decide how they want to respond.

Key findings

We conducted extensive research to understand the impact digital/mobile health technologies could have on providers and health insurers, especially when they are used by financially accountable consumers. We interviewed technology innovators, investors, and healthcare industry incumbents. We also surveyed thousands of U.S. consumers to learn how their perceptions about and use of the technologies are evolving. In addition, we analyzed the business models of scores of new entrants and other industry shapers (e.g., venture capitalists, technology incubators, and existing IT companies serving incumbents in other ways) to understand their strategic intent and impact potential. This research revealed five key findings:

Consumers are starting to replace traditional healthcare services with digital ones

Consumers' awareness of digital/mobile health technologies is growing rapidly. Between 2014 and 2015 alone, awareness of many of these technologies more than doubled. However, utilization of the technologies lags awareness. For example, 86% of our survey respondents indicated that they knew it was possible to fill prescriptions or order health supplies online, but only 29% had actually done so. Yet even low utilization rates can translate to high real-world numbers. Executives at Zocdoc, an online scheduling service, told us that more than six million Americans use it each month.[1] Nearly 80% of the consultations occurred within 72 hours of the appointment request. Eighty-five percent of the appointments were with providers the consumers had not previously consulted, suggesting that many people view conveni-

[1]Interview with Oliver Kharraz, MD (then COO and now CEO of ZocDoc), April 2015.

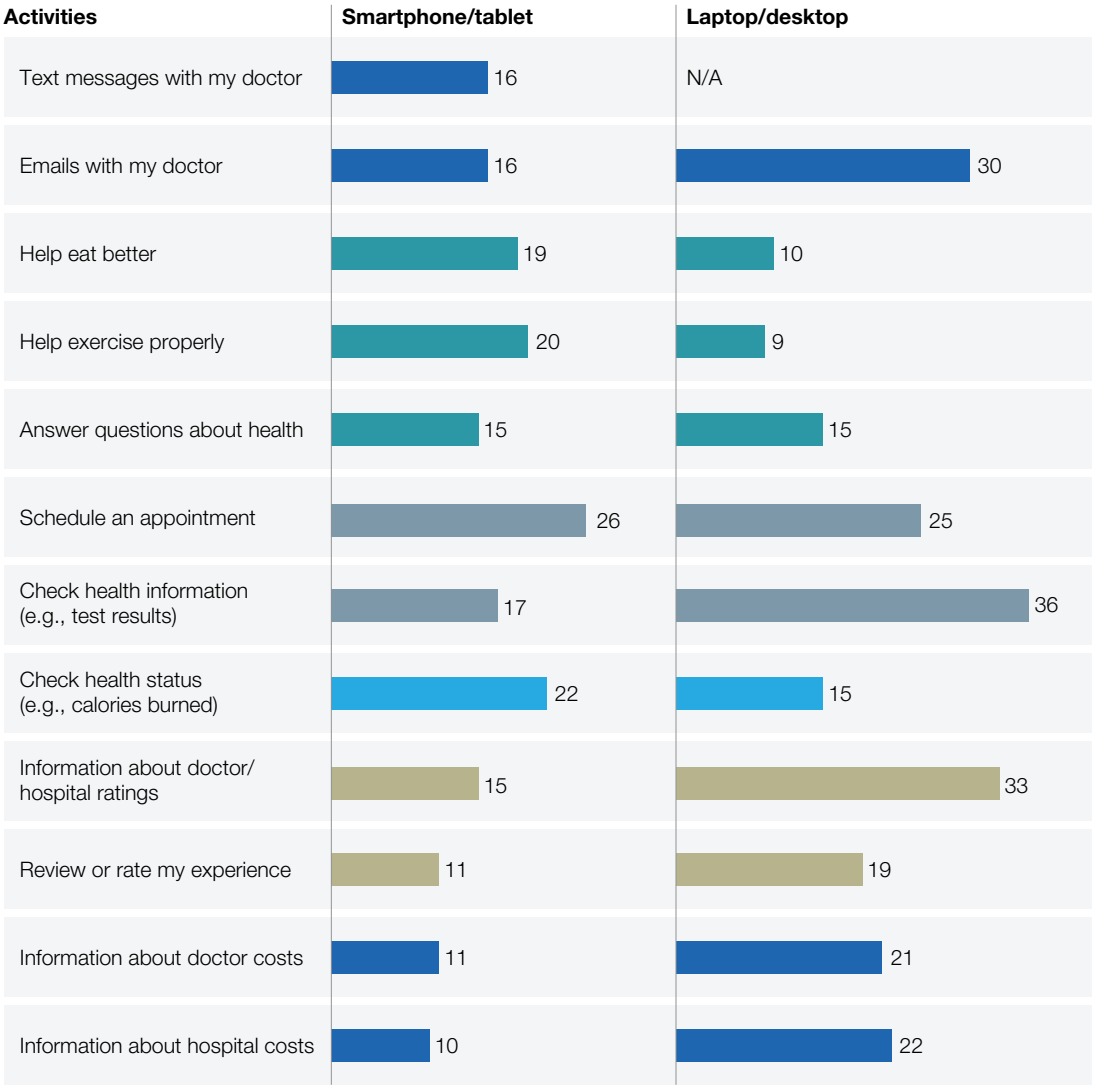
ence and easy access as more important than loyalty to a physician.

