



# 2020 global health care outlook

Laying a foundation for the future

## About the author

**Dr. Stephanie Allen** | [steallen@deloitte.com.au](mailto:steallen@deloitte.com.au)

Dr. Stephanie Allen is the Deloitte Global Health Care sector leader. In addition, Allen leads the Health & Human Services practice for Deloitte Australia. She has more than 25 years of experience in health and social care, having worked extensively in both the United Kingdom and Australia. Allen specializes in leading large-scale transformation programs across health and social care payers and providers. Connect with her on LinkedIn at [www.linkedin.com/in/dr-stephanie-allen-gaicd-7a841a4/](https://www.linkedin.com/in/dr-stephanie-allen-gaicd-7a841a4/).

# Contents

Overview and outlook	2
Global health care sector issues in 2020	7
Financial operations and performance improvement	7
Care model innovation	13
Digital transformation and interoperability	19
Future of work	24
Questions/actions leaders should consider for 2020	30
Appendix: Suggestions for further reading	33
Endnotes	34

# Overview and outlook

**T**HIS IS AN exciting time for the global health care sector as it progresses along its journey to the future. It also may be viewed with uncertainty, and stakeholders concerned would be wise to heed Confucius's advice to "study the past if you would define the future" and factor in historic and current drivers of change when strategizing for 2020 and beyond.

Among these drivers are a growing and aging population, rising prevalence of chronic diseases, infrastructure investments, technological advancement, evolving care models, higher labor costs amid worker shortages, and the expansion of health care systems in developing markets (see sidebar, "Global health care by the numbers").

## GLOBAL HEALTH CARE BY THE NUMBERS

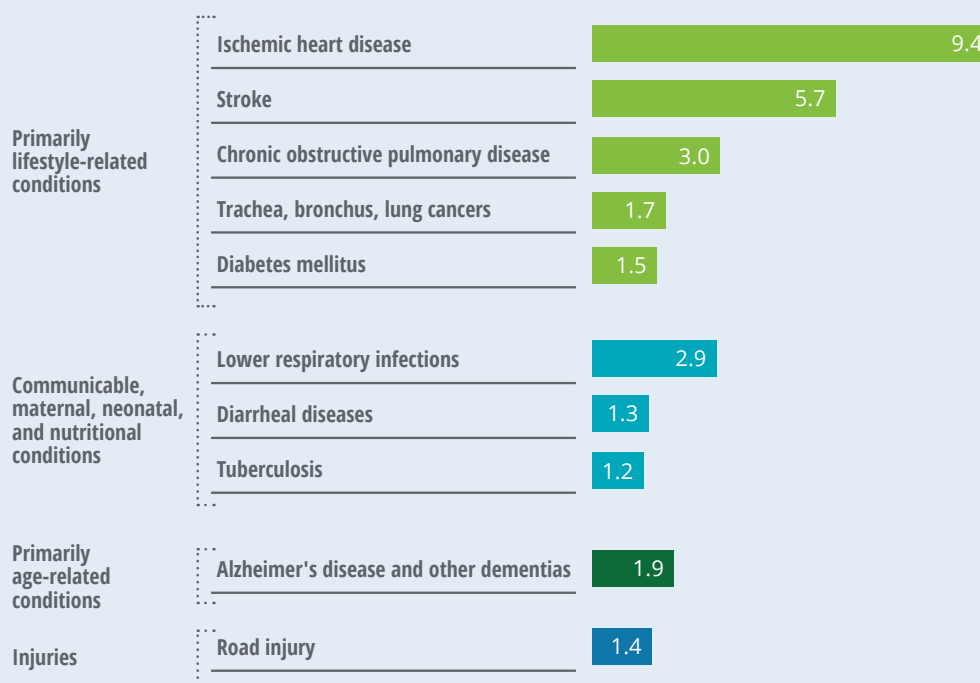
- Global health care spending is expected to slow down to 3.2 percent in 2019, from 5.2 percent in 2018. This is likely the effect of currency shifts and decelerating global economic growth stemming from geopolitical tensions including the United States-China trade war and the United Kingdom's planned exit from the European Union (EU). Over 2019–23, however, health spending is expected to rise at a more robust compound annual growth rate (CAGR) of 5 percent, up from 2.7 percent in 2014–18.<sup>1</sup> All regions apart from North America are expected to see average spending growth accelerate in the forecast period, with the largest annual increases in the Middle East/Africa (7.4 percent) and in Asia (7.1 percent).<sup>2</sup>
- Global health care spending as a share of gross domestic product (GDP) will likely remain at around 10.2 percent through 2023, equal to 2018's ratio. This anticipated steady state reflects both economic improvements and health systems' efforts to contain costs.<sup>3</sup>
- On a per capita basis, spending will likely continue to be unevenly spread, ranging from US\$12,262 in the United States to just US\$45 in Pakistan in 2023. Efforts to close this gap will be hampered by higher population growth in many developing economies.
- With the 2019 global population of 7.7 billion expected to reach 8.5 billion by 2030,<sup>4</sup> meeting health needs won't be easy. However, Asian countries will likely also contribute around half of the global growth in higher-income households (those earning over US\$25,000 a year). Population growth, combined with increased economic power and efforts to expand public health systems, will likely result in higher health spending.<sup>5</sup>
- Providing health care to the expanding geriatric demographic is likely a key concern for governments and health systems. Overall life expectancy is projected to increase from an estimated 73.7 years in 2018 to 74.7 years by 2023.<sup>6</sup> The number of people aged over 65 will be more than 686 million, or 11.8 percent of the total population.<sup>7</sup> The trend will be most noticeable in Japan, where the share of people aged 65+ is expected to reach almost 29 percent by 2023; in Western Europe this is expected to be 22 percent.<sup>8</sup> Spending on the global geriatric care market (home health, remote patient monitoring, etc.) will likely exceed US\$1.4 trillion by 2023.<sup>9</sup>

- Dementia currently impacts over 50 million people aged 60 and above globally. The number is expected to reach 82 million by 2030 and 152 million by 2050.<sup>10</sup>
- While communicable diseases continue to pose a threat, especially in developing countries, chronic and noncommunicable diseases (NCDs) are also on the rise. Nearly 425 million people were living with diabetes in 2017; by 2045, that number is projected to increase by 48 percent to 629 million. China (114.4 million), India (72.9 million), and the United States (30.2 million) topped the list of people with diabetes in 2017 and are expected to retain those spots into 2045.<sup>11</sup>
- Lifestyle-related factors including smoking, poor diet, hypertension, obesity, and lack of physical activity contribute to many of the top 10 global causes of death (figure 1).

FIGURE 1

### Many of the top 10 global causes of death are related to unhealthy behaviors

Top 10 global causes of deaths, 2016 (figures in millions)



The leading causes of heart disease, stroke, chronic obstructive pulmonary disease, lung cancer, and diabetes include one or more of the following lifestyle-related factors:



Smoking



Poor diet



High blood pressure  
(hypertension)



Overweight



Obesity



Physical  
inactivity

Source: *Smart health communities and the future of health*, Deloitte, 2019.

Communicable and noncommunicable diseases apart, health care stakeholders also face the challenge of combating mental or neurological disorders (see sidebar, “The imperative to improve mental health outcomes”). While treating these diseases is a given, it is crucial for health care stakeholders to work toward a future in which the collective focus shifts away from a system of sick care—treating patients after they fall ill—to one of health care,<sup>12</sup> which supports physical and mental well-being, prevention, and early intervention. Some steps are being taken in this direction. In partnership with sectors such as employment, housing, education, transportation, retail, banking, and technology, health care stakeholders are beginning to employ a smart health community (SHC) approach (see sidebar, “Spotlight: Smart

health communities”) to collectively help drive innovation, increase access and affordability, improve quality, and lower costs through more efficient delivery models.<sup>13</sup>

However, a lot remains to be done. To get to this envisioned future, health care providers, governments and other payers, disruptive entrants, and even consumers should begin by understanding, analyzing, and responding to the trends and issues driving change across the ecosystem. This year’s global health care outlook reviews the state of the sector; explores key issues shaping 2020 (figure 2); and poses questions and actions leaders should consider as they lay a solid foundation for the future.

FIGURE 2

## In 2020, the health care sector faces challenges of different kinds—financial, strategic, digital, and talent-related



### Financial operations and performance improvement

Health systems are working to achieve financial sustainability by reducing the cost to deliver and finance high-quality and effective care for patients.



### Care model innovation

New strategies, capabilities, and technologies are shifting health systems’ focus from providing episodic, acute care to keeping people healthy.



### Digital transformation and interoperability

Exponential advances and interoperability in digital technologies are helping clinicians deliver health care services in ways that consumers prefer to receive them.



### Future of work

An aging population and shortage of skilled clinicians are changing the future of work in health care and increasing the importance of sourcing, hiring, training, and retaining skilled workers.

Source: Deloitte analysis.

## THE IMPERATIVE TO IMPROVE MENTAL HEALTH OUTCOMES

One in four people worldwide will be affected by a mental or neurological disorder at some point in their lives. Around 450 million people currently suffer from such conditions, placing mental disorders among the leading causes of ill health and disability.<sup>14</sup> With the World Health Organization (WHO) now naming mental health care a fundamental right, it becomes all the more important for the global health community to identify ways to improve mental health outcomes. Disruptive technologies can play a vital role in combating these often-debilitating conditions and hold great promise in the delivery of mental health interventions.

Deloitte is collaborating with the World Economic Forum on a two-year project, “Disruptive technologies in mental health,” to build an actionable policy framework that will guide the use of technology in mental health. The framework will include ethical, strategic, and practical guidelines for governments, corporations, funders, innovators, providers, and consumers.

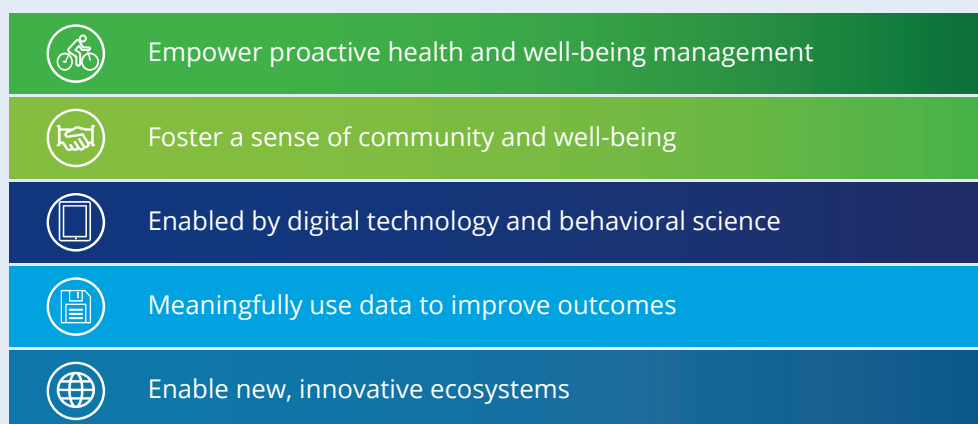
## SPOTLIGHT: SMART HEALTH COMMUNITIES

A significant body of research shows that about 80 percent of health outcomes are caused by factors unrelated to the medical system. People’s eating and exercise habits, socioeconomic status, and where they live tend to have a greater impact on health outcomes than health care.<sup>15</sup> Moreover, it has been known for years that school, work, and community-based health education programs can have an impact on public health and society.

Today, cadres of nontraditional players, including public, nonprofit, and commercial enterprises, are establishing SHCs—aggregated forms of people focused on disease prevention and well-being, working together on a sustained basis, and operating largely outside of the traditional health care system.<sup>16</sup> Communities can be geographic or virtual, population segments (seniors, opioids, mental health), self-formed or social (weight management), or natural communities (schools, employers).<sup>17</sup> Many SHCs are consumer-driven and fill a need unmet by the traditional health system. They typically contain some or all of five core elements (figure 3).

FIGURE 3

### The five key elements of smart health communities



Source: The Deloitte Center for Health Solutions and the Deloitte Center for Government Insights.

The basics of SHCs have been around for many years—think diabetes prevention, weight loss, and addiction programs that use communities to encourage individuals to proactively manage their weight and exercise with a coach in a group setting. While successful, these programs have had limited reach since they are tied to brick-and-mortar locations and require individuals to participate in person. Digital technologies have the potential to significantly bring these programs to scale, thus increasing their impact. Platforms developed for SHCs can use data-fueled technologies such as the Internet of Things (IoT) and augmented/virtual reality to make timely and informed decisions. An engagement model can be tailored to each community that is citizen-oriented, social, connected to care, and enabled by scalable technology. It can also combine behavioral and clinical science, yielding evidence-based and substantially improved outcomes.

