



Global Top Health Industry Issues 2021

Innovation fuelled by digital capabilities

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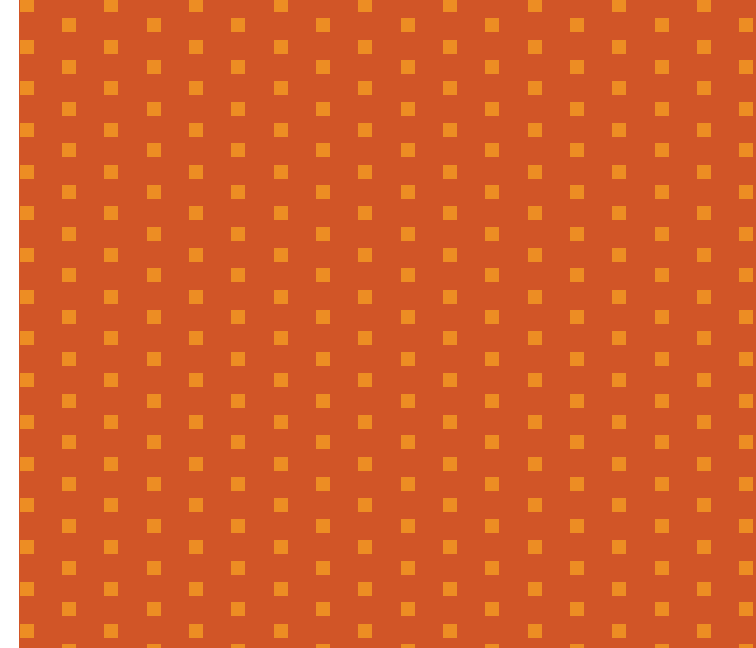
A year of challenges

The healthcare industry responded with astonishing speed to the shock of the COVID-19 pandemic. As we start to move from crisis response to recovery and reform, we all owe a debt of gratitude to our healthcare and aged-care workers and leaders for their commitment and sacrifice.

Practically overnight, clinicians, healthcare providers, pharmaceutical companies and payers shifted much of their work onto virtual platforms and other digital technologies. As consumers grappled with a deadly new virus, providers embraced virtual technology in unprecedented numbers so they could continue to serve patients despite restrictions on in-person interactions. In doing so, they packed a decade's worth of reforms into a few short months. Players across the industry boosted data analytics capabilities to respond to ongoing shifts in healthcare needs, consumer behaviour and the economy. The deployment of digital tools in clinical trials helped companies quickly test whether existing medicines worked against the new virus and enabled the rapid development of COVID-19 vaccines. And work began to shore up the weaknesses evident in the healthcare supply chain.

All this took place amid the broader backdrop of changes coursing through the industry and a set of long-standing common issues affecting the health ecosystem. In the years before the pandemic, and in the months since COVID-19 altered the course of history, a series of transformations has been altering traditional paradigms. And they will continue to do so in coming years. These include a heightened focus on well-being and prevention, the push to develop cures in addition to treatments, paying based on outcomes rather than fee-for-service, new developments in gene therapy and precision medicine, cross-industry convergence, and an end-to-end focus on patient and clinician experience. These themes intersect and interact with significant issues, including excessive cost; health inequities; inadequate transparency, interoperability and collaboration; and a general lack of trust.





Though there are opportunities for improvement in every component of operations in the vast US\$8.3tn global healthcare system, our Global Top Health Industry Issues report focuses on four major themes that were given a shot of momentum by the response to the pandemic, and that will continue to grow in strength. These themes are the opportunity presented by the increase in virtual clinical care, the power of data analytics to deliver better health and economic outcomes, the influential technology-fuelled innovation in clinical trials, and the efforts to build supply chain resilience.¹ The continuing digital transformation plays a key role in each of these issues as players across the healthcare spectrum embrace new tools and capabilities to improve clinical and business operations.

Our analysis is buttressed by a PwC survey of 10,000 consumers in ten territories, conducted in January 2021 to obtain insights into people's healthcare experience during the pandemic and their readiness to adapt to change. The upshot: a year after the onset of the pandemic, many consumers are open to interacting with the healthcare system on digital platforms even after COVID-19 risks have subsided.

Some health systems may address these top issues in the next 12 to 24 months, while others may find these changes being manifested over a longer timeline. But one thing is clear. Rather than revert to normal, the industry has the potential to reimagine healthcare as it progresses to a new normal. We can apply the lessons and innovations learned during the crisis to build a healthcare system that is more resilient and dynamic, more open to new possibilities, and more effective from clinical and business perspectives, as well as one that provides better experiences and outcomes to patients.



Striking the right balance on virtual clinical care

The pandemic forced an immediate halt of most in-person, non-urgent care and the quick uptake of virtual healthcare. Since the initial spike in spring 2020, use of virtual, or remote, healthcare has declined somewhat. But it remains at a level significantly higher than it was before the pandemic.² The actions of investors and players and the opinions of consumers suggest that demand for virtual care will remain high even once COVID vaccination becomes more widespread.



Corporate funding for digital health companies worldwide doubled last year to US\$21.6bn.³ Investment in telemedicine alone hit US\$4.3bn, a 139% jump from 2019. Optimism about virtual care's future is driving M&A activity, including 2020's largest industry deal—US telemedicine provider Teladoc's US\$18.5bn acquisition of digital disease management company Livongo Health in October.

Advances in technology and consumers' desire for convenience are expected to drive adoption of virtual care to a level that disrupts the traditional care delivery system. As a result, provider and payer organisations must develop forward-looking, comprehensive virtual care strategies that make sense from both a patient care and business perspective.

"You either disrupt yourselves or somebody is going to do it for you; we aim to grow and to get better at what we do," said Richard Baggaley, chief people officer at the global private healthcare business Ramsay Health Care UK, in an interview with PwC. "Our business (along with others in healthcare) will evolve significantly in the next five to ten years with the application of new technology and a focus on patient experience."

The PwC global health consumer survey shows extremely high interest in remote care—whether via smartphones or video appointments—even once people are able to return to in-person care. The challenge for hospitals is determining the right mix of virtual and in-person care and the types of virtual care that meet patients' needs while advancing strategic goals. Some specialities, including chronic disease management and care for mental health, might be better suited for virtual care. In the PwC global consumer survey, 36% of respondents said they had experienced symptoms of anxiety or depression as a result of the pandemic, and 44% of respondents who had participated in video virtual care said they were interested in using it for mental health services even after the risk of COVID abates.

