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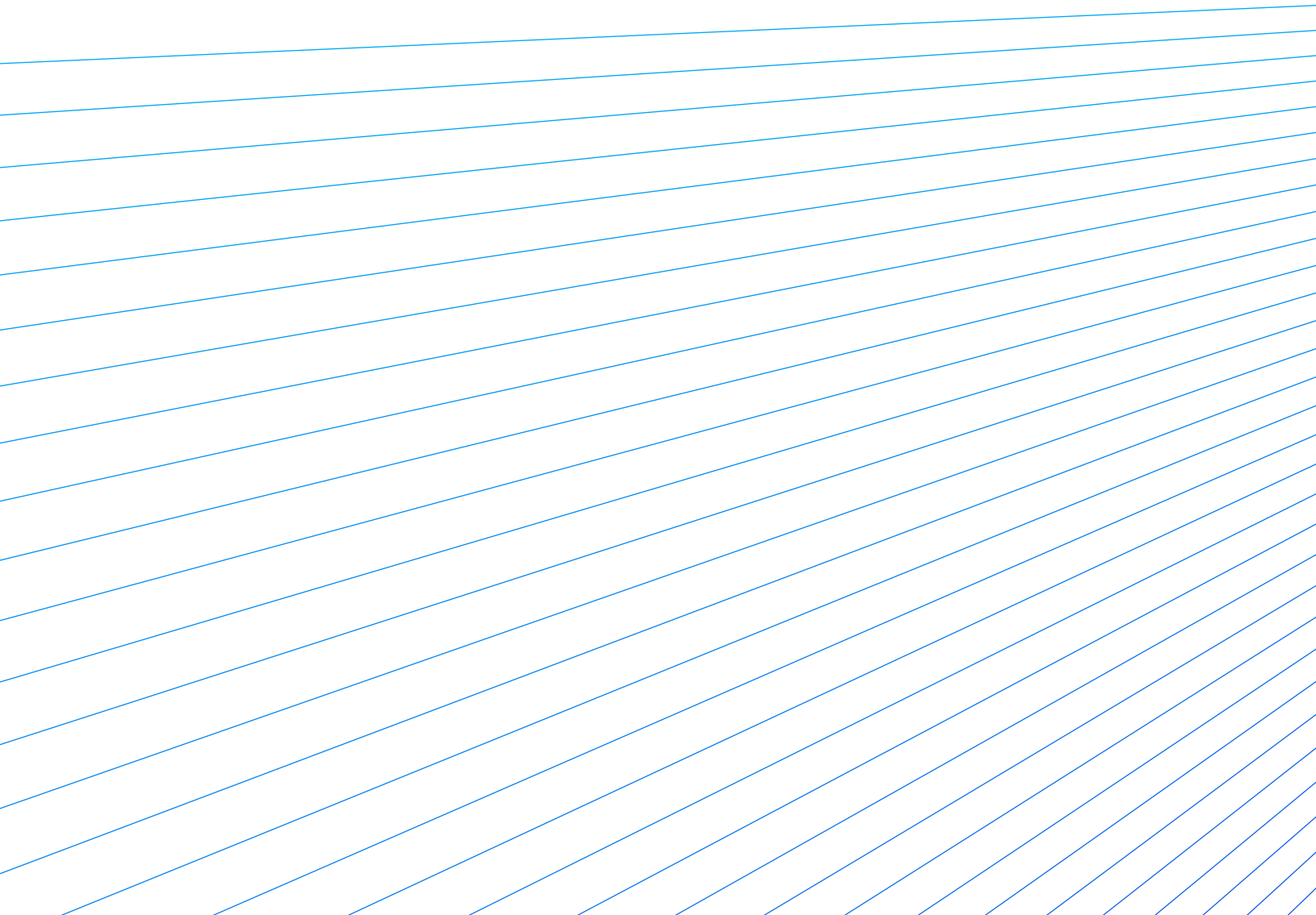

Foreword

As we enter the next decade for US healthcare, it is worthwhile to reflect on the broad strokes of how we arrived at where we are today. In each prior decade since 1970, the gap between average annual growth of GDP per capita and total national health expenditures per capita was at least 100 basis points. Since 2010, the reported gap is only 50 basis points, even with a large expansion of insurance coverage in this period.[1] While a wide range of factors have contributed, all parties have engaged in innovation to achieve this result.

However, despite many successes, healthcare leaders face a variety of challenges, which include the changing healthcare needs of their communities and the evolving role of technology and automation. Our research indicates that artificial intelligence, robotics, and natural language processing will transform healthcare jobs. While in healthcare we will see continued net job growth, almost every job will require reskilling to adapt to the new technology-driven world.

In addition to the increasing role of technology, debates on the future of US healthcare stand against a backdrop of mounting consumer expectations, accentuated by employer-sponsored and individual market health plan premiums that are growing faster than wages. Nearly one-third of those on employer-sponsored health insurance now have high-deductible health plans. Moreover, demographic shifts are expanding the role of government payers, especially Medicare, for which providers report negative margins; from 2010 to 2030, the share of the population eligible for Medicare is forecast to increase from 13 to 21 percent.[2]

Plus, amid the ongoing increase in healthcare spending, some also question the returns. Life expectancy has declined for three consecutive years—the first such decline since World War I—in part due to behavioral health issues.[3] Infant mortality, which has been stagnant over the past five years after decades of steady decline, is now 75 percent higher than that of the median Organisation for Economic Cooperation and Development (OECD) country.[4] It has become clear that social, non-medical factors—where people are born, live, work, and age—play a substantial role in individual and population health.

Healthcare organizations are at a tipping point. The recent wave of vertical integration, especially between payers and pharmacy benefit managers, is one response to a desire for solutions. Federal and state governments also could take drastic action to disrupt incumbents. New access points and technology-enabled interactions reflect how well-funded players will continue their efforts to rearrange the status quo. More value is emerging through modernized transaction and data infrastructure, efficiency in the supply chain, and faster therapy development. Most notably, digital innovators are taking steps to create value by engaging consumers in more actively managing their health.

Accelerating progress on reducing healthcare spending growth—improving efficiency while also delivering greater efficacy and patient and provider experience—will require both innovation and speed in rendering decisions and pursu-

1 Kamal R and Cox C, "How has U.S. spending on healthcare changed over time?" Peterson-Kaiser Health System Tracker, December 10, 2018, healthsystemtracker.org.
2 US Medicare Payment Advisory Commission.
3 See Murphy SL et al., "Mortality in the United States, 2017," National Center for Health Statistics Data Brief, November 2018, Number 328, cdc.gov.
4 OECD data for 2017 or the latest available year, based on number of deaths of children under one year of age per 1,000 live births.

ing actions. CEOs will need to lead the development of their strategies and adapt quickly to a changing landscape to successfully navigate a challenging path forward. Continued progress as an industry also will depend on collaboration among innovative leaders and organizations, as no one stakeholder will be able to deliver the transformation we need in isolation.

In this compendium, we have collected several articles that highlight opportunities for healthcare leaders to champion transformation of their organizations and the industry at large. As you reflect on our perspectives, we hope that you will keep in mind the many opportunities available to work with other leaders to improve healthcare.

Ultimately, industry leaders and innovators are united in a common goal: A healthier population supported by high-quality, efficient, and accessible care.

We look forward to continuing the conversation.

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Part III: Economics of healthcare

Healthcare today and its workforce

The productivity imperative for healthcare delivery in the United States

Pooja Kumar, MD; Edward Levine, MD; Nikhil Sahni; and Shubham Singhal

Healthcare is a key component of the US economy, but healthcare spending increases consistently outstrip GDP growth. Improving productivity in healthcare delivery could change this dynamic without harming patient care.

There is little doubt that the trajectory of healthcare spending in the United States is worrisome and perhaps unsustainable. Underlying this spending is the complex system used to deliver healthcare services to patients. Given that the United States currently expends 18 percent of its GDP on healthcare, this system might be expected to deliver high-quality, affordable, and convenient patient care—yet it often fails to achieve that goal.

Numerous factors have been blamed for the United States' higher healthcare spending, including an excess supply of healthcare services, poorly controlled demand for those services, other market irregularities (e.g., reimbursement mechanisms), regulatory requirements, structural differences between the United States and other wealthy countries, and patient characteristics and behaviors (especially those influenced by social determinants of health). One explanation, however, has largely been overlooked: poor productivity in the healthcare delivery industry.[1] Between 2001 and 2016, healthcare delivery contributed 9 percent of the $8.1 trillion ($4.2 trillion in real terms) growth in the United States economy—but 29 percent of the 14.4 million net new jobs.[2] Looking at healthcare delivery in terms of productivity provides three important advantages.

- First, it puts the focus not on short-term spending minimization but on long-term growth and the overall spending trajectory.
- Second, it makes it possible to identify specific opportunities that are likely to better control healthcare spending growth without harming—and in some cases improving—both patient outcomes and the overall economy.
- Third, productivity is the lifeblood of any economy's ability to deliver more for less (or, at least, the same cost). In practical terms, increased productivity in healthcare delivery would make it possible to continue driving medical advances and meet the growing demand for services while improving affordability (and likely maintaining current employment and wages).

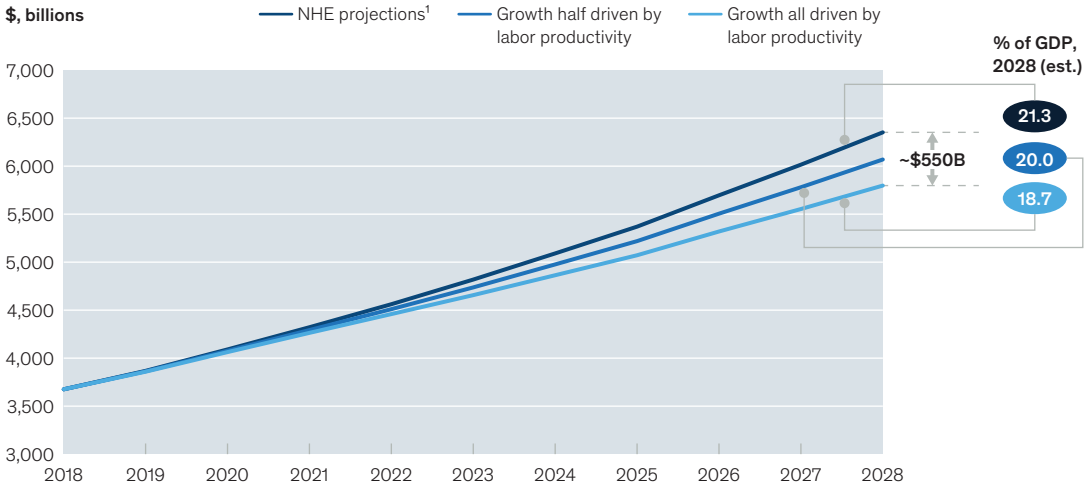
This report addresses the supply side of the healthcare delivery equation—what and how services are delivered. Thus, our focus is on the individuals and organizations that provide

1 This report focuses on how healthcare services are delivered to patients, not how those services are paid for. The health insurance sector is also in need of productivity improvements, but that is an issue that needs to be investigated separately. In this report, we discuss payers only in terms of how their policies and activities have a direct impact on the delivery of patient care services.

2 Source data does not adjust for the skill or education of the workforce.

Exhibit

Projections for healthcare spending growth over next decade



GDP, gross domestic product.
[1] National health expenditure (NHE) projections from the Centers for Medicare & Medicaid Services.
Sources: Bureau of Economic Analysis; McKinsey analysis

healthcare services, including ambulatory services, hospitals, and nursing and residential care facilities. Although we describe the implications of our findings for payers and governments, the productivity of these sectors (and others, such as pharmaceuticals and medical devices) is not analyzed in depth. Furthermore, we acknowledge that the demand side of healthcare delivery is also important for controlling the long-term healthcare spending trajectory. Demographic changes in the United States make it highly likely that demand will continue to grow, although greater patient engagement in healthcare decisions could slow the rate of healthcare spending growth considerably. While demand-related opportunities can play a significant role, they do not eliminate the need to improve the productivity of healthcare delivery.

The impact of improving productivity would be profound. Our conservative estimates suggest that if the healthcare delivery industry could rely more heavily on labor productivity gains rather than workforce expansion to meet demand growth, by 2028 healthcare spending could potentially be (on a nominal basis) about $280 billion to $550 billion less than current national health expenditures (NHE) projections suggest (Exhibit).[3] Cumulatively, $1.2 trillion to $2.3 trillion could be saved over the next decade if healthcare delivery were to move to a productivity-driven growth model. Savings of this magnitude would bring the rise in healthcare spending in line with—and possibly below—GDP growth. In addition, the increased labor productivity in healthcare delivery would boost overall US economic growth at a faster rate than current projections—an incremental 20 to 40 basis points (bps) per annum—both through direct economic growth and the spillover impact of greater consumption in other industries. However, meaningful action by, and collaboration among, all stakeholders will be needed to deliver this value.

Inputs to healthcare delivery

In all industries, productivity growth can be assessed by comparing changes in inputs with changes in outputs. In economic terms, the inputs can be categorized as labor, capital, and

[3] This calculation assumes that medical inflation would become partially or fully equivalent to economic inflation during that time.

multifactor productivity (MFP)—the contributions made by innovation, changes in technology, and inputs that cannot be properly measured or are unmeasured. (Parsing out each component's individual contribution to MFP is difficult, however.) Examples of innovations that hold the potential to improve MFP in healthcare include clinical products (e.g., pharmaceuticals and medical devices), new care delivery models, operating model changes,[4] and the democratization of information (e.g., electronic health records, price transparency). The outputs are the services delivered. Productivity rises, for example, when inputs hold steady while outputs increase, or when inputs decrease without a change in outputs.

From 2001 to 2016, the US economy grew (in real terms) by 1.9 percent per annum, to $19.4 trillion. Just over half of this growth resulted from capital investments. Labor contributed another 25 percent, and MFP was responsible for 19 percent. In contrast, the healthcare delivery industry grew (in real terms) by 3.3 percent per annum during those years, to $1.3 trillion.[5] Labor contributed 99 percent of this growth, and capital, 14 percent. MFP had a negative (–13 percent) contribution.[6] More than two-thirds of the contribution made by labor resulted from workforce expansion (over 4 million net new jobs were added).

In short, job creation—not labor productivity gains—was responsible for most of the growth in the US healthcare delivery industry from 2001 to 2016. Innovation, changes in business practices, and the other variables that typically constitute MFP harmed the industry's growth. If the goal is to control healthcare spending growth, both trends must change.

Outputs of healthcare delivery

In this report, our primary aim is to identify specific opportunities the healthcare delivery industry could pursue today to improve its productivity, and so we define the industry's outputs as services delivered (e.g., treatments administered to sick patients, preventive health measures given to the well).[7] By focusing on services, we can explore how service delivery could be made more efficient—and pinpoint a number of opportunities that, we believe, will make it possible to effectively bend the spending curve without lowering the quality of care. (For example, better care coordination could deliver the same outputs by using fewer inputs more efficiently.)

How productivity can be improved

Our investigation revealed a range of issues that have been hampering productivity growth in the healthcare delivery industry; the primary problems are detailed in the sidebar that begins on p. 10. However, we also confirmed that none of these problems are intractable. Industry stakeholders have numerous opportunities to improve the productivity of healthcare delivery—and there are concrete steps they could take *today* to seize these opportunities. A sizable portion of the opportunities do not require major technological advances or massive operating model shifts.

Minor changes, for example, could help provider systems more fully utilize their clinical workforce. Physician utilization, for example, could be increased through a combination of approaches:

— Modifying scheduling systems by periodically "pruning" clinically inappropriate

4 Operating model changes could include economies of scale, improved managerial skill, changes in the organization of production, or some combination of these factors.

5 To understand why this number differs from estimates of national health expenditures, see the technical appendix in "The productivity imperative for healthcare delivery in the United States," McKinsey Center for US Health System Reform, February 2019, on McKinsey.com.

6 To understand how MFP can affect the productivity of healthcare delivery, consider the example of a new treatment option for back pain. If the treatment that had routinely been offered patients is surgery, the inputs would include labor (the surgeon, anesthesiologist, nursing staff, etc.) and associated capital (for the operating room, recovery room, etc.). If, instead, the patient could obtain similar relief from back pain through physical therapy, the inputs would decrease markedly. These types of changes in the operating model can affect MFP positively.

7 We chose to define the system's outputs as the services delivered—not as the outcomes achieved (the metric often used in academic studies, typically measured in terms of quality-adjusted life-years, or QALYs). We acknowledge that better outcomes are the ultimate goal of the healthcare delivery industry. However, outcomes are influenced by a range of factors (e.g., social determinants of health), not all of which are within the control of those who deliver healthcare services; furthermore, QALYs can be difficult to measure objectively. Furthermore, a focus on outcomes rather than services would not have allowed us to identify specific opportunities to improve the efficiency of how healthcare is delivered, which was our goal.

preference rules that limit the types of patients clinicians will see at certain times

— Broadening the application of automatic reminder systems to reduce the number of patients who fail to show up for appointments

Our analysis suggests that given the current unused capacity in physician schedules, these types of improvements could fill much—if not all—of the projected national physician shortage. (Note: this analysis does not fully account for differences in specialty or geography.) To prevent physicians from burning out after these changes are made, provider systems could encourage all clinical staff members to maximize the amount of time they spend on the highest-complexity activities commensurate with their training and experience (what is referred to as working at

Sidebar

The causes of low productivity growth: Our findings

Although the US economy experienced approximately 370 bps per annum MFP growth from 2001 to 2016, MFP decreased by about 420 bps per annum within healthcare delivery. To determine why productivity improvements have been so small—and what could be done to change that situation—we looked closely at the two factors that have contributed most to economic growth in healthcare delivery: labor and capital. (We did not investigate MFP closely because its impact on economic growth was small. However, improvements in the productivity of labor and capital would eventually translate to improvements in MFP.)

We looked at clinical labor and administrative labor separately, given the marked difference in their responsibilities. We also considered the effect of historical forces on current capital allocations within the industry. In all cases, we used comparisons with other US services industries and other wealthy countries to identify problems and potential solutions.

Clinical workforce. This group's productivity remains low because the clinical workforce is neither fully nor optimally utilized. Our research suggests that at many provider systems, physicians' schedule density is currently about 80 percent, but high-performing practices can consistently reach a 90 percent to 95 percent density without physician burnout.

The lower density results primarily from suboptimal scheduling practices for physicians and other clinicians. An additional problem is that tasks are not consistently assigned to workers at the appropriate skill level (e.g., RNs perform activities that could be delegated to nursing assistants). However, other industries, such as legal services, have found that task reallocation can usher in rapid labor productivity growth. Furthermore, most provider systems have not fully harnessed the ability of technology to safely automate certain tasks, even though doing so would free up clinical staff for more complex patient care services.

To date, approaches to address these issues have been slow to spread (e.g., better scheduling), too blunt in nature (e.g., mandated nursing staff ratios), or inadequate in scope (e.g., automation efforts that address only a small minority of tasks). Also, the clinical workforce is not always sufficiently supported or given appropriate—and aligned—incentives to make changes that would benefit overall industry productivity.

Administrative functions. The degree of administrative complexity in the US healthcare delivery industry is high, especially because of the considerable number of provider systems and payers that must interact to process billing and insurance-related (BIR) information. In

"top of license"). Our research has shown, for example, that in the inpatient units at many hospitals, 36 percent of the tasks performed by registered nurses (RNs) could safely be performed by non-RN team members. In addition, technological advances, including artificial intelligence, computer-assisted coding, and natural language processing, could be used. The key to success when integrating these opportunities into a provider system is to leave sufficient flexibility in the team structure to ensure that services can always be provided in the most efficient and effective way possible.

Productivity gains through asset reallocation are likely to be harder to achieve in the near term, but not in the longer term. Demand for inpatient services continues to drop, yet excess—and therefore unpro-

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2017, the top 10 US provider systems were responsible for only 18 percent of all inpatient days; an additional 3,000+ systems accounted for the remaining 152 million inpatient days. That year, Medicare (Part A/B only), Medicaid (fee-for-service only), and the top five private health insurers accounted for only 58 percent of covered lives; more than 350 other payers covered the remaining 120+ million Americans with health insurance. According to the Institute of Medicine, the absence of standardization among these players has produced "excess" BIR costs of about 50 percent to 70 percent.

An additional problem results from the industry's substantial performance reportingrequirements. The Centers for Medicare & Medicaid Services alone uses more than 1,700 metrics, most of which focus on processes, not outcomes.

Because of the industry's administrative complexity, healthcare delivery has an unusually high number of non-clinical workers, many of whom focus on routine transactions that could easily be digitized or automated. Other industries with a similar high number of players (e.g., financial services) have found ways to standardize and streamline the interactions among the players. The healthcare delivery industry would also benefit from more aggressive efforts to streamline and improve performance metric reporting.

Capital. Capital's contribution to the healthcare delivery industry's GDP growth from 2001 to 2016 (14 percent) was the lowest among major US services industries. Often, capital is not optimally allocated in the healthcare delivery industry—much of it is tied up in or allocated to underutilized fixed assets rather than productivity-enhancing investments. (In 2016, for example, several other sectors, including utilities, had capacity utilization of 73 percent to 86 percent, whereas hospital bed utilization was 63 percent.)

Healthcare delivery has historically been hospital-centric, and thus significant sums have been spent on buildings and beds that once were, but no longer are, central to care pathways. Requirements to serve the public good (e.g., through critical access hospitals) have also entailed major investments. Most provider systems have market-driven incentives to keep installed capacity in use even when it is not needed on a total-system level.

In addition, some provider systems may invest in equipment to meet patient expectations, such as short wait times for diagnostic imaging, even if the equipment duplicates what is available nearby. (The United States has more imaging devices per person than most other wealthy countries, and utilization of those devices is below average.)

ductive—capital continues to remain in the healthcare delivery infrastructure. (For example, US bed capacity is 62 percent, compared with 75 percent to 90 percent in other wealthy countries.) As provider systems contemplate renovations or rebuilding, they have the chance to more aggressively rethink service distribution in light of modern care pathways. Even in the short term, provider systems could increase the productivity of some fixed assets by consolidating certain services (e.g., pathology and radiology reviews) and delivering some services in the community or at home.

Payers have an opportunity to take the lead in simplifying and streamlining administrative processes, and in standardizing reporting requirements and the incentives offered through alternative payment models. As a first step, they could aggregate certain functions (e.g., claims processing and adjudication) and further automate their BIR processes. We estimate that if payers were to collaborate to develop a clearinghouse for BIR data (similar to the approach taken in the financial services industry), overall administrative spending could be reduced by up to 30 percent.

Government agencies could consider moving forward with the adoption of "smart" regulations—those well aligned with current healthcare delivery needs and flexible enough to accommodate industry evolution. For example, research has shown that US physician practices currently spend more than $15 billion annually to report performance metrics; streamlining reporting requirements holds the potential to reduce this sum considerably. Updating some healthcare regulations might make it easier for provider systems and payers to undertake the innovations needed to improve the productivity of healthcare delivery.

In addition, some government agencies might want to consider taking steps to encourage payers to increase their streamlining and standardizing activities, or even to help develop a clearinghouse for BIR data.

The opportunities described above—and many more—are discussed in greater detail in the full productivity report.

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Women in the healthcare industry

Gretchen Berlin, Lucia Darino, Megan Greenfield, and Irina Starikova

To see how the healthcare sector stacks up on gender equality, we look at employee experiences, policies, and the effectiveness of industry programs intended to promote diversity and inclusion.

How does the healthcare sector stack up on gender equality? To answer that question, we look at pipeline practices, employee experiences, and policies and programs the industry has implemented to promote diversity and inclusion. We also hear from industry leaders on what it takes to accelerate change across the sector.

Our research for Women in the Workplace, a collaborative initiative between Lean In and McKinsey, attempts to create a definitive fact base on women's advancement in leadership. In addition to the 33 healthcare companies for which we have pipeline data, we surveyed more than 10,848 employees at 11 healthcare companies and interviewed ten senior executives in North America. Although the data are based on North American research, we believe the insights and implications are relevant globally.

From this research, healthcare appears to be one of the best industries for working women on several dimensions. A broad industry that includes drug and medical-device manufacturers, as well as service providers and payers, healthcare surpasses other industries in female representation. Women hold executive management positions at the highest levels, including Emma Walmsley (CEO of GlaxoSmithKline and the first woman to lead a global pharma company), Gail K. Boudreaux (president and CEO of Anthem), and Laura N. Dietch (president and CEO of BioTrace). There are also many examples of women in healthcare gaining worldwide recognition for their achievements, such as Frances H. Arnold, who in 2018 became the fifth woman to win the Nobel Prize in Chemistry. Women are the primary consumers and decision makers in the healthcare market, and they make up almost 50 percent of the workforce: much of their advancement and leadership in the field rests on those facts.

That said, women, especially women of color, remain underrepresented in leadership positions, and not only at the highest levels. There remain challenges to address in hiring, advancement, and day-to-day experiences that could promote a more flexible and inclusive working culture.

Many reasons to celebrate

There are good reasons to believe the healthcare industry is one of the best for women. For example, women are better represented at all levels than in other sectors, are promoted at similar rates to men, and report similar career satisfaction. We highlight several reasons to celebrate the sector's progress on diversity below.

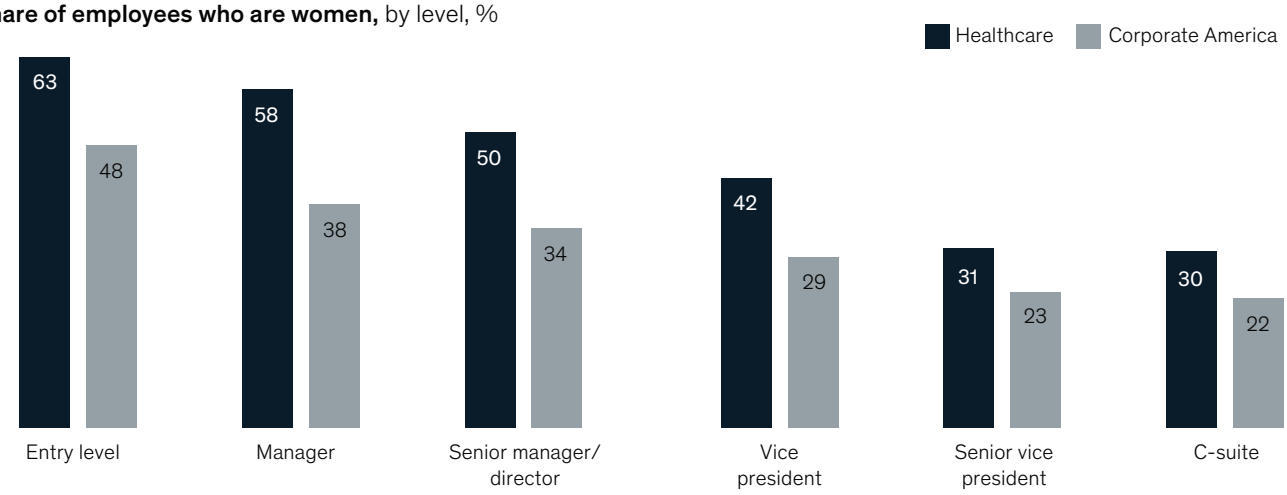
Better representation at all levels

Over 60 percent of employees entering the healthcare industry are women, while across sectors in the United States, women represent an average of just under 50 percent of entry-level employees (Exhibit 1).

Exhibit 1

Women are better represented in healthcare at all levels than in corporate America overall

Share of employees who are women, by level, %



Source: *Women in the workplace 2018*, a joint report from LeanIn.org and McKinsey, womenintheworkplace.com

Healthcare's many subsegments are a natural draw for the 50 percent of STEM graduates[1] that are women, affording them the opportunity of a career in an industry with a variety of technical disciplines such as medicine, science, engineering, technology, business, operations, and even design. Also, nurses are more than 80 percent women[2] and they comprise a large part of the workforce in healthcare provider and payer organizations in the United States.

In the provider subsector (including hospitals, health systems, and physician practices), gender diversity is especially important because women represent a significant patient population. For example, approximately 57 percent of patients who visit emergency departments are women—and a majority of those are women of color. Clinical outcomes correlate to a diverse workforce; in cardiac care, for example, women treated by female doctors are more likely to survive a heart attack than women treated by male doctors; and male doctors are more effective at treating heart attacks when they work in hospitals with more female doctors.[3,4]

In the pharma, biotech, and device subsectors, gender diversity is especially important in composing the development and marketing teams for therapies and solutions to treat conditions that disproportionately affect women—enabling companies to more authentically and responsibly market to female patients.

Getting promoted and advancing in senior roles

When comparing the rate of promotions between men and women across industries, the healthcare industry performs better than average, with relatively low gaps across the board (Exhibit 2). For example, in the critical first promotion to manager, healthcare outperforms almost all other sectors.

1 *Women, minorities, and persons with disabilities in science and engineering*, National Center for Science and Engineering Statistics, March 2019, ncses.nsf.gov.
2 Gender ratio of nurses across 50 states, *Becker's Hospital Review*, May 29, 2015, beckershospitalreview.com.
3 Ed Young, "Women more likely to survive heart attacks if treated by female doctors," *Atlantic*, August 6, 2016, theatlantic.com.
4 Seth Carnahan, Brad N. Greenwood, and Laura Huang, "Patient–physician gender concordance and increased mortality among female heart attack patients," *Proceedings of the National Academy of Sciences*, August 2018, Volume 115, Number 34, pp. 8569–8574, pnas.org.

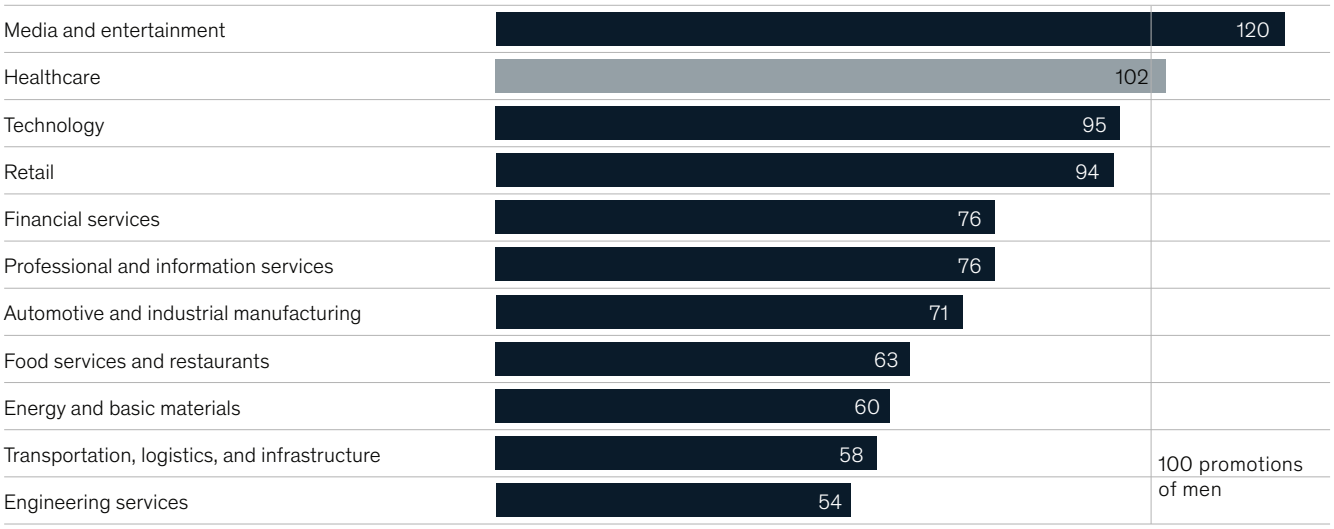
Negotiating and achieving more when asking for raises

Both women and men report asking for raises at the same rates, but women in healthcare say they are slightly more successful in achieving positive outcomes (Exhibit 3). Women can do (and are doing) more actionable things to change the status quo, including negotiating with their employers for higher salaries. As one executive leading a global business unit (BU) in an international top ten pharma company said, "[With] every woman I talk to who is in the midpoint of her range, [I tell her] you need to go and say, 'With my delivery and results, I need to be on the other side of that midpoint.' It is simple math.... I see a lot of women uncomfortable with this, but as one steps up and has success, the next does it."

Exhibit 2

There is no gender gap in promotion rates in healthcare, unlike in many other industries

Number of women promoted for every 100 promotions of men[1]



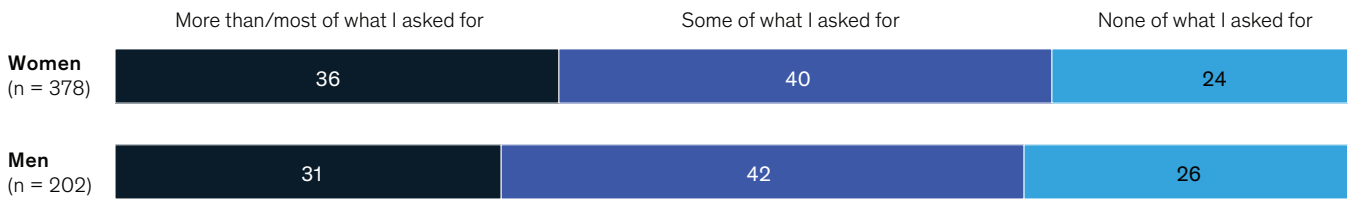
[1] 100 equals parity.

Source: *Women in the workplace 2018*, a joint report from LeanIn.org and McKinsey, womenintheworkplace.com

Exhibit 3

Women in healthcare reported receiving more of what they requested in compensation negotiations more often than men did

Compensation received upon request, % of respondents[1]



[1] Figures may not sum to 100%, because of rounding.

Source: *Women in the workplace 2018*, a joint report from LeanIn.org and McKinsey, womenintheworkplace.com

Greater career satisfaction

On average, women in healthcare report high satisfaction with their careers (75 percent versus 71 percent of men) (Exhibit 4). They find opportunities aligned with their passions and can adapt their careers over time.

As the strategy lead at a large biotech firm we interviewed said, "People come [into the healthcare industry] because they really care—and these people are disproportionately female." As a global executive most recently working in healthcare information solutions observed, "Women can get into healthcare, stay there for many years, and have a variety of experiences. I took a lot of different twists and turns—most where I had enough technical and leadership expertise to move to a different role. I moved from analytics into an operational role leveraging leadership where I didn't have technical skills. Another time, I took a combined technical and leadership skill to create a portfolio-management role that didn't exist. Sometimes people asked me [to take on roles], others I went after. And I have been in the industry very satisfied for a long time."

Critical challenges to address

While there is a lot to celebrate and most employees see diversity as a priority, examining the representation of women across different levels indicate that healthcare still faces challenges in sustaining a diverse workforce.

As in other sectors, the proportion of women in the healthcare industry decreases as the responsibility level of the job rises (Exhibit 5). The share of white women in entry-level positions is 41 percent compared to 26 percent at the C-suite level. This decline is particularly steep for white women at more senior levels (such as VP, SVP, and C-suite) due to the glass ceiling that seems to exist between senior manager/director and VP levels.

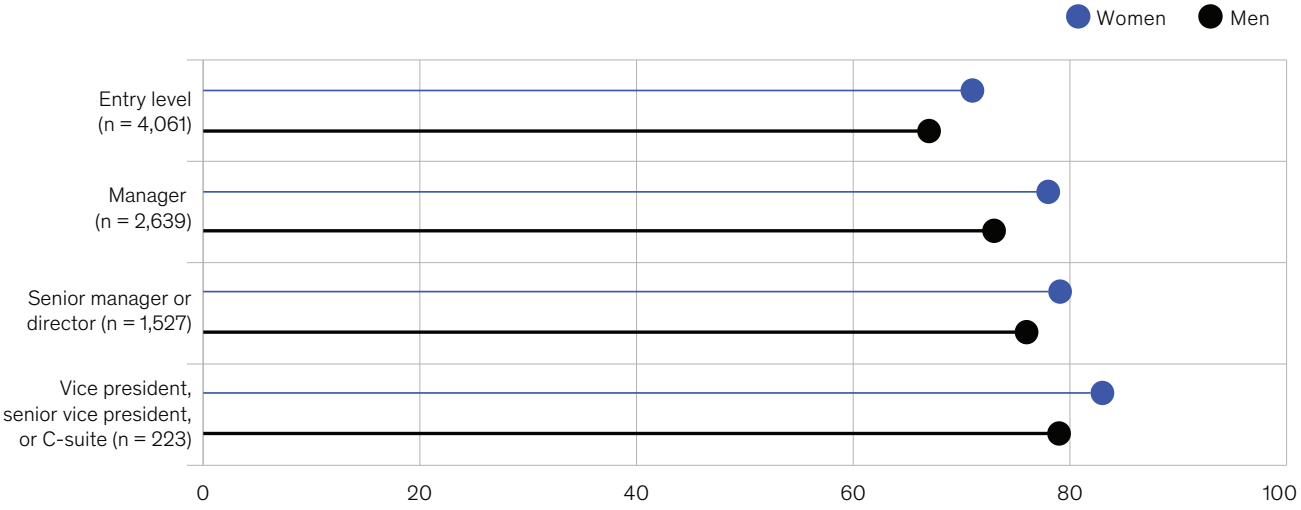
The share of women of color drops off even more, with 22 percent holding entry-level jobs and just 4 percent working at the C-suite level. Declines in representation for women of color span all levels of employment. The glass ceiling for women of color starts at the first promotion to manager.

While our research indicates that lack of ambition cannot explain the leakiness of the

Exhibit 4

Women in healthcare tend to be happier about their careers compared with men in the same field

Career satisfaction, % of respondents reporting as "satisfied"



Source: *Women in the workplace 2018*, a joint report from LeanIn.org and McKinsey, womenintheworkplace.com

talent pipeline for women, there are three emerging problems that lead to representation decline in healthcare: structural challenges (such as hiring and advancement practices), institutional barriers allowing underlying biases to persist, and impact of the daily work environment not promoting an inclusive and supportive experience for all employees. Companies need to better understand and address these key challenges in order to promote diversity.

While the study did not find specific reasons to explain why women of color lag further behind, our research suggests all the factors that apply to women generally—such as unequal promotions and microaggressions—are amplified for women of color, and are likely contributing factors in the healthcare industry as well.