The widespread use of smartphones—which are prevalent even in lower-income communities—can increase the potential for virtual SHC programs to scale widely. Apps on these phones can incorporate concepts from the behavioral sciences, such as nudges and gamification, to help people stay on track with their health care goals.<sup>18</sup>

A case in point is the Health Village (or Terveyskylä in Finnish)—an online and mobile platform dedicated to bringing care out of hospitals into homes. The concept consists of 30 different “houses,” each acting as a symptom-, disease-, or body part-specific digital hub. The platform allows users to log in and create an identity, and has a component for physicians. Content is developed in consultation with providers at university hospitals and has generated over 1.5 million website visits in just over a year of the pilot.<sup>19</sup> Similarly, ParkinsonNet, a collection of 70 regional networks in the Netherlands, focuses on delivering high-quality, evidence-based care to patients with Parkinson’s disease (PD). With a community of patients, physicians, neurologists, academics, and over 3,000 allied health professionals across 12 disciplines, the platform has helped reduce the cost of treatment per patient by nearly 40 percent (250 euros).<sup>20</sup>

SHCs, using a socially distributed network model at the micro (workplace/community) and macro (intracountry collaboration) levels, are disrupting/challenging traditional health care systems built on vertical integration and hierarchical power models. Recently, about 600 Deloitte employees participated in a 36-week randomized clinical trial to determine if a wearable activity tracker—combined with gamification—would increase physical activity among overweight and obese adults. The “Step Up” study was led by the Perelman School of Medicine at the University of Pennsylvania. Findings demonstrate—scientifically—that engagement programs, if designed correctly, can move people toward healthy behaviors.<sup>21</sup>

Some challenges exist in creating, sustaining, and growing effective SHCs. These include developing a business model framework for ecosystem partners and concurrently enabling information-sharing and patient privacy. It also appears to be much easier to attract and retain the “wealthy, worried, and well” than those who lack the motivation or resources to improve their health. SHCs should embed strategies for helping the poor, unmotivated, and unhealthy to adopt healthy behaviors using the science of behavior change and interventions that address social drivers of health.<sup>22</sup> Despite these challenges, SHC models have the potential to fundamentally redesign how sections of society work together to drive healthier communities.



# Global health care sector issues in 2020

## Financial operations and performance improvement

### WHAT IS DRIVING THIS TREND?

Many of the world's health systems are struggling to maintain financial sustainability in an uncertain and changing environment:

- In 2018–19, the NHS hospital trust deficit of £551 million improved on the 2017–18 deficit of £960 million; however, this was largely due to one-off savings, temporary extra funding, and accounting adjustments. Overall, the underlying financial deficit of hospital trusts at the end of 2018–19 was £5 billion, compared to £4.3 billion in 2017–19.<sup>23</sup>
- China's medical insurance funds' expenditure growth exceeded income growth in 2018,<sup>24</sup> burdened by the country's slowing economy and increasing elderly population.
- Twelve percent of hospitals in Germany are in financial distress,<sup>25</sup> insolvency cases are growing across all types of operators, and for the first time in years, hospitals are seeing a decline in inpatient cases.
- The average profit margin in 2017 for top clinical hospitals in the Netherlands was a thin 1.8 percent, and about half of them have been recently or are in the process of major cost transformations.<sup>26</sup>
- A typical US\$2 billion US health care provider with a current 3 percent margin that does not

act, will likely see margin degradation of 6 percent to a negative operating margin of 3.5 percent by 2023, based on actuarial analyses and market trends.<sup>27</sup>

For years, financial challenges have shadowed the world's public and private health systems to varying degrees, and we expect the situation to persist in 2020. Examples of contributing factors include expanding and aging populations; increasing numbers of people with chronic, long-term conditions; costly infrastructure and medical technology investments (compounded by low levels of capital spending over many years); rising labor costs and staff shortages; and growing demand for a larger ecosystem of services (general practitioner, community- and home-based, mental health, long-term, etc.).

Countries appear to have different levers they can pull to bend the cost curve, improve financial and operational performance, and provide affordable, accessible health care. Among a few of the options could be payment reform, universal health coverage, pricing controls, population health management (PHM), and public-private partnerships (PPPs). Industry consolidation and a changing regulatory landscape also are seen as influencing factors. Health system leaders will likely need to employ a balanced mix of these levers in 2020 to deliver high-quality care and achieve financial sustainability.

### HOW MAY THIS TREND IMPACT THE YEAR AHEAD?

Value will likely be a watchword in health care **payment reform**. As part of the industry's

continued shift from a traditional fee-for-service reimbursement model to one that is based on outcomes, government and commercial insurers are increasingly requiring evidence of value delivered prior to authorizing reimbursement. Consumers, too, are becoming more discerning and value-conscious; they expect personalization, convenience, and quality in their health care services and purchases.

Value-based care aims to optimize value for payers and patients by achieving the best outcomes at the lowest cost. In the United States, some hospitals and health systems have been moving procedures from inpatient to outpatient facilities as a strategy to diversify revenue and prepare for value-based payment models.<sup>28</sup> In addition to financial incentives, this trend is likely due, in part, to technology advances (e.g., minimally invasive surgical procedures and new anesthesia techniques) as well as consumer preferences.<sup>29</sup> Patient engagement is also seen as a central tenet of value-based care. To the degree that providers and insurers can get people activated and engaged in their own care, using enabling technologies and robust data likely offers better potential to achieve improved health outcomes at a lower cost.

A growing number of surgical procedures are being performed in outpatient settings. In the United States, aggregate hospital revenue from outpatient services grew from 30 percent in 1995 to 47 percent in 2016.<sup>30</sup>

The United Kingdom's National Health Service (NHS) Long Term Plan (LTP) includes major reforms to the NHS's financial architecture, payment systems, and incentives, and a requirement for the NHS to deliver cash-releasing productivity growth of at least 1.1 percent a year.<sup>31</sup> It also details how the funding will be used to shift the balance to primary care. Many integrated care systems in the United Kingdom are moving toward block or aligned incentive contracts (AICs) that

focus on shared principles and agreed-upon working procedures, and that manage demand jointly while being clear about **risk-sharing arrangements**. This model has helped increase certainty for both commissioners and providers as they move to cost-based rather than activity-based contracts. The contractual and other payment reforms highlighted in the LTP should help programs avoid unintended consequences and ensure that efficiencies are a true saving to the system.<sup>32</sup>

## A growing number of surgical procedures are being performed in outpatient settings. In the United States, aggregate hospital revenue from outpatient services grew from 30 percent in 1995 to 47 percent in 2016.

The large contingent of developed countries that have **universal health coverage** is being joined by an increasing number of developing markets that are establishing and/or expanding universal health care systems:

- Indonesia's Jaminan Kesehatan Nasional (JKN) program, introduced in 2014, now covers 76 percent of the population and is the largest single-payer scheme in the world.<sup>33</sup>
- Over 99 percent of Thailand's population receives free health care under the country's universal health coverage program.<sup>34</sup>
- In the Philippines, the government is targeting 100 percent enrollment in PhilHealth (the national health system) by 2020, by making it fully mandatory.<sup>35</sup>

- India unveiled an ambitious National Health Protection Scheme (NHPS) in February 2018, which it claimed would be the world's largest government-funded health care program. It is expected to implement the program despite funding pressures.<sup>36</sup>

Universal health care systems can typically be seen as large, complex, and expensive to operate. To contain spending growth, governments are focusing on preventative health and improved cost-efficiency<sup>37</sup> through, for example, pricing controls on pharmaceuticals and medical technology devices. In both developed and developing markets, governments have made conscious decisions to challenge manufacturers and insist on wider availability of lower-cost medicines. Health systems are sharing cost information about the products they buy, conscious that some countries are paying more than others. In addition, governments are using international benchmarking, evidence-based usage, and generics as levers to drive down prices. Even countries without universal health care are looking to rein in escalating drug and device costs. In the run-up to the United States' 2020 presidential election, the current US administration is promoting plans to reduce pharmaceutical prices and to force providers to be more transparent over how they price procedures.<sup>38</sup>

Numerous public and private health systems have been turning to **population health management** (PHM) to optimize the physical and mental health of patient populations over individual life spans and across generations.<sup>39</sup> Continuing improvements in health outcomes through advances in technology and therapies are

enabling more people to live longer. However, many are living with multiple chronic conditions, such as coronary heart disease, chronic obstructive pulmonary disorder, and diabetes.<sup>40</sup> People with chronic conditions are intensive users of health and social care services, and the associated costs of care tend to be much higher. For example, the UK Department of Health and Social Care estimates that 70 percent of total health funding in England is spent on services for 30 percent of the population that have long-term conditions.<sup>41</sup> This presents a growing imperative to identify these patients, treat them, keep them healthier and independent longer, and have clear protocols in place for end-of-life care.

Population health brings together an understanding of population need (public health) through big data, patient engagement and health, and care delivery, to embrace the quadruple aims of health care: to improve the health of the population, the experience of care, the health and well-being of the workforce, and reduce the overall costs of care.<sup>42</sup>

**Population health brings together an understanding of population need (public health) through big data, patient engagement and health, and care delivery, to embrace the quadruple aims of health care: to improve the health of the population, the experience of care, the health and well-being of the workforce, and reduce the overall costs of care.**

Grouping populations according to their conditions, severity of illness, demographic qualities, location, or other parameters to identify risk levels can help in leveraging resources to improve care and

outcomes while reducing health inequalities. The focus of population health is also on strengthening primary care and delivering care closer to home, which can address growing demand pressures (see sidebar, “Spotlight: Population health management”).<sup>43</sup>

**Consolidation**, both horizontal and vertical, is driving the development of PHM solutions and new business models to optimize the health care

value chain and improve outcomes. In the United States, commercial payers are acquiring provider networks to reduce inpatient visits through regular primary care check-ups and the promotion of home health care. Hospitals in Japan are consolidating to improve efficiency and Brazil is seeing acquisitions by both payers and providers. India’s recent wave of consolidation is expected to continue, with large hospital chains acquiring assets of varying sizes.

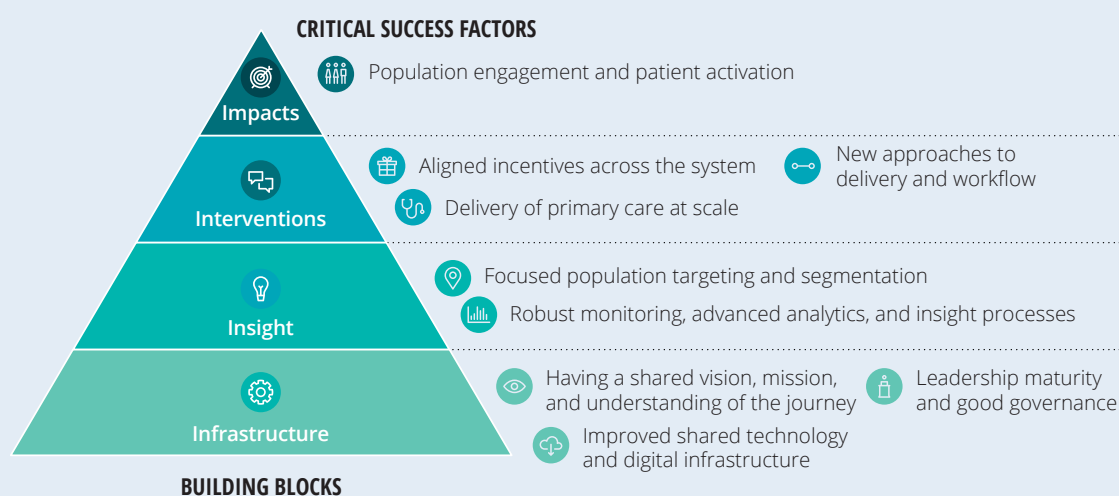
### SPOTLIGHT: POPULATION HEALTH MANAGEMENT

While just one of many levers to tackle health outcomes, PHM is increasingly viewed as a key to ensuring the affordability and sustainability of care. PHM is the concept of gathering data and insights about population health and well-being across multiple care and service settings, with a view to identify the main health care needs of the community and adapt services accordingly. Today, major advances in data analytics, machine learning, and digital technologies can provide the tools to make PHM a reality, by helping to identify risks and stratify patient populations, improving the speed and accuracy of diagnostics, and designing personalized treatment plans.<sup>44</sup>

Experience across the world shows that there isn’t a single approach or “rule book” for PHM; in the United Kingdom, for example, the administrations of England, Scotland, Wales, and Northern Ireland have adopted different approaches to health and social care, including prioritizing the role of PHM.<sup>45</sup> There are, however, several distinct building blocks and critical success factors to enable a health care system to adopt an effective PHM approach (figure 4).<sup>46</sup>

FIGURE 4

### Four key building blocks and nine critical success factors enabling PHM



Source: *The transition to integrated care: Population health management in England*, Deloitte Centre for Health Solutions, 2019.