Consumers are adopting digital/mobile health technologies not just to manage prescriptions or schedule appointments, but also to interact directly with physicians, monitor their health and physical activity, learn about their medical conditions, rate providers, and more (Exhibit 1). Not surprisingly, utilization rates are currently

EXHIBIT 1 **Consumers are using a broad set of digital health tools**

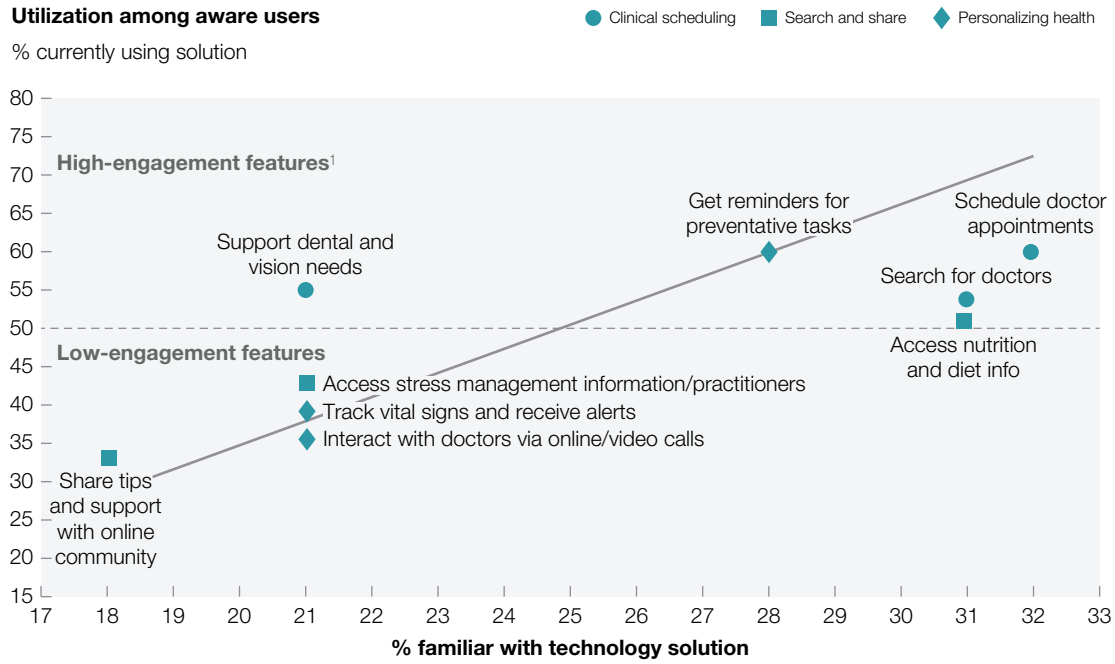
Health-related activities consumers report having used technology for

% of respondents



Source: Consumer Health Insights Digital Survey, April 2015

EXHIBIT 2 **Utilization increases once awareness grows**



[1]Defined as features with usage rates above 50% among those familiar with the technology.

Source: Consumer Health Insights Digital Survey, April 2015

highest among younger Americans. For example, millennials are twice as likely as baby boomers, and three times as likely as seniors, to use email or text messages to communicate with physicians. However, use does correlate with awareness (Exhibit 2). Once a high awareness level is reached, generational differences often diminish significantly.[2] For example, among the respondents who knew about online appointment-scheduling services, utilization rates were similar among millennials and seniors.

While awareness can drive initial uptake of a technology, long-term use requires that consumers understand the value the technology provides and perceive it as better than what more traditional approaches may deliver (Exhibit 3). Among the survey respondents who had tried one or more digital/mobile health technologies, three-quarters thought they were more effective than traditional approaches.

Digital/mobile health technologies could be especially helpful for patients with chronic conditions, given the difficulty and high cost of managing those conditions.[3] Here again, a growing number of consumers appear to prefer technology to more traditional approaches. In our survey, we asked respondents whether they had a chronic condition and, if so, whether they wanted a health coach. Of those who wanted one, 48% favored an online solution. Only 28%

[2]Use of mobile technologies also depends on smartphone ownership, something that is still far more common among younger Americans. However, older adults are catching up. Between 2014 and 2015, overall smartphone use in the United States rose by about 10%. Among those over 65, it increased more than 40%. (Smith A. U.S. smartphone use in 2015. Pew Research Center. April 1, 2015.)

[3]According to the Agency for Healthcare Research and Quality (AHRQ), annual healthcare expenditures average about $3,000 for patients with one chronic condition and more than $7,000 for patients with multiple chronic conditions. Patients with one or more chronic conditions account for more than 80% of total annual healthcare spending in the United States. (AHRQ. *Multiple Chronic Conditions Chartbook*. April 2014.)

wanted an in-person coach, and 18% preferred telephone interactions.