A willingness to connect

A large majority of people who tried virtual care during the pandemic say they are willing to do so again in the future.

Q: Of the virtual settings you have used to receive healthcare treatment, would you be willing to use these again once the pandemic risk has decreased and a COVID-19 vaccine has mass adoption?



Base: Those who have used forms of virtual care other than video (1,764–3,798).

Note: Virtual care includes phone, mobile, email and text.

Source: PwC's Global Top Health Industry Issues 2021



3.6bn



Some 3.6bn people remain offline, and broadband services are too expensive for half of the population in developed countries.

From a business perspective, the way systems treat virtual care reimbursement will be a key influencer.⁴ To maintain patient access to care during the pandemic, many countries adopted reimbursement policies that placed virtual care on par with in-person care and/or expanded the types of telemedicine services for which clinicians could be paid.⁵ Questions remain as to whether these payment changes will stay in place and whether reimbursement will vary based on the type of virtual care.

Experience and evidence matter

The shift towards virtual care will stick if provider organisations get the physician and patient experience right. It is vital to give physicians the clinical tools they need to be effective in a remote environment and to ensure that these tools are firmly grounded in evidence-based medicine. New technologies have burst onto the scene, including the Binah.ai app that takes patient vitals via smart-device cameras, Dexcom's continuous glucose monitoring devices for diabetics and Sword Health's connected wearable sensors that guide virtual physical therapy sessions. It is essential to integrate these new tools and modalities into clinical practices, and to adequately train clinicians so they're comfortable with the technology.⁶

The PwC global health consumer survey showed that around half of patients had yet to use virtual care. Providing a good consumer experience will help leverage the positive experience other patients have had and entice non-users to engage in remote care. Going forward, convenience—not pure necessity—is likely to be a driver of patient uptake. But convenience won't be enough if patients don't feel that they're receiving at least the same care as they would in person. And here there's substantial room for improvement. More than one-quarter of respondents to our survey said that during video virtual care visits, they had a technical problem, felt their health problem was not adequately addressed or weren't clear on follow-up care steps, among other difficulties.

Building virtual care capabilities

The PwC global health consumer survey found that many consumers are open to virtual options for a variety of types of care—from initial assessment of a condition or ailment to chronic disease management. But there's a gap between the demand for virtual care and the capacity to deliver it effectively. Investing in increased and enhanced virtual care capabilities will attract patients drawn to remote care's convenience, expand the patient population as physical presence becomes less important, and

generate savings through improved clinician efficiency and reduced facility needs. Triaging care to the most appropriate setting, whether virtual or in person, will create further efficiencies and improve outcomes.

However, developing virtual care capabilities requires substantial investment. This already is driving deals, often in the form of healthcare organisation partnerships with virtual care providers and tech players.⁷ For example, US telehealth company Amwell increasingly is offering its platform to physician and hospital organisations so they can enable their own virtual programmes with their own clinicians.⁸ In India, dozens of leading hospitals use the virtual consulting platform developed by the startup MyHealthcare.⁹

If payers, providers and patients can achieve the right mix of virtual and in-person care while improving the overall patient experience, it could be a catalyst to lower costs—thus freeing up funds to invest in further enhancements. However, adoption levels will have to stabilise before major changes can be undertaken.



Implications

- ✓ **Protect against care inequities.** Though immensely promising for patients with mobility barriers or access issues, virtual care can create new disparities or worsen existing inequities if vulnerable populations, including minorities, the elderly, and the poor, don't have the mobile devices, connectivity, and digital literacy needed to participate. Some 3.6bn people remain offline, and broadband services are too expensive for half of the population in developed countries, according to the World Economic Forum.¹⁰ Health organisations should take into account technology access among vulnerable populations when building their strategies.
- ✓ **Address health data privacy and security.** The more people use telemedicine, healthcare apps and remote monitoring devices, the greater the number of potential entry points for cybercriminals seeking to steal patient data or launch ransomware attacks.^{11,12} Healthcare organisations must boost their cybersecurity efforts, understand privacy laws and build powerful security into solutions or products they design.
- ✓ **Manage for change.** It's not enough simply to make digital tools available or demand that employees and partners use them. Providing digital upskilling opportunities, building organisational digital fitness and helping employees adjust to changing work practices will be essential. "Managing the change and taking care of employee well-being will be huge," Ramsay Health Care's Baggaley said. "Organisations will have to work very hard to communicate with their employees and to explain what they're doing and why."





Harnessing data analytics

COVID-19 was the first truly global pandemic in the age of artificial intelligence (AI) and big data. But when the pandemic arrived, healthcare organisations often struggled to find the basic information they needed to respond—whether it was disease and death rates or the availability of hospital beds and critical supplies. The experience shows the need for prospective models fuelled by a steady stream of data in as close to real time as possible. The disorganised rollout of COVID vaccination programmes in many countries illustrates how much more must be done to harness the power of data and analytics. At the same time, a recognition of the power of data analytics to improve care, enhance the patient experience and lower costs is driving a convergence between the tech, health services, and pharmaceutical and life sciences industries.



Take an ecosystem view

The pandemic showed that healthcare organisations need to understand how health, economic, and social data intersect and amplify one another.¹³ Overnight, the crisis radically changed people's health needs and their behaviour. Demand for services related to COVID spiked, while the risk of infection meant it was no longer safe to provide or receive care for non-essential needs. The economic crisis that soon followed strained healthcare budgets. These changes affected the bottom lines of organisations across the health industry. Building dynamic data analysis and forecasting systems that combine these data streams would help healthcare organisations respond more effectively during the next public health emergency, as well as help deliver better health outcomes with more sustainable, affordable costs over the long term.

Because no one organisation holds the keys to all these types of data, collaboration and a willingness to gather information from nontraditional sources are vital.

In short, an ecosystem view is required. Players in the healthcare ecosystem can include hospitals and doctors, pharmaceutical and life sciences companies, healthcare payers, social media and technology companies, pharmacies, government, employers, and community organisations.

