PROJECT MUSE®

What is TechQuity?

Kyu Rhee, Irene Dankwa-Mullan, Virginia Brennan, Cheryl Clark

Journal of Health Care for the Poor and Underserved, Volume 32,
Number 2, May 2021 Supplement, pp. xiii-xviii (Article)

Published by Johns Hopkins University Press

DOI: <https://doi.org/10.1353/hpu.2021.0045>

➔ *For additional information about this article*

<https://muse.jhu.edu/article/789652>

What is TechQuity?

Kyu Rhee, MD, MPP
Irene Dankwa-Mullan, MD, MPH
Virginia Brennan, PhD, MA
Cheryl Clark, MD, ScD

Background

Health inequities have been embedded in U.S. health care delivery since the country's inception. Three seminal reports, the 2001 Institute of Medicine's *Crossing the Quality Chasm*, the 2003 report *Unequal Treatment*,¹ and the 2020 National Academy of Medicine's (formerly Institute of Medicine) *Artificial Intelligence in Healthcare*² represented inflection points in highlighting the substantial disparities in access, clinical care, and outcomes, and recommended that *equity* in health care and health technology must be achieved to deliver quality care.³ Though *Crossing the Quality Chasm* set up the STEEEP framework, which explicitly called out equity as one of six health care quality domains (alongside safety, timeliness, effectiveness, efficiency, and patient-centered care) the issue of inequities in health care delivery was truly laid bare in *Unequal Treatment*, which also called upon health care institutions and providers to develop strategies to confront disparities in care.⁴ *Artificial Intelligence in Healthcare* introduced the "Quintuple Aim" where "Equity and Inclusion" was added to the "Quadruple Aim."⁵

Since these reports, health care institutions have slowly recognized health care delivery as one of multiple, mutually reinforcing institutions through which structural racism affects the health of people who identify as Black, Indigenous, Asian and Pacific Islander, Latino/a/x, and multiracial groups. Importantly, as technology becomes a greater facilitator and driver of health care delivery, it is urgent to recognize the ways that its misuse may exacerbate structural racism that already exists in the U.S. and in medicine. As the impact of the COVID-19 pandemic and social movements of the 2020s have again exposed the crisis of health inequities in the U.S., it is critical that we take this historical moment to promote anti-racism actively in a relentless effort to eliminate inequities in care. As we confront the role of technology as part of the reinforcing structure of health care inequities, we require a framework to guide specific anti-racism activities within health technology applications to reshape the use of technology as a force for promoting equity in health, in ways that begin to address root causes of structural racism. Specifically, an anti-racism and pro-equity approach to the use of technology, or *TechQuity*, must (1) address structural racism and discrimination to achieve a diverse workforce to co-create and implement technologies that promote health equity, (2) collect and track data that is representative of the concerns and needs of populations that face health inequities, (3) deploy data-driven and technology strategies to hold health institutions accountable for achieving equity and monitoring progress toward this end,

Figure 1. Advancing the Quintuple Aim.

and (4) use the power of artificial intelligence in transparent ways so that algorithms may be trained on diverse data and used to enhance the health of diverse communities. The definition and key priorities for TechQuity are outlined below.

4 Key Priorities for TechQuity

*TechQuity*⁶ is the strategic development and deployment of technology in health care and health to achieve health equity.⁷ We highlight four key priorities for TechQuity: (1) workforce diversity; (2) data trust; (3) equity dashboards; (4) transparent AI. (Figure 1)

I. Workforce Diversity

Marian Wright Edelman, founder of the Children’s Defense Fund stated, “It’s hard to be what you can’t see.”⁸ While she was referring to the “all-white world of children’s books,” the same saying can be applied to the worlds of health care and technology. While the U.S. population has over 30% self-identifying as African American or Hispanic,⁹ only 11% of U.S. physicians¹⁰ and 15% of people in technology jobs identify as members of these persistently underrepresented minorities.¹¹ This underrepresentation worsens as you go higher into faculty, leadership, and C-suite positions in both health care and technology.^{12,13} We must assure that our workforces represent the populations affected by structural and health inequities that we hope to support and whose health we seek to improve.

