# Deloitte.

**2018 Global health care outlook**
The evolution of smart health care

# Overview
# and outlook

With quality, outcomes, and value the watchwords for health care in the 21st century, sector stakeholders around the globe are looking for innovative, cost-effective ways to deliver patient-centered, technology-enabled "smart" health care, both inside and outside hospital walls.
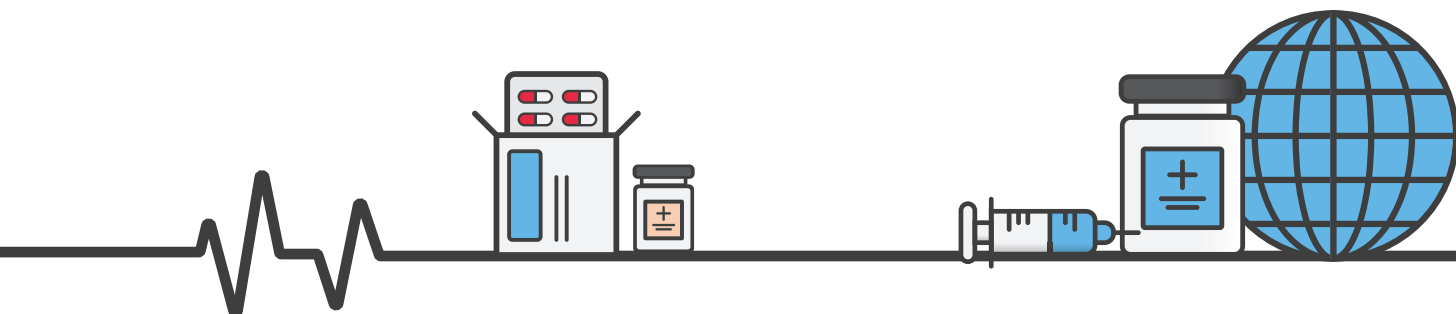
# What exactly does **smart** health care look like?

- Appropriate treatments are delivered at the appropriate time, in the appropriate place, for the appropriate patient

- Clinicians use technology to more accurately diagnose and treat illness and deliver care

- All care delivery stakeholders across the ecosystem effectively and efficiently communicate and use information

- Patient data is in one, easily accessible place

- The correct individuals do the correct work (e.g., nurses handle patient care, not administrative tasks)

- Patients are informed and actively involved in their treatment plan

- New, cost-effective delivery models bring health care to places and people that don't have it

- Efficiency improves; waste declines
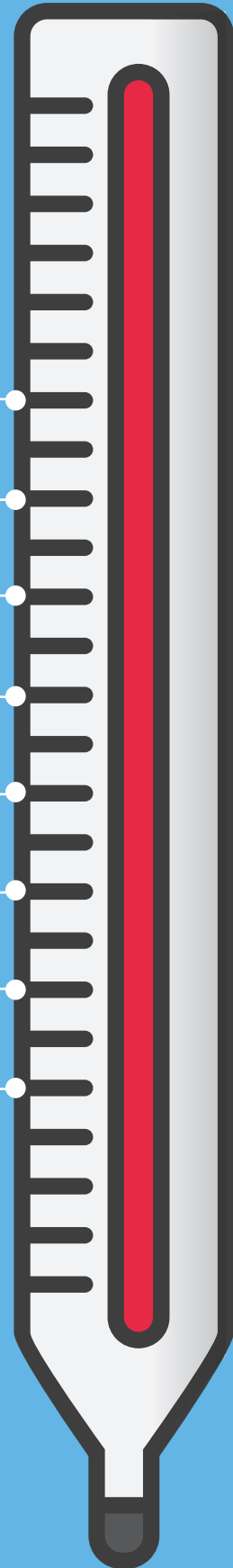
Evolving policies, processes, and capabilities to deliver smart health care will not be easy, given global health care's magnitude and complexity. For example, there could be significant logistical and technology obstacles to overcome. More and more inpatient services are being pushed to non-traditional care settings such as the home and outpatient ambulatory facilities. Members of the health care delivery chain often work in multiple locations (hospital, doctor's office, retail medical clinic, diagnostics lab). Patients may reside in a city or even a country away from their care providers. And health records frequently reside in different formats and on disparate systems. Clinicians may, therefore, have difficulty coordinating appointments and procedures, sharing test results, and involving patients in their treatment plan. In other words, care providers may be working hard but they are not necessarily working "smart."

Global health care spending is projected to increase at an annual rate of **4.1% in 2017-2021,** up from just **1.3% in 2012-2016.** Aging and increasing populations, developing market expansion, advances in medical treatments, and rising labor costs will drive spending growth.[1]

Per-person health care spending will continue to vary widely, ranging from **$11,356 in the United States** to just **$53 in Pakistan in 2021.**[2]

Life expectancy is estimated to increase by more than a full year between **2016 and 2021**—from **73 to 74.1 years**—bringing the number of people aged over **65 to more than 656 million, or 11.5%** of the total population. Much of the gain in life expectancy globally is due to falling infant mortality rates.[3]

Although the battle against communicable diseases is far from over, countries are making headway through improved sanitation, better living conditions, and wider access to health care and vaccinations. The estimated number of malaria deaths worldwide fell to **429,000 in 2015,** down from nearly **1 million in 2000.**[4] The number of AIDS-related deaths dropped from **2.3 million in 2005** to an estimated **1.1 million in 2015,** due largely to the successful rollout of treatment.[5]

Rapid urbanization, sedentary lifestyles, changing diets, and rising obesity levels are fueling an increase in chronic diseases—most prominently, cancer, heart disease, and diabetes—even in developing markets.[6] China and India have the largest number of diabetes sufferers in the world, at around **114 million and 69 million,** respectively. Globally, the number is expected to rise from the current **415 million to 642 million by 2040.**[7]

Someone develops dementia every three seconds. In **2017, an estimated 50 million** people worldwide live with dementia—a number that is predicted to double every **20 years.**[8] **By 2018, dementia will become a trillion-dollar disease.**[9]
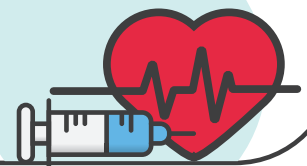
Independently and collectively, health care stakeholders in 2018 are likely to face a number of existing and emerging issues in their quest to get "smarter" (Figure 1):

· Creating a positive margin in an uncertain and changing health economy
· Strategically moving from volume to value
· Responding to health policy and complex regulations
· Investing in exponential technologies to reduce costs, increase access, and improve care
· Engaging with consumers and improving the patient experience
· Shaping the workforce of the future

This 2018 outlook reviews the current state of the global health care sector; explores trends and issues impacting health care providers, governments, other payers, and patients; and suggests considerations for stakeholders as they seek to deliver high-quality, cost-efficient, smart health care.

**Figure 1. Key issues in global health care**
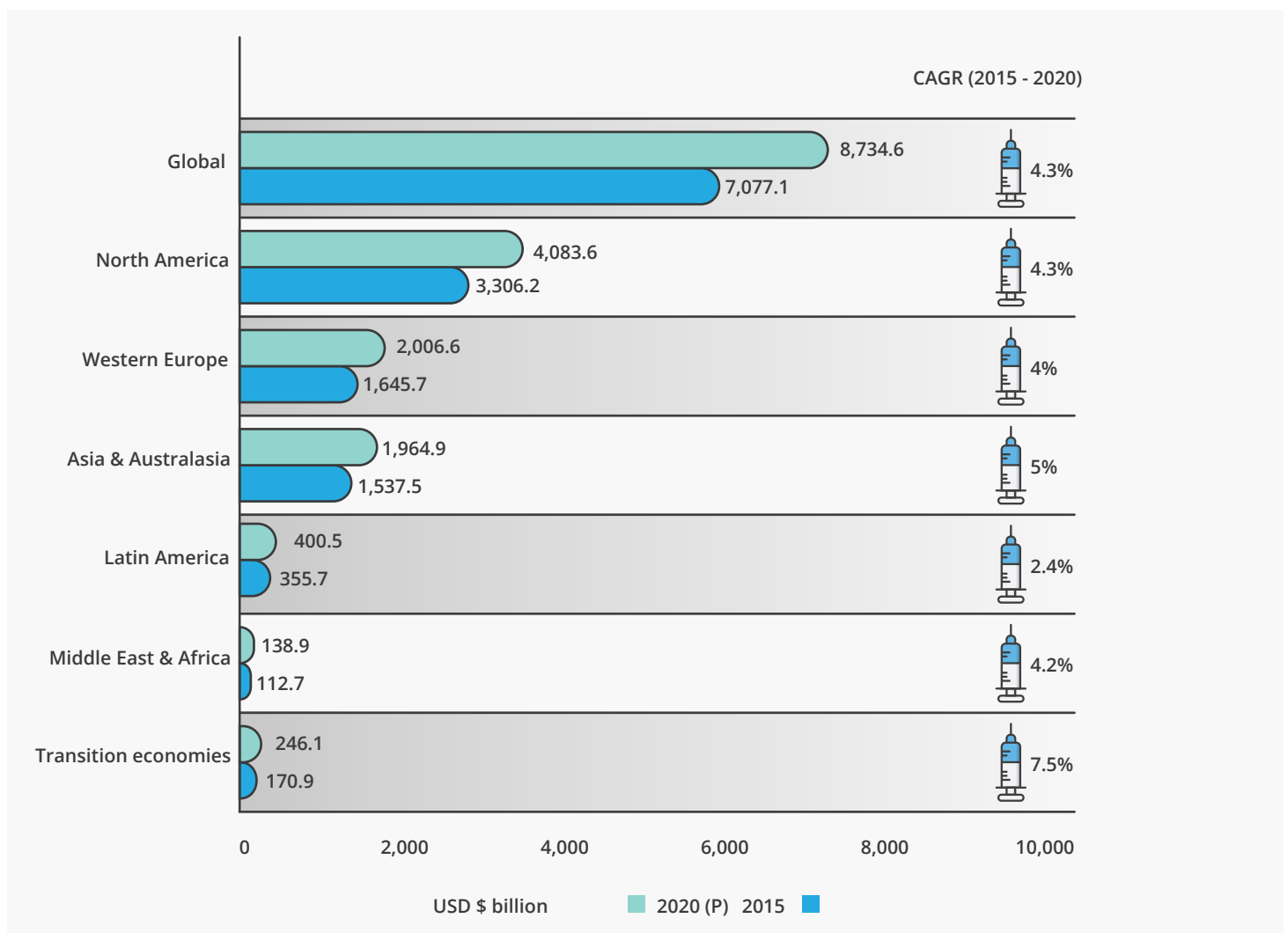
# Global health care sector issues in 2018

## Creating a positive margin in an uncertain and changing health economy

Improving financial performance and operating margins is likely to remain a top issue. Many public and private health systems have been experiencing revenue pressure, rising costs, and stagnating or declining margins for years. The trend is expected to persist, as increasing demand, funding limitations, infrastructure upgrades, and therapeutic and technology advancements strain already limited financial resources. Combined health care spending in the world's major regions is expected to reach USD $8.7 trillion by 2020, up from USD $7 trillion in 2015[10] (Figure 2).