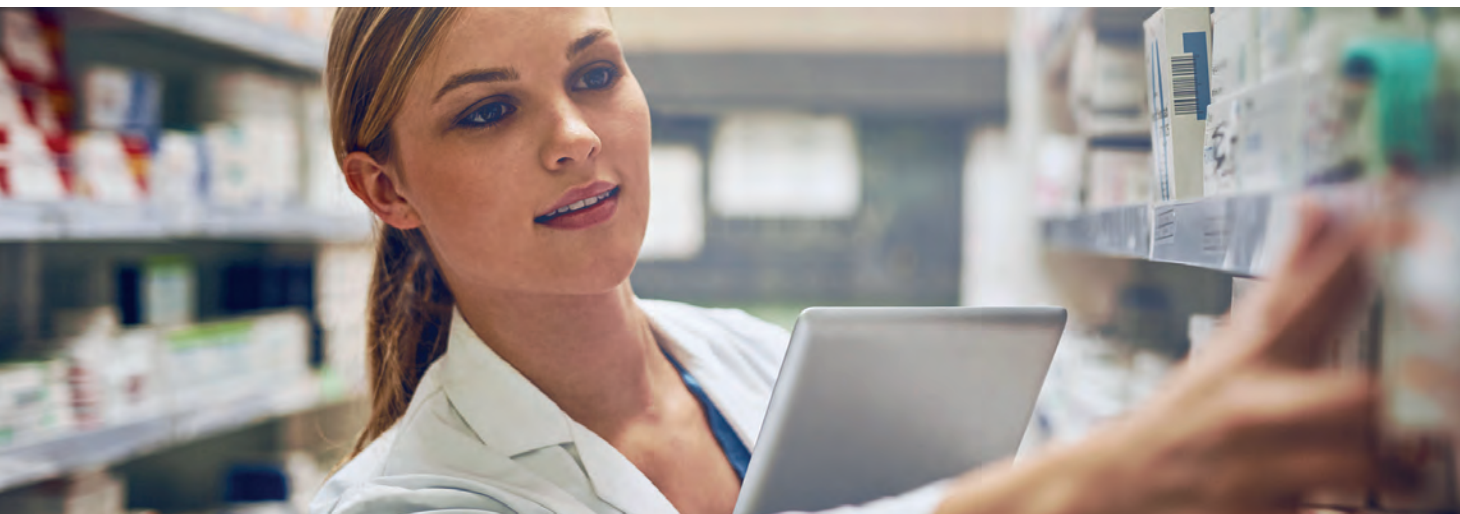
Because these participants have different goals that need to be aligned for cross-sector collaborations to work, the value proposition must be clear to each party. For example, an initiative to predict influenza outbreaks better by tracking social media chatter, search trends and purchases at pharmacies could (1) give providers more time to prepare for surges in demand and clinician absences due to illness, (2) afford employers an opportunity to prepare and perhaps shift some employees to remote work, and (3) help drug makers, pharmacies and retailers make sure shelves are properly stocked.

In Australia, the glue holding together the 140-plus partner organisations in the Western Sydney Diabetes alliance is

the size of the problem and its cost—nearly AUS\$1.5bn (US\$1.1bn) in 2018.¹⁴ “You have to put it in economic terms to get organisations’ attention,” said Glen F. Maberly, director of the alliance, in an interview with PwC. “Once they’re on board, it’s about showing them how helping to tackle the problem helps their organisation and supports its vision.”

Though historically hesitant to cast a wide net for data, healthcare organisations are turning to alternative sources that can provide crucial insights into social determinants of health.¹⁵ For example, Western Sydney Diabetes looks to schools and clothing retailers for data that can be used to spot weight trends—because obesity is a major diabetes risk factor.

Given the rise of chronic disease and the impact of underlying health conditions on COVID-19 severity, leveraging data analytics will be critical to targeting interventions to deliver better health outcomes going forward.¹⁶



The unprecedented cooperation and data sharing between governments, pharmaceutical companies and healthcare providers enabled the development of a COVID-19 vaccine within just a year of the virus's emergence. The collaborative model continues in the efforts to evaluate vaccine performance in patient populations, especially as new COVID variants emerge. The collaborative agreement between Israel and Pfizer to study the effectiveness of the Pfizer-BioNTech vaccine is a case in point. COVID vaccine development serves as a powerful example that shows how increased collaboration and use of data analytics can benefit human health—and do so much more rapidly and efficiently than in the past.

Build data analytics capacity

The lessons learned from the pandemic are fuelling interest in cross-sector collaborations that will make better data analytics possible. In a recent PwC Health Research Institute survey, 73% of US healthcare executives said they were starting to or had plans to collaborate with other care providers and payers due to the pandemic, and 65% said they were starting to or had plans to collaborate with public health agencies.¹⁷

The desire to make use of data is driving a convergence of tech and healthcare. Data analytics tools, often powered by machine learning and artificial intelligence, are being deployed across the industry to drive therapeutic discoveries, improve patient care, create a better patient experience, and generate savings by speeding innovation and improving business operations and care delivery.¹⁸

Tech companies—from the established giants to modest startups—are developing analytics and AI tools

aimed at the healthcare industry. For example, Amazon Web Services in December 2020 launched Amazon HealthLake, a tool that enables users to aggregate, search and analyse data to make more precise predictions about the health of their patients and populations.¹⁹

As is the case with virtual healthcare, the thirst for data is driving deals.²⁰ “Healthcare organisations are thinking about how they can amalgamate data for the good of patients and the people who are paying for care,” Ramsay Health’s Baggaley said. “There are going to be big partnerships between companies that have that data and want to give it to another for various reasons.”

Access to data was the impetus for the collaboration between the multinational pharmaceutical company GlaxoSmithKline (GSK) and personal genomics company 23andMe. “It’s all about [finding out] who do we need to partner with to make our data do something for the patients and the consumers we serve,” said Jayne Haines, senior vice president for talent, learning and organisation development at GSK, in an interview with PwC. The companies began working together in 2018 to prioritise drug-development candidates using genetic data. And in July 2020, the two began their first joint clinical trial—for a potential cancer treatment. More than two dozen other projects are underway.²¹

As AI and machine learning are increasingly applied to data analytics across the healthcare industry, they will accelerate the shift towards personalised and genetic medicine, individualised medical care, and personal wellness. “The opportunity is: how can you use this technology and this data ultimately to understand patients better so you can keep them fit and well?” Baggaley said.






73%

of US healthcare executives said they were starting to or had plans to collaborate with other care providers and payers due to the pandemic.