II. Data Trustworthiness

Trustworthy and complete data collection is often a critical first step for leveraging technology towards health equity. While most health care datasets already include gender,

Figure 2. Four key priorities for “TechQuity.”

age, geography, and insurance status, many do not include key health determinants such as race, ethnicity, country of origin, sexual orientation, disability status, education, employment, housing, or wealth. Aligning data with the right determinants of health (e.g., environmental, social, and behavioral) is also essential.^{14,15} We must ensure data trustworthiness, transparency, and diversity to fuel the next two stages of applying analytics and artificial intelligence in order to facilitate insights of critical importance to decision-making.¹⁶

III. Equity Dashboards

The application of analytics to demonstrate health care quality in the domains of safety, timeliness, effectiveness, efficiency, and patient-centeredness has been common in diverse dashboards for hospital ratings and other key health care certifications (e.g., National Committee for Quality Assurance, Joint Commission); however, equity has often been overlooked.¹⁷ Peter Drucker, a famous business thinker and writer for the modern company, stated that “if you can’t measure it, you can’t improve it.”¹⁸ To improve equity, we must ensure that equity is foundational, standard, and required for all ratings,¹⁹ certifications, and dashboards.

IV. Transparent AI

Beyond more traditional analytics and dashboards, artificial intelligence (AI) represents perhaps the most exciting technology for improving care.^{20–22} Since the 1950s, there have been many AI winters (periods of declining interest and investment in AI); however, since IBM’s demonstration of AI on the gameshow of Jeopardy in 2011,²³ many have claimed that AI is here to stay and there will be no more AI winters.²⁴ Numerous industries are being changed and disrupted by AI.²⁵ Nonetheless, as stated in the 2020 report on *AI in Healthcare*, “it is imperative to proceed with caution or risk the potential of user disillusionment, another AI winter, or further exacerbation of existing health- and technology-driven disparities.”² For example, a 2019 study discovered bias in an AI algorithm that perpetuated disparities in chronic care coordination and treatment. This same study claimed that an estimated 200 million people are affected each year by similar tools used by providers, governments, and other stakeholders in the U.S. health system.^{26,27} Many technology companies have claimed that bias in training, datasets, and AI cannot be avoided; however, trust of AI systems is essential, especially in health care. Therefore, we must move AI from being a “black box” to a “clear box” with AI factsheets like nutrition labels where buyers and end-users of AI algorithms can transparently see who trained the AI, what datasets were used, and what specific AI algorithms and models were used.²⁸ We must assure transparent, ethical, fair, and equitable AI.

The global pandemic has brought awareness and focus to health inequities and the important role of technology in pandemic response, recovery, and preparedness. At this moment, we see a unique opportunity to advance a TechQuity movement through a moral and relentless commitment to workforce diversity, data trust, equity dashboards, and transparent AI.

References

1. Institute of Medicine, Board on Health Sciences Policy, Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care. (Smedley BD, Stith AY, Nelson AR, eds.) Unequal treatment: confronting racial and ethnic disparities in health care. Washington, DC: The National Academies Press, 2003.
2. Matheny M, Israni ST, Ahmed M, et al, eds. Artificial intelligence in health care: the hope, the hype, the promise, the peril. Washington, DC: National Academy of Medicine, 2019. Available at: <https://nam.edu/artificial-intelligence-special-publication>.
3. Institute of Medicine (US) Committee on Quality of Health Care in America. Crossing the quality chasm: a new health system for the 21st century. Washington, DC: National Academies Press, 2001.
4. Thomas Craig KJ, McKillop MM, Huang HT, et al. BMC Health Serv Res. 2020 Jul 10;20(1):640. <https://doi.org/10.1186/s12913-020-05503-z> PMID:32650759
5. Sikka R, Morath JM, Leape L. The Quadruple Aim: care, health, cost and meaning in work. BMJ Qual Saf. 2015;24:608–10. <https://doi.org/10.1136/bmjqs-2015-004160> PMID:26038586

