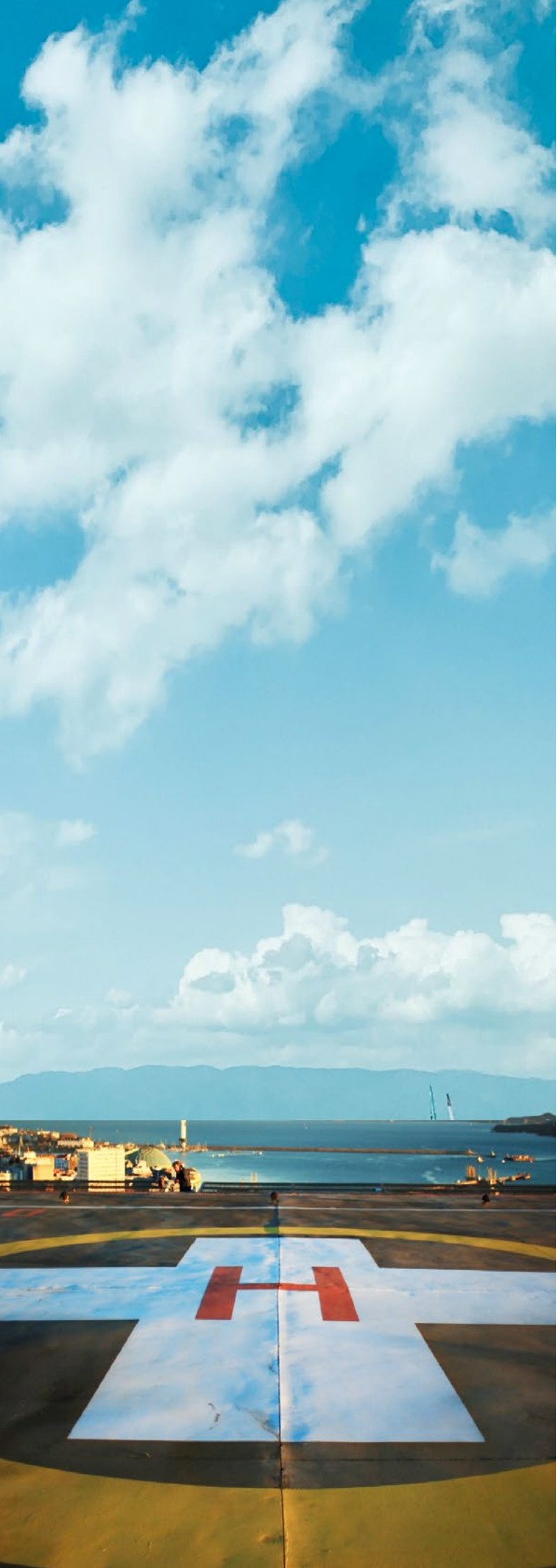


Expert Insights

A hybrid cloud prescription

Accelerating transformation in healthcare and life sciences

IBM **Institute for Business Value**

Experts on this topic

Ryan Hodgin

IBM Global Markets,
Chief Technology Officer
for Healthcare Providers
linkedin.com/in/rhodgin/
hodgin@us.ibm.com

Ryan Hodgin has deep expertise in guiding large organizations through cloud transformations. With a unique background as a developer, application architect, and emerging technologist, he provides hands-on technical leadership for development teams and senior leaders at C-level.

Carlin “Rick” Smith

IBM Global Markets,
Chief Technology Officer
for Healthcare Payers
linkedin.com/in/carlinsmithjr/
crsmithj@us.ibm.com

Carlin “Rick” Smith’s focus is integration strategy, solution design, and architectural methodology for customer innovation. His diverse background includes unearthing high performance and research computing, and grid initiatives.

Ramesh Gangisetty

IBM Global Markets,
Chief Technology Officer
for Consumer Healthcare
linkedin.com/in/rameshgangisetty/
ramesh.gangisetty@us.ibm.com

Ramesh Gangisetty’s industry expertise comes from 25 years of direct customer-facing experience in financial services, public, and healthcare payer industries. He is a trusted strategy and technology adviser working closely with the IBM Technology Architecture and Innovation group.