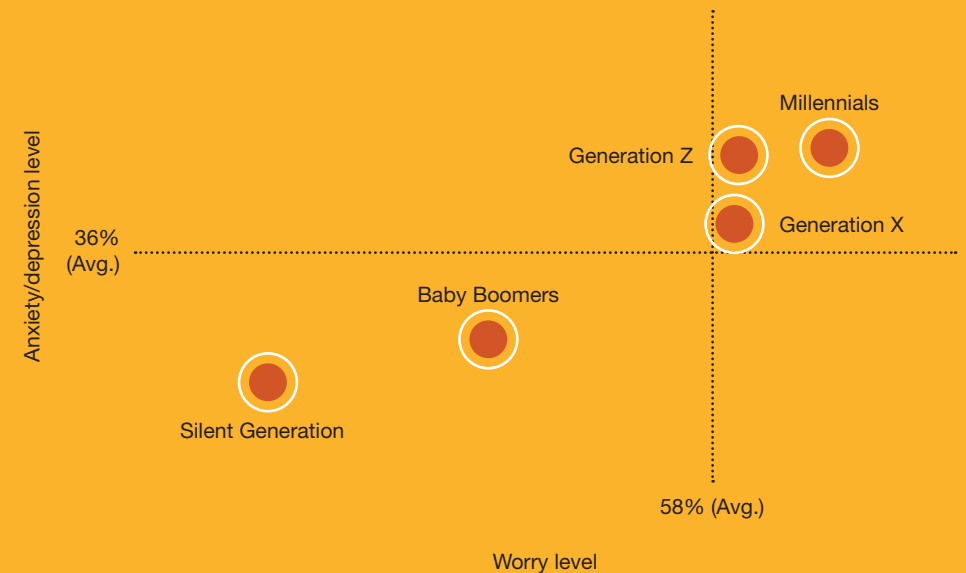
Implications

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Leverage data to target interventions. Data can be used to target interventions to the right patients, thus improving outcomes and lowering costs.²² The PwC global health consumer survey found that though 36% of respondents overall experienced anxiety or depression as a result of the pandemic, the prevalence was higher among Generation Z (42%) and Millennials (43%). Such findings can help healthcare organisations develop communication and outreach strategies directed at specific populations. Behavioural analytics can be applied by pharmaceutical and health services organisations to drive patient engagement and improve adherence to medication, health and wellness regimens.
- 
Convene regional collaborations. Health systems and medical research organisations can bring together and lead data-driven regional healthcare collaborations with local players, such as community organisations, pharmacies, government and local employers. Tech players can serve as key partners, helping generate insights from health, consumer and social determinants of health data that can be used to identify trends, target interventions and drive smart outreach strategies.
- 
Develop a data-driven culture. The increasing focus on data and analytics means that healthcare organisations need to create a culture of data-driven decision-making in which information is transformed into insights.²³ “You need to be much more data-fluent as an organisation and have people who not only can read the data, but have the insight and influence to make something of it,” said GSK’s Haines.

Generation gap

Younger people were much more likely to report mental health issues as a result of the pandemic.

Q: Since the pandemic, have you experienced any symptoms of anxiety or depression as a result of the COVID-19 pandemic?



Base: All respondents (10,038). Don't know 4%.

Source: PwC's Global Top Health Industry Issues 2021



Evolving clinical trials

Pharmaceutical companies that had invested in innovation enabled by digital technologies fared better during the pandemic than those that had not. These investments will accelerate the adoption of digitally enabled tools and processes in the industry.



Pfizer focused on digitising its R&D process in 2018 and 2019. That work built the infrastructure that supported Pfizer's massive COVID vaccine trial, its first to use digital methodologies from the beginning to the end, as CEO Albert Bourla told *strategy+business*.²⁴ "There were billions of entries, because so many tests were run and had to be included into this system. Yet there was very little paper to move. So that helped a lot."

The pandemic's disruption of existing in-person clinical trials forced the adoption of digital technology and remote-care tools that enable researchers to handle some aspects of trials virtually. To maintain its existing trials, Providence St. Joseph Health in Washington state conducted telehealth visits, used home-based testing or monitoring technologies, and provided curbside or courier pickup and delivery of participant samples and investigational products.²⁵

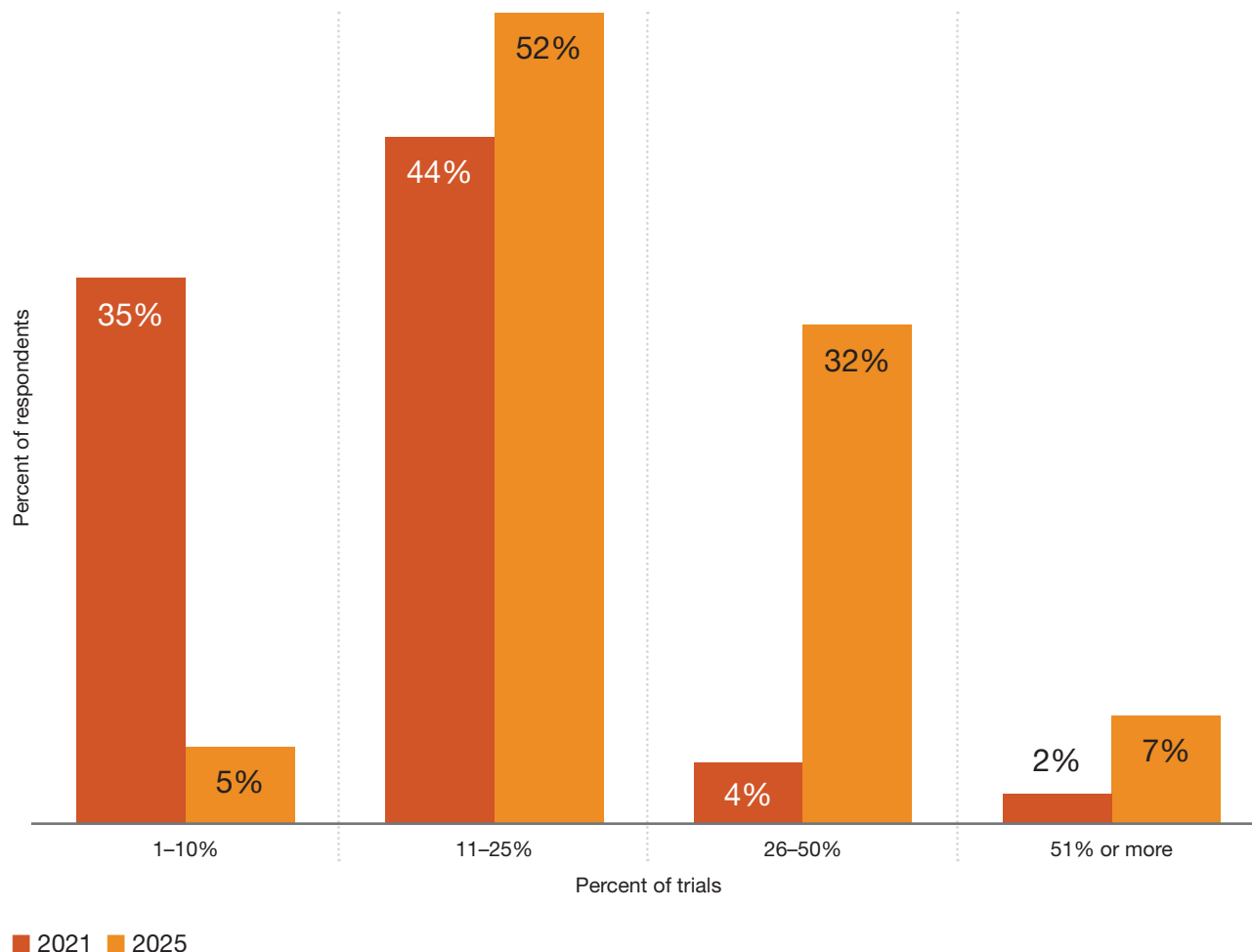
Positive experiences during COVID-related trials undoubtedly increased enthusiasm for incorporating digital components into trials when feasible. Novartis Chief Medical Officer John Tsai, MD, has attributed the record speed of getting the company's COVID-related trials up and running, in part, to digital methodologies for recruitment.²⁶ Eli Lilly CEO David Ricks has said that the effectiveness of COVID-induced changes, such as remote monitoring and digital interactions with trial sites, will have a lasting effect.²⁷