If awareness of digital/mobile health technologies continues to rise rapidly and their adoption curves are similar to those other digital/mobile applications followed, we anticipate that 60% to 65% of all consumers will be using common digital/mobile healthcare technologies (e.g., e-visits) within five to ten years. To understand the significance of this percentage, consider: at present, about 68% of Americans have smartphones.[4]

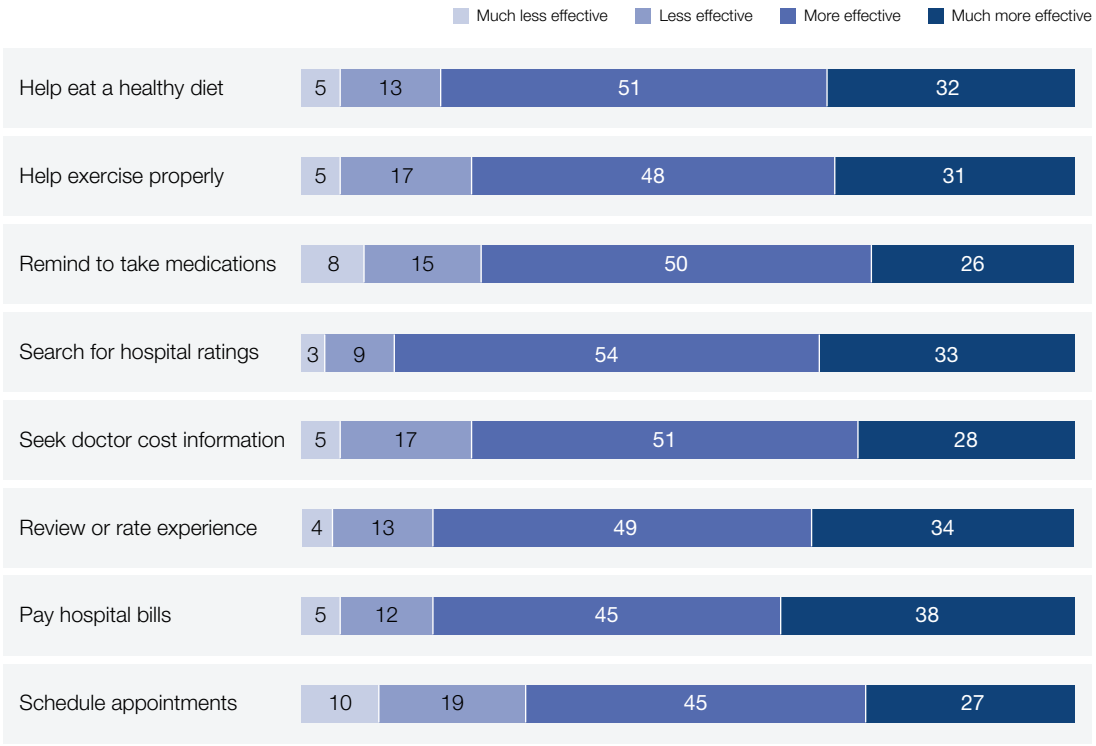
Investment in these technologies is robust and growing

Since 2011, venture capitalists have invested over $14 billion (cumulatively) in more than 1,200 companies developing consumer-centric digital/mobile health and related healthcare technologies in the United States.[5] However, the actual amount being invested in the technologies is much higher, because the $14 billion does not include the internal innovation dollars companies have committed to digital transformation (including the creation of a foundation for advanced analytics).

EXHIBIT 3 **Technology is viewed as more effective for a range of healthcare uses**

Do you think that websites and apps are a more—or less—effective way to perform each of these activities than phone or in-person communication?

% of all respondents who said they own a digital device



Source: Consumer Health Insights Digital Survey, April 2015

[4]Anderson M. Technology device ownership: 2015. Pew Research Center. October 29, 2015.

[5]Wang T, King E, Perman M, Tecco H. Digital health funding: 2015 year in review. Rock Health. December 2015.

Investors appear to be equally interested in direct-to-consumer and intermediated technologies, but for very different reasons.

The consumer-centric, digital/mobile technologies fall into three categories. About half are aimed directly at consumers (e.g., wearables, scheduling applications, and e-visit tools). Our estimates suggest these technologies received roughly 40% of the more than $4.5 billion invested in the sector during 2015. Another 40% of the funding focused on technologies consumers would use after a recommendation or prescription from a physician. Examples include medical devices (e.g., remote diagnostic equipment) and personalized medicine enablers (e.g., micro-devices that must be ingested). These technologies are typically more complex than those aimed directly at consumers and need to achieve a higher standard of performance before providers will use them or insurers will pay for them.[6] The remaining 20% of the funding was invested in electronic health records, data analytics, and other technologies beyond the scope of this article.

Thus, investors appear to be equally interested in direct-to-consumer and intermediated technologies, but for very different reasons. Technologies directly addressing consumers' concerns about costs and convenience, and requiring little or no physician involvement, currently have higher awareness and adoption rates, and they are likely to have a less challenging path to achieving scale. Intermediated technologies present greater cost-reduction potential, given that many of them are designed for patients with chronic conditions. The likelihood these technologies could produce savings sufficient to offset their cost is therefore much higher. Once the value of intermediated technologies is proved, consumers may begin to demand them through their providers.

New technologies address consumer dissatisfaction

Consumer-centric digital/mobile health technologies can be grouped into six categories, each of which addresses one or more of the top consumer points of dissatisfaction with the current healthcare system (Exhibit 4). These categories provide a more nuanced way to analyze the technologies' likely impact on health system economics.

- Self-service tools, such as online appointment scheduling, prescription auto-renewal, and electronic payment, reduce the transactional friction frequently associated with administrative tasks. At present, about 15% of the companies focusing on direct-to-consumer and intermediated healthcare technologies fall into the category. These companies are likely to see accelerated adoption levels, given consumers' familiarity with the similar tools used in other sectors (e.g., transportation and retail).