Neeraj Nargund

IBM Global Markets,
Chief Technology Officer
for Life Sciences
linkedin.com/in/neerajnargund/
Neeraj.Nargund@ibm.com

Neeraj Nargund is a technologist with more than 22 years’ experience in the financial services, insurance, and life sciences industries. He’s led multiple global technology transformation programs in highly regulated industries.
In his current role, Neeraj spearheads client opportunities around cloud, data, and AI services.

Health data once compromised is compromised forever: People can't change their medical history.

Key takeaways

COVID-19 underscored the need for change

To manage population health at the outset of the novel coronavirus, healthcare and life sciences companies needed to quickly pivot to connect caregivers and patients remotely, and fast-track development of testing options and vaccines.

Sensitive data, handle with care

Healthcare organizations need technologies that address critical imperatives of increased security, protection of patient data, and meeting regulatory compliance while reducing risk. A highly secure, flexible architecture that accelerates value with scale is what's needed, stat.

Transforming healthcare and life sciences: Just what the doctor ordered

Cloud computing has the potential to create more personalized patient experiences to compete in the new era of the healthcare consumer.

—

Turning the page

For years, healthcare and life sciences companies have been relentlessly tasked to improve the quality of and access to services while lowering costs. Then COVID-19 showed that established and predictable revenue streams, supply chains, and labor availability can be disrupted quickly. The industry is now racing even faster to digital for the speed and agility to respond to an oftentimes unpredictable marketplace.

Globally, as of 2019, 80 percent of surveyed companies had moved to a cloud environment, but only 20 percent of their workloads had—usually microservices that are native.[1] Moving mission-critical applications and core business workloads, the other 80 percent, is the next step.

In fact, moving to a hybrid cloud infrastructure can address challenges facing organizations across the healthcare ecosystem: healthcare providers and payers, consumer health, and life sciences. A hybrid cloud makes it possible to improve the agility and scalability of enterprise applications and data by combining the benefits of a public cloud and an on-premises infrastructure.

The conundrum, however, lies in the highly sensitive nature of health data. Breached protected health information (PHI) is one of the most profitable types of data sold on the dark web, more than Social Security numbers and credit card information.[2]

And there's a lot of data to consider.

HIPAA: Why it's so important to medical professionals and patients[3]

- HIPAA aims to prevent medical identity theft by making certain medical providers do not disclose patient information
- Patients have complete, unrestricted access to a copy of their medical records
- HIPAA protects patient confidentiality and ensures that every healthcare institution has a compliance department.

The enormity of variables

The separate entities that make up the healthcare and life sciences ecosystem are fed by an enormous amount of data. For example, home care where data is collected by a device in the patient's home. Some of that data goes to the health system, the payer, the pharmacy, and—potentially—the life sciences company.

Each organization will use the data in some fashion, including sending it to others. The payer collects data about services rendered, determines reimbursement amounts, and sends financial and benefit information to the provider's revenue cycle management department. The pharmacy sends reminder alerts to members for drug renewals, and to payers for reimbursement.

Healthcare has been one of the slower industries to fully adopt cloud because of concerns about data security and privacy. Not only can data loss from a cyber-attack or breach bring bad press and negatively impact reputations of those who expose or lose sensitive data, it can result in hefty fines.

In the US, the Health Insurance Portability and Accountability Act (HIPAA) protects patient information and medical records, and monitors healthcare providers' compliance (see sidebar, "HIPAA: Why it's so important to medical professionals and patients"). The Office for Civil Rights (OCR)—which enforces HIPAA rules—has settled or imposed financial penalties of more than USD 116 million between 2003 and 2019.[4]

The COVID-19 pandemic spurred a huge increase in virtual visits to evaluate patients. From mid-March through early July 2020, 10.1 million Medicare beneficiaries received telehealth services: Before that, it was 14,000 weekly.[5]

The industry can more confidently move toward a public cloud environment when security and privacy remain on center stage. Healthcare companies will rely on technologies built by cloud providers, yes, but the providers don't have access to their data. Encryption technology protects the data from the cloud provider and other cloud tenants. Capabilities, like Bring Your Own Key (BYOK) and Keep Your Own Key (KYOK) encryption, provide an additional layer of protection by enabling cloud customers to use encryption keys not generated by the cloud provider, making the data unreadable to others.