Structural challenges hold women back

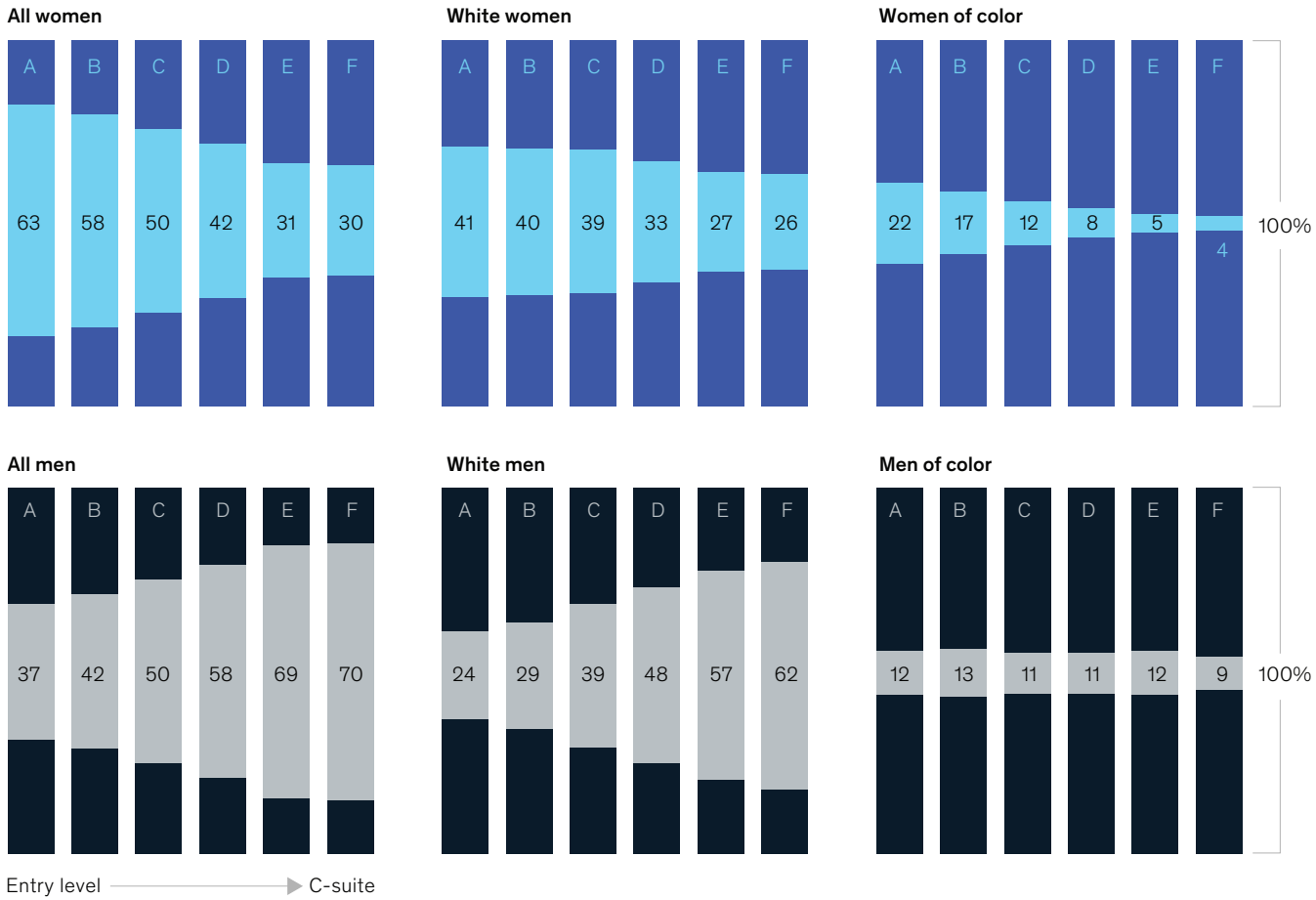
There are a few structural challenges companies need to address to promote diversity: constrained advancement opportunities and

Exhibit 5

Representation of women in healthcare declines at senior-leadership positions, particularly for women of color

Representation pipelines in healthcare in 2017, by gender and ethnicity, % of total[1]

A Entry level, **B** Manager, **C** Senior manager/director, **D** Vice president, **E** Senior vice president, **F** C-suite



[1] Figures may not sum to listed totals, because not all companies split by race.

Source: *Women in the workplace 2018*, a joint report from LeanIn.org and McKinsey, womenintheworkplace.com

lack of sponsorship, and limited pool for external hiring.

While women occupy a large share of entry-level line roles, that declines rapidly at more senior levels due to advancement opportunities. At entry level, women make up 63 percent of line roles; at the C-suite level, women comprise 29 percent of line roles (Exhibit 6). This imbalance is worrisome because line roles carry material financial and profits-and-losses responsibilities and lead to more CEO roles, whereas nonline roles tend to be more support-function related, consultative, and project-management oriented. While this trend holds for virtually all sectors, healthcare has some additional career structures and advancement practices that can box women into nonline roles. For providers, a large proportion of entry-level hires are female nurses, and nursing is a career path that often ends at the nursing-director level with few additional senior roles. For biotech, the decline sometimes comes down to women leaving senior-manager roles for senior positions at larger pharmaceutical companies where there are a broader set of opportunities given these companies' global remit and scale.

When looking at relative rates of promotion and attrition for women and men in healthcare, our research shows that women lose the most ground to men through external hiring. Women have slightly lower attrition than men at all levels (1 to 2 percent less), however women have 1 to 2 percent lower likelihood of being promoted to the next level (on average across all levels) and also maintain their underrepresentation in proportion of external hires.

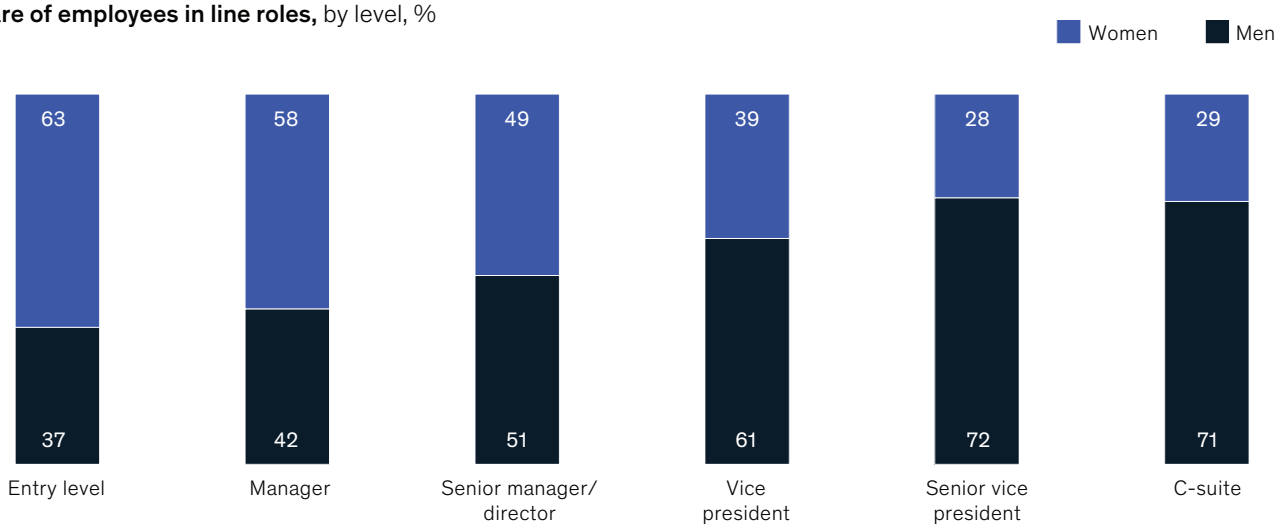
Overall, while women represent 61 percent of external hires at the entry level, that number drops to 33 percent at the senior level and is lower at many levels than the existing level of women's representation, further decreasing the representation of women leaders (Exhibit 7).

Through our work with leading organizations, we have uncovered a set of drivers associated with external hiring. For example, in sourcing, women may represent a smaller proportion of the candidate hiring pool than men (for example, there are fewer women out there in senior-level roles). In applicant screening and interviews, women might be less likely to pass if a job requires

Exhibit 6

Women in senior levels of healthcare are less likely than their male colleagues to be in line roles

Share of employees in line roles, by level, %

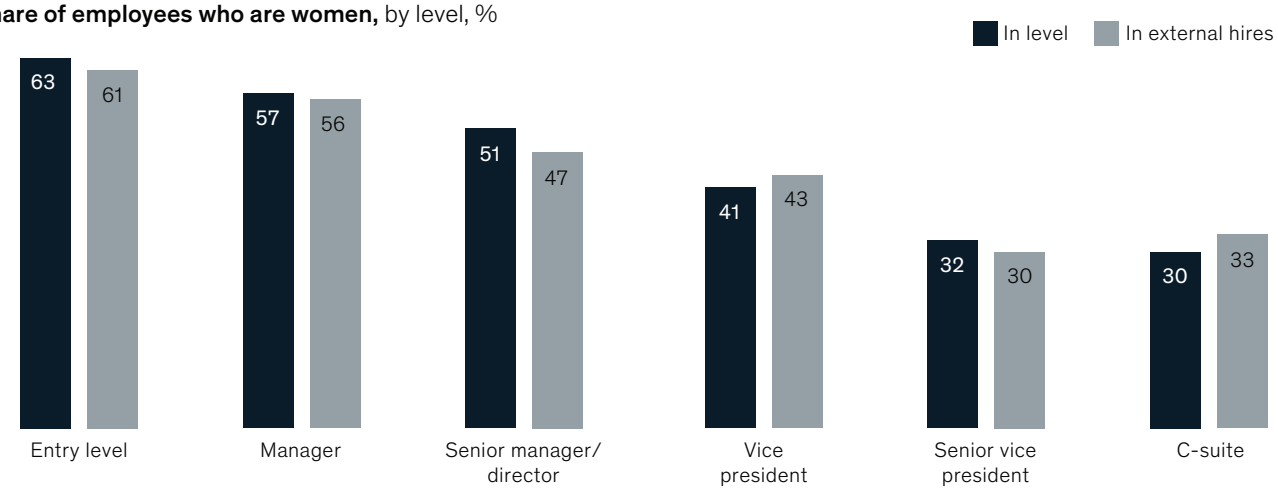


Source: *Women in the workplace 2018*, a joint report from LeanIn.org and McKinsey, womenintheworkplace.com

Exhibit 7

External hiring does not significantly affect women's representation, across all levels

Share of employees who are women, by level, %



Source: *Women in the workplace 2018*, a joint report from LeanIn.org and McKinsey, womenintheworkplace.com

continuous work experience or if an interviewer panel has no women on it. These are addressable issues, but it takes dedicated resources to remove both actual and perceived structural barriers.

Institutional barriers perpetuate biases in the system

As institutional barriers have persisted, they have embedded mind-sets and biases that may be creating additional challenges.

Despite being promoted at similar rates, women are more than twice as likely as men to report that their gender may have played a role in missing a raise, promotion, or chance to get ahead (18 percent of women, 7 percent of men). This follows findings of a recent Rock Health survey, where 86 percent of African American women reported race as a high barrier to career advancement, followed by 52 percent of Asian women, and 49 percent of Hispanic/Latino women.[5] A health-system-strategy executive said, "We tend to hire what's similar [to ourselves], and when there is not a lot of diversity at the top, it's hard to break through."

We found that women and men cite different reasons for pursuing top leadership roles and perceive different expectations. For example, women are more motivated by an opportunity to become role models for other women (38 percent of women and 27 percent of men reported they are motivated to be "a role model for others like me"), whereas men tend to be slightly more financially driven (22 percent of women, 29 percent of men) and aspire to create impact for the company (59 percent of women, 66 percent of men).

At a top five global biopharma company trying to foster diversity, the SVP and global head of HR noticed a difference in how women want to lead, "[We are] moving from command-and-control leadership to more collaborative and servant leadership…this is what women are really good at and may feel like they are better able to lead in their own style…to lead with purpose." When asked, the divisional HR head shared, "I think there are [four] things [that hold women back from seeking promotions]—imposter syndrome; the feeling that if I work hard enough, I'll get

5 Nicole Fisher, "600+ women open up about working in health care in 2018," *Forbes*, July 27, 2018, forbes.com.

there; a lack of sponsors and mentors; and not being able to bring one's full self to work."

In our survey, the reasons women gave for *not pursuing* top leadership roles (broadly, VP and higher) also differ from those cited by men. Women tend to be less interested in senior executive roles than men (29 percent of women, 38 percent of men) and mention concerns about the pressure to deliver results 50 percent more often than men.

As the global executive from information solutions we interviewed put it, "Advancement is not always equated with success.... Some of the traditional senior-level roles just aren't that attractive for women in terms of the expectations, the responsibilities." On the other hand, nearly a third of both women and men balk at the prospect of office politics, and well over a quarter of both men and women consider the personal cost of advancement not worth the professional benefit.

Biases remain around belittling the importance of diversity. While 80 percent of employees believe gender diversity is a high priority for their company, 40 percent of people who do not believe it's a high priority think that diversity deprioritizes individual performance. While this outlook is disappointing, it can be addressed by communicating the business case around diversity.

Impact of the daily work environment

Our research also revealed several critical themes about how the daily work environment impacts how it feels to be a woman in the healthcare industry.

Women are more likely to face microaggressions and incivility in the workplace. In healthcare, 61 percent of women we surveyed reported they experience microaggressions at work versus 49 percent of men. This difference between women's and men's experience was even bigger when we asked about incivilities: over 43 percent of women have experienced two or more instances of incivility in the workplace versus 30 percent of men.

Senior women and those in technical roles are more likely to be the only person of their gender in the room. On average, approximately 10 percent of both women and men across all roles often find themselves to be the only person of their gender in the room; however, the experience for women in senior roles (VP, SVP, and C-suite) and technical roles is drastically different. Senior women are nine times more likely than men to be the only person of their gender in the room (28 percent of women, 3 percent of men) and women in technical roles are roughly eight times more likely than men to be an "only" (39 percent of women, 5 percent of men). This is important because women "onlys" can face higher levels of scrutiny and pressure to perform. As a result, they often are more likely to think about leaving their jobs.

Actions to take

The key to accelerating and having a greater impact at scale is two-fold. First, focus on the shifts that matter to your organization (for this you need real data as a starting point). Second, reframe your efforts against core actions (see six types of action highlighted in our Women in the Workplace research)[6] that we know have an impact.

Of these six core actions, we want to focus on three in particular to address challenges faced by women in the healthcare industry: promotions and external hiring, inclusiveness training, and flexibility in the workplace.

Ensure promotions, evaluations, and external hiring processes are fair

To address promotion bottlenecks, identify and groom women within the organization to compete for senior positions; this form of sponsorship can be fostered through training. But this, in and of itself, is not sufficient. Unconscious bias can have a significant impact on who's hired and promoted—and who's not. It's critical that

[6] Alexis Krivkovich, Marie-Claude Nadeau, Kelsey Robinson, Nicole Robinson, Irina Starikova, and Lareina Yee, "Women in the Workplace 2018," October 2018, McKinsey.com.

companies put safeguards in place to reduce bias such as using automated résumé-screening tools, requiring diverse slates of candidates, and setting clear, consistent evaluation criteria before the process begins.

Furthermore, it's important to track outcomes. Otherwise, it's impossible for a company to know if it's treating candidates fairly. Many companies track outcomes in hiring to check for gender bias, which is a good start. But far fewer track the compounding effect of gender and racial bias, which disadvantages women of color. And companies are far less likely to track bias in performance reviews—for example, to see if women's communication styles are criticized more often than men's—yet performance reviews play a major role in who gets promoted and who doesn't.

One health system addressed this through "sustained intentionality" by proactively identifying women throughout their career and recommending them for high-profile committees to raise their visibility and leadership. Over the past ten years, this along with sending them to leadership development programs and supporting them with coaching and mentoring have doubled the percentage of women in leadership positions across the organization.

An alternative is to recruit women directly into leadership positions (or line roles), although this requires persistence and persuasion with external candidates. One way to close the gap is to consider hiring outside the industry—looking for exceptional talent with transferable skills. In the healthcare industry, examples include Jody Bilney, chief consumer officer for Humana, who previously had marketing-leadership roles in hospitality, software, financial services, and telecom; Karen L. Parkhill, CFO for Medtronic, who previously had a long career in the financial-services industry; and Bridgette Heller, who started her career in the food business before coming to healthcare and is now in consumer nutritionals at Danone.

Invest in training to create a more diverse and inclusive employee culture

Diversity and inclusion (D&I) training can help improve hiring, sponsorship, employee development, and raise awareness of the business case for D&I.[7] Healthcare employees understand and support the value of D&I and feel that they know how to improve the workplace. However, managers don't regularly address learning moments or role model key behaviors and mind-sets. By leveraging both formal and informal training opportunities, managers can help employees feel more confident in what to do and when. Training needs to do the following:

- provide targeted unconscious-bias training and reminders for hiring managers as they select interview slates and make offer decisions
- foster sponsorship and mentoring
- recognize senior leaders who are spearheading D&I initiatives in their organizations and educate line managers on how to promote D&I within their teams
- provide intensive professional development training to accelerate the career trajectories of high-potential women and underrepresented minorities
- make managers aware of the signs and impact of microaggressions

Give employees the flexibility to fit work into their lives

Healthcare employers can support women throughout their organization—from those in entry-level jobs to those in top leadership positions—by offering flexible work arrangements. Flexible work benefits all employees but especially women.

As a clinical operations lead we interviewed said, "Some in the field believe we need to make flex programs the norm, as

[7] Sundiatu Dixon-Fyle, Vivian Hunt, Sara Prince, and Lareina Yee, "Delivering through diversity," January 2018, McKinsey.com.

it is not part of the culture in clinical. They believe it's holding women back from continuing on the clinical paths, and in many cases delaying their starting a family." As the health-systems lead remarked, "Many of our physician groups are still 80-plus percent male, and work–life balance is a big reason for women not going into surgery.… Our physician community is changing; they want more work–life balance."

For office-based roles, this may mean creating or enabling more options to combine work and family; any interventions here must derive from data that would put employers in a position to know what is happening and make provision for women's needs before the situation becomes acute.

As the biotech strategy lead shared, "Women disproportionately bear the challenge of balancing family versus travel and long hours. Women often choose not to ask for flexibility even when it might be on offer. They often choose to invest in family over careers, when it's not a zero-sum game.… Companies can be more progressive in offering benefits that resonate with women, such as extended maternity leave, childcare credits, [and] teleworking."

The global executive we interviewed thought that employers should "support [the] concept of more flexible workers with internships and rotations."

One global pharma company is experimenting with being more agnostic to the location of leadership roles to allow more flexibility and enable sustainability with family and other personal commitments.

We can and should be proud of the momentum of women in the healthcare industry. We must continue to highlight the success stories and spread best practices to accelerate recent gains. For areas that still lag, we must continue to remove barriers and address issues that matter with all employees in the industry.

The healthcare industry has an opportunity to lead in the next phase of establishing gender and racial equity. In taking the lead, it stands to benefit economically and socially. A more equitable workplace drives better innovation, performance, employee experiences, and patient outcomes.

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The future of work in America: People and places, today and tomorrow

André Dua, Bryan Hancock, Liz Hilton Segel, Susan Lund, Brent Macon, James Manyika, and Scott Rutherford

A shift in healthcare jobs will create wide variations in census and payer mix for providers, plus create business line mix shifts. Improving productivity in healthcare will depend on effective labor, managing increased automation, and developing a plan for changing demographics within the workforce. Healthcare entities have an opportunity to lead their communities through proactive economic development and by embracing a diverse workforce.

The US labor market looks markedly different today than it did two decades ago. It has been reshaped by dramatic events like the Great Recession but also by a quieter ongoing evolution in the mix and location of jobs. In the decade ahead, the next wave of technology may accelerate the pace of change. Millions of jobs could be phased out even as new ones are created. More broadly, the day-to-day nature of work could change for nearly everyone as intelligent machines become fixtures in the American workplace.

Until recently, most research on the potential effects of automation, including our own body of work, has focused on the national-level effects. Our previous work ran multiple scenarios regarding the pace and extent of adoption. In the midpoint case, our modeling shows some jobs being phased out but sufficient numbers being added at the same time to produce net positive job growth for the United States as a whole through 2030.[1] But the national results contain a wide spectrum of outcomes, and this report goes one step further to explore those variations. Automation is not happening in a vacuum, and the health of local economies today will affect their ability to adapt and thrive in the face of the changes that lie ahead.

Our analysis of more than 3,000 US counties and 315 cities finds they are on sharply different paths. Twenty-five megacities and high-growth hubs, plus their peripheries, have generated the majority of job growth since the Great Recession. By contrast, 54 trailing cities and roughly 2,000 rural counties that are home to one-quarter of the US population have older and shrinking workforces, higher unemployment, and lower educational attainment. Automation technologies may widen these disparities at a time when workforce mobility is at historic lows.

The labor market could become even more polarized. Workers with a high school degree or less are four times as likely as those with a bachelor's degree to be displaced by automation. Reflecting more limited access to education, Hispanic workers are most at risk of displacement, followed by African Americans. Jobs held by nearly 15 million

[1] This research builds on McKinsey Global Institute's (MGI) automation and job creation models, which have formed the basis of previous research reports including *A future that works: Automation, employment, and productivity (January 2017), and Jobs lost, jobs gained: Workforce transitions in a time of automation* (November 2017).

workers ages 18–34 may be automated, so young people will need new career paths to gain an initial foothold in the working world. Roughly 11.5 million workers over age 50 could also be displaced and face the challenge of making late-career moves. The hollowing out of middle-wage work could continue.

The future of work is not just about how many jobs could be lost and gained. Technology is altering the day-to-day mix of activities associated with more and more jobs over time. The occupational mix of the economy is changing, and the demand for skills is changing along with it. Employers will need to manage large-scale workforce transformations that could involve redefining business processes and workforce needs, retraining and moving some people into new roles, and creating programs for continuous learning. This could be an opportunity to upgrade jobs and make them more rewarding. The choices that employers make will ripple through the communities in which they operate.

Local economies have been on diverging trajectories for years

Cities and counties across the United States are entering this period of technological and labor market change from different starting points. We used a mathematical clustering method to categorize all US counties (and, for counties in urban core areas, the cities with which they are associated) into 13 segments using more than 40 variables reflecting their economic health, business dynamism, industry mix, labor force demographics, and other characteristics (Exhibit 1).[2] This approach reveals that the differences between local economies across the country are more nuanced than a simple rural-urban divide or regional variations. (See the technical appendix in the full report or visit www.mckinsey.com/futureofworkinamerica for a full list of the cities and counties in each segment.)

Our 13 archetypes can be grouped into five segments with common patterns (Exhibit 2):

— **Urban core.** Twenty-five megacities and high-growth hubs account for roughly 30 percent of the US population and are the nation's most dynamic places. The high-growth industries of high tech, media, healthcare, real estate, and finance make up a large share of these local economies. These cities have higher incomes, faster employment growth since the Great Recession, high net migration, and younger and more educated workforces than the rest of the country—but also high levels of income inequality. Many are experiencing congestion and affordable housing shortages.

— **Urban periphery.** These 271 counties are the extended suburbs of US cities. Home to 16 percent of the US population, they also have seen strong net migration, attracting people moving out of cities in search of more space. In most of these counties, a large share of the population works in nearby urban areas. Healthcare, retail, logistics, and local services are large parts of these local economies.

— **Niche cities.** These 56 much smaller towns and cities, home to 6 percent of the US population, have found success by building on unique features. In college-centric towns, a major research university dominates the local economy. Silver cities, many of which are in Florida, are fast-growing retirement destinations. Small powerhouses, such as Bend, OR, and Provo, UT, have built economic clusters around technology and other industries; they have the fastest economic growth rates and second-highest rate of net migration across our archetypes. All niche cities are attracting both workers and companies with a low cost of living and a high quality of life.

— **Mixed middle.** Almost one-quarter of the nation's population is found in these 180 stable cities (such as Cincinnati and St. Louis), smaller independent economies (such as Lancaster, PA, and Winston-Salem, NC), and the manufacturing hubs that we call "America's makers" (such as

[2] For this effort, we updated the county segmentation used in *America at work: A national mosaic and roadmap for tomorrow* (2019), a research collaboration between Walmart and McKinsey & Company. Our database includes indicators for all 3,113 US counties.

Rockford, IL, and Oshkosh, WI). Neither thriving nor in distress, these places have slower economic and job growth, higher unemployment, and workforces with slightly lower educational attainment than those in urban core cities. Some of America's makers are on an upward trajectory, while others are in decline.

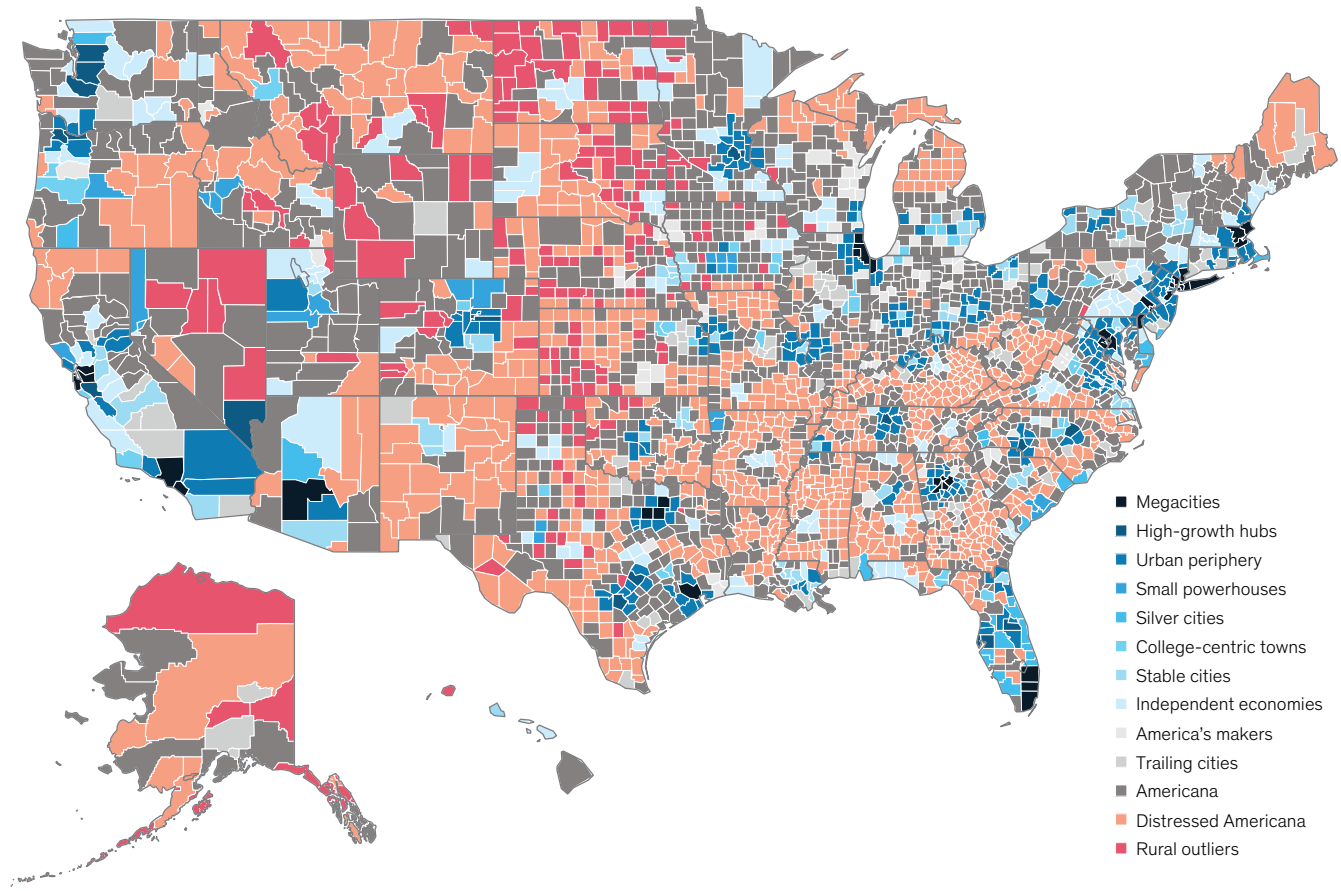
— **Low-growth and rural areas.** This group, which includes 54 trailing cities and more than 2,000 rural counties, is home to one-quarter of the US population. Many trailing cities, such as Flint, MI, and Bridgeport, CT, are former industrial towns with struggling economies. Rural counties encompass somewhat better-performing places (Americana) and struggling areas (distressed Americana). In these segments, populations are older, unemployment is higher, and educational attainment is lower than the national average. Things are somewhat brighter in the 192 rural outlier counties that have found some success with tourism or mining and energy.

The economic performance of these segments has been diverging for decades, and that trend accelerated after the Great Recession. While all areas of the country lost employment during the downturn, job growth since then has been a tale of two Americas. Just 25 cities (megacities and high-growth hubs, plus their urban peripheries) have accounted for more than two-thirds

Exhibit 1

The United States is a complex mosaic of local economies, with 13 distinct community archetypes

Map of county types (color-coded by segment)



Source: McKinsey Global Institute analysis

Exhibit 2

Community segments have varying demographic and economic profiles

More economically favorable — Less economically favorable

		Examples	Economic indicators: Household income, $ thousand	GDP growth, 2012–17, CAGR[1]	Empl. growth, 2012–17, CAGR	Net migration 2010–17,[2] %	Poverty rate, %	Industry mix: GDP in high-growth industries,[3] %	Labor market: Pop. over age 55, %	Pop. with BA or higher, %
Urban core	Megacities *12 cities, 74.3M people*	New York, NY San Francisco, CA	68.8	2.5	2.2	3.2	14.2	48.0	24.5	38.5
	High-growth hubs *13 cities, 21.6M people*	Seattle, WA Austin, TX	65.6	3.7	3.0	7.4	13.4	44.4	23.1	40.0
Periphery	Urban periphery *271 counties, 52.2M people*	Arlington, VA Riverside, CA	69.0	2.5	2.1	4.1	10.2	29.6	28.0	29.4
Niche cities	Small powerhouses *11 cities, 5.0M people*	Provo, UT Reno, NV	63.5	4.9	3.6	8.7	12.0	35.3	24.8	33.5
	Silver cities *19 cities, 6.8M people*	The Villages, FL Prescott, AZ	53.7	2.4	2.7	11.9	13.3	40.7	40.4	29.2
	College-centric towns *26 cities, 6.1M people*	Chapel Hill, NC South Bend, IN	55.1	1.9	1.7	3.7	18.9	38.1	23.5	43.2
Mixed middle	Stable cities *36 cities, 39.3M people*	Detroit, MI Columbus, OH	55.6	1.6	1.4	0.6	15.7	41.2	26.3	32.1
	Independent economies *94 cities, 26.0M people*	Little Rock, AR Providence, RI	57.9	2.0	1.6	3.3	13.7	36.7	27.4	29.3
	America's makers *50 cities, 11.2M people*	Grand Rapids, MI Greensboro, NC	52.7	1.6	1.2	0.2	14.4	29.4	28.0	25.0
Low-growth and rural areas	Trailing cities *54 cities, 14.8M people*	Bridgeport, CT Flint, MI	53.2	0.3	0.3	–2.0	16.4	33.7	26.8	24.2
	Americana *1,118 counties, 44.0M people*	Cameron, TX Caddo Parish, LA	48.7	1.1	0.5	–1.1	15.4	23.5	31.6	19.2
	Distressed Americana *972 counties, 18.1M people*	Coahoma, MS Pittsylvania/ Danville, VA	38.9	0.5	0.0	–2.4	20.8	23.0	33.9	15.9
	Rural outliers *192 counties, 1.5M people*	Kauai County, HI Juneau Borough, AK	57.5	1.1	0.0	–1.2	10.4	21.3	34.2	22.5

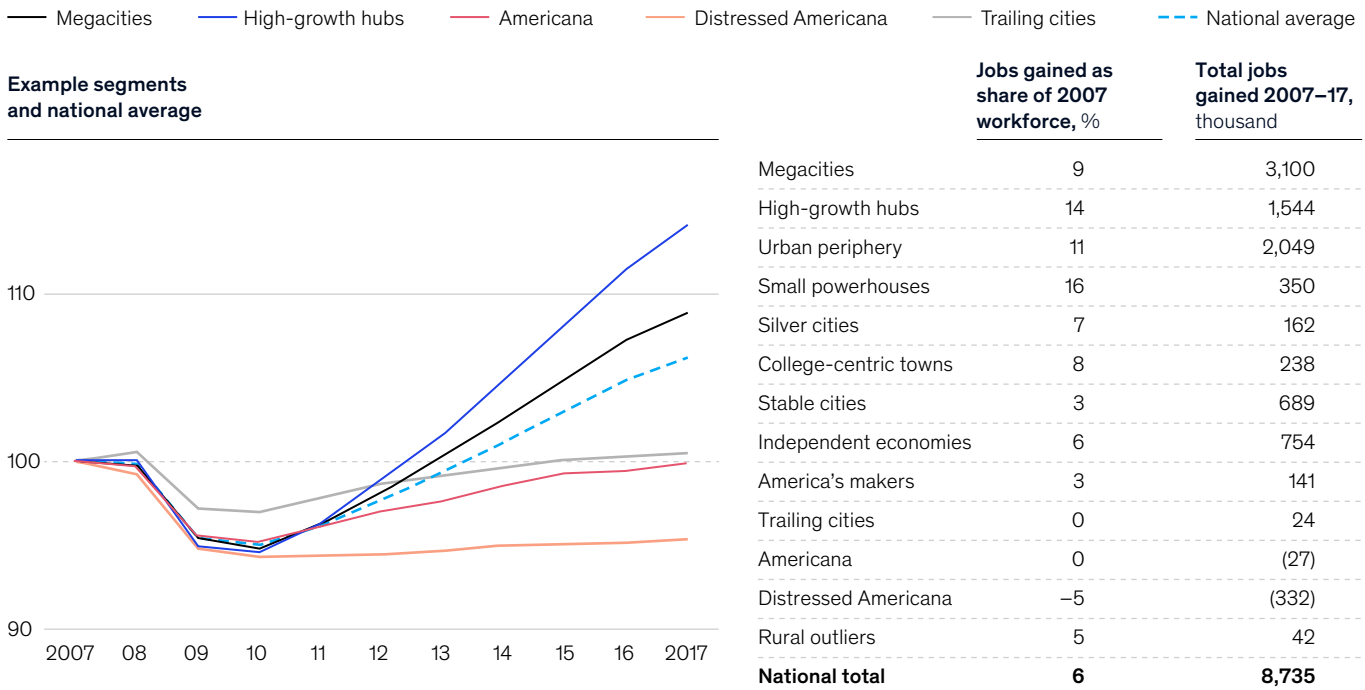
[1] Compound annual growth rate.
[2] Calculated as total net migration between 2010 and 2017 divided by 2017 population.
[3] Information; finance and insurance; real estate/rental leasing; professional, scientific, and technical services; and healthcare and social assistance.
Note: This exhibit shows only a sample of the more than 40 variables used in a clustering analysis to segment communities across the United States.

Source: US Census American Community Survey, Moody's Analytics; McKinsey Global Institute analysis

Exhibit 3

All segments lost jobs during the Great Recession, but employment gains during the recovery have been heavily concentrated in urban areas

Annual employment by segment, % of 2007 employment



Example segments and national average	Jobs gained as share of 2007 workforce, %	Total jobs gained 2007–17, thousand
Megacities	9	3,100
High-growth hubs	14	1,544
Urban periphery	11	2,049
Small powerhouses	16	350
Silver cities	7	162
College-centric towns	8	238
Stable cities	3	689
Independent economies	6	754
America's makers	3	141
Trailing cities	0	24
Americana	0	(27)
Distressed Americana	–5	(332)
Rural outliers	5	42
National total	**6**	**8,735**

Source: Moody's Analytics; McKinsey Global Institute analysis

of job growth in the last decade (Exhibit 3). By contrast, trailing cities have had virtually no job growth for a decade—and the counties of Americana and distressed Americana have 360,000 fewer jobs in 2017 than they did in 2007.[3]

Population growth has also tilted toward urban America. High-growth hubs, small powerhouses, and silver cities have grown by more than 10 percent since 2007, and most urban peripheries are also growing. Residents have been moving out of megacities, stable cities, America's makers, and trailing cities, but immigration has more than offset the losses in megacities and stable cities. By contrast, populations in rural Americana counties grew by less than 1 percent—and distressed Americana is shrinking.

One of the most profound changes of the past two decades has been the "hollowing out" of middle-wage jobs.[4] Our analysis finds that middle-wage jobs accounted for 49 percent of employment in 1997 but only 41 percent in 2017.[5] More Americans have been climbing into higher income brackets or slipping out of the middle class altogether. Some 2.9 million middle-wage roles—including jobs in construction, manufacturing, and office support—vanished between 2007 and 2012, although some were regained in the recovery. But this trend has not played out evenly across the country. While states such as Florida, Maryland, and Rhode Island all saw middle-wage jobs vanish over the last decade, many others,

3 See also Enrico Moretti, The New Geography of Jobs, Boston, MA: Houghton Mifflin Harcourt, 2012; and Clare Hendrickson, Mark Muro, and William A. Galston, *Countering the geography of discontent: Strategies for left-behind places*, Brookings Institution, November 2018.

4 See David H. Autor and David Dorn, "The growth of low-skill service jobs and the polarization of the US labor market," *American Economic Review*, August 2013, Volume 103, Number 5.

5 Low-wage jobs are those paying less than $27,500 annually; middle-wage jobs pay $27,500–$54,200 annually; high-wage jobs pay more than $54,200 annually (all figures in 2017 dollars).

from West Virginia to Utah, have seen middle-wage jobs grow in construction, mining and energy, and other sectors.

Growing economic divergence might have been expected to prompt more people to move from distressed areas to thriving job markets. Yet geographic mobility in the United States has eroded to historically low levels. While 6.1 percent of Americans moved between counties or states in 1990, only 3.6 percent did so in 2017. Furthermore, when people in rural segments and less vibrant cities do move, it is usually to places with a similar profile rather than to megacities or high-growth hubs (Exhibit 4). Differentials in the cost of living, ties with family and friends, and a growing cultural divide all partially explain these patterns, but more research is needed to understand them fully.