As has been the case for the past several years, spending is expected to be driven by aging and growing populations, developing market expansion, clinical and technology advances, and rising labor costs (exacerbated by many markets' competition for health care workers).[11]

Figure 2. Health care spending, 2015 - 2020



CAGR (2015 - 2020)

| Region | 2020 (P) | 2015 | CAGR |
|---|---|---|---|
| Global | 8,734.6 | 7,077.1 | 4.3% |
| North America | 4,083.6 | 3,306.2 | 4.3% |
| Western Europe | 2,006.6 | 1,645.7 | 4% |
| Asia & Australasia | 1,964.9 | 1,537.5 | 5% |
| Latin America | 400.5 | 355.7 | 2.4% |
| Middle East & Africa | 138.9 | 112.7 | 4.2% |
| Transition economies | 246.1 | 170.9 | 7.5% |

USD $ billion    ■ 2020 (P)   2015 ■

*Source: World Industry Outlook, Healtcare and Pharmaceuticals, The Economic Intelligence Unit, June 2017*

Health care spending by country varies widely (Figure 3). Unfortunately, higher spending levels don't always produce better health outcomes and value. For example, the United States, at 16.9 percent of GDP in 2016, continues to spend considerably more on health care than comparable countries but it is in the lower half of the Organization for Economic Cooperation and Development (OECD) countries' life expectancy rankings.[12] US health spending now exceeds USD $3 trillion per year, with growth rates projected to accelerate through 2024. Major spending categories are led by hospital care (USD $1 trillion), physicians (USD $634.9 billion), and prescription drugs (USD $328.6 billion).[13]

**Figure 3. Health care spending by country**



Health care expenditures as a share of GDP, 2016
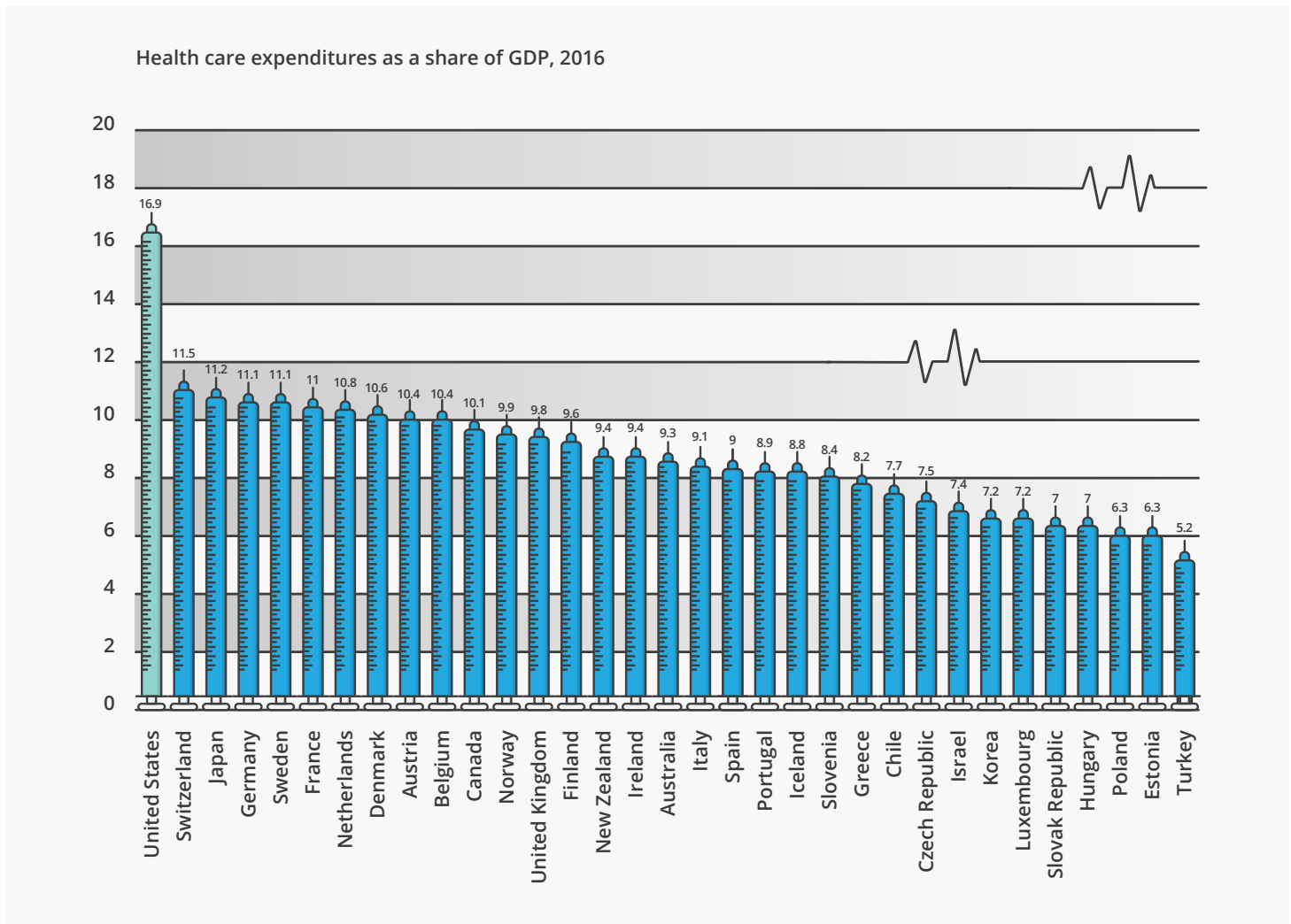
Source: OECD

## Populations, therapeutics, and infrastructure drive spending

There are various views as to the drivers of health care spending. In developed markets, it's expected that aging populations will continue to be a major factor—especially in Japan, where the share of people over age 65 will reach almost 30 percent by 2021, and in Western Europe, with its share nearing 21 percent.[14] Changing patterns of care, including increased visits and higher-quality services, could also be major cost-drivers.[15] Therapeutic advances and the desires of doctors and patients are prompting more (and more costly) tests and interventions for chronic and communicable diseases. Providers, payers, and life sciences companies may have to balance the development and adoption of new therapies and medical technologies with their potential quality, experience, and health outcomes. In developing markets, growing populations, an increase in higher-income households, and rising consumer expectations are pushing up health costs.[16] In addition, health systems are dealing with the ongoing challenges of containing and treating both communicable and chronic diseases. Once a hallmark of developed markets, chronic diseases (diabetes, chronic heart disease, Alzheimer's disease) exacerbated by lifestyle risks are becoming a shared health and cost issue.[17]

Adding to the cost equation, many health systems are struggling to update aging infrastructure and legacy technologies with already limited capital resources.

As health care costs increase, affordability and insurance coverage remain problematic. In the United States, deductible cost increases are far outpacing increases in costs covered by insurance.[18] Brazil's private health insurance sector lost 2.5 million beneficiaries between 2014 and 2016 due to the country's high unemployment rate. Added to that, companies in Brazil had to cut expenses, and changing their employees' health insurance plan to a cheaper one was a popular option.[19]

Sector stakeholders' efforts to manage rising costs are complicated by price controls, reduced funding, and misaligned incentives (e.g., the longstanding fee-for-service payment model). For example:

- The United Kingdom's National Health Service (NHS) is currently experiencing the longest slowdown in funding in its history. While all four nations (England, Scotland, Wales, and Northern Ireland) share many of the same challenges, the demand and financial sustainability issues appear most acute in England. Between 2010-2011 and 2015-2016, NHS funding growth slowed significantly, averaging 1.2 percent per year (in real terms), and is set to average 1.1 percent from 2016-2017 until 2020-2021, compared to the long-term average of nearly 4 percent a year since the NHS was established.[20] While the first few years of the United Kingdom's response to the global financial crisis provided an opportunity to improve efficiency of services, the last two years have seen NHS providers struggling to break even. Meanwhile, a growing and aging population, changing patient expectations, and pressure on social care and public health budgets are increasing demands on NHS services.

- China's policy of "zero markups" for drugs sold at hospitals is a major contributor to eroding profit margins. For more than 20 years, hospitals were able to add a 15

percent surcharge to the cost of drugs. Some hospitals derived as much as 40 percent of their revenues from drug sales—which could account for their entire profit margin.[21] In 2009, the Chinese government passed the Zero-Markup Drug Policy, to rein in out-of-control drug costs, curb over prescribing, and reduce the financial burden to the public, especially those in low-income settings. The policy went nationwide in 2015 and hospital margins have been falling as a result.[22]

- In Brazil, profit margins for private health care providers have become less attractive following a ruling by the high court, Supremo Tribunal Federal, that these providers are to reimburse the Brazilian public health care system (Sistema Único de Saúde, or SUS) in the same way that private hospitals are currently reimbursed for treating privately insured patients.[23]

- Many hospitals in India are discovering they need to build more financially sound operating models to offset diminishing margins due to price controls on drugs, consumables, and medical devices, and due to insurance companies' use of growing patient share and buying power to squeeze hospital pricing. In addition, India's medical workforce shortage means available doctors command a high price structure, further eating into hospital margins.

**Consolidating and collaborating to compete**
Health care providers are employing a variety of strategies to combat shrinking margins and rising costs. Case in point: Rather than being paid more to increase inpatient volume to generate revenue, many health systems are responding to new financial incentives to treat patients outside traditional hospital settings. To illustrate the impact, the proportion of revenue from inpatient services relative to outpatient services in US hospitals has fallen 10 percentage points since 2004.[24] Among other margin-enhancing strategies are combining traditional workforce planning with predictive analytics to improve efficiencies in labor costs and find

alternatives to contract labor; and revisiting revenue cycle strategies, such as leveraging new technologies and analytics tools that help improve processes and coding to reduce claims denials.[25]

Particularly in the United States, hospitals and health systems are engaging in mergers and acquisitions (M&A) and other partnering schemes to achieve economies of scale. Provider organizations are working to increase their physician networks, expand their geographic reach, and diversify their specialized offerings and talent. Growth via M&A could provide several benefits, including increased access to capital, which could mean more money to invest in facilities, technologies, and staff.[26]

In another example, large medical groups in China are trying to form a "closed-loop" supply chain by acquiring hospitals. CR Healthcare currently manages 109 hospitals with more than 11,000 beds, while sister company CR Pharmaceuticals supplies the hospitals' drugs. Chinese insurance companies are also using similar business models to promote commercial medical insurance.[27]

In April 2017, Japan's government began allowing medical corporations to create nonprofit holding companies without corporate acquisitions as a way to promote organizational change. Under the scheme, a holding company can manage several medical institutions/nursing care facilities in the region. This may be especially effective for medical institutions in rural areas that need to increase operational efficiency despite declining patient populations.

Joint ventures, public-private partnerships (PPPs), and other collaborative arrangements are taking place within and across health care sectors and geographies. Governments, providers, employers, and insurers are developing wellness programs to aid public health efforts. Hospitals are cooperating with biotech companies to develop personalized therapies, especially for cancers.

Large conglomerates are entering Southeast Asia (SEA) and expanding laterally between life sciences and health care through M&A and joint ventures (JVs), and traditional medical technology (medtech) companies are moving into care provision. And, nontraditional players like technology companies and other disruptors are entering the health care market and providing innovative perspectives.

Considerable opportunities exist for health care players to work collaboratively on innovative access, delivery, and financing models to reduce health care costs and increase quality.

**Stakeholder considerations**

While reducing costs has long been a way for health care organizations to offset shrinking margins, many are pursuing new cost-cutting measures, such as developing alternative staffing models, shifting patients to outpatient services, and reducing administrative and supply costs. In addition, health systems are exploring new revenue sources. Some, for example, are looking to capitalize on their intellectual property (IP) by working with employees to develop innovations including medical devices, training videos, health information technology (HIT) tools, or patient safety solutions.