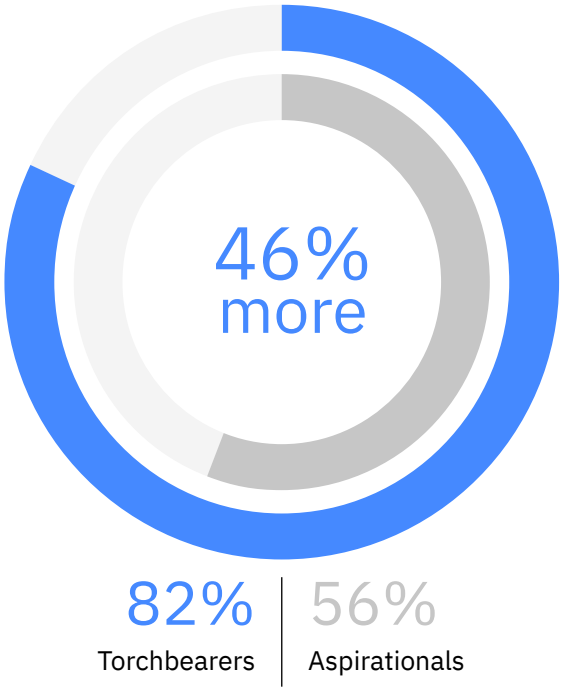
More healthcare and life sciences organizations have been adopting cloud or making significant progress over the past five years, and are moving ahead with more intent, interest, and investments (see Figure 1). The 2019 IBM Global C-suite Study identified "Torchbearers," a subset of 9 percent of more than 13,000 executives surveyed, who said they primarily incorporate data in their strategies, operations, and culture. Of those Torchbearers in healthcare and life sciences, 82 percent expect to make significant investments in the hybrid cloud in the next few years, 46 percent more than those identified as "Aspirational" who are beginning to integrate enterprise wide business and data strategies but don't have a data-driven culture in place.

Cloud tools and capabilities make it easier to connect, which is especially helpful given changing industry rules and regulations. These include interoperability rules set by the Centers for Medicare & Medicaid Services (CMS)—which regulates reimbursement for products and services for two of the largest healthcare programs in the US[6]—and common security frameworks set and overseen by HIPAA and Health Information Trust Alliance (HITRUST).[7] Common interoperability formats like Fast Healthcare Interoperability Resource (FHIR) set standard data formats, elements, and application programming interfaces to exchange electronic health records.[8]

Beyond building ground-up projects and new or cloud-native applications without the complexity and legacy of existing applications, organizations are beginning to focus more on improving complicated systems and moving toward cloud solutions.

Figure 1

Healthcare and life sciences leaders put their money on hybrid cloud



Source: 20th Global C-Suite Study: Build Your Trust Advantage. IBM Institute for Business Value. November 2019.