- Quantified self/wellness tools include technologies that monitor health status or treatment adherence, enable coaching, or provide social connectivity, as well as devices that can be worn, ingested, or embedded in the human body. These technologies have the potential to reduce over- or under-utilization of healthcare services and increase compliance with

[6]For example, the intermediated technologies usually require medical-grade data to support evidence of efficacy, in many cases must undergo peer review, and frequently require regulatory approval.

EXHIBIT 4 **Digital/mobile healthcare technologies can be grouped into six categories**

appropriate treatments. About 20% of the companies concentrate on this area.

- Clinical transparency tools decrease information asymmetry and could help consumers use healthcare services more appropriately because they offer support for clinical decision making as well as insights into provider performance (e.g., outcomes achieved, adherence to evidenced-based standards). This category includes 25% to 30% of the companies.

- Financial transparency tools allow consumers to compare the prices and benefits offered by different insurance plans, as well as the prices charged by different providers for the same service. This information could help direct consumers to lower-cost plans and services and, over the longer term, reduce price dispersion. About 8% to 10% of the companies are active here.

- Virtual access tools, which enable remote monitoring and care, as well as e-visits with providers, make healthcare services more accessible and thus have the potential to decrease suboptimal utilization and reduce readmission rates. This category is the focus of 25% to 30% of the companies.

- Distributed delivery tools permit the other technologies to be delivered to consumers through multiple channels. Examples include interfacing, messaging, and interoperability-related tools. About 5% to 7% of the companies focus here.

During our interviews, many venture capitalists expressed particular enthusiasm for transparency solutions and virtual access tools. In their opinion, these technologies are the most likely to scale because of their potential value in terms of cost, convenience, or ease of use. Virtual access tools do hold considerable promise—but at present there is little consistent evidence to show they can sustainably reduce costs or improve patient outcomes at scale.

Who will pay remains unclear

The venture capitalists and industry experts we interviewed believe employers, insurers, and providers—not consumers—are likely to pay for most of the technologies. They noted that employers still underwrite a material portion of healthcare spending and are adversely affected by health-related absenteeism and workers' compensation (all of which would decrease if the technologies show a return on investment). Furthermore, employer support would be consistent with a growing trend: companies are giving employees help to make better-informed, more cost-effective decisions while shifting an increased proportion of healthcare costs to them.

The venture capitalists and industry experts also believe that health insurers and providers will pay for some of these technologies. In their opinion, insurers will see the technologies as a way to speed the path to value-based reimbursement. Providers will view them as a way to reduce costs and enhance quality in a fee-for-service world, and to optimize risk and medical utilization under value-based reimbursement arrangements.

In our consumer survey, respondents were more interested in getting digital/mobile health technologies from their health insurers than from their employers or providers.

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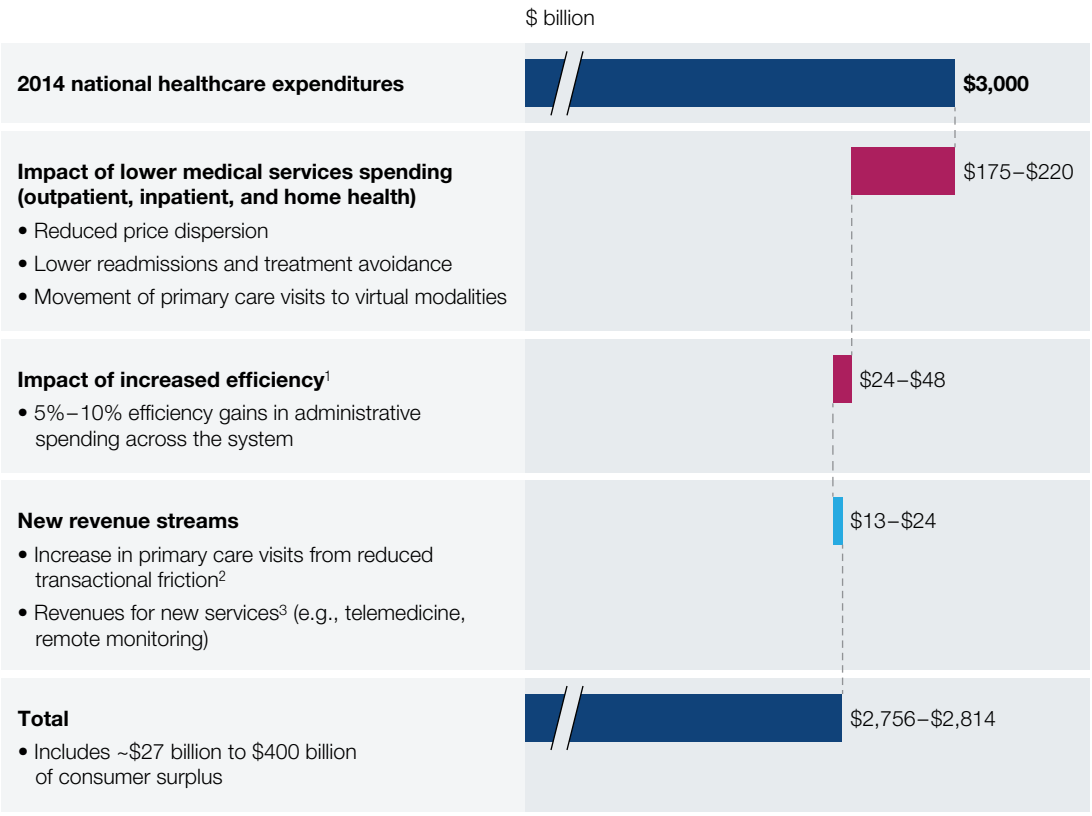
EXHIBIT 5 **Almost $300 billion of healthcare spending could be up for grabs**



[1] Assumes that 5% to 10% of total administrative cost ($480 billion) can be eliminated through greater use of digital.
[2] Assumes that ~60% of currently underserved patients will increase primary care use (in-person or virtual consultations); cost estimates include both the increased primary care use and the incremental utilization (a small proportion of the new patients will need complex treatments or inpatient care).
[3] Includes revenue to companies developing telemedicine services, new monitoring and wellness devices, transparency solutions, and self-service solutions.