Automation will not be felt evenly across places or occupational categories

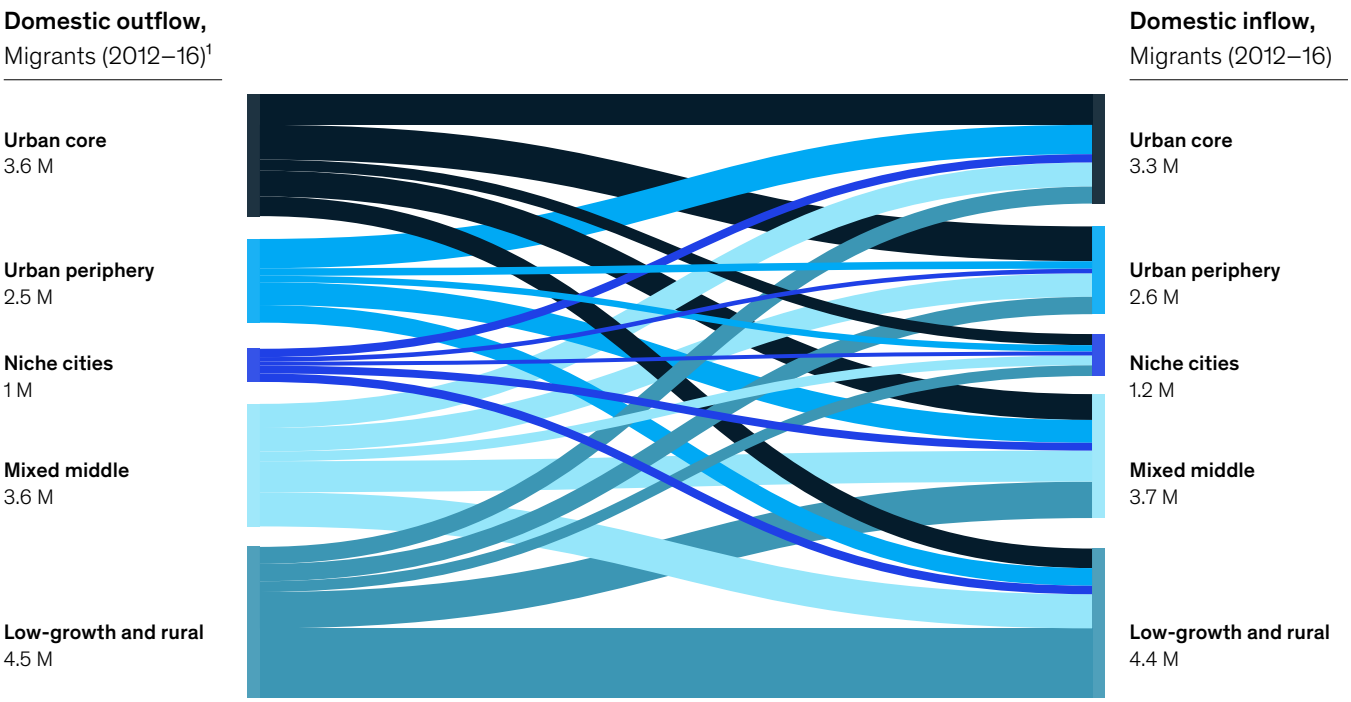
Previous McKinsey Global Institute (MGI) research has found that less than 5 percent of occupations can be automated in their entirety, but within 60 percent of jobs, at least 30 percent of activities could be automated by adapting currently demonstrated technologies.[6] What lies ahead is not a sudden robot takeover but a period of ongoing, and perhaps accelerated, change in how work is organized and the mix of jobs in the economy. Even as some jobs decline, the US economy will continue to create others—and technologies themselves will give rise to new occupations. All workers will need to adapt as machines take over routine and some physical tasks and as demand grows for work involving socioemotional, creative, technological, and higher cognitive skills.[7]

6 See two earlier MGI reports: *A future that works: Automation, employment and productivity* (January 2017) and *Jobs lost, jobs gained: Workforce transitions in a time of automation* (November 2017). We analyze the automation potential of every occupation by looking at the extent to which its constituent activities and associated capabilities can be handled by currently demonstrated automation technologies.

7 *Skill shift: Automation and the future of the workforce*, McKinsey Global Institute, May 2018.

Exhibit 4

Americans in lower-growth areas are not migrating to high-growth places



[1] Analysis excludes all migration within a core-based statistical area that is within the same segment (e.g., migration from one New York City CBSA megacity county to another).
Source: US Census Bureau County-to-County Migration Flows 2012-2016, McKinsey Global Institute analysis

Building on our earlier research, we modeled scenarios with varying timelines for the widespread adoption of automation technologies in the American workplace. Throughout this report, we focus on the midpoint adoption scenario.[8] Our model shows some local economies experiencing more disruption than others. At the high end of the displacement spectrum are 512 counties, home to 20.3 million people, where more than 25 percent of workers could be displaced. The vast majority (429 counties) are rural areas in the Americana and distressed Americana segments. In contrast, urban areas with more diversified economies and workers with higher educational attainment, such as Washington, DC, and Durham, NC, might feel somewhat more muted effects from automation; just over 20 percent of their workforces are likely to be displaced. These differences are explained by each county and city's current industry and occupation mix as well as wages.[9]

The coming wave of automation will affect some of the largest occupational categories in the US economy, such as office support, food service, production work, and customer service and retail sales (Exhibit 5). Nearly 40 percent of current US jobs are in occupational categories that could shrink between now and 2030. A common thread among shrinking roles is that they involve many routine or physical tasks. Because these roles are distributed across the country, no community will be immune from automation-related displacement.

These losses will not necessarily manifest as sudden mass unemployment. Many occupations are likely to shrink through attrition and reduced hiring. This has already been occurring in office support roles, for instance. Offices once populated by armies of administrative assistants, research librarians, and payroll and data clerks now run with leaner support teams and more digital tools. Administrative assistants, bill collectors, and bookkeepers lost a combined 226,000 jobs from 2012 to 2017.

Almost

40%

of Americans are in occupational categories that could shrink by 2030

Even as some occupations decline, the US economy should continue to grow and create new jobs in the years to 2030. But the occupational mix of the economy is evolving and could do so at an even faster pace in the decade ahead. While employment in categories such as office support and food service may decline, our scenario suggests strong job growth in healthcare, STEM occupations, creatives and arts management, and business services (Exhibit 6). Growth and displacement may occur even within the same occupational category. In customer service and retail sales, for example, counter attendants and rental clerks may decline, but more workers could be added to help customers in stores or to staff distribution centers. Growth in transportation services may seem surprising as autonomous trucks and cars appear to be making rapid advances. In reality, it could take years to surmount the technical and regulatory hurdles to their deployment and for companies to replace the extensive capital assets already on the roads.

A look at some of the fastest-growing job categories of the past five years reveals that shifts are already occurring.[10] The economy is adding jobs that make use of new technologies—not only software developers and information security analysts but also solar panel installers and wind turbine technicians. A society with increasing affluence has more demand for per-

8 See also Mark Muro, Robert Maxim, and Jacob Whiton, *Automation and artificial intelligence: How machines are affecting people and places*, Metropolitan Policy Program at Brookings, January 2019.

9 The pace of disruption from automation will depend on how rapidly companies adopt the new technologies. We model a range of different adoption scenarios based on historical experience that take local wage differentials into account. Our modeling is not intended to produce a forecast; it is a mechanism for assessing and sizing a range of potential outcomes. See the technical appendix in the full report for more detail on methodology and potential limitations.

10 David H. Autor, *Work of the past, work of the future*, Richard T. Ely Lecture, American Economic Association Annual Meeting, Atlanta, GA, January 4, 2019.

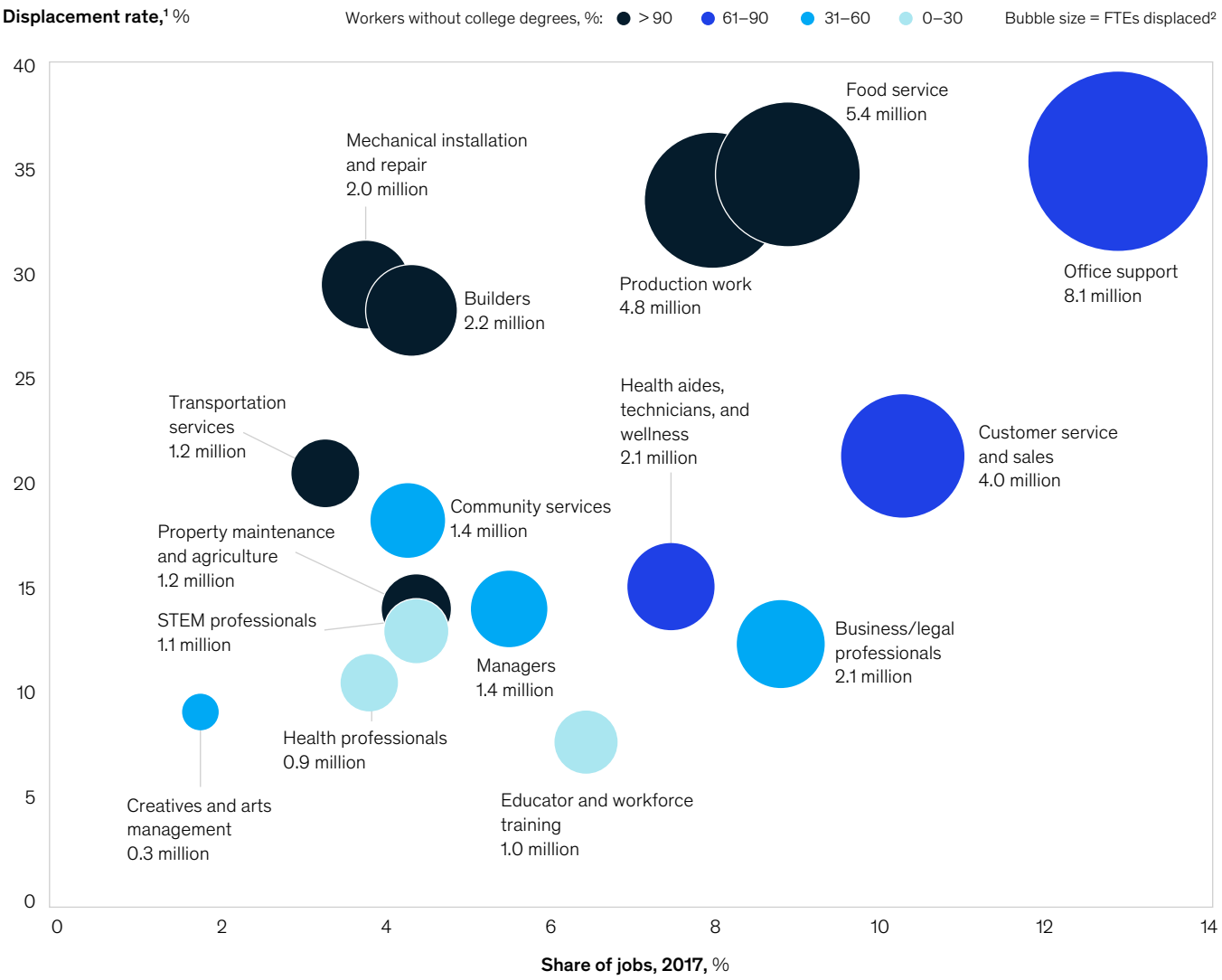
sonal services, creating work for massage therapists, concierges, and fitness trainers. Healthcare roles such as hearing aid specialists and personal care aides are expanding. Creative jobs, such as video editors, makeup artists, and fashion designers, are another growth area. There are more family therapists, psychologists, and community service managers—roles involving the kind of interpersonal interaction and empathy that machines cannot provide. At the same time, technology is likely to create new jobs we cannot imagine today; academic research suggests that about 8 to 9 percent of jobs by 2030 will be ones that barely exist today.[11]

[11] Jeffrey Lin, "Technological adaptation, cities, and new work," *Review of Economics and Statistics*, May 2011, Volume 93, Number 2.

Exhibit 5

The largest occupational categories in the US economy have the highest potential displacement rates

Occupational categories by share of US employment and displacement rate[1] through 2030, midpoint adoption scenario

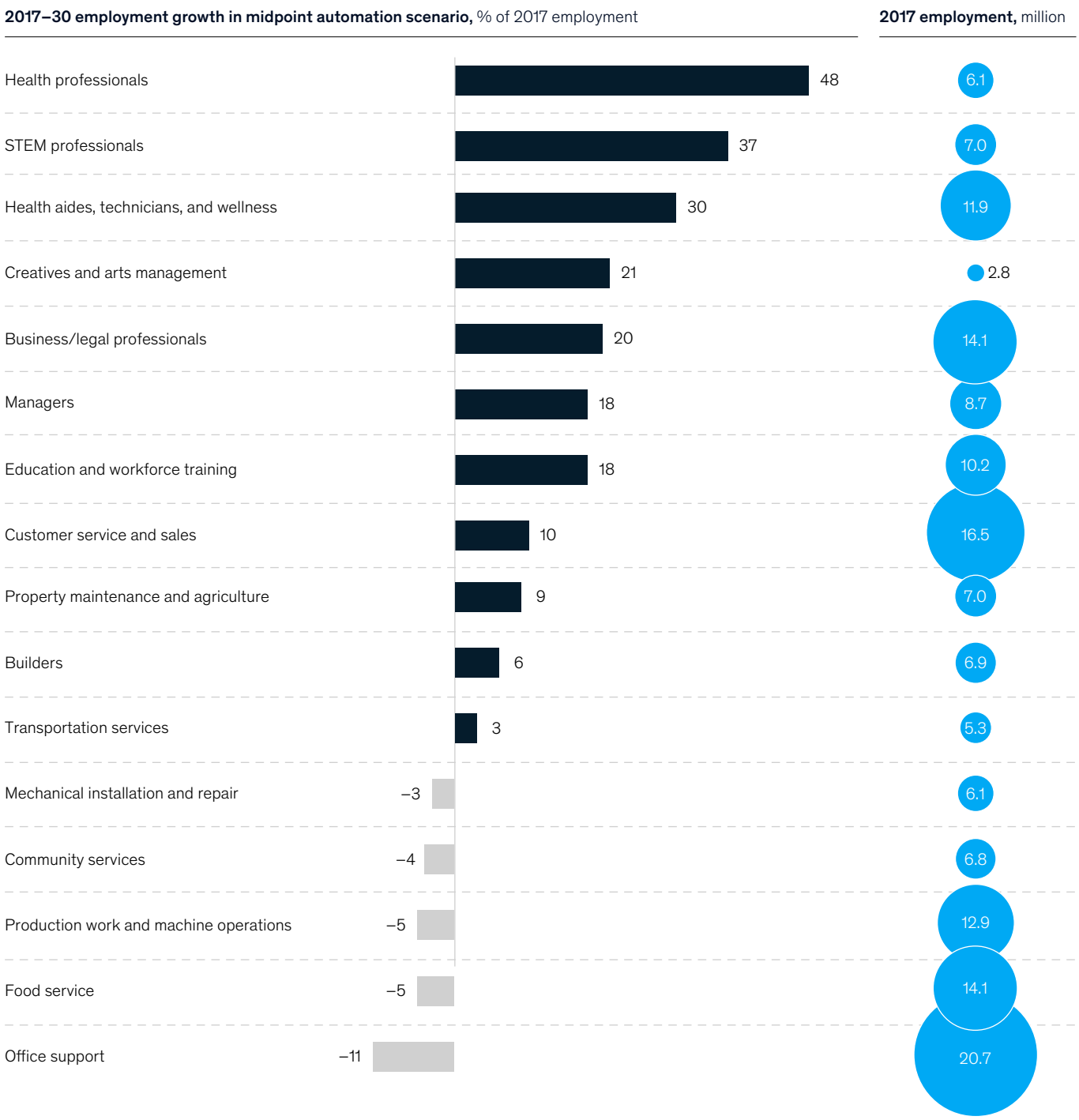


[1] Based on the share of automatable activities for occupations within each category.
[2] Full-time equivalents displaced in midpoint automation scenario by 2030. In office support, for example, technology could handle the activities that account for more than 35 percent of all hours worked, or the equivalent of 8.1 million full-time workers.

Source: US Bureau of Labor Statistics; McKinsey Global Institute analysis

Exhibit 6

In the decade ahead, health and STEM occupations could post rapid growth while office support, food service, and manufacturing production jobs could decline



Note: This exhibit displays net job growth, factoring in both job losses due to automation and expected job creation. Customer service and sales, for instance, is one of the occupational categories with the largest number of potential displacements, yet our model finds that enough jobs will be added over the same period to produce positive net growth overall.

Source: McKinsey Global Institute analysis

Despite new occupations and overall job growth, one worrisome trend could continue: the hollowing out of middle-wage jobs. Our analysis suggests that by 2030, they could decline as a share of national employment by 3.4 percentage points. Our model shows employment in low-wage jobs declining by 0.4 percentage point, while employment in the highest-wage jobs grows by 3.8 percentage points.[12] The growth of high-wage roles can be realized only if workers can obtain the necessary education and skills. Forging career pathways to help people move up and finding sources of future middle-wage jobs will be essential to sustaining the US middle class (see Sidebar "Mapping new career pathways to enable economic mobility").

All Americans will need to cultivate new skills to remain relevant in a more digital and knowledge-intensive economy. The biggest effect of automation will not necessarily be in sidelining people but in augmenting what they do. As machines perform some tasks, the time that is freed up can be reallocated into different, and often higher-value, activities. More workers will need to work side by side with machines and use them to become more productive.

In the decade ahead, local economies could continue to diverge

Workforce transitions will play out differently in local communities across the United States. Our findings suggest that net job growth through 2030 may be concentrated in relatively few urban areas, while wide swaths of the country see little employment growth or even lose jobs (Exhibit 7).[13]

The 25 megacities and high-growth hubs, plus their peripheries, may account for about 60 percent of net job growth by 2030, although they have just 44 percent of the population. Individual standouts like Phoenix and Austin have diverse economies and high concentrations of the tech and business services that may

[12] Based on the median salary of jobs in 2017. We define middle-wage jobs as those in the middle 40 percent in the income distribution. This analysis does not account for different wage growth or decline over time.

[13] These results should not be read as forecasts. As in our previous research, we model a likely scenario to indicate the scale and direction of what could occur.

Sidebar

Mapping new career pathways to enable economic mobility

Although technology may displace some workers, it can also be part of the solution for re-engaging them—by identifying career pathways and logical job moves based on the skills an individual already has.

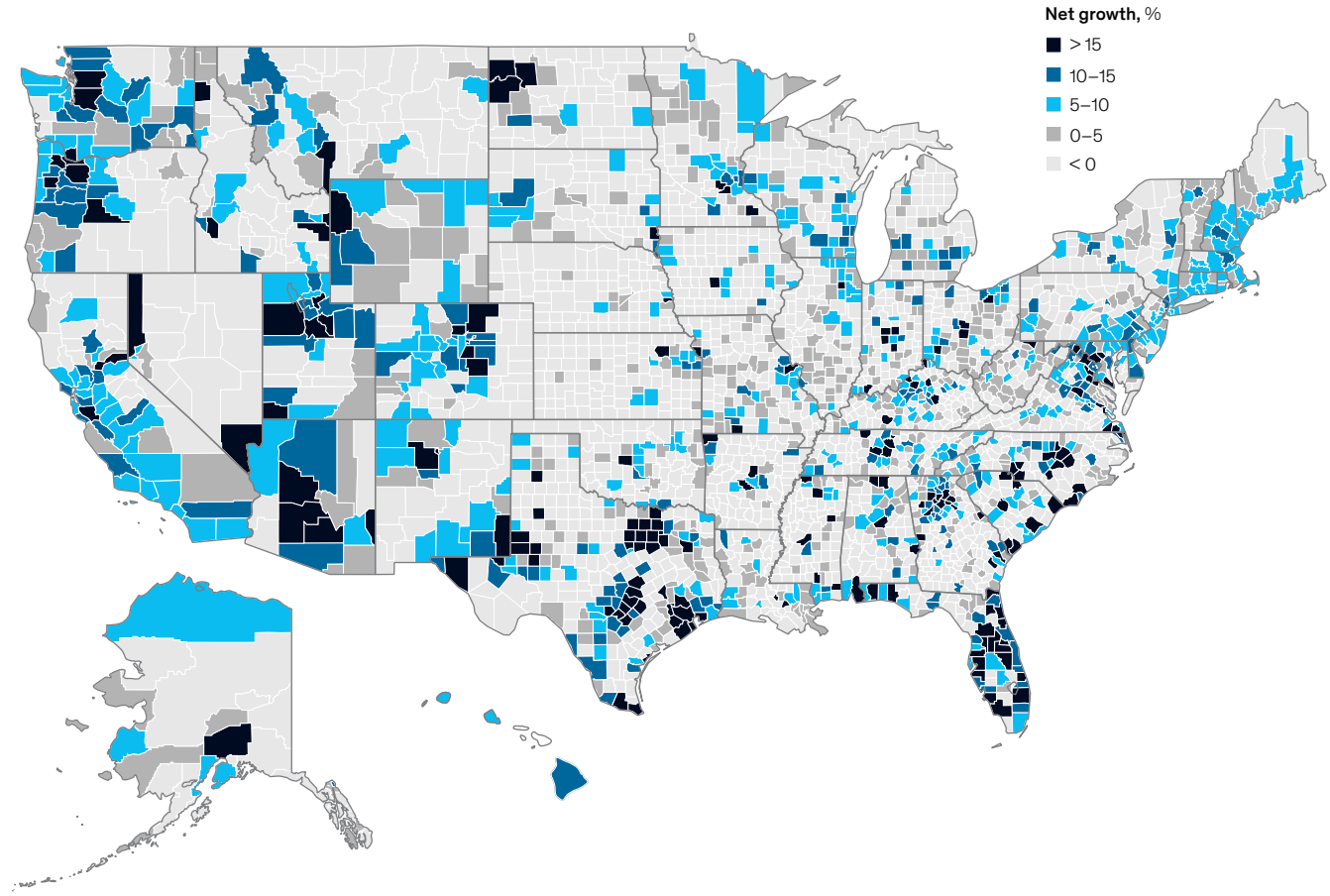
Using data from Economic Modeling Specialists International, we can match displaced workers with growing occupations that utilize compatible skills and require similar education credentials—even some with the same or higher median wages. For example, 900,000 bookkeepers, accountants, and auditing clerks nationwide, with a median annual salary of $39,240, may see their jobs phased out in the decade ahead. But their skills are highly compatible with less automatable occupations such as insurance underwriter (median salary of $69,760), loan officer ($64,660), credit analyst ($71, 290), and claims adjuster ($64,900). Workers might need to acquire new credentials or add specific skills to make some of these moves. This type of analysis can be applied at the level of a city, country, state, or industry.

Identifying career pathways in this way can not only help people clarify a course of action in a time of change; it can put more people on the path to upward mobility. Employers, too, can use a similar approach in their internal workforce transformations to map whether employees in declining roles have complementary skills that could make them a good fit for growing roles and determine what kind of additional training they might need to fill the gaps.

Exhibit 7

In our midpoint adoption scenario, net job creation through 2030 is concentrated in some urban counties, while rural areas lose jobs

Estimated net job growth in midpoint adoption scenario, 2017–30, %



Source: McKinsey Global Institute analysis

boost job creation. But even the most thriving cities will need to connect marginalized populations with better opportunities.

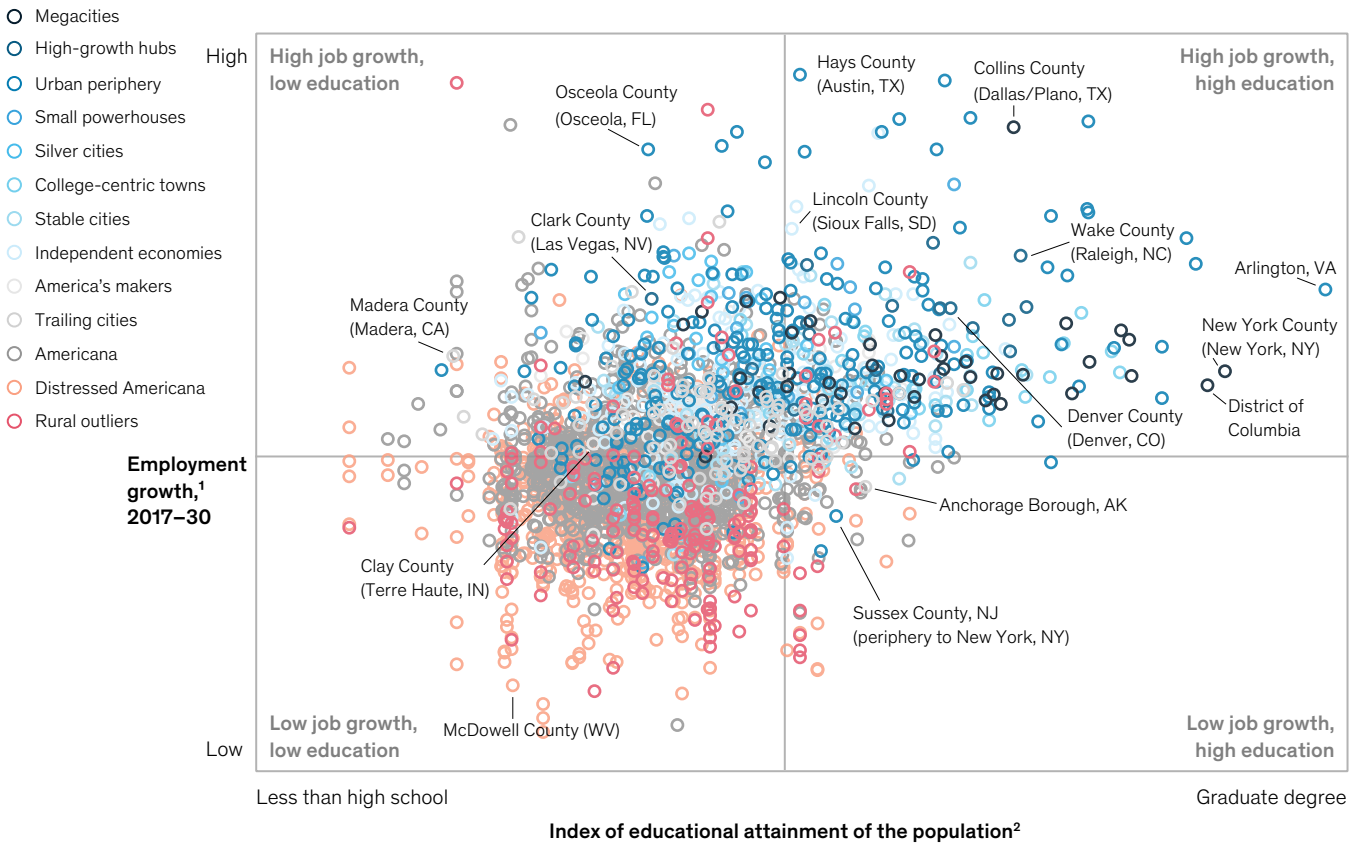
Some niche cities are also well positioned. Small powerhouses could enjoy 15 percent employment growth on average by 2030, fueled in many places by technology businesses. Silver cities are riding a wave of growth as the retirement-age population swells. Employment in this segment could grow by 15 percent as seniors drive demand for healthcare and other services—and as more of them continue working past traditional retirement age. College-centric towns may see 11 percent employment growth over the next decade; they can build on their well-educated talent pools.

On the other end of the spectrum, the decade ahead could be a rocky one for rural America. Low-growth and rural areas as a group account for 20 percent of jobs today but could drive as little as 3 percent of job growth through 2030. Our model indicates anemic 1 percent employment growth over the entirety of the next decade in the more than 1,100 rural Americana counties. Rural outlier counties should continue to sustain growth through natural resources and tourism, although they may manage job growth of only 3 percent. The picture is worst for the roughly 970 distressed Americana counties that are entering the decade in poor economic health. Our model suggests that these areas could experience

Exhibit 8

Urban counties, with higher levels of education, are positioned for stronger job growth

County average educational attainment and employment growth in midpoint adoption scenario, 2017–30



[1] Midpoint adoption scenario. Counties above the line have positive growth, and counties below the line have negative growth.
[2] Scaled from 0-10 where 0 is less than high school, 2.5 is high school, 5 is some college, 7.5 is bachelor's degree, and 10 is graduate degree, multiplying the share of each by its value.

Source: Integrated Public Use Microdata Series (IPUMS ACS); McKinsey Global Institute analysis

net job loss, with their employment bases shrinking by 3 percent.

The mixed middle cities are positioned for modest jobs gains. Some could manage to accelerate growth, but in a period of change and churn, others could slip into decline. Many stable cities and independent economies have relatively educated workforces and could become attractive regional outposts for corporations looking to expand into lower-cost locations. America's makers may see mixed results; they will need clear strategies to shift to advanced manufacturing and rebuild local supply chains.[14]

Exhibit 8 shows that correlation between the educational attainment of individual communities and their future economic prospects. Most fast-growing cities fall into the upper right quadrant, with highly educated workforces and more robust employment growth; the reverse is true for rural counties, many of which are concentrated in the lower left quadrant. Some stable cities and independent economies combine relatively lower education levels with high job growth potential, raising questions about the quality of the jobs they are generating. Notably few places combine high education levels with poor employment prospects.

[14] Making it in America: *Revitalizing US manufacturing*, McKinsey Global Institute, November 2017.

Less educated workers are most likely to be displaced, while the youngest and oldest workers could face unique challenges

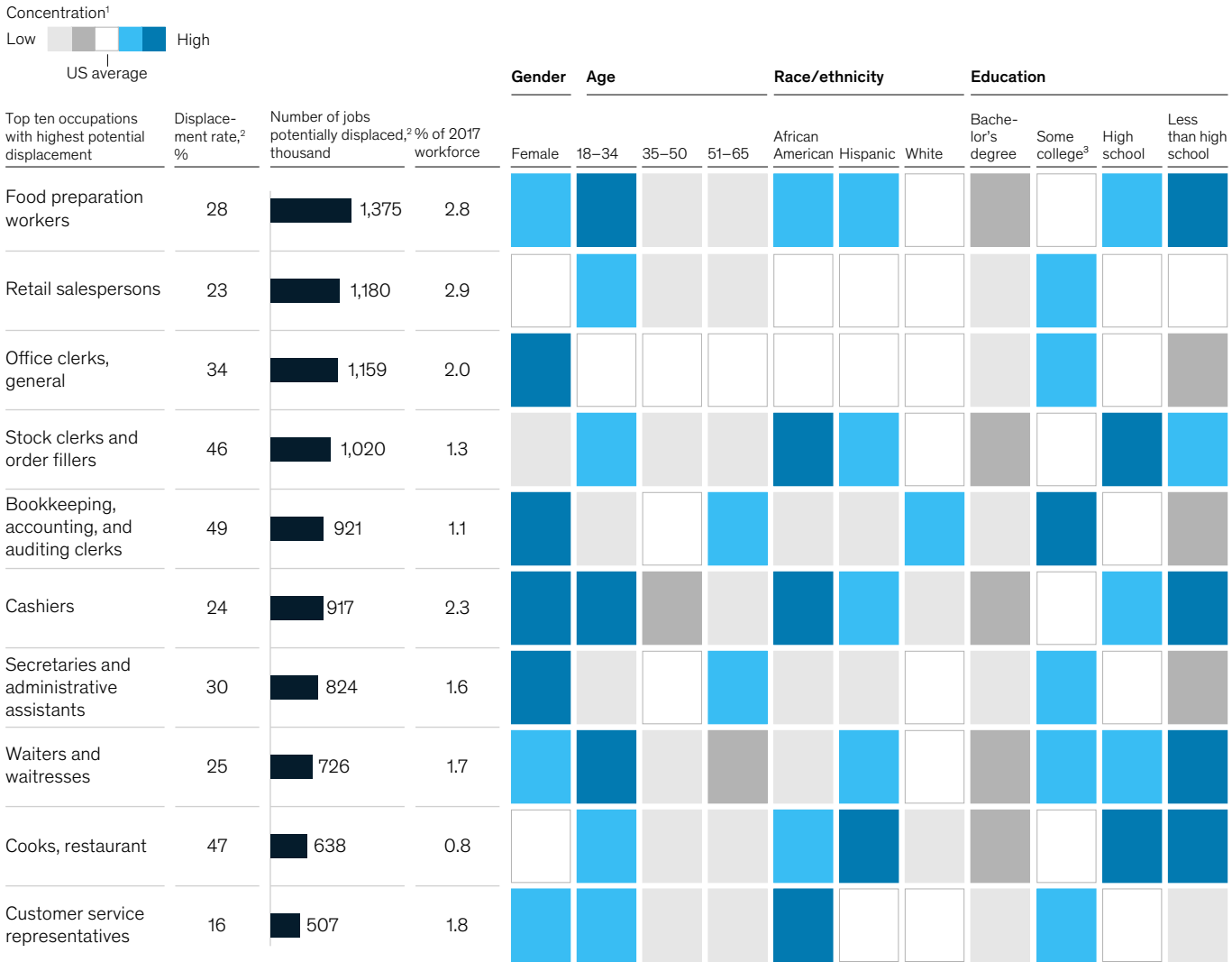
The effects of automation will vary across specific demographic groups (Exhibit 9). Understanding who holds the occupations with the highest automation potential today and which workers are best positioned for future job growth is an important first step for designing targeted interventions and training programs. Our findings suggest that automation could disproportionately affect workers in already underrepresented racial groups.

Workers with the lowest levels of educational attainment are at greatest risk

Education does not automatically confer job skills, but we rely on educational attainment as a proxy for skills—and it stands out as a key indicator of displacement risk from automation. We find

Exhibit 9

Some occupations with high displacement potential have skewed demographic concentrations



[1] Measured by comparing share of persons fitting each demographic profile in an occupation with share in total US workforce.
[2] 2030 midpoint adoption scenario.
[3] Includes associate's degrees.

Source: US Bureau of Labor Statistics, Integrated Public Use Microdata Series (IPUMS ACS) 2017; McKinsey Global Institute analysis

14.7M

young workers are in highly automatable jobs

that individuals with a high school degree or less are four times more likely to be in a highly automatable role than individuals with a bachelor's degree or higher—and as much as 14 times more vulnerable than someone with a graduate degree.

For a number of years, job postings have shown persistent "degree inflation." One report found that almost two-thirds of job postings for executive assistants, for example, now call for a bachelor's degree when only 19 percent of those employed in those roles at the time of the study held those degrees.[15] Breaking this trend by focusing on the specific skills needed in a given job, rather than on degree requirements, can vastly increase the number of qualified job applicants and create opportunities for more people.

Because some minority groups have lower educational attainment, we find they are more vulnerable to being displaced by automation. Hispanic workers, for instance, are overrepresented in food service roles and have the highest rate of potential displacement among all minority groups, at 25.5 percent (7.4 million individuals). For African Americans, the potential displacement rate is 23.1 percent (4.6 million individuals). White workers have a potential displacement rate of 22.4 percent, and Asian-American workers have the lowest rate, at 21.7 percent. Particularly in places such as California, Texas, and Florida, all of which have large concentrations of Hispanic workers, targeted retraining and job placement programs will be needed.

Automation will pose particular challenges for young and old workers

Automation will affect workers across age brackets, but both the youngest and oldest segments of the labor force face unique risks.

Young people will need new career paths to build skills and gain a foothold into the working world. Tens of millions of Americans can think back to their first jobs in retail or food service—roles that gave them valuable soft skills and experience that propelled them on their way. But these are the very roles that automation could phase out. Roughly 14.7 million workers under age 34 could be displaced by automation; almost half of them are in roles with high separation rates, so employers may not see a clear business case for retraining and redeploying them. It will be important to create a wider variety of pathways from high school to work, perhaps through apprenticeship.

On the opposite side of the generational divide, some 11.5 million US workers over the age of 50 could be displaced by automation. While some of these workers are close to retirement, others have years to go. One study looking at labor market recovery after recessions found that displaced workers ages 55 to 64 were 16 percentage points less likely to be re-employed at the time of follow-up surveys than workers ages 35 to 44.[16] While some displaced older workers who have spent much of their career doing one thing may not be willing or able to make a drastic change, millions more might embrace the opportunity to train for different lines of work.

While both men and women could be displaced by automation, women may be better positioned for future job growth

Many of the specific jobs most at risk from automation skew heavily toward one gender or the other. Men, for example, make up the majority of drivers and assembly line workers, while administrative assistants and bookkeepers are predominantly female. Overall, women represent 47 percent of the displaced workers in our midpoint automation scenario, while men are 53 percent. Based on the current gender share of occupations, our modeling suggests that women could capture 58 percent of net job growth through 2030, although the gender balance in occupations can and does change over time. Much of this is due to women's heavy representation in health professions and personal care work.

[15] *Moving the goalposts: How demand for a bachelor's degree is reshaping the workforce*, Burning Glass Technologies, September 2014.
[16] Henry S. Farber, *Job loss in the Great Recession and its aftermath: US evidence from the Displaced Workers Survey*, NBER working paper number 21216, May 2015.

But these growing categories consider only jobs that exist today. Recent research notes that men are more heavily represented in "frontier" jobs involving cutting-edge technologies, which may position them for other jobs that have yet to emerge.[17] Improving the representation of women in the tech sector is a priority. A 2018 report that surveyed 279 companies with a combined workforce of 13 million found that progress on improving gender diversity has stalled, despite the fact that more women than men earn college degrees.[18] Overall, this period of change is an opportunity for many women to move into more productive, better-paying work.[19]

The opportunities and challenges for employers depend on their workforce characteristics and geographic footprint

To take full advantage of what automation technologies can do for innovation and productivity, employers will need to rethink business processes and workflows—all of which may require large-scale workforce transformations. Several factors will shape their decisions: the state of their current digital initiatives, the share of current work that machines can handle, whether technology complements existing labor or substitutes for it, the diversity of current roles, the education level of the current workforce, turnover rates, and the customer experience.

Large-scale workforce transformation requires vision and adept leadership from the entire management team—and it has implications for the company's overall strategy, operations, talent needs, capital investment, geographic footprint, diversity goals, and external reputation. As the demand for labor shifts across the country, these changes will affect the geography of consumer purchasing power.

Every company will forge its own path. But some common considerations exist, particularly for companies with similar profiles. While not exhaustive, Exhibit 10 profiles the opportunities and challenges for six types of employers with varying workforce characteristics, geographic concentrations, and density of automatable activities.

For example, a company with a large, nationally distributed frontline workforce, such as those in retail, food service, and hospitality, can raise productivity through labor-saving automation.[20] Retraining and redeploying workers into other roles, for instance in distribution centers or customer experience roles, might make sense. With high turnover rates in entry-level roles, however, companies may not see a clear business case for retraining. But it is wrong to assume that training cannot pay off for these workforces; many employers have found that offering learning programs and upward pathways can reduce attrition rates and enhance employee engagement.[21] This period of transition could be a once-in-a-generation opportunity to transform many "dead-end" jobs into more interesting and rewarding work. Because these employers will be making decisions that affect millions of low-wage workers, they could affect many local communities.

The challenges look very different for geographically concentrated businesses with white-collar workforces. Automation and AI technologies could replace millions of workers in middle- to high-wage accounting, finance, business, legal, and support functions. Many of these workers have college degrees, with low turnover and attrition, presenting companies with meaningful decisions regarding redeployment. Their challenge will be determining when to hire external talent with digital skills and when retraining and redeploying committed workers who already know the company's business and culture is feasible.