Here are a few examples of public health systems with PHM programs:

- Greater Manchester (GM) has poorer-than-average population health outcomes, with substantial inequality across the region. In 2015, the GM Health & Social Care Partnership (GMHSCP) was given the responsibility to oversee the £6 billion health and social care spend in GM. A Strategic Partnership Board was established to develop a shared strategic direction, tailor budgets and priorities to suit the GM community, and integrate resources across health and social care and wider public services. In subsequent years, GM released its strategy for delivering primary care at scale, published a digital strategy outlining its approach to adopting transformational technology,<sup>47</sup> and announced an investment of £134 million in mental health.<sup>48</sup> GM has improved performance across the national mental health standards. In primary care, 100 percent of GM's residents can now get routine or prebooked appointments with their general practice seven days a week (up from 47 percent in 2016).<sup>49</sup>
- Gesundes Kinzigtal, in the German state of Baden-Württemberg, has a population of about 33,000 people. Since 2016, it has been demonstrating how a people-centered focus can lead to significant improvements in population health, a better care experience, and reduced per capita costs.<sup>50</sup> Through strong management, a sophisticated data management system, and a trusting relationship between network partners and communities, the Gesundes Kinzigtal model has resulted in this population being both healthier and less cost-intensive compared to the overall population of the state.<sup>51</sup> One of the first and largest investments that Gesundes Kinzigtal made, and continues to make, is in an IT infrastructure that gathers insurer, hospital, and provider data for analysis, and builds connections between providers to track patients across the system. This helps identify high-risk patients, predict and plan intervention programs, and track outcomes.<sup>52</sup>
- The Yorkshire & Humber Care Record Population Health Management Programme (YHCR-PHM) aims to provide an advanced PHM solution to address the most challenging health outcomes for the benefit of the region's five million residents. The solution consists of a cloud-based platform and analytic products that will enable users to create new insights to achieve higher-quality reporting and faster, more accurate decision-making. The solution is expected to be fully operational in March 2020 with regional rollout thereafter. The Yorkshire & Humber Care Record (YHCR) is one of five examples within NHS England's Local Health and Care Record Exemplar program (LHCRE) that is enabling health care organizations to share data to help people get the right care at the right time in the right place, improving safety and effectiveness.

If PHM is to be embedded throughout the health system, there are numerous barriers to overcome; not the least of which is the challenge of linking previously disparate data sets and developing leadership models that embrace new, integrated, ways of working and a shared culture and mindset. Clinical and care teams also should look to private health insurance for ways to connect with and organize populations in need of care.<sup>53</sup>

Whether they choose to consolidate or remain independent, many hospitals and health systems are working to improve their operating and financial performance by exploring **new revenue-generating opportunities**. For example, demographic changes, rising economic

development and consumer income, favorable government regulations, and underdeveloped public health care infrastructures are presenting growth opportunities for private hospitals and consumptive health services, especially in developing countries.

China's private hospital sector is representative of the trend. Bolstered by supportive government policies and private capital investment, the number of private hospitals in China reached 20,977 in 2018, accounting for 63.5 percent of the total hospitals—and an addition of about 2,000 hospitals since 2017.<sup>54</sup> These hospitals tend to target higher-profit fields like gynecology, andrology, dentistry, orthopedics, and ophthalmology, as well as consumptive health services including medical cosmetology; assisted reproduction services; high-end prenatal, delivery, and postpartum care; and rehabilitation services.

Medical tourism is expanding in China, particularly in the Hainan province, as well as in Thailand, Singapore, and other Southeast Asian (SEA) countries, with an estimated CAGR of 29 percent in the next decade.<sup>55</sup> To meet rising demand from foreign patients, many private hospitals are planning to invest in expanding their medical facilities.

In a broader effort to grow the industry,

China's government launched the Hainan International Medical Tourism Pilot Zone Scheme in 2013 and issued several supporting policies in 2018 and 2019. This zone focuses on providing high-end health services, including cancer and cardiovascular disease treatment and rehabilitation; assisted reproduction technology; health and well-being programs using both cutting-edge technologies and traditional Chinese medicine; cosmetic services; and retreat tourism.<sup>56</sup>

One cautionary note: While rapid growth of the private hospital sector creates new revenue

opportunities, it could be accompanied by patient safety risks. In response, some governments may need to strengthen their regulatory supervision of this sector.

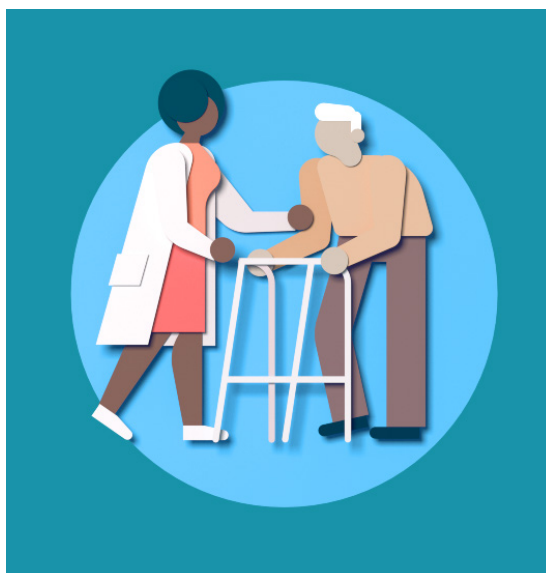
The **entry of nontraditional players** in the health care industry has the potential to both support and suppress incumbents' efforts to grow revenue. Digital giants and digital-first health solution disruptors are taking advantage of their large customer base and cloud platforms, demonstrating that there is an easier and more user-friendly way to conduct health care

transactions. In response, industry incumbents are thinking differently about their digital front door: Many are starting to build capabilities around the empowered consumer, reshaping their business models, and even partnering with market disruptors to create a seamless, frictionless digital health care experience.

Disruptive market entrants are also creating opportunities

for new types of **public-private partnerships** that serve their domestic markets and often export services and platforms to other countries:

- In India, NITI Aayog, the government policy think tank, launched PPP guidelines in 2018 and outlined various models through which a private organization can partner with a government hospital to provide oncology, cardiology, and other NCD-related care.<sup>57</sup> The government is working to establish 75 additional medical colleges in the next four to five years, largely through PPP models. This is



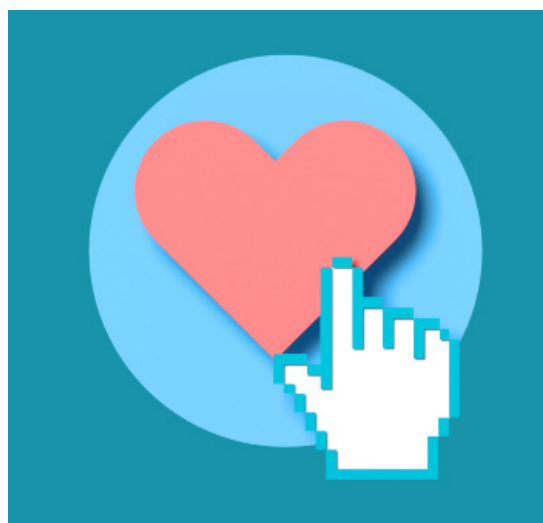


in addition to the creation of 82 medical colleges that began five years ago.<sup>58</sup> Many of the country's health care players have shown interest in exploring PPPs; for example, HealthMap Diagnostics Private Limited (HDPL) is addressing India's shortage of affordable diagnostic imaging services by partnering with state-owned hospitals that serve over 500 million Indians.<sup>59</sup>

- Across SEA countries, PPPs are helping to alleviate financial and logistical pressures on public health systems that are working to increase health care capacity through infrastructure improvements and innovative technology solutions designed to increase health care accessibility, efficiency, and quality.<sup>60</sup>
- Canada's Digital Technology Supercluster (based in British Columbia), a collective of businesses, not-for-profits, and educational institutions, is one of five entities sharing US\$950 million in funding from the federal government's supercluster initiative.<sup>61</sup> The Digital Technology Supercluster will use advanced data collection, analytics, and visualization to build health care, natural resources, and industrial applications.<sup>62</sup>

Finally, the **changing regulatory landscape** can exert a major influence on health systems' efforts to improve financial and operational performance. For example, to reduce health insurance costs, China's State Council published a National Drug Centralized Procurement Organization Pilot Scheme in 2019.<sup>63</sup> The government is piloting value-based purchasing (VBP) in 11 cities, with plans to expand nationwide.<sup>64</sup> The practice currently covers 25 drugs, but that number is likely to grow to include all drugs with generics that pass Generic Quality Consistency Evaluation (GQCE). Germany's MDK legislation increases control of hospital invoices<sup>65</sup> and its Pflegeestärkungsgesetz policy changes

reimbursement/increases costs for certain spending categories.<sup>66</sup> India's Clinical Establishment Act defines charges for services provided by all hospitals/clinics and mandates compulsory treatment for emergency services.<sup>67</sup> While many states have adopted the Act, they are yet to implement it amid opposition from private players.<sup>68</sup>



## Care model innovation

### WHAT IS DRIVING THIS TREND?

Pressures on health care's traditional break-fix model to change—to become more proactive, predictive, and focused on well-being—are coming from multiple directions, including a shift in attitudes and behaviors toward greater **consumer engagement and empowerment**. No longer passive participants in the health care process, consumers are demanding transparency, convenience, access, and personalized products and services—which they get in all other aspects of their life.

Enabled by visibility into, and control over, their health information and digital tools tailored to their health goals, life stage, and lifestyle, growing numbers of consumers are actively managing their

own and their families' health and well-being. Which elements of consumers' experiences with today's health care ecosystem matter most to them? The Deloitte 2016 Consumer Priorities in Health Care Survey<sup>69</sup> tried to find the answer to this question. Here's what it revealed:

- Consumers want to be known and understood in order to get a personalized health care experience—providers deliver on this the best.
- Consumers want affordable care with no surprises—this drives their coverage and care choices.
- Consumers want access to care when, where, and how best it suits them; convenience dictates behavior.
- Consumers are looking for tools to help manage their care. Digital tools are increasingly doing this, but they must become easier to use and more connected to make an impact.<sup>70</sup>

Deloitte's 2019 Survey of Global Health Care Consumers revealed that despite some differences, many consumers in eight countries (Australia, Canada, Denmark, Germany, the Netherlands, Singapore, the United Kingdom, and the United States) are interested in engaging with the health systems in new ways:

- Consumers are more alike than different, though they may be on different levels of maturity of "consumerism."
- Consumers are willing to share personal and health information, especially with their doctor. Trust is critical.
- Most consumers believe they should own their personal health record.
- Consumers have access to (and use) tools that keep them healthy.

- Consumers are no longer passive; they demand transparency, convenience, and access. They also are willing to disagree with their doctors and are engaging in more preventive behaviors than in the past, such as personalized exercise and nutrition.
- Consumers use technology and otherwise take charge of their health. Those who don't use technology are interested, suggesting that the right tools haven't been built yet.
- Consumers have similar pain points, but in varying degrees in the countries surveyed.

#### HOW MAY THIS TREND IMPACT THE YEAR AHEAD?

We expect care model innovation to manifest itself in numerous ways during 2020. Aided by technologies that enable easier consumer access, improvements in early diagnosis, and the application of behavioral economics to motivate engagement, new and evolving care models are **focusing more on prevention and well-being and less on treatment**. For example, certain models are placing increased emphasis on the underlying social and economic conditions that drive health outcomes. Treating an illness often doesn't address many of the social and contextual factors that may have caused it (e.g., limited access to nutritious food, lack of exercise, unsafe or unstable living conditions, poor air quality, etc.). Improving the health of a population likely requires health systems, health plans, not-for-profit health organizations, and government payers to come together in impactful ways to develop strategies and investments in new care models and technologies that address the drivers of health,<sup>71</sup> enable early diagnosis, and monitor response to treatment.

Specifically, stakeholders should look for opportunities to collaborate with each other to identify needs and determine where investments could have the most impact. For example, health



systems that now compete for patients in a region might find a way to collaborate to keep community members healthy and out of the hospital. Hospital leaders might invest more in virtual care technologies or existing facilities rather than expanding their physical footprint. Health plan leaders might decide to develop new coverage models that emphasize health and well-being rather than provider networks. Some health plans might build community organizations to meet social needs. These coordinated approaches could help drive meaningful, sustainable change.<sup>72</sup>

Health system stakeholders in the Netherlands are collaborating to deliver the “right care at the right place.” Academic hospitals primarily treat complex cases, and the “outflow” of other patients are assigned to top clinical hospitals, regional/basic hospitals, and independent treatment centers (orthopedics, eye care, etc.) according to each facility’s chosen portfolio of service and patient types. Hospitals also

collaborate with other health care players; for example, transferring older patients from hospital beds to the long-term care system, and pointing chronic patients toward primary and home care. The country’s four main health insurers play a role as well, with initiatives aimed at decreasing unnecessary care and practice variation, and long-term hospital contracts with value-based reimbursement components.

In another example, health systems in several US cities, including Denver, Colorado, are taking advantage of recent federal policy changes that

encourage hospitals to allocate charity dollars for housing to help “stranded” patients find a home.<sup>73</sup> Denver Health is partnering with the Denver Housing Authority to convert a shuttered 10-story building on the hospital campus into affordable senior housing that includes about 15 apartments designated to help homeless patients transition out of the hospital. (Completion is scheduled for 2021.) Denver Health will pay for the transitional housing itself and provide a case manager to assist patients with their physical and behavioral health needs. A coordinator hired by the housing authority will help tenants in the transitional units find

permanent housing. Denver Health expects most transitional patients to be able to move out within 90 days. With each candidate for the transitional units staying in the hospital on average 73 days—at a cost of nearly US\$200,000 to Denver Health—the estimated expense of US\$10,000 to house a patient for a year presents a strong financial incentive for the program, in addition to the health and social benefits.<sup>74</sup>



Given the typical time horizon constraints—and without a clear return on investment (ROI)—securing investments to address the drivers of health can be challenging. It might take longer to reap a return on an investment when compared with more targeted efforts such as securing transportation for disease-specific at-risk members. However, in a value-based system that is rapidly shifting financial incentives toward prevention and maintaining well-being, there is both clinical and financial imperative for all stakeholders to invest in the drivers of health.<sup>75</sup>

Innovative care models that solve the challenge of unequal access, capacity, capability, and affordability (ACCA) are important to advancing health care's journey to prevention and well-being. Health systems are employing a variety of approaches to **provide earlier and easier access to care**. One model that is already demonstrating positive results is moving health services into the community. Traditionally, hospitals have served as health care's center of gravity; however, that is shifting as health systems transition certain inpatient procedures from inside hospital walls to less-acute, outpatient settings: ambulatory care centers, retail clinics, community health centers, and even people's homes.

