Five trends shaping health care's data-driven future

Health care can become more resilient, agile and innovative by shifting to digitally enabled business models with data at the core.

The COVID-19 pandemic, and not the C-suite, has necessitated the health industry's accelerated adoption of virtual care and enabled a digital care transformation. Will history look back on this time as the point at which health care finally realized that it could become virtual?

Although the technology has existed for several years, data-based tools and technologies make a more personalized and virtual approach to health and wellness possible. The world has never needed the industry to embrace these technologies more than it does now. While companies and health care providers have long recognized that new tools to capture and use data have the potential to transform health, they lacked the "burning platform" to fuel this change. The COVID-19 pandemic – and the global disruption it has caused – has demonstrated that health care organizations have the opportunity to become more resilient, agile and innovative if they shift to digitally enabled business models with data at the core.

This shift suggests two important opportunities. First, new data streams from new sources and partners offer a more complete picture of patient health and a means to delivering better health outcomes through preventative and personalized care. Second, we can look past the pandemic to what lies beyond. In response to the pandemic, a deep vein of virtual care has arisen and has shown us that technologies are the bridge to building smarter health systems. Virtual care and telehealth offer a permanent way to change clinical and operational models, leading to greater efficiency, more individualized health management and improved experiences.

As we reflect on what comes next, it is an opportune moment to pursue real transformation for better connected and integrated data and information systems. Digital technologies offer a data-driven foundation for the future health industry. There are still major challenges to realizing the vision of a personalized health ecosystem. But health care organizations that focus on creating truly patient-centered, data-driven products and offerings have the greatest opportunity to lead the transformation of health and wellness.

The road to leveraging artificial intelligence is built from good data

As health care organizations consider how to move ahead, creating the right data environment to support a more human-centered approach to health care is an urgent need. Five key trends in data will bring this about.
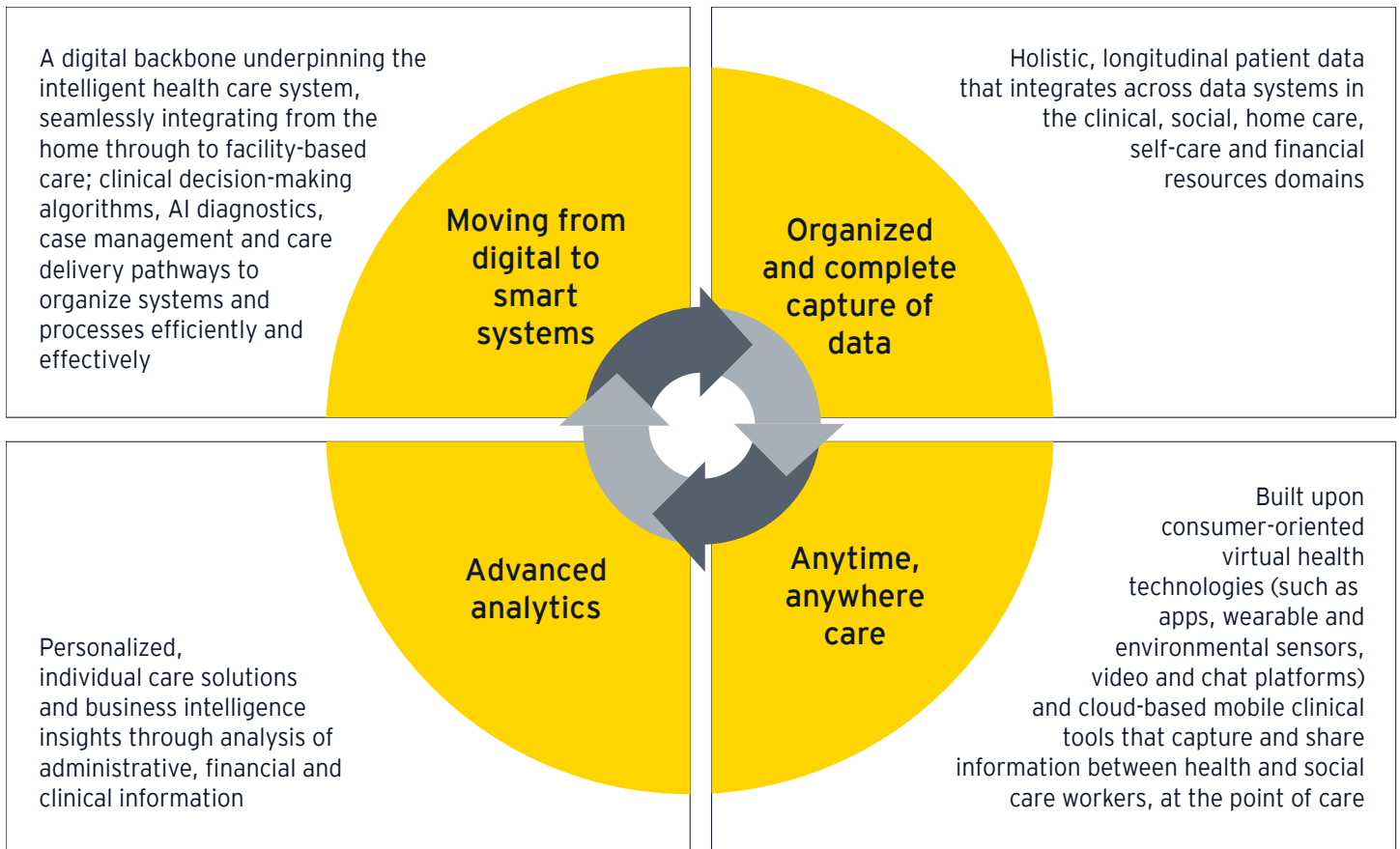
1. A new ecosystem built around the needs of the individual