[17] David H. Autor, *Work of the past, work of the future*, Richard T. Ely Lecture, American Economic Association Annual Meeting, Atlanta, GA, January 4, 2019.
[18] *Women in the Workplace 2018*, McKinsey & Company and LeanIn.Org.
[19] For more on this topic, see *The future of women and work: Transitions in the age of automation*, McKinsey Global Institute, June 2019.
[20] Steven Begley, Bryan Hancock, Thomas Kilroy, and Sajal Kohli, "Automation in retail: An executive overview for getting ready," May 2019, McKinsey.com.
[21] See, for instance, Zeynep Ton, *The Good Jobs Strategy: How the Smartest Companies Invest in Workers to Lower Costs and Boost Profits*, Boston, MA: Houghton Mifflin Harcourt, 2014.

Exhibit 10

Employers' opportunities and challenges depend on company footprint and workforce characteristics

Size of workforce | Share of workers with bachelor's degree | Automation displacement rate

Workforce characteristics	Examples	Description	Key challenges
White-collar workforces 25M–30M · 35–45% · 20–25%	Insurance Banking HQ functions Gov't agencies	Concentrated footprint, middle- and high-skill workforce with low turnover. Process automation can enhance efficiency but may displace workers.	• Retraining and redeployment to new roles within the company, especially digital • Hiring required tech talent
Nationwide customer-facing 15M–20M · 15–25% · 25–30%	Retail Food service Hospitality	Nationally dispersed geographic footprint. Majority of workforce is in lower-skill jobs with high turnover.	• Economics of retraining may be challenging given high turnover • Reskilling and redeployment (into managers, delivery, other new customer experience roles)
Movers and builders 10M–15M · 5–15% · 20–25%	Parcel delivery Warehouses Construction	Mix of local and national footprint. Largely middle-skill workforce, some with specialized skills. High diversity of occupations and automation potential.	• Training employees to integrate, operate, and maintain technologies • Finding adjacent middle-skill occupations to redeploy workers
Specialized practitioners 5M–10M · 50–60% · 10–15%	Healthcare Education Professional services	Middle- to high-skill workforce. Automation complements labor and reduces routine tasks, allowing more time on highest-value-added work.	• Continuous learning to adopt new technology • Finding new business models that leverage technology, including remote service delivery
STEM-based workforce 5M–10M · 65–75% · 10–15%	Pharmaceutical Tech Software	Highly specialized, high-skill workforce with concentrated geographic footprint. High pace of sector technology change.	• Attracting and retaining top talent and continuous learning • Rethinking location strategy based on cost and access to talent
Makers and extractors 5M–10M · 5–15% · 25–30%	Manufacturing Oil and gas Mining	Geographically concentrated. Low- to middle-skill workforces performing physically intensive and repetitive tasks. Lower turnover.	• Building technical capabilities; attracting talent to remote areas or retraining existing employees • Potential for community disruption

Note: "Archetype" refers to organizations with particular workforce characteristics, largely determined by work activities and related skills, workforce mobility and churn, and geographic footprint. "Examples" highlight sectors in which these workforce characteristics are common, although they are not universal or exhaustive. The "key challenges," too, are highlights rather than a comprehensive list.

Source: McKinsey Global Institute analysis

Local business leaders, policy makers, and educators will need to work together to chart a new course

The next decade will bring every community new challenges—but also new opportunities to boost innovation, productivity, and inclusive growth. Even in the nation's most prosperous cities, large populations are already struggling to find a place in the new economy and keep up with the rising cost of living. But in general, cities are more diversified and have more resources and investment flows on which to draw. Reinvention will be a harder task for trailing cities, some manufacturing towns, and rural counties that never bounced back from the Great Recession. Without forward-thinking interventions, the disparities separating America's communities could widen.[22]

The good news is that there is a growing tool kit of potential solutions, and many promising pilots are under way. The relative priorities will vary from place to place, and each community will need to determine what is most urgent and set its own agenda (Exhibit 11). Wherever they choose to begin, the growing urgency for coordinated action from local business leaders, policy makers, educators, and other stakeholders from coast to coast is clear.

Connecting workers with opportunities

A central challenge in the automation age will be connecting millions of displaced workers to new, growing jobs. Some may need to change jobs within the same company, and employers would provide the necessary training in these situations. But many workers may need to switch employers or make even bigger moves to different occupations in new locations. A survey of US households found that over half of workers displaced between 2005 and 2015 found their next job in a different industry.[23] For these workers, governments and other stakeholders can help to make local labor markets more fluid and easier to navigate.

In a more technology-driven world, job-matching efforts can be aided by a range of new digital tools and should run on easily accessible digital platforms. New online tools can assess an individual's skills, suggest appropriate career choices, and clarify which jobs are in demand and the credentials needed to obtain them.[24] Many efforts are under way to centralize and standardize information on skills, job postings, and credentials.[25] The Markle Foundation's Skillful initiative brings together employers, state governments, technology experts, and educators to improve job matching.

Geography itself can be a barrier to connecting to new opportunities, given the declines in Americans' mobility. It is sometimes suggested that people should simply leave distressed places and move to where the jobs are. But this greatly oversimplifies the weight of this decision for individuals who may have deep personal and family ties to the places where they live, as well as economic barriers to leaving. Addressing the affordable housing shortage in the fastest-growing urban areas would enable people who *do* want to move for better opportunities to do so (and would create demand in the construction sector at the same time). Because there is a national benefit to improving labor market fluidity, policy makers might consider providing relocation assistance or tax credits, as they have for other investments, such as home energy efficiency.

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[22] For a comprehensive discussion of potential policy interventions, see *The work ahead: Machines, skills, and US leadership in the twenty-first century*, Council on Foreign Relations, Independent Task Force Report number 76, 2018; *America at work: A national mosaic and roadmap for tomorrow*, Walmart, 2019; and Ethan Pollack, Alastair Fitzpayne, and Conor McKay, *Automation and a changing economy*, Aspen Institute Future of Work Initiative, April 2019.

[23] *Addressing America's reskilling challenge*, US Council of Economic Advisers, July 2018.

[24] *Online talent platforms: Connecting workers with opportunity in the digital age*, McKinsey Global Institute, June 2015.

[25] Major efforts are under way to create a consistent taxonomy to describe workforce skills. The US Chamber of Commerce Foundation and the Lumina Foundation have launched the T3 Innovation Network to create an open data ecosystem to centralize information on skills, credentialing, and the needs of the economy and to standardize how skills are defined across industries and employers. A nonprofit called Credential Engine is creating an online registry to make information about the thousands of varying credentials across the country more transparent and searchable.

Retraining workers and providing lifelong learning

Workforce skills have been a growing concern in the United States for many years. Now new and higher-level skills are in demand, including not only digital skills but also critical thinking, creativity, and socioemotional skills. The skills needed in fast-growing STEM roles, in particular, are continuously evolving. The old model of front-loading education early in life needs to give way to lifelong learning. Training and education can no longer end when workers are in their twenties and carry them through the decades.

Employers will be the natural providers of training and continuous learning opportunities for many workers. For instance, Walmart's Academy is designed to allow high-performing associates to move into management. Toyota's Advanced Manufacturing Technician program integrates a two-year technical degree curriculum with paid part-time employment. SAP quantified an expected skills gap, then mapped comprehensive "learning journeys" to help thousands of employees transition into new roles through in-house classroom training courses

Exhibit 11

Communities face different future of work challenges

		Key priorities
Urban core *Megacities* *High-growth hubs*		• Increase affordable housing near employment centers • Involve employers in creating high school and community college programs to develop key skills needed in growing fields • Target job training and placement to low-income and marginalized populations • Improve transportation links within city and with periphery
Urban periphery		• Attract investment in high-value businesses to diversify beyond local services • Link tertiary education programs to urban employers to create talent pipeline • Improve transportation links with city and within periphery
Niche cities *Small powerhouses* *Silver cities* *College-centric towns*		• Promote startup clusters and innovation (technology businesses in small powerhouses, healthcare in silver cities, university spin-offs in college-centric towns) • Adopt varying local strategies: silver cities need to attract young workers in growing industries; college-centric towns need to prevent brain drain and address poverty rates
Mixed middle *Stable cities* *Independent economies* *America's makers*		• Create a clear value proposition and economic development strategy to attract investment to create a thriving economic cluster • Facilitate entrepreneurship through incentives, access to capital, and streamlined regulation • Retrain and redeploy workers at scale to avoid unemployment and slow-growth downward spiral
Low-growth and rural areas *Trailing cities* *Americana* *Distressed Americana* *Rural outliers*		• Identify potential anchor industries that can be growth engines building on local advantages (e.g., low-cost land) • Improve / update skills through high school completion programs, apprenticeships, training boot camps • Expand digital infrastructure and teach digital skills to enable remote work

Source: McKinsey Global Institute analysis

and boot camps, job shadowing, and on-the-job practice.[26]

Many workers who need to switch employers or change occupations will need training options outside the workplace. All levels of government, nonprofits, education providers, and industry associations can play a role here. Midcareer workers need to continue paying their bills while they train for the next chapter in their careers; they require short, flexible courses that follow the boot camp model, teaching new skills in weeks or months rather than years.

Across the country are numerous examples of industry-specific training programs delivered through local educational institutions that result in job placements. Georgia's Quick Start, for instance, is a state-funded program that provides customized workforce development training at no cost to qualified businesses; it covers industries such as advanced manufacturing and bioscience. The online company Coursera offers an eight-month Google-designed IT support certificate program that has drawn tens of thousands of trainees. Udacity, another online learning company, offers "nanodegrees" in areas including data science, programming, and cloud computing.

4X **higher risk of displacement for workers with high school diplomas or less**

The millions of Americans who did not complete high school will be hit hardest by automation. The Michigan 23+ program aims to reach them with an online program offering high school diplomas, workforce credentials, guidance, and job placement. The American Association of Community Colleges' Plus 50 initiative provides grants to hundreds of individual institutions across the country for workforce training programs geared to participants over age 50.

The challenge ahead is to scale up the most successful programs. Using data to track employment outcomes will be essential so that funding can be channeled into what works and individuals can make more informed choices about their own training and careers. The most effective programs will need to be replicated across cities, regions, and industries.

Creating tailored economic development strategies to boost job creation

Every community, from the most dynamic to the most distressed, faces economic development issues that need to be solved at the local and regional level. Priorities may vary across different community segments, and individual cities and counties will need highly tailored strategies. For megacities and high-growth hubs, the priorities may be connecting disadvantaged populations with new opportunities, adding affordable housing, and improving transportation. The communities in the mixed middle segment need to accelerate economic growth and focus on entrepreneurship and skills development.

For rural counties, the road is tougher. Many of these places lack the economic base or the inflows of investment or people to create new jobs. No amount of workforce retraining can solve the bigger challenge of lack of economic activity. Individual companies can help to ease this strain by considering whether there is a business case for establishing operations in more affordable parts of the country that need the investment.

Turning around places that have lost their economic dynamism is a multiyear journey, but it is possible. Each community will have to take inventory of its assets, such as available industrial space, natural attractions, local universities, and specialized workforce skills.[27] That data can form the basis of an economic development plan built around a growth engine industry that can create jobs and spillover effects. The next step is attracting investment, which does not have to come from within the United States. Subsidies and tax incentives can be part of the tool kit, but they need to be backed by a rigorous business case. Incentives for brownfield investment could help legacy firms modernize and grow. Almost every city and county has pockets of poverty that need special attention. Stabilizing the most distressed neighborhoods may take extra invest-

[26] "Building the workforce of tomorrow, today," *McKinsey Quarterly*, November 2018.
[27] See James Fallows and Deborah Fallows, *Our Towns: A 100,000-Mile Journey into the Heart of America*, New York, NY: Pantheon Books, 2018.

ment and targeted efforts (such as blight removal, home and infrastructure repair, and additional community services).

The growing acceptance of remote working models could be a positive trend for creating jobs in rural counties, whether full-time work-at-home employee roles or contract work. But it will take a push to continue building out fast, affordable broadband in the regions that still need service. The Rural Innovation Initiative, recently launched in nine communities nationwide, is building outposts for workers in the downtowns of rural cities, aiming to spur professional collaboration and nurture tech talent across the country.

Supporting workers in transition

In this period of technological change, the United States will need to look at modernizing and strengthening the social safety net to support people transitioning between jobs. Workers displaced from full-time roles experience an average 35 percent loss of earnings, due to gaps in employment or working fewer hours at a new job.[28] Some of the people most likely to be affected are already living paycheck-to-paycheck. For them, even a short period of disruption could provoke tremendous stress.[29]

Supporting them can take many forms: longer and more flexible income support programs during periods of unemployment, relocation assistance, training grants, and earned income tax credits. Because unemployment insurance is administered at the state level, this is an opportunity for state governments to innovate and lead. In addition, establishing tax incentives for employers to offer job retraining could help to head off some potential displacements before they occur.

Portable benefits—tied to the worker rather than the employer—could offer stability to people who need to move between opportunities and geographies. Benefits could be universal for full-time, part-time, and independent workers, and they could be prorated so that contributions are tied to hours worked for different employers. A broader system of portable benefits can offer more stability and free more Americans to strike out on their own and become entrepreneurs.

Wages and purchasing power are real concerns. Although a tighter labor market may increase wage growth in the short term, it will take sustained growth to counter the trend of wage stagnation, which dates to the 1980s.[30] In the decade ahead, if displacement leaves more uncredentialed workers competing for the jobs that remain, this surplus labor could flood the market and again drive down wages at the lower end of the pay scale. Policy makers and employers alike cannot ignore the implications if a large share of the population is falling behind.

The United States does not have to let opportunity concentrate in a limited number of places, some of which are straining at the seams, while others wither. Policy choices, along with increased public and private investment in people and in the places that need it, can create more inclusive growth. Companies can make a difference by recognizing that talent is available all over the country and investing alongside other entities to realize untapped potential. The nation will need the combined energy and ingenuity of many local coalitions from coast to coast, united not in fighting against technology but in preparing US workers to succeed alongside it.

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[28] Henry Farber. "Employment, hours, and earnings consequences of job loss," *Journal of Labor Economics*. Volume 35, number S1, July 2017.
[29] Conor McKay, Ethan Pollack, and Alastair Fitzpayne, *Automation and a changing economy, Part I: The case for action*, Aspen Institute Future of Work Initiative, April 2019.
[30] Jay Shambaugh et al., *Thirteen facts about wage growth*, The Hamilton Project, Brookings Institution, September 2017.

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Healthcare tomorrow and the potential for technological transformation

The era of exponential improvement in healthcare?

Stephanie Carlton and Shubham Singhal

Technology-driven innovation holds the potential to improve our understanding of patients, enable the delivery of more convenient, individualized care—and create $350 billion–$410 billion in annual value by 2025.

Healthcare advances have delivered great benefits to society, bringing material improvements in average life spans and quality of life.[1] Yet these improvements have come at a cost—an ever-expanding portion of the US GDP is being consumed by healthcare expenses, as medical inflation continues to outstrip GDP growth and inflation in the rest of the economy.[2] Going forward, might we be able to deliver healthcare advances while improving affordability? Exponential progress through technology-driven innovation could have deflationary impact on the cost of healthcare while delivering new medical advances. Our analysis shows that there are practical use cases that together have the potential to deliver between $350 billion and $410 billion in annual value by 2025 (out of the $5.34 trillion in healthcare spending projected for that year[3]).

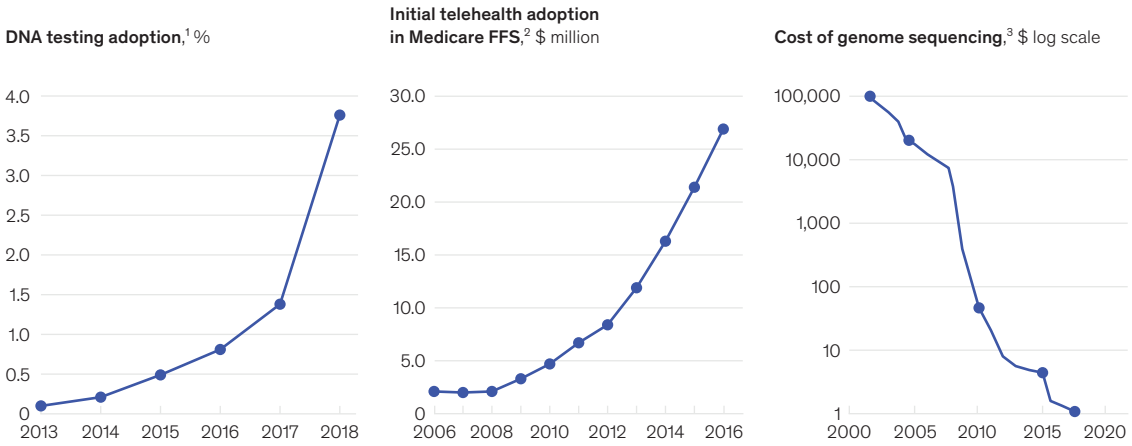
Many information and communication technologies have followed predictably exponential improvement and growth trajectories.[4] Moore's law is a well-recognized example.[5] Technology-based home- and ride-sharing services have grown exponentially to disrupt established businesses by delivering more affordable access to lodging and transportation and greater utilization of capital assets. With the mapping of the human genome and digitization of medical data, healthcare could now be subject to the same type of exponential progress. For instance, the cost of genome sequencing has dropped significantly over the past decade and a half. Adoption of both DNA testing and telehealth, while still small, is growing swiftly (Exhibit 1). Such exponential progress can seem benign at first, with seemingly minimal change to the status quo, but an explosion of progress then follows. To illustrate, if the rate of improvement doubles every year, it would take seven years to get from 0.01 to 1 percent—but only another seven years to get to 100 percent.

Exponential progress, however, is not preordained. Technology-driven progress can be quite expensive in the early days as initial R&D costs are amortized. We see this today in the cost of emerging genomics-based treatments. Additional investments are necessary to underwrite a longitudinal, fully integrated patient data infrastructure,[6] as well as the development of advanced analytics and machine learning capabilities. How will these

1 For the past three years, life expectancy has declined, largely because of a broader set of behavioral health issues. (See Murphy SL et al. Mortality in the United States, 2017. National Center for Health Statistics Data Brief, no. 328. November 2018. cdc.gov.)
2 See Exhibit 1 in Singhal S, Coe E. The next imperatives for US healthcare. McKinsey white paper. November 2016.
3 Office of the Actuaries in the Centers for Medicare & Medicaid Services. National health expenditure projections, 2018–2027. cms.gov.
4 Kurzweil R. *The Singularity is Near: When Humans Transcend Biology*. 2005.
5 Moore's law is an observation made by Intel's founder Gordon Moore that the number of transistors on a chip doubles each year, whereas the costs are halved.
6 For example, additional investments are needed to establish common data standards across providers and to ensure good data hygiene following the adoption of electronic health records.

Exhibit 1

Progress in healthcare can be exponential



FFS, fee-for-service.
[1] Consumer adoption of major testing companies (Ancestry.com and 23andme) within the US, assuming one test per person.
[2] Based on Medicare physician fee schedule claims for distant site telehealth visits per 1,000 FFS Part B beneficiaries. Although the data shown here is only a small fraction of Medicare's budget (approximately $770 billion for 2019), it illustrates the increased utilization of telehealth services.
[3] Based on National Human Genome Research Institute data.
Source: Medicare Payment Advisory Committee, *Report to the Congress: Medicare Payment Policy*, March 2018; National Human Genome Research Institute, DNA sequencing costs: Data, April 25, 2018; Regaldo A, "2017 was the year consumer DNA testing blew up," *MIT Technology Review*, February 12, 2018

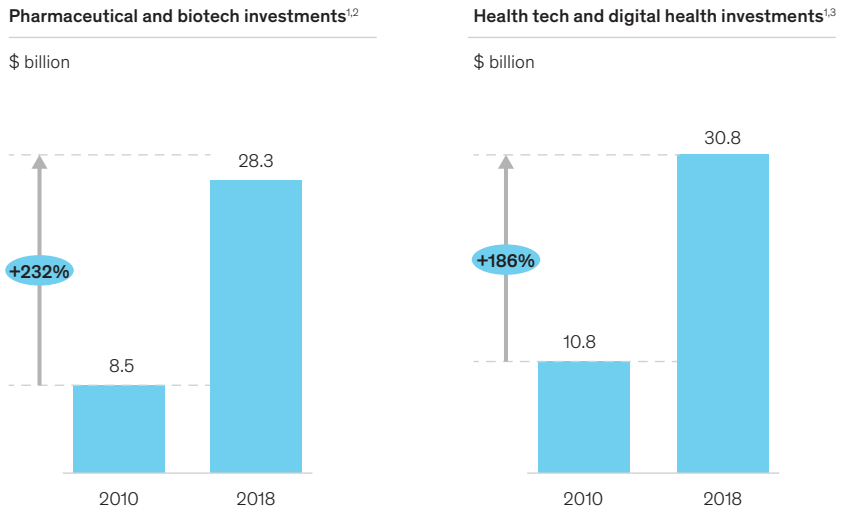
investments be funded and early high costs absorbed? Over the past decade, the amount of private equity and venture capital deployed in pharmaceutical, biopharma, health technology, and digital health assets has grown (Exhibit 2). The next five to seven years are likely to require a sustained upshift in investment to unlock the potential of these assets, and the strategies used to pursue this potential could have significant effects on both their effectiveness and rate of adoption. Once progress gets underway and the exponential improvements seen typically with information and communication technologies take root, at-scale costs could drop rapidly.

Within healthcare, however, traditional dynamics—resulting from ingrained consumer and clinician behaviors, entrenched stakeholder interests, a complex regulatory framework, and the fragmented nature of the market—have affected, and may continue to affect, the adoption of new technology-enabled approaches and innovation. Indeed, it is possible that if these traditional dynamics predominate, exponential progress may not come to pass in the foreseeable future.[7] These forces certainly make it difficult to predict the pace of change. Nonetheless, the ascent of technology-driven disruption in other industries (consider online retail platforms, home- and ride-sharing services, and personalized, on-demand media) demonstrates that underestimating the pace and extent of change can be more problematic for incumbents than overestimating it. At a minimum, technology innovators are reshaping consumer expectations for healthcare: today's consumers expect personalized, device-enabled, intuitive 24/7 service that revolves around convenience and empowerment in all areas of their lives.[8,9]

7 We acknowledge that, in general, portfolio momentum from a zealous focus on growth out-competes the market, but it is possible for incumbents to invest in the wrong place at the wrong time during periods of industry disruption. Atsom Y. How growth champions thrive even in stagnating markets. McKinsey white paper. August 2017.
8 Cordina J et al. Healthcare consumerism 2018: An update on the journey. McKinsey white paper. July 2018.
9 Cordina J et al. Debunking common myths about healthcare consumerism. McKinsey white paper. December 2015.

Exhibit 2

Sizeable investments are being made to fuel healthcare innovation



[1] Includes venture capital and private equity funding sources only and excludes all PIPE (private investment into public entity) investments.
[2] Sum of investments in biotechnology, healthcare discovery tools, drug delivery, drug discovery, and pharmaceutical categories.
[3] Health tech is defined as mobility and information technology companies that aid care delivery while decreasing costs; digital health is defined as hardware and software solutions to track health and enable patient-physician communications.

Source: PitchBook data (2010–2018); McKinsey analysis

To understand the potential for industry disruption, consider: clinical care, an important and primary focus for the healthcare industry to date, explains about 15 percent of overall health outcomes; social determinants, health behaviors, and genetics account for the rest.[10] Consider further that the average patient will, in his or her lifetime, generate about 2,750 times more data related to social and environmental influences than to clinical factors (Exhibit 3). In a data- and technology-enabled world, it is not a stretch to imagine that whole new business models could be created by nonhealthcare players to deliver superior health outcomes.

In the remainder of this article, we address three topics: What emerging technologies have the potential to reshape healthcare? What is the potential value at stake? What disruptive changes might happen?

What emerging technologies could reshape healthcare?

Healthcare innovation is occurring at an unprecedented pace. The Center for Drug Evaluation and Research in the Food and Drug Administration (FDA) approves double the average annual number of novel drugs as it did a decade ago.[11] Among the therapies approved in 2017, 15 were first-in-class, indicating that they had a unique mechanism of action; another 18 address rare or orphan diseases. Some could dramatically improve the precision of diagnostics and the ability to personalize treatments (for example, through biomarkers), which could help reduce the significant variability in outcomes achieved by standard therapies. In the past two years, truly individualized treatments have been approved, ones that genetically modify patients' immune cells to battle leu-

[10] This estimate is based on a McKinsey analysis of data from a range of organizations (for example, Centers for Disease Control and Prevention, Association of State and Territorial Health Officers), academic studies (for example, Hood CM et al. County health rankings: Relationships between determinant factors and health outcomes. *American Journal of Preventive Medicine*. 2016;50(2):129–35), and other groups, including the Robert Wood Johnson Foundation (see Medicaid's role in addressing social determinants of health. Robert Wood Johnson Briefing Series. Issue 5. February 2019).
[11] Center for Drug Evaluation and Research. Advancing health through innovation: 2017 new drug therapy approvals. US Food and Drug Administration. 2018. fda.gov.

kemia and lymphoma.[12] Curative therapies could substantially alter the nature and length of delivery system demands from patients with chronic illnesses, potentially creating downstream savings. Furthermore, the care delivery requirements of some novel treatments could make possible more convenient and affordable care in or closer to patients' homes.

Novel drugs are just one of nine emerging technologies that are reshaping healthcare in multiple ways—how consumers access it, how and which providers deliver it, and what health outcomes are achieved. Some of these innovations are specific to healthcare; others are more advanced in nonhealthcare sectors but hold tremendous potential in healthcare.

Connected and cognitive devices. Portable, wearable, ingestible, and/or implantable devices can monitor health information, engage patients and their community of caregivers, and deliver therapies autonomously.

Electroceuticals. Small implantable devices can alter the nervous system's electrical impulses to treat a variety of diseases.

Targeted and personalized medicine. Novel drug therapies that use a patient's own cells or deliver targeted genetic material can often treat disease more successfully than small-molecule or protein-effector drugs can.

Robotics. Next-generation robots could enable minimally invasive approaches and ease the physical burden of surgeries. Advanced robotics could also expand automation beyond specimen and material transport within the hospital to facilitate instrument handling and other tasks within the operating room.

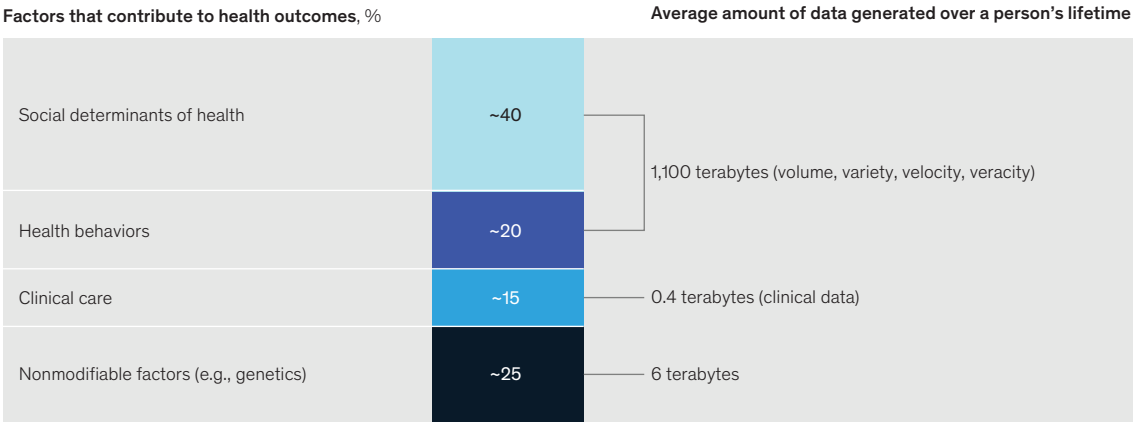
3D printing. This technology can produce customized, 3-dimensional structures composed of biological and industrial materials, in the process creating organ replacements, personalized prosthetics, and precision medication dosages.

Big data and analytics. Platforms and applications that store, transmit, and analyze continuously expanding medical data sets can be used to identify patients who are candidates for highly targeted therapies. In the future, physiological data recorded by robots during procedures could be leveraged to improve both medical education and surgical planning. As more data becomes readily available—some sources suggest an annual growth rate in available data of 48

[12] Aptekar J et al. Precision medicine: Opening the aperture. McKinsey white paper. February 2019.

Exhibit 3

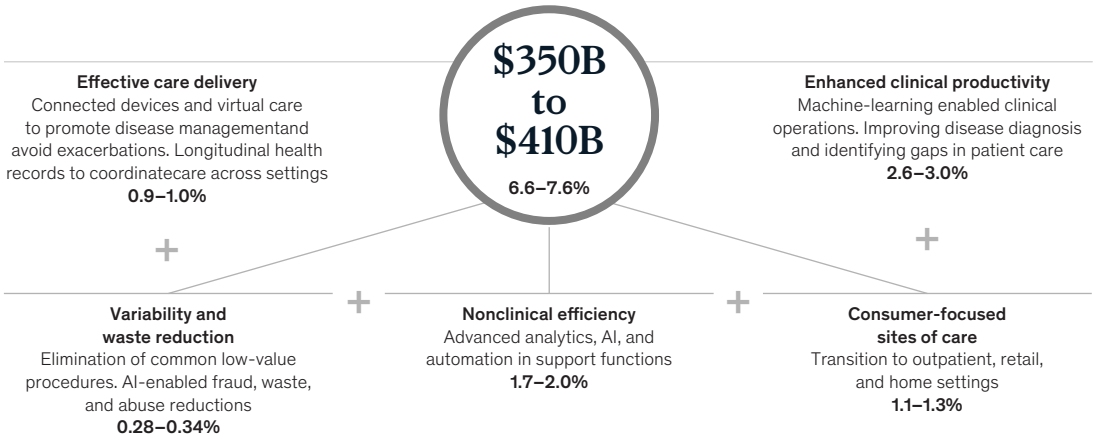
Societal issues have a major impact on consumer health



Source: Bureau of Labor Statistics; Robert Wood Johnson Foundation; IBM Watson (Latts L. *The age of big data and the power of Watson.* European Medicines Agency presentation. Updated April 1, 2017); McKinsey analysis

Exhibit 4

Technology-driven value estimates are based upon potential use cases



AI, artificial intelligence.
Source: McKinsey analysis

percent[13]—the opportunity to better collect data and translate it into actionable insights is increasing.[14]

Artificial intelligence (AI). Technologies that convert analytical insights into cognitive engagement solutions can enhance diagnosis, improve predictive interventions, and optimize clinical productivity.

Blockchain. This decentralized digital ledger technology holds the potential (with clear and simple use cases[15]) to enable more secure transactions, more confidential patient data sharing, and more democratized data access, which could allow other technologies to better leverage data (for example, provider directories that can be rapidly updated with new network structures).

Robotic process automation (RPA). The automation of repetitive tasks (including the majority of claims processing) via simple rules or heuristics has the potential to rapidly enhance productivity.

While we cannot predict precisely how quickly each technology will emerge and scale in healthcare, each has the potential to have significant impact over the next five to seven years. Among the factors that will influence the speed of change are the pace of innovators, the appetite of incumbents for change, and the rate at which regulations adapt to technology.

What is the potential value at stake?

By 2025, US healthcare spending is expected to top $5.34 trillion.[16] Recently, we identified a $284-billion to $550-billion opportunity for value creation from the application of best practices to improve healthcare productivity and market function.[17] Integration of the nine emerging technologies in healthcare could create an additional $350 billion to $410 billion in value annually by 2025 (Exhibit 4). This value creation could be offset, in part, by increased demand due to improved affordability (that is, if individual healthcare services are more affordable, utilization could rise, which could reduce gross savings to the system). Nevertheless, these value creation levers may have the potential to contain the growth in health expenditures to be in line with broader economic growth.

[13] Stanford medicine 2017 health trends report. Harnessing the power of data in health. June 2017. med.stanford.edu.
[14] Admittedly, data privacy and patient privacy regulations will influence the extent to which this can be done.
[15] Higginson M et al. Blockchain's Occam problem. McKinsey white paper. January 2019.
[16] Office of the Actuaries in the Centers for Medicare & Medicaid Services. National health expenditure projections, 2018–2027. cms.gov.
[17] Singhal S, Coe E. The next imperatives for US healthcare. McKinsey white paper. November 2016.

Technology could accelerate the shift... to consumer-focused sites of care.

This estimate of value creation reflects a net effect and the beginning of paradigm shifts in how healthcare is delivered. New curative therapies, for example, might be more expensive than current drugs but hold the potential to improve outcomes for patients with previously unaddressable conditions and lower the costs associated with current care delivery approaches.[18] We have estimated the shifts in costs[19] and incorporated them into our net impact estimate of technology-driven healthcare disruption. However, it is also possible that new curative therapies could deliver or make possible other economic benefits that might eventually affect the shifts in spending. For instance, our estimate did not assess the potential impact to economic productivity and lifetime healthcare costs that could be realized through better health or increased longevity.

We outline below why we believe this value creation is possible in several categories, based on our review of the evidence, identification of use cases, and quantitative analysis. The estimates of value creation are discrete and do not overlap across categories; in each category, they are shown as percentages to better inform the strategic planning efforts of incumbents and innovators alike. The question to be considered in realizing this value is: Will healthcare incumbents and attackers advance the business strategies to capture the potential value? Put another way, will the technology overcome the inertia of the healthcare industry and consumers of care under the status quo?

Consumer-focused sites of care optimization

We believe the combination of the nine emerging technologies discussed above can enable greater innovation in moving care into or close to patients' homes. Consumers increasingly expect this for healthcare services[20] now that they can shop, connect with friends, bank, and access personalized, on-demand media content this way. Care delivered in or close to a patient's home—geographically or in lower-acuity settings that feel like home—is usually less expensive and reduces the risk of nosocomial infections (which provides an additional opportunity for care delivery savings). As regulatory and market pressures evolve, technology could accelerate the shift from traditional hospital settings to consumer-focused sites of care, such as ambulatory surgery centers, retail clinics, and homes.[21,22] For some conditions, at-home management may lower costs by 19 to 32 percent.[23] Home infusion and observation care models are expected to grow by

[18] Over the long term, the combination of these technologies could also affect life expectancy, but the costs and savings associated with longer life expectancy were not analyzed as part of this report.

[19] To estimate the potential impact of these advances, we identified the therapeutic areas and conditions with both high medical spending and unmet need: leukemia, hemophilia, macular degeneration, sickle-cell disease, some breast cancers, some lung cancers, hypercholesterolemia, and depression. We then identified potential therapies in the FDA pipeline and sized the value that could be realized through approval and launch of innovative therapies that could meet these needs by 2025. Using commercial claims data and adjusting for overall population characteristics, we determined the impact of these therapies on spending across all major categories of care (for example, hospital, post-acute, pharmaceutical).

[20] Cordina J et al. Healthcare consumerism 2018: An update on the journey. McKinsey white paper. July 2018.

[21] Note: The scope of procedures appropriate in ambulatory surgery centers (ASCs) supports a potential shift away from traditional hospital care: for 2019, CMS recommended 172 additional procedures to join 3,910 existing procedures eligible for reimbursement through ASCs. (See Centers for Medicare & Medicaid Services. Medicare program: Proposed changes to hospital outpatient prospective payment and ambulatory payment systems and quality reporting programs. CMS-1695-P. 2019. Also see Addendum AA from Centers for Medicare & Medicaid Services. Medicare program: Hospital outpatient prospective payment and ambulatory surgical center payment systems and quality reporting programs. CMS-1678-FC. 2018.)

[22] Merchant Medicine. Reports, data licensing and research. merchantmedicine.com.

[23] Klein S et al. The hospital at home model: Bringing hospital-level care to the patient. The Commonwealth Fund. August 2016; Cryer L et al. Costs for 'hospital at home' patients were 19 percent lower, with equal or better outcomes compared to similar inpatients. *Health Affairs*. 2012;31(6):1237–43.

more than 10 percent over the next five years, as predictive analytics improves its ability to identify patients most likely to benefit from home-based care and connected devices allow clinicians to remotely monitor patients.[24] Increasingly sophisticated data and analytics could, over time, accelerate this transition in care delivery by giving patients clearer information in advance to guide choices related to their site of care.

Many novel treatments could also enable more efficient care delivery. For instance, once protocols are well established for genomics-based treatments, the delivery requirements (which primarily involve infusion and observation) could move into or close to home. While this has not happened rapidly for every new therapy—as slow adoption of home hemodialysis has shown—we describe below some of the achievable savings where we see strong evidence of potential delivery structure and economic impact.

For our economic estimate, we sized the potential value from shifting sites of care for three major care transition areas with broad potential for impact: transferring avoidable emergency department care to urgent care centers or retail clinics, increasing the volume of procedures performed outside the traditional hospital setting (for example, in ambulatory surgery centers), and moving some facility-based care to the home. Based on recent academic and industry literature on the opportunity at stake in each of these three care transition areas, we applied comparable technology adoption rates and assumed that approximately half of the possible value could shift to consumer-focused sites of care by 2025. Several other related shifts in care—for instance, the movement of infusion therapy from the clinic to the home or in-home post-acute care recovery—were not included in our estimate but have the potential to augment this value. In each case, we estimated value using commercial claims data, adjustments for overall population characteristics, and evidence-based assumptions on savings; we then aggregated the projected value across the three areas to determine the total opportunity. Taken together, shifting care to lower-acuity sites could generate annual value equivalent to between 1.1 and 1.3 percent of national health expenditures by 2025.[25,26]

Enhanced clinical productivity

The healthcare industry lags behind other industries in its ability to "do more for less."[27] Yet, the introduction of technology-enabled interventions could dramatically improve productivity in clinical settings (as well as patient outcomes) and eventually lead to the automation of activities related to care delivery. Critical to improving productivity—rather than simply spending more money on technology—is identifying a clear set of use cases and evaluating their potential return on investment (ROI). Examples of such use cases already exist. Robotic technology, for instance, is being used to increase the precision of percutaneous coronary interventions that improve circulation to the heart, which reduces demands on the clinical staff, lowers stent usage in patients, and decreases radiation exposure during the procedure for both groups. Miniature electroceutical devices that can stimulate nerves in the human body are being developed to treat diabetes, arthritis, and asthma. Other tools that could enhance clinical productivity include:

- cognitive engagement platforms designed to improve wellness among all patient segments and, specifically, increase adherence among patients with chronic or high-acuity conditions
- automated analytics tools that enhance diagnosis by utilizing data aggregated across the population
- AI-based assistance in patient diagnosis and routine administrative duties to enhance physician productivity

[24] Home infusion therapy market expected to be worth US $25 billion by 2024. MarketWatch. August 31, 2018. marketwatch.com.
[25] This estimate does not account for the potential additional savings that could be achieved by lowering in-hospital disease transmission.
[26] This analysis used simplifying assumptions: that the shift to lower-acuity sites would not lead to overutilization of services; that this shift could lead to a reduction in hospital emergency department usage, which could prompt some hospitals to reevaluate their cost distribution structures; and that technology will improve consumer incentives to select lower-cost, lower-acuity settings for care.
[27] Singhal S, Coe E. The next imperatives for US healthcare. McKinsey white paper. November 2016.