The Victorian government in Australia developed a program, HealthLinks, which aims to determine whether flexible funding can enable health services to develop and implement alternative models to inpatient acute care that provide better experiences and outcomes for patients with chronic conditions, at equal or lower cost. Funding for regular hospital visitors is provided by the Victorian government based on activity—the number of visits. HealthLinks allows hospital providers to 'cash out' this funding and use it for other interventions that would support these 'frequent flyers' to live in their homes and communities rather than go to the hospital.

For example, Western HealthLinks is a partnership between Western Health, a system that provides services to the western region of Melbourne, and Silver Chain, a non-profit organization delivering

community health and aged care services across Australia. The program's key feature is a priority response assessment (PRA)— an initial clinical assessment by a nurse via telephone (versus a patient emergency department visit), with further assessment and intervention within four hours of referral (7 a.m.–11 p.m., seven days a week).

An on-call general practitioner (GP) consults with the treating team at Western HealthLinks, and the patient's regular GP is informed of the assessment. In 2018, Western HealthLinks had over 3,000 activated patients. Eighty-six percent of patients who required a PRA remained at home and out of the hospital.

The most telling issue in Western HealthLinks is that 75 percent of the interventions required to avoid hospital visits are not health related. These are typically "social determinants," relating to areas such as social care support and measures to avoid isolation or housing. The importance of these social determinants has been underscored by research and other initiatives in the United States.<sup>76</sup>

As health expenditures continue to increase, Japan's health care system has been shifting from inpatient to community- and home-based medical care. By 2025, Japan aims to accelerate the development of community-based integrated care systems, in which people can maintain their usual lifestyle in their local neighborhood even when they require medical care and/or daily support. Developing these care systems is viewed as crucial,

### SPOTLIGHT: IN-STORE HEALTHHUBS

CVS Health wants to connect the physical and digital experience to expand consumers' access to care. The company (which merged with health insurer Aetna in 2018) is renovating 1,500 of its stores into HealthHUBs, with more than 20 percent of store space dedicated to health services, including "new product categories, digital tools, and on-demand health kiosks, trusted advice and personalized care." The company is also investing heavily in its technology infrastructure to build tech-enabled health care experiences such as a virtual doctor visit, using an artificial intelligence (AI)-powered chatbot, or sending health data to a physician through a connected device.<sup>77</sup>

given the increasing prevalence of dementia in the nation. New technologies are being tested and adopted to aid early detection, intervention, and care of dementia patients. These technologies include pattern analysis to understand disease progression and AI-based alerts/communication systems for caregivers and families.

The trend is also evident in India (ReMiND project),<sup>78</sup> where a basic mHealth application has elevated community health worker performance and contributed to significant improvements in maternal and infant health outcomes in India's rural communities. Similarly, a combination of remote monitoring, AI, behavioral nudging, and nutritional and psychological support has improved quality of life for people with chronic conditions in Chile (AccuHealth).<sup>79</sup> Also in India, companies such as ReMeDi (Remote Medical Diagnostics),<sup>80</sup> Karma Healthcare,<sup>81</sup> and others use a mix of technology such as e-doctor visits and in-person interventions to serve patients in rural and semiurban areas.

Germany's Ministry of Health recently launched the Health Innovation Hub (HIH) in Berlin, which is described as an "idea factory" for digital health solutions to improve care for patients. HIH aims to support the expansion of out-of-hospital care by establishing a legal and economic framework to

boost the digital health industry.<sup>82</sup> Thailand has introduced apps for teleconsultation, home testing, medicine delivery, and an AI-driven program to screen for diabetes-related eye disease.<sup>83</sup>

As patients become more engaged, informed, and involved with their health care decisions, and demand better, faster, and real-time access to care, digital technology-enabled **virtual health**—a method of delivering health care via digital and telecommunication technologies—will likely play an important role in meeting consumers' needs (see sidebar, "Spotlight: Virtual health"). Virtual health works within and around a patient's life, as opposed to their sickness, to deliver care when, where, and how they need and want it. Currently, health systems in many countries are exploring virtual health as an alternative delivery model that has the potential to reduce costs.

Digital technologies feature prominently in health systems' innovative care models because of their ability to bridge time and distance, educate and empower consumers, and strengthen the caregiver-patient relationship. But they are just one part of the innovation equation: Future-focused care models will likely leverage people, processes, and technology to address evolving individual and group health needs.

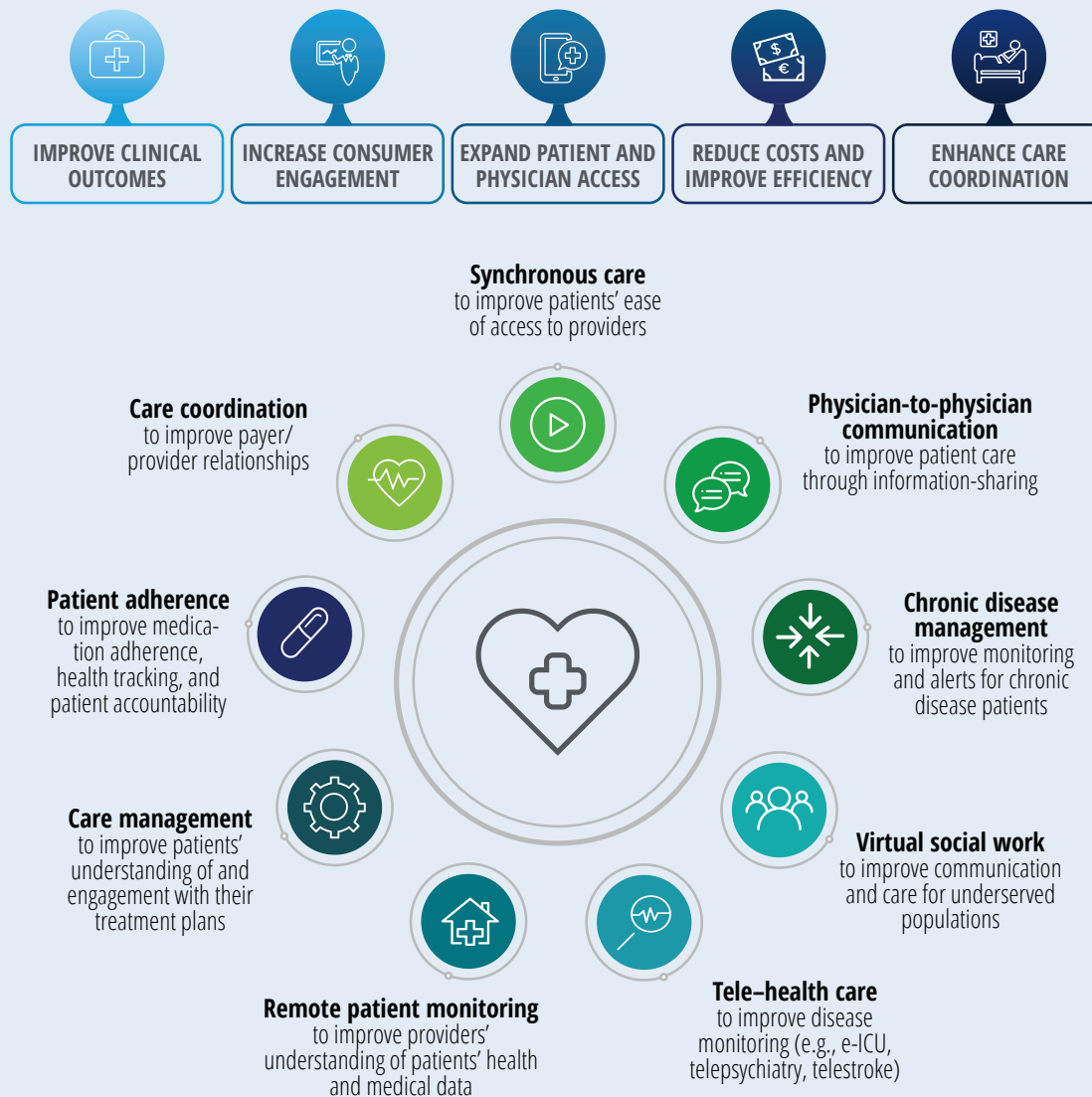
### SPOTLIGHT: VIRTUAL HEALTH

It's not likely a question of if, but when virtual health will become a mainstay of a next-generation, patient-focused, digitally enabled health care delivery model.

Virtual health uses telecommunication and networked technologies to connect clinicians with patients (and with other clinicians and stakeholders) to remotely deliver health care services and support well-being. Virtual health appears to have the capacity to inform, personalize, accelerate, and augment people's ability to care for one another. Apart from enabling video visits or teleconferencing appointments, virtual health can act as a complement to, or even a substitute for, in-person care delivery based on patient population needs, health organization capabilities, and resource availability.<sup>84</sup> Its primary goals are to expand patient and physician access to critical health services, improve clinical outcomes, increase consumer engagement, enhance care coordination, reduce costs, and improve efficiency across the continuum of care (figure 5).

FIGURE 5

## Virtual health helps stakeholders access relevant data easily, improve quality of care, and deliver value



Source: Deloitte analysis.

When planning and building life-centric virtual health programs, organization leaders should consider “strategy, first; technology, second.” An important initial step is to define an enterprisewide virtual health strategy that will help ensure that investments address short-term goals and allow for future scalability. Then, when considering technology, it is imperative to think about its potential impact on patient engagement, affordability, digital transformation, and the craft of medicine.

For providers, committing to virtual health at a personal and organizational level could afford ever-increasing opportunities to deliver the right care at the right time in the right place, in a connected and coordinated manner. While an optimal program depends on each organization's specific goals, being strategic from the outset may help ensure that the selected path supports an enterprisewide approach to strengthen and facilitate a therapeutic alliance between clinicians and patients along their continual journey to the future.

## Digital transformation and interoperability

### WHAT IS DRIVING THIS TREND?

Fueled by unprecedented advancements in digital health solutions, “always-on” data, and open, secure platforms, digital transformation is slated to

play a major part in laying the foundation for new care delivery models; shaping a predictive, preventive, and personalized future; promoting closer collaboration among industry stakeholders; and driving cheaper, more precise, and less invasive treatments and therapies (see sidebar, “Examples of current and emerging innovations”).<sup>85</sup>

### EXAMPLES OF CURRENT AND EMERGING INNOVATIONS

- **Cloud computing solutions** that create more flexibility and mobility than on-premise computing platforms, help health care professionals streamline formerly time-consuming tasks, give access to applications with richer features, and provide physicians working alone and in teams with new ways of instant communication.<sup>86</sup>
- **Fifth-generation (5G) technology** that is designed to support ultrareliable, low-latency, and massive data communications in the health care industry's rapid move toward a complete digital environment.<sup>87</sup>
- **Radical interoperability and open platforms** that make health care information more accessible by encouraging providers and insurers to share data with each other, to improve the quality and efficiency of health care, and with patients, to help them make informed decisions (see sidebar, “Is regulatory compliance a gateway to radical interoperability?”).<sup>88</sup>
- **Artificial intelligence (AI)** that supplements memory and experience to improve diagnostic accuracy and treatment efficacy.
- **Natural language processing (NLP)** that generates detailed, accurate medical notes through spoken or written sentences; crowdsourcing and virtual technology that allows asynchronous, geographically distributed input.
- **Big data analytics** that can examine large, unstructured data sets to uncover patient patterns or correlations; data visualization that presents data in the most efficient and effective way to ensure findings that drive strategy and decision-making. Already, computer algorithms can interpret a range of digital images more accurately than clinicians.<sup>89</sup>
- **Data as a Platform (DaaP)** that extracts insights from patient data, which can support several opportunity areas (see sidebar, “Spotlight: Getting more from data management with DaaP”).