Growing impact

Leaders project that the way they conduct trials will evolve in the coming years.

Q: What percentage of your organisation's clinical trials do you expect will use virtual components in 2021?

Q: What percentage do you expect will use virtual components in five years?



Note: Not shown: 13% of respondents selected 0% for 2021; 2% selected 0% for 2025.

Source: PwC Health Research Institute health executive survey, August–September 2020

Appealing to consumers

In theory, clinical trials that include digital tools and some remote patient monitoring and virtual interactions attract a larger participant pool because they greatly reduce the inconvenience of travelling to trial sites. Enabling participants to engage in much of the trial from home also can improve retention.

The PwC global health consumer survey indicates strong interest in such trials. Sixty-six percent of respondents said they would be very or somewhat willing to engage in clinical trials that included such features, with 32% of Millennials, 26% of Baby Boomers and 24% in Generation Z reporting that they'd be very willing to participate.

The survey also found that a large proportion of consumers interested in such trials were comfortable with the various elements they involve, including using technology to provide data (88%), having in-depth conversations with the research team virtually (83%), signing up for a trial through digital technology (83%) and using a remote health monitoring device (81%).

Trials that incorporate digital and virtual tools also can attract a broader diversity of patients than can clinic sites or research hospitals, which typically are located in metropolitan areas. By reducing the travel and time inconvenience of traditional locations, remote trials could boost enrolment among typically underserved populations, including women, rural residents and minorities.²⁸

Pharmaceutical companies increasingly are looking for opportunities to decentralise clinical trials where appropriate by using nontraditional physical locations

for trials, such as in-store health clinics, that are closer to patients' homes. In December 2020, a large number of life sciences and healthcare organisations created an alliance aimed at accelerating the broad adoption of patient-focused, decentralised clinical trials. The mission of the Decentralized Trials & Research Alliance is to unite stakeholders—healthcare companies, regulators, patient groups and research organisations—in an effort “to make clinical trial participation widely accessible by advancing policies, research practices and new technologies in decentralized clinical research.”²⁹

Increasing investment in innovation

In the PwC Health Research Institute survey, 93% of pharmaceutical and life sciences executives said trials that include digital elements were important to their company's pipeline in the next five years, and 98% said they expected digital investment in clinical trials to increase in 2021.³⁰ The global market size for trials that involve virtual or digital elements could reach US\$10bn by 2026, according to one recent estimate.³¹

Heightened interest fuelled strong funding rounds for several US companies that leverage the virtual and/or digital elements of clinical trials. In August 2020, Novartis, Amgen and Sanofi Ventures participated in the US\$40m funding round for Science 37, a US firm that facilitates trials in which some or all subjects can participate from home.³² In November 2020, the global contract research organisation PPD Inc. participated in the US\$91m funding round for the US startup Medable, which offers a variety of tools for digitally or virtually enabled trials and a decentralised trial platform.³³

93% 

of pharmaceutical and life sciences executives said trials that include digital elements were important to their company's pipeline in the next five years.





Implications

- 
Determine the right studies for new models. Not every therapeutic area is a good match for decentralised studies, or those that incorporate remote patient interactions, due to trial requirements and patient safety and needs. Trial sponsors should identify and prioritise appropriate disease areas and, in the case of decentralised trials, examine the feasibility of running studies in unconventional locations that can adequately facilitate patient visits, drug storage and biospecimen collection. Some locations, such as retail health clinics, may already have the necessary infrastructure in place.
- 
Weigh the costs and savings. Trials that feature remote tools for some patient interactions and monitoring create savings in a number of areas, including those associated with onsite monitoring and management.³⁴ However, sponsors must factor in nontraditional costs, such as the expense of providing participants with any necessary monitoring devices or wearables.
- 
Address consumer concerns. In the PwC global health consumer survey, 23% of respondents said they were unwilling or somewhat unwilling to take part in remote trials. Among reasons were trust concerns (30%), the time commitment (21%) and health concerns (20%). To boost consumer interest in remote trials, research organisations could engage in messaging that addresses these barriers.
- 
Increase participant diversity. Bringing clinical trials closer to patients by decentralising the locations for studies (in instances where this model is appropriate) can increase participant diversity. Use of patient-facing tools that reduce the number of visits to traditional trial centres can also make studies more appealing to patients in rural populations or those with other access issues. Technology access challenges—including connectivity problems and the expense of mobile devices—must be addressed lest they pose barriers to reaching remote, low-income and minority populations.