Healthcare providers: The care patients want and deserve

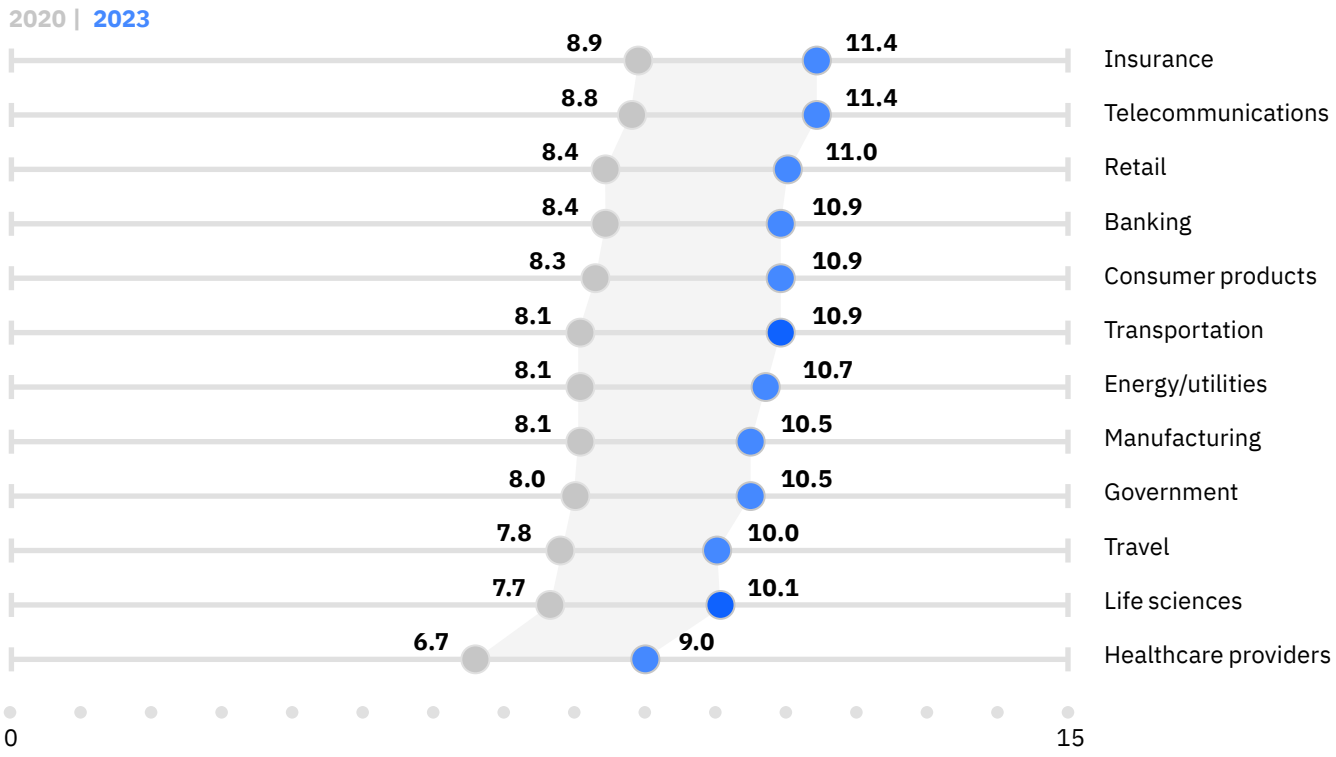
For healthcare providers, the priority for investments goes into delivering care. But the cloud can lower costs and engage consumers in ways that are most effective to them as individuals, so it's no surprise that life sciences companies and healthcare providers—although lagging behind other industries currently—plan to grow cloud resources at the same pace over the next three years (see Figure 2).

Appealing to a patient demographic that's cost-focused and embraces self-care management, digital engagement comes via the web, mobile and wearable devices, and video interactions. Virtual telehealth options complement in-person interaction and offer digital checkpoints with care facilities to reduce the cost of care for all, even those with complicated conditions that require monitoring and regular provider check-in.

The benefits of digital engagement include better health outcomes, (see sidebar, "Insight: When blood pressure rises at the doctor's office"), fewer readmittances after initial diagnosis or procedure, better and more instances of preventative care, and more people with access to care living healthier and more fulfilling lives. And while the cost of care decreases, patient satisfaction and retention can grow.

Figure 2

Cloud gathers steam



Source. The hybrid cloud platform advantage. IBM Institute for Business Value. June 2020.

Cloud computing can streamline claims methods that rely on mountains of documentation.

Health consumers have become accustomed to a different way of receiving care, even something as simple as ordering prescriptions online for mail delivery rather than making a trip to the pharmacy. Care providers can be less concerned with the size of their on-premise data centers or infrastructures since the cloud can scale when needed. And, the recent rise in telemedicine use precipitated by the COVID-19 pandemic is a trend unlikely to ebb soon.[9]

Healthcare payers: Digital transformation takes commitment

A large number of industries, healthcare and life sciences included, operate a multicloud environment, but many lack thoughtful management strategy. Health payer executives should be aware that their organizations' workloads can move to and run on the cloud, but true benefits can be lost, and investment misspent, if it's not done optimally. They must balance the immediate needs of processing millions of claims transactions per month, and the long-term view of running workloads closer to the consumer and in a distributed fashion.

Transformation also requires a fair amount of reimagining of both traditional plans and start-up pursuits. Digitization has to occur across the entire ecosystem as consumers expect transactional models that complete in one step. For example, will the industry globally evolve into one without claims handling? Some countries have this in place already: When patients visit their providers, "payment-on-premises" occurs then and there in real time.