Once the hospital has filed for patent or copyright protections, it can sell or license the IP to other industry stakeholders. Hospitals and health systems are also investing in JVs, commercializing their foreign assets

(e.g., services for international patients traveling abroad for care), and launching new companies and philanthropic organizations—all to come up with an alternative revenue stream to subsidize government or improve the bottom line.[28]

Respondents to Deloitte's 2017 survey of US health care CEOs had the following suggestions for producing and sustaining positive margins in an uncertain and changing health economy:
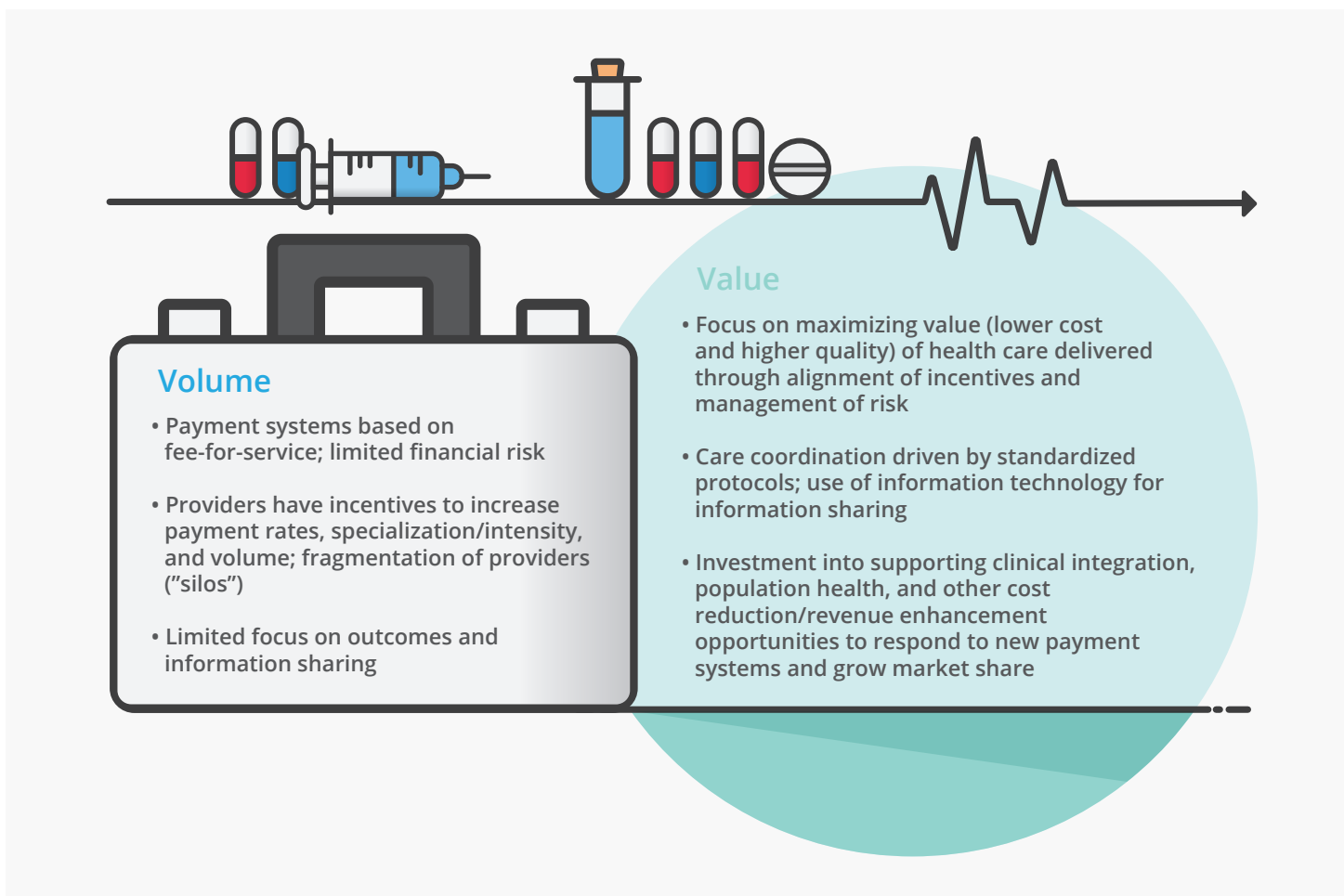
- **Increase system efficiencies beyond what is needed to be profitable.** Many hospitals and health systems have reduced costs and increased efficiencies at the margins of their organizations, but long-term sustainability may require a fundamental transformation of the way that services are organized and delivered.

- **Operate as a consolidated system.** Many health systems have grown through acquisition, and have not fully realized new efficiencies and synergies system-wide. Consolidating where appropriate and looking for synergies across the system can improve efficiency.

- **Diversify beyond the core hospital.** As inpatient revenues decline, many CEOs are partnering or integrating physician practices, as well as investing in outpatient services, step-down care, urgent care, etc.

- **Improve revenue cycle systems.** Despite upgrades to revenue cycle systems in recent years, many health systems are still leaving money on the table. They may be able to leverage scale and improve efficiency by reducing the number of supply chain vendors and noncritical employees.[29]

# Strategically moving from volume to value

Health care is continuing its transition from fee-for-service (FFS) reimbursement to outcomes - and value-based payment models (Figure 4):

**Figure 4. A continued shift from volume to value**



**Volume**

- Payment systems based on fee-for-service; limited financial risk

- Providers have incentives to increase payment rates, specialization/intensity, and volume; fragmentation of providers ("silos")

- Limited focus on outcomes and information sharing

**Value**

- Focus on maximizing value (lower cost and higher quality) of health care delivered through alignment of incentives and management of risk

- Care coordination driven by standardized protocols; use of information technology for information sharing

- Investment into supporting clinical integration, population health, and other cost reduction/revenue enhancement opportunities to respond to new payment systems and grow market share

In the United States, the shift toward value is being accelerated by the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA), which offers significant financial incentives for health care professionals to participate in risk-bearing, coordinated care models and to move away from the traditional FFS system. MACRA is poised to drive increased participation in risk-bearing models across all payers, not just Medicare.

Other countries are also moving from volume to value through reform policies and programs promoting operational efficiency, technology use, population health management, and wellness. For example, the Connecting to Care program in Saskatchewan, Canada, uses proactive outreach to prevent hospitalizations and emergency room (ER) visits by focusing on timely use of community-based services, including support for medical, mental health, and addiction treatments, as well as assistance with social needs.[30] Mexico's CASALUD primary care delivery model deploys innovative medical technologies that better engage patients and health care professionals.[31] One such application is the MIDO® Mobile Module Cart, an all-in-one, self-contained system (and standardized training) that facilitates a proactive approach to disease detection and offers promise in preventing or slowing the rate of disease progression.[32]

Japan's government has introduced a series of reform initiatives, the most symbolic being the establishment of an Integrated Community Care System that combines health care, long-term care, housing, and livelihood support services in a unified manner so that Japan's elderly can receive continuous quality care in their local communities[33] versus the hospital.

The Singapore Ministry of Health (MOH) has categorized the nation's top health care reform issues and trends into three broad shifts referred to as the "3 beyonds"—moving "beyond the hospital to the community,"

"beyond quality to value," and "beyond health care to health."[34] The MOH is focusing its productivity improvement projects in four areas to deliver quality care and better value: helping patients navigate the health care system more efficiently without compromising quality of care; automating labor-intensive activities to increase operational efficiency; streamlining workflows, expanding job roles, and upskilling health care staff to work more effectively and productively, and meet the needs of patients more holistically; and empowering patients, caregivers, and volunteers to self-serve and self-care.

The Unite Kingdom's 2015 NHS Five Year Forward View sets a clear course of action to 2020: While the NHS is already one of the leanest publicly funded health services in the industrialized world, opportunities to go further faster are detailed in the NHS's Ten Point Efficiency Plan. The NHS is also seeking to leverage the potential of technology and innovation more effectively, empowering patients to take a more active role in their own health and care while also enabling NHS staff and their care colleagues to do their jobs more efficiently.

# Untangling the knotty problem of low-value health care

Wasted spending on low-value health care—services that offer little or no expected benefit or that are inefficiently delivered—can total billions of dollars a year. The Institute of Medicine (IOM) calculated that roughly $765 billion of US medical spending in 2009 was wasted on unnecessary services, excessive administrative costs, fraud, and other problems.[35]

Programs such as the ABIM Foundation's Choosing Wisely Initiative[36] (the European Federation of Internal Medicine has also launched its own Choosing Wisely campaign),[37] which seeks to advance a national dialogue on avoiding wasteful or unnecessary medical tests, treatments, and procedures, aim to reduce low-value health care services, but it's a knotty problem to untangle. Generally, there is a lack of consensus on how to incorporate clinical nuance, patient preferences and priorities, and cost-benefit tradeoffs in provider and consumer-facing initiatives to reduce low-value care.[38] Also, evidence is lacking for best practices to operationalize programs and emerging technologies to reduce unnecessary and inefficient care.

According to IOM, incremental upgrades and changes by individual hospitals or health systems will not be enough. Achieving high-value care, reducing waste, and lowering costs could require an across-the-board commitment to develop a "learning" health care system that continuously improves by capturing and sharing lessons from every care experience and research discovery. Stakeholders should consider strategies that include adopting value- and outcomes-based payment models; embracing new technologies to collect and analyze data at the point of care; engaging patients and their families; and establishing better teamwork and transparency within and across organizations.[39]

## Population health management and wellness

Sector stakeholders, particularly in advanced health systems, are advocating the shift from a "break-fix" model of health care to one focused on prevention and the overall holistic health of populations rather than episodic and transaction-based treatments.

Population health— health policy for specified groups, from prevention to diagnosis and treatment of chronic disease—takes a broad look at the management of outcomes for all of a health system's patients, including efforts to use health care resources effectively and efficiently to improve the lifetime health and well-being of a specific population.[40]

Activities include promoting health and well-being; primary, secondary, tertiary care; and disease prevention.

Population health requires data and analytics to identify at-risk patients and target services that reduce their use of expensive and low-quality care. Under a population health model, providers manage care—from preventive and maintenance care to acute and long-term care—for a defined population.

Those who are most successful often deploy innovative delivery models; analyzing data and trends in a population's health, quality, and costs, and bearing financial risk. Value-based payment contracts reward providers for successfully executing these processes.[41]

The goals of population health management are critical: improving clinical effectiveness, lowering costs, sharing accountability, enhancing safety and, most importantly, keeping an entire population healthier. But striving to achieve these goals is both challenging and complex. Countries' population health efforts range from minimal to robust and are as diverse as combating opioid addiction to planning future care for aging citizens.

- The opioid crisis plaguing many nations is inciting widespread action by health systems, insurers, families, communities, and all levels of government. Initiatives include more funding for interventional programs to reduce overdoses, increased efforts to integrate health and social care to support vulnerable populations being impacted by opioids, and enhanced support for recognizing and treating mental health issues and addictions.

- In July 2016, Japan's government released the "Asia Human Well-Being Initiative," which aims to apply aspects of the Japanese health care/nursing care system in other aging Asian countries. With the initiative, it is expected that Japanese providers will expand their overseas footprint, especially in Asian countries that are facing rapidly aging societies.

- Some Southeast Asian nations are taking a holistic approach to addressing current and future health care needs with initiatives designed to expand care options (e.g., home and community-based care, long-term care, virtual care), increase access, reduce costs, and empower patients.