6. Rhee K. Inventing and predicting a new era of health with AI and Techquity. Presented at: Discover Brigham, Boston (MA), Nov 2019.
7. Braveman P. What Are Health Disparities and Health Equity? We Need to Be Clear. *Public Health Rep.* 2014 Jan-Feb; 129(Suppl 2): 5–8.
8. Edelman MW. It's hard to be what you can't see. Washington, DC: Children's Defense Fund, 2015. Available at: <https://www.childrensdefense.org/child-watch-columns/health/2015/its-hard-to-be-what-you-cant-see/>.
9. U.S. Census Bureau. QuickFacts Table: Population. Washington, DC: U.S. Census Bureau, 2020. Available at: <https://www.census.gov/quickfacts/fact/table/US/PST045219>.
10. Association of American Medical Colleges (AAMC). Diversity in Medicine: Facts and Figures 2019: Figure 18. Percentage of all active physicians by race/ethnicity, 2018. Washington, DC: AAMC, 2019. Available at: <https://www.aamc.org/data-reports/workforce/interactive-data/figure-18-percentage-all-active-physicians-race/ethnicity-2018>.
11. Muro M, Berube A, Whiton J. Black and Hispanic underrepresentation in tech: It's time to change the equation. Washington, DC: Brookings Institution, 2018. Available at: <https://www.brookings.edu/research/black-and-hispanic-underrepresentation-in-tech-its-time-to-change-the-equation/>
12. Kapko M. Tech leaders confront diversity, inclusion at CES. Denver, CO: SDxCentral News, 2021. Available at: <https://www.sdxcentral.com/articles/news/tech-leaders-confront-diversity-inclusion-at-ces/2021/01/>.
13. Association of American Medical Colleges (AAMC). Diversity in Medicine: Facts and Figures 2019: Figure 15. Percentage of full-time U.S. medical school faculty by race /ethnicity, 2018. Washington, DC: AAMC, 2019. Available at: <https://www.aamc.org/data-reports/workforce/interactive-data/figure-15-percentage-full-time-us-medical-school-faculty-race/ethnicity-2018>.
14. Rockefeller Foundation, Boston University. 3-D Commission. Boston, MA: 3-D Commission, 2021. Available at: <https://3dcommission.health>.
15. McGinnis JM, Williams-Russo P, Knickman JR. The case for more active policy attention to health promotion. *Health Aff (Millwood)*. 2002 Mar–Apr;21(2):78–93. <https://doi.org/10.1377/hlthaff.21.2.78>
PMid:11900188
16. Sherman BW, Dankwa-Mullan I, Karunakaram H, et al. Race and ethnicity must be included in employee health data analyses. Bethesda, MD: Health Affairs Blog, 2020. Available at: <https://www.healthaffairs.org/doi/10.1377/hblog20201217.850341/full/>.
17. Zak P. Measurement myopia. Claremont, CA, The Drucker Institute, 2013. Available at: <https://www.drucker.institute/thedx/measurement-myopia/>.
18. Kowitt B. The one major metric missing from 'Best Hospital' rankings. *New York, NY: Fortune*, 2020. Available at: <https://fortune.com/2020/08/16/best-hospital-rankings-equity/>.
19. Bates DW, Levine D, Syrowatka Ania, et al. The potential of artificial intelligence to improve patient safety: a scoping review. *NPJ Digit Med.* 2021 Mar 19;4(1):54. <https://doi.org/10.1038/s41746-021-00423-6>
PMid:33742085
20. Topol E. Deep medicine: how artificial intelligence can make healthcare human again. New York, NY: Basic Books, 2019.
21. Miller DD. The medical AI insurgency: what physicians must know about data to practice with intelligent machines. *NPJ Digit Med.* 2019 Jun 28;2:62. <https://doi.org/10.1038/s41746-019-0138-5>
PMid:31388566

22. Matheny ME, Whicher D, Israni ST. Artificial intelligence in health care: a report from the National Academy of Medicine. *JAMA*. 2020 Feb 11;323(6):509–10. <https://doi.org/10.1001/jama.2019.21579>
PMid:31845963
23. Best J. IBM Watson: The inside story of how the Jeopardy-winning supercomputer was born, and what it wants to do next. Louisville, KY: TechRepublic, 2013. Available at: <https://www.techrepublic.com/article/ibm-watson-the-inside-story-of-how-the-jeopardy-winning-supercomputer-was-born-and-what-it-wants-to-do-next/>.
24. Ray T. No, there will be no AI winter. Jersey City, NJ: Forbes Media, 2019. Available at: <https://www.forbes.com/sites/tiernanray/2019/09/12/no-there-will-be-no-ai-winter/?sh=6562d49d46a5>.
25. The UK'S Department for International Trade. From A to I: how 9 industries are being transformed by UK innovation around the world. New York, NY: Business Insider, 2017. Available at: <https://www.businessinsider.com/sc/artificial-intelligence-companies?IR=T>.
26. Gawronski Q. Racial bias found in widely used health care algorithm. New York, NY: NBC News, 2019. Available at: <https://www.nbcnews.com/news/nbcblk/racial-bias-found-widely-used-health-care-algorithm-n1076436>.
27. Obermeyer Z, Powers B, Vogeli C, et al. Dissecting racial bias in an algorithm used to manage the health of populations. *Science*. 2019 Oct 25;366(6464):447–53. <https://doi.org/10.1126/science.aax2342>
PMid:31649194
28. Mojsilovic A. Factsheets for AI Services. Armonk, NY: IBM, 2018. Available at: <https://www.ibm.com/blogs/research/2018/08/factsheets-ai/>.