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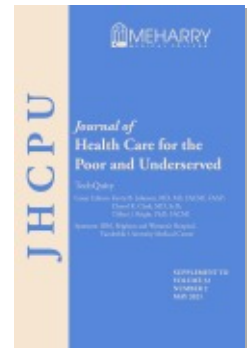
## The Five A's of Access for TechQuity

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## The Five A's of Access for TechQuity

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*Abstract:* The COVID-19 pandemic caused a rapid and significant shift from in-person health care to care delivered virtually, highlighting the impact of disparities in access to technology. Panchansky and Thomas conceptualized the idea of access to health care as comprising five dimensions, known as the Five A's of access: affordability, availability, accessibility, accommodation, and acceptability. Considering these dimensions of access allowed health care systems to dissect barriers to access to better identify ways to overcome them. In the current health care landscape, we must consider technology access. For example, patients without Internet service, appropriate devices, and digital literacy skills experience greater challenges in accessing care via telehealth. To ensure equitable technology access, or *techQuity*, health care systems must identify data to monitor the Five A's of technology access. We re-envision the Five A's of access as they relate to access to technology for telehealth and present a framework for evaluating a health care system's techQuity.

*Key words:* Telehealth, equity, access, digital divide.

The ability to access the Internet and use associated technology has been called a social determinant of health because of its broad impact across all domains of a person's life.<sup>1</sup> The COVID-19 pandemic brought into sharp focus the extent of disparities in access to technology and the ways in which lack of access exacerbates disparities in education, employment, health and other domains.<sup>2-4</sup> In health care, this is particularly relevant for use of remote tools such as telehealth to access care. Dispari-

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ties in use of remote tools existed prior to the COVID-19 pandemic as demonstrated by racial, age and income differences in use of patient portals as well as tools specific to telehealth.<sup>5-7</sup> In addition, despite the documented ability of telehealth to improve patient care while reducing barriers to access such as time away from work and travel time for patients,<sup>8-10</sup> use of telehealth prior to the pandemic was not equal across the country.<sup>11,12</sup> Before the rapid expansion of telehealth services during the COVID-19 pandemic, disparities in the types of health care organizations offering telehealth had been documented: underserved communities were less likely than others to be offered telehealth services.<sup>13</sup>

The shift to a virtual setting to protect both patients and clinicians from increased exposure to COVID-19 exacerbated barriers related to digital skills and access and highlighted the broad implications of the digital divide.<sup>7,11</sup> Many patients who could previously access in-person care found themselves struggling to receive care in this new virtual setting. Those without a regular source of health care pre-COVID faced even greater challenges in accessing services including telehealth early on in the pandemic. As a result, the pandemic has caused us to redefine how we consider equity in access to technology and how we can bring about greater equity. Below, we re-examine the concept of five dimensions of access originally proposed by Penchansky and Thomas in 1981,<sup>14</sup> and draw upon the National Institute on Minority Health and Health Disparities (NIMHD) Research Framework to suggest mechanisms through which health care organizations can increase equity in access to telehealth.<sup>15</sup>

The NIMHD Research Framework offers guidance in understanding and addressing health disparities by considering the intersection of a range of factors at the individual, interpersonal, community and societal levels that can lead to health disparities.<sup>15</sup> Health equity interventions focused on the individual level aim to influence individual health outcomes. Interpersonal interventions are aimed at improving family or organizational health outcomes, while interventions targeting the community level will improve community health. Lastly, societal level interventions target improving population health outcomes. Lafarga and Vega highlight the overlap between the NIMHD Research Framework and social determinants of health (SDoH), pointing to the impact of structural systems on the lives of community members and noting that “health disparities do not occur in a vacuum.”<sup>16[p.8544]</sup> While access to health care in any form is only one element of SDoH, this framework allows us to examine the levels of influence of factors relating to each dimension of access to care and technology.