The introduction of AI…could enhance non-clinical [and] clinical efficiency, largely through automation of routine administrative tasks.

These three examples are just a subset of the opportunities to enhance clinical productivity. We completed a more holistic sizing of these opportunities, building on research from the McKinsey Global Institute (MGI).[28] An evaluation of technology-enabled potential suggests a subset of 25 healthcare-specific use cases that would improve clinical productivity, consumer satisfaction, and health outcomes. Using MGI's proprietary estimates of the impact of the various analytics tools in different categories of spending, we sized these use cases across the US healthcare industry and applied adoption rates similar to historical adoption rates for healthcare technologies, such as electronic health records. We estimate that technology-driven improvements in clinical productivity, consumer satisfaction, and health outcomes could deliver net savings equal to 2.6 to 3.0 percent of national health expenditures by 2025.

Variability and waste reduction

Uneven adherence to evidence-based medicine is common in US healthcare. Nearly three-quarters of today's physicians identify the ordering of unnecessary tests as a serious problem.[29] Technologies available today can be used to unlock the potential of improving clinician and patient awareness of rapidly evolving medical evidence, enabling more precise and efficient diagnostics, and ensuring tighter adherence to established and personalized treatment protocols (with an associated reduction in activities that add little value in improving health outcomes). For instance, low-value procedures (such as unnecessary or duplicative imaging) could be eliminated from standard practice using longitudinal patient records and at-home monitoring.[30,31] The integration of AI and new record-keeping technologies such as blockchain into billing and claims processes could reduce the incidence of fraud, waste, and abuse, yielding additional value.

For our economic assessment, we began with MGI's proprietary estimates of proven ways to use analytic tools to reduce fraud, waste, and abuse, and then applied these use cases to US healthcare spending (again, assuming adoption rates would be similar to historical healthcare technology adoption rates). We also used professional medical association standards to identify low-value services (tests, treatments, or procedures), as well as state-level data on the prevalence of unnecessary tests and procedures, to size the potential impact of reducing variability and waste by minimizing the use of ten of those services. Using this evidence base, we estimated the potential value at stake and then refined our estimate based on the potential for technology to enable clinician behavior change. Technological advances, for instance, could dramatically reduce the frequency of unnecessary screening by giving clinicians access to longitudinal patient records. In addition, we built on the MGI research to analyze the potential impact of decreasing fraud, waste, and abuse through the use of improved algorithms. We estimate that the total annual value delivered by technology in these two areas is likely to be about 0.28 to 0.34 percent of national health expenditures by 2025.

[28] Bughin J et al. Notes from the AI frontier: Modeling the impact of AI on the world economy. McKinsey Global Institute. September 2018.
[29] ABIM Foundation. Research Report. Choosing Wisely. 2017. choosingwisely.org.
[30] Truven Commercial claims database.
[31] ABIM Foundation. Choosing Wisely. abimfoundation.org.

Nonclinical efficiency

The introduction of AI and other analytics tools could enhance nonclinical efficiency as well as clinical efficiency, largely through automation of routine administrative tasks. For instance, payers that have applied RPA in areas like claims adjudication and provider network life-cycle management have achieved significant improvements in productivity through a reduction in manual activities. One healthcare-focused technology company recently introduced an enterprise-scale blockchain solution that can process up to about 50 million events daily and allows hospitals and physician practices to track the real-time status of claims from submission to remittance.[32]

Building on the MGI research, we sized a set of use cases in which automation could be used to improve nonclinical efficiency in areas such as hiring and retention, marketing, pricing, and procurement. Each use case was evaluated for its readiness for application in healthcare settings (for example, how automation of broader core business functions or procurement could be relevant for providers) and then scaled across the US healthcare industry, adjusted for source of coverage, and adjusted again to account for historical healthcare technology adoption rates. We estimate that these and other use cases could deliver annual value equal to approximately 1.7 to 2.0 percent of national health expenditures by 2025.

Effective care delivery

We see the potential for technology to alter current care pathways via longitudinal patient-centric records, real-time patient monitoring, and remote and autonomous patient engagement. Apple's well-known partnership with a growing number of health systems, including Stanford Medicine, Partners HealthCare, and Johns Hopkins, is beginning to integrate longitudinal health records and supplemental data sources into a patient-controlled smart phone ecosystem, which could lead to a paradigm shift from "provider-centric" to "patient-centric" data structures.[33] The FDA has cleared two mobile medical Apple Watch "apps" that can take electrocardiograms and monitor pulses for irregular heart rhythms.[34] One start-up is using an AI-enabled diagnostic system to detect diabetic retinopathy based on images of patients' eyes and pooled data; the goal is to help primary care providers more rapidly diagnose the condition without extensive testing. These new technologies are making possible both better integration of care between patients and caregivers and fully autonomous care (similar to the technology available for an artificial pancreas that monitors glucose and then provides appropriate insulin dosing). In addition, a number of AI-enabled chatbot technologies, designed to help young adults deal with anxiety and depression through intelligent conversational engagement, are starting a paradigm shift—AI cognitive engagement replacing a role played by licensed clinicians.

We believe the highest ROI will stem from tying these technologies to the care pathways for chronic conditions, given that spending on chronic conditions continues to increase. For instance, heart disease, diabetes, and hypertension together account for about $575 billion annually in national health expenditures.[35]

To estimate potential savings, we prioritized seven high-spend pathways that might benefit significantly from technology: heart disease, diabetes, hypertension, chronic obstructive pulmonary disease, cancer, depression, and general primary care. These pathways were selected from an evidence-based review of over 300 studies and

[32] Miliard M. Change Healthcare's enterprise blockchain tech now available for hospitals, practices, payers. Healthcare IT News. January 8, 2018. healthcareitnews.com.
[33] Apple. Empower your patients with Health Records on iPhone. apple.com.
[34] U.S. Food and Drug Administration. Statement from FDA Commissioner Scott Gottlieb, MD, and Center for Devices and Radiological Health Director Jeff Shuren, MD, JD, on agency efforts to work with tech industry to spur innovation in digital health. FDA. September 12, 2018. fda.gov.
[35] Centers for Disease Control and Prevention. Diabetes at work: Calculate what diabetes costs your business, high blood pressure fact sheet, and heart disease fact sheet. cdc.gov.

academic physician interviews.[36] For each pathway, we determined average episode spending based on a proprietary algorithm applied to commercial claims data (adjusted for overall US population size, sources of coverage, and other characteristics), as well as historical healthcare industry technology adoption rates. This approach allowed us to identify the current extent of care variations in the pathways, as well as the potential reduction in variation that might be achieved by particular levers associated with these technologies. (For example, the availability of devices that enable clinician connectivity could reduce episode spending variations, particularly on outpatient or home care services.) This estimate of value assumes that technology could equip physicians with better awareness of the latest medical evidence and improve access to better data about current and historical patient conditions. We calculate that by rethinking how technology can improve care for these and other high-spend pathways, annual value of 0.9 to 1.0 percent of national health expenditures could be realized by 2025.

What disruptive changes might happen?

Each of these use cases and sources of value does not exist in isolation. Innovators are considering how to integrate them and deliver transformative change. As we journey toward the future of healthcare, we see four potential industry-level changes that could disrupt healthcare value pools as they exist today:

Modernized transaction and data infrastructure. The integration of technologies such as blockchain digital ledgers, RPA, cloud computing, and AI could automate risk prediction and utilization management (capabilities currently delivered by payers). It could also result in a patient-centric data infrastructure (for example, longitudinal patient data could be integrated with nonclinical sources of atient data and then parsed by machine learning). In addition, the entire billing and insurance transaction infrastructure could be standardized, automated, and streamlined. Such a transaction infrastructure could be operated by a few large-scale entities, become a broad industry utility—or both.

Radically more efficient medical supply chain. Technologies such as real-time patient monitoring, RPA, AI, and drone deliveries could anticipate patients' diagnostic and treatment needs, then deliver supplies to patient homes or targeted clinical settings precisely when needed. The result could be stronger supply chain management, fewer user errors, better patient adherence, and improved health outcomes. This reorganization of the supply chain, however, could be disruptive to the established business models of wholesale and retail distributors across the pharmaceutical and medical products industries.

Faster, more effective therapy development. The time needed to demonstrate the safety and efficacy of innovative therapies could potentially be reduced by the combination of two things: the ability to analyze longitudinal patient records (which will become even more powerful once the records can be integrated with genomic data and data on social and environmental factors) and the ability to test new therapies on 3D-printed tissue. Historical data (and eventually historical and contemporaneous data) could be used to predict the likelihood of outcomes, and new therapies could be tested on 3D-printed tissue in real time. This type of simulation of traditional clinical trials could significantly reduce the extent and duration of those traditional trials. As an aside, traditional clinical trials themselves could be made more effective and efficient by leveraging advanced analytics and AI. The resulting reduction in both the cost and timeline of therapy development could enhance competition, thereby increasing the affordability of the therapies.

New, personalized, and intuitive healthcare ecosystems. Perhaps the most sig-

[36] Interviews with clinicians at Harvard and Johns Hopkins medical schools.

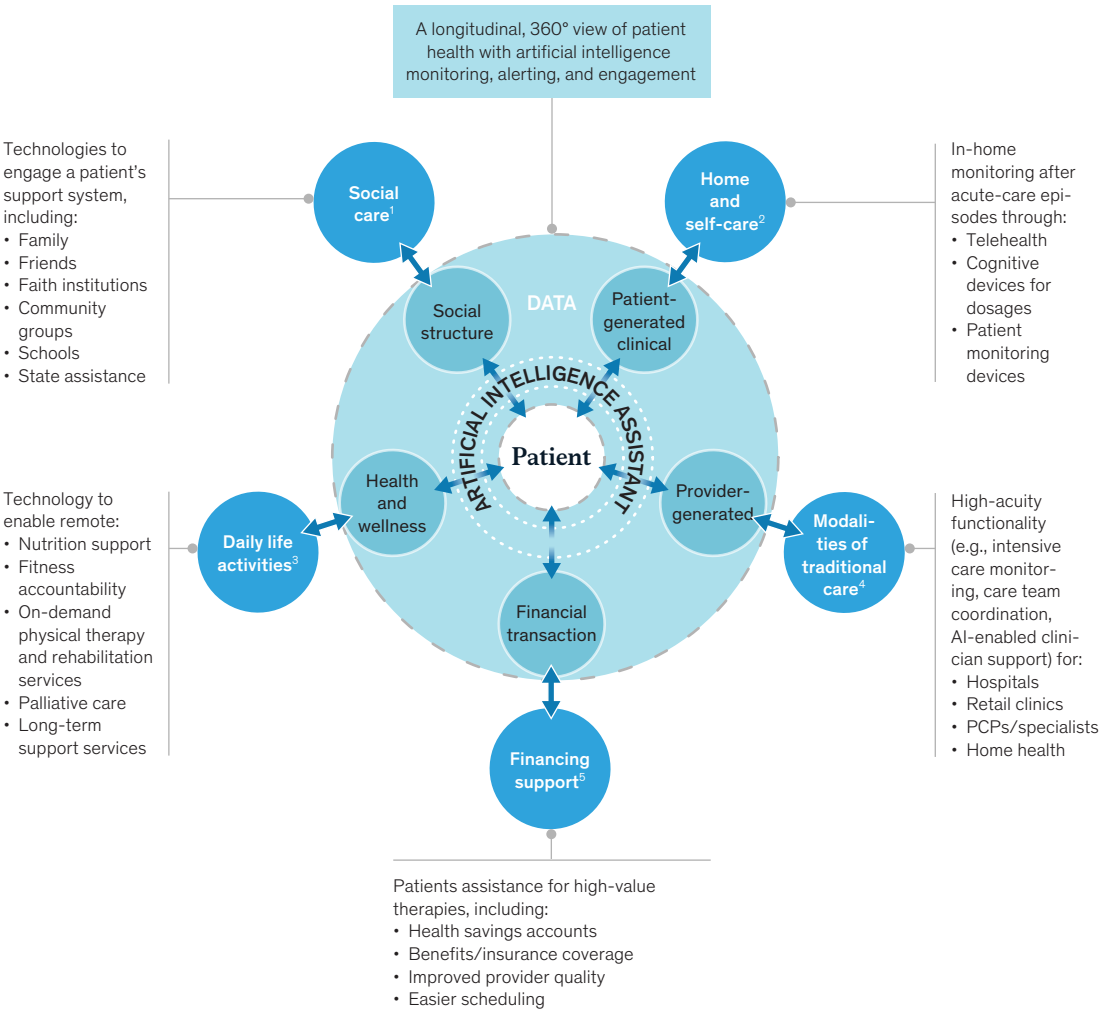
nificant change could be the creation of intuitive and personalized ecosystems of care centered around patients and their families, into which their community of medical and social caregivers would be integrated. Such ecosystems would make possible the delivery of the right type and amount of care, in the right setting, at the right time (Exhibit 5). The ecosystems could be enabled by a combination of:

— *holistic and longitudinal patient data sets* to integrate today's fragmented information from social systems, financial resources and systems, home-care and self-care monitoring, activities of daily life, and traditional modalities of care,

— *advanced analytics and AI personalization engines* to generate insights for patients and their community of caregivers,

Exhibit 5

Intuitive ecosystems could enable access to the full continuum of care through technology-enabled modalities



AI, artificial intelligence; PCP, primary care physician.
[1] Social care: Social and community networks related to a patient's holistic health.
[2] Home and self-care: Patient engagement, health-focused activities.
[3] Daily life activities: Patient actions enabling wellness, tangential to direct care delivery.
[4] Modalities of traditional care: Direct care administered by clinicians across evolving sites of care.
[5] Financing support: Operational and financial infrastructure of healthcare ecosystem.

Sidebar

Considerations and cautions on this analysis

The range and pace of healthcare industry evolution remain to be determined; a variety of outcomes are possible by 2025, depending on the actions taken by various stakeholders. For instance, technology could simply make traditional care delivery systems marginally more efficient, or it could make possible radically new modes of care delivery focused around consumers (by enhancing both B2B and B2C healthcare delivery). Stakeholders must decide on their vision of the future if they are to effectively focus their strategies—for instance, by doubling down on aggregating the continuum of care or by orchestrating across technologies to meaningfully change how healthcare is delivered and managed.

It is worth remembering that experts have previously proclaimed that the healthcare industry is on the verge of technology disruption, yet little has materially changed. What's different today is the proliferation and liquidity of data, as well as the capabilities of data analytics and AI. In our estimates of value, we have analyzed only objective and measurable potential; however, the actual value delivered will depend on the path the healthcare industry takes, based on the economic and clinical decisions of individual stakeholders.

Additionally, to realize this objective value, several major barriers, such as the ones listed below, will likely need to be overcome:

— *the rate of technology adoption* and level of value creation, until now, has been much lower in healthcare than in other industries

— *the current healthcare regulatory structure* is complex, well-functioning standards for secure and full data interoperability are needed, and there is little transparency on costs and outcomes

— *the current reimbursement methodology* for providers, as well as pharmaceutical and device manufacturers, is still largely based on services rendered, not value delivered

— *fragmented sources of consumer data* (for example, medical records, self-monitoring data, social support inputs) are not yet broadly liberated nor integrated, a necessary change if technology is to effectively transform traditional modalities of care

If introduced in a haphazard or half-hearted way, the emerging innovations could increase, rather than reduce, the cost of care. Thus, stakeholders may need to carefully evaluate their strategies against their near- and longer-term ability to participate in the value-creating, integrated ecosystem of tomorrow.

— *continuum of care interaction models*, ranging from digital solutions to close-to-home services to traditional facilities, based on individual needs,

— *device-enabled, autonomous care* and cognitive engagement,

— *real-time refinement of individualized care solutions* and cognitive engagement through an AI-enabled interaction medium, and

— *seamless integration of monitoring and care* from clinical caregivers, social and community structures, and family members.

We are aware that predictions of healthcare disruption have been made for decades. We

want to be clear: we are not *predicting* that the US healthcare system will achieve net savings of $350 billion to $410 billion annually by 2025. Rather, we have reviewed the evidence, done the math, and identified use cases that *could* create $350 billion to $410 billion in technology-driven value annually by 2025. Realizing this value will require disruptors—incumbents and attackers alike—to understand the technologies available today, develop clear use cases with an evidence-based ROI, implement effective human change management strategies, and execute disciplined implementation plans. Stakeholders will need to make big bets on what role to play in this future, where to deploy capital, which capabilities to develop, what talent to attract, and how to drive such a transformation[37] in a world of exponential change. Some stakeholders will choose to maintain the status quo, but this approach will leave them at risk of either being left behind by disruptors or failing to capture part of the billions of dollars in net value.

[37] In our experience, driving such a transformation requires careful human change management and significant business model transformations.

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Promoting an overdue digital transformation in healthcare

Gareth L. Jones, Zinaida Peter, Kristin-Anne Rutter, and Adam Somauroo

Research from over 30 countries offers insight into providing digital healthcare, including practical steps for key stakeholders.

For all the ways that technology is transforming the way people shop, bank, and travel, it has yet to make major inroads into how they receive healthcare. The adoption of digitally enabled tools for diagnosis, treatment, and management, for example, has been modest. Electronic medical records are still not a part of routine care. According to the Electronic Medical Record Adoption model, adoption ranges from just 3 percent in Europe to 35 percent in the United States.[1]

Technology itself isn't the problem. Many healthcare tasks have been automated or digitally enhanced for decades. And evidence of further potential is compelling. This includes, for example, preventing up to 95 percent of adverse drug events,[2] saving lives by improving compliance with care recommendations, and reducing the number of duplicate diagnostic tests and reducing costs by 7 to 11 percent.[3]

Instead, the barriers to a digital transformation in healthcare are often decidedly nontechnological. In a recent interview, Harold F. Wolf, president and CEO of the Healthcare Information and Management Systems Society (HIMSS), considers a change of culture to be the biggest hurdle in the industry's digital transformation. Similarly, our McKinsey colleagues found that the three barriers to digital most mentioned by leaders in the pharmaceutical and medical-technology industry were culture and mind-set, organizational structure, and governance.[4]

It will likely take a concerted effort among stakeholders to get past those barriers. To draw attention to the characteristics of health systems that best support adoption of digital tools, we conducted a high-level review of more than 30 countries. We followed that with a deeper look at a dozen countries with digitally advanced health economies—where they either have managed to implement digital solutions at scale or have disrupted the market with their innovation. In this article, we have deconstructed their journeys and distilled a set of six conditions that can smooth the path toward a successful systemwide digital transformation in healthcare—no matter where a country is in its digital health journey. A sidebar summarizes each stakeholder's potential roles (see Sidebar, "Stakeholders have various roles in digital transformation").

1 Cross-regional EMRAM score distribution, Q3 2016, Healthcare Information and Management Systems Society, himms.eu. The Electronic Medical Record (EMR) Adoption Model (EMRAM) is an eight-stage model that measures the adoption and utilization of EMR functions required to achieve a paperless environment and harnesses technology to support patient care. The model allows healthcare organizations to benchmark progress globally. Scores are for stages 6 and 7.

2 Such as medication errors, adverse drug reactions, allergic reactions, and overdoses in hospitals, long-term-care facilities, and outpatient settings.

3 Jessica S. Ancker et al., "Associations between healthcare quality and use of electronic health record functions in ambulatory care," *Journal of the American Medical Informatics Association*, July 2015, Volume 22, Issue 4, pp. 864–71, academic.oup.com; Gerardo Aue, Stefan Biesdorf, and Nicolaus Henke, *ehealth 2.0: How health systems can gain a leadership role in digital health*, January 2016, McKinsey.com; "Reducing and preventing adverse drug events to decrease hospital costs," *Research in Action*, March 2001, Issue 1; Jack V. Tu, John J. You, and Lingsong Yun, "Impact of picture archiving communication systems on rates of duplicate imaging: a before–after study," *BMC Health Services Research*, November 2008, Volume 8, Number 234, bmchealthservres.biomedcentral.com.

4 Stefan Biesdorf, Manuel Möller, and Franziska Thomas, "Barriers to Digital@Scale: Shifting the focus from tech to culture," October 2018, McKinsey.com.

1. Governments have a role to play in instigating digital transformation in healthcare systems

Governments tend to have unique relationships to their systems of healthcare, whether at the local, regional, or national level. One exception appears to be about promoting the use of technology.

Among the countries we looked at, whether the prevailing system was government run or market oriented, those with the most digitally advanced healthcare played an active role in promoting digital transformation.

In fact, our research indicates that governments have often played a key role in instigating systemwide digital health projects. For example, Australia developed the National Digital Health Strategy and set up the My Health Record as an

Sidebar

Stakeholders have various roles in digital transformation

It will likely take a concerted effort among stakeholders to get past the barriers to digital healthcare most cited by industry leaders—and each stakeholder has a role to play in a digital transformation in healthcare (Exhibit).

Exhibit

Stakeholders have a variety of potential roles in digital transformation

Stakeholder	Potential roles
Government	• Consider how best to accelerate adoption of digital and analytical innovations • Support underpinning infrastructure (patient and physician digital IDs, cybersecurity, and/or ecosystems) and defining standards (including for data exchange) • Encourage smart regulations that are well aligned with current healthcare-delivery needs • Encourage education for healthcare and medical personnel to plan for and develop digital and analytical therapy skills
Payer	• Use advanced analytics and big data insights to promote quality of care and transition to value-based reimbursement • Look to see how alternative providers and new market entrants can provide services to customers • Invest in IT infrastructure to develop ecosystems and platforms on which third-party providers can innovate
Healthcare provider	• Design and follow a clear strategy to deploy solutions for prioritized use cases that will add most value to patients, clinicians, and their staff • Provide sufficient staff education and training to develop appropriate digital capabilities • Continuously adopt digital innovations, internally or in partnership with solution providers, that promote both quality of care and productivity • Consider expanding resources for existing pilot projects, rather than starting new ones, when timing is out of sync with budget cycles • Introduce culture-changing initiatives that promote uptake of innovations
Solution provider	• Partner with healthcare providers, payers, and academia to establish a precedent for innovative ways to provide safe, effective care and demonstrate potential value at stake • Offer flexible, clinically validated solutions as part of a tailored solution to targeted payer or provider while recognizing and understanding its incentives and appetite for disruptive change

As digital technology changes, payers and health-standards boards may frequently need to adapt their models of reimbursement and accreditation.

opt-out medical record for all Australians.[5] England established national bodies, like NHS Digital[6] and NHSX,[7] to support and transform NHS and social care.[8] Meanwhile, the Danish government has announced investment into an app-based platform known as the World-Class Digital Service (WCDS); it can be used to access all publicly held data on Danish citizens and is jointly financed with local authorities via the country's Technology Investment Fund.[9]

Among more market-oriented countries, the US government introduced financial incentives to physicians and hospitals in the American Recovery and Reinvestment Act of 2009 to encourage the adoption of electronic health records.[10] Israel's government, too, aims to promote the country's foothold in digital health through grants and investment. It has announced a $33 million grant specifically in biotech and medicine, as well as a planned $275 million investment to digitize every citizen's personal health records.[11]

Moreover, sharing IT infrastructure with other public services, such as citizen-ID and consent-management systems, can accelerate progress, creating a platform that encourages patients to adopt digital services. For example, the Estonian Electronic Health Record is part of the country's Health Information Exchange platform and is credited with helping to simplify the implementation of healthcare interconnectivity.[12]

2. Payers and standards bodies can accelerate and sustain technological advancement by adapting reimbursement guidelines

As with any market, healthcare systems operate most efficiently when the incentives of each part are mutually reinforcing. As digital technology changes, payers and health-standards boards may frequently need to adapt their models of reimbursement and accreditation. This might include, for example, evaluating new digital-first providers for quality care, adding some measure of digital adoption to accreditation, and assessing new software products that might be classified as medical devices. It can also include promulgating guidelines for sharing and protecting data among stakeholders and developing a reimbursement tariff for digital services.

Many countries are already pursuing efforts to modernize digital-related regulations. For example, recent regulation from the Centers for Medicare & Medicaid Services in the United States proposed several policy changes.[13] These would make more information accessible to patients through an open application programming interface (API). Similarly, NHS Digital in England has developed a first set of standards on the interoperability of clinical IT systems.[14] To meet its gold-standard qualification, England requires that health apps receive regu-

5 "Australia's National Digital Health Strategy," Australian Digital Health Agency, conversation.digitalhealth.gov.au.
6 NHS Digital, digital.nhs.uk.
7 "NHSX: New joint organisation for digital, data and technology," Department of Health and Social Care, February 19, 2019, gov.uk.
8 NHS Digital, digital.nhs.uk; "NHSX: New joint organisation for digital, data and technology," Department of Health and Social Care, February 19, 2019, gov.uk.
9 Gerard O'Dwyer, "Danish government launches wide-ranging digital services project," *Computer Weekly*, November 29, 2018, computerweekly.com.
10 Chantal Worzala, "Policy update: Federal incentives for the adoption of electronic health records," *Journal of Oncology Practice*, September 2009; Volume 5, Number 5, pp. 262–3, ascopubs.org.
11 Laura Lovett, "Israeli government dips into digital health with $33M grant," *MobiHealthNews*, July 18, 2018, mobihealthnews.com.
12 e-Estonia, e-estonia.com.
13 The Centers for Medicare & Medicaid Services (CMS) has issued a new proposed regulation that would require all health plans subject to CMS authority to make certain clinical, claims, and coverage information available to patients and their personal representative, cms.gov.
14 "Interoperability," NHS England, england.nhs.uk.

latory approval from three bodies[15]: approval from the Medicines and Healthcare products Regulatory Agency (MHRA),[16] along with a Care Quality Commission registration, followed by an assessment from NICE (National Institute for Health and Care Excellence).[17] France also introduced a new reimbursement system for providers of telemedicine. Under the new rules, the system reimburses telemedicine consultations at the same per-visit level as physical primary care.

In many health systems, digital services and innovation can cause a shift in how payers and providers earn returns. That may explain why some of the most integrated systems, including in the United States, have been at the forefront of digital adoption. The advantage of being an integrated organization is in the embedded internal incentive to be efficient. That, in turn, encourages the use of digital technologies that promote efficiency. For example, health-maintenance organizations (HMOs) in Israel that want to prevent patients from needing high-cost hospital care have a strong economic incentive to manage their covered populations more effectively. Digital tools can help them focus on prevention and earlier intervention in primary care. For example, Maccabi Healthcare Services, an HMO, operates a community-focused integrated-care platform that connects multidisciplinary care providers and allows them to manage patients' health through comprehensive health promotion and prevention activities.[18]

Healthcare regulations serve an important role in protecting patient safety. But to improve the productivity of healthcare delivery, some older regulations may need to be updated, while others may best be phased out. In a few cases, new regulations may warrant consideration to accommodate industry evolution.[19] Moreover, proactive changes may be necessary to encourage providers to adopt digital services and to prevent unforeseen consequences. In Sweden, for example, mobile primary-care teleconsultations providers, like KRY, Min Doktor, and Doktor24, are serving patients across the country using a reimbursement framework designed to help patients find care when they fall ill while visiting other regions. Setting up one physical teleconsultation hub with health practitioners allows a digital player to serve the whole country remotely, allowing patients to receive care in areas where they do not pay taxes.

3. Healthcare organizations that promote open innovation will help spur digital transformation

A number of countries are following the route of creating an open innovation platform—or ecosystem—around patient healthcare data that allows providers to develop their own interfaces to access the data.

For example, a partnership of several organizations, led by the government-run Social Insurance Institution of Finland, has built a set of digital healthcare services for the social and healthcare sector. Called Kanta, these services include personal electronic health records, a prescription service, a pharmaceutical database, a patient-data repository, and archives. The latest set of services, My Kanta Pages, is a national data repository in which citizens may enter information on their own health and well-being. The system's architecture is open, allowing software suppliers to develop their own interfaces for Kanta's content.

Similarly, NHS England has developed an open API architecture policy and supporting guidance.[20] This policy sets out the key expectations for healthcare organizations when developing, upgrading, or procuring their systems in the move to open architecture. Indeed, health systems that had already embarked on

15 "Criteria for health app assessment," Public Health England, October 9, 2017, gov.uk.
16 Medicines and Healthcare products Regulatory Agency, gov.uk.
17 NICE, nice.org.uk.
18 Maccabi Healthcare Services, DECI Fondazione Politecnico di Milano, deci-europe.eu.
19 Pooja Kumar, Edward Levine, Nikhil Sahni, and Shubham Singhal, *The productivity imperative for healthcare delivery in the United States*, February 2019, McKinsey.com.
20 NHS England leads the National Health Service in England and supports the commissioning of health services.

a digital transformation reported in our interviews that if they were to rerun the process again, the major change they would make would be to set clear standards for interoperability from the start.

Several other countries have developed open platforms. Denmark's OpenTeleHealth, for example, encourages the development of new applications by third-party vendors.[21] In China, Alibaba Holding's AliGenie[22] and Tencent's artificial-intelligence (AI) open platform[23] allow different manufacturers to work on the systems and add them to third-party products.

4. Healthcare providers can improve adoption and expedite benefits by focusing on tangible value to consumers

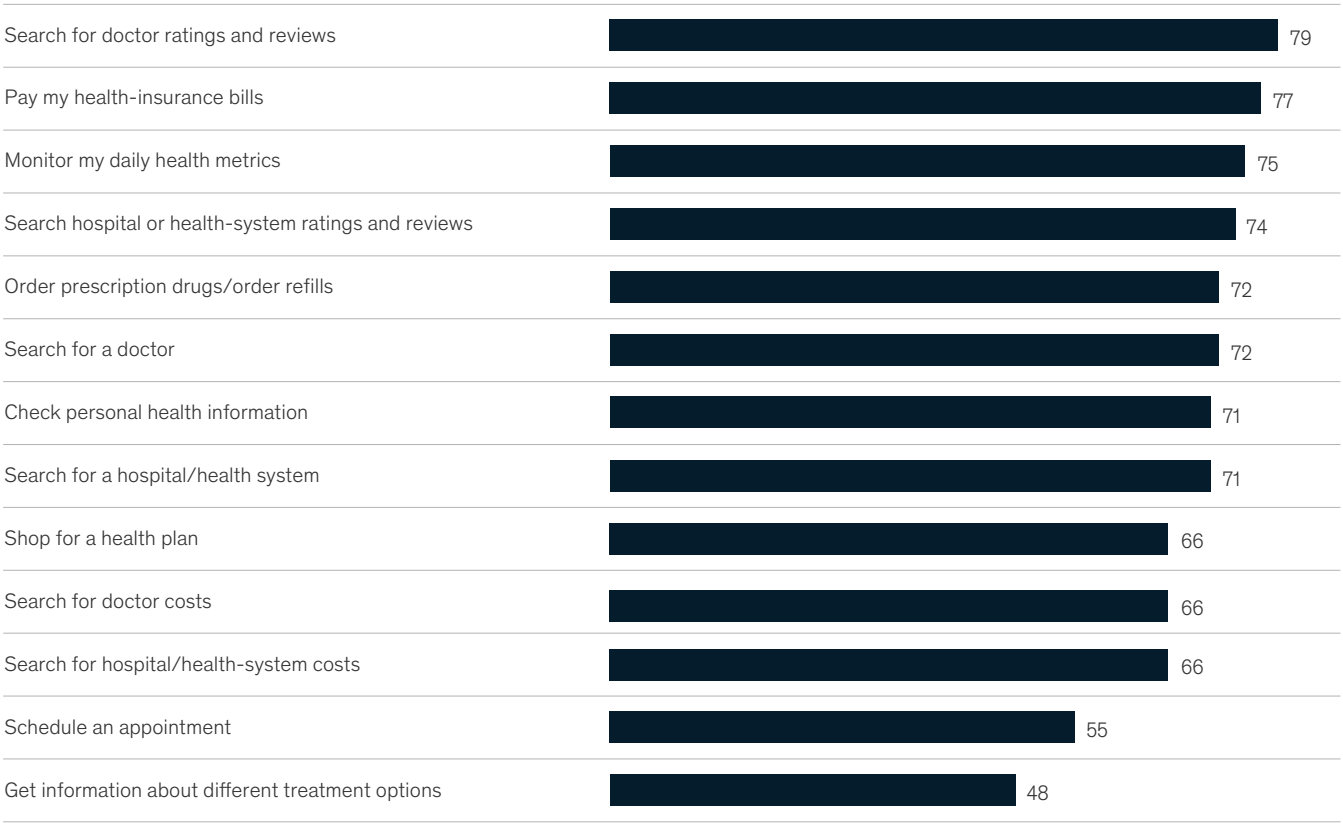
Some industries have digitized their processes—travel, banking, and entertainment, for example—so that consumers have now come to expect digital service delivery. Multiple surveys, including McKinsey's, show that people are open to the use of technology in healthcare (Exhibit) and even expect that it should be modern and convenient, consistent with their experience elsewhere.

[21] Martin Benedict, Werner Esswein, and Hanno Herrmann, "eHealth-platforms: The case of Europe," in Adrien Ugon et al., *Building Continents of Knowledge in Oceans of Data: The Future of Co-Created eHealth*, Amsterdam, Netherlands: IOS Press, 2018.
[22] "Alibaba debuts AliGenie open voice platform," October 16, 2017, hangzhou.gov.cn.
[23] Iris Deng, "Tencent releases open platform to help drive AI projects at other companies," *South China Morning Post*, September 19, 2018, scmp.com.

Exhibit

Most consumers are open to the use of digital in healthcare

Top reasons why healthcare consumers prefer digital, 2018, % of respondents[1]



[1]Includes those who strongly or somewhat prefer digital or online, n = 2,809.
Source: McKinsey Consumer Health Insights Survey, 2018

It's clear that digital leaders that make strategic investments in the right workforce-skill mix can spur on technology breakthroughs.

At the same time, emerging disruptive providers facilitate transformation by presenting new opportunities to the market and generating demand for innovative models of care delivery. For instance, Europe's subscription health-service provider Babylon Health's *GP At Hand* service has pioneered NHS-funded teleconsultations in London, complete with an interactive, AI-supported symptom checker. The practice has increased the number of subscribers tenfold by addressing unmet needs and delivering value to consumers. The key lesson here is that the power of consumer choice can lead other stakeholders to innovate.

5. Stakeholders who invest in the right mix of skills can help accelerate and sustain long-term digital transformation

In the 1990s, Estonia tapped into transferable skills among former aerospace engineers to build its first eGovernment system and later the X-road system, a solution that ensures secure transfers of health information and other digital infrastructure for public services.[24] This allowed the country to leapfrog its neighbors in terms of their level of digital maturity by providing a basic interconnectivity infrastructure.

Elsewhere, Babylon Health has announced an additional $100 million investment to double its research workforce to develop the next generation of AI-powered healthcare technology. The United Kingdom's NHS Digital has launched Digital Academy, a countrywide, digital upskilling program for hospital chief information officers.[25] The UK secretary of state for health and social care has also commissioned a publication—the *Topol Review*—to explore how to prepare the healthcare workforce, through education and training, for a digital future.[26]

It's clear that digital leaders that make strategic investments in the right workforce-skill mix can spur on technology breakthroughs. This is especially important in the health sector, where healthcare professionals are the key influencers of patients. For example, if providers are to encourage electronic prescribing and broad adoption of digital therapeutics, then physicians must have the skill set needed to understand the benefits and drawbacks of novel technologies. Accordingly, healthcare payers may need to consider additional investment in workforce-education and -communication programs to encourage a mind-set shift toward digital.

6. Payers and providers can start with near-term initiatives—but still need long-term investment

Healthcare organizations and systems that achieved recognizable improvement in clinical-care delivery, patient outcomes, or population health, such as the winners of the HIMSS Nicholas E. Davies Award of Excellence,[27] illustrate the need to start with a high-value, low-cost innovation.

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[24] The tool can write to multiple information systems, transmit large data sets, and perform searches across several information systems simultaneously. For more, see e-estonia.com.
[25] NHS Digital Academy, england.nhs.uk.
[26] *Topol Review*, topol.hee.nhs.uk.
[27] The HIMSS Nicholas E. Davies Award of Excellence recognizes the thoughtful application of health information and technology to substantially improve clinical-care delivery, patient outcomes, and population health, himss.org .

For example, one of the latest recipients of the award, UCLA Health, was recognized for three use cases covering reduction of denials of payment through automated notifications to case management, improving depression screening in primary care, and optimizing blood utilization using real-time clinical-decision support.[28] The organization has a history of innovating around care delivery using the latest digital technologies.[29] It established a Global Lab for Innovation with a major goal to create cost-effective results, emphasizing the need for a quick link to execution.[30]

Still, the adoption of value-adding innovation is not possible without investments that are substantial enough to achieve an organization's long-term performance goals.[31] Moreover, the decentralized departmental budgets that are common among healthcare providers often lead to considerable underinvestment in innovative technologies that create benefits across the entire cycle of care. Therefore, organizations that operate with a central innovation budget can create benefits systemwide.[32]

McKinsey research also suggests that the companies with a long-term view outperform their peers.[33] Therefore, a central long-term investment into technologies transforming care across the whole care cycle is necessary to achieve the ambition of digital transformation.

Although a number of countries have achieved promising digital-adoption rates in healthcare, the full value of a digital transformation of the sector remains elusive. Health systems have been unable to close quality, access, and financial gaps, even as their budgets continue to grow. More thought and effort are needed—and success is most likely for systems where all stakeholders are working collaboratively.

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[28] UCLA Health was named a 2018 HIMSS Davies Enterprise Award recipient for leveraging the value of health information and technology to improve outcomes, himss.org.
[29] "UCLA biodesign innovation fellowship opportunity drives transformative innovation," UCLA Clinical and Translational Science Institute, ctsi.ucla.edu.
[30] Mark Hagland, "Peter Kung: UCLA Health will be an incubator of healthcare innovation," *Healthcare Innovation*, August 23, 2014, hcinnovationgroup.com.
[31] Marc de Jong, Nathan Marston, Erik Roth, and Peet van Biljon, *The eight essentials of innovation performance*, December 2013.
[32] Derek A. Haas, Michael S. Jellinek, and Robert S. Kaplan, "Hospital budget systems are holding back innovation," *Harvard Business Review*, March 29, 2018, hbr.org.
[33] "Where companies with a long-term view outperform their peers," McKinsey Global Institute, February 2017, McKinsey.com.