Source: McKinsey analysis

However, many respondents said they were willing to pay for the technologies themselves.

Up to $292 billion of health sector revenue could be in play

To understand the economic impact the new technologies could have on providers and insurers, we analyzed how each of the six categories could affect three things: demand for and pricing of existing healthcare services; new revenues the technologies might bring in; and operational efficiencies they might create (Exhibit 5). Our findings are summarized below (for more detail, see the appendix, "Calculating the financial impact of digital technologies").

- Demand and pricing. The new technologies are not likely to lower demand for primary care services, but they should make it possible to deliver many of those

Barriers that must be overcome

Before consumers can fully create their own healthcare ecosystems, several barriers need to be overcome. First, consumers' understanding of the overall health system is low, as is their awareness of many digital/mobile health technologies and the value they can provide. However, consumers' awareness of the technologies, at least, is rising rapidly. Second, consumers' concerns about information security remain high; it is the reason cited most frequently by consumers for rejecting digital/mobile health technologies (or for not trusting the entities offering them). Third, many of the technologies are likely to require FDA approval. Clear definitions of which of them do—and do not—require approval must be developed, and streamlined approaches for securing approval must be created (especially for technologies that administer or involve changes in medication). Fourth, providers have to become willing to share the information in patients' electronic health records with other digital record-keeping solutions. (If they refuse to do this, though, consumers may simply opt to find new providers.)

Another barrier is technological. More than 70% of the new entrants we interviewed agreed that before consumers can create their own digitally enabled healthcare ecosystems, one or more integrated solutions is needed: IT platforms that can aggregate the data from various technologies and applications into a single, seamless personal health record enabling consumers to share their data with providers and insurers when appropriate. No such platform yet exists, but a number of industry players, as well as nontraditional entrants, are vying to develop one.

Within healthcare, we have already seen a comparable platform evolution occur: the emergence of public and private health insurance exchanges. A few years ago, it would have been nearly impossible for consumers to go to a single online marketplace to compare and contrast health plans and select their own coverage options.

During our interviews, most of the new entrants and investors said they expect such platforms to emerge within three to five years. They cited the growing breadth of information aggregation and the consumer engagement capabilities offered by several at-scale players (e.g., health information systems vendors, super-scale revenue cycle management companies, population health managers, healthcare data and analytics organizations, and even telecommunications companies as evidence of each group's potential to emerge as a platform. The diversity of these players also helps explain why the new entrants and investors believe it is unlikely a single platform winner will appear. Rather, a set of winning platforms will probably be used to address discrete opportunities, such as virtual care, financial transparency and decision support, and information aggregation and sharing.

services less expensively. For example, the average cost of an outpatient physician visit is currently about $100 to $150, whereas most e-visits are priced at about $40. Better monitoring and real-time communication should improve care quality, which could reduce inpatient volumes. By revealing price differences, transparency solutions should lower both inpatient and outpatient costs. As a result, we expect overall healthcare spending to decrease by $175 billion to $220 billion. A significant portion of the decrease is likely to accrue to consumers as surplus. How providers and insurers will be affected by the decline in spending will likely depend on how they prepare for the changes ahead.

- Increased efficiency and productivity. Administrative costs account for about 16% of total healthcare spending. The increased automation and self-service enabled by new digital/mobile technologies should reduce labor costs and transactional complexities, lowering overall administrative costs by 5% to 10% ($24 billion to $48 billion annually). The pervasive use of digital/mobile technologies should also help drive down the current friction associated with healthcare workflows and enhance productivity at the unit level. Most of the savings and productivity gains should accrue to incumbents.

- New revenue streams. Although some of the new technologies will be substitutes for more expensive services, others will be new services with new revenue streams. In addition, demand for primary care services is likely to rise once transactional friction is reduced, access is easier, and consumers take a more active role in monitoring their health status. As a result, $13 billion to $24 billion of new revenue could enter the health system. How much of this will accrue to incumbents and how much to technology companies remains to be seen.

Implications for industry participants

Exactly when consumers will be able to build their own, personal health management ecosystems is unclear; the barriers remain significant (see the sidebar on p. 10, “Barriers that must be overcome”). However, even relatively modest adoption could have enormous implications for insurers and providers. Consider what would happen if benefit designs continue migrating toward greater cost sharing and most consumers eventually pay the majority of their healthcare expenses out of pocket. If these consumers decide to take control of their clinical information, organize their provider networks based on what they value most (e.g., convenience, quality, price), and select their preferred service delivery channels (which could render geographic proximity much less relevant), what would a large, integrated health system offer them, especially if it is perceived as more administratively complex, less responsive, and more expensive? And what value would a traditional insurer offer them, especially one that limits access to certain providers?

