CHCF Issue Brief

FEBRUARY 2022

by Courtney R. Lyles, Adrian Aguilera, Oanh Nguyen, and Urmimala Sarkar

Bridging the Digital Health Divide:
How Providers and Plans Can Help Communities Better Adopt Digital Health Tools

A plethora of digital health tools for patients have been developed in the United States over recent years, including mobile phone applications, wearable devices, and technology linked to health care data, such as patient portals.[1] However, there are large inequities in who is using these digital tools.

The goal of this two-part series, "**Bridging the Digital Health Divide**," is to provide key stakeholders with action-oriented recommendations to ensure digital health technology meets the needs of diverse patients. The goal is to ensure all patients benefit from digital health tools regardless of their cultural background, language, income, race, or ethnicity. The audience for this issue brief includes those who implement digital health products and services, including health care providers; leaders of hospitals, clinics, and health systems; information technology staff; and payers. The challenges described in the series — including the digital divide as well as digital health inequities — are multifaceted. Approaches to address these challenges must reach patients where they are, whether at the doctor's office, at home, or on the go.

The other brief in the series discusses the challenges for technology developers in ensuring equitable digital health design and suggests design principles that can help them overcome these challenges.

With a focus on equity and inclusion during implementation and design, health care providers, health plans, and developers can create technology that better reaches everyone.

Why Change Is Needed

It has never been more apparent that digital health in the US needs to be more inclusive. The COVID-19 pandemic amplified the need for remote and digital approaches to complete everyday tasks, such as going to school or seeing the doctor. The rapid conversion to remote health care delivery via telemedicine also highlighted key pitfalls of our existing digital health infrastructure.[2]

In particular, the shift to telemedicine meant that people already suffering from health inequities were left even further behind due to limited access to digital health services. This included rural residents who lack reliable broadband, people from racial and ethnic minority groups who are alienated from the health care system, older adults who have lower digital literacy skills, those with low incomes who have unaffordable cell phone data plans, and those with a preferred language other than English who could not effectively use English-only digital health platforms.[3] Without focused attention, the health care system will continue to see uneven adoption of digital tools such as telemedicine, resulting in worsening health inequities, even beyond the pandemic.[4]

Multiple underlying drivers of digital health equity exist. Within the US, 93% of American adults use the internet and 85% own smartphones.[5] However, access and use are not distributed equally, a disparity known as the digital divide.[6] Among adults over age 65 in the US, only 55% to 60% own a smartphone or have home broadband access, and only 60% can send an

email, fill out a web form, and find a website. Similarly, the nearly one in eight Americans living in poverty have markedly lower rates of smartphone ownership (71%), home broadband access (59%), and internet use (82%), and they also report having only basic digital skills (53%).[7]

These issues are systemic and include a lack of investment in broadband infrastructure in systematically excluded rural and urban neighborhoods.[8] In addition, many groups have received unequal access to computers and digital literacy education. Considered together, at least one in four adults in the US may not have the digital literacy, access to the internet, or the necessary devices to meaningfully engage with digital technologies.

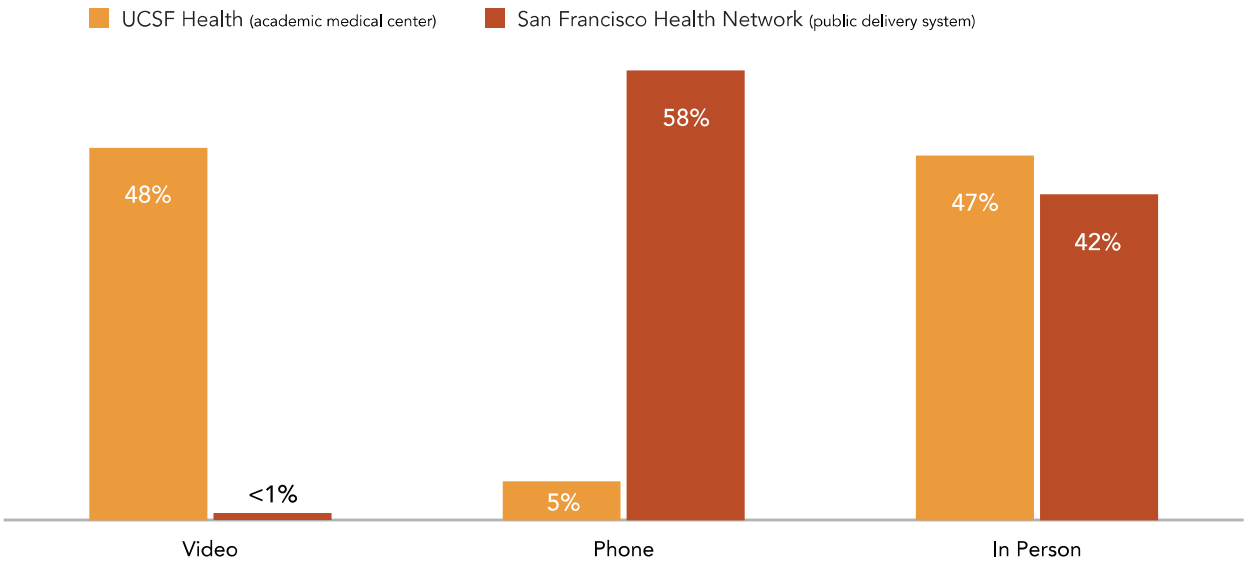
The digital divide extends into digital health (Figure 1). Digital health includes all of the technologies and systems that health care providers and payers use with patients, including telemedicine (e.g., telephone and video visits with a physician or other health care provider), patient portals, remote monitoring devices, apps, health trackers, and electronic health records.

