DIGITAL HEALTH 2023: SUMMARY OF ISSUES DISCUSSED AT CTA-HOSTED EVENTS

CTA hosted many digital health-related conferences and other events in 2023, including the HealthFuture conference, the Health Industry Leaders Summit 2023 and Health AI+. What follows is a summary of the issues and discussions that were central focus areas for speakers and attendees from those events.

Introduction

Digital health technologies are transforming health care systems worldwide. They are also transforming people's lives. The term "digital health"—meaning "the use of technology and electronic communications tools, services, and processes to deliver health care services or to facilitate better health"—has an extremely broad scope and includes several types of technologies with numerous different functions. Digital health technologies have the capacity to improve access to health care services, increase systemic efficiency, promote and facilitate patient self-efficacy, enhance communications between all parts of our health care system, lower costs, and lead to better health outcomes.

Although the U.S. health system has begun taking advantage of these potential gains, digital health still faces many barriers to broader adoption. Among the barriers is uncertainty about health insurance provider coverage and reimbursement for digital health technologies and the evidence needed to obtain them causes misdirected resources and lost opportunities. Actions also need to be taken to ensure that digital health technologies do not further exacerbate the inequities in our health system that afflict historically marginalized groups. Concerns about how well patients' sensitive health information is protected may hinder data collection and analysis that could provide great insights into a variety of health conditions and diseases. The challenges of artificial/augmented intelligence are headline news and contribute to consumer and health care provider mistrust. Data from mobile apps and wearables are too often not integrated with information from patients' electronic health records and other elements of the health information stream.

The Role of Evidence

Without persuasive high-quality evidence to demonstrate value to all involved decision makers, a digital health solution may not ultimately be adopted A wearable device that continuously measures blood glucose levels, for example, could appeal to wearers because of its light weight, attractive appearance, and potential to help with self-management. If clinicians are not convinced of its accuracy, however, or have difficulty interpreting the data it provides, they will not recommend it to their patients. If employers or health insurance providers are not convinced of its cost-effectiveness or clinical utility, they will not cover it under their health plan.

In identifying the value proposition for various stakeholders, digital health developers should bear in mind that digital health solutions often differ from pharmaceuticals and more traditional medical devices because some or all of their value may be derived from factors other than clinical outcomes. These include factors such as improved access to health care; improved quality of care; increased ability of consumers to manage their own health; cost savings; improved workflow or other administrative benefits and larger contributions to big data analytics.

Clinician Concerns

Participants at CTA events believed that clinicians were generally enthusiastic about digital health technologies but had some concerns relating to data and evidence—specifically about data overload and alarm fatigue. More than 70% of US physicians report being overwhelmed by data. It is one of the top-reported reasons physicians say adoption of connected care is slow. Assuming clinicians can access the data in meaningful form, clinicians still have to confront what the data signify. Without better parsing of the data provided and indications of actionability, physicians are being forced to make clinical decisions based on information with uncertain meaning. Evidence of data significance is badly needed.

The other main concern is "alert fatigue," which describes how clinicians become desensitized to various digital alarms and alerts and, therefore, become less likely to respond to truly important alerts. Alert fatigue comes from the sheer number of alarms and alerts clinicians face—up to 100 per day in a VA primary care practice, for example.

Data Privacy

Health data sharing only moves at the speed of trust. The digital transformation of health care is making available extensive amounts of health and health-related data. The scope and complexity of this data is unprecedented and provides unique opportunities for medicine and public health.

Numerous studies have identified data privacy and security as critical factors in willingness to share information and the observation is true across many types of populations. Furthermore, while the particular circumstances and context of the information-sharing can affect many individuals' willingness to share, there is evidence that a majority of patients make sharing decisions based primarily on their core beliefs about privacy rather than context.

As highly as individuals generally value privacy, however, they often are willing to share health information in particular contexts. One of the main factors they consider is the use to which the health information is going. If sharing will benefit the sharer, or perhaps the community, then people are more likely to provide access. Thus, people are inclined to share health information for the purpose of research but are much less willing if the use is commercial. Sharing that will enable health self-management or peer-to-peer information exchange is also more likely to prompt participation. Apps that measure health markers like physical activity or blood pressure, for instance, can facilitate patients' ability to manage their health and may cause them to be more interested in data sharing, particularly with other individuals in similar situations.

Equity

CTA conference participants consistently emphasized both the importance of equity in the greater adoption of digital health and the opportunities for new technology to help alleviate health disparities—although participants also stressed that digital health could potentially exacerbate inequities.