- In late 2016, China's National Health and Family Planning Commission (NHFPC) announced "Healthy China 2030," the country's first long-term strategic population health plan. The plan aims to grow investments in the "Big Health" sector to 16 trillion RMB by 2030.[42]

Encouraged and incentivized by employers, health care practitioners, and even governments, more and more consumers are taking their health and wellness into their own hands. In an evolution to what Deloitte calls an informed and empowered "quantified self," consumer engagement in and expectations of health care are growing, especially as individuals become better informed about their genetic profile, the diseases they have and might develop, and the effectiveness of health interventions. They are embracing prevention and devoting time, energy, and money to staying healthy, including using regulated and validated health applications (apps) and wearables.[43]

One indication of the emerging "quantified self" is the increasing popularity of mobile communication devices for health services and information.[44] From wearable fitness trackers to smart devices to cyber networks, the mHealth market has doubled in just four years.[45] In fact, there are more than 100,000 mHealth apps currently available,[46] and health app market revenue was projected to grow to USD $26 billion by the end of 2017.[47] While these devices and services encourage consumers to be engaged participants in managing their own health, fitness, and general wellness, broader benefits may be reaped as well. From the perspective of population health, where 75 percent of all health costs derive from preventable conditions,[48] feedback devices like these could be enormously helpful in facilitating healthy behavior change.[49]

Combining the power of analytics and mHealth devices, wearables, and other nontraditional sources of data collection could add even more value to wellness programs by helping to identify new care pathways and high-risk individuals.[50] Unfortunately, lack of interoperability among devices currently limits big data's promise and, by extension, overall wellness and prevention initiatives. Interoperability has the potential to decrease costs[51] and improve care coordination.[52] With the advent of more open systems, data sharing should improve[53] and analytics use increase.

### Social determinants' impact on health care

Health care stakeholders have long recognized that factors outside the system—the social determinants of health—influence an individual's health and well-being (see sidebar). Health-related social needs have been shown to affect individuals' health outcomes to a large extent.[54]

### The social determinants of health

Health-related social needs generally refer to factors that affect health outside of the health care system and that are beyond an individual's control.[55] Typical categories include:

**Housing instability/homelessness:** e.g., having difficulty paying rent or affording a stable place of one's own, living in overcrowded or run-down conditions

**Food insecurity (hunger and nutrition):** Not having reliable access to enough affordable, nutritious food

**Transportation:** Not having affordable and reliable ways to get to medical appointments or purchase healthy foods

**Education:** Not having access to high school or other training that might help someone gain consistent employment

**Utility needs:** Not being able to regularly pay utility bills (e.g., electricity, gas, water, phone) and/ or afford necessary maintenance or repairs

**Interpersonal violence:** Being exposed to intentional use of physical force or power, threatened or actual, that results in or has a high likelihood of resulting in injury, death, psychological harm, etc.

**Family and social supports:** Not having relationships that provide interaction, nurturing, and help in coping with daily life

**Employment and income:**
Not having the ability to get or keep a job, or gain steady income

*Source: Social determinants of health: How are hospitals and health systems investing in and addressing social needs? Deloitte Center for Health Solutions, 2017*
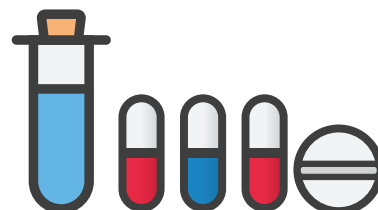
Across all developed countries, "vulnerable" or "troubled families,"—defined as those that are in contact with several departments of the local authority including the child or youth welfare system—are a growing concern. These families rarely succeed in breaking the negative spiral, which leads to persistent poverty, deprivation, and transgenerational dependency on public support. Living in vulnerable families accentuates the risks of poor life outcomes for those most dependent on family structures, especially children and adolescents. The current failure to address the social determinants of health for these vulnerable families is creating avoidable cost and social pressures on society.[56]

Social determinants also can affect health outcomes and payments for health systems. For example, while a top-rated hospital might be highly effective at treating an acute health issue, the patient's condition could deteriorate when he returns home to an unhealthy environment. Factors there—unstable housing situation, food insecurity, violence in the patient's home or personal relationships, or others—may contribute to the patient's eventual return to the hospital for declining health, which can make it difficult for the hospitals to receive incentives and/or avoid financial penalties.[57]

Increasingly, hospitals and health systems are working to navigate the challenges of effectively linking community and clinical services to improve health outcomes in the long term. For instance, many hospitals now screen for social needs, although some of this screening appears to be occasional and ad hoc rather than consistent and systematic.[58] Some health systems employ community health assistants (CHAs), non-licensed professionals who assess patients' needs, connect with primary care and case management teams, and coordinate referrals.[59] Other hospitals and medical providers are partnering with ride-hailing services to overcome transportation barriers.[60]

There are amazing programs and innovations being developed and implemented right now, but efforts are fragmented, incremental, and there's no blueprint.[61] Hospitals often lack dedicated funds for all of the populations they want to target, and finding sustainable funding to address social needs can be difficult. Determining return-on-investment (ROI) for social need activities is another challenge; it requires hospitals to identify meaningful measures, such as quantifiable improvements in health outcomes and cost savings. Generally, hospitals that are further along in the journey to value-based care report the largest investments and most activity around addressing social needs. These organizations are also more likely to engage in public and private partnerships, employ innovative solutions, and measure more aspects of their social needs activities, including health outcomes, cost outcomes, and patient experience.[62]

## Stakeholder considerations
The needle is moving from treatment to prevention as health care costs continue to escalate, and governments, health systems, health plans, and other stakeholders understand that it makes clinical and financial sense to invest in keeping individuals and populations healthy. Value-based payment models that reward health systems for improved quality and other outcomes have the potential to improve outcomes and margins, and reduce total costs of care.[63]

However, a successful transition to value-based care requires that stakeholders—including consumers—move beyond health care to health; from treatment to prevention/wellness; and from individual to population health. Already, providers are leveraging technology advances to expand care beyond brick and mortar locations by establishing digitally enabled, integrated community care systems.

And while addressing social determinants is still outside the core of health care,[64] the shift to value is spurring more investment and activity around addressing social needs. Taking a holistic system and life cycle approach to address care inequalities and social needs can ease the burden on vulnerable individuals, families, and communities, and improve outcomes at all stages of life.[65] There is also an economic rationale for investing in the social determinants of care: healthier individuals contribute more to the economy, increasing government tax revenues and a country's GDP.

# Responding to health policy and complex regulations

**Creating a positive margin in an uncertain and changing health economy**

Growing health care market complexity leads to more regulatory complexity and increases the need for heightened stakeholder risk management. And while health systems worldwide share overarching health policy and regulatory goals—ensuring quality care and patient safety, mitigating fraud, and cyber threats—regions and countries are grappling with their own specific challenges.

**Brazil**—Brazil is experiencing a profound movement in its corporate management culture, moral conscience, and ethical action across all industries. In recent years, there have been a number of corruption cases in Brazil, even in companies that apparently had clear and well-established compliance and other initiatives to mitigate inappropriate conduct and practices. The health sector was not immune to these cases. Several scandals have been widely reported in the major press, especially in the last three years, such as the so-called "Mafia of Orthotics and Prosthetics." [66]

**China**—The number of private hospitals in China surpassed public hospitals in 2015,[67] prompting more regulatory supervision of the registration, drug management, medical environment, and physician certification of private hospitals. Adding to the need for oversight, the number of illegal private medical institutions is also growing, accompanied unfortunately, by an increase in medical negligence incidents.

**Japan**—In May 2017, Japan introduced a law establishing a standardized rule for anonymously processing medical care information.[68] The law's purpose is to promote R&D and advanced medical studies.

The new legislation is expected to drive development and widespread promotion of a comprehensive medical database to aid research for drug discovery using artificial intelligence (AI) and other advances.

**United Kingdom**—The tax-funded NHS operates within a very complex regulatory environment. England, for instance, has both a national financial (NHS Improvement) and quality (Care Quality Commission) regulator; they provide ongoing evaluation of performance against agreed-upon criteria and publish the findings. There are also professional group regulators and all organizations have to comply with financial and data protection regulations. While fulfilling requests for data and information can be burdensome for health care stakeholders, regulatory pressure is a facet of the larger financial, demand, and staffing pressures under which the NHS operates.

**United States**—Although significant legislative, industry, and public attention is heavily focused on the debate over the future of the Affordable Care Act (ACA), health care stakeholders face other significant strategic and compliance challenges related to government programs, health care payment and delivery system reforms, and new billing and coding requirements.

**Data management and security**

Digital health care (mobile health, wireless health, connected health, etc.) technology is delivering solutions to tackle the increasing need for better diagnostics and more personalized therapeutic tools.[69] It also is creating challenges for governments, health systems, and insurers, which must collect, analyze, and store more and more data.

Three developments are helping health care organizations mine insights from myriad data sources:

- **Cognitive computing.** Turning the vast volume of available health care data—from medical devices, smartphones, activity trackers, electronic health records (EHRs), and more—into insights that enable personalized medicine necessitates new aggregation, storage, and modeling approaches. Cognitive computing (machine learning, neural networks, deep learning, etc.) is a common technique for dealing with large volumes of rapidly changing data. It allows for a variety of statistical algorithms, can involve a large number of highly granular models, and can quickly generate new models for new data. It can be used to predict (disease onset, for example), detect patterns in data (a drug's effects on populations or individuals, for example), or to classify populations (patient subpopulations, for example). Machine learning can also be used to combine data across disparate data sources—say, to create a Patient 360 view.[70]

- **Cloud-based, interoperable electronic health records.** Interoperable EHRs coupled with AI could create process efficiencies and improve decision making necessary to boost quality. Data could be better integrated into daily care, and patients could play a role in curating their own data. The data could include genetic, social, and behavioral patient information, as well as financial, clinical, and administrative records. It could be securely stored in the cloud and accessed on an as-needed basis—perhaps on a blockchain (a distributed, immutable record ledger of digital transactions that is shared and editable by various stakeholders).[71]
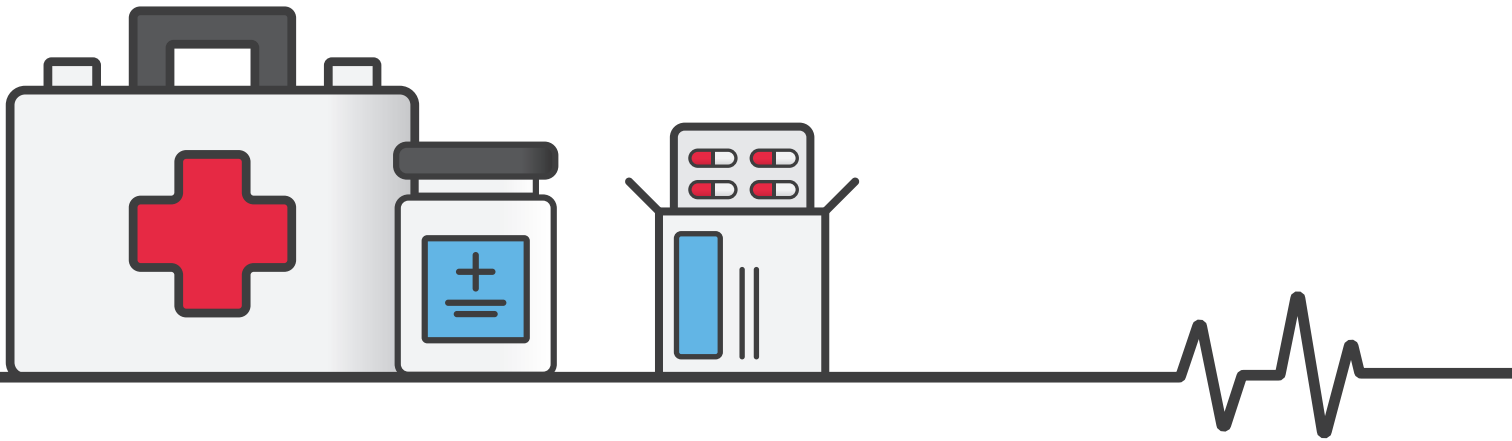
- **Internet of Things (IoT).** Development of the IoT in the health care market (where it is also called the Internet of Medical Things, or IoMT) has been proving particularly valuable in remote clinical monitoring, chronic disease management, preventive care, assisted living for the elderly, and fitness monitoring. IoT's application is lowering costs, improving efficiency, and bringing the focus back to quality patient care.[72]

## The cybersecurity conundrum

WannaCry, a recent, widespread ransomware attack, infected computers in tens of thousands of locations, including hospitals and telecom companies.[73] In May, a malware variant called Wanna Decryptor hit Britain's NHS and infiltrated major international corporations such FedEx, Telefónica in Spain and Portugal, and computers in Russia, Ukraine, and Taiwan.[74]

These and other recent cyberattacks have moved the issues of cybersecurity and data risk management front and center. Health care is second only to the finance industry in the number of cyberattacks annually.[75]

An average of one health care breach incident per day was reported in the United States during the first half of 2017, with at least half of the incidents perpetrated by hackers.[76] Globally, the average total cost of a health care data breach to an organization reached USD $3.62 million per incident in 2017. [77]

As patients take more active control of their health, they will likely be accessing public and private health care in component parts (e.g., software applications, devices) and in nontraditional settings (e.g., at home). This independence is likely to complicate quality assurance and cybersecurity efforts, prompting such questions as:

- Who is responsible when the health care technology a consumer chooses to buy—a self-monitoring device, for example— produces faulty information and sends it to the consumer's primary care physician?

