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Perspective

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# *TechQuity* is an imperative for health and technology business: Let's work together to achieve it

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**ABSTRACT**

Open discussions of social justice and health inequities may be an uncommon focus within information technology science, business, and health care delivery partnerships. However, the COVID-19 pandemic—which disproportionately affected Black, indigenous, and people of color—has reinforced the need to examine and define roles that technology partners should play to lead anti-racism efforts through our work. In our perspective piece, we describe the imperative to prioritize *TechQuity*—equity and social justice as a technology business strategy—through collaborating in partnerships that focus on eliminating racial and social inequities.

In early June of 2020, following the horrifying killings of George Floyd, Ahmaud Arbery, and Breonna Taylor, IBM CEO Arvind Krishna sent a letter to Congress with a policy proposal discussing the ways that technology companies can advance racial equity in the United States.[1] Mr Krishna's letter is part of the larger national conversation on the convergence of systemic racism and the coronavirus disease 2019 (COVID-19) pandemic, which have led to disproportionate and unnecessary deaths of people who identify as Black, Indigenous, or people of color. The ongoing dialogue and social movement have led to introspection within health and technology sectors, and within scientific disciplines including health informatics, on the need to articulate the ethical standards and values expressed through our work that could either contribute actively to promoting social justice in health, or inadvertently worsen inequities. To this end, in this perspective piece we discuss the term *TechQuity* to express the idea that health equity and social justice should be prioritized in processes and outcomes of health technology science, business and practice.[2,3]

The working definition of *TechQuity* is "the strategic development and deployment of technology to advance health equity."[4] The *TechQuity* concept calls for us to be accountable for using our work in the active promotion of health equity, defined as the opportunity to attain one's full health potential without barriers due to avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically, or geographically.[5,6] The concept of health equity explicitly names social justice as the necessary foundation for remediating health inequities between groups that historically and currently face structural racism, and other forms of social exploitation and dehumanizing treatment.[7] Codifying the term *TechQuity* emphasizes the role of technology in producing social gradients in health and encourages deeper commitment to eliminating structural inequities that arise through our participation in broader, multisector ecosystems. We act within multisector ecosystems through the kinds of questions we ask and the problems we choose to prioritize in scientific inquiry and innovation in health informatics; through the health information technology (HIT) applications we develop for the practice of medicine, public health, community health; and through our health and technology business strategies that affect environment, social, and governance impacts of commercial activities.[8] A full embrace of *TechQuity* eschews positions of disinterest and incuriousness about the impact of informatics on social and economic goals, and questions assumptions that technological advances can uniformly benefit human health without concerted, directed efforts within a systemic, multisector context.

The relevance of the *TechQuity* concept to science and practice along the continuum of health informatics disciplines, from biomedical, clinical, population, and public health and policy areas, has been explored in recent publications.[9–11] Health informatics has contributed to recent successes in achieving health equity in several arenas including using HIT for identifying social disparities and risk prediction in electronic health records.[12] During the early stage of the COVID-19 pandemic, big data and analytics were also used to create COVID-19 dashboards stratified by demographics across the United States, and electronic health records were used to identify the disproportionate COVID-19 mortality among Black people served by an integrated-delivery health system in the state of Louisiana early in the pandemic.[13–15] Unfortunately, these efforts have not been systematically implemented, and research on outcomes for mitigating and eliminating health inequities are sparse. At this writing, few states report data on COVID-19 testing rates to facilitate tracking and eliminating COVID-19 testing rates by race/ethnicity or other demographic indicators.[13] As of February 2021, national data tracking COVID-19 vaccination reported race/ethnicity information on only 55% of those vaccinated, which may potentially yield biased estimates of vaccination prevalence in some population groups.[16] As telemedicine has become widely used in care delivery during the COVID-19 pandemic, inequitable access and lower care utilization has been reported by age, race/ethnicity, and language preference by at least one integrated health system.[17] Additional COVID-19–related care delivery disparities may have been introduced through sole reliance on patient portals and electronic applications to schedule COVID vaccination without supplemental strategies for high-risk populations who do not access digital tools.[18]

What we should take away from these recurring and persistent demonstrations of systemic inequities is that *TechQuity* requires the commitment and the will to apply what we know to serve a more diverse population than is currently reached by current health, technology, and business efforts. More importantly, these examples show the ways that informatics disciplines operate to support larger ecosystems that have historically and currently produced inequitable outcomes for diverse groups. Without a commitment to *TechQuity*, we will tolerate technology that contributes to systemic racism, such as electronic health records or telehealth tools that do not accommodate communication in multiple languages, or inadequate data and biased outcomes from predictive modeling using advanced analytics, which should be able to anticipate and help mitigate risks to health. Without *TechQuity*, we will continue to work within an overburdened public health sector using ineffective data systems that do not identify or act on pending threats to Black people and other communities. We will also continue to miss opportunities to invest in communities and leadership to strengthen the foundation for equitable participation in the economic benefits of technology growth.