Overcoming obstacles

Consumers cite trust issues and time commitment as the leading reasons they're sceptical of remote trials.

Q: Why would you not be willing to participate in a clinical trial which was conducted remotely (e.g., collecting data digitally, with fewer visits to a physical study site)?



Base: Those unwilling to take part (3420). Don't know 20%.

Source: PwC's Global Top Health Industry Issues 2021



Developing supply chain resiliency

The pandemic shone a harsh spotlight on supply chain weaknesses. The over-reliance on cheaper markets—primarily China and India—resulted in shortages of APIs (application programming interfaces), supportive care drugs, ventilators and personal protective equipment in early 2020.³⁵ In a PwC Health Research Institute executive survey, 94% of pharmaceutical and life sciences executives and 86% of provider executives said that improving their supply chain overall was a priority in 2021.³⁶



Building stronger links

Executives plan a range of activities to make their supply chains more resilient.

Q: Which of the following will your organisation prioritise in 2021 related to supply chain?

Improving supply chain transparency

41%

50%

Improving the security of the supply chain

29%

16%

Finding the right suppliers

16%

22%

Understanding and managing third-party risks

9%

11%

None of the above

5%

1%

■ Health services provider executives

■ Pharmaceutical/life sciences executives

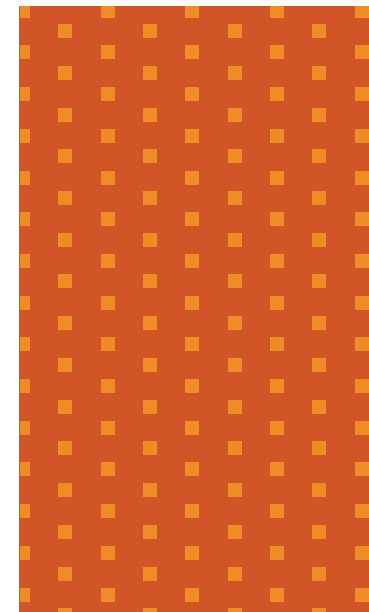
Source: PwC Health Research Institute health executive survey, August–September 2020

The focus in 2021 will be on building flexibility and redundancy into the supply chain—work that not only prepares industry players for the next public health crisis but builds a buffer against other disruptions, including natural disasters and geopolitical conflicts. This work produces a host of other positive outcomes, including job creation and environmental, social and governance (ESG) benefits through appropriate localisation of manufacturing and the supply chain.

Increasing redundancy and boosting efficiency

Pharmaceutical manufacturers need to proactively map suppliers of essential goods to determine whether they are in regions that could be subject to disruption. Depending on the results, manufacturers should identify and secure secondary suppliers. Drug makers are advised to have at least two registered sources for critical supplies, ideally in different geographic locations.³⁷ If a problem occurs at one, the other can ramp up quickly because regulatory approval (where necessary), supplier qualification and equipment are already in place. Most major suppliers are located in just a few countries, so finding alternative sources in different countries will take time.

Increasingly, companies are considering near-shore or onshore sources of supplies. Pharmaceutical companies could borrow from the tech industry's and automakers' playbook by maintaining overseas manufacturing facilities but building a secondary facility in their home country.³⁸ Key considerations for companies evaluating whether to reshore include tax implications, the time and costs of establishing new facilities and supply networks, transportation logistics, the availability of a skilled workforce, and payer or consumer price sensitivity.





Efficiency is another key component in building supply chain resilience. Among the most important efficiency drivers of systems are increased automation and advanced manufacturing practices, including 3D printing and continuous manufacturing. Investment in data analytics to track supplies, identify waste, ensure quality and safety, and drive innovation is also critical. GSK is using AI and machine learning–driven models to establish end-to-end visibility of products.³⁹ “We are using AI-based automation within the warehouse extensively,” noted Subroto Mukherjee, head of innovation and emerging technology, Americas, at GlaxoSmithKline Consumer Healthcare, in a December 2020 podcast. Available tools range from mechanical arms that can sort and handle cargo to software capable of calculating daily stock movement, and diagnostic and blockchain technologies to protect against counterfeit products.



Forging deals to secure PPE

To avoid a repeat of the shortages experienced in early 2020, many hospitals are exploring nontraditional relationships—joint ventures, partnerships or nontraditional contracting—to create supply chain redundancy, particularly with respect to personal protective equipment. In November 2020, the US group purchasing organisation Premier Inc. and 34 of its member health systems partnered with DeRoyal Industries Inc., a medical manufacturer, to create a joint venture dedicated to the domestic production of isolation gowns.⁴⁰ An existing facility in Tennessee will produce the product, and raw materials will come primarily from US-based manufacturers, with backup capacity from Mexico and South America. Canadian medical products manufacturer PRIMED established a new medical manufacturing facility in Cambridge, Ontario, that will make surgical masks; in November 2020, it entered into a supply deal with the provincial government.^{41,42}

94%



of pharmaceutical and life sciences executives and 86% of provider executives said that improving their supply chain overall was a priority in 2021.



Implications

- ✓ **Consider supply localisation.** Healthcare organisations—whether buyers or providers of products—must decide the degree to which they need to localise their supply chains for different products. Such factors as risk and resilience, development of a broader ecosystem, cost–benefit analysis, tax incentives, and talent availability should be considered for the short and long term. Organisations should build in agility with redundant infrastructure.
- ✓ **Build partnerships required for resilience.** Governments, pharmaceutical companies and providers collaborated at an unprecedented level in the effort to develop and manufacture COVID vaccines. Going forward, healthcare organisations should explore partnerships that enable innovation, foster supply chain resilience and advance product distribution. For example, the partnerships and infrastructure put in place to support the efficient deployment of COVID-19 mRNA vaccines could be leveraged to accelerate development of any new cell and gene therapies or mRNA products.
- ✓ **Invest in the workforce of the future.** Supply chain resilience requires investment not only in advanced manufacturing processes and data analytics but in people who understand the technology and the power of data. As AI and machine learning pervade the supply chain—from identifying promising molecules for drug development to getting finished products to customers—companies are competing for people with data science skills. “There is a massive war for talent on at the moment, be that the vaccine companies looking for the best scientists or the supply chain companies looking for the people who are the best at combating the likes of Amazon,” GSK’s Haines told PwC.