- Who owns patient information and who is responsible for keeping it safe, especially when it is shared across clinicians, facilities, and geographies?

- Realistically, how much of a health plan or provider's confidential clinical, business, and patient data can a cybersecurity program (no matter how sophisticated) protect?

- How can data monetization opportunities (already in use by health plans and of interest to providers) move forward amid privacy constraints?

Among new legislation designed to mitigate data access and security concerns is the European Commission's General Data Protection Regulation (GDPR), which reforms data protection rules in the European Union (EU).

The objective of the new set of rules, which came into force in May 2016 and will apply beginning in May 2018, is to give citizens back control over their personal data, and to simplify the regulatory environment for business in the digital economy.[78] Similarly, the United Kingdom has "Patients Know Best"—a platform on which the patient controls who accesses their health record.

In May 2017, Japan's Ministry of Health, Labor and Welfare released the latest edition of its Security Guidelines for Health Information Systems. This edition incorporates measures to address the risk of cyberattacks targeting medical institutions. Following the guidelines is not mandatory, but is recommended.

Until recently, medical institutions in Japan generally used closed systems to help reduce cyber threats. However, implementation of the national health system's new medical ID and data-sharing scheme will require medical institutions to upload data to external servers, heightening the importance of cybersecurity.
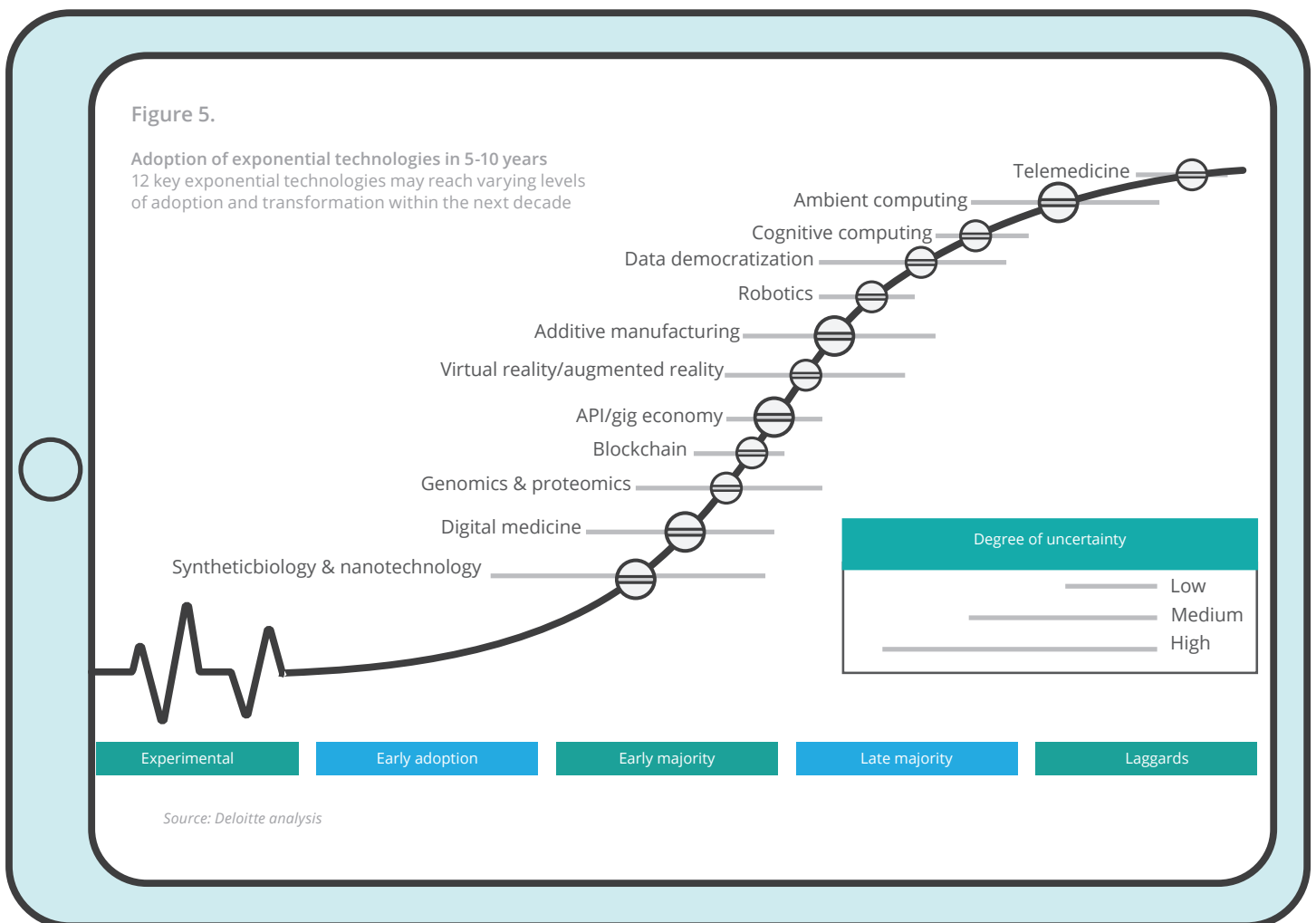
## Stakeholder considerations

Ineffective data management, compliance issues, and cyber risks are often linked with not having systematic approaches to investments in people, processes, and technology. Dated technology is everywhere and connected to everything— not just on desktop PCs. And while government policies and regulations seek to strengthen health care security and safety on a macro level, individual organizations need to focus executive attention on compliance, ethics, and risk.

Many employees at hospitals, health plans, life sciences companies, and governments lack awareness of and training to manage financial, operational, compliance, and cyber risks. Led by senior management, organizations should perform a thorough assessment to understand how recent and upcoming policy changes will impact organizational priorities and explore strategies to build second-line defenses to reduce their administrative, financial, and reputational exposure.

# Investing in exponential technologies to reduce costs, increase access, and improve care

There is no doubt that change is coming to health care. Exponential technologies are helping to drive that change by making care delivery less expensive, more efficient, and more accessible on a global basis. Consider: Beginning in 1999, scientists spent five months and approximately USD $300 million to generate the first initial "draft" of a human genome sequence. The cost to generate a human genome sequence is now less than USD $1,000,[79] and could eventually drop to less than USD $1. In coming years, exponential technologies have the potential to dramatically disrupt the systems and processes that have historically defined the industry (Figure 5).

**Figure 5.**

**Adoption of exponential technologies in 5-10 years**
12 key exponential technologies may reach varying levels of adoption and transformation within the next decade



Telemedicine
Ambient computing
Cognitive computing
Data democratization
Robotics
Additive manufacturing
Virtual reality/augmented reality
API/gig economy
Blockchain
Genomics & proteomics
Digital medicine
Syntheticbiology & nanotechnology

| Degree of uncertainty | |
| --- | --- |
| | Low |
| | Medium |
| | High |

| Experimental | Early adoption | Early majority | Late majority | Laggards |

*Source: Deloitte analysis*

Already, Japan is experimenting with care robots to assist its elderly.[80] In China, clinicians are using AI to support imaging diagnosis in lung, ophthalmic, and skin diseases. A US startup is using AI to take all the data flowing through a hospital to learn how to free up doctors and nurses to see more patients and improve outcomes: One of its clients has been able to treat 3,000 more patients a year with the same resources, an increase of 18 percent.[81]

As individual exponentials combine with others, the convergences push technology ahead even more quickly.[82] Among areas where exponentials are beginning to help reshape health care:

- **Synthetic biology.** Synthetic biology (an interdisciplinary branch of biology and engineering) and the ability to create DNA, genomics, and proteomics are advancing rapidly. Applications for life sciences companies are phenomenal, particularly when considering how these technologies could be combined with cognitive computing, AI, and others.[83]

- **3D printing and nanotechnology.** Once scientists understand DNA sequencing at a detailed level, it reaches a point where they can print actual tissue—there are people today who have at least one ear that was printed. Through nanotechnology, innovators could develop a customized white blood cell that is specifically designed to hunt down and attack cancer cells at a molecular level.[84]

- **Companion diagnostics.** When paired with targeted therapies, companion diagnostics (an in-vitro diagnostic device or an imaging tool that provides information that is essential for the safe and effective use of a corresponding therapeutic product[85]), can help physicians to select an optimal treatment the first time, avoiding the costly and risky practice of trial-and-error prescribing.[86]

- **Biosensors and trackers.** Biosensors included in rapidly shrinking wearables and medical devices allow consumers and clinicians to monitor and track more aspects of patients' health, enabling earlier intervention—and even prevention—in a way that is much less intrusive to patients' lives.[87]
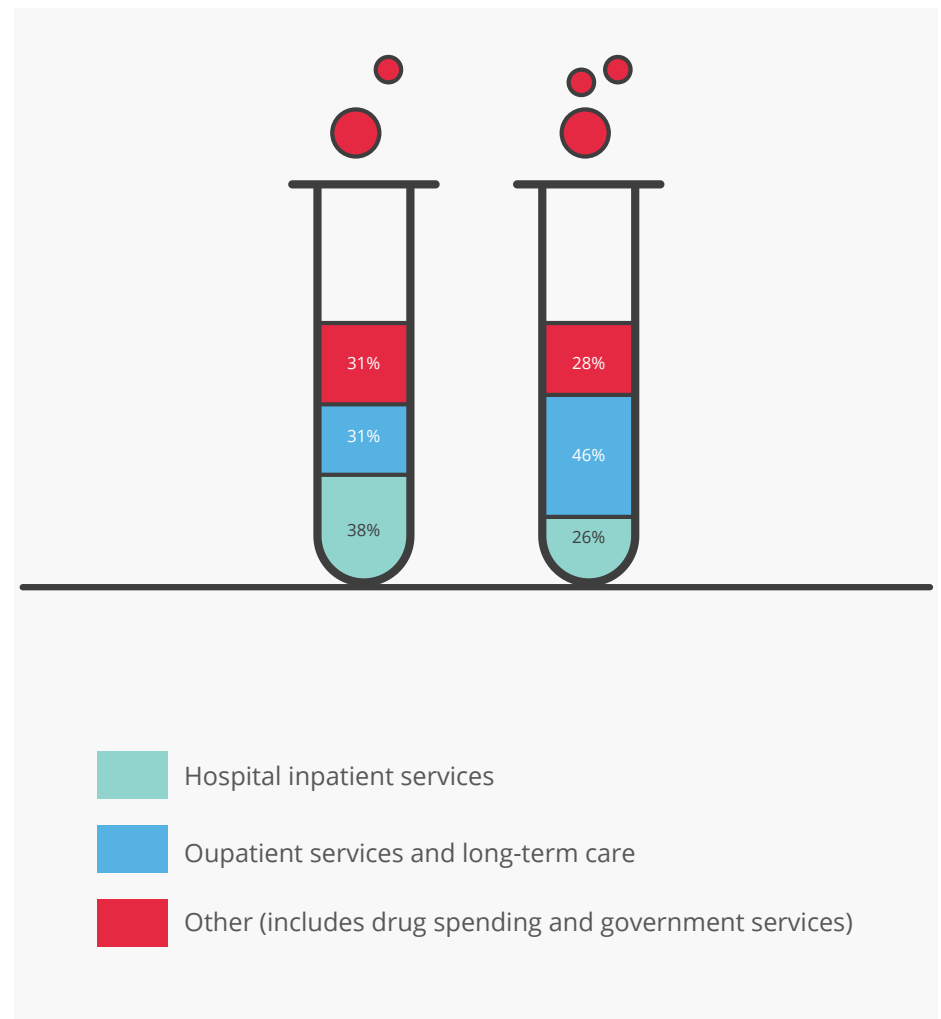
## Planning today for the hospital of tomorrow

With aging infrastructure in some developed countries and the lack of robust infrastructure in emerging markets, governments and private health care providers (driven by consumers) are rethinking how to optimize inpatient and outpatient settings, and are planning how to integrate digital technologies into traditional hospital services to reduce costs, increase access, and improve patient care in the future. In the coming decade, many U.S. and European hospital executives plan to renovate or rebuild outdated infrastructure.[88][89][90] Similarly, increasing health care demand in emerging economies should drive considerable hospital planning and construction.