- **Robotics** that help physicians perform complex procedures with more precision and flexibility; augmented reality that gives surgeons easy access to digital images and data so that they don't need to look away from the patient to gather information.
- **Sensors** on wearables that monitor patient health and develop algorithms to determine treatment recommendations; machine learning that helps recognize and flag abnormalities without bias; 3-D holograms that bring the delivery of care closer and more comprehensively to the patient.
- **Enterprise applications** that are designed to integrate computer systems which run all phases of an enterprise's operations, to facilitate cooperation and coordination of work across the enterprise; AI and robotic process automation (RPA) to digest data and information to support future-oriented decisions.
- **Blockchain systems** that use a digital record of transactions to help life sciences and health care organizations monitor and track medical products in the supply chain; share data generated by clinical trials; pull together transactions from multiple health systems, pharmacies, and health plans for patient and/or EMR use; and streamline insurance claims reviews.<sup>90</sup>
- **Learning platforms** that encourage flexible and interactive learning among medical students and allow educators to drive targeted training; workgroup collaboration tools to drive efficient information-sharing, teamwork, and data control in research and academic capacities.<sup>91</sup>
- **Internet of Medical Things (IoMT)**, a connected infrastructure of medical devices, software applications, and health systems and services that brings together people (patients, caregivers, and clinicians), data (patient or performance data), processes (care delivery and patient support), and enablers (sensors and connected medical devices) to deliver improved patient outcomes more efficiently.<sup>92</sup>

## IS REGULATORY COMPLIANCE A GATEWAY TO RADICAL INTEROPERABILITY?

Levers such as new payment models, the Trusted Exchange Framework and Common Agreement (TEFCA), proposed rules from the US Centers for Medicare & Medicaid Services (CMS) and Office of the National Coordinator for Health Information Technology (ONC), and a recent executive order on transparency are laying out a plan to drive the US health care sector toward widespread interoperability.<sup>93</sup>

Deloitte recently surveyed technology leaders at large US health plans and health systems to gauge their attitudes and priorities around the CMS- and ONC-proposed rules. Forty-three percent of health system leaders and 63 percent of health plan leaders said they plan to use compliance requirements for the proposed rules as a foundation for their broader strategic interoperability initiatives. Moreover, many reported that they are planning to go beyond compliance by building their own application programming interfaces (APIs) even while they work with a vendor to build solutions.<sup>94</sup>



Organizations that develop and implement a strategic approach to interoperability are likely to have a competitive advantage with insights, affordability, and consumer engagement in the future of health.<sup>95</sup>

## SPOTLIGHT: GETTING MORE FROM DATA MANAGEMENT WITH DAAP

Health care organizations are witnessing a shift in data management approaches. Instead of storing data sets for operational reasons, many are focusing on extracting insights that can be monetized and support opportunity areas including population health management and value-based care (figure 6).

FIGURE 6

### DaaP is expected to gain traction with the growth in use of patient data to identify disease trends and explore avenues for new products

HEALTH CARE DATA SOURCES	KEY CUSTOMERS OF DATA	OPPORTUNITIES FOR DAAP
<b>Health care providers</b> The providers process patient data using EHR and EMR platforms. They also process financial transactions and other information.		<ul style="list-style-type: none"> <li>Population health management</li> </ul>
<b>Clinics/labs</b> The private clinics and labs process patient prescriptions, lab records, and other information using EHR/EMR software.	<ul style="list-style-type: none"> <li>Pharma companies</li> <li>Medtech companies</li> <li>Insurance companies</li> <li>IT companies</li> <li>Hospitals</li> <li>Public health organizations</li> </ul>	<ul style="list-style-type: none"> <li>Value-based care</li> </ul>
<b>Payers</b> Payers process huge data sets of patient claims and billing data.		<ul style="list-style-type: none"> <li>Reducing fraud, waste, and abuse of resources</li> </ul>
<b>Patients</b> Patient data generated by devices through search history contributes to unstructured data.		<ul style="list-style-type: none"> <li>Precision medicine and bioinformatics</li> </ul>
<b>Medtech companies</b> Medtech companies collect patient information using IoT devices, from third parties, hospitals, and other sources.	<b>Technology partners</b> <ul style="list-style-type: none"> <li>Analytics providers</li> <li>Cloud storage and infrastructure providers</li> <li>Key technologies can include AI and blockchain</li> </ul>	<ul style="list-style-type: none"> <li>Real-time patient monitoring</li> </ul>
<b>Technology providers</b> Large technology companies and others provide data storage, processing, and analytical platforms.		<ul style="list-style-type: none"> <li>New product/service development</li> </ul>
<b>Government</b> Governments generate huge data sets on indicators such as population demographics, health care expenditures, disease trends, etc.		

Sources: Agency for Healthcare Research and Quality, "Data sources for health care quality measures," accessed June 24, 2019; Jennifer Bresnick, "Identifying big data sources for population health management," Health IT Analytics, January 2, 2018; Commvault, "Building a healthcare data management platform," accessed June 24, 2019; Redhat, "The open data platform—improving healthcare with analytics," accessed June 24, 2019.

Health care stakeholders are taking advantage of proliferating technologies to advance patient care.

The government of India has developed a National Digital Health Blueprint (NDHB) to transition to



integrated digital services in a comprehensive and holistic manner.<sup>96</sup> The blueprint's key features include a five-layered system of architectural building blocks, Unique Health Identification (UHID), privacy and consent management, national portability, EHR, applicable standards and regulations, health analytics, and multiple access channels such as a call center, the Digital Health India portal, and MyHealth App.<sup>97</sup> Brazil is using health analytics, compliance procedures, digital health records, and medical second opinions to combat instances of fraud and waste through excessive use of hospital services. Startups in Indonesia are providing digitized health care to the country's rapidly growing group of internet and smartphone users.<sup>98</sup>

To implement individual technologies or undertake broader digital transformation, health care organizations likely will need to overcome both technology and business challenges, including:

- **Antiquated legacy platforms** and foundational constructs that are costly to maintain and inhibit growth and innovation
- **Tightly coupled legacy systems** that make system modifications or enhancements extremely complex and prone to issues
- **Cost and complexity of new technologies** that require careful consideration of their immediate versus long-term value propositions
- **Constantly evolving business needs and scenarios** that tend to result in error-prone processes, data inaccuracies, and costly manual workarounds and interventions
- **Convincing clinical and business staff of the benefits of using technology** and training them on its use, which can be time- and cost-intensive

Concerns over the safety and security of new technology also need to be addressed.

**Cybersecurity** remains a massive challenge for public and private health care entities, given the continuous evolution of cyberattacks. The most frequent types targeting health care organizations are ransomware attacks, distributed denial-of-service (DDoS) attacks, spam emails and phishing, and data breaches.<sup>99</sup> Worrisome factors include a lack of unified security standards across health care organizations; risks arising from the use of IoT, mobile health apps, and cloud;<sup>100</sup> and employee use of personal devices at work.

Cybercriminals attack health care organizations because of the exploitable value of their electronic health records<sup>101</sup> and personally identifiable information (PII) such as social security numbers, financial transactions, insurance records, and other sensitive data. As virtual health care increases in capability and popularity, organizations will likely need to continue investing in security tools and services to identify risks and keep them at bay. The five key areas to address include: medical devices and wearables security; identity management and external device authentication; telemedicine security monitoring and behavioral analysis; development, security, operations (DevSecOps); and telemedicine security training and awareness.<sup>102</sup>

Health care organizations are using digital technologies to respond to the ongoing threat. For example, AI and predictive analytics are enabling them to identify threat agents and data leakage patterns and to take suitable counteractions. Major cloud solution vendors are collaborating with EMR and EHR vendors to integrate their data systems and shift to more secure cloud platforms. Blockchain is being used to secure digital identity management, financial and insurance records, supply chain management, clinical research, and data access.<sup>103</sup>



## DEVSECOPS AND THE CYBER IMPERATIVE

To enhance their approaches to cybersecurity and cyber risk, forward-thinking health care organizations are embedding security, privacy, policy, and controls into their evolved IT delivery models. DevSecOps transforms cyber and risk management from compliance-based activities (typically undertaken late in the development life cycle) into essential framing mindsets that help shape system design from the ground up. DevSecOps has the capability to reduce security breaches and associated costs because it allows cybersecurity to “shift-left” (happen earlier) in the development. Security-as-Code and Compliance-as-Code features allow for more governance automation than ever before, helping organizations improve compliance to requirements and regulations.<sup>104</sup>

## HOW MAY THIS TREND IMPACT THE YEAR AHEAD?

Despite numerous challenges, examples of forward progress in health care digital transformation are proliferating and should continue to do so in 2020 and beyond.

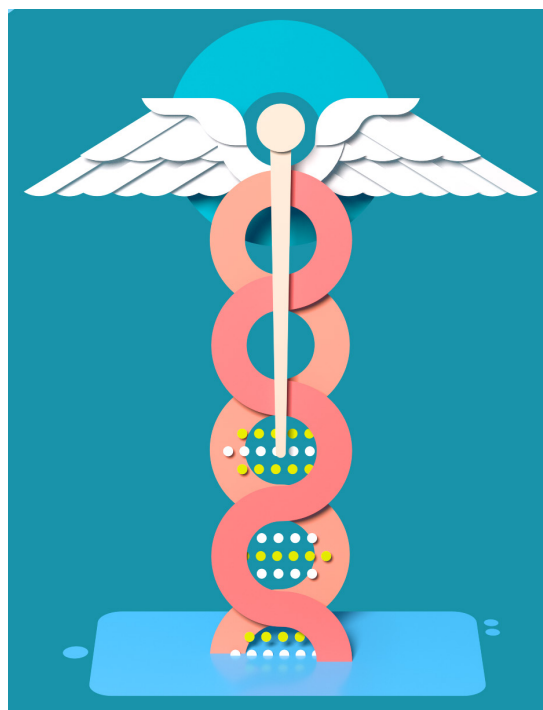
Australia’s first fully integrated digital hospital, St Stephen’s Private Hospital in Hervey Bay, is described as “the Australian benchmark in automated patient care.” Patient health records and results are updated and accessible on tablets and mobile devices throughout the hospital, personalized food and medication can be managed electronically, and practitioners can log in at any time to see what a patient is doing in real time.<sup>105</sup>

Health systems in Canada are making significant investments in the next wave of EHRs, which offer an improved data value proposition and support better clinical and financial outcomes. One hospital in India is using AI to develop an Indian-specific heart risk score<sup>106</sup> and others are exploring various use cases of AI and machine learning (ML).

Germany’s Digitale-Versorgung-Gesetz law, which comes into effect in 2020, focuses on providing better care through digitization and innovation, including improvements and progress in health apps, EHRs, virtual care, and structured patient data to share across sectors as a basis for DaaP.<sup>107</sup>

Japan legalized the medical field’s use of big data in 2017, and the central government has been accelerating the development of personal health records (PHRs). Increased access to and analysis of patient health data is expected to support development of AI-based medical support systems and to aid in epidemiological, clinical, and market research.<sup>108</sup>

China’s central government is promoting an “Internet Plus” concept within the country’s health



care sector. Nearly 100 percent of tertiary hospitals and around 80 percent of primary and secondary hospitals have health information systems, and they are generating real-world data for multiple government health care reform policies such as Diagnosis Related Group (DRG) payments and drug efficiency/indication expansion. Also on the agenda is enabling interoperability among disparate EMR systems.<sup>109</sup>

Many health care organizations are progressing along a unique path toward greater digital adoption. While complexity and unpredictability are universal, health care has a clear and constant mission to steer by: It exists to deliver and finance the services and support that make the quality of life better for people everywhere. Developing a systematic approach for identifying and harnessing opportunities born in the intersections of technology, science, and business is an essential first step in demystifying digital transformation, and making it concrete, achievable, and measurable.<sup>110</sup>



## Future of work

### WHAT IS DRIVING THIS TREND?

Transforming the health care workforce through innovative technologies, career models, and creative workplaces is a growing imperative.

Already, the evolving care model is blurring traditional health care boundaries, opening the door to nontraditional players, and spawning new ways to address the classic “jobs to be done” of delivering care and sustaining well-being.<sup>111</sup> In addition, an aging population and a shortage of skilled clinicians are increasing the importance of sourcing, hiring, training, and retaining skilled workers.

Yet doing so may be easier said than done. A widening demand-supply gap of skilled professionals is creating immediate challenges for public and private health systems: India reports a lack of skilled medical professionals in smaller towns and rural regions, where 71 percent of its population resides.<sup>112</sup> Low wages have encouraged health care professionals in the Philippines to emigrate, leaving the country with a shortage of workers. Germany expects a deficit of 1.3 million health care professionals by 2030.<sup>113</sup> The United Kingdom is seeing reductions in key staff groups including general practitioners (GPs), A&E departments, district and community nurses, and mental health professionals. The looming specter of Brexit is adding another layer of uncertainty to the UK talent issue.

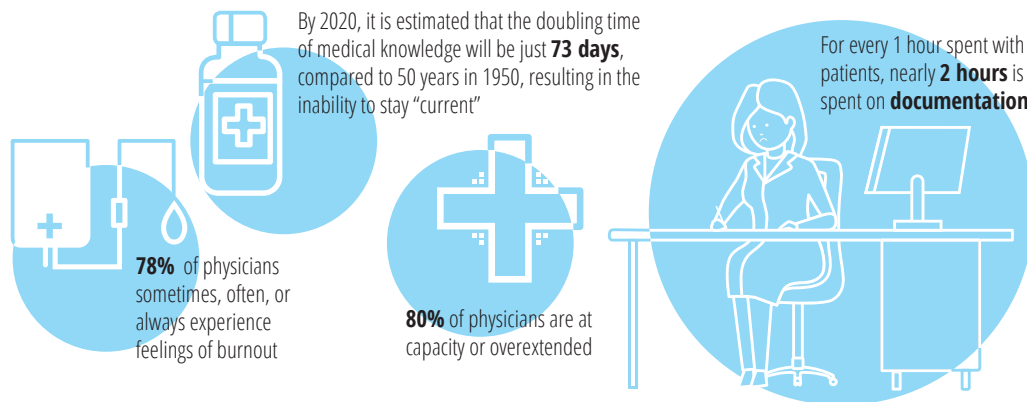
If not promptly and thoughtfully addressed, this talent gap may have long-term, detrimental consequences for inpatient/outpatient care, elderly care, home health, and remote health care services; as well as for enterprise functions, including HR and payroll processes; finance and revenue cycle management; customer service and relationship management; recruitment and talent management; prescription management and reporting; and IT infrastructure and operations.