## The Original Five A’s of Access

Penchansky and Thomas originally proposed five dimensions that help define access to care: availability, accessibility, accommodation, affordability and acceptability.<sup>14</sup> They wrote, “Access is presented here as a general concept that summarizes a set of more specific dimensions describing the fit between the patient and the health care system.”<sup>14[p.127]</sup> This work represented an attempt to articulate factors relevant to the interaction between the health care system and patient that influence how easily the patient can use a system, and recognized that *access* does mean the same thing to all

patients. Penchansky and Thomas view *availability* as the relationship between the volume and type of services offered in a system and the volume and type of patient needs. *Accessibility* considers where patients live and where services are located, and accounts for distance, availability of transportation, travel time, and cost of transportation. The third element, *accommodation*, reflects the way in which the system is organized to accept patients, how well this organization meets patient needs, and patient perception of the appropriateness of accommodation. *Affordability* includes the price of services and availability of existing insurance coverage for services as well as the patient's view of costs and coverage. Finally, *acceptability* is defined by the relationship between expectations of clinicians and of patients.

Considering these Five A's of access as Penchansky and Thomas proposed them has allowed health care systems to understand barriers to access in order to identify solutions. In the current health care landscape, however, our traditional understanding of access has changed considerably. The COVID-19 pandemic catalyzed a significant increase in the use of telehealth and revealed significant gaps in capacity to use telehealth, affecting health outcomes and decreasing equity in care.<sup>17</sup> Disparities in ownership of devices such as smartphones, tablets, or computers, as well as in digital skills and access to effective and reliable Internet service are well-documented.<sup>1,7,18</sup> Because of this, patients without any or steady, reliable Internet access, appropriate devices, and digital literacy skills faced greater risks to their health by seeking in-person care for conditions that did not require it, or not seeking care at all. Even as in-person visits resume, experts acknowledge that telehealth will remain a more significant modality for patient care than it was before the pandemic.<sup>17,19</sup> In light of the impact of the COVID-19 pandemic and resulting increase in care provided through telehealth across the health care system on patient's ability to use health care, we reconsider each these Five A's of access as they apply to access to telehealth and the goal of equitable access in a virtual environment, or *techQuity*.

### **TechQuity: Five A's of Access in a virtual context**

The original Five A's concept presented by Penchansky and Thomas offers a useful guide for understanding access in the context of telehealth. Box 1 provides definitions of this new conceptualization including each dimension of access as well as mechanisms health care organizations can use to assess the equitability of each dimension as it relates to telehealth.

Using the Five A's, *availability* in the telehealth context relates to the fit between the volume and types of telehealth services provided by a health care organization and the needs of patients in that organization. For example, some applications require access through a patient portal; those without a portal may not be able to use telehealth services. *Accessibility* in the context of telehealth can be defined as the relationship between the digital skills and literacy of patients and support available to patients in their use. Digital literacy refers to "individual's ability to find, evaluate, and compose clear information through writing and other media on various digital platforms."<sup>20[nop.#]</sup> In the realm of health care and telehealth, this concept includes activities such as