Exactly when consumers will be able to build their own, personal health management ecosystems is unclear; the barriers remain significant.

In short, more engaged consumers enabled by new digital/mobile health technologies could potentially cause three shifts in industry dynamics:

Change in the basis for competitive advantage

The basis for competitive advantage (and competitive models) could be fundamentally different. In a world of engaged, enabled healthcare consumers, the geographic scope of competition, historically concentrated in metropolitan service areas, would broaden—especially once price and quality transparency tools alert consumers to the existence of higher-value alternatives elsewhere. Greater transparency would also make it easier for disruptors (e.g., retail clinics) to gain market share by making their advantages known to consumers.[7] Consumers seeking greater convenience, superior value, and an enhanced experience will likely want to utilize different service providers at each step in the care continuum, challenging the value proposition of the "fully wired," yet still not fully integrated, health system.

Consumers become clinical data integrators

Consumers may increasingly own and manage their clinical data, which would allow them to decide for themselves who should be given access to that information (and when) in clinical, transactional, and administrative settings. It would also make it easier for consumers to select and utilize providers they view as more accessible, convenient, and lower cost.

Incumbents' roles shift

Today, insurers and providers largely control the healthcare experience for consumers. In the future, their control is apt to diminish, which would change the roles they play. Insurers would become holistic risk managers, helping consumers navigate competitive alternatives by advising them on how best to manage their financial accountability and risk preferences. However, new intermediaries may emerge to compete with insurers attempting to play this role. For example, retirement and wealth advisers could integrate health risk assessment and health cost estimation into the advice they give clients.

EXHIBIT 6 **Seven steps are needed to prepare for the digital future**

- Boldly reimagine your business model (don't use technology just to make your current model more efficient)
- Use a comprehensive, integrated approach—not piecemeal initiatives—to develop your connected health strategy
- Restructure your business and consumer value propositions; compete on more than just price
- Build the capabilities to serve "segments of one"
- Structure and manage strategic alliances carefully
- Use dynamic portfolio management mechanisms, especially rapid (three- to six-month) reviews
- Invest not only in technology (e.g., integration platforms and flexible technology architectures), but also in operational and organizational redesign

[7] Retail clinics, which are offering a growing array of primary care and diagnostic services, have experienced a 12% CAGR over the past three years. Their spread could accelerate in a quality- and price-transparent world.

Providers, especially physicians, would become trusted health advisers. They would spend much less time gathering information and performing diagnostic tests and procedures. Instead, they would rebalance some of their time to serve as healing counselors by coaching consumers, helping them make sense of the information already gathered, and when necessary, helping them orchestrate and select among potential treatment options.

Actions players should contemplate

All industry players will need to evolve their business and operational models to navigate the coming disruption. They will also have to place a premium on strategic audacity and organizational agility—incumbency could shift in a matter of months, not years, in the new digitally enabled healthcare landscape. (Consider: several prominent social media sites have already become obsolete in the personal messaging realm.) We believe seven actions are required (Exhibit 6).

First, the entire business model should be boldly reimagined—digital/mobile technologies should not be deployed just to make the current model marginally more efficient. Without a bold aspiration, any changes made could simply reinforce the status quo. Companies in other industries adapting to digital successfully have taken the opportunity to rethink and reinvent the core principles of their business.

Second, the approach used to create an effective connected health strategy should be comprehensive and integrated, accounting for all stages of the patients' health journey—not a series of random, disconnected initiatives. For instance, many health systems are starting to let patients schedule appointments online or track their health vitals through wearables. However, they still don't allow patients to preregister, complete a health risk assessment online, integrate their data into their personal health records, or make payments electronically.

Winners will be defined by their ability to "know their customers" on a more intimate level than standard market segmentation models allow.

Third, business and consumer value propositions should be restructured to adapt to the new basis of competition. It will become increasingly critical to compete on more than just price in a world where mobile is the dominant source of Internet traffic. Many companies have already found that consumers are often willing to spend more for a superior customer experience.

Fourth, winners will be defined by their ability to "know their customers" on a more intimate level than standard market segmentation models allow. Understanding context is critical for understanding how consumers may behave in a particular health scenario. For example, a physically active consumer who strongly values her ability to exercise may behave as a price seeker when shopping for primary care services but could be completely price indifferent, and highly attuned to care quality and outcomes, when looking for an orthopedic surgeon. Assumptions based on traditional consumer demo-

graphic or psychographic profiles will not suffice in a world where "segments of one" are the norm.

Fifth, if incumbents are to take part in the healthcare ecosystems consumers create for themselves, they will need external alliances to ensure they are present where consumers are. Consumers will be easier to influence when the "right choice" for them correlates strongly with their convenience and self-interest. (More than 40 health systems are already affiliated with CVS to make certain both sides have a complete picture of consumers' health activity and can proactively address their health needs.) Thus, incumbents must have processes for structuring and managing broad alliances.

Sixth, incumbents will need to make frequent trade-offs between physical and digital assets, and the bets they place on new technologies will likely require frequent resource reallocation decisions (three- to six-month review cycles). In a world where technology companies can provide budding entrepreneurs with curated healthcare data, computing infrastructure, and the business intelligence tools needed to launch new businesses "out of the box" in ten days or less and test the viability of their business models at lightning pace, organizations cannot afford to fund digital projects on an annual basis and then sit back and wait for results.