The situation appears to be particularly acute within two pivotal medical professions: physicians and nurses. Many physicians feel they experience burnout and a dip in productivity, eventually driving them away from the sector (figure 7).

FIGURE 7

## Burnout and decreased productivity are major factors contributing to physician attrition

Physician burnout and decreased productivity



Sources: The Physicians Foundation, 2018 survey of America's physicians: Practice patterns & perspectives, September 2018; Christine Sinsky et al., "Allocation of physician time in ambulatory practice: A time and motion study in 4 specialties," *Annals of Internal Medicine* 165, no. 11 (2016): 753–60; Peter Densen, "Challenges and opportunities facing medical education," *Transactions of the American Clinical and Climatological Association* 122 (2011): 48.

Some physicians are so dissatisfied with their profession that they plan to retire early or exit the field. According to a 2018 survey of US physicians, 46 percent of respondents plan to change career paths.<sup>114</sup> Seventeen percent say that they're retiring, and 12 percent want to find a job where they don't have to deal with patients.<sup>115</sup> These actions have the potential to exacerbate a looming problem:

Physician demand continues to outpace supply. In the United States, a shortage of 124,000 physicians is projected by 2025, with primary care accounting for the largest share of the shortage, at 37 percent.<sup>116</sup>

Numerous health systems are reporting issues with hiring and retaining skilled nursing professionals. In the United States, the total bedside registered nurse (RN) turnover has risen to 17.2 percent and the average cost of turnover for a bedside RN is US\$52,100.<sup>117</sup> The Netherlands, already grappling with the problem in its long-term care sector, is seeing new shortages in several specialty areas, including operating theater nurses. Brexit is presenting challenges for the United Kingdom's National Health Service (NHS) around net

immigration of skilled clinicians, especially nurses. For the first time, the NHS has a net negative in terms of inflow versus outflow. In Germany, new regulations which introduced thresholds for different medical specialties and a shift in reimbursement for nurses are fueling competition for talent.<sup>118</sup>

The future of work is top-of-mind for health system leaders; many of whom are using improved working conditions, alternative employment models (e.g., virtual, gig/contract), and innovative technologies to anchor cost-effective, next-generation talent models. For example, Japan's health system cannot rely on foreign workers to address physician shortages—a big issue in rural areas—because health care delivery requires a Japanese physician license. In response, the government is considering various physician-retention initiatives, including introducing an upper limit on their working hours by 2024.<sup>119</sup>

Germany's Nursing Staff Strengthening Act (PpSG), which came into effect in January 2019, has

support programs to ease nurses' workload through better staffing practices and workplace conditions. Patient assistance and staff coordination solutions, which allow requests and complaints to be automatically tracked and monitored for timely completion by the appropriate staff, reduce the time nurses spend handling patient requirements not meant for them.<sup>120</sup>

India's National Medical Commission (NMC) Act, 2019, was introduced by the minister of health and family welfare in July 2019. The Bill seeks to repeal the Indian Medical Council Act, 1956, and provide for a medical education system which ensures the availability of adequate and high-quality medical professionals, adoption of the latest medical research by medical professionals, periodic assessment of medical institutions, and an effective grievance redressal mechanism.<sup>121</sup>

Transformational technology investments and initiatives are coming from within and outside of health care.<sup>122</sup> Advances in AI, automation, and analytics accelerate decision-making and ease or eliminate routine administrative tasks, enabling clinical employees to perform at the top of their license—focusing their time, attention, and effort on patients. The New Delhi-based Centre for Advanced Research in Imaging, Neurosciences, and Genomics (CARING) has developed a high-sensitivity deep learning algorithm for automated classification of chest X-rays as normal or abnormal; however, additional in-depth trials are required to ascertain the impact.<sup>123</sup>

While workforce-focused technologies are being introduced with increasing frequency, they may not attain their full clinical value if health system employees are not equipped to adopt and use technologies in the most efficient and effective way.<sup>124</sup> Furthermore, clinical staff likely need to understand, and be able to convey to patients, the benefits that digital technologies can bring while being confident that the technology meets the

requisite regulatory and data protection standards.<sup>125</sup>

"The education and training of the existing workforce, along with the preparation of an appropriate pipeline of talented future staff, will be key to the success of any program of change designed to empower staff to take advantage of the advances in technology to improve service delivery."

— *The Topol review: Preparing the healthcare workforce to deliver the digital future, Interim report June 2018—A call for evidence*<sup>126</sup>

As a key component of its workforce development strategy, the United Kingdom's NHS in 2018 commissioned an independent review of its employees' readiness for a digital future. A review board and three expert advisory panels led by Dr. Eric Topol, an expert in cardiology, genetics, and digital medicine, issued an initial report in June of that year.<sup>127</sup> The report recognizes that digital medicine (digital technologies and products that directly impact the diagnosis, prevention, monitoring, and treatment of a disease, condition, or syndrome) is already having a positive, albeit uneven, impact on health care. It highlights the potential of telemedicine, telephone triage, video consultations, and smartphone apps and wearables, and emphasizes that the patient-clinician relationship is important for adoption and that technologies need to be intuitive to use. However, the report also notes that there is "an evidence and skills gap" in the current NHS workforce's ability to realize the potential for AI in health care and that addressing this gap requires the NHS to develop education and training collaborations.<sup>128</sup> Although the Topol review is NHS-specific, its findings may provide guidance for other health systems looking to improve their employees' digital literacy.

Many countries are trying to offset workforce shortages by providing incentives to attract foreign talent or to encourage health care professionals to work in remote regions. The Philippines

government has developed the program “Doctors to the Barrios (villages)” and raised the salary of participating doctors to encourage participation. In addition, the country’s Commission on Higher Education provides free education to students enrolled in public medical schools, under a social responsibility condition that they will work in the Philippines for several years after graduating.<sup>129</sup> The Malaysian government has introduced the Returning Expert Program (REP) to bring its highly skilled expatriate talent back to Malaysia with incentives such as a flat 15 percent income tax rate for five years.<sup>130</sup>

## HOW MAY THIS TREND IMPACT THE YEAR AHEAD?

Increasing demand for health care services amid the existing and projected shortage of skilled clinicians will likely continue to exert pressure on health systems to reframe and diversify traditional talent models to be more future-focused. For example, broadening and “upscaling” nurse practitioners’ roles could increase their job satisfaction. Also,

evidence is mounting that a technology-enabled, evolving care model has the potential to change physicians’ future roles in health care delivery, infrastructure, and enablement. The transition will not be like flipping a light switch, but evolution is already underway and we expect it to accelerate over the next five to 10 years, although the pace of change is likely to vary.

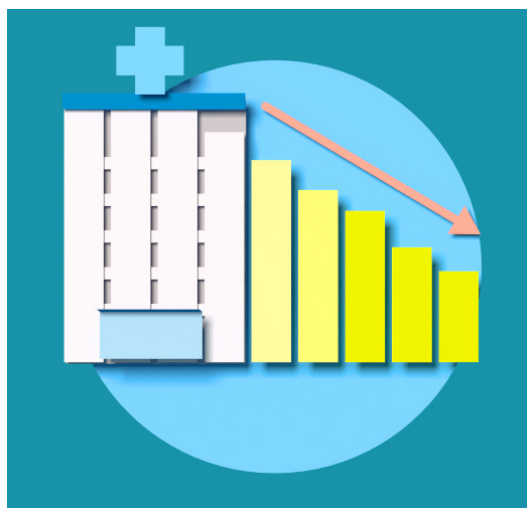
In one scenario, we envision eight physician archetypes of the future (figure 8). (An individual may exhibit characteristics of multiple archetypes

and may migrate among them during her/his career.) Numerous examples already exist of physicians exhibiting characteristics of these emerging archetypes.<sup>131</sup>

To help their physicians make the transition toward the future of health and preventive care, health systems could employ a three-pronged approach:

1. **Create a physician organization** that enables all caregivers to practice at the top of their license, anticipates changes in care delivery, reduces burnout factors, and affirms physicians as partners in care rather than employees to be managed. Analyze how the

evolving health care model is changing the nature of work and the future role of the physician. Identify a preferred future care model and let it guide the future physician organizational structure (functions, roles). Zoom out five to 10 years and then zoom in one to two years to think about how future aspirations will impact decisions made today.



2. **Execute a deliberate change management process that is led by physicians and equips them to drive change rather than resist it.** Organizations should educate physicians on the “business of medicine” as it relates to cost and population health, as well as equip them with the skills they will need to care for patients in a future outcomes-focused, technology-enabled environment. In addition, encourage a culture of collaboration and communication to help drive change adoption and buy-in among

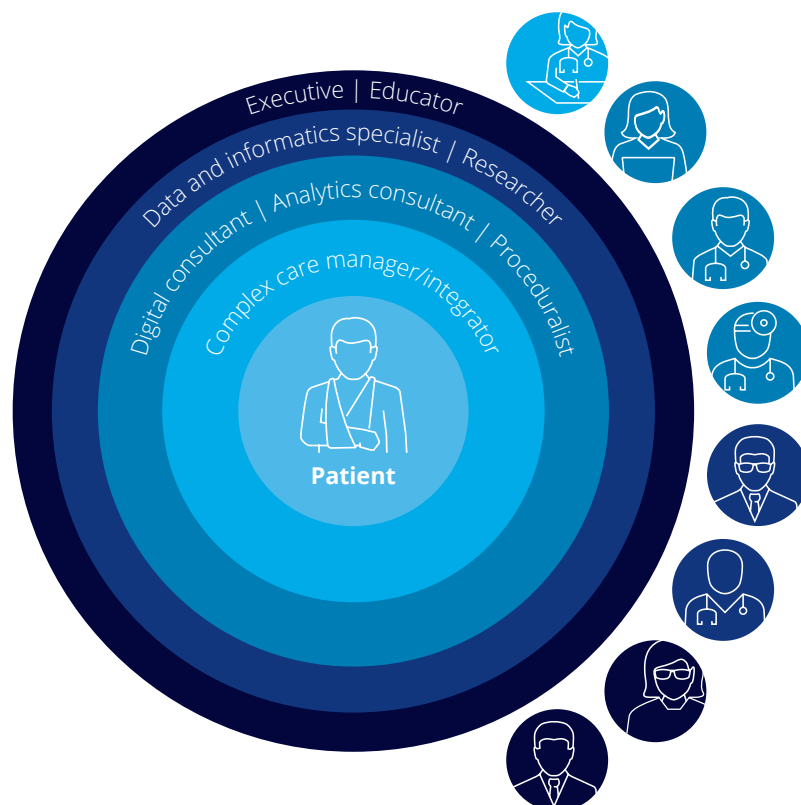
physicians. Most importantly, position physicians as organizational leaders who are responsible for executing on a change agenda; this can help accelerate the uptake and deployment of desired behaviors and workflows.

3. **Make smart investments in workforce and technology based on the future, not the past.** Technology has the potential to enable physicians to improve their caregiving and care outcomes; however, the track record for many technologies has been a dissatisfier for some physicians.<sup>132</sup> Therefore, when developing

criteria for specific technology investments, include physician time and workflow in addition to business value. Consider investing in training tools that can help physicians feel confident about their changing role. For example, virtual reality (VR) technology is modernizing the process of medical training with its immersive experience and realistic scenarios for physicians. Organizations that commence and continue to invest in people, process, and technology should be well-equipped for their journey to transformation.

FIGURE 8

### Physician\* archetypes of the future



\* Physician is used to include independent practitioners, such as nurse practitioners.

Source: Randolph L Gordon et al., *Shaping the physician of the future: An evolving care model in the health care ecosystem*, Deloitte, 2019.

# Questions/actions leaders should consider for 2020

## How can our organization deliver cost-effective, high-quality health care today and prepare for the future?

Smarter spending and better performance will likely work together to help health care stakeholders meet current obligations and build a solid foundation for what is likely to be a radically different future.

Deloitte research shows that leading organizations are exploring ways to innovate and reposition themselves:

- They are **leveraging their data assets and conducting sophisticated data analytics** to see how they are performing across the organization and to improve their business and clinical decision-making.
- They are **incorporating automated systems** wherever possible to lock in efficiency savings and improve the quality of outputs.
- Some are **building new revenue streams** and “edge businesses” outside the core of care delivery.
- Others are **hiring talent from other industries** to bring in greater consumer centricity or are developing innovative digital capabilities and solutions.
- Many are demonstrating **readiness to work with new partners** (even former competitors

and those outside the industry) to collaborate for new outcomes.

All are taking future-focused actions and making future-focused investments ahead of their peers and competitors.<sup>133</sup>

## How can we strengthen consumer engagement, improve the patient experience, and optimize where and how health care is delivered?