**Box 1.****THE FIVE A'S OF ACCESS FOR TECHQUITY AND ASSOCIATED ASSESSMENT METRICS FOR HEALTHCARE ORGANIZATIONS**

Dimension	Definition	Assessment
Availability	The relationship between existing telehealth services provided by a system and resources to the patient's need and ability	<ul style="list-style-type: none"> <li>• Comparison of:               <ul style="list-style-type: none"> <li>• Patterns of telehealth encounter data by demographic and diagnosis</li> <li>• Telehealth and in-person patterns</li> </ul> </li> </ul>
Accessibility	The relationship between digital skills and literacy of a patient population and the support available to use them	<ul style="list-style-type: none"> <li>• Conduct digital literacy screening of patients</li> <li>• Inventory of 211 data digital skills training sources</li> </ul>
Accommodation	The relationship between requirements of digital platforms and the patient's ability to navigate them	<ul style="list-style-type: none"> <li>• Analysis of:               <ul style="list-style-type: none"> <li>• Telehealth platform requirements</li> <li>• Organizational workflows to support patients' needs</li> </ul> </li> </ul>
Affordability	The relationship between the costs of internet services and devices and the patient's ability to pay for them	<ul style="list-style-type: none"> <li>• Analysis of:               <ul style="list-style-type: none"> <li>• Regional cost of Internet service</li> <li>• Number of Internet Service Providers</li> <li>• Low-cost device programs</li> </ul> </li> </ul>
Acceptability	The relationship between the healthcare organizations telehealth tools and workflows and the patient's attitude toward and comfort with tools and workflows	<ul style="list-style-type: none"> <li>• Patient satisfaction surveys</li> <li>• Focus groups/Patient and Family Advisory Councils</li> </ul>

searching for and evaluation of health information on the Internet, scheduling an appointment online, communicating with a provider through a patient portal, as well as use of video telehealth visits.

*Accommodation* in this context refers to the relationship between the requirements of telehealth platforms and the patient's ability to meet them. Requirements in this sense can be technical such as requirements for the most recent software; the need to download multiple applications; flexibility to use on a desktop computer, tablet or smartphone; or requirement to maintain the latest operating system to use telehealth applications. This dimension also includes clinic workflows and the range of interactions from scheduling an appointment to pre-appointment activities to interaction with the clinician.

*Affordability* can be defined as the relationship between the cost of devices and Internet service at sufficient speeds to accommodate a range of uses in an organization's

service area and the resources available to patients to purchase them. Finally, *acceptability* of telehealth applications refers to the patients' attitudes toward or comfort with this mode of care and workflows surrounding its use.

## **Addressing the Dimensions of Access to Telehealth in the NIHMD Research Framework**

The Five A's focus on understanding the fit between what a system offers and what patients need. For telehealth access, the COVID-19 pandemic clearly demonstrated that we have a limited understanding of what patients need, thus limiting our ability to adapt the system to meet those needs. For example, digital skills and literacy assessment is not typically a part of routine screenings but can be a powerful tool to examine disparities in access and develop possible solutions. In Box 1, we suggest mechanisms to guide health care organization efforts to examine each dimension of patient access in the context of telehealth. Below we describe how these mechanisms fit and interrelatedness within the NIHMD Research Framework to guide interventions at appropriate levels of influence.

*Availability* falls within the community level of influence. In this context, health care organizations can look to how well telehealth services offered meet patient needs through examining patterns of telehealth and in-person use for differences in demographic characteristics or patient condition to identify gaps in services offered. This type of inquiry can include examining rates of telehealth use at different clinics or rates of video versus phone visits. To be most effective, however, this analysis should be combined with an assessment of the *accessibility* of telehealth at the individual level of influence. This requires understanding the digital skills and literacy of a patient population and supports available to help patients gain these skills.<sup>20-22</sup> Although this type of screening is not currently routine in clinical practice, it can be included more broadly with social determinants of health screening.<sup>22,23</sup>

Research documents the impact of the lack of assessment of digital skills and literacy had on patient access when the COVID-19 pandemic hit in the U.S.<sup>24</sup> For example, Nouri, et al. compared in-person, telephone and video visits in a two-week period prior to the COVID-19 shut down and a two-week period in late March. They found that populations that would be expected to have lower digital skills, including older adults, non-English speakers and patients enrolled in Medicaid, had fewer than expected visits during this time period, indicating that availability was low for these populations.<sup>25</sup> While understandable given the immediate and intense shift to telehealth that occurred, it highlights for the future the importance of knowing the accessibility of telehealth. Examples of health literacy and digital skills assessments include the Newest Vital Sign (NVS)<sup>26,27</sup> and the Brief Health Literacy Screen (BHLS),<sup>28</sup> both of which assesses ability to understand health information; the electronic health literacy assessment (eHEALS) addresses ability to use electronic resources to access health information.<sup>29</sup> Additionally, Vollbrecht et al. combined assessments of access, use, and capabilities related to digital tools.<sup>29</sup> To provide support to patients who need additional training and tools, an inventory of resources for training can be generated from a variety of sources including

the local 211 service widely available through the United Way.<sup>11,30</sup> Local public libraries also often provide digital skills training, although additional orientation specific to health-related digital tools may be required for patients to fully use them.