Finally, all industry players will need to think comprehensively about the magnitude of change required to be successful in a digital age. This will require investments not just in technology (resilient and secure systems), but also in operational redesign, culture (including frontline culture), organizational restructuring, governance and oversight models, and performance management measurements and incentives. Ultimately, technology, in and of itself, is not likely to serve as a sustainable source of competitive advantage. Rather, advantage will come from the ability to create and seamlessly integrate "open" systems of record, systems of insight, and systems engagement.

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The healthcare industry is already shifting toward increased consumer control, and new digital/mobile health technologies are likely to hasten the trend. At least $200 billion of incumbents' revenue could be at risk, and the healthcare industry's current emphasis on consolidation could become much less relevant. However, up to $24 billion in new revenue could enter the healthcare system as well, and much of this money could flow to incumbents if they are agile enough to capture it. We believe the time for incumbent providers and insurers to act is now, because many of their current sources of advantages (e.g., local presence, information asymmetry) may disappear. The impact of engaged, tech-enabled healthcare consumers may not be felt for five to ten years, but by then it may be too late. In other industries, many of the companies that failed to prepare in advance for the impact of digital/mobile technologies lost out to more nimble new entrants. ○

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Appendix: Calculating the financial impact of digital technologies

To estimate the impact digital/mobile health technologies could have on payor and provider economics, we analyzed three variables: demand for and pricing of existing healthcare services; new revenues the technologies could bring in; and operational efficiencies the technologies might create. We then calculated how much of the potential savings would be achieved through the different technology categories.

IMPACT ON OVERALL HEALTHCARE SPENDING

Demand and pricing

Digital technologies will likely intensify the shift to lower-cost sites of care, and in many cases may replace in-person consultations with virtual modalities. As a result, inpatient and outpatient healthcare spending could decline by as much as $175 billion to $220 billion. We anticipate that roughly $27 billion to $40 billion of this decline will accrue to consumers as surplus. How much of the remaining decrease will be absorbed by providers, and how much by insurers, is less clear, in part because it will depend on the types of risk-based arrangements used in the future. Three factors will likely account for the majority of the spending decrease:

- ***Reduced price dispersion.*** Widespread adoption of clinical and financial transparency solutions could narrow price dispersion for both inpatient and outpatient services (similar to the impact online travel platforms have had on airline and hotel pricing). Today, prices for the same healthcare service often vary considerably among providers in the same market—often, by 15% to 60%, but sometimes by 100% or more.[1,2] Admittedly, some of the price dispersion is linked to care setting. However, reducing the dispersion by bringing prices in the top two quartiles for most health services to the 50-percentile price could lower healthcare spending by $100 billion to $120 billion.[3]

- ***Primary care shifting to virtual modalities.*** As awareness and demand for telemedicine and other virtual services grows, an increasing number of outpatient consultations and home health visits could be delivered through these modalities. Currently, an average outpatient physician visit costs $100 to $150. An average home health visit is approximately $100. Most e-visits are offered at about $40. If 15% to 20% of current outpatient consultations and home health visits were to occur electronically, healthcare spending could potentially be cut by $25 billion to $40 billion.

- ***Reduced readmissions and enhanced care quality.*** Virtual access technologies that enable remote monitoring and better real-time communication with physicians have the potential to lower the need for outpatient consultations and, especially, inpatient care for high-cost conditions such as diabetes and heart disease. For example, about 20% of patients hospitalized for diabetes are currently readmitted within 30 days[4]; lowering the readmission rate could produce considerable savings.

[1]Castlight Health. Costliest cities 2015. (www.castlighthealth.com/costliest-cities/).
[2]Health Care Pricing Project. The price ain't right? Hospital prices and healthcare spending on the privately insured. (www.healthcarepricingproject.org/papers/paper-1).
[3]We excluded emergency room, acute inpatient, and high-intensity chronic care services from this analysis because it is unlikely that the price dispersion for these very costly services could be reduced as significantly.
[4]Robbins JM, Webb DA. Diagnosing diabetes and preventing re-hospitalizations: the urban diabetes study. *Medical Care*. 2006; 44:292–296.

At present, few studies have been able to show that remote monitoring tools can reduce hospitalization rates, but the field is developing rapidly. If the data from these tools can be easily integrated with clinical records, it should be possible to offer proactive interventions that might prevent the need for many admissions and readmissions. How soon this will occur and how effective the interventions will be remain unknown, however. Thus, we took a conservative approach to estimate impact but acknowledge that actual impact could prove to be much higher. We analyzed the 20 conditions that together account for about 80% of the total healthcare spending (as identified through the Medical Expenditures Panel Survey),[5] and we assumed that the effect the technologies could have on treatment avoidance and inpatient volumes is likely to vary by condition. Our findings suggest that in the near to medium term, the aggregate reduction in spending could be between $50 billion and $60 billion, driven primarily by a 5% to 15% reduction in inpatient volumes.

Increased efficiency across the system

Administrative costs are currently estimated to account for about 16% of total healthcare spend annually (i.e., $480 billion). Digital/mobile technologies could allow some processes to be automated and help increase the use of self-service, thereby reducing labor costs and transactional complexities. For example, we have found that the average cost to a health system of sending and processing a paper statement is about $5 to $6. Electronic bill presentment and self-pay solutions targeted to consumers can lower this cost by more than 50% while giving consumers a superior payment experience and helping providers get paid faster. At the system level, the increased efficiency could lower administrative costs by 5% to 10% and generate $24 billion to $48 billion in efficiency gains.