Enveloping the end-to-end process with machine learning and artificial intelligence (AI) can help determine if anything is missing from traditional multi-step processes based on historical and statistical models using prediction. Digitizing end-to-end can push the point of presence from the cloud, or cloud-connected edge computing, to the point of care.

Insight: When blood pressure rises at the doctor's office[10]

The human body flight-or-flight cues can get in the way of medical test results. White Coat Hypertension or White Coat Syndrome—so named since healthcare professionals sometimes wear white coats—can create anxiety-induced blood pressure and heart rate spike in patients, leading to inaccurate reads. A big benefit of digital health is being able to measure vital signs on an ongoing basis and not only when in a physician's office or clinical setting.

Protecting personal information that can enable lifesaving treatment protocols is paramount.

A leading US payer has a short-term plan—within five years—where all data centers will exist on cloud, protected by solid controls and security structures. The true value realization lies in ultimately completing a full digital transformation of the organization and its processes. The organizational or cultural structure will be redefined to create new ways of working that use automation and low human touch, which eliminates costs and errors. Once the culture of change is ingrained with new ways of getting things done, the subsequent workflow can be more efficient and can scale with greater velocity.

Consumer health: Come together

A healthcare provider could be a consumer-facing retailer, pharmacy benefits manager, and a health insurance provider all in one. The entirety of that ecosystem must be integrated for it to best serve both clients and partners, but each operates in a siloed fashion, as individual companies within a company.

Hybrid cloud could expedite the building of an integrated platform across lines of businesses to create a single, and more enduring, holistic platform. For example, some pharmacists in-store may not have visibility into other parts of the ecosystem. They can't access health records, which could have dangerous consequences if the customer is over-prescribed, and don't know what patients have purchased on the retail side of the store. Natural supplements, for example, could have adverse reactions with prescribed medicines or lessen their effectiveness.

With a unified platform, no matter the touchpoint, a complete view of the customer allows for superior service and more personalized experiences. The pharmacist could also cross-sell and upsell other products in-store, for example, recommend an over-the-counter medicine that might reduce side effects of prescribed medicine like nausea. Cloud is a key component to get to that end state of end-to-end customer visibility.

Life sciences: The digital race in pharma

Medicines, vaccines, and consumer products that empower self-care can change a person's life. Perhaps save it. For life sciences companies, digital platform can deliver personalized treatments, and automate outcome-based care delivery and management. Digital care management can include hub services for patient-centric education, counseling and adherence programs, and prescription refill reminders. The bold action for life sciences leaders seeking to move to cloud is to transform the go-to-market model into one that can readily exchange information to strengthen data security.

Tech-enablement benefits life sciences companies in a myriad of ways. Exchanging claims data between a pharmaceutical company and a payer offers insights into the therapeutic effectiveness of drugs; tracking and tracing a drug's location throughout the supply chain serves the population should it be recalled; and payment processing with less human touch lowers the chance of clerical errors in billing.

Data insights culled from AI and machine learning can also reduce drug discovery research and development timelines and schedules. Drug research must be collaborative and accessible to partners, and the end product affordable to consumers. As drug companies work together at speed to find an effective vaccine for coronavirus,[11] AI and cloud computing will affect how research is done. Pharma needs a model in which information can be exchanged securely, and be able to connect its data centers both to the cloud and other partners (see sidebar, "Insight: Mining data for drug targets").

Insight: Mining data for drug targets[12]

Pfizer and Insilico Medicine have entered into a research collaboration to identify real-world evidence for potential therapeutic targets implicated in a variety of diseases. The partnership will explore how AI and machine learning in research and development could help identify targets and biomarkers in drug discovery programs.

Action guide

A hybrid cloud prescription

Greater flexibility and high system scalability, interoperability, and fluid data movement, and better patient outcomes through collaborative research and drug development can be achieved in a committed move to hybrid cloud.

1. Protect patient privacy

Choose a cloud provider that prioritizes security and data held on a solidly governed "need to know" basis by the healthcare organization.

2. Maintain regulatory compliance

Healthcare and life sciences companies already have strong compliance organizations established. Extend existing controls and improve responsiveness through new hybrid cloud-based capabilities.