The explosion of health care data requires a new ecosystem built around the needs of the individual enabled by technical standards, open data models and empowered by governance systems that deliver trust.

Health care is a highly data-driven business with vast amounts of data created both within health systems and externally. Today, the ideal of longitudinal health records from birth (if not before) that records care received and other relevant data and that travels with the individual remains an ambition rather than a reality. But eventually, this goal will be realized: our data will be captured and used over the course of our lifetime.

To truly leverage the power of this data, health care organizations need to be able to connect and share permissioned data securely and seamlessly. The data must be understandable and able to be analyzed for actionable insights. These will contribute to better

decision-making and safer clinical care, improve clinical pathways and productivity, and enable more efficient operations.

Unifying disparate information from multiple sources and making sense of it call for a health information architecture that can connect and share data, at scale, within and among enterprises and systems.

The optimal architecture will separate content and technology and will be vendor neutral, distributed and modular, incorporating third-party as well as legacy systems. This will not lead to the abandoning of existing core services, such as EHRs, imaging and laboratory systems; rather, these will become part of the broader data ecosystem.[1]

Good governance and cybersecurity in a trusted system that is secure, safe, and reliable are foundational to a consumer's willingness to share valuable personal information.

2. The rise of digital remote care supported by data liquidity

AI will be fed by sensors in, around and on us, and this data will move at the speed of 5G and beyond.

Anywhere, anytime care is built upon consumer-oriented virtual health technologies and care models. Apps, wearables and environmental sensors capture and share permissioned information across the care continuum.

Health information ecosystem

A digital backbone underpinning the intelligent health care system, seamlessly integrating from the home through to facility-based care; clinical decision-making algorithms, AI diagnostics, case management and care delivery pathways to organize systems and processes efficiently and effectively

Moving from digital to smart systems

Organized and complete capture of data

Holistic, longitudinal patient data that integrates across data systems in the clinical, social, home care, self-care and financial resources domains

Advanced analytics

Anytime, anywhere care

Personalized, individual care solutions and business intelligence insights through analysis of administrative, financial and clinical information

Built upon consumer-oriented virtual health technologies (such as apps, wearable and environmental sensors, video and chat platforms) and cloud-based mobile clinical tools that capture and share information between health and social care workers, at the point of care

As 5G networks further penetrate, they will make the capture of real-time data much faster and more robust. The potential of 5G is immediately apparent for acute home-based care, new community services and connected hospital devices. More complex health programs and analytics tools become possible, such as virtual reality, gamification, robotics, video coaching and the smart home.