One of the most important ways that digital health can help achieve equity is by increasing access to health care and health information. People living in rural areas, for example, can use patient portals, telehealth visits, and remote monitoring to overcome problems with transportation and lack of providers. The growth of real-time language translation apps provides greater accessibility of health information to people who do not know or have difficulty with English. AI technology can improve accessibility for people with disabilities through, e.g., real-time transcription and captioning services for people with hearing-impairments1 or smart readers that can record text and generate speech for people with visual impairments. Digital health technology can further improve health care for people with disabilities by better capturing and analyzing information about their function in various contexts to assist health care providers in adopting a more holistic approach.

The three aspects of the digital divide most often mentioned at the CTA HealthFuture conference as affecting use of digital health technologies: broadband Internet availability and adoption, digital literacy, and health literacy (including digital health literacy). CTA explored these issues in a [white paper](#) that was the result of recommendations from the Health Equity and Access Leadership Coalition, a group of about 35 organizations spanning the entire health ecosystem led by CTA and the [Connected Health Initiative](#).

Artificial Intelligence

Artificial intelligence (AI) was a major theme of discussion at many CTA-sponsored conferences and events. Experts do not agree on a single definition of AI. It probably is best regarded as an umbrella term referring to computers or other technologies that seem to simulate intelligent human behavior, including learning, making decisions, and making predictions. Two other frequently-referenced terms include (1) machine learning ("ML"), which refers to AI technology that provides "the ability to learn and change without providing/programming an explicit model for mapping input to output," and (2) large language models ("LLMs"), which are trained on vast amounts of text data in order to translate, summarize, generate text, and answer questions. CTA [has published](#) standard definitions for reference.

The range of possible AI applications in health care is almost unlimited. For patients, technologies like ML, natural language processing, speech recognition, and chatbots will increasingly be incorporated into wearables and apps to provide advances in health monitoring, disease prevention and self-management, and medication management, among other areas. Stakeholders are already using algorithms for scheduling, billing, and identifying potential health billing fraud and extending them to functions such as automating reimbursement coding, making prior authorization decisions, and possibly assessing physician competence. Such uses may not be implemented without constraints, however. Effective in 2024, for example, Centers for Medicare and Medicaid Services (CMS) is substantially limiting Medicare Advantage plans' use of proprietary algorithms to deny beneficiary claims based on medical necessity.

In the clinical research environment, AI tools are being used to identify and screen potential clinical trial participants, examine clinical trial data in greater depth and review data integrity, and monitor patients for adverse events. For more basic science research, neural networks and machine learning can accelerate drug discoveries, genomics, and disease prediction. AI can advance public health aims as well - machine learning and geospatial pattern mining can enable air and water pollution detection as well as epidemiologic analysis and contact tracing.

One of the greatest potential benefits of AI involves its potential to help address the health workforce crisis made more dire because of the pandemic and clinician burnout. The Association of American Medical Colleges estimates that, just ten years from now, the U.S. [will have a shortage](#) of up to 139,000 physicians with the most severe scarcities occurring in primary care and in rural areas. Two demographic factors are largely driving this shortage – the aging of the population (people older than 65 years are projected to increase by 45% by 2033) and the expected retirement of 40% of current physicians over the same period, with burnout likely to accelerate retirements.

The causes of health worker burnout are complex but excessive workloads and administrative burdens are chief among them. AI-enabled technologies can both reduce administrative burdens and relieve clinician workloads.

While digital health tools and technologies have tremendous promise to help alleviate health inequities, they also carry the risk of inadvertently incorporating and magnifying societal biases. AI-enabled digital health technologies can absorb biases in three main ways: (1) using (for training, testing, and validation) data sets that do not accurately represent the population; (2) using data that itself reflects biases in the health care system or in clinical decision making; (3) through human choices made during the design, development, and use of these

systems. AI products need to be thoughtfully and carefully developed and employed in order to avoid these problems.

Several models and frameworks are available to help guide developer processes. CTA has published a voluntary ANSI-accredited standard to help stakeholders [identify and manage](#) bias in AI/ML systems.

Conclusion

CTA is planning even more digital health-related events, convenings, and conferences in 2024. The issues discussed in this paper will continue to be important areas of focus for healthcare stakeholders as well as federal and state policymakers. Most parties agree that technology is going play an increasingly important role in addressing the critical issues in the U.S. healthcare system, like clinician workforce shortages. And while technology Is not a panacea, the many issues in our increasingly dysfunctional and fractured healthcare system cannot be solved without technology.