At the interpersonal level, a health care organization's role in assessing the *accommodation* dimension of access and techQuity involves examining the technical and workflow elements of telehealth services through an equity lens. The availability of platforms only accessible through a patient portal, for example, may present a barrier to those with limited digital skills. In addition, designing workflows to support patients with varying levels of ability can promote techQuity. For example, offering new users the opportunity to test out their devices with a medical assistant before their visit can save time during the visit and allow a greater focus on medical rather than technological issues.

At the community level of influence, assessing *affordability* of Internet access and devices is critical for understanding the context in which patients live and how that influences their ability to use telehealth. Health care organizations can find information about the cost and speeds of Internet access from multiple sources. Internet mapping, for example, is available from digital inclusion advocacy organizations to describe Internet service providers (ISP) by geographic region as well as rates of subscription by household in an area. Additionally, wifi hotspot maps can detail access to public Internet in the area. Other locations such as public libraries also often offer both Internet and device access. These options, however, should be promoted with caution because of concerns about use of health tools in public settings where privacy may be severely limited and travel may be required to make use of these hotspots. Furthermore, during the time of Covid-19 restrictions, few libraries and loanable devices are available. Digital equity advocacy organizations, such as the National Digital Inclusion Alliance, provide links to resources to assist with low-cost devices and Internet subscriptions.<sup>31</sup> This type of information allows targeting resources where they may make the greatest impact, including through community partnerships working to address the digital divide across all domains.<sup>32</sup>

Finally, *acceptability*, at the individual level of influence, is commonly assessed through patient experience surveys. Ease of administration and analysis are strengths of this mechanism of understanding acceptability. However, non-White and non-English proficient patients are underrepresented in the most common satisfaction surveys and therefore these results may not adequately reflect the challenges underserved populations experience.<sup>33-35</sup> In addition, telehealth-specific satisfaction surveys are only administered to those who use telehealth services, which leaves out the very valuable perspective of non-users. To provide a more inclusive perspective, health care organizations can leverage Patient and Family Advisory Councils (PFAC) as an important mechanism for understanding a range of views and experiences. These Councils are formal groups of patients or family members convened to advise health care organizations on issues from the perspectives of patients. Because members are patients themselves, as well as often in communication with other patients, if designed to appropriately reflect the demographic characteristics of the community, they can help systems understand fac-

tors that affect the use of tools such as telehealth as well as provide input on possible interventions to facilitate use.

## Conclusion

Building on Penchansky and Thomas's view of access as the fit between the characteristics and expectations of clinicians and health care organizations and of patients, we propose that access to telehealth can be made more equitable by examining the Five A's in this new context. Considering how each of these dimensions of access relates to telehealth is critical for creating more equitable access, or techQuity. However, none of the dimensions can be considered in isolation. As others highlight, the Five A's of access can be thought of as a chain which is only as strong as its weakest link.<sup>36</sup> Improving the equity of our telehealth and other digital services requires a comprehensive approach that examines all dimensions of access. As telehealth becomes more routine in clinical care, it is critical to ensure that increased use does not leave some patients behind. Comprehensive strategies for addressing disparities in access to telehealth must consider the correct level of influence, whether it is individual, interpersonal, community-level, or society-level. This blending of the Five A's with the NIMHD Research Framework allows us to re-envision access with a health equity lens, as a way to examine models of telehealth, in order to help bridge the digital divide and promote techQuity in the care we deliver.

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