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Next-generation member engagement during the care journey

Jenny Cordina, Greg Gilbert, Nevada Griffin, and Rohit Kumar

Next-generation member engagement tools empower members to make higher-value care decisions and enable health insurers to improve care quality, increase member satisfaction, and reduce medical spending.

Health insurers have long recognized the importance of engaging members to improve the value of care,[1] particularly in the context of traditional care/disease management. Yet efforts to date have rarely achieved the desired impact. The promise of member engagement throughout the care journey remains, however, and the underlying capabilities required to drive impact—especially data liquidity, advanced analytics, and digital solutions—are rapidly advancing. In fact, it is estimated that digitally enabled capabilities could reduce medical costs in the United States by as much as $175 billion to $220 billion annually.[2]

Few insurers today are aggressively pursuing the next generation of personalized engagement opportunities that occur during a member's care journey.[3] This cautiousness is understandable given past challenges, especially the fact that member engagement has long been over-hyped and its promise in supporting members to make higher-value care decisions has not yet been realized at scale. Until recently, the primary challenge payers have faced has been how to drive the required member behavioral modifications.

This is changing—early signs indicate that payers are beginning to convince members to modify their behavior—and we believe that success is now within reach. Until recently, health insurers have typically relied on algorithms based on mostly static factors to identify members potentially at increased risk. Once identified, the members are usually contacted by phone by call center specialists. Now, however, health insurers are beginning to leverage the digital, advanced analytics, and personalization capabilities developed and refined in other industries to create new, more effective digital member support tools and to scale the member engagement solutions already available. Collectively, these capabilities and tools, when applied broadly, are starting to improve clinical outcomes, enhance member experience, and reduce near-term medical costs.

In this paper, we provide a perspective on how health insurers can engage members to improve

1 In this article, we define the value of care in terms of both the benefits delivered to patients (such as better outcomes, greater satisfaction with care, lower out-of-pocket costs) and the advantages health insurers derive, especially the ability to reduce spending without harming—and often improving—the quality of care.

2 Atluri V, Cordina J, Mango P, Velamoor S. How tech-enabled consumers are reordering the healthcare landscape. November 2016. mckinsey.com.

3 These opportunities can be identified through a comprehensive effort to identify the patients with the greatest unmet care needs, understand those needs, and proactively engage the patients in a personalized way to address their needs so that outcomes and the member experience can be improved and costs can be lowered. Although many health insurers have undertaken activities in areas related to member engagement (broadly defined), few have done so in a scalable, comprehensive, digitally enabled, and personalized way.

the value of care. We start by focusing on a member's care experience, then outline our recommended approach and the core enablers needed to move solutions from the drawing board to members' hands.

The member experience today

In this paper, we use low back pain as a case example to highlight the value of next-generation member engagement in the context of a specific care journey. However, the approach we describe can be applied to a wide variety of use cases.

Low back pain is a common problem for millions of Americans and a top contributor to US healthcare spending. The affliction costs the country more than $100 billion annually when medical spending, lost wages, and reduced productivity are considered.[4] An illustrative patient journey for someone with low back pain is shown in Exhibit 1.

$100B

Low back pain costs the country more than $100 billion annually when medical spending, lost wages, and reduced productivity are considered.

Our research has shown that, contrary to evidence-based protocols, many members with low back pain undergo surgery without receiving first- or second-line therapies.[5] For instance, among the patients in our analysis who were operated on within six months of initial diagnosis, fewer than half had received spinal injections first. These findings highlight that a data-driven patient journey approach can help health insurers identify significant opportunities to improve care delivery and reduce unnecessary medical spending. In the low-back-pain patient journey, for example, next-generation member engagement could be used to help patients understand their treatment options and guide them to higher-value care facilities where evidence-based protocols are reliably followed.

Critical enablers to realize and amplify value

Most health insurance companies lack the critical enablers required to provide measurable impact through member engagement. These B2C capabilities have been developed and proved in other industries to deliver high-value, personalized experiences to consumers, yet they have only recently gained traction in healthcare.

Advanced analytics

Data science and advanced analytics are foundational to all aspects of next-generation member engagement, but this is especially true when it comes to supporting a member during his or her care journey. Advanced analytics enables the swift development of actionable personas (identifiable member segments with distinct known features and preferences). Real-time signal interpretation makes it possible to track member behavior and enables rapid multivariate testing of different member experiences. Episode analytics allows health insurers to identify and size highly granular sources of value and undertake an array of other applications.

In each case, advanced analytics leverages claims and other traditional health insurer data as well as touch-point information (such as website usage, contact center details) and third-party data (including consumer data, clinical data from providers, information about relevant social determinants of health).

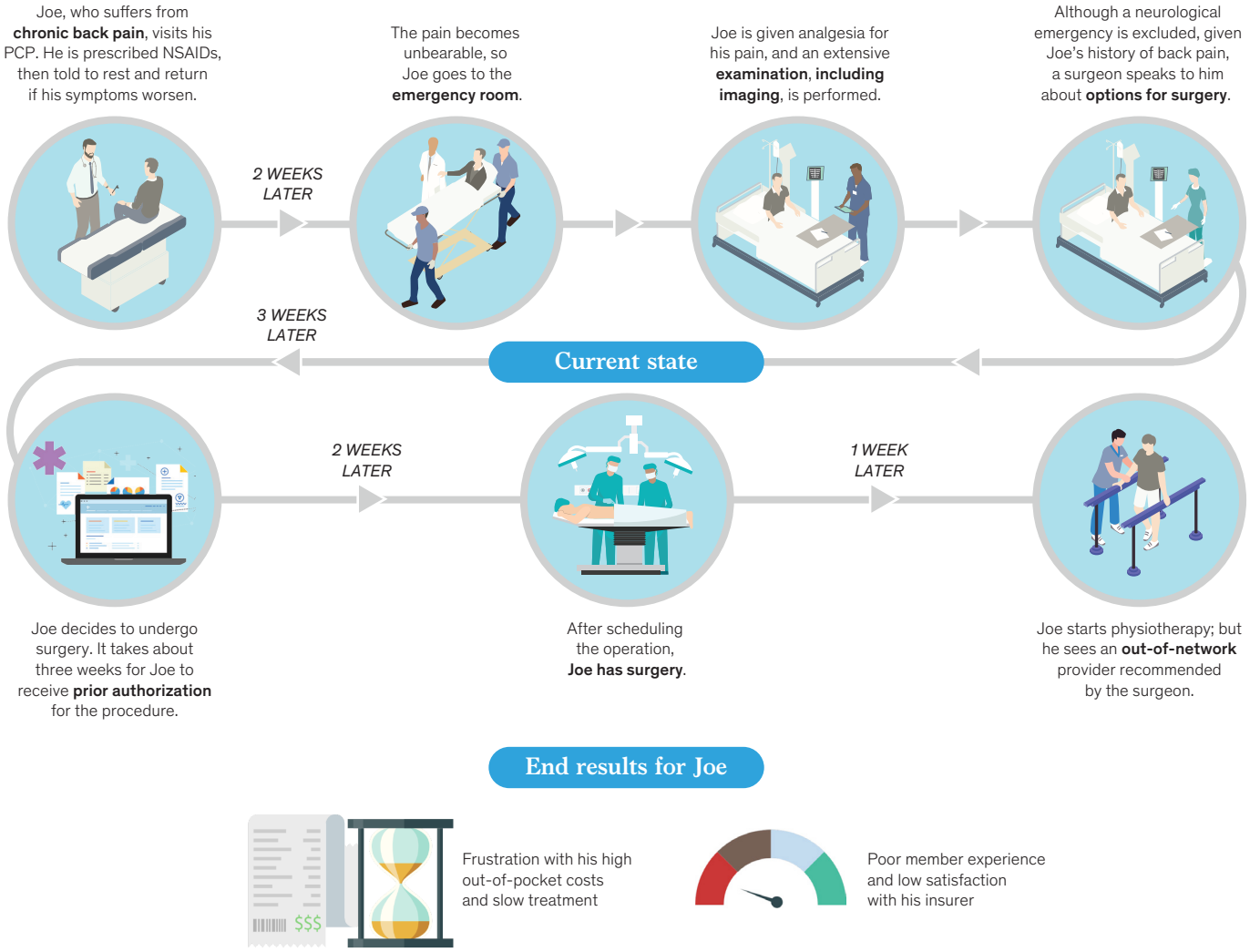
Consumer engagement and personalization

Consumer engagement is a core competency of B2C companies. These companies employ advanced analytics to deeply understand customer needs, develop products and services to meet those needs, and engage (market to) consumers through hyper-personalized messages and content across an array of traditional and digital channels. Retailers, for instance, are now able to provide relevant, personalized recommendations delivered digitally, espe-

4 Crow WT, Willis DR. Estimating cost of care for patients with acute low back pain: a retrospective review of patient records. *Journal of the American Osteopathic Association*. 2009;109(4):229–33.
5 Danning H et al. Low back pain: Two insights on treatment patterns from a patient journey analysis. November 2017. mckinsey.com.

Exhibit 1

Example of a typical patient journey today



NSAIDs, nonsteroidal anti-inflammatory drugs; PCP, primary care provider.

cially when consumers are in a shopping mode. A clothing company found that shoppers who visited one of its physical stores or its online store were more likely to open and respond to messages that were delivered either later the same day or exactly one week later.[6]

Our research has shown that healthcare consumers are no different from retail customers: they want to be good consumers who can make informed choices about the care they receive and expect digital to be a core part of this engagement. In our Consumer Health Insights survey, for instance, about 70 percent of respondents said they prefer digital healthcare solutions to phone or in-person solutions for all major aspects of their care journey.[7] Using personalization techniques pioneered by other industries, health insurers can drive higher engagement and better support the needs of their members.

6 Boudet J et al. What shoppers really want from personalized marketing. October 2017. mckinsey.com.
7 Cordina J et al. Healthcare consumerism 2018: An update on the journey. July 2018. mckinsey.com.

Behavioral economics applied to healthcare

Academics have long believed that deploying more nuanced insights from behavioral economics could lead to increased member engagement and deliver dividends for individuals, insurers, and employers.[8] Put simply, behavioral economics is a hybrid of psychology and economics that provides robust insights into the drivers of behavior while acknowledging human irrationality. Insights from behavioral economics can be used to guide human behavior and perceptions via unobtrusive "nudges," an approach increasingly being employed by companies to improve customer satisfaction.

In healthcare, previous studies have shown that behavioral economic incentives—the use of standard economic incentives in combination with psychological factors, such as probability weighting or regret aversion—can promote healthy behaviors, such as smoking cessation and weight loss.[9,10] It has been more difficult, however, to show significant medical cost reductions directly attributable to behavioral nudges. This difficulty is partly due to the limited use in healthcare of advanced analytics and digital consumer-engagement capabilities, which are core requirements for tracking and optimizing the incremental value of behavioral economics efforts in real or near-real time.

The member experience reimagined

If all three critical enablers were effectively employed by a health insurer, the patient journey for someone with low back pain would look very different. Exhibit 2 shows the same member from Exhibit 1, this time receiving targeted support through personalized interventions at the moments that matter. This example of next-generation member engagement illustrates some of the potential benefits to both the member (higher-quality care, lower out-of-pocket costs, improved experience) and the health insurer (lower unnecessary emergency department [ED] utilization, fewer unnecessary procedures, increased member satisfaction).

Implementing next-generation member engagement

Through multiple client engagements over the past several years, we have identified three steps health insurers can take to realize measurable value from next-generation member engagement during the care journey (Exhibit 3).

Step 1. Identify members for engagement

A health insurer's members collectively make millions of healthcare decisions each day. Which medications to take? When to schedule an appointment? Which doctor to see? What treatment path to follow?

The first step in effectively engaging members is to understand these decisions and, ultimately, what each member needs at a given point in time.

Take a patient journey lens. We recommend that health insurers first define a set of prioritized patient journeys, either specific to a disease area or procedure (colonoscopy, for instance) or more general (such as whether to visit the ED for acute nonemergent symptoms). Patient journeys can be prioritized based on potential value (in terms of quality, experience, and cost) to the member and payer, as well as the feasibility of execution (such as the payer's ability to identify and engage members who might benefit from targeted support). As we showed in the low-back-pain example, each journey involves a unique set of decisions and value opportunities (the potential for out-of-pocket savings if an unnecessary ED visit is avoided, for instance). Some decisions are highly journey-specific (whether

8 Loewenstein G et al. Behavioral economics holds potential to deliver better results for patients, insurers, and employers. *Health Affairs*. 2013;32(7):1244–50.
9 Volpp K et al. A randomized controlled trial of financial incentives for smoking cessation. *Cancer Epidemiology, Biomarkers, & Prevention*. 2006;15(1):12–8.
10 Volpp K et al. Financial incentive-based approaches for weight loss: a randomized trial. *JAMA*. 2008;300(22):2631–7.

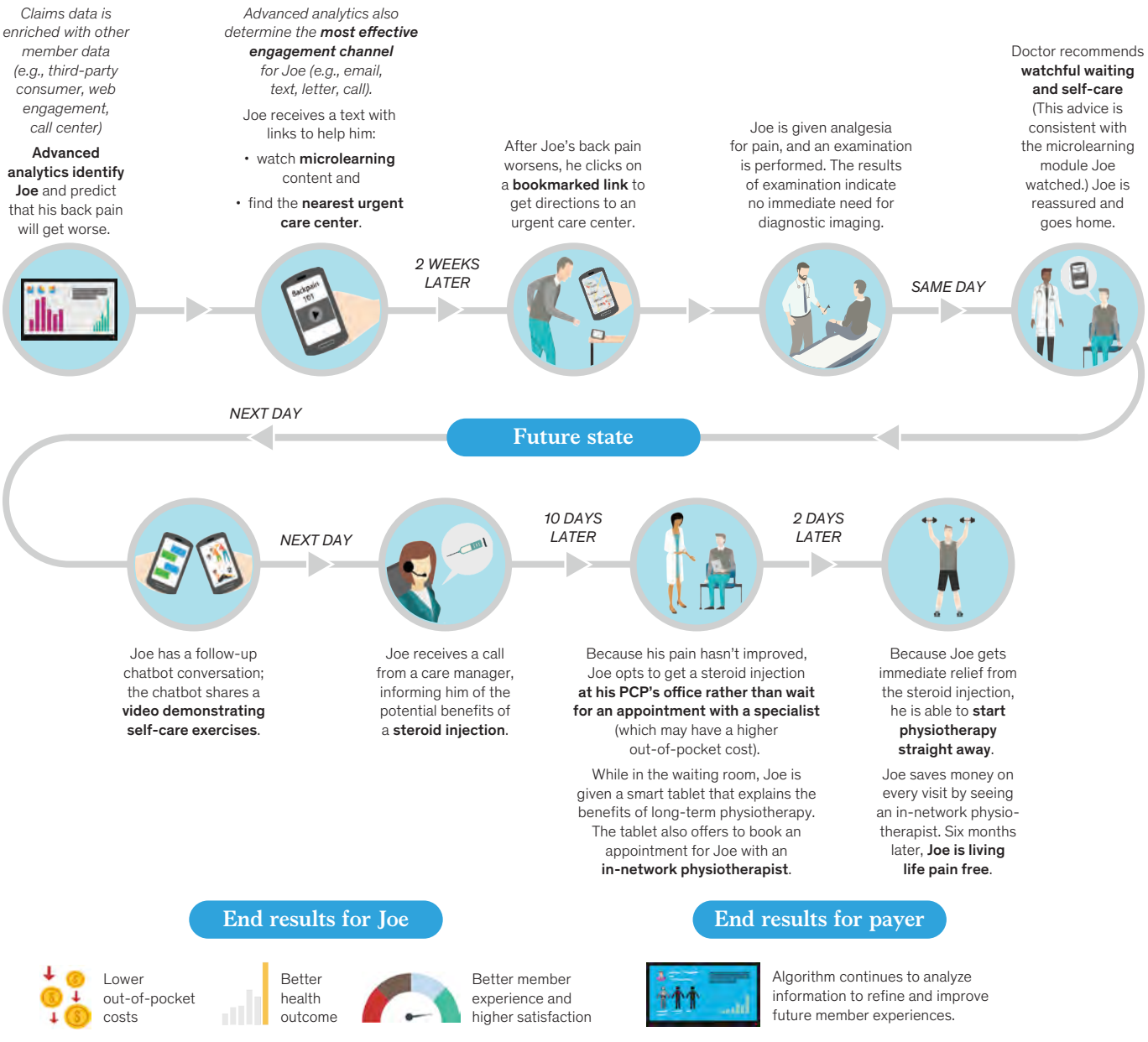
to choose anesthesia versus light sedation for a colonoscopy is an example), while others are common across multiple journeys (such as whether to have a planned procedure in an outpatient hospital, stand-alone ambulatory surgery center, or physician office).

Identify the care decisions that matter. McKinsey has pinpointed a core set of approximately 100 care decisions that can deliver meaningful value to members and payers. This set was developed from among several hundred potential decisions we identified using episode analytics, clinical guidelines, and expert review.

— *Episode analytics.* We found over 500 potential sources of value that were asso-

Exhibit 2

Example of targeted support at moments that matter

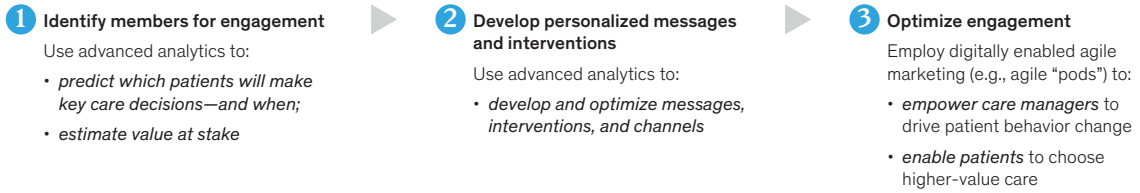


PCP, primary care provider.

Exhibit 3

Three steps to realize measurable value from next-generation member engagement

By engaging patients with personalized experiences at moments that matter, health insurers can help them make better healthcare decisions.



ciated with defined episodes of care. For each of them, we determined the specific decisions members could make that might affect costs or health outcomes, as well as the potential impact of each decision on both costs and outcomes.

— *Cross-cutting sources of value.* We also looked for targeted care decisions (site of care selection, for instance) that would enable members, regardless of their clinical condition, to save out-of-pocket costs, while also reducing a payer's liabilities.

— *Members' ability to affect a source of value.* We then considered the potential impact members could have by asking such questions as: Does the member have the ability to make a decision, and if so, does he or she have access to the right information to make an informed decision?

— *Health insurer's ability to anticipate the decision.* We also investigated the extent to which an insurer could anticipate or predict that a member will be faced with a given decision, and when. In this way, the payer can ensure that the engagement is tailored to a member's needs, at the moments that matter most to that member.

Understand each member's needs. Next, advanced analytics techniques are used to identify each member's unique set of needs, specific to his or her journey. A 25-year-old woman looking for a doctor for an annual physical exam has very different needs from a 60-year-old man seeking an oncologist to treat a recently diagnosed cancer, and the two will have very different patient journeys. Empathy maps and similar tools, which can highlight specific member needs and pain points, help machine learning algorithms identify signals that reflect the needs and intentions of each member.

Step 2. Develop personalized messaging and interventions

Personalized engagement is a two-way street: the member provides signals—information about his or her needs and intention—through such activities as physician visits (with associated diagnoses and procedures), website use, contact center inquiries, and changes in life (such as marriage or children).

Listen and respond: Plan in advance to react quickly to member signals. Health insurers can quickly respond to signals from members with a personalized engagement approach specifically designed to address the triggers and tailored to each individual. The response should have three components: the insight/solution, the message, and the channel.

— *The insight/solution.* The most important component of the response is the specific insight being given to each member (for instance, the estimated cost of a procedure or drive/wait time) and/or the solution the member needs (such as a telemedicine visit or appointment scheduling).

— *The message.* While the insights and solutions may be common across member segments, the underlying needs often

vary. Personalizing the message for each member (such as emphasizing a procedure's risks versus its cost or convenience) strongly influences whether a member ignores or responds to the support offered.

— *The channel.* Choosing the most appropriate channel or channels—email, text message, reminder alert in a web portal, outbound call from a nurse, et cetera—to deliver messages is critical. More innovative digital channel strategies include text/in-app engagement, virtual chat assistants powered by artificial intelligence, and phone call scripts/talking points that change in the middle of a conversation with a member by leveraging natural language processing and sentiment analysis. In all cases, the anticipated return on investment of each channel should be considered when the choice of channel(s) is made.

Successful member support is often multichannel and relies on dynamic workflows that tailor the messaging and channels based on the member's engagement (for instance, a member is emailed first; if the member clicks through the email, an outbound call is triggered).

Step 3. Optimize engagement

Going from a traditional member engagement approach, such as care/disease management or nontargeted outreach campaigns, to personalized engagements sent in response to an individual's signals requires health insurers to shift to a radically different way of working. In our experience, many insurers are challenged by this shift. The key to kick-starting the needed changes is to empower a small, cross-functional group of people with the right capabilities and skill sets.

Build the pod: Empower a small group of the right people. We call the small cross-functional teams "pods" (they are also sometimes referred to as "war rooms" or "command centers"). The teams are typically led by a single business area or function and staffed with a small number of people with carefully selected, cross-functional profiles, including a campaign manager and staff from the creative, digital media, analytics, operations, clinical, and IT departments. A small health insurer may need only one or two such pods; large organizations could have five to ten pods or more working at once. To be successful, the pods need to have a clear understanding of the business problem they are solving and strong executive sponsorship to remove roadblocks and ensure their ability to implement changes.

The pod is not a task force in which people come together for a few hours a week while staying in their current jobs; rather, team members must be dedicated to the pod. The focus of their job is on driving business results—not merely member responses, but material and measurable results (for instance, lowering the proportion of total joint replacement patients that require a postsurgical hospital readmission and thereby reducing the average cost of care for that episode of care). The pod's tactics often vary depending on specific goals. To select the right tactics, the pod should continually search for the member signals with the highest predictive value (such as a flu outbreak in a specific region) and then develop, launch, and iterate on personalized engagement approaches to find the ones that produce the desired results (for instance, notifying parents about convenient locations that offer flu shots or informing them about more appropriate sites of care, including available virtual care alternatives, *before* an ED visit).

Personalizing the message for each member… strongly influences whether a member ignores or responds to the support offered.

Rewire and hardwire: Focus on the processes and technology that really help teams work faster. For successful delivery at scale, agile processes must replace traditional ones. The pods must be able to act quickly to test and iterate on different ideas and zero in on what works well. Mistakes are inevitable; leadership must be prepared to accept and learn from them, and then move on.

The second facet of maintaining pace at scale is using the right digital marketing technology. Assembling and operating a digital marketing tech stack[11] can be challenging, however. Thousands of tools are available, but despite vendor claims, few offer a true end-to-end solution. Health insurers are therefore left on their own to determine which technology to purchase and to implement integration. The result, all too often, is mass-marketing software spitting out millions of messages that amount to little more than spam.

Digital marketing technology should enable pods to identify member needs quickly and deliver personalized member engagement in the moments that matter. Thus, the member engagement use cases pursued by the pods should dictate the functionality and evolution of the tech stack. By tailoring their technological needs to specific sets of use cases, health insurers can establish precise requirements and parameters that will help them invest in the tech-stack solutions that create real value.

Health insurers have yet to realize the full potential of digital member engagement. By empowering members to make higher-value care decisions, next-generation member engagement tools can improve clinical outcomes, enhance member experience, and reduce near-term medical costs. While many health insurers have invested in digital member engagement efforts, most lack the needed capabilities in advanced analytics and personalized engagement at scale, which are the critical enablers required to realize and amplify value. Where they do exist at health insurers, these capabilities are often fragmented, residing across multiple domains or functions within the organization.

Establishing integrated next-generation member engagement capabilities requires a focused effort, typically led initially by a single business vertical or function (care management, for instance) with support and coordination from other key domains or functions. Once these capabilities are established, health insurers should be able to identify unique member needs in the moments that matter, develop personalized interventions tailored to each individual, and continuously optimize engagement through digital agile marketing capabilities. By investing in digital member support capabilities, health insurers will soon be able to realize measurable value from next-generation member engagement.

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[11] A tech stack is a combination of software products and programming languages used to create an application.

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Economics of healthcare

The silent shapers of healthcare services

Lisa Foo, Neha Patel, and Saum Sutaria, MD

The US healthcare services industry is at a tipping point, but who—or what—is driving the undercurrents of change?

Over the past five years, institutional investors have been quietly shaping parts of the healthcare industry. Private equity (PE) investors, for example, have begun to consolidate several markets, including ambulatory surgery, hospitalist staffing, and home health, undertaking more than $50 billion in total transactions.

Institutional investors' focus on healthcare services—healthcare delivery and its enablers—is likely to continue, given industry trends. Ongoing growth in health expenditures, the degree of medical waste, and industry fragmentation signal high upside potential. Furthermore, the impact on the industry could be even greater in coming years. Institutional investors have been learning from their experience and will likely be using those lessons as they inject hundreds of billions in capital into healthcare in the next five years. These new investments have the potential to drive structural shifts in ways that are more direct and proactive than have been used before.

Health systems must decide how they want to respond—inaction is no longer an option. As they consider their responses, the systems need to answer two questions: Do they want to shape the industry on their own or alongside the institutional investors? And, how can they transform their business models to be sustainable as the industry evolves?

How active have investors been, and will it continue?

The degree of institutional investing in healthcare has accelerated. The number of deals has grown at a compound annual growth rate of 18 percent since 2012—PE, venture capital (VC), and hedge fund investors announced about 225 deals in 2012 but more than 510 in 2017.[1] Each of these investor types has increased both its number of deals and share of overall healthcare investments. The capital inflow has been accompanied by high expectations for the return on invested capital (ROIC) and time frame within which returns would be achieved. These expectations have created tension with healthcare service providers and have shifted the providers' expectations about how to deliver services and optimize operations to remain competitive, resulting in higher performance levels.

Because of the sums involved, institutional investors are now proactively shaping business models and submarkets within healthcare services. Exhibit 1 illustrates the magnitude of the fund flows.

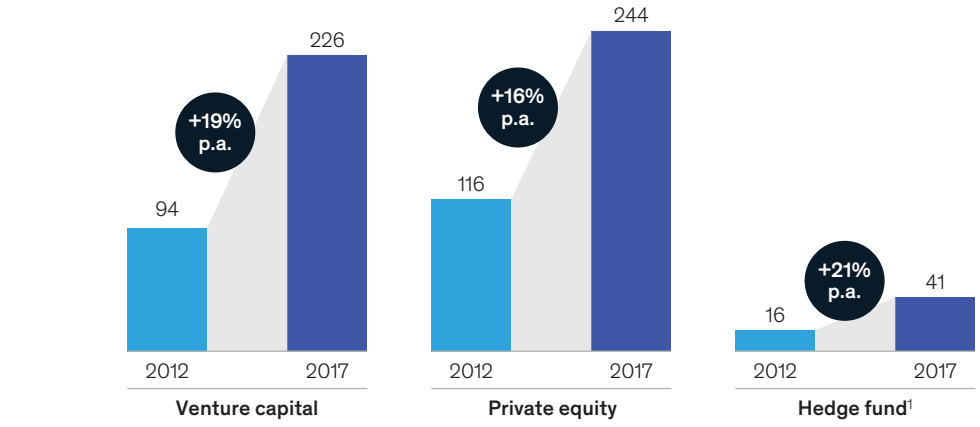
Over the past five years, annual returns on investments in healthcare services have averaged about 10 percent,[2] but some investments have paid off better than others. Multiple investors had predicted increased demand for

1 Unless otherwise stated, all statistics in this article about the number of deals, amounts invested, and growth in deal activity were calculated based on an analysis of data from the following 2017 sources: the Levin, Capital IQ, and Dealogic M&A databases; Rock Health's Digital Health Company Funding Database.

2 McKinsey Corporate Performance Analytics Tool (based on financial reporting of publicly traded companies).

Exhibit 1

Healthcare services deal activity among institutional investors



p.a., per annum.
[1] Publicly traded healthcare companies only.
Source: McKinsey analysis of data from Capital IQ, Dealogic, Levin, RockHealth

healthcare services and changes in market dynamics following passage of the Affordable Care Act (ACA). Those who have kept their money focused primarily on those themes have not fared as well as those who refined their view and shifted their investments in response to changes in the industry. Nevertheless, institutional investors have been able to raise additional funds. Several factors suggest the capital inflow from institutional investors will continue.

Demand dynamics remain favorable. Between 2012 and 2016, total overall healthcare earnings before interest, taxes, depreciation, and amortization (EBITDA) grew faster than did the combined EBITDA of the top 1,000 US companies.[3] Growth in both the senior population and number of patients with chronic disease is likely to create a sustained increase in service demand. Healthcare spending in the United States is projected to rise by about 6 percent per annum through 2025 (assuming current care delivery trends continue).[4]

Economies-of-scale opportunity is clear. Most healthcare service providers remain subscale and fragmented. The top five health systems together account for only about 13 percent of annual hospital admissions.[5] Unsustainable cost pressures within the healthcare industry are leading to structural shifts, accelerating consolidation, a trend that lends well to investors' efforts to create and leverage scale to unlock value-creation opportunities (e.g., centralization of back-office resources, improved supplier negotiations, increased patient volumes, and risk-based arrangements with managed care payers).

Conditions favor new business models. Changing consumer preferences and pressures to reduce the total cost of care have led to service delivery innovations. One of the factors that has helped prompt these changes is regulatory: between 2013 and 2017, the Centers for Medicare & Medicaid Services increased reimbursement by 1 percent to 2

3 Singhal S et al. The future of healthcare: Finding the opportunities that lie beneath the uncertainty. McKinsey white paper. January 2018.
4 Centers for Medicare & Medicaid Services. Office of the Actuary. National Health Expenditure Projections, 2017–2026.
5 American Hospital Association. Hospital survey. 2016.

percent per annum for hospital-based surgical care but by 4 percent to 5 percent annually for similar procedures performed in ambulatory surgery centers.[6,7] Additionally, technological advancements have made services and technology companies the fastest-growing profit pool in the healthcare industry.[8]

Access to investable platforms remains. Fragmentation has also created investment opportunities. For example, ambulatory networks with less than ten sites have EBITDA multiples in the low single digits, while some networks with more than 50 sites (e.g., a few large, metropolitan urgent care networks) have multiples in the low- to mid-teens. (Such large networks are still relatively rare in the healthcare services industry, however.) Furthermore, there has been a steady supply of new assets every year. VC firms have developed a significant pipeline, investing at least $20 billion in nearly 1,000 companies over the past five years.

Where has the activity been and where might it go?

The question is not if institutional investments will continue, but rather where the money will be invested and what it will influence. We believe that the overarching focus in the next few years is likely to be on lowering the cost of care and reducing leakage in providers' revenues. Healthcare services areas of interest are likely to be consumerism, alternative sites of care, medical management, and healthcare payments (Exhibit 2). However, the types of investment made within these areas will probably shift as industry dynamics continue to change, investors' savvy in predicting service uptake increases, and investors become better advisors to the operators of the companies they invest in.

Consumerism

The profile of healthcare consumers has evolved in recent years—they are now more price sensitive and tech savvy, and put greater emphasis on convenience. In our 2017 Consumer Health

6 Centers for Medicare & Medicaid Services. Inpatient Prospective Payment System, Fiscal Years 2013–2017.
7 Centers for Medicare & Medicaid Services. Outpatient Prospective Payment System, Fiscal Years 2013–2017.
8 Reddy P et al. Why the evolving healthcare services and technology market matters. McKinsey white paper. April 2018.

Exhibit 2

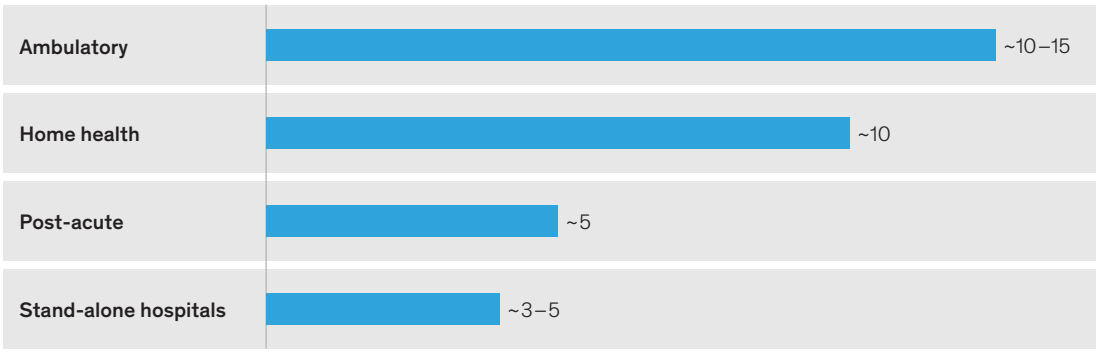
Evolution of venture capital and private equity areas of investment

	Example historical asset classes	Example companies	Example future asset classes
Consumerism	• Wellness and fitness solutions • Digital therapeutics • Disease management	• Omada • Jawbone	• Access solutions • Member advocacy solutions • Behavioral health
Alternative sites of care	• Urgent care centers • Ambulatory surgery centers • Hospitalists	• CityMD • Surgery Partners	• Retail clinics • Physician services • Home-based care • Telehealth
Medical management	• Population health analytics • Practice management • Skilled nursing facilities	• Evolent Health • DocuTAP	• Medical benefits management • Clinical decision support
Healthcare payments	• Claims editing • Claims clearinghouse • Denials management	• Change Healthcare • Waystar	• Patient portals/engagement • Payment solutions • Coverage discovery • Medical credit

Exhibit 3

Return profile for select healthcare asset classes

Pre-tax ROIC, including good will, %



ROIC, return on invested capital.
Source: McKinsey Corporate Performance Analysis Tool (based on annual financial reporting of publicly traded companies)

Insights Survey, for example, 65 percent of commercial insurance respondents selected cost as a top area to better understand when choosing where to get healthcare, and 71 percent said they would use video or online doctor visits if such tools were offered by their primary care physician.[9] We believe this evolution will continue.

Many investor bets on consumer-centric healthcare were initially placed on wellness and disease management solutions given to consumers via their healthcare provider or employer. However, these approaches failed to gain significant traction, given the fragmented care environment and their inability to demonstrate outcome improvements sufficient to justify their cost. In the future, we believe investments in consumerism will focus more on solutions that address under-served types of care or enable a more seamless patient experience. Most of these solutions will be geared to payers, providers, or employers—not patients—as buyers; more time is likely to be needed to document the improvements necessary to convince consumers to purchase the solutions.

Outpatient behavioral health is an example of a consumer-driven, unmet need. Future investments in behavioral health could focus on outpatient offerings (e.g., addiction clinics) or innovative solutions that integrate similar offerings with technology-enabled delivery to provide services to high-cost and/or high-risk populations. Quartet, for example, has begun to partner with health systems and payers alike to address high-need patients.

Alternatives in the provision of care

Increasingly, substitution is occurring in the provision of care—who provides it and where it is delivered. Shifts across asset classes have been driven by several forces: changes in reimbursement that favor lower-cost sites, health plan redesign to incentivize consumers to utilize lower-cost care settings (e.g., urgent care in ambulatory settings rather than hospitals; post-acute home health rather than facility-based care). Substitution within an asset class has largely focused on hospitals—cost and quality pressures have resulted in changes to the traditional business model. Many facilities, for example, have moved to outsourced hospital-based physicians (e.g., anesthesiologists and emergency physicians). The substitution effect, coupled with the newer asset classes' better return on capital (Exhibit 3), has increased investors' interest in two areas in particular:

9 McKinsey 2017 Consumer Health Insights Survey.

— *Low-cost providers in need of capital to scale.* Since 2012, PE investments in this area have increased by about 16 percent per annum. Examples include Warburg Pincus's investment in CityMD; TPG's in GoHealth; and Welsh, Carson, Anderson & Stowe's in InnovAge. In these cases, the assets required capital to further scale locally or nationally. The continued emphasis on shifting to lower-cost providers will create ongoing opportunities for investment in retail-type care provision models (e.g., on-site employer clinics), home-based care (e.g., home health, personal care assistance), and remote health (e.g., e-visits, telehealth).

— *Physician groups that can provide care within alternate settings.* Historically, investors have focused on hospital-based specialties that can be outsourced as a low-cost alternative to hospitals or specialties with higher exposure to private pay (e.g., dermatology). Looking forward, an increasing volume of investments will likely be made in areas that can deliver more convenient, lower-cost services for an aging population (e.g., orthopedics, gastroenterology, cardiovascular, oncology), especially given current dynamics within physician services. (The United States is projected to have a physician deficit of up to 88,000 providers by 2025.[10]) While these specialties have greater exposure to Medicare reimbursement, they also enable investors to access non-traditional value-creation levers. These levers include expanding ancillary offerings to shift day surgeries, imaging, and lab services from hospital-outpatient to free-standing settings; adopting risk-based arrangements to capture upside from managing the total cost of care; and investing in technology solutions to increase physician productivity and lower administrative burdens.

Medical management

Historically, investments in medical management focused on population health analytics and direct ownership of the parts of the care continuum that were driving variation in costs. However, success has been difficult to achieve in these areas—population health analytics predicated on risk-based arrangements with downside risk (to align incentives) and payer-provider data integration are still in nascent stages of development. Achieving success in direct ownership of skilled nursing facilities, for example, requires business model transformation to unlock value, given reimbursement headwinds. To date, most investors have not had sufficient operational savvy to accomplish that.

In the future, reducing medical "waste" is likely to remain a priority. Many investments may therefore focus on data-driven services that might decrease utilization and improve unit-cost management. For example, investors will continue to help expand the historical success pharmacy benefits management achieved into other categories of benefits (e.g., medical oncology, post-acute care) and to specific types of patients (e.g., high-risk, behavioral). Nearly $1 billion in VC funding has already been invested in medical benefits management, which has created a pipeline of assets for PE firms.

As value-based care models continue to be implemented across the country, the need for clinical decision-support tools designed to reduce the cost of care and outcomes variability will grow. Although PE groups have yet to invest seriously in this area, decision-support companies have received more than $2 billion in VC funding since 2011—so uptake may be expected.