A brighter future

To be sure, healthcare organisations face much uncertainty as the COVID-19 pandemic continues more than a year after it began. They continue to grapple with a series of demands, each of which in isolation would be a major challenge. They have to operate with a deadly pathogen in their midst, conduct a massive immunisation drive, catch up on deferred preventive and elective care, and manage normal healthcare demand.

Still, going back to the same old way of doing business is not an option. Healthcare organisations have the opportunity to build on the lessons they learned in 2020 by establishing a stronger footing on the balance between in-person and virtual care; embracing digital technologies and analytics to improve operations, clinical trials, preventive health and patient care; and taking steps to strengthen their supply chains. Healthcare organisations that do so will grow stronger, more resilient, and more effective from the clinical and business perspectives in 2021 and beyond. Reimagining healthcare as we emerge from the COVID-19 crisis gives us the opportunity to deliver better health outcomes to all, with more sustainable and affordable costs—truly a silver lining from the pandemic's dark clouds.

Endnotes

1. Jing Zhang and Milena Izmirlieva, "Global healthcare spend to remain stable," IHS Markit, 1 Sep 2020: <https://ihsmarkit.com/research-analysis/global-healthcare-spend-to-remain-stable.html>.
2. COVID-19 Healthcare Coalition, *Telehealth Impact: Claims Data Analysis*, 21 Jan 2021: <https://c19hcc.org/telehealth/claims-analysis>.
3. Heather Landi, "COVID-19 supercharged digital health funding in 2020 to reach record levels: report," *Fierce Healthcare*, 7 Jan 2021: <https://www.fiercehealthcare.com/tech/covid-19-supercharged-digital-health-funding-2020-record-21-6b-invested-report>.
4. COVID-19 Healthcare Coalition, *Telehealth Impact: Physician Survey Analysis*, 16 Nov 2020: <https://c19hcc.org/telehealth/physician-survey-analysis>.
5. Ateev Mehrotra, MD, et al., "Paying for Telemedicine After the Pandemic," *JAMA*, 2 Feb 2021: <https://jamanetwork.com/journals/jama/article-abstract/2775723>.
6. Ashwini M. Zenooz, "Telehealth Is Working for Patients. But What About Doctors?" *Harvard Business Review*, 13 Nov 2020: <https://hbr.org/2020/11/telehealth-is-working-for-patients-but-what-about-doctors>.
7. PwC Health Research Institute, *How the health industry will position for growth in 2021*, 22 Jan 2021: <https://www.pwc.com/us/en/industries/health-industries/library/position-for-growth-health-2021.html>.
8. Jessica Kim Cohen, "What's next for on-demand telehealth companies?" *Modern Healthcare*, 22 Feb 2021: <https://www.modernhealthcare.com/patients/whats-next-demand-telehealth-companies>.
9. MyHealthcare, "MyHealthcare—transforming healthcare delivery," *VCCircle*, 9 Mar 2021: <https://www.vccircle.com/myhealthcare-transforming-healthcare-delivery>.
10. World Economic Forum, "Tackling Digital Deserts: Launch of First Cross-Sector Alliance to Close the Digital Divide," 28 Jan 2021: <https://www.weforum.org/press/2021/01/tackling-digital-deserts-launch-of-first-cross-sector-alliance-to-close-the-digital-divide/>.
11. Kelly Rozumalski and Andrew Speirs, "Balancing cybersecurity and patient care in telehealth," *Security*, 9 Dec 2020: <https://www.securitymagazine.com/articles/93737-balancing-cybersecurity-and-patient-care-in-telehealth>.
12. Ryan Basen, "Data Security: Telehealth's Achilles Heel?" *Medpage Today*, 4 Sep 2020: <https://www.medpagetoday.com/practicemanagement/telehealth/88469>.
13. PwC Health Research Institute, *Q&A on how forecasting can help health organizations navigate the pandemic and more*, 10 Feb 2021: [pwc.com/us/en/industries/health-industries/library/qa-healthcare-predictive-modeling-forecasting.html](https://www.pwc.com/us/en/industries/health-industries/library/qa-healthcare-predictive-modeling-forecasting.html).
14. PwC Australia, *Working together to prevent diabetes in western Sydney*: <https://www.pwc.com.au/about-us/solving-important-problems/working-together-to-prevent-diabetes-in-western-sydney.html>.
15. PwC Health Research Institute, *Q&A on how forecasting can help health organizations navigate the pandemic and more*, 10 Feb 2021: [pwc.com/us/en/industries/health-industries/library/qa-healthcare-predictive-modeling-forecasting.html](https://www.pwc.com/us/en/industries/health-industries/library/qa-healthcare-predictive-modeling-forecasting.html).
16. US Centers for Disease Control and Prevention, *COVID-19: People with Certain Medical Conditions*, 15 Mar 2021: <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html>.
17. PwC Health Research Institute, *Top health industry issues of 2021: Will a shocked system emerge stronger?* Dec 2020: <https://www.pwc.com/us/en/industries/health-industries/top-health-industry-issues.html>.
18. PwC Australia, *Adopting AI in healthcare: Why change?* 2019: <https://www.pwc.com.au/health/adopting-ai-in-healthcare.html>.
19. Amazon, "Introducing Amazon HealthLake to make sense of health data," 8 Dec 2020: <https://aws.amazon.com/about-aws/whats-new/2020/12/introducing-amazon-healthlake-to-make-sense-of-health-data>.
20. PwC Health Research Institute, *How the health industry will position for growth in 2021*, 22 Jan 2021: <https://www.pwc.com/us/en/industries/health-industries/library/position-for-growth-health-2021.html>.
21. Kristen V. Brown, "23andMe and GSK Head to Clinical Trials with Cancer Drug," *Bloomberg*, 29 Jul 2020: <https://www.bloomberg.com/news/articles/2020-07-29/23andme-and-gsk-head-to-clinical-trials-with-cancer-drug>.
22. PwC Australia, *Adopting AI in healthcare: Why change?* 2019: <https://www.pwc.com.au/health/adopting-ai-in-healthcare.html>.
23. Anil Khurana, Roger Wery, and Amy Peirce, "How companies can transform information into insight," *strategy+business*, 9 Sep 2020: <https://www.strategy-business.com/article/How-companies-can-transform-information-into-insight>.
24. Ron Chopoorian and Daniel Gross, "Pfizer's vaccine machine," *strategy+business*, 4 Feb 2021: <https://www.strategy-business.com/article/Pfizers-vaccine-machine>.
25. Katherine R. Tuttle, "Impact of the COVID-19 pandemic on clinical research," *Nature*, 5 Aug 2020: <https://www.nature.com/articles/s41581-020-00336-9>.
26. Ben Adams, "JPM: Novartis CMO Tsai on how the pandemic is changing the face of biopharma R&D, how pharma works," *Fierce Biotech*, 12 Jan 2021: <https://www.fiercebiotech.com/biotech/jpm-novartis-cmo-john-tsai-pandemic-changing-face-biopharma-r-d-and-how-pharma-works>.
27. Eric Sagonowsky, "JPM: Lilly, Moderna, insitro CEOs say pandemic forced R&D, marketing and ops changes worth keeping," *Fierce Pharma*, 12 Jan 2021: <https://www.fiercepharma.com/pharma/jpm-amid-first-ever-virtual-jpm-conference-ceos-see-some-pandemic-changes-becoming-permanent>.
28. Deborah Plana et al., "Re-Envisioning Clinical Trials During the COVID-19 Pandemic," *Health Affairs*, 8 Jul 2020: <https://www.healthaffairs.org/doi/10.1377/hblog20200702.963588/full>.
29. Decentralized Trials & Research Alliance, "Decentralized Trials & Research Alliance (DTRA) Launches to Democratize and Accelerate Clinical Trials," 10 Dec 2020: <https://dtra.org/dtra-launches-to-democratize-and-accelerate-clinical-trials>.
30. PwC Health Research Institute, *Top health industry issues of 2021: Will a shocked system emerge stronger?* Dec 2020: <https://www.pwc.com/us/en/industries/health-industries/top-health-industry-issues.html>.
31. Intrado GlobeNewsire, "Global Virtual Clinical Trials Market by Study Type, by Indication, by Region, Industry Analysis and Forecast, 2020–2026," 23 Dec 2020: <https://www.globenewswire.com/news-release/2020/12/23/2150133/0/en/Global-Virtual-Clinical-Trials-Market-By-Study-Type-By-Indication-By-Region-Industry-Analysis-and-Forecast-2020-2026.html>.
32. Science 37, "Science 37 Raises \$40 Million to Extend Its Leadership in the Decentralized Clinical Trial Market," 20 Aug 2020: <https://www.prnewswire.com/news-releases/science-37-raises-40-million-to-extend-its-leadership-in-the-decentralized-clinical-trial-market-301115398.html>.
33. Business Wire, "Medable Secures \$91 Million Funding to Accelerate Industry Shift to Digital and Decentralized Clinical Trials," 19 Nov 2020: <https://www.businesswire.com/news/home/20201119005713/en/Medable-Secures-91-Million-Funding-to-Accelerate-Industry-Shift-to-Digital-and-Decentralized-Clinical-Trials>.
34. Débora S. Araujo, "Measuring the Financial Impact of Remote (Digital) Clinical Trials," *Clinical Leader*, 29 Jan 2019: <https://www.clinicalleader.com/doc/measuring-the-financial-impact-of-remote-digital-clinical-trials-0001>.