Working successfully toward *TechQuity* means that our science, business strategies, products, and economic contributions create opportunities and better conditions for everyone. To make meaningful change, we must articulate and commit to action steps that are needed to achieve *TechQuity*. Some essential steps include the following:

**Invest in people and communities.** Technology companies and health institutions are key engines of economic growth as well as producers of science, technology, information, and services needed to prevent and treat disease. We must recognize that when we have roles as supervisors or employers, we have a responsibility to conduct businessin ways that confront the institutional racism and stigma that prevent hiring and entrepreneurship for people who identify as Black, Indigenous, people of color; people with disabilities; lesbian, gay, bisexual, transgender, or queer individuals; immigrant communities; rural populations; and other groups. As an upstream strategy, we should grow economic opportunity in diverse communities by locating brick-and-mortar facilities and training opportunities in diverse communities to secure the foundation for wealth creation that will yield equitable health outcomes. Technology and health companies should collect data on their staff and executive leadership, set benchmarks and targets to grow the multicultural leadership of their teams, and track their investments in economic opportunities for diverse communities. Specifically, coupling community investments with training, hiring, promotion, and prioritizing opportunities for diverse executive leadership is necessary to grow the multicultural employee community and leaders who are needed to identify the concerns and opportunities in diverse communities that will open up potential for new markets and prospects for shared growth. At minimum, as we engage in building teams for science, practice, and commercial activities, we should commit to using ethical artificial intelligence (AI) techniques in talent acquisition, including educating candidates when data are being collected for use in algorithms for hiring decisions, and ensuring bias mitigation by investing in processes to have human resources software algorithms and tools available and subjected to external audit.[19]

**Be trustworthy, collect data that are relevant to diverse communities, and keep it secure.** Building trust with Black, Indigenous, and other communities of color is imperative for collecting data on race/ethnicity and other dimensions of social identity. Yet, our collective history of systemic racism complicates this necessary step. Among many examples, the infamous Tuskegee syphilis study, which was launched by the U.S. Public Health Service in 1932 and lasted for 40 years, denied effective treatment to Black men and their families in order to study the natural course of the disease.[20,21] The study has become a symbol of the indifference of health systems to the well-being of Black people, with lasting effects on their health and faith in health systems. More recently, sharing COVID-19 results with law enforcement has further strained trust relationships with refugee and immigrant communities, who in turn may be less likely to seek COVID-19 testing.[22,23] Legitimate concerns over stigmatization, the possibility that data will be used to profit business without benefit to diverse communities, or worse—that needed information will be withheld from communities that need it—erode trust needed to develop the robust data systems that will identify and prevent deaths we observe during the COVID-19 pandemic. We must partner to collect data that are important to diverse communities, including social and environmental data. We must create dashboards that are easy for local, state, and federal public health entities, health systems, and community-based organizations to use. In the 10-year strategic plan, the Office of the National Coordinator for Health IT describes a vision of the Health IT Ecosystem that would support data collection, including personal health records and electronic records to promote clinical decision support, health information exchanges to promote public health and health policy, and national health analytics to promote development of clinical guidelines.[24] Our national experience with COVID-19 also argues for stronger efforts to establish infrastructure and systems to collect social determinants and health-related needs data, data on community health assets, and information on employee health to support public health planning. We must also invest in data security to protect the privacy and earn the trust of those who contribute their data. The National Institutes of Health *All of Us* Research Program provides an example of a large-scale initiative to collect multiple data types on diverse

populations that are protected in a controlled environment, and yet de-identified in a way that allows communities to access data to advance precision health and equity research efforts, in ways that enhance trustworthiness and bidirectional benefits of research.[25]

**Use AI and analytics to promote health equity.** AI analytics are sophisticated tools used to support decision making such as predicting outcomes and stratifying high-risk patient groups through machine learning, neural networks, and other techniques. But all these methods are guided by human inputs. It is essential that the workforce that develops and trains AI algorithms is diverse. It is also essential that the datasets used to train AI algorithms represent the populations that they are meant to serve. We have seen the problems that arise when equity is not a key part of evaluating the effectiveness and impact of AI tools on diverse groups in practice, including deeply troubling failures with facial recognition technology, and racial bias found in algorithms used to manage population health in healthcare institutions.[26] As we implement AI solutions, it is critical to ensure extensive testing, monitoring, and evaluation of these tools in practice, with an emphasis on the impact in diverse populations.

**Purchasers of technology must also drive change.** We challenge health institutions, insurance payors, and other purchasers of health technology, information, and innovation to drive change by choosing to partner with companies that produce the products and services that lead to equity in health outcomes for diverse groups. With health spending at $3 trillion annually, health sectors have enormous leverage to push demand for services that work for the communities we serve.[27] As technology companies and health institutions look to integrate diversity into their practices, they can also support minority- and women-owned businesses with their purchasing power. By supporting businesses of diverse groups, purchasers of technology can contribute to promoting economic opportunity and closing the racial wealth gap that perpetuates some structural inequities in outcomes.

**Develop innovative partnerships that engage diverse communities.** Creating health equity is a process that requires engagement across sectors and with diverse groups. These ideas have emerged from a new health system and industry research collaboration among Brigham and Women's Hospital, Vanderbilt University Medical Center, and IBM Watson Health, who are partnering to evaluate ways to implement a *TechQuity* agenda in health, community-based settings, and as a core business model.[28–30] The response to COVID-19 has exposed the need to break down traditional silos to make sure solutions are scaled quickly, and that diverse communities are prioritized in conversations and actions to respond to the COVID-19 pandemic and address systemic racism that threads across the issues we have discussed. We, of course, cannot alone define the opportunities that exist to prioritize equity as a core principle moving forward. We plan to create space for conversations and dialog that will fuel a serious commitment to advancing *TechQuity* within our partnership and for the field. By way of this perspective piece, we look forward to soliciting ideas and actions that will bring the *TechQuity* agenda to fruition.

*For those we have lost, and all those who deserved to live in the world made better by the movements they catalyzed.*

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## AUTHOR CONTRIBUTIONS

CRC, CHW, KR, KBJ, DWB, and ID-M contributed to the conception and design of the work. CRC, YA, CHW, and ID-M contributed to drafting the article. CRC, YA, CHW, KR, KBJ, DWB, and ID-M contributed to critical revision of the article and final approval of the submitted version

## DATA AVAILABILITY STATEMENT

No original data were generated in the preparation of this perspectives piece.

## CONFLICT OF INTEREST STATEMENT

The other authors have no other competing interests to declare.

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