The data generated by these rising technologies will need equally powerful tools to organize, interpret and draw insights from them – and AI is critical in this journey.

Volumes of patient data can be aggregated from multiple sources. AI and analytics turn complex information into usable insights, including individualized wellness solutions and show how to efficiently provide care across the ecosystem.

For consumers, this data-driven connected health environment will anticipate their needs, passively monitor their health, and improve the quality and timeliness of their care. For health care organizations, AI analytics help address operational challenges, such as waste across workflows, supply chains and duplicative procedures, as well as help to anticipate clinical risks.

3. Interconnecting broad-based data for highly personalized care

Data regarding a unique individual's habits, social determinants, genomics and preferences, in addition to traditional medical information, will be leveraged by providers to influence a person's healthy behaviors and outcomes.

To keep up with the velocity and variety of health data generated today, the health information infrastructure must enable providers to connect, combine, analyze and share health and social data. Current health information architectures have some integration capabilities, but these, such as SMART or Fast Healthcare Interoperability Resource (FHIR), are generally viewed as workarounds. There are multiple limitations around what can be integrated, as the sheer quantity of solutions (and thus integration points), diverse data models and lack of standard data nomenclature make sharing data within and across systems difficult and expensive.[2, 3]

Combining all the relevant sources of data offers the necessary underpinning for a preventive model of health where people have wellness as usual and clinical care by exception. Data analytics can shed light on individual behavior patterns and predict future behaviors, barriers to change and high-probability solutions.

Well-established scientific consensus holds that behavior is critical to health outcomes. It is now clear that to deliver better outcomes to individuals across the population, lasting behavioral change needs to become a central part of health care.[4, 5]

Most importantly, behavior change needs to be treated as an integral aspect of the way health care is personalized and managed. Future products and services need to be delivered within an influencing environment where sensors and AI can enable a continuous "judge and nudge" assessment of patient behavior and steer them toward better health.[6, 7]

4. Trusted intelligence drives participation and engagement

Trusted intelligence systems will emerge to secure the confidence and participation of consumers and other stakeholders.

Increasing mobility, transparency and availability of health information bring both benefit for consumers and clinicians, as well as risk associated with a fluid system.

> " Building and analyzing a wealth of health and health-related data such as health outcomes, prescribing, insurance, consumer-generated, population health, patient-reported outcomes and genetics form the foundation of predictive, preventive and personalized health care.

Aloha McBride
EY Global Health Leader

While data sharing brings immense value, connecting data also brings risk. To share data, you need to trust the other party's data security and have tools that support digital use authorizations, traceability and control, much of which is currently a serious unmet need across the sector. Governance structures, policies and practices must be sufficiently robust and cover the ethical, legal and moral aspects of collecting, storing and sharing of sensitive health data.

As connectivity becomes more central to health care, regulators will continue to take a strong stance on the need to secure data. Attention will be directed toward providing consumers with control over their health information. Gaining consumer and clinician trust is critical, particularly when it comes to the safety, validity and integrity of the data generated.

In the near future, data will be passively captured by unobtrusive remote monitoring and continuously analyzed via AI. The onus will be on health care organizations to maintain high standards of transparency around the integrity and security of data and devices. All elements must meet accepted data security frameworks and safety standards for personal health and social care information. This includes clarity around the ownership rights regarding personal data, secondary uses of data and the protection of an individual's privacy.[8, 9]

5. A future-ready culture and workforce that embraces digital

Clinicians will need to leverage medical, data and behavioral science knowledge and skills in the near future to deliver the personalized care demanded by patients.