To realize the value derived from customer experience transformation, health care organizations should formulate a holistic approach to customer experience with a tight linkage of leadership, employee engagement, and culture:

- Develop an **integrated customer experience strategy** based on the segments of the customers they serve, market opportunity, and competition.
- Starting from the customers’ point of view and working outward, **remove operational barriers** and standardize elements such as call centers and front-end interactions; also, utilize metrics tied to customer satisfaction and stickiness in approaches to clinical excellence.
- Understand existing organization cultures and subcultures (i.e., clinical vs. administrative) to



**support a cultural shift** and facilitate deeper customer engagement.

- **Reimagine leadership capabilities** to bring the organization in step with its customers, the technology they use, and leading health behaviors.
- **Link digital offerings** to a strategically segmented customer experience and plug data connectivity holes.

In addition, health systems should consider investing in human and physical capital of their own, as well as develop new relationships with organizations that have alternative care settings (e.g., ambulatory care centers, retail clinics, etc.). Technology upgrades to help organizations manage operations and patient care more efficiently should also underpin organizational transformation. Invest in core analytics to create a 360-degree view of the consumer across the care continuum—summarizing all the conditions they have, their interactions, the drugs they take—and make it available to everyone.

## How well prepared is our health care system to undertake digital transformation? What needs to happen to equip our clinical workforce and patients to embrace technology-enabled care?

In its publication *Closing the digital gap*, the Deloitte UK Centre for Health Solutions identified five key steps to accelerate health care digital transformation:

- **Create a robust health IT infrastructure for data storage, access to health data, and information-sharing.** This

infrastructure should include reliable network connectivity and sufficient data storage capacity. Move patient data to cloud services to improve data storage and system integration by providing health care organizations with remote access to real-time, easy-to-use data, letting them pay only for what they use, such as storage, applications, and infrastructure services.

- **Implement accessible electronic health records and invest in the basic technologies needed for transformation.**

Organizations need to address fragmentation in the numbers, types, and functionality of their EHR platforms to better access data from other providers, and to share and use data internally and externally. Other basic technologies needed to achieve an acceptable level of digitalization include e-prescribing, e-referral, e-diagnostics, e-rostering, and e-discharge; secure communication systems; point-of-care (POC) diagnostics; digital imaging; and electronic tracking of equipment, patients, and staff. These are designed to keep patients safe and optimize clinical workflows by accelerating the flow and quality of information, enabling timely responsive care.

- **Address the challenge of interoperability.**

Health care interoperability is extremely complex and relies on being able to establish connectivity and secure communication of data between multiple and often disparate IT systems (and organizations). Health care providers and their partners should consider collaborating to create an environment to help raise the bar and improve how they share information safely and securely. The consistent use of data standards and open APIs and protocols can also help improve access to and interoperability of EHR systems by enabling the flow of data from different applications and platforms, while maintaining privacy and security standards.



- **Establish a robust governance framework to support a culture of digital transformation.** Health care organizations must comply with the regulatory requirements that apply to data and technology in general, and to data security and privacy in particular. Both health systems and individual health care organizations should establish a governance framework that enables the development and adoption of safe, ethical, and effective data-driven health care technologies; as well as guidance on the entity's approach to data ownership, patient consent, and patient education.
- **Develop digital leadership skills and improve the digital literacy of staff and patients.** Implementing digital solutions successfully requires leaders with a clear vision about the role of digital technology in care delivery transformation; clinical staff who feel consulted, empowered, and trained in the use of the technology; and patients who are encouraged and supported in developing their digital literacy.<sup>134</sup>
- **Break down concrete barriers.** Health care will likely no longer take place inside the four walls of a clinic or hospital. Instead, employees can connect with patients virtually, via telehealth, RPM, virtual clinical trials, customer portals, etc.
- **Remove the “nine-to-five” boundaries.** The rise in urgent care clinics, shift to outpatient care, and 24/7 availability of virtual care assistants may require different employee skill sets. In addition, subject matter expertise will likely no longer need to be in-house or even in the country. Shift workers can virtually access experts to solve problems or upskill leveraging augmented reality.
- **Train for success.** Training employees in trending technologies such as AI-enabled RPA and cognitive intelligence<sup>135</sup> is an important step in enhancing productivity and increasing job-related satisfaction. By extension, all health care workforce training should be future-focused: shorten training time, modularize training programs, offer training credit for apprenticeships, and create pathways to upskill and help employees move into new positions.

## How do we attract, develop, and retain skilled health care professionals? How do we make our workforce more efficient and help them feel more fulfilled and satisfied?

Rethinking combinations of talent, technology, and workplace can help health care organizations evolve their current ecosystem for the future of work and enable them to become an employer of choice.

As the health care industry continues its exciting and challenging journey to the future, all stakeholders will need to understand, analyze, and respond to trends and issues driving change across the ecosystem. For 2020, these include achieving financial sustainability by reducing the cost and increasing the efficiency of care delivery; developing and implementing innovative care models that meet—and exceed—the evolving expectations of their patients and members; using health information technology to improve outcomes and access; and implementing new methods to source, hire, train, and retain skilled workers.

# Appendix: Suggestions for further reading

## A CONSUMER-CENTERED FUTURE OF HEALTH

Our survey of health care consumers in eight countries around the world finds people are exhibiting traditional “consumer behaviors” when it comes to health care: They are willing to shop for deals, disagree with their doctor, and use technology to track and maintain their health.

## SHAPING THE PHYSICIAN OF THE FUTURE

The health system is preparing its physicians for a future that will likely look very different from today. Trends such as increasing costs, value-based payment models, and personalized care are all coming together to disrupt the traditional health care ecosystem. Learn how the role of the physician is changing to align with the future of health care.

## CLOSING THE DIGITAL GAP: SHAPING THE FUTURE OF UK HEALTHCARE

Leveraging the opportunities and efficiencies offered by digital transformation is key for any organization to remain viable and fit for the future. But for the UK’s healthcare services, which are made up of multiple services and organizations, across a range of geographies and jurisdictions, the view is more complex than for most.

## SMART HEALTH COMMUNITIES AND THE FUTURE OF HEALTH

Expanded connectivity and the exponential growth of technology are enabling smart health communities, which could offer a modern take on community-based well-being and disease prevention.

## THE TRANSITION TO INTEGRATED CARE: POPULATION HEALTH MANAGEMENT

Ageing populations and rising patient expectations, together with increasing costs in the face of substantial budget constraints for health and social care, is putting enormous pressure on the sustainability of the NHS. Population Health Management, a patient-centric, data-driven approach, has been recognized in the NHS Long Term Plan as key to delivering a sustainable health and care system, and improving the lives of the English population.

## THE FUTURE OF HEALTH: HOW INNOVATION WILL BLUR TRADITIONAL HEALTH CARE BOUNDARIES

The life sciences and health care industry is on the brink of large-scale disruption. In a future of health that’s defined by radically interoperable data, open yet secure platforms, and consumer-driven care, what role will you play?

# Endnotes

1. Economist Intelligence Unit, *World industry outlook: Healthcare and pharmaceuticals*, September 29, 2019.
2. Ibid.
3. Ibid.
4. Department of Economic and Social Affairs, "World Population Prospects 2019," United Nations, accessed December 2019.
5. Economist Intelligence Unit, *World industry outlook*.
6. Ibid.
7. Ibid.
8. Ibid.
9. Melissa Majerol and William Carroll, *Medicaid and digital health: Findings from the Deloitte 2018 survey of US health care consumers*, Deloitte Insights, September 7, 2018.
10. Christina Patterson, *World Alzheimer's report 2018*, Alzheimer's Disease International, September 2018;.
11. International Diabetes Federation, *IDF diabetes atlas, 8th edition*, accessed 18 June 2019.
12. Jitinder Kohli and Anne De Biasi, *Supporting healthy communities: How rethinking the funding approach can break down silos and promote health and health equity*, Deloitte Insights, August 2, 2017.
13. Deloitte, *2019 Global health care outlook: Shaping the future*, 2018.
14. World Health Organization, "Mental disorders affect one in four people," press release, October 4, 2019.
15. Lisa Purdy and Asif Dhar, "Smart Health Communities: Addressing the world's health challenges with digital communities," Deloitte blog, January 11, 2019; Steven A. Schroeder, "We can do better—Improving the health of the American people," *New England Journal of Medicine* 379, no. 12 (2007): pp. 1221–28.
16. While SHCs operate outside of the traditional health care system, they may be initiated by traditional health care players. The Fresh Food Farmacy is an example of such an SHC.
17. Asif Dhar et al., *Smart health communities and the future of health*, Deloitte Insights, July 6, 2019.
18. Ibid.
19. Bradford Gray, Dana O. Sarnak, and Marit Tanke, "ParkinsonNet: An innovative Dutch approach to patient-centered care for a degenerative disease," *The Commonwealth Fund*, December 23, 2016.
20. Bas R. Bloem et al., "ParkinsonNet: A low-cost health care innovation with a systems approach from the Netherlands," *Health Aff (Millwood)* 36, no. 11 (2017): pp.1987–96.
21. Greg Schwartz, "STEP UP: When paired with gamification and a science-based engagement program, wearables can boost (and sustain) activity levels," Deloitte blog, September 9, 2019.
22. Dhar et al., *Smart health communities and the future of health*.
23. Full Fact, "Spending on the NHS in England," July 9, 2019.
24. National Healthcare Security Administration, "Statistical bulletin on the development of national basic medical security in 2018," 30 June 2019.

25. Boris Augurzky et al., *Krankenhaus Rating Report 2019: Das Ende des Wachstums?*, Medhochzwei Verlag, May 2019.
26. Deloitte analysis of hospital annual reports.
27. Deloitte analysis.
28. Steve Burrill, "An eye on growth in outpatient hospital services," Deloitte Health Care Current, August 21, 2018.
29. Mark E. Grub et al., "The Kaufman Hall point of view: Decline in utilization rates signals a change in the inpatient business model", April 2013; Dustin L. Richter and David R. Diduch, "Cost comparison of outpatient versus inpatient unicompartmental knee arthroplasty," *Orthopaedic Journal of Sports Medicine* 5, no. 3 (2017).
30. Deloitte analyses based on data from the AHA annual survey and Medicare cost reports (via Truven Health Analytics).
31. NHS, *The NHS long term plan*, June 2019.
32. Dr. Christine Armistead and Gurminder Khaira, "Delivering the efficiency challenge: The case for system wide efficiency programmes," Deloitte blog, June 9, 2019.
33. Lancet, "Successes and challenges for health in Indonesia," *Lancet* 393, no. 10166 (2019): 2.
34. Center for Global Development, "Thailand's universal coverage scheme," accessed November 14, 2019.
35. Economist Intelligence Unit, *World industry outlook*.
36. Ibid.
37. Ibid.
38. Ibid.
39. Karen Taylor, Cosima Pettinicchio, and Maria Arvanitidou, *The transition to integrated care: Population health management in England*, Deloitte, 2019.
40. Ibid.
41. Ibid.
42. Ibid.
43. Ibid.
44. Ibid.
45. Ibid.
46. Ibid.
47. Greater Manchester Combined Authority, "The Greater Manchester digital strategy 2018-2020," 2018.
48. Greater Manchester Health and Social Care Partnership, "£134M investment in mental health across Greater Manchester," July 28, 2017.
49. Taylor, Pettinicchio, and Arvanitidou, *The transition to integrated care*.
50. The Advisory Board Company, "The business of population health management," Gesundes Kinzigital GmbH, 2016.
51. Ingo Meyer et al., "Gesundes Kinzigital 4.0 - A new financial model and performance metrics for the delivery of population-based integrated care," *International Journal of Integrated Care* 17, no. 5 (2017): 291.

52. Taylor, Pettinicchio, and Arvanitidou, *The transition to integrated care*.
53. Ibid.
54. Planning Development and Information Technology Division, "Statistical bulletin on the development of China's health care industry in 2018," National Health Commission, May 22, 2019.
55. Nabeela Khan Inayati, "Asia – the global giant in medical tourism," *Nation*, October 20, 2019.
56. Fu Wangrun, "Hainan Medical Tourism Industry Implementation Plan," *Hainan Daily*, January 6, 2019.
57. Niti Aayog, *Guidelines for public-private partnerships for non-communicable diseases*, October 17, 2018.
58. FICCI, "NITI Aayog puts focus on successful PPP in healthcare," press release, August 22, 2019.
59. BioSpectrum, "Morgan Stanley invests Rs 1 Bn in HealthMaP Diagnostics," May 17, 2019.
60. Lieven Jacquemyn, "Public + private = Better health care in Southeast Asia," Brink News, October 13, 2017.
61. Max Greenwood, "Canada unveils the five winning superclusters that will push tech sector into the future," Techvibes, February 15, 2018.
62. Jessica Galang, "Federal gov't announces winning supercluster proposals," Betakit, February 15, 2018.
63. Office of the State Council, "General Office of the State Council on printing and distributing national organizational drugs," January 17, 2019.
64. China's Joint Procurement Office, "2019 Medicine centralised procurement document," 2019.
65. Aerzteblatt, "Zahl der MDK-Prüfungen zu Krankenhausabrechnungen steigt weiter an," April 11, 2019.
66. Aerzteblatt, "2019 bringt zahlreiche Änderungen bei Gesundheit und Pflege," January 2, 2019.
67. Ministry of Health and Family Welfare, "Questions related to the Clinical Establishments Act," accessed November 14, 2019, p. 10.
68. PTI, "Health Ministry proposes minimum standards for clinical establishments," *Economic Times*, July 21, 2019.
69. Deloitte, What matters most to the health care consumer? Insights for health care providers from the Deloitte 2016 Consumer Priorities in Health Care Survey, 2016.
70. Ibid.
71. David Rabinowitz and Josh Lee, "From sick care to health care: Focusing on what drives health could improve our well-being," Deloitte blog, August 8, 2019.
72. Ibid.
73. Markian Hawryluk (Kaiser Health News), "Hospitals are buying up housing units, helping 'stranded' patients find a home," *USA Today*, October 2, 2019.
74. Ibid.
75. David Rabinowitz and Josh Lee, "From sick care to health care."
76. Victoria State Government, "HealthLinks: Chronic care," accessed November 14, 2019; Western Health, "HealthLinks," accessed November 14, 2019.
77. Heather Landi, "CVS Health exec: Retail giant wants to create a Netflix-like healthcare experience," *FierceHealthcare*, September 10, 2019.