Optimizing healthcare payments

Each year, more than $3.5 trillion flows through the US healthcare system to providers. Employers and government are responsible for over 85 percent of these funds via payments to health insurers or directly to providers, but

[10] IHS. 2017 Update: *The Complexities of Physician Supply and Demand: Projections from 2015 to 2030. Final Report Prepared for the Association of American Medical Colleges*. February 28, 2017.

more than $200 billion is sent directly from consumers to providers.[11] Given these sums, many investments have focused on the digitization and standardization of both payers' payment integrity and providers' revenue cycle management. However, the complexity of healthcare payments is increasing. As consumers take on a greater share of healthcare payments, it is becoming increasingly important that they be given an accurate estimate of the costs that will be billed to them before an encounter with a provider. Furthermore, "smarter" methods to predict and adjudicate payments are needed to account for risk- and quality-adjustment factors.[12]

Better approaches to payment are required if patients are to proactively manage out-of-pocket expenses, providers are to reduce consumer bad debt, and payers are to accurately anticipate medical expenses. For example, an integrated solution could give patients financial planning tools and an accurate idea of what their out-of-pocket costs are likely to be (based on their coverage), while also giving providers a way to estimate patients' payments. If then combined with an online payment portal, the solution could reduce the complexity patients' face with managing healthcare payments. New approaches might also include technology-enabled solutions that address pain points healthcare providers have in revenue cycle management, such as coverage discovery and point-of-service payment collections.

Investors are therefore likely to continue seeking new payment solutions, with a heightened focus on those that could fundamentally change how patients, providers, and payers understand and manage payments before an encounter. Investments will probably also accelerate for technology-based solutions that enable automated eligibility checks, cost and propensity-to-pay estimation, and point-of-service payment. More than $5 million in VC funding has already supported development of several patient payment companies.

How could these trends reshape the industry?

Deal activity is likely to accelerate, given average annual returns above 10 percent in healthcare services.[13] The inflow of capital from institutional investors will make possible the development of new business models. This inflow, in combination with greater maturity in analytics and digital capabilities, wider implementation of risk-based reimbursement arrangements, and greater pressure from payers and consumers, could accelerate the pace of change in healthcare services. Areas of the value chain that could be disrupted include both the non-acute and post-acute care continuums, services analytics platforms, and care delivery operating models. The disruption could play out in at least six ways:

Healthcare as a service industry. Increased access to lower-cost settings of care and investments in consumerism could change thinking about how healthcare should be delivered. Healthcare could shift away from a "build it and they will come" mind-set and toward assumptions in other services industries, where anticipating customers' needs, digital marketing, and consumer shopping are essential.

Chronic disease management that works. The strategy of establishing standardized clinical pathways has lacked the intensity needed to drive behavioral change. New strategies based on redesigned incentives could use digital approaches to keep patients, providers, and payers more closely engaged with each other. For example, some of the top US payers are now offering members access to cellular-phone-connected glucose monitoring that issues an alert if a patient's blood glucose is too low.

Automation that changes the cost of care. Capability improvements could make it possible to apply advanced analytics and automation to clinical and operational workflows to increase asset utilization, reduce clinical variability, and streamline labor-intensive processes. Integration of analytics into existing

[11] Centers for Medicare & Medicaid Services. Office of the Actuary. National Health Expenditure Projections, 2017–2026.
[12] Calkins Holloway S et al. From revenue cycle management to revenue excellence. McKinsey white paper. June 2018.
[13] McKinsey Corporate Performance Analytics Tool (based on financial reporting of publicly traded companies).

Will [health systems] become leaders or followers in helping shape the industry's future?

clinical information systems is a key opportunity to be unlocked. The need to better control the cost of care delivery positions the market for faster adoption of effective solutions.

New approaches for post-acute care. The traditional "buy it and fix it" approach that many institutional investors have used for post-acute care has proved that it is not sufficient to simply develop a more efficient version of the same business model. Given the demands for "aging in place" from consumers and lower post-acute costs from payers, effective home health and remote monitoring solutions could disrupt the market. Should this occur, the facility-based post-acute market will need to further restructure.

Carve-out of elective ancillary revenues from hospitals. Investments are expanding from primary care groups to specialist and multi-specialty groups that own ambulatory surgery and other ancillary facilities (e.g., diagnostic imaging, lab, pharmacy, and intermediate care). This shift is likely to create physician organizations that can cater to consumers' one-stop-shop preferences and take risk by providing lower-cost alternatives, thereby supporting payers' efforts at medical management. As a result, referral networks for elective care could consolidate and lower-acuity elective services would continue to shift out of hospitals.

Next generation of revenue cycle innovation. A greater focus on the intersection of patients, providers, and payers in healthcare payments, coupled with predictive analytics and consumer engagement, could breathe new life into the marketplace. This change could make possible new tools that would enable payers and providers to determine and adjudicate complex claims more effectively as well as give patients a simpler payments process.

Even if only half the investments from institutional investors are successful, the resulting industry shifts could reduce variability in care delivery, optimize appropriate sites of care, and lower the overall cost of care. Over the past decade, the annual increase in national health expenditures has averaged just over 4 percent.[14] We believe that the trend curve could be bent—it is even possible that the cost curve could become negative (temporarily, at least) if enough waste if driven out of the system.

How providers could respond

We believe that future investments will need to be more directive and have a clearer ROIC, given the amount of capital being put into healthcare. Therefore, health systems will need to think differently about their role: Will they become leaders or followers in helping shape the industry's future? There are a few directions a health system could take, depending on its business strategy and access to capital.

Become an active investor. Some health systems may want to take the cue from institutional investors and continue to diversify their investments and sources of revenues in healthcare services. These health systems could invest to build capabilities de novo, given their expertise in local markets, or compete with institutional investors on deals. Since 2012, health systems have engaged in nearly 1,000 transactions, and those that have successfully diversified their portfolios to include high-return ancillary assets have achieved stronger performance than their peers (nearly 10 percent ROIC versus less than 5 percent for a simple hospital network).[15] However, becoming an active

[14] Centers for Medicare & Medicaid Services. Office of the Actuary, National Health Statistics Group. 2017.
[15] McKinsey Corporate Performance Analytics Tool (based on financial reporting of publicly traded companies).

investor requires access to capital and a willingness to divert strategic capital to new businesses with longer timelines for returns.

Partner with institutional investors. Institutional investors will continue to buy assets across the healthcare continuum, which creates a range of partnership opportunities for health systems, including joint venture structures for acquisitions, and preferred contractual relationships with PE-backed portfolio companies. Such partnerships could be mutually beneficial to both parties. Health systems would benefit from improved offerings tailored to their markets or unmet needs, as well as having access to part of the upside gains. Institutional investors would be able to scale their investments more quickly, resulting in higher value generation. However, these arrangements may be complex to manage, and there could be differences between an institutional investor's and the health system's expectations for returns. Additionally, for select not-for-profit health systems, there could be tension between investing in a community mission (e.g., serving Medicaid patients) and investing in revenue diversification.

Wait to acquire scaled business models. Over several years, institutional investors could potentially aggregate assets and create platforms of scale. These platforms might be attractive acquisition targets for health systems that want to accelerate their business model evolution with less risk. Health systems that want to use this approach would have to be able to afford a premium, given that PE buying sprees create scale and often result in a shortage of supply, which expands multiples. The increase in costs likely helps explain why health system acquisition activity has cooled off recently (there were only about 100 transactions in 2017, compared with about 230 two years earlier). Another drawback is that this approach requires health systems to wait and may create a window for new entrants, (e.g., payers) to acquire healthcare services assets.

Health systems will also need to put defensive strategies in place. The new business models likely to emerge from institutional investments will probably continue the longer-term trend of reducing care delivery in hospitals. This will disproportionately affect health systems with high cost structures, insufficient quality outcomes, and/or an inadequate consumer experience. Furthermore, the scale-up of non-hospital services will decrease health systems' negotiating leverage (e.g., with an existing anesthesiology group or revenue cycle management vendor)—a problem that will be particularly acute for smaller health systems. These pressures will increase the imperative for health systems to continue to evolve their business models to focus on delivering high-quality healthcare, to make sure their operating models have a dual focus on cost management and quality and to build capabilities to integrate with new healthcare services partners into an ecosystem to create value.

The silent shapers of healthcare are here to stay. Their investments are likely to accelerate and have even deeper impact. We believe it is crucial that health systems not attempt to maintain the status quo or be passive observers of market restructuring. The longer a health system waits to become part of the industry's changes, the costlier the impact will be—its current business model could further erode, and entering new markets will likely become more expensive.

New, proactive tactics are needed regardless of the degree of active investment. Such an approach will allow health systems not only to preserve economics and share the market with institutional investors, but also to shape how and where care is delivered to patients.

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Recession and resilience: Preparing for the next economic downturn

Aneesh Krishna, Carlos Pardo Martin, Cara Repasky, Shubham Singhal, and Sean Zhao

Economic ebbs and flows are called "cycles" for a reason. The question for healthcare leaders is not whether or when the next downturn will occur—it's whether you will win when it does.

It has now been more than ten years since the Great Recession ended. For many of today's healthcare leaders, the downturn that reshaped the global economy is a distant memory, and many leaders have not experienced a recession while in their current roles. Moreover, we have not experienced a recession post-Affordable Care Act (ACA). Old rules of thumb do not apply. With concerns about the next economic downturn brewing, now is the time for leaders to consider how they will respond.

In the infographic that follows, we describe the potential effect of a recession on healthcare organizations and review lessons from organizations that most successfully weathered the 2008–09 downturn. These organizations—the "resilients"—not only outperformed their peers during the recession and recovery but also grew more quickly during the expansion that followed. In other words, the resilients—widened the gap to their competitors through and after the downturn.

The resilients have several characteristics in common. They prepared for, reacted to, and emerged from tough periods differently from their peers, and they reaped the rewards. We reviewed these features earlier this year in the article *Bubbles pop, downturns stop*[1] and found that the resilients did three things to create a significant earnings advantage over their peers: created a safety buffer by cleaning up their balance sheets, improved cash flow by improving productivity ahead of the downturn, and shaped their portfolios by divesting underperforming assets early and acquiring new ones after the downturn.

To execute these strategies, the resilients had to make balanced decisions more quickly than their peers. Their example points toward a new resilience playbook, enabled by a "nerve center" that can monitor the most material risks, decide quickly how to manage those risks, and execute through cross-functional units that drive toward clear outcomes.

Cutting through the noise to manage efficiently the greatest risks frees up leaders' attention. This enabled resilients to pursue opportunities that emerged during recent downturns and propelled growth during recovery, including attracting top talent. Following their example, healthcare companies with ambitions for digital transformation might consider bringing onboard technology leaders who can accelerate those efforts.

[1] Martin Hirt, Kevin Laczkowski, and Mihir Mysore, "Bubbles pop, downturns stop," *McKinsey Quarterly*, May 2019, McKinsey.com.

In addition, the most successful resilients started planning early. Organizations that begin planning strategic bets now will be better positioned to execute when opportunities arise.

Leaders of healthcare organizations must also bear in mind that the landscape has changed significantly since the last recession began in 2008; assumptions based on experience from past business cycles may no longer hold. Expansion of Medicaid and individual exchanges under the ACA has changed the options available to consumers who lose employer-sponsored coverage. Today, many of these consumers are likely to shift onto Medicaid plans rather than become uninsured, mitigating some risk for private payers and providers while adding pressure to state health budgets. Meanwhile, the increased penetration of high-deductible health plans (HDHPs) relative to 2008 may dampen the effect on utilization of coverage shifts; for example, higher cost sharing may discourage consumers from using care for elective procedures prior to expected loss of employment.

Many of the projections in the infographic that follows are stark. For example, some healthcare organizations may see earnings before interest, tax, depreciation, and amortization (EBITDA) drop by 15 to 30 percent in a recession like the one that began in 2008. However, bear in mind the performance gap between the resilients and their peers: organizations that start preparing now and respond quickly during the next downturn are likely to fare much better.

RECESSION AND RESILIENCE: PREPARING FOR THE NEXT ECONOMIC DOWNTURN

Economic ebbs and flows are called "cycles" for a reason. It has been over 10 years since the last recession began. The challenge for today's healthcare leaders is not whether the next downturn will occur—it's whether you are ready for it. Consider:

The structure of the healthcare industry has fundamentally changed since 2008, making previous experience in understanding the impact of a recession less relevant

Many industry leaders have not experienced a recession in their current roles because of the long period of economic growth

The gap between industry leaders and laggards widens during and after a recession, driven by actions taken by leaders before and throughout the downturn

Healthcare leaders need to consider the implications of an economic slowdown and build a resilience plan—not only to weather the impact, but also to enable their companies to emerge financially and strategically stronger

Impact of a recession on healthcare: The next time could be different

MAJOR CHANGES IN THE HEALTHCARE INDUSTRY SINCE THE 2008–09 RECESSION

34 states[1] expanded Medicaid, extending eligibility to ~13M adults as of 2018

55% +[3] of payer revenues are attributed to government businesses (Medicaid and Medicare)

2/3 + Enrollees in the Individual market receive financial assistance

~800 deals[4] have been announced since 2008, involving ~1800 hospitals

1/3 of people with employer coverage have high-deductible health plans (HDHPs), compared to fewer than 1/10 in 2008

32% year-over-year growth in venture funding for digital health since 2011

POTENTIAL IMPLICATIONS OF THE NEXT RECESSION

Increased Medicaid enrollment could create budgetary pressure for states: 13 of the 34 expansion states have rainy day funds <5% of the general fund expenditures[2] and may experience significant budget shortfalls

Increased presence in Medicaid and Medicare will help diversified payers mitigate downside impact in other segments; managed care organizations (MCOs) may have an opportunity to grow in Medicaid, but may face pricing pressure as states experience budgetary shortfalls

Increased adverse selection in recession may lead to market instability and pricing risk, particularly in regions with high pre-recession employer-sponsored insurance concentration

Scale advantages are likely to be even more important as payer and provider market dynamics have shifted; from 2012–17, 1/3 of counties (2/5 of US population) experienced greater provider consolidation relative to payer consolidation, and 1/4 of counties (1/6 of US population) experienced the opposite[5]

Higher cost sharing for those in HDHPs may dampen potential utilization increase pre-downturn; employers may turn to "non-traditional" levers such as narrow networks to reduce cost, providing an opportunity for payers to increase differentiation through innovative product offerings

Organizations that invested early in digital and advanced analytics capabilities may have competitive advantages in being able to respond during a downturn by better understanding coverage/utilization shifts and consumer behavior

1 As of February 2019, includes DC but excludes ID, NE, and UT, which are set to expand later in 2019. | 2 Based on National Association of State Budget Officers (NASBO) report for fiscal year 2019. | 3 As of 2018, based on McKinsey payer financial database. | 4 Gee E, Gurwitz E, "Provider Consolidation Drives Up Health Care Costs, Center for American Progress," December 5, 2018, americanprogress.org. | 5 Measured by the shift in provider-to-payer Herfindahl–Hirschman Index (HHI) ratio from 2012–17, based on American Hospital Association (AHA) and Interstudy data. Greater provider consolidation defined as an increase in the ratio by at least 0.2, and greater payer consolidation defined as a decrease in the ratio by at least 0.2.

SOURCE: AHA database; CMS, 2017 Actuarial report on the financial outlook for Medicaid; Interstudy database; Kaiser Family Foundation; NASBO Fiscal Survey of States; McKinsey Enrollment Database

Potential impact* of an economic recession on current healthcare market

Likely coverage shifts (lives)

~4–10M
Out of Commercial

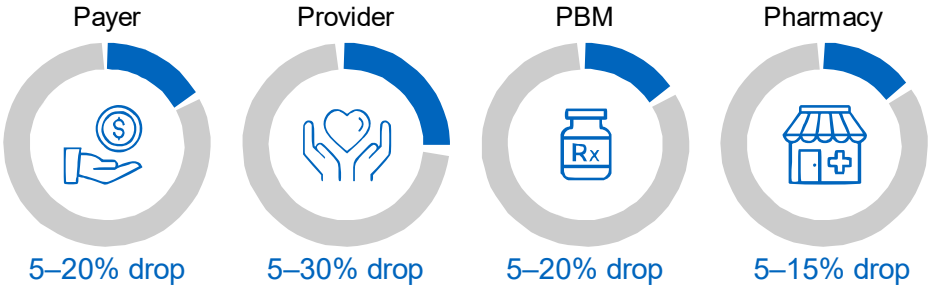
~3–7M
Into Medicaid

~1–3M
Into uninsured pool

State budgetary pressure

Medicaid cost as a percentage of states' general revenue could increase by ~3–10 percentage points,[1] relative to 2018 levels

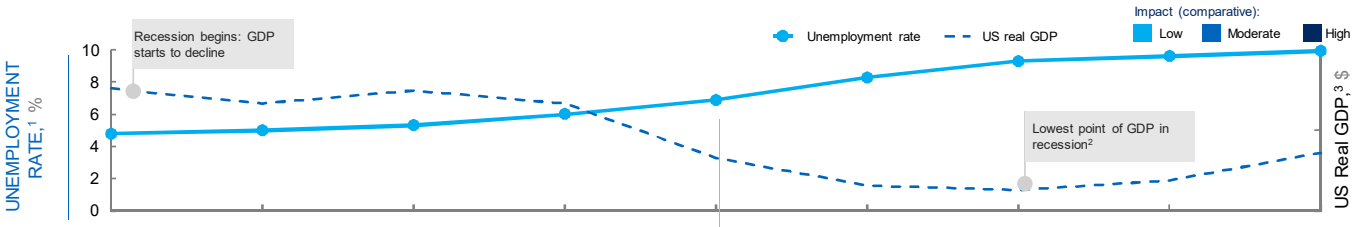
Stakeholder bottom line (EBITDA)



* For illustrative purposes only; impact estimate ranges were modeled based on the severity of the 2001 "dot com" recession (low range) and the 2008 "Great Recession" (high range). Given the uncertainty on the severity of the next downturn, we have used economic indicators (e.g., unemployment rates, GDP decline) from the last two and applied those to the current legislative and regulatory environment to highlight the potential impact. The analysis does not factor in any specific actions payers, providers, pharmacy benefit managers (PBMs), or pharmacies might take in response to the recession.

1 Includes state portion of Medicaid cost only; increase in Medicaid cost also accounts for non-recession factors such as reduction in Federal Medical Assistance Percentage (FMAP) for expansion population and reductions in Disproportionate Share Hospital (DSH) payments.

Healthcare stakeholders may experience varying degrees of impact due to likely coverage shifts



LIKELY STAKEHOLDER AGGREGATE MARGIN IMPACT, RELATIVE TO BASELINE[4]

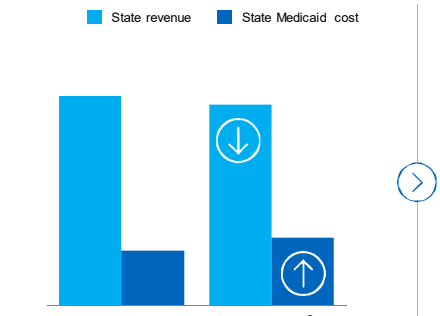
	Recession Year 1 Coverage shifts begin as unemployment rises and some employers reduce coverage and benefits	Recession Year 2 Coverage shifts increase (driven by growth in Medicaid coverage and uninsured rates) as unemployment rate peaks
Payer	▪ Increase in uninsured lives ▪ Shift of fully insured commercial lives to Medicaid ▪ Increasing medical loss ratios (adverse selection)	▪ Low or no growth in Medicaid MCO capitation rates, and employers strengthen cost controls
Provider	▪ Shift to Medicaid decreases reimbursements ▪ Rising uninsured rate increases bad debt ▪ Utilization upticks in elective care and ancillary services as individuals anticipate coverage loss	▪ Utilization drops, especially for elective and ancillary services; states could further cut provider reimbursements
PBM	▪ Shifts to Medicaid/uninsured, along with drug utilization decreases (as consumers tighten budgets), reduce revenue and rebates retained	▪ Coverage shifts and utilization decreases continue; employers and payers strengthen utilization management
Pharmacy	▪ Shifts to Medicaid/uninsured, along with drug utilization decreases, reduce revenue, but there may be an increase in 340B-eligible[5] pharmacies	▪ Coverage shifts and utilization decreases continue; PBMs and payers reduce dispensing fees and drug reimbursement

1 Based on unemployment rates observed in the 2008–09 recession for illustrative purposes. | 2 Defined as quarter with the lowest GDP in recession period. | 3 Real GDP for illustrative purposes only, not modeled. | 4 Assumes consistent market position and share. | 5 Allows hospitals and contracted pharmacies to purchase medications at a lower price; eligibility partially based on volume of Medicaid patients served.

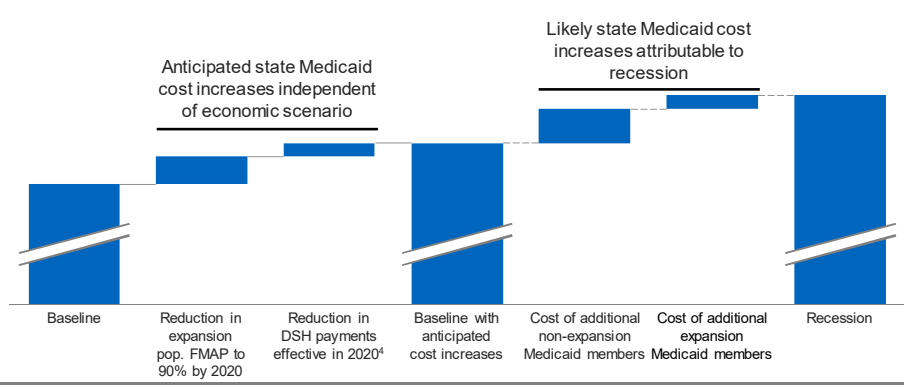
SOURCE: Expert interviews; literature review; Multpl.com; McKinsey Healthcare Recession Model

States will likely experience significant budgetary pressures as Medicaid costs rise and general revenue declines

STATE MEDICAID COST[1] & REVENUE COMPARISON FOR **EXPANSION** STATES, UNDER RECESSION SCENARIO[2]



PROJECTED STATE MEDICAID COSTS[1] FOR **EXPANSION** STATES IN A RECESSION SCENARIO



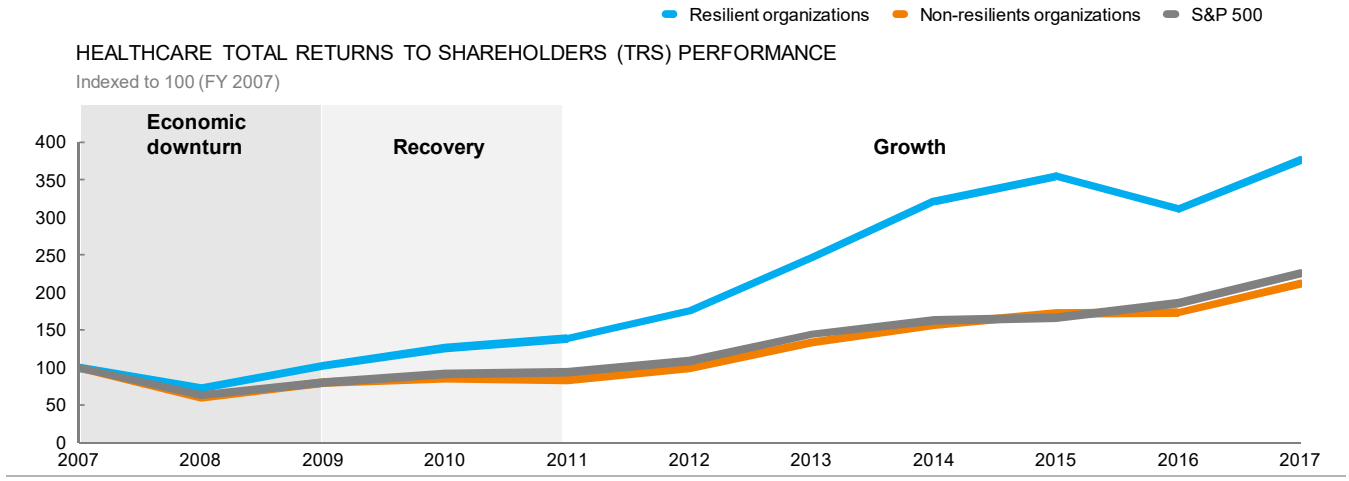
ACROSS EXPANSION STATES, MEDICAID COST AS A PERCENTAGE OF TOTAL STATE REVENUES MAY INCREASE DRIVEN BY:

- Reduced state tax revenue during a recession
- Anticipated FMAP (Federal Medical Assistance Percentage) reductions for the expansion population to 90% and DSH (Disproportionate Share Hospital) reduction of $4Bn by 2020[4,5]
- Increased enrollment of traditional and expansion members

1 Accounts for state portion of the cost (i.e., total cost less federal match). | 2 Does not include DC. | 3 Assumes 3.5% state budget increase. | 4 Scheduled Medicaid DSH cuts of $4 billion in FY 2020, and $8 billion thereafter. | 5 For majority of expansion states.

SOURCE: Holahan J, The 2007–09 recession and health insurance coverage, *Health Affairs*, 2011;30(1):145–52; Jacobs PD et al, Adults are more likely to become eligible for Medicaid during future recessions if their state expanded Medicaid, *Health Affairs*, 2017;36(1):32–9; Moody's Analytics stress testing states, 2018; National Association of State Budget Officers, Fiscal survey of the states; McKinsey Healthcare Recession Model; McKinsey Medicaid Reform Model

Analysis of the last recession shows that "resilient" organizations outperformed others throughout the downturn and widened the performance gap after



Resilient organizations are the top 20% of performers in their sectors, as measured by average total returns to shareholders from 2007–11

Note: Calculated as median of "resilient" and "non-resilient" companies within healthcare industry, including healthcare services, distributors, facilities, device manufacturers, suppliers, technology companies, and managed healthcare organizations.
SOURCE: Capital IQ; CPAnalytics; McKinsey resilience analysis

The resilient organizations that survived (and even thrived) during the last downturn did three things differently:

Secured their balance sheets ahead of the downturn

Moved faster to drive a step-change improvement in clinical and administrative operating costs

Purposefully shaped their portfolios by divesting before the downturn and acquiring afterwards, as appropriate

Is your organization prepared for the impact of a potential economic downturn?

Are you ready to do the three things listed above better than others to survive and even thrive during a potential downturn?

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Ensuring financial sustainability while serving a growing Medicaid population

Bede Broome, MD; Connie Cibrone; Michael Elliott; and Li Han

High-performing health systems have succeeded in "breaking even" in Medicare, but many continue to struggle to achieve similar results in Medicaid. A concerted effort to improve revenue can strengthen a system's financial sustainability.

Many high-performing health systems have succeeded in "breaking even" in the Medicare segment of their business, but their hospitals continue to struggle financially with both fee-for-service (FFS) and managed Medicaid. Furthermore, an increasing number of states are working with Medicaid managed care organizations (MCOs), and we anticipate that these MCOs will experience ongoing, if not increasing, pressures to maintain or lower hospital reimbursement rates. Given the other challenges health systems currently face—including overall cost pressures, slow growth in reimbursement rates, and decreased commercial volume—absorbing losses in the Medicaid segment is becoming increasingly untenable for many of them. These systems need to pivot quickly to improve their hospitals' financial performance in Medicaid—the era of "breaking even" only on Medicare is over if they want to ensure their financial sustainability.

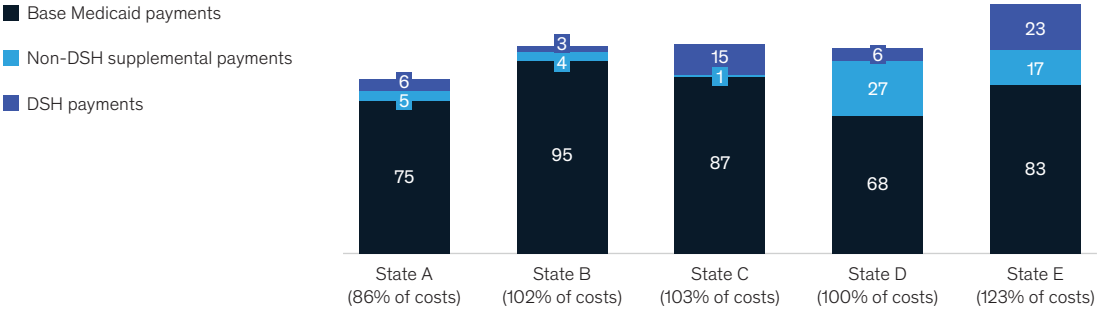
Because Medicaid's reimbursement structures differ from Medicare's, the traditional methods health systems have been using to ensure financial success in Medicare may not be sufficient in the Medicaid line of business. Both Medicaid's base payments and the percentage of total Medicaid costs those payments cover vary tremendously by state (Exhibit 1).[1] In addition, many health systems receive disproportional share hospital or other supplemental payments from the federal and/or state governments; however, the availability and size of the supplemental payments also vary by state. Additional complexity arises from the fact that, in some cases, the lag time between when services are provided and when some of the supplemental payments are received can be as long as three years.

The complexity of Medicaid reimbursement—the different base rates, payment structures, and sources of supplemental reimbursement—has made it difficult for many health systems to improve their financial performance in that line of business. It can be done, especially by systems that already serve a high volume of Medicaid patients. However, most systems will need innovative solutions if they want to do so without jeopardizing quality of care. We have found that one approach, in particular, can help many health systems—combining stringent cost containment efforts with a strengthened approach for claiming the supplemental reimbursements they are entitled to receive. This combined strategy is the focus of this article.

[1] MACPAC, Medicaid base and supplemental payments to hospitals, Issue brief, June 2018, macpac.gov.

Exhibit 1

Medicaid payments to DSH hospitals as a percentage of Medicaid costs for selected states, SPRY 2013



Note: In this exhibit "base Medicaid payments" include both fee-for-service and managed care payments.
DSH, disproportionate share hospital; SPRY, state plan rate year.

Source: MACPAC. Medicaid base and supplemental payments to hospitals. Issue brief. June 2018

Time is of the essence, however, given the lag time until supplemental payments may be received. Health systems that want to improve their financial performance in Medicaid should start making changes now to account for that delay.

Note: Some healthcare systems may want to launch—or have launched—broader strategies to address the full continuum of care, which would allow them to fully benefit from a capitated payment model. Those systems that succeed with this approach are likely to find themselves under less financial pressure from Medicaid reimbursement. Nevertheless, even those systems would benefit from the steps outlined in this article.

Traditional cost containment strategies

There is no doubt that a sustained push to balance costs and revenues using the methods health systems have traditionally relied on to break even in Medicare—disciplined expense management, stronger revenue cycle management, and improved operations—is crucial for success in Medicaid (Exhibit 2). But, even if these steps are pursued aggressively, they may not be enough in Medicaid.

Disciplined expense management

In our experience, best practice for an average health system with a typical payer mix would be to spend just under half of its net revenues on labor, no more than 20 percent on supplies and drugs, and perhaps 15 percent to 25 percent on all other costs.[2] (The exact percentages will depend on a system's geographic footprint and the extent to which it has outsourced certain functions.) Depending on how heavily a health system pulls various levers, it might achieve savings of 5 percent to 10 percent—and sometimes more—over one to five years if it adopts a very disciplined approach to expense management.

Workforce. Initial levers that can be used to reduce workforce spend include setting department-level targets for productivity[3] and premium spend (e.g., overtime and contract labor), actively managing staff scheduling and flexing, and when necessary, rightsizing through a reduction in force. In addition, strict, ongoing tracking and adherence processes for performance against best-practice targets should be instituted, and steps should be taken to ensure that all caregivers are practicing at the top of their license.

External spend. Reducing external spend also requires a very lean approach, including a high-

2 For-profit provider quarterly earnings data, January 2017.
3 See Sahni N et al. *The productivity imperative for healthcare delivery in the United States*, February 2019, McKinsey.com.

ly standardized pharmacy formulary, narrow set of approved commodity supplies, and approval requirements for select high-cost, long-term-use drugs. In addition, restrictions should be placed on physician-preference items when evidence demonstrates that more cost-effective options with equal or better efficacy exist.

Outsourcing. For health systems with mostly in-house operations, outsourcing can achieve significant savings. Among the functions that can be outsourced are food purchasing and cafeteria services, IT services, supply chain management, and revenue cycle management. Although outsourcing may entail dramatic changes in existing processes and operations, it can have a proportionally large impact on costs.

Stronger revenue cycle management

Health systems should also focus closely on revenue cycle management in all lines of business. Two levers are especially important:

Addressing denials with payers to ensure full, accurate payment. Health systems today need to navigate the complex and varying medical policies and requirements different payers use if they are to receive appropriate payment commensurate with the care provided. For health systems that want to ensure full revenue capture, effective mid-cycle management—including appropriate coding, billing, and documentation—is essential. As part of the process of improving operations and performance, these systems must stress the importance of proper clinical documentation to ensure appropriate and timely payment. When denials or other issues arise, they should be addressed rapidly. Other revenue levers that can be used include bad debt reduction (for example, through coverage discovery) and accurate documentation to support coding and billing.

Effectively negotiating with MCOs. Given the large shift from FFS Medicaid to managed care, a nuanced pricing and negotiation strategy with MCOs can help a health system achieve an appropriate, market-competitive payment schedule. In addition to traditional service-pricing levers, other areas that should be explored include terms and conditions (especially in reducing administrative costs), pay-for-performance/pay-for-quality programs, and capitated arrangements.

A comprehensive approach that combines revenue cycle management and MCO contracting may increase Medicaid revenues by 5 percent or more. As we discuss below,

Exhibit 2

Strong expense, revenue cycle, and operational management can help health systems improve financial performance in Medicaid

Labor and organizational structure	• Spans and layers • Productivity
External spend	• Supplies • Pharmaceuticals • Purchased services
Revenue cycle management	• Payer yield and collections • Uncompensated care • Coding and documentation
Managed care and pricing	• Strategic pricing • Contracting terms and conditions • Value-based contracting models (e.g., capitation)
Clinical operations	• Length of stay • Emergency room throughput and access • Operating room, outpatient, and clinic efficiency

Systems must stress the importance of proper clinical documentation to ensure appropriate and timely payment.

however, approaches that go beyond these steps are often needed to significantly increase Medicaid revenues.

Improved operations

Despite the differences in Medicare and Medicaid reimbursement, both programs often base reimbursement on some type of bundled payment, such as case rates or diagnosis-related groups (DRGs).[4] Increasingly, MCOs are moving in the same direction. In this environment, additional operational improvements (e.g., reducing length of stay, increasing emergency department access and throughput, and optimizing operating room capacity) can help further reduce costs and may allow for volume growth. However, the full impact of these measures depends on whether the health system can fill the freed-up capacity or has strict cost-management measures in place. Additional savings here can yield a further 1 percent to 2 percent reduction in the total cost of care. In addition, volume growth can contribute to a significant uptick in revenue and profitability. Despite the difficulty in "breaking even" on Medicaid overall, Medicaid patients are still typically contribution positive—because reimbursement for their care exceeds variable costs, every incremental case helps the overall financial performance of the hospital.

Strengthened approach to supplemental payments

The steps outlined above, if implemented aggressively, should yield 10 percent to 15 percent in a combination of expense savings and revenue impact. Even if some of the steps are implemented with only Medicaid as a focus point, they are likely to produce a halo effect across the system—stronger labor standards and payer-contracting strategies, as well as better supply choices and revenue cycle management, are usually transferable to other lines of business. Similarly, improvements in length of stay, throughput, and access often involve operational changes that lead to better performance throughout the hospital. Such efforts would not only improve the financial viability of Medicaid patients, but also help ensure profitability across the entire system. But, are savings of 10 percent to 15 percent always sufficient in the Medicaid line of business? If not, what can be done to cover the gap?

Answering these questions requires that a health system know how much total Medicaid reimbursement it is receiving and how wide the current gap is between revenues and costs. These questions are especially important—and should be a focus area—for systems that are not receiving reimbursements beyond base-rate payments from Medicaid. However, given the various streams through which Medicaid payments are made and the timing of when some payments are received, answering the questions is not as easy as it might seem.

The gap between base payments and costs

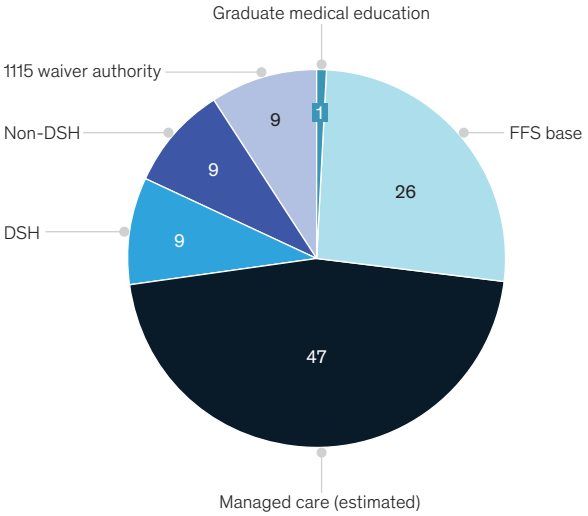
As discussed, Medicaid base-rate payments vary significantly among the states, depending on funding availability. Although some states still reimburse for inpatient care on a per-diem basis, many have moved, or are in the process of moving, toward using approaches based on DRGs. Based on data from the Medicaid and CHIP Payment and Access Commission (MACPAC), we estimate that many hospitals will need to meet an average gap of about 20 percent to break even if they receive base-rate payments alone, and even stronger performance to achieve a positive margin.

[4] Some exceptions apply, such as behavioral health cases, which are often reimbursed on a per-diem basis.

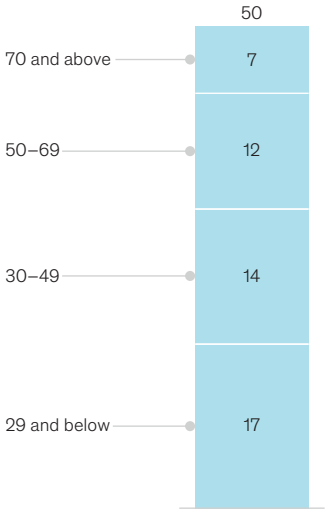
Exhibit 3

Supplemental payments are a significant portion of total Medicaid reimbursement

Sources of Medicaid payments to hospitals, % (FY 2016, nationwide)[1]



Count of states by share of supplemental Medicaid payments as a percentage of total reimbursement



DSH, disproportionate share hospital; FFS, fee-for-service.
[1] Figures may not sum to 100%, because of rounding.

Source: MACPAC. Medicaid base and supplemental payments to hospitals. Issue brief. June 2018; *MACStats: Medicaid and CHIP Data Book*. December 2018.

A sizable portion of the gap can be closed if health systems strengthen their approach to claiming the supplemental payments they are entitled to receive. MACPAC data indicate that about 27 percent of Medicaid payments to hospitals in fiscal year 2016 (which totaled almost $190 billion) came from supplemental sources (Exhibit 3).[5]

DSH and non-DSH supplemental payments

The supplemental payments used to help reimburse for care delivered to Medicaid patients come primarily from three sources: the Medicare disproportionate share hospital (DSH) program, the Medicaid DSH program, and various state-based non-DSH programs, or a mix of the three (Exhibit 4).[6] Total nationwide state non-DSH supplemental payments are estimated to have reached $18 billion in fiscal year 2016 (about 9 percent of total Medicaid payments), a sum that surpassed the $16.5 billion paid that year through the Medicaid DSH program.[7] In addition, states are allowed to apply for Section 1115 Medicaid demonstration waivers to use a portion of their base payments to test innovative approaches to Medicaid reimbursement.