3. Build trust through transparency

Modernize the healthcare systems to both maintain security and secure new capabilities. The security controls within the cloud are there to offer greater visibility and provide confidence that systems are being managed as they should be.

4. Create a cloud collaboration space

Experts warn that COVID-19 vaccine timelines appear ambitious.[13] Now isn't the time to hold research close to the chest. Implement cloud to support new capabilities and create opportunities to work collaboratively with existing partners, vendors, and organizations outside of established relationships.

Notes and sources

1 Comfort, Jim, Blaine Dolph, Steve Robinson, Lynn Kesterson-Townes, and Anthony Marshall. “The hybrid cloud platform advantage.” IBM Institute for Business Value. June 2020. https://www.ibm.com/thought-leadership/institute-business-value/report/hybrid-cloud-platform#

2 Norquist, Alan. “Medical Records are Worth $50 Each on the Black Market.” Veriphyr. Accessed August 3, 2020. https://veriphyr.com/patient-data-worth-50-each-on-black-market/

3 U.S. Department of Health & Human Services (HHS). Accessed August 20, 2020. https://www.hhs.gov/hipaa/index.html

4 “Enforcement Results as of June 30, 2020” HHS. Accessed August 20, 2020. https://www.hhs.gov/hipaa/for-professionals/compliance-enforcement/data/enforcement-highlights/index.html; “HIPAA Violation Fines.” HIPAA Journal. Accessed August 19, 2020. https://www.hipaajournal.com/hipaa-violation-fines/

5 “Trump Administration Proposes to Expand Telehealth Benefits Permanently for Medicare Beneficiaries Beyond the COVID-19 Public Health Emergency and Advances Access to Care in Rural Areas.” CMS. August 3, 2020. https://www.cms.gov/newsroom/press-releases/trump-administration-proposes-expand-telehealth-benefits-permanently-medicare-beneficiaries-beyond#:~:text=Before%20the%20public%20health%20emergency,-March%20through%20early-July

6 “CMS Interoperability and Patient Access final rule.” Centers for Medicare & Medicaid Service. Accessed August 6, 2020. https://www.cms.gov/Regulations-and-Guidance/Guidance/Interoperability/index

7 Halbleib, Matt. “What is HITRUST Compliance?” Security Metrics. Accessed August 6, 2020. https://www.securitymetrics.com/blog/what-hitrust-compliance

8 Bresnick, Jennifer. “4 Basics to Know about the Role of FHIR in Interoperability.” Health IT Analytics. Accessed August 6, 2020. https://healthitanalytics.com/news/4-basics-to-know-about-the-role-of-fhir-in-interoperability

9 Fraser, Heather. “Telemedicine Isn’t Just Here To Help—It’s Here To Stay.” *Electronic Health Reporter*. June 25, 2020. https://electronichealthreporter.com/telemedicine-isnt-just-here-to-help-its-here-to-stay/

10 Cassidy, Natalie. “White coat hypertension: do you have it and how to manage it.” Qardio. Accessed August 6, 2020. https://www.getqardio.com/healthy-heart-blog/white-coat-hypertension/

11 Staines, Richard. “Pharma giants including Novartis collaborate on COVID-19 therapies.” pharmaphorum. March 26, 2020. https://pharmaphorum.com/news/collaborate-covid19-therapies/

12 Fassbender, Melissa. “Pfizer Taps Insilico Medicine to Use AI for Drug Target Discovery.” Xconomy. January 14, 2020. https://xconomy.com/national/2020/01/14/pfizer-taps-insilico-medicine-to-use-ai-for-drug-target-discovery/

13 Tatelbaum, Julianna. “Pharma giants granted coronavirus approvals but doubts remain on manufacturing a global vaccine.” CNBC. Accessed August 6, 2020. https://www.cnbc.com/2020/05/04/coronavirus-drug-approvals-but-doubts-remain-on-manufacturing-vaccine.html

About Expert Insights

Expert Insights represent the opinions of thought leaders on newsworthy business and related technology topics. They are based upon conversations with leading subject matter experts from around the globe. For more information, contact the IBM Institute for Business Value at iibv@us.ibm.com.

IBM Corporation
New Orchard Road
Armonk, NY 10504
August 2020