78. ReMiND, "ReMiND: An mHealth initiative," accessed November 14, 2019; Shankar Prinja et al., "Cost effectiveness of mHealth intervention by community health workers for reducing maternal and newborn mortality in rural Uttar Pradesh, India," *Cost Effectiveness and Resource Allocation* : C/E 16 (2018).
79. Deloitte, *Health data and information technology: Global experiences from today for tomorrow*, 2019.
80. Suparna Dutt D'Cunha, "India's most remote villages are getting better healthcare with this cloud-based solution," *Forbes*, November 21, 2016.
81. Karma Healthcare, "Welcome to Karma Healthcare," accessed November 14, 2019.
82. Armin Scheuer, "Ministry of Health in Germany officially launches Health Innovation Hub," *Healthcare IT News*, 12 April 2019; Health Innovation Hub, "Re-thinking healthcare," accessed November 14, 2019.
83. Dean Koh, "Samitivej launches multi-service 'Virtual Hospital' app in Thailand," *Healthcare IT News*, March 14, 2019; Channel News Asia, "Google launches Thai AI project to screen for diabetic eye disease," December 13, 2018.
84. Josh Nelson et al., *Transforming care delivery through virtual health*, Deloitte, 2017; Deb Hunt, Marc Scheinrock, and Saurabh Vyas, *Virtual Health: Can it help your organization create a transformational culture while bending the cost curve?*, Deloitte, August 2014.
85. Karen Taylor and Francesca Properzi, *Shaping the future of UK healthcare: Closing the digital gap*, Deloitte, 2019.
86. Nathan Eddy, "How the cloud impacts the day-to-day lives of physicians," *Healthcare IT News*, August 19, 2019.
87. Verizon, "The journey to 5G," *Healthcare IT News*, March 2, 2018.
88. Anne Phelps, Jason Wainstein, and Claire Boozer Cruse, *Going beyond compliance to achieve radical interoperability: Pulse survey on CMS and ONC proposed rules*, Deloitte Insights, August 29, 2019.
89. Karen Taylor, "Preparing the healthcare workforce to deliver the digital future: A conundrum that needs to be resolved," Deloitte blog, January 3, 2019.
90. Greg Reh, "Beyond bitcoin: Five possible uses for blockchain in health care," Deloitte Health Care Current, April 3, 2018.
91. Randolph L. Gordon, *Shaping the physician of the future*, Deloitte, 2019.
92. Deloitte, *2019 Global health care outlook*.
93. Phelps, Wainstein, and Boozer Cruse, *Going beyond compliance to achieve radical interoperability*.
94. Ibid.
95. Ibid.
96. Ministry of Health and Family Welfare, *National Digital Health Blueprint (NDHB)*, July 15, 2019.
97. Ibid.
98. Nicko Widjaja, "How tech startups are bringing healthcare to Indonesia's rural areas," *Entrepreneur*, June 11, 2019.
99. Ponemon Institute, *2018 cost of a data breach study: Global overview*, July 2018.
100. IBM Security, *Security trends in the healthcare industry*, 2017.
101. Ibid.
102. Deloitte, *Securing the promise of virtual health care: Addressing cyber risk in a new era of medicine*, 2019.

103. Keren Priyadarshini, "Cybersecurity needs to be at the heart of healthcare sector's transformation," Microsoft Asia, February 12, 2019; Niccolo Mijea, Machine learning in healthcare cybersecurity–Current applications, Emerj, May 16, 2019; HIMSS, *2019 HIMSS cybersecurity survey*, accessed July 8, 2019.
104. Deloitte, *Tech Trends 2019: Health care perspective*, 2019.
105. Wood & Grieve Engineers, "Australia's first digital hospital officially opens," accessed November 14, 2019; UnitingCare, "St Stephen's Hospital," accessed November 14, 2019.
106. Dr. Sangita Reddy, "Will AI be the silver bullet in the fight against cardiovascular disease?," Microsoft India, September 13, 2019.
107. Bundesministerium für Gesundheit (Federal Ministry of Health), "Ärzte sollen Apps verschreiben können," accessed November 14, 2019.
108. Cabinet Secretariat, Office of Healthcare Policy, "Next-generation Medical ICT Infrastructure Council," accessed November 14, 2019.
109. Dean Koh, "IT investment in China's hospital system estimated to reach 65.7 billion yuan in 2020," *Healthcare IT News*, November 30, 2018.
110. Deloitte, *Tech Trends 2019*.
111. Gordon, *Shaping the physician of the future*.
112. TV Jayan, "Distribution of health workers in rural areas anaemic: Study," *Hindu Business Line*, May 28, 2019.
113. Augurzyk et al., *Krankenhaus Rating Report 2019*.
114. Physicians Foundation, *2018 Survey of America's Physicians*, September 2018.
115. Sally Pipes, "Government policies are driving doctors to quit healthcare," *Forbes*, October 15, 2018.
116. Michael J. Dill and Edward S. Salsberg, *The complexities of physician supply and demand: Projections through 2025*, Association of American Medical Colleges, November 2008.
117. NSI Nursing Solutions Inc, *2019 National health care retention & RN staffing report*, March 2019.
118. Thomas Hommel, "Pflegebranche fürchtet fatalen Wettbewerb um Personal," *ArzteZeitung*, September 19, 2019.
119. Ministry of Health, Labor, and Welfare, *Report on the study group on doctoral work style reform*, March 29, 2019.
120. Bundesministerium für Gesundheit (Federal Ministry of Health), "Drittes Pflegestärkungsgesetz (PSG III)," accessed November 14, 2019.
121. PRS Legislative Research, "The National Medical Commission Bill, 2019," accessed November 14, 2019.
122. Gordon, *Shaping the physician of the future*.
123. Caring Research, "Automated classification of chest X-rays as normal/abnormal using a high sensitivity deep learning algorithm," January 21, 2019.
124. Taylor, "Preparing the healthcare workforce to deliver the digital future."
125. Ibid.
126. Health Education England, *The Topol review: Preparing the healthcare workforce to deliver the digital future, Interim report*, NHS, June 2018.
127. Health Education England, *The Topol review*.

128. Taylor, "Preparing the healthcare workforce to deliver the digital future."
129. John Peabody et al., "Financial incentives and measurement improved physicians' quality of care in the Philippines," *Health Affairs* 30, no. 4 (2011): 773–81; Republic of Philippines Department of Health, "Doctors to the Barrios (DTTB)," accessed November 14, 2019.
130. Vicky Stavropoulos, "Encouraging the return of talent: Evidence on tax incentives from Malaysia's returning expert program," *Chicago Policy Review*, April 17, 2017.
131. Gordon, *Shaping the physician of the future*.
132. Eric Topol, *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again*, (Basic Books, 2018).
133. Josh Lee et al., *Six imperatives for chief strategy officers in health care*, Deloitte Insights, November 7, 2019.
134. Taylor and Properzi, *Shaping the future of UK healthcare*.
135. James Manyika, "What is the future of work?," podcast, McKinsey, December 2017; Global Commission on the Future of Work, *Work for a brighter future*, ILO, January 2019; MI Report, *Future of work in healthcare*, accessed July 12, 2019.

## Acknowledgments

The author would like to thank **Terry Koch** of Deloitte Touche Tohmatsu Limited, **Sarah Thomas** of Deloitte Services LP, **Karen Thomas** of Deloitte LLP, and **Rebecca Schultz** for their contributions to this report.



## Contact us

*Our insights can help you take advantage of change. If you're looking for fresh ideas to address your challenges, we should talk.*

### Industry leadership

**Stephanie Allen, PhD**

Global & Australia Health & Social Care leader | Deloitte Australia  
steallen@deloitte.com.au

**Ashleigh Theophanides**

LSHC industry leader | Deloitte Africa  
atheophanides@deloitte.co.za

**Doug Beaudoin**

Global LSHC Industry & HC Sector Consulting leader | LSHC industry leader | Deloitte United States  
dbeaudoin@deloitte.com

**Dan Ressler**

Global LSHC risk advisory leader | Deloitte United States  
dressler@deloitte.com

**Pierre-Henri Revault**

Global LSHC tax leader | Deloitte United States  
prevault@deloitte.com

**Phil Pfrang**

Global LSHC financial advisory leader | Deloitte United States  
ppfrang@deloitte.com

**Tina Wheeler**

Global health care audit leader | Deloitte United States  
twheeler@deloitte.com

**Dr. Rohan Hammett**

Asia Pacific Region Health Care Sector leader | Deloitte Australia  
rhammett@deloitte.com

**Mathieu Van Bergen**

North & South Europe Health Care leader | Deloitte Netherlands  
mvanbergen@deloitte.nl

**Enrico de Vettori**

LSHC Industry leader | Deloitte Brazil  
enricovettori@deloitte.com

**Lisa Purdy**

LSHC Industry leader | Deloitte Canada  
lpurdy@deloitte.ca

**Zheng Qun**

Health Care Sector leader | Deloitte China  
qzheng@deloitte.com.cn

**Thomas Croisier**

LSHC industry leader | Deloitte France  
tcroisier@deloitte.fr

**Michael Dohrmann**

LSHC Industry leader | Deloitte Germany  
mdohrmann@deloitte.de

**Charu Sehgal**

LSHC Industry leader | Deloitte India  
csehgal@deloitte.com

**Takayuki Yamamoto**

Health Care Sector leader | Deloitte Japan  
takayuki.yamamoto@tohmatsu.co.jp

**Abdelhamid Suboh**

LSHC Industry leader | Deloitte Middle East  
asuboh@deloitte.com

**Kavita Rekhraj**

LSHC Industry leader | Deloitte Southeast Asia  
krekhraj@deloitte.com

**Sara Siegel**

Public Sector Health Care leader | Deloitte United Kingdom  
sarasiegel@deloitte.co.uk

**Steve Burrill**

Health Care Sector leader | Deloitte United States  
sburrill@deloitte.com



# Deloitte. Insights

Sign up for Deloitte Insights updates at [www.deloitte.com/insights](http://www.deloitte.com/insights).



Follow @DeloitteInsight

## Deloitte Insights contributors

**Editorial:** Ramani Moses, Blythe Hurley, Aparna Prusty, and Anya George Tharakan

**Creative:** Sonya Vasilieff and Rajesh Venkataraju

**Promotion:** Alexandra Kawecki

**Cover artwork:** Eduardo Fuentes

## About Deloitte Insights

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited, a UK private company limited by guarantee ("DTTL"), its network of member firms, and their related entities. DTTL and each of its member firms are legally separate and independent entities. DTTL (also referred to as "Deloitte Global") does not provide services to clients. Please see [www.deloitte.com/about](http://www.deloitte.com/about) for a more detailed description of DTTL and its member firms.

Deloitte provides audit, consulting, financial advisory, risk management, tax and related services to public and private clients spanning multiple industries. With a globally connected network of member firms in more than 150 countries and territories, Deloitte brings world-class capabilities and high-quality service to clients, delivering the insights they need to address their most complex business challenges. Deloitte's more than 200,000 professionals are committed to becoming the standard of excellence.

## Disclaimer

This publication contains general information only, and none of Deloitte Touche Tohmatsu Limited, its member firms, or their related entities (collectively the "Deloitte Network") is, by means of this publication, rendering professional advice or services. Before making any decision or taking any action that may affect your finances or your business, you should consult a qualified professional adviser. No entity in the Deloitte Network shall be responsible for any loss whatsoever sustained by any person who relies on this publication.

## About Deloitte

The Deloitte Touche Tohmatsu Limited's life sciences and health care (LSHC) industry group is composed of more than 12,000 professionals in more than 90 countries. These member firm professionals understand the complexity of today's life sciences and health care industry challenges, and provide clients with integrated, comprehensive services that meet their respective needs. In today's environment, LSHC professionals from across the Deloitte network help companies to evolve in a changing marketplace, pursue new and innovative solutions, and sustain long-term profitability.

For more information about the DTTL LSHC industry group, email [dttlshc@deloitte.com](mailto:dttlshc@deloitte.com) or access [www.deloitte.com/healthcare](http://www.deloitte.com/healthcare).