For instance, spending on new hospital infrastructure in India is expected to reach USD $200 billion by 2024, and China plans to add 89,000 new hospital beds by 2020.[91][92]

Demographic and economic trends, coupled with advancing technologies, could have significant implications for how hospitals of the future will be staffed, sized, and designed. For example, more health care services are taking place in outpatient settings and in the home (Figure 6), although some types of patients—for example, complex cases and the very ill—likely will still require inpatient hospital care.

Figure 6. Health care expenditure by function—average of OECD countries



Hospital inpatient services

Oupatient services and long-term care

Other (includes drug spending and government services)

*Source: OECD*

To learn what a hospital of the future may look like, the Deloitte US Center for Health Solutions conducted a crowdsourcing simulation in May 2017 with experts from across the globe. Participants included health care CXOs, physician and nurse leaders, public policy leaders, technologists, and futurists. Their charge was to come up with specific use cases for the design of digital hospitals globally in 10 years (a period that offers hospital leaders and boards time to prepare). The crowdsourcing simulation developed use cases in five categories:

- **Redefined care delivery:** Emerging features including centralized digital centers to enable decision making, continuous clinical monitoring, targeted treatments (such as 3D printing for surgeries), and the use of smaller, portable devices will characterize acute care hospitals.

- **Digital patient experience:** Digital and AI technologies will help enable on-demand interaction and seamless processes to improve patient experience.

- **Enhanced talent development:** Robotic process automation (RPA) and AI will allow caregivers to spend more time providing care and less time documenting it as well as help enhance their development and learning.

- **Operational efficiencies through technology:** Digital supply chains, automation, robotics, and next-generation interoperability will drive operations management and back-office efficiencies.

- **Healing and well-being designs:** The well-being of patients and staff members—with an emphasis on the importance of experience in healing—will be important in future hospital designs.

Most of these use case concepts are already in play. For example, as of early 2017, China

has 79 digital hospitals, with 90 percent of them built after 2016. Most of these digital hospitals are located in economically undeveloped provinces.[93]

But there is no need to wait for a building boom to integrate emerging technologies into hospital operations. Numerous digital solutions could be implemented now or in the near future to improve operational efficiencies and clinical outcomes. Hospitals could implement remote patient monitoring, telehealth, advanced analytics, and wearables to more fully engage with patients for improved quality and outcomes. Many back-office functions—finance, supply chain, human resources, and revenue cycle, among them—could benefit from robotics, advanced analytics, sensors, and automation to drive cost efficiencies. These functions also could be digitally improved by using cloud-based enterprise resource planning (ERP) solutions to make them shorter, faster, and more responsive.[94]

Where budgets allow, numerous countries are investing in tools and programs to digitize their health systems. Many Canadian jurisdictions and individual and regional groups of hospital providers are working toward enhanced hospital information systems to allow them to better manage patient care in the hospital setting. A number of Mexico's health systems are using wearables, personal devices, and apps for knowledge transfer and communication with physicians and patients. In the Netherlands, patient-centered health care enabled by e-health solutions is a top agenda item within hospitals and care organizations.

**Data and analytics**
Health data is the new health care currency, as organizations increasingly use advanced digital and cognitive technologies to mine vast amounts of data to produce clinical and

operational insights.[95] Facing a continuous, ever-growing influx of data from internal and external sources, hospitals will come to depend on cognitive analytics to sort through and find the most important data points and trends, analyze the data, and present actionable insights to clinicians, patients, and caregivers in an easy-to-understand format that seamlessly fits into their daily activities.

Hospital expenditures on analytics are anticipated to reach USD $18.7 billion by 2020, up from USD $5.8 billion in 2015, as hospitals focus on quality and cost reduction.[96] But health care lags other industries in applying technology and data analytics to daily activities. Three functional areas that may need immediate attention: operational (clinical coding, nursing support), clinical (decision support tools to de-risk processes), and back office (HR, payroll, supply chain, patient/customer interface). And as health care moves outside the hospital and into the home and community, providers are expected to need analytics to address the challenge of measuring outcomes in nontraditional settings.

No single organization has all the data required to look at a patient or targeted population in a holistic manner. This can limit the abilities of the health system that's providing the care and the payer that's financing the care—directly impacting the patient journey. In the United States, many health systems and health plans that are making value-based care a priority are investing in population health analytics to enable their strategies.
However, Deloitte research suggests that most organizations aren't yet sufficiently focusing on cross-sector collaboration approaches that could unlock the synergistic benefits of combining the best of what each stakeholder has to offer.[97]

To increase the potential for health care innovation, the constraint of limited data-sharing among stakeholders will need to be broken. A new construct between health systems and payers might accelerate the necessary transformation. This includes new provider payment methodologies, clearly defined roles and responsibilities, evidence-based patient engagement approaches, workflow and collaboration tools, and an ability to align each organization's investment in analytics to improve health care outcomes.

### Stakeholder considerations

Any decision by governments and private health systems to upgrade, replace, and develop their clinical infrastructure should include acknowledging the importance of exponential technologies in advancing new care delivery models and powering care facilities. Keeping pace with rapid technology developments is likely to require massive investments in supporting systems (ERP), primary systems (electronic patient records), hospital information systems, connectivity/interoperability, eHealth/mHealth, and big data.

A well-crafted strategy should lay the foundation for near- and long-term investments to aid care delivery.

Health care leaders should consider building technology ecosystems that embrace nontraditional players and sources of knowledge outside their own four walls. They also should consider building pilots before investing in scale; embracing change; and evaluating new technology-aided revenue sources. Additionally, organizations should strive to be agile in anticipating and adjusting their strategies as innovations continue to evolve. From a tactical perspective, incorporating digital health care and analytics into daily practice can help hospitals and health systems to streamline care pathways, reduce costs, increase patient satisfaction, and improve quality.

Even though technology will underlie most aspects of future hospital and health system operations, care delivery—especially for complex patients and procedures—will likely still require hands-on human expertise.

Stakeholders, therefore, should consider how to plan for strategic investments in people, processes, and premises enabled by digital technologies.[98]
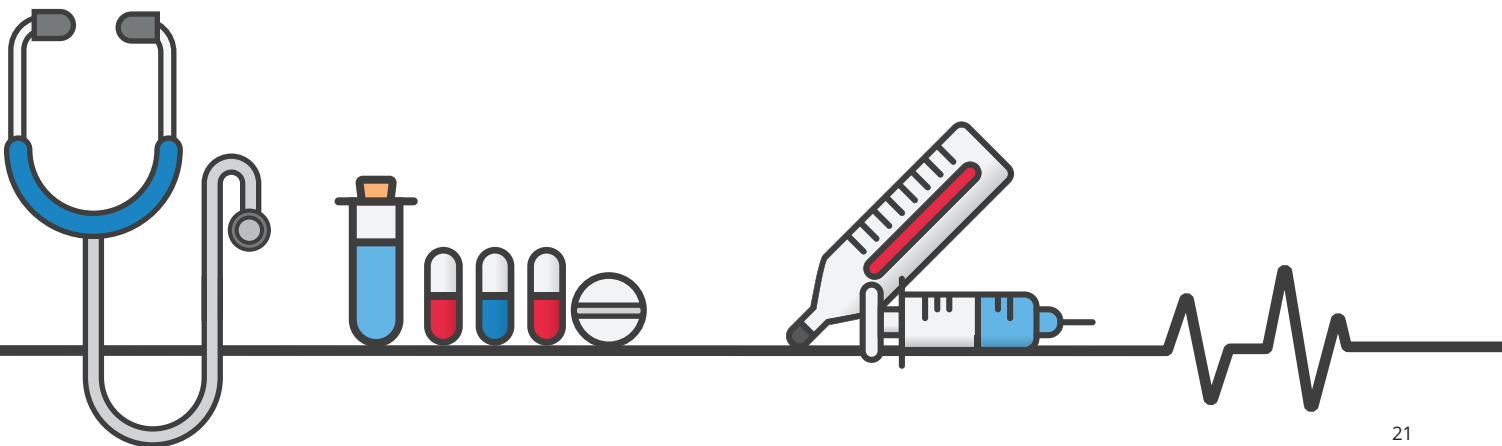
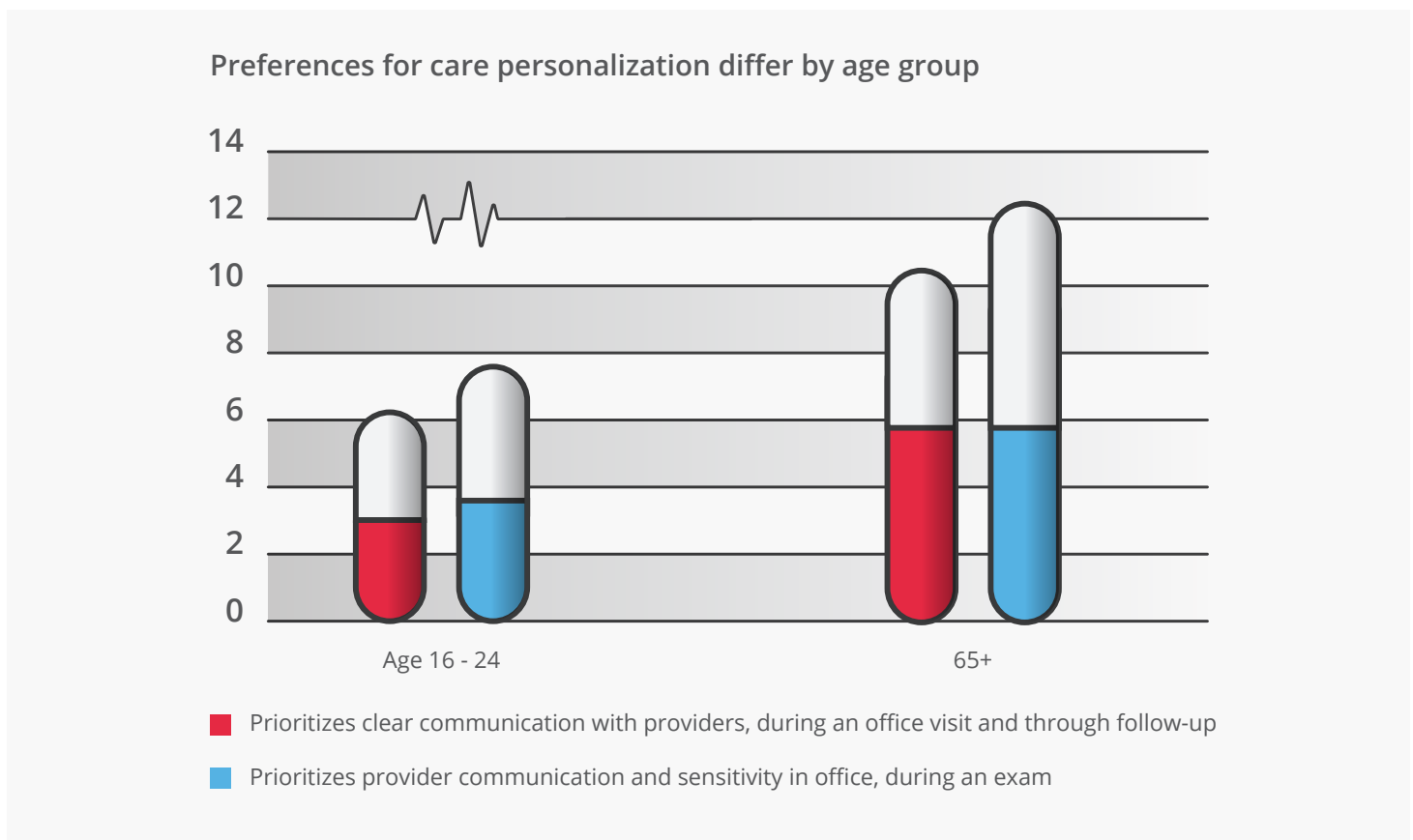# Engaging with consumers and improving the patient experience