To support this shift, health entities must decide now where to invest in education, training and recruiting.

Health care organizations will achieve success when they see that the way forward is built around data, technologies and human capacities that grow the business of tomorrow, rather than just repeating today's procurement and training cycles. The winning organizations will build from an ecosystem mindset, identifying what data are critical and the right strategy to access them. They will understand they must, in parallel, attract the right workforce to fully leverage technology innovations. For these organizations, data will become the central asset in the organization.

Fostering innovation is key to creating and testing effective blueprints for doing things differently by using data and technology. Health care organizations must adapt operating models and partnering strategies to the realities of the emerging ecosystem, augmenting their skills mix and capabilities by working with other organizations.

Business model architecture should reflect the core capabilities in the new data environment. This includes a governance model that steers the enterprise from a siloed to a frictionless data environment. New commercial and operating models built around creating value will be required to support new ways of delivering care. A workforce strategy will need to address the shifts in workforce supply and demand that arise through automation and a shift in the mix of skills and the nature of job roles. And finally, a new mix of leadership skills will be needed to lead health care providers in the digital era.

A health data agenda

To build for the beyond, prioritizing a health data agenda may allow health care organizations to anticipate and plan for a connected health ecosystem in the future. Right now, entities should anticipate how they can create future value and enable personalized outcomes driven by the power of data.

Three elements we consider important to a health data agenda are:

1. Harnessing the volume, variety and velocity of health data.

The potential of massive health data sets may allow organizations to capitalize upon the promise of transformative technologies.

Good governance for digital enablement

At the enterprise level, those in a governance role must have a digital fluency and an intimate understanding of the health sector. This includes understanding the economics of technologies disrupting the health industry business and production of care models. A deep knowledge is required of health IT trends and expertise in applications appropriate to the enterprise.

| Expertise in technological transformation and logistics | > | The delegation of limited, agility-enabling authority to the right people | > | Integrated governance and financial decision-making to allow for rapid, flexible responses | > | Strong technology IQ and EQ and intimate understanding of health sector | > | Leadership of the decision-making and governance around critical enterprise standards and guidelines |

Data science models are developing that inform clinical decision-making. These are moving past simply reporting data to providers to machine learning algorithms in a dynamic environment of predictive analytical models for application in multiple care settings.

At the enterprise level, intelligence functions convert data into actionable insights around population health, clinical decision support and streamlining operations for greater efficiencies. Rather than waiting for the ideal data model or vendor, health care organizations need to start implementing data-driven care models and operations in parallel to uplifting capabilities and defining the future state.

2. Envisioning for the future

Envisioning for the future should guide stakeholders to see beyond the present to what's not (yet) possible. Implementing futureproof infrastructure and capabilities will be critical. This means adopting the principles of modularity, agility, interoperability and heterogeneity.

Through a lens of "now, next, and beyond," data-generating technologies can be considered as bringing benefit as:

▸ Foundational – to bring agility and efficiency into the present

▸ Supporting – to provide appropriate capabilities in the near future

▸ Differentiators – to support new models and advanced technologies into the future

3. Laying the foundations for the next generation of patient-centered products and services

The next generation of products and services will be built around data-driven intelligence technologies that support key high-value areas of clinician productivity, patient experience, innovation and insights, sustainability, business operations, permissioned and secure access, and asset utilization.

Centered around the patient, the end result is a connected everywhere ecosystem – connecting all people and all things for better care outcomes, health equity and more sustainable business models.

Top questions for health executives

Executives and health care leaders should ask themselves three questions as they reimagine their future data strategy:

1. How do we use the data that is generated in safe and meaningful ways?

2. What is the right data strategy to make operations that are data- and AI-driven, for predictive models of care?

3. What opportunities exist for partnerships with technology players to build out the necessary technical capabilities for greater data tractability and to take advantage of enabling data sets?

To get in contact with an EY Smart Health solutions team member, email smarthealth@ey.com. To read further EY Smart Health insights, visit ey.com/exploresmarthealth.

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