New revenue streams

Offsetting the reduction in inpatient and outpatient spending will be the costs associated with the new, digitally enabled health services, which will likely result in $13 billion to $24 billion in new consumption. Two factors will account for most of the spending:

- ***Increase in primary care visits from reduced transactional friction.*** Healthcare utilization is likely to grow as self-service tools become more widely available, digital marketing campaigns raise awareness, and consumers find it easier to locate and access health services digitally. For example, the availability of e-visits for basic health consultations would give consumers greater choice and make possible services that previously were difficult or, in some cases, impossible to obtain. Online scheduling solutions would further increase choice and convenience. Although this trend will affect all consumers, the greatest impact will likely be seen among the 50 million Americans who currently do not seek healthcare services[6] and, to a lesser extent, the

[5]Cohen SB. The concentration of health care expenditures and related expenses for costly medical conditions, 2012. AHRQ Medical Expenditures Panel Survey. October 2014.

[6]Defined as those who have not visited a physician within the past 12 months.

150 million people who use those services at a lower-than-average rate for their age group.[7] If digital/mobile health technologies encourage 20% to 30% of these two groups to increase just their primary care utilization to the mean level, about $8 billion in incremental healthcare spending will result. If we further assume that 3% to 5% of this subset will need additional healthcare services (e.g., complex treatments delivered by specialists or inpatient care), incremental spending could reach $10 billion to $20 billion.

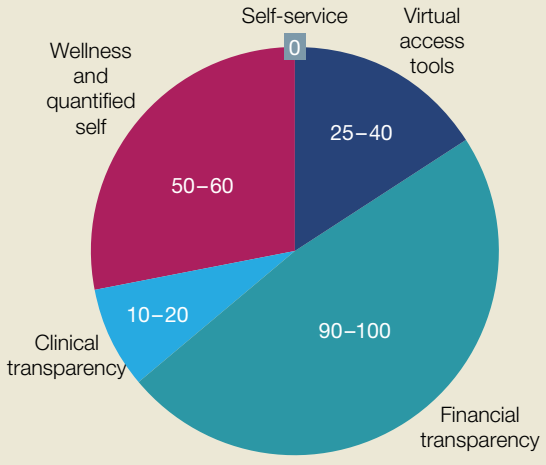
- ***Revenue from new services.*** As adoption rates for digital/mobile health technologies grow and revenue models mature, new classes of services—including telemedicine, self-service, and personal diagnostic and medical devices—will likely produce new revenue streams. We estimate that these services could generate between $20 billion and $25 billion in annual spending. Much of this money will not be new revenue but rather substitute spending for money saved elsewhere (e.g., the cost of a remote monitoring system would

EXHIBIT **Digital/mobile health technologies differ in their likely economic impact**

Types of technologies that will likely account for…

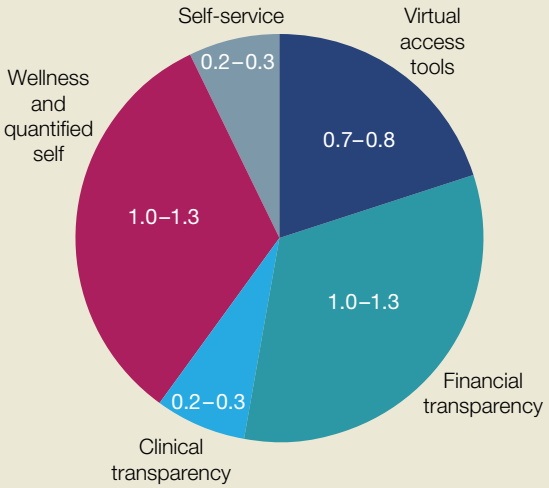
… $175 billion–$220 billion reduction in health expenditures

$ billion



… $3 billion–$4 billion of new revenue that could go to technology companies

$ billion



Source: McKinsey analysis

[7]Centers for Disease Control and Prevention. *Health, United States*, 2014. Table 71.

partially offset any savings achieved from remote monitoring). We estimate, however, that about 15% of the money—perhaps $3 billion to $4 billion—will be new revenue that will likely accrue to new digital/mobile service providers (unless they are wholly owned by incumbent health systems). Where the remainder will go will depend on a number of factors, most notably what amount of risk is transferred to providers.

IMPACT BY TECHNOLOGY CATEGORY

The exhibit on page 17 illustrates which of the six categories of digital/mobile health technologies are likely to have the greatest impact on the revenue of healthcare industry incumbents, as well as where the $3 billion to $4 billion that is likely to accrue to new technology players is likely to go.

- ***Financial transparency tools*** (and, to a lesser extent, clinical transparency tools) are likely to produce the largest shifts in incumbent revenues, since they could reduce price dispersion. They would not have any significant impact on how healthcare is delivered, however.

- ***Quantified-self/wellness and virtual access tools*** could encourage many consumers to better manage their own health, which has the potential to reduce the need for expensive and often unnecessary health services (e.g., emergency room visits for common health conditions) and lower the readmission rate. At the same time, the heightened awareness of health status these tools give consumers will likely increase demand for primary care services.

- ***Accessibility and self-service tools*** could accelerate primary care demand by making it easier and quicker to obtain care. Self-service technologies could also help reduce administrative costs, bringing healthcare closer to other mature industry sectors that employ similar technologies.

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