DSH payments. Both the Medicare and Medicaid programs offer DSH patients to qualifying hospitals. A hospital may qualify for one or both sources based on the percentage of inpatient days attributed to patients either A) covered by Medicare Part A and Supplemental Security Income or B) eligible for Medicaid but not covered by Medicare Part A.[8] (Medicaid DSH payments are meant to reimburse

5 MACPAC, Medicaid base and supplemental payments to hospitals, Issue brief, June 2018, macpac.gov; *MACPAC Stats: Medicaid and CHIP Data Book*, December 2018, macpac.gov.
6 The reductions in DSH allotments stipulated in the Affordable Care Act have been repeatedly delayed by Congressional action. Whether the cuts scheduled for 2020 will go into effect remains unclear.
7 MACPAC, Medicaid base and supplemental payments to hospitals, Issue brief, June 2018, macpac.gov.
8 For more details about the qualifications for becoming a disproportionate share hospital, see Centers for Medicare & Medicaid Services, Disproportionate share hospital (DSH), April 23, 2019, cms.gov.

Exhibit 4

Medicaid supplementary payment programs include an initial qualification requirement and an ongoing payment determination structure

	Qualification for payment	Payment structure
Medicaid DSH	Based on Medicaid utilization rate or low-income utilization rate, both of which include a component of Medicaid revenue or Medicaid days	Once qualified, payment is based on Medicaid and managed Medicaid patient days
Medicare DSH	Based on DPP, which includes input from total Medicaid days in addition to Medicare days	Similar to the qualification metric; payment is also based on DPP, which is dependent, in part, on Medicaid days
Non-DSH supplemental	Qualification for payment varies by state; many states opt to exclude requirements for any specific threshold to be met	Various payment structures, depending on the state program; many look at Medicaid and managed Medicaid patient days or revenue

DPP, disproportionate patient percentage; DSH, disproportionate share hospital.

health systems for services delivered to uninsured patients as well as Medicaid beneficiaries.) Although Medicare DSH payments are made directly to hospitals by the Centers for Medicare & Medicaid Services, Medicaid DSH payments are distributed by each state individually. Because the rules for DSH payments differ between FFS and managed Medicaid, the increasing shift to managed care is altering DSH allocations for that program.

Non-DSH payments. Most states also offer additional, non-DSH payments under different structures.[9,10] Some states also offer other types of MCO-based supplemental Medicaid payments (funding levels vary by state).[11] However, the availability and size of supplemental payments is highly dependent on state laws. In some states, Medicaid supplemental programs are based on qualification criteria similar to those used by the federal DSH program; in other states, funds may be distributed based simply on Medicaid and managed Medicaid patients served, often by relevant patient days. The state funds are given to qualifying hospitals either directly or indirectly (via Medicaid MCOs) as additional payments.

In short, DSH and state non-DSH supplemental payments vary greatly in terms of funding availability, eligibility criteria, and how (and when) the money is paid—which helps explain why many health systems have difficulty determining how much Medicaid reimbursement they are receiving. Nevertheless, the MACPAC data suggest that if a hospital qualifies for DSH funds *and* is in a state that provides an average level of non-DSH supplemental payments, the total Medicaid payments could cover up to 107 percent of costs. In our experience, however, many hospitals either are in states that do not provide an average (or higher) level of non-DSH supplemental funding or have not increased their volume of Medicaid patients sufficiently to qualify for the payments.

Calculating a hospital's performance

When a health system is trying to determine whether its hospitals can improve their financial performance in Medicaid through both traditional methods and increased supplemental revenue, the first factor to consider is where the hospitals are situated—location strongly influences the level of available federal and state supplemental payments, as well as the

9 Centers for Medicare & Medicaid Services, Medicare disproportionate share hospital, September 2017, cms.gov.
10 Office of Statewide Health Planning and Development, Description of disproportionate share hospitals eligible formulas, November 2017, oshpd.ca.gov.
11 Note: MCO-based supplemental payments are difficult to track.

qualifications for payment and how the ongoing payments work (these are dependent on state-established rules for how the funding should be distributed). For each hospital, the health system should calculate two things:

— The average number of Medicaid and uninsured patients it treats annually

— The individual contributions of both supplemental payments and Medicaid base (FFS or MCO) reimbursement to covering the cost of care for those patients

Given the lag times until some types of payment are made, the calculations should be based on multiple years of data.

If a hospital with adequate operational/expense management qualifies for DSH funds and the state provides generous supplemental payments, then it may already be breaking even on Medicaid (or even see that its Medicaid reimbursement exceeds its Medicare payments). However, if the hospital has access to only the base rate—or the base rate plus either DSH funds or some non-DSH supplementary payments—then a shortfall is likely; the extent of the shortfall depends on the state but, on average, could be around 10 percent or 15 percent. Very aggressive management of operational performance and expenses (as discussed above) could help narrow that gap to between 5 percent and 10 percent. To further narrow the gap, even more innovative solutions must be considered.

Increasing Medicaid volume

For hospitals that are close to qualifying for Medicare and Medicaid DSH funds (and, in some cases, state supplemental payment pro-

Sidebar

Potential pitfalls when attempting to increase Medicaid payments

Although increasing the volume of Medicaid patients can help hospitals maximize appropriate reimbursement for the care delivered to those patients, the effort is not without risk. Several factors must be kept in mind whenever a hospital is contemplating this strategy.

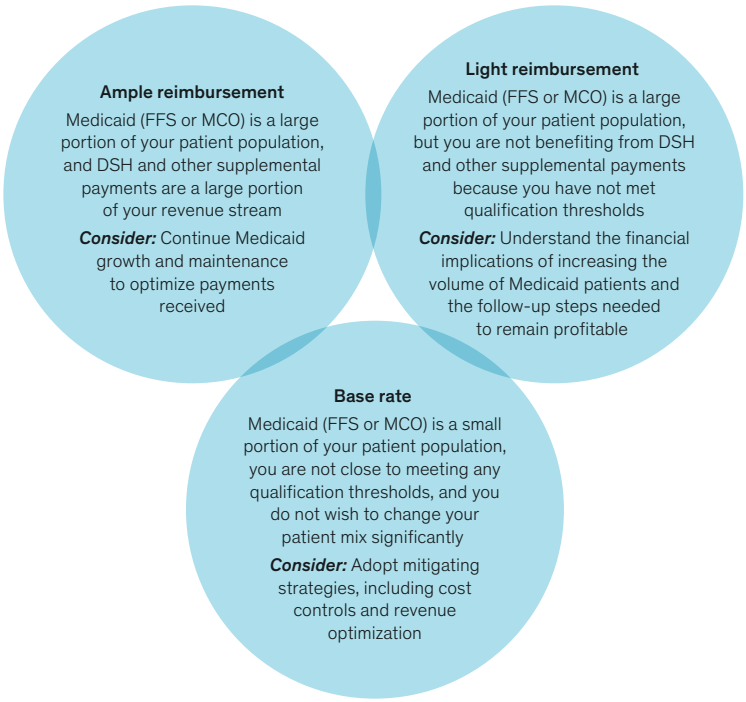
For example, there can be up to a three-year lag in receiving state supplemental payments (for example, 2017 Medicaid days would be used to determine 2020 supplemental payments.) There is also a two-year lag for Medicare and Medicaid DSH funds. (Payments are predetermined for the current and next fiscal year.) Thus, any efforts to increase the Medicaid FFS or managed care volume must be planned to ensure that the jump from the current Medicaid mix to the qualification threshold can, ideally, be completed in a single year.

Furthermore, if the increase in Medicaid volume required to meet the qualifications for DSH/non-DSH supplemental payments is large, the move could prove financially detrimental if a hospital has significant Medicare and/or commercial volume and the Medicaid increase comes at the expense of those patients. Most hospitals today have spare capacity; however, if a hospital at or close to full capacity substantially increases its Medicaid volume yet is not able to meet the necessary thresholds to qualify for DSH payments, the shift in payer mix could put it at a disadvantage.

Given the complexity of the qualification criteria and subsequent payment structure, the delayed payment timeline, and the need to consider the non-Medicaid patient segments, thorough due diligence should be conducted before a health system or hospital decides to pursue either an increased share of incremental Medicaid volume within existing operational structures or transformative innovative solutions that could potentially have adverse downstream financial implications.

Exhibit 5

How health systems can close the Medicaid reimbursement gap



DSH, disproportionate share hospital; FFS, fee-for-service; MCO, managed care organization.

grams), a modest increase in Medicaid patient volume to meet the qualification thresholds could be beneficial—and better support the needs of the community. As noted earlier, Medicaid patients can be contribution positive even if a hospital is not yet "breaking even" on the program overall. Furthermore, because eligibility is often determined on a threshold basis, just a small change in the number of Medicaid patients served can alter a hospital's eligibility status. The volume increase can be achieved in a variety of ways, including geographically segmented marketing and advertising, a focus on growth in specific service lines (e.g., obstetrics), or targeted patient capture through emergency department and hospital outpatient visits. A longer-term solution might be clinic-based scheduling modifications that increase the number of Medicaid patients.

Another potential solution would be to develop one or more end-to-end tailored programs. Such programs could include but are not limited to:

- Value-based payment programs and provider-led health plans
- Improved care delivery in line with episode-based payment models (e.g., an end-to-end pregnancy support program)
- Nonacute care delivery, including urgent care centers, as a way to build loyalty to the hospital

All strategies to increase the volume of Medicaid patients must be refined and tailored to each hospital to achieve the desired increase while minimizing potential risks. (For a discussion of these risks, see the sidebar on p. 94.) Because the thresholds often vary by state and include graduated or scaled payment structures, health systems cannot use a one-size-fits-all approach.

Even once the required thresholds have been met, it may make sense to further increase the volume of Medicaid patients to augment the supplemental payments received (Exhibit 5). Even in states where non-DSH supplemental

Exhibit 6

Approaches hospitals can consider based on their Medicaid reimbursement level

	Patient access	Targeted strategy
The "ample reimbursement" hospital	• Innovative end-to-end programs • Targeted physician recruitment	• Explore partnerships to sustain long-term pipeline for Medicaid population
The "light reimbursement" hospital	• Targeted service line growth • Targeted branding and marketing	• Joint ventures and partnership to draw in target volume • Targeted patient attachment strategies (e.g., in the emergency room)
The "base rate" hospital	• Site-of-care analysis • Transfer protocols to ensure appropriate level of care	• Care delivery and post-acute partnerships (e.g., with a federally qualified health center)

payments are minimal, carefully managed hospitals that can qualify for and maximize appropriate DSH payments have been shown to obtain total Medicaid payments covering an average of 96 percent of costs.[12] If additional state supplemental funding is available and obtained, then DSH-qualified hospitals may be able to reach or exceed the break-even point.

In addition to increasing Medicaid patient volume on an incremental basis with existing operational structures, other innovative solutions are available. The ideal strategy for a hospital depends on how close it comes to meeting or exceeding the Medicaid thresholds (Exhibit 6). To ensure success, the health system (and hospital) should explore a complement of different initiatives, including partnerships and joint ventures, targeted physician recruiting, and improved overall care delivery.

The range of options health systems have to improve the economics of delivering care to Medicaid beneficiaries are abundant. At many health systems, there are typically broader problems—with access, cost management, payer mix, and revenue optimization—that are putting margin pressure on the organization, pressure that is felt especially acutely in the Medicaid line of business.

[12] MACPAC, Improving data as the first step to a more targeted disproportionate share hospital policy, March 2016, macpac.gov.

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From revenue cycle management to revenue excellence

Sarah Calkins Holloway, Andrew MacDonald, Michael Peterson, and Bridget Pollak

Technology and payment trends are reshaping the revenue cycle. Providers that want to improve yield must think about revenue cycle management in a whole new way, which we call revenue excellence.

Across the country, hospitals and health systems continue to struggle with downward pressure on reimbursement and yield. At the same time, most are experiencing significant increases in costs associated with the revenue cycle. In this environment, many organizations are looking to their revenue cycle management (RCM) teams to deliver significant performance improvement at reduced cost—with mixed results.

If providers are going to be able to both improve performance—both yield and cash collections—and obtain a step-change improvement in efficiency, they must think about RCM in a new way, which we call *Revenue Excellence*. In contrast to traditional RCM, revenue excellence begins with a belief that improved performance requires ownership throughout the organization, places the patient experience at the center of all collections activities, and leverages analytics and technology in new ways to prevent revenue cycle problems before they occur.

In this paper, we describe the major forces that have challenged RCM performance for the past five years. We then address the most important question: How can providers shift to revenue excellence?

External trends challenging performance

Over the past five years, hospitals and health systems across the country have faced new challenges to RCM performance. The decrease in the number of uninsured individuals following passage of the Affordable Care Act (ACA) has been offset by increased complexity in other areas. Three underlying trends are the primary drivers of the increased complexity and accompanying performance challenges: shifts in payment responsibility and bad debt, changes in payment requirements, and heightened administrative burdens. These trends, combined with broader changes in how and where care is delivered, have created significant new obstacles for the revenue cycle.

Shifts in payment responsibility and bad debt

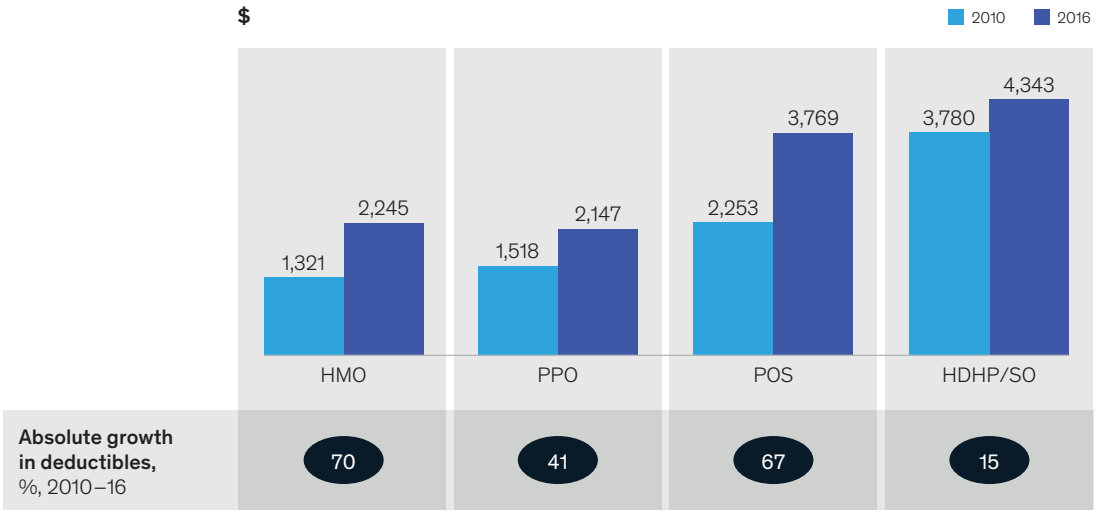
By far, one of the most important trends in healthcare in recent years has been the shift in financial responsibility towards patients and managed care plans. Two specific factors account for this trend:

- Most patients now bear a greater share of the overall financial burden
- An increasing proportion of patients covered by government-sponsored insurance are now in managed care plans

Shift of the financial burden to patients. Under the ACA, the uninsured rate among adults fell

Exhibit 1

Average annual deductibles for families with employer-sponsored health plans[1]



HDHP/SO, high-deductible health plan with a savings option; HMO, health maintenance organization; POS, point-of-service plan; PPO, preferred provider organization.

[1] Average annual general health plan deductibles for all plans except HMOs are for in-network services.

Source: Kaiser Family Foundation/Health Research and Education Trust. Employer Health Benefits: 2016 Annual Survey. September 16, 2016; US Census Bureau's American Community Survey income data tables 2010–16

from nearly 18 percent in 2013 to 12.2 percent in 2017.[1] Consequently, many providers saw their total outstanding liabilities from uninsured patients decrease. However, they also experienced a corresponding increase in unpaid liabilities from insured patients, making the net effect on their bottom lines nearly null. Changes in health insurers' plan designs were largely responsible for the latter shift. Between 2010 and 2016, for example, the deductibles for families of four with employer-sponsored health insurance rose 15 percent to 70 percent, depending on the plan type (Exhibit 1).[2] During that time, average American incomes largely remained flat, leaving patients with less disposable income to pay their growing healthcare bills.[3] As a result, effectively estimating, communicating, and collecting balances from patients who are underinsured or likely to have large out-of-pocket liabilities has become a top priority for providers.

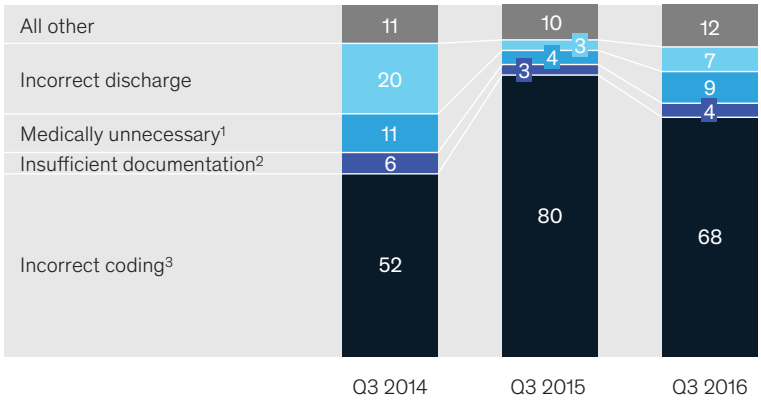
Shift into managed government plans. There has also been a shift away from traditional government health insurance plans to managed portfolios. An increasing proportion of Medicaid beneficiaries (80 percent in 2017, compared with 64 percent in 2007) are enrolled in plans run by managed care organizations.[4] Similarly, the proportion of Medicare beneficiaries enrolled in Medicare Advantage plans was 33 percent in 2017, up from 19 percent a decade earlier.[5] This shift may have implications for providers, because early studies have found evidence that managed care plans use different approaches to claims review than traditional government plans do, and may have different timelines to payment.[6]

1 Auter Z. US uninsured rate steady at 12.2% in fourth quarter of 2017. Gallup.com. January 18, 2018.
2 Kaiser Family Foundation/Health Research and Education Trust. *Employer Health Benefits: 2016 Annual Survey*. September 16, 2016.
3 US Census Bureau. American Community Survey income data tables. 2010–16.
4 Centers for Medicare & Medicaid Services. State Medicaid and CHIP applications, eligibility determinations, and enrollment data reporting. 2007–17.
5 Jacobson G et al. Medicare Advantage 2017 Spotlight: Enrollment Market Update. Kaiser Family Foundation. June 6, 2017.
6 For more information on reported denial rates and time to payment, see the recent paper by Gottlieb JD et al. The complexity of billing and paying for physician care. *Health Affairs*. 2018;37(4):619-26.

Exhibit 2

Top reasons for claims denials, as reported in the national RACTrac Survey

% of participating hospitals' denials, by dollar value



[1] Includes "short stay medically unnecessary," "medically unnecessary inpatient stay longer than 3 days," and "other medically unnecessary."
[2] Same as "no or insufficient documentation in the medical record."
[3] Includes "incorrect MS-DRG or other coding error" and "incorrect APC or other outpatient coding error." (APC stands for ambulatory payment classifications.)

Source: American Hospital Association. RACTrac Surveys, 2014–16; DiChiara J. Hospitals facing more payment claims audits, costly denials. *RevCycle Intelligence*. December 7, 2015

Because of these two trends, many providers have experienced changes in the size of the liabilities owed by both patients and payers, the time required for collections, and balance-after-insurance bad debt.

Changes in payment requirements

Another important trend relates to the requirements providers must meet to collect revenues owed from payers. Specifically, three changes in payment methodologies—the adoption of ICD-10,[7] stricter enforcement of medical policies, and risk-adjusted revenue—have created challenges for providers.

The rollout of ICD-10, for example, expanded the number of possible code options by about eight times to 140,000 codes.[8] As such, coding teams must have access to much more nuanced and comprehensive documentation to accurately code claims. Furthermore, many insurers have increased their enforcement of contract terms and scrutiny of claims, putting greater focus on medical necessity as a prerequisite for payment. According to a recent report, 81 percent of recovery audit contractor denials in Q3 2016 were based on factors related to either documentation or medical necessity (Exhibit 2).[9] Even when these two changes have not raised write-off levels, they have increased costs at most providers (because additional resources are required to create detailed clinical documentation, train coding teams on more nuanced code selection, and process and respond to claim follow-up activity). Furthermore, to obtain the appropriate risk-adjusted revenue from Medicare, providers must put additional focus on documenting the acuity of patient conditions.

The result: to maintain yield, providers must be smarter with their time and limited resources to ensure that documentation is accurate and denials are prevented whenever possible. Accomplishing this requires more effective engagement and collaboration with clinical staff and better use of electronic health systems to ensure proper support for billing teams.

7 World Health Organization. *International Statistical Classification of Diseases and Related Health Problems*. Tenth revision. 1992.
8 There were approximately 17,000 code options under ICD-9 and there are approximately 140,000 code options under ICD-10.
9 American Hospital Association. 2016 RACTrac Survey.

Heightened administrative burdens

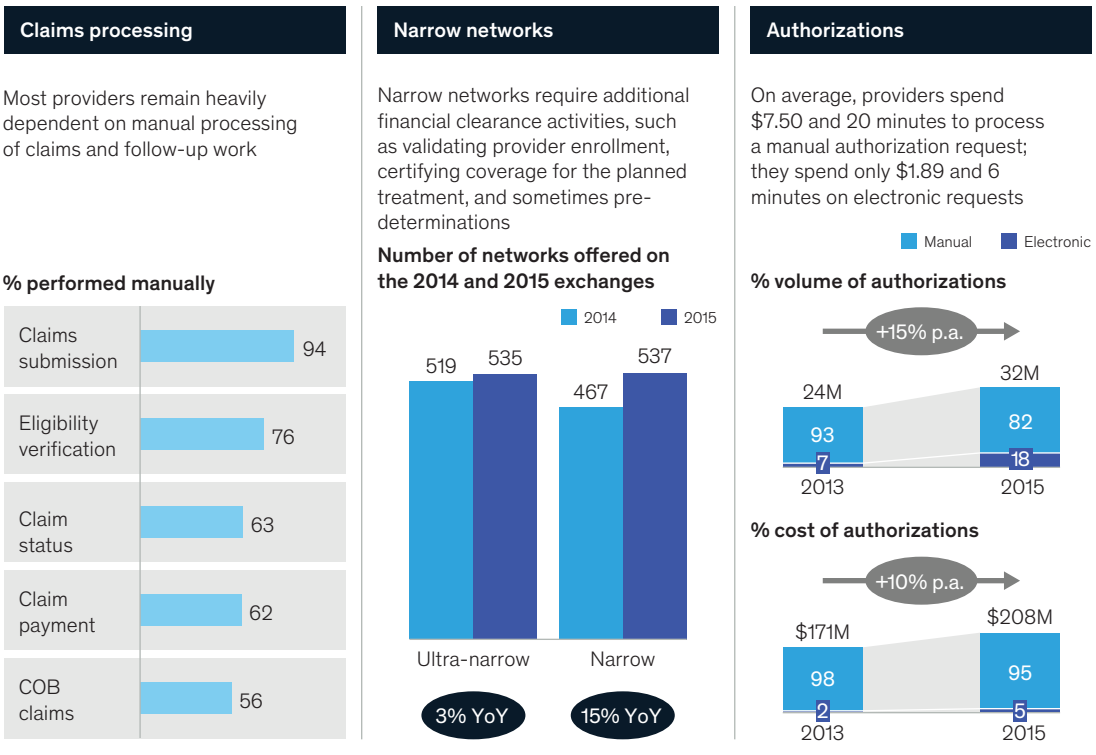
The ACA reduced providers' administrative burden in certain areas, especially by streamlining enrollment processes and encouraging electronic transactions. Adoption rates for standardized electronic transactions have been high in some areas, and this trend has lowered the burden for providers and payers alike. Among the commercial plans offered in 2016, for example, the adoption rates for electronic eligibility/benefit verification and claims submission were 76 percent and 94 percent, respectively.[10]

However, several trends have increased the overall administrative burden in recent years (Exhibit 3). In particular, the amount of financial clearance activity (especially authorization requirements) has risen, and these transactions are still largely manual. Some of the growth in clearance activity has been driven by the rising prevalence of narrow networks, but some has resulted from the increased attention now being paid to medical policies. Between 2013 and 2015, for example, authorization request volumes grew to 32 million, from 24 million, a 15 percent annual rise.[11] As a result, in 2016 physicians and staff spent an average of 16.4 hours per week on authorization activities and processed 37 authorizations each week; furthermore, because of the slow adoption of electronic authorization requests, nearly 60 percent of physicians and staff had to wait at least one business day to get a response to at least one

[10] CAQH Explorations. 2016 CAQH Index: A Report of Healthcare Industry Adoption of Electronic Business Transactions and Cost Savings. January 2017.
[11] CAQH Explorations. 2013 and 2015 CAQH Index Reports.

Exhibit 3

Trends that have increased the administrative burden



COB, coordination of benefits; p.a., per anum; YoY, year on year.

Source: CAQH Index Reports, 2013–16; MPACT model; Bauman N et al. Hospital networks: Evolution of the configurations on the 2015 exchanges. McKinsey white paper. April 2015

Exhibit 4

The primary steps toward revenue excellence

Establishing cross-functional revenue ownership	• Partner with stakeholders outside of the revenue cycle to unlock new levels of performance • In particular, elevate the role of finance, managed care, and clinical leadership
Enhancing patient engagement	• Optimize the patient experience—and, as a result, the patient's likelihood to return—by optimizing the patient engagement strategy • Increase transparency for patients regarding cost and liabilities before treatment is given • Simultaneously, manage the increasing balance-after-insurance liabilities many patients face and improve the collection process
Digitizing and optimizing operations	• Digitize and automate operations to increase both effectiveness and efficiency, offset the rising cost of the revenue cycle, reduce complexity, and improve yield • Leverage advanced analytics to enable better decision making and resource management
Optimizing revenue cycle management across functions	• Ensure that revenue operations are standardized across sites of care and information can flow seamlessly • Evolve revenue cycle management practice to account for shifts in sites of care, increased administrative burden, and growth of narrow networks • Ensure that the patient experience and pre-service activities are streamlined and standardized across sites of care

of their authorization requests.[12] All of these changes have increased operating costs, particularly for patient-access functions (e.g., financial clearance teams). The continued use of manual processes is a leading contributor to the growth in rejections outlined above.

A new framework: Integrated revenue excellence

Because the challenging external environment has made many RCM processes more complex and difficult, providers need to think differently if they are to significantly improve performance while reducing costs and complexity. We believe that achieving that level of performance will be table stakes for hospitals and health systems going forward.

Achieving revenue excellence requires a comprehensive approach. A range of stakeholders, including the managed care, revenue cycle, finance, and clinical care teams, must be brought together. Analytics and technology must be leveraged so the staff can work "smarter" rather than harder. A hard look must be taken at the costs associated with the revenue cycle, and opportunities to reduce costs through automation and technology must be sought. Above, we outline the primary steps providers must take (Exhibit 4).

Establishing cross-functional revenue ownership

Unlocking a new level of performance requires hospital and health system executives to create an operating model that fosters greater collaboration and partnership between traditionally siloed stakeholders: not only managed care, revenue cycle, finance, and clinical care, but also legal, case management, and more. To understand why greater collaboration is necessary, consider how ownership of revenue-influencing activities is typically allocated at most providers today (Exhibit 5).

To reduce or eliminate organizational silos and increase collaboration between functions, provider executives will need to use a range of structural and "softer" levers. For example, they should create aligned incen-

[12] American Medical Association. 2016 AMA prior authorization physician survey results. January 2017.

tives and performance metrics, simplify and consolidate the organization structure, share cross-functional key performance indicators among stakeholders, and establish scalable feedback mechanisms to "upstream" teams. In our experience, some providers have made progress in these areas, but the results realized to date are often insufficient to achieve revenue excellence. Progress needs to continue.

Enhancing patient engagement

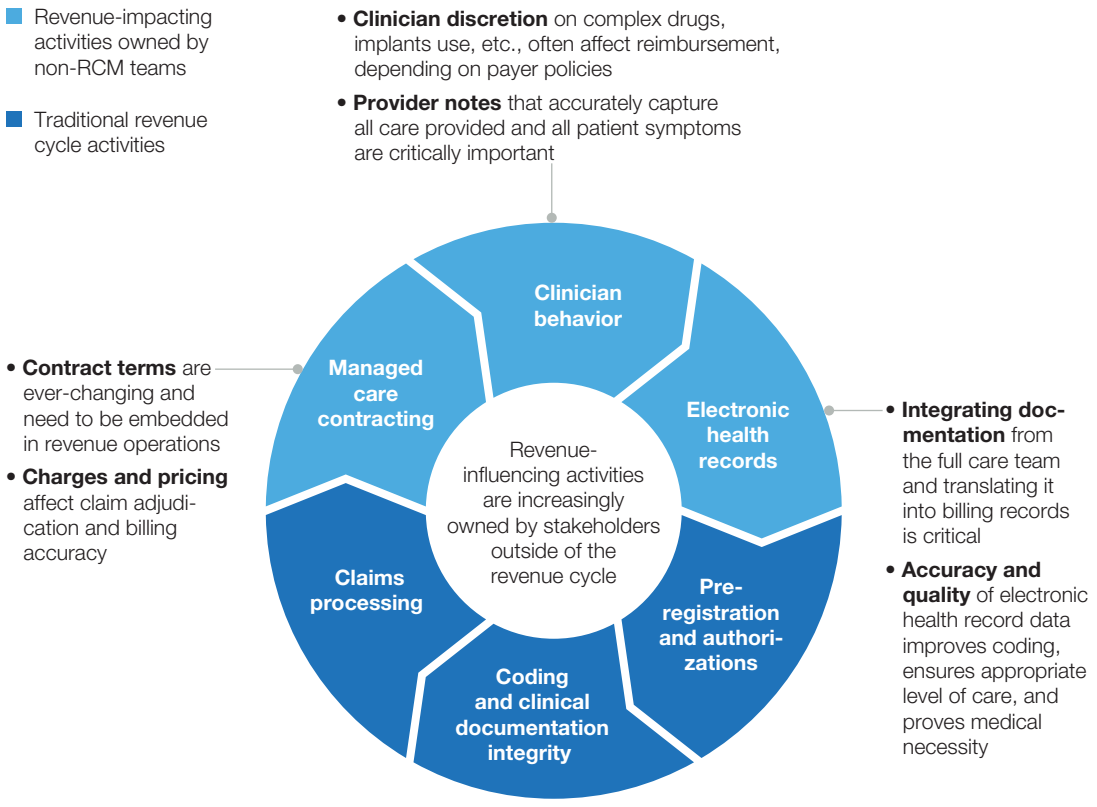
Providers today are seeking broader and deeper means to engage patients, a trend that is particularly essential in the revenue cycle for two reasons. First, patients are facing a growing financial burden while their ability to pay is decreasing. Second, revenue cycle team members often now have a high volume of very significant nonclinical interactions with patients to discuss highly sensitive topics, such as financial liability. As a result, these teams can play a very important role in improving patient satisfaction.

In recent years, providers have made significant investments to more actively engage patients, often through strategies focused on encouraging online interactions. (For example, many providers now allow patients to view and pay bills online.) We believe, however, that if providers are to reap the full benefits of patient engagement and improve their collection rates, additional effort is required—they must have open, honest conversations with patients about costs before care is delivered.

Although clinical topics have been—and will continue to be—a core element of communications between providers and patients,

Exhibit 5

Typical ownership of revenue-influencing activities at most providers today



RCM, revenue cycle management.

financial topics need to be given more attention and focus. McKinsey research has shown that satisfaction levels are strongly influenced by the information patients are given before, as well as after, a procedure.[13] Transparent discussions about financial issues could help patients understand what their out-of-pocket liabilities are likely to be and thus enable them to better prepare for the financial obligations they may face. Today, most interactions about financial topics occur after the time of service, when patients' options largely consist of payment or default.

Provider executives should therefore focus on increasing transparency in their organization's communications with patients and create a culture centered on customized, holistic engagement on both clinical and financial topics between their teams and patients before the time of service. Increased transparency during a single encounter with a patient is not enough—providers should focus on their overall relationship with each patient. Admittedly, many barriers to improving patient engagement exist (e.g., high turnover among patient-facing staff and difficulties in segmentation when creating customized patient pathways). Nevertheless, today's providers can take advantage of a range of start-ups and technological innovations that would enable them to take a more thoughtful—and often digitally-based—approach to connecting with their patients.

Digitizing and optimizing operations

Hospitals and health systems will continue to face pricing pressures as well as rising claims processing workloads. Given that funding to increase head count is limited, RCM teams will increasingly need to leverage technology to replace highly manual processes and take greater advantage of available data and advanced analytics.

Digitizing and automating for both effectiveness and efficiency. Leveraging digital tools and automating activities can improve the effectiveness as well as the efficiency of the teams. Across industries, we are seeing a shift toward automation and digitization of a range of activities. In finance, for example, it is estimated that activities that currently take up about 43 percent of employees' time (e.g., mortgage application processing, verifying financial data, analyzing market trends) could be automated.[14] Many administrative activities in healthcare could similarly be automated. To start, providers should focus on low-complexity, highly repetitive tasks—in these cases, automation can reduce the propensity for human error and free up additional team time for more complex activities. Some of the more interesting (and currently available) advances include software that can predict clinical codes based on clinical documentation, voice recognition software to reduce reliance on manual data entry, machine learning to automate bill scrubbing and modifier usage, and software that can automate straightforward appeals with remittance data.

Relying on advanced analytics for business decisions. Because capacity can increasingly be created by leveraging digital tools and automating activities, many providers are using advanced analytics to enable better decision making and resource management. For example, predictive analytics can now be used to better understand rejection and denial trends. Data and analytics can also be used to streamline billing-office processes and develop more targeted or "smarter" claims processing approaches.

Optimizing RCM across sites

Access points and mechanisms of care delivery are evolving. For example, new approaches to chronic care management are being developed.[15] Patients are increasingly using ambulatory surgical centers, outpatient clinics, and other sites of care besides the hospital. Providers will need a more "seamless" revenue cycle if they are to respond effectively to these changes:

[13] Cordina J et al. Debunking common myths about healthcare consumerism. McKinsey white paper. December 2015.
[14] Chui M et al. Where machines could replace humans—and where they can't (yet). *McKinsey Quarterly*. July 2016.
[15] Kunte A et al. Chronic disease excellence:"Service line 2.0" for health systems. McKinsey white paper. April 2018.

Providers that can respond effectively to these changes will be well positioned for success in the future.

Communicating more smoothly across sites of care. As the number of patient interactions with non-hospital-based employees increases, so too does the importance of those interactions. To provide high-quality care, hospitals and health systems must ensure that data can be transmitted effectively from site to site. Such transmissions are also a prerequisite for ensuring that the patient experience is consistently good across sites. However, establishing seamless data transmissions can be incredibly challenging—and if not done well, significant collection issues can arise downstream. As a first step in addressing these challenges, providers will need to establish platform interoperability across their full portfolio of locations.

Standardizing operations. When employees are scattered across geographic sites, it can also be quite difficult to standardize and optimize core revenue cycle operations, particularly complex ones such as the financial clearance process. At present, many providers must cope not only with different sites of care but also with different claim types (facility and professional) and different IT systems. Even providers with a unified patient accounting platform typically engage multiple vendors for reporting, referral management, authorizations, and other RCM tasks. Revenue excellence requires that providers adopt a more unified approach to processes, systems, and data, which often means that they must rethink their IT platform. Without this unified approach, standardizing and optimizing core operations is likely to be impossible. As an example, consider the impact that well-trained front-end RCM teams can have on referrals. These teams are well positioned to help retain patients in-network; however, the lack of interoperability and standard processes makes it difficult for them to do so.

Ensuring consistent patient experience. Ensuring that the patient experience is consistently good throughout the system is challenging when the patient-facing staff is decentralized and has minimal oversight. Most inpatient teams are centralized, and thus hospital and health system executives can monitor and optimize the patient experience through strong central oversight. As care increasingly shifts to outpatient settings, however, those executives must ensure that all staff members deliver a good patient experience, regardless of the site or type of care. A good patient experience makes it easier to engage with patients—which, in turn, can improve collection rates.

The healthcare payment and collections landscape has changed significantly over the past several years, which has created new collections challenges for providers. Providers that can respond effectively to these changes will be well positioned for success in the future. Increased training and cross-site apprenticeship opportunities for revenue cycle leaders can help them accomplish this. Provider executives should remember, however, that the next generation of revenue cycle leaders—the ones who can make revenue excellence possible—may not always come from "locally grown" managers in traditional inpatient departments. Instead, providers may want to look for talent, and new perspectives on revenue topics, in all parts of their organization, not just the RCM team.

Provider executives that want to achieve revenue excellence should start by taking

Exhibit 6

Questions to consider when embarking on a journey toward revenue excellence

Establishing cross-functional ownership	Enhancing patient engagement
• Do we have the **right performance metrics and incentives** in place to ensure everyone is working toward a common goal? • What tools and talent do we have in place to **effectively coordinate with different functions outside of RCM** as well as other stakeholders (payers, employers, etc.)? • What barriers make it difficult to **more effectively join our operating teams** across the organization?	• Is our system's **patient collection process optimized from beginning to end** (e.g., do we have flexible payment options for patients via a digital platform, use analytics to segment patients based on willingness and capacity to pay)? • Have we **created stickiness for patients** within the heath system when they need care? • Do we have the **right team and structure** to shift the way in which we engage patients?
Digitizing and automating operations	**Optimizing RCM across sites**
• Have we **redesigned back-office operations within the past five years**? If not, are our **operations taking advantage of technology advancements**? • Do our managers **leverage data and analytics** in day-to-day work (e.g., performance management, prioritization of work, strategic decisions)? • How does our organization make **RCM-related capital investments** today?	• How can RCM teams **encourage and facilitate the development of a truly caring culture** to ensure that patients are receiving the **appropriate care in the right location**? • What level of interaction or overlap exists today between the **billing teams and physicians or hospitals**? For the patient access teams? • What organizational changes would we need to address to **ensure accountability for results across different functions**?

a hard look at their current operations to better understand how prepared they are to more effectively manage their revenue streams. The questions included in Exhibit 6 can help executives better understand their current revenue cycle performance and what they will need to do to transform their performance to achieve revenue excellence.

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