35. Susan Haigney, "Ensuring a Safe and Robust Supply of Pharma Materials," *Pharmaceutical Technology*, 2 Aug 2020: <https://www.pharmtech.com/view/ensuring-a-safe-and-robust-supply-of-pharma-materials>.
Sarah Butler and Tom Sorrell, "Strengthening Australia's life sciences sector and medical supply chain beyond COVID-19," PwC Australia, 23 Jul 2020: <https://www.pwc.com.au/health/health-matters/strengthening-australias-life-sciences-sector-and-medical-supply-chain-beyond-covid-19.html>.
36. PwC Health Research Institute, *Top health industry issues of 2021: Will a shocked system emerge stronger?* Dec 2020: <https://www.pwc.com/us/en/industries/health-industries/top-health-industry-issues.html>.
37. Susan Haigney, "Ensuring a Safe and Robust Supply of Pharma Materials," *Pharmaceutical Technology*, 2 Aug 2020: <https://www.pharmtech.com/view/ensuring-a-safe-and-robust-supply-of-pharma-materials>.
38. PwC Health Research Institute, *Top health industry issues of 2021: Will a shocked system emerge stronger?* Dec 2020: <https://www.pwc.com/us/en/industries/health-industries/top-health-industry-issues.html>.
39. Cognilytica, "AI Today Podcast: AI in Pharma, Interview with Subroto Mukherjee, Head of Innovation and Emerging Technology, Americas, at GlaxoSmithKline Consumer Healthcare," 16 Dec 2020: <https://www.cognilytica.com/2020/12/16/ai-today-podcast-ai-in-pharma-interview-with-subroto-mukherjee-head-of-innovation-and-emerging-technology-americas-at-glaxosmithkline-consumer-healthcare>.
40. Premier, "Premier and 34 Leading Health Systems Partner with DeRoyal to Expand Domestic Production of Isolation Gowns," 16 Nov 2020: <https://www.premierinc.com/newsroom/press-releases/premier-and-34-leading-health-systems-partner-with-deroyal-to-expand-domestic-production-of-isolation-gowns>.
41. PRIMED, "PRIMED Medical Products Announces Location of Major Medical Manufacturing Facility in Canada," 26 Aug 2020: <https://www.globenewswire.com/news-release/2020/08/26/2084213/0/en/PRIMED-Medical-Products-Announces-Location-of-Major-Medical-Manufacturing-Facility-in-Canada.html>.
42. "Cambridge medical mask manufacturer inks deal with province for 50 million masks a year," *CBC News*, 17 Nov 2020: <https://www.cbc.ca/news/canada/kitchener-waterloo/primed-mask-manufacturer-cambridge-1.5804139>.

About this research

The first Global Top Health Industry Issues report was published in 2018; in this second edition, PwC identified four issues that affect health industries globally for healthcare providers, health insurers, pharmaceutical and life sciences companies, new entrants, and employers. PwC conducted interviews in January and February 2021 with health industry executives, government-funded health and social service programmes, and global member firms. Also included are findings from PwC's 2021 global health consumer survey of roughly 10,000 consumers across ten territories. PwC also examined government data sources, journal articles and conference proceedings in developing this report.

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About PwC Research

PwC Research, PwC's global centre of excellence for market research and insight, conducted this global health consumer survey. For further information on the research, please contact Rachel Surgenor (rachel.a.surgenor@pwc.com), PwC Research.

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