Many entrepreneurs and health care consumers are asking fundamental questions about why the patient experience isn't more personalized and why the system isn't more convenient. Why do patients have to go to a centralized location to see a doctor? Why can't the health plan, the hospital, and the doctors all agree to prices and a payment model before the patient gets involved? These are questions that established health care stakeholders should consider addressing if they hope to preserve and grow their existing customer relationships. Meanwhile, agile competitors not hindered by established processes and systems may be able to detect and capitalize on technology-driven disruptors more quickly than incumbents.[99] According to the Deloitte 2017 Survey of US Health Care Consumers, personalized care from their providers—including clear communication and sensitivity—is respondents' top health care priority (Figure 7):

**Figure 7.**

**Consumers report their first priority in health care is the personalization of care from their providers**



**Preferences for care personalization differ by age group**

Age 16 - 24      65+

■ Prioritizes clear communication with providers, during an office visit and through follow-up

■ Prioritizes provider communication and sensitivity in office, during an exam

*Source: Deloitte 2017 Survey of U.S. Health Care Consumers*

Hospitals can provide more personalized care, better engage with consumers, and elevate the patient experience by using digital solutions to aid omni-channel patient access, including customer apps, patient portals, personalized digital information kits, and self-check-in kiosks.[100] Other digital channels and tools to enhance provider-consumer interactions include:

• **Leveraging social media to improve patient experience:** Social media offers health care organizations a potentially rich source of data to efficiently track consumer experiences and population health trends in real time, much more efficiently than current approaches.

• **Telehealth:** Telehealth provides a more convenient way for consumers to access care while potentially reducing office visits and travel time. This convenient care model has the potential to increase self-care and prevent complications and ER visits.[101]

• **Virtual reality/augmented reality:** VR/AR can engage patients in low-risk, artificially generated sensory experiences that could accelerate behavior change in a way that is safer, more convenient, and more accessible to the consumer.[102]

In the future, digital technology may improve the patient experience by providing real-time access to medical knowledge and assistance (see sidebar, next page). Imagine a voice-activated system for an impatient patient—an AI-powered, bedside virtual care assistant that can answer or direct queries to the most appropriate person at the hospital. This virtual assistant will be able to answer the patient's routine questions about diagnoses, expected recovery experiences and times, and daily medication schedules. It also will be able to direct specific questions to specialists. In addition, the virtual assistant can act as a data repository for the patient's medical history, test results, consultation times, appointment schedules, and even

stories about other patients who had a similar diagnosis. Such accessible AI technologies will help empower patients and their families.[103]
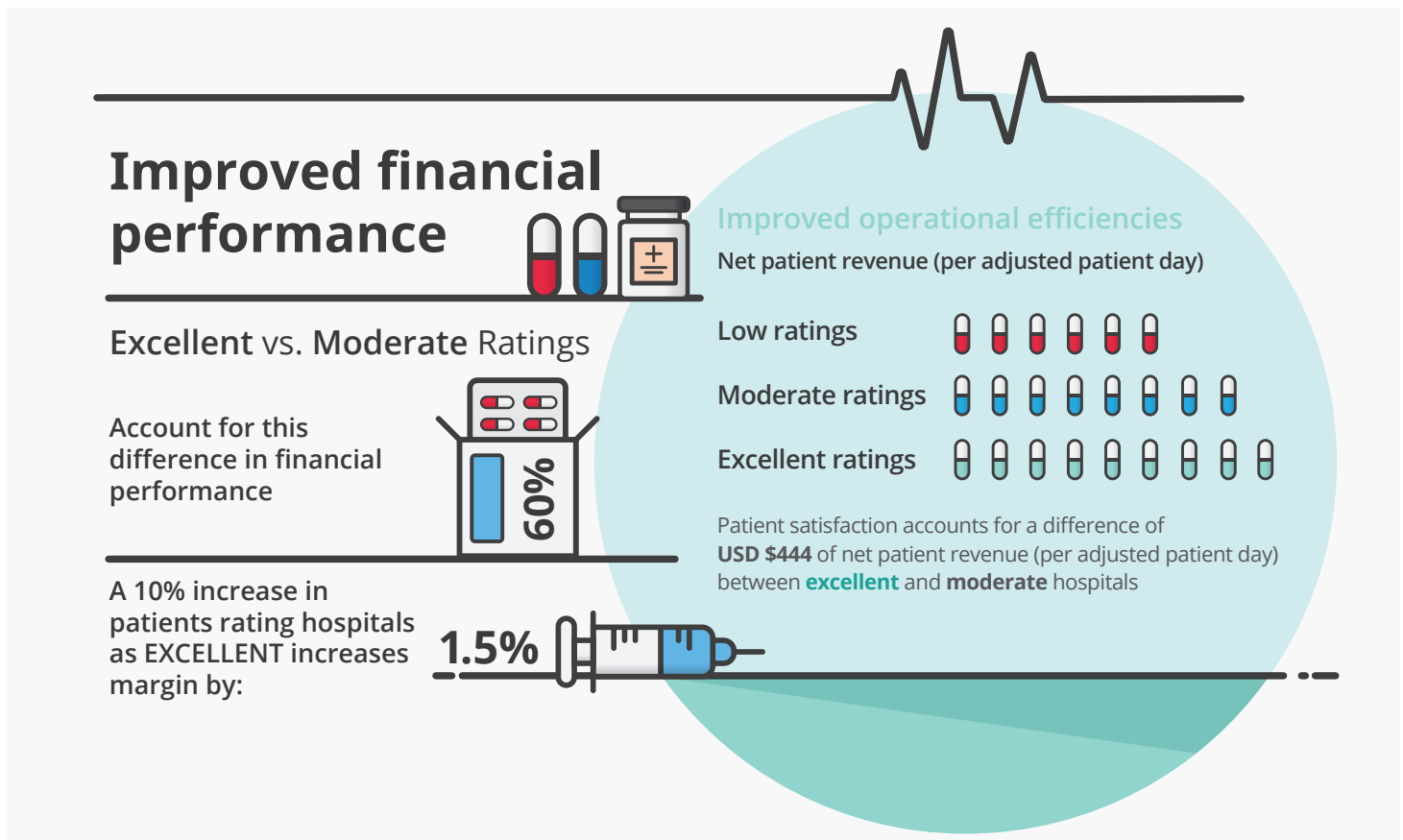
What's good for consumers also can be good for providers. Enhancing the patient experience is regarded as a potential driver of hospital performance, since it can strengthen customer loyalty, build reputation and brand, and boost utilization of hospital services through increased referrals to family and friends.[104] Furthermore, research has shown that better patient experience correlates with lower medical malpractice risk for physicians[105] and lower staff turnover ratios.[106]

A Deloitte analysis found that improving the patient experience can help improve hospital operations and financials (Figure 8):

**Figure 8.**

Hospitals with excellent patient ratings have higher profitability
Our analysis found that providers who deliver exceptional experience often demonstrate strong financial performance and efficient operations



**Improved financial performance**

**Excellent** vs. **Moderate** Ratings

**Account for this difference in financial performance**

60%

**A 10% increase in patients rating hospitals as EXCELLENT increases margin by:**

1.5%

**Improved operational efficiencies**

**Net patient revenue (per adjusted patient day)**

Low ratings

Moderate ratings

Excellent ratings

Patient satisfaction accounts for a difference of **USD $444** of net patient revenue (per adjusted patient day) between **excellent** and **moderate** hospitals

*Source: Deloitte: Value of Patient Experiences, 2016*

# Improving the patient flow pathway

Technology disruption is transforming both clinical and operational processes within today's health care systems. D.Assist, part of the Deloitte Smarter Health Care Solutions suite across the patient flow pathway in hospital settings, covers "classic pinch points" such as admissions, operating theater and ICU utilization, length of stay, the discharge process, clinical coding, and outpatient scheduling.

One D.Assist application is a lean, enhanced patient-to-nurse communication system that replaces the existing call button system used in most of the world's hospitals and aged care facilities. The solution captures a spoken request for assistance in the patient's room, which is understood by the system and converted to text. The message is then assessed using AI services and processed to identify the patient's request and determine how best to respond. In many cases D.Assist is able to respond to the patient from a database of FAQs, relieving nurses' workload. Where physical assistance is required, the request is assigned a priority, and routed to the most appropriately skilled team to respond to the patient, displaying the patient need with a target time in which to respond. While this is happening, the patient receives a confirmation that their request has been made to the nursing team, providing them with important emotional reassurance.

D.Assist provides nurses and the medical team with critical information needed to effectively respond to patients and save lives. For patients, D.Assist is also capable of connecting them with entertainment services such as music and books, and can be combined with intelligent room automation to enable smart controls of the patient environment. Patients can access D.Assist from anywhere in the room, calling for assistance even when the call button is out of reach, such as after a fall.
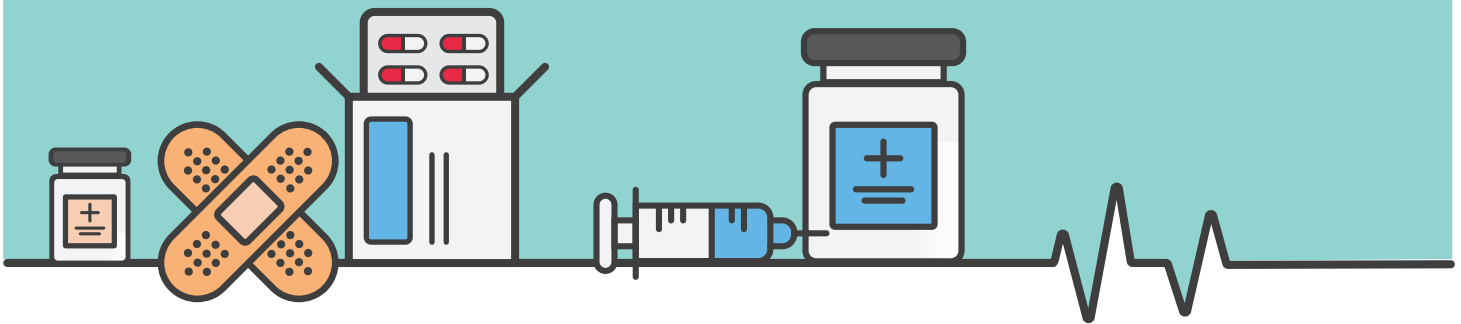


## Stakeholder considerations

Health care organizations should consider extending their focus beyond price and quality of care to create a customer-centered relationship by:

- Focusing on customer engagement and experience using the same principles and practices that successful, customer-driven businesses use

- Acknowledging that attracting and retaining customers impacts the bottom line

- Understanding that health care is "shoppable" and that consumer expectations are increasingly high

- Designing and utilizing innovative, technology-enabled customer programs that take behaviors and preferences into consideration to deliver the right experience at the right time

- Defining the market segment(s) their brand and services will become recognized and valued for delivering

Technology is making consumers more active in the health care decision-making process. Providers and payers should capitalize on this trend and improve communications and the patient experience life cycle (research, diagnosis, treatment, and follow-up).

Yet the industry also needs to narrow the gap between rapidly increasing consumer demands and clinical appropriateness: Are providers delivering the right level of diagnostic services and interventions? Just because there's a demand doesn't mean there is a need. Also, how can stakeholders create a business case to effectively and efficiently deliver on patient expectations? Health care has an opportunity to learn from other industries (consumer products, financial services, and hospitality, as examples) how to more effectively target, serve, communicate with, and retain customers.

# Shaping the workforce of the future

Health care workforce challenges are being felt across more and more countries. Staffing shortages are evident in a number of hospital specialties (emergency medicine and geriatrics) and in general practice; there are also growing nursing shortages across both health and social care. Compounding the problem is a scarcity of leaders with strategic, next-generation skills to guide and support the transformation to becoming patient-centric, insight-driven, and value-focused organizations.

Digital technology, robotics, and other automated tools have enormous potential to resolve current and future health care workforce pain points—if stakeholders are willing to embrace an augmented workforce, the concept that all of the work that employees do will be augmented; will be extended in different ways.

In Deloitte's view, the future of work is likely to be powered by technology advancements and an augmented workforce that combines people and machines to get things done in a way that's not only more productive, but also more rewarding. From a hospital or health system perspective, it means addressing pain points including a dispirited workforce with growing staff shortages and high levels of burnout, a reduced ability to attract and retain top skills, a reduction in the quality of care, and a loss of position as a patient's provider of choice.[107]

What stands in the way of more rapid progress in the move toward augmenting today's workforce? One factor may be that many leaders of health care provider organizations anticipate that the scale and pace of change will overwhelm their workforce and compound current talent issues. What these executives may not be considering is that technology-fueled shifts in the nature of work represent a tremendous opportunity to help resolve today's challenges and build tomorrow's capabilities.[108]

One hundred percent of providers surveyed in the 2017 Deloitte Human Capital Trends report say they plan to make significant progress in adopting cognitive and AI technologies in the next three to five years. Additionally, 33 percent say they consider it a priority to develop employees so they can work side-by-side with robots; as a result of those workflow-enhancing applications, individuals can and will need to take on more advanced skills. However, despite the heavy emphasis and awareness of the changes, none of the providers surveyed responded that they have made significant progress in adopting these technologies.[109]

Innovative new solutions that can address present-day provider pain points and focus organizations on mission-critical activities to support the quadruple aim—enhance the patient experience, improve the health of populations, reduce the per capita cost, and enhance the caregiver experience of health care—will spring from different combinations of technology and talent. Nurses could use digital technology, robotics, and other tools to redirect their time from rote administrative tasks toward "healing-touch activities" and decision making, while minimizing potential costs and improving care related to human error resulting from manual activities, overwork, and lack of resources. For example, home voice-activated devices could be used to support oral chemo symptomatology management and enhance outcomes. Robotic support for lifting patients could reduce physical burdens and injuries. And an application-based crowdsourced scheduling software can enable more flexibility in shift management, reduce last-minute shift changes, and improve coverage.[111]

In addition to easing current concerns, the future of work also represents a huge opportunity to evolve the ways in which care is delivered. For instance, health systems are beginning to take advantage of telemedicine technologies that enable virtual care.

Changing the proximity of where care can be provided—remotely, in a patient's home, or by specialists that are 100 of miles from the patient's location —allows certain clinicians to see more patients, attend to more complex episodes of care, and serve populations across a wider geography and in hard-to-reach locations. It also enables clinicians to "practice to the top of their license" and spend more time doing impactful and fulfilling work.

Health care organizations have an opportunity to help talent and technology join forces rather than compete with each other, and should coordinate human and technological resources from the outset. Already, leading health systems are demonstrating the benefits of an augmented workforce. For example, Automated Guided Vehicles (AVGs) at Sydney, Australia's Royal North Shore Hospital deliver about 2,000 meals a day for patients and carry 25,000 kilograms of linen, freeing staff to focus more on patient care. The next chapter of Chinese health care reform is "balancing health care resources," with the goal of improving public hospitals' operational efficiency. One potential strategy: adopting a technology-aided enterprise management model in which hospitals use professional managers instead of senior doctors to manage operations, implement clinical pathways, and optimize the care delivery process.

When planning for the future of work, health care organizations will need to assess the trajectory of specific jobs and workflows, evaluating the mix of factors that combine to operate those jobs and processes, and how they can be re-envisioned by using enabling technologies and new talent models such as:
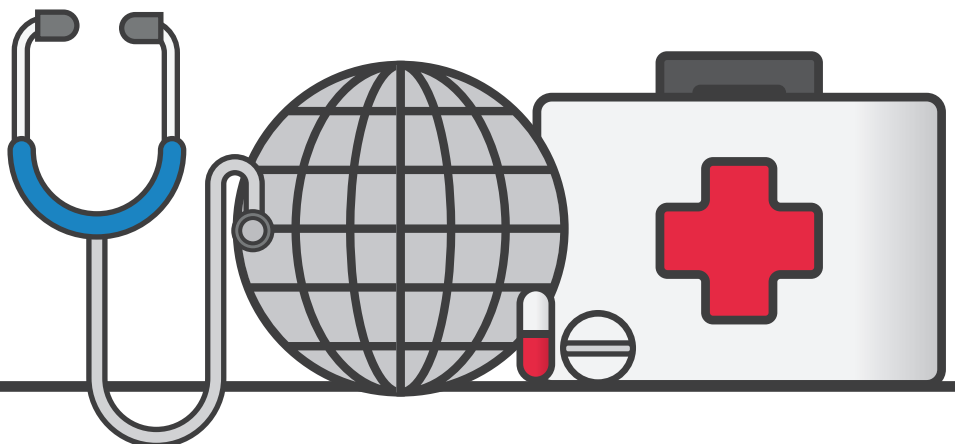
- **Physical proximity:** Must this job happen in person or on-site? Does the physician, nurse, or other caregiver need to be present at the site of service delivery? What about the patient? Can the care or service be delivered virtually or in a location that has hard-to-find skillsets or more affordable labor?

- **Automation level:** How much of the work is made up of tasks that can be delivered through robotics, cognitive intelligence, AI, or other technologies? What skill-based parts of the job must remain in human hands? How can humans and robots work in concert with one another to optimize performance?

- **Talent category:** Is this a full-time, in-house job? To what extent can different categories, such as contract, off-balance-sheet (e.g., external consultants), or crowdsourcing, accomplish this?[112]

### Stakeholder considerations

As health care technologies' reach and influence begin to transform longstanding clinical and administrative processes, the workforce structure will inevitably change. Jobs which involve repetitive or administrative processes may be automated and replaced; for example, the use of mobile applications for appointment booking could potentially reduce many receptionist jobs. On the other hand, an augmented workforce should enable clinicians and other staff to focus more on their core responsibilities and improve treatment efficiency and quality. Also, an AI- or robotics-augmented health care workforce may be able to make better decisions, reduce errors, and increase productivity.

From a technology perspective, the future of work is already here. But in many health care organizations, the plan for working in that future is still on the drawing board.

As individual health care organizations seek to map out their workforce strategy, it is important to realize that each part of the workforce will evolve not along a single linear path, but in response to a collection of forces. Breaking down the clinical work steps and evaluating opportunities to leverage automation and alternative talent models can identify opportunities for augmentation in clinical workflows, pinpoint where clinicians, patients, and their families will benefit from new technologies, identify how alternative talent models can reduce burnout, and expand locations where care is delivered for a better-served population.[113]

# Appendix

Explore the latest health care sector research from Deloitte members or visit:
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www.deloitte.co.uk/centreforhealthsolutions
www.deloitte.com/healthcare

### Time to care: Securing a future for the hospital workforce in Europe
There is widespread recognition across Europe of the growing mismatch between demand for hospital care and the supply of staff and other resources to meet that demand. The quality of care is dependent on having the right professionals with the right skills in the right place at the right time; however there are concerns that the current workforce model is unsustainable.

### The future awakens: Life sciences and health care predictions 2022
The year is 2022. The quantified self is alive and well, digital technologies have transformed the culture of health care and new entrants have disrupted delivery models. We offer some predictions that, if they come true, will shake up the life sciences and health care industry in the next five years.

### The digital hospital of the future
In 10 years, technology may change the face of global health care delivery. As the cost of care continues to rise, many hospitals are looking for long-term solutions to minimize inpatient services. Learn how technology and health care delivery will merge to influence the future of hospital design and the patient experience across the globe.

### Breaking the dependency cycle: Tackling health inequalities of vulnerable families
Vulnerable families face significant health inequalities, despite rising life expectancy across Western Europe. While access to good health care is important, it only accounts for 15-25 percent of health inequalities. A range of social determinants crucially drives trends around mortality and ill-health, including quality of education, housing, employment, working conditions, and welfare.

### Supporting healthy communities
As health care shifts toward treating people before they get sick, community partners and government agencies are becoming involved, aiming to address social factors such as education and housing. More players, though, means more complications, particularly in funding. One possible solution: a hub model.

### Addressing social determinants of health in hospitals: How are hospitals and health systems investing in social needs?
Our survey of 300 hospitals and health systems explores how factors outside the health care system—the social determinants of health—affect patients' long-term well-being and what health care organizations can do to address these challenges.

### Deloitte 2017 survey of US health system CEOs: Moving forward in an uncertain environment
CEOs at hospitals and health systems are faced with increasing headwinds as they look to move forward in an uncertain environment. So what are the key issues and trends CEOs are facing? While none of the key themes emerging from our interviews have really changed since we last spoke with health system CEOs in 2015, the urgency certainly has. Instead of thinking about these issues in a futuristic sense, CEOs are ready to address and tackle them now.

### Can emerging technologies improve hospital performance? Strategies for healthier operating margins
Hospitals are anticipating tighter operating margins in 2017 and beyond, due to increasing financial pressure from policy, industry, and market changes. This report discusses innovative technologies and cost-reduction strategies that hospitals can consider to enhance revenue, increase efficiency, and achieve long-term financial stability.

### Hospital mergers and acquisitions: When done well, M&A can achieve valuable outcomes
With a rise in the number of mergers and acquisitions in the health care industry, we conducted a study with the Healthcare Financial Management Association to learn more about the factors that lead to increased value following a hospital merger or acquisition.

### Cognitive health care in 2027: Harnessing a data-driven approach in personalized health care
"Precision medicine" or care that is highly personalized for each person's genome is likely to revolutionize health care of the future. And cognitive technologies will play a pivotal role, as handling the enormous amounts of data—one of the imperatives of cognitive health care—requires much more than just "artisanal" analytic capabilities.

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