The Healthy People initiative, a 10-year federal program meant to improve the health of Americans,[9] found that while the general population increasingly used mobile devices for health care and had steadily increasing online communication with health care providers, inequities across different populations persist.[10] These disparities are most pronounced among older adults, those with limited English proficiency or health literacy, those facing poverty and other economic barriers, and those with limited digital literacy. These groups use digital health tools at significantly lower rates than other groups.[11]

A recent analysis found that more than one in six people are not able to engage in telemedicine. Older adults, Black and Latinx individuals, those with public health insurance (i.e., Medicaid and Medicare) or no

Figure 1. Primary Care Visits, by Visit Type, Academic Medical Center vs. Public Delivery System, August 2020

The Digital Divide. Some public and safety-net settings differed substantially from other settings in use of telemedicine modalities during the COVID-19 pandemic.



Source: The Commonwealth Fund, "**Launching a Toolkit for Safety-Net Clinics Implementing Telemedicine During the COVID-19 Pandemic**," October 27, 2020, with data from the authors.

insurance, respondents with lower levels of education, and those experiencing food insecurity or social isolation have a much lower ability to access telemedicine. These findings highlight how differences in digital health readiness threaten to widen existing disparities among populations already at risk.[12]

Mistrust stemming from historical and current exclusion and discrimination within the health care system also can have a profound impact on the acceptance and use of digital products and services that health care providers or plans offer. Because many in the US have been excluded from digital health innovation and have experienced discrimination from health care more generally, it is critical to explicitly focus on the needs and preferences of these groups[13] rather than assume current approaches and products are sufficient. Decisionmakers in digital health must therefore be intentional and thoughtful about acknowledging historical and current exclusion, as well as including diverse populations throughout all phases of developing and implementing programs.

Ensuring Digital Health Readiness

Although a wide range of digital health solutions have been developed in the US over the past decade, including both patient apps and wearables, as well as technology such as patient portals, people have a range of needs and preferences that influence digital health use from the outset.

Addressing the major technology-related barriers that hinder people from using new digital health tools — such as providing broadband and computer access — is necessary to ensure greater adoption of such tools. In addition, it is important that health care providers and health plan leaders understand something more: whether people are ready and able to adopt a digital health tool.

Health care providers and health plan leaders therefore need to ask a range of questions on topics that go to the heart of digital readiness, such as the following:

- **Motivation and trust.** Do members of a specific population believe that they have a problem that can be helped or solved with a digital health tool? And do individuals trust using available digital health tools, in general, as well as in combination with in-person health care interactions?
- **Access.** Do patients have the appropriate device and connectivity to engage with a digital health tool?
- **Digital literacy.** Do patients have the necessary abilities to use digital health technology?

Some of these questions are similar to health and health care promotion more broadly. To promote positive health behaviors — whether to take a pill, check one's blood pressure, or attend a follow-up appointment — requires an understanding of the patient's needs, motivation, and capabilities. The same is true for patient engagement in digital health technology.

Motivation and Trust

Technology has a greater likelihood of being used if it meets a pressing need that a specific group of people consider relevant.[14] Digital health stakeholders should partner with populations to understand what is important to them. This could range from culturally responsive health education to integrated community support (i.e., public libraries, churches, or other key community organizations collaborating with health systems to provide education and support for digital health tools). Health providers and health plan leaders should pay particular attention to defining specific needs that the proposed technology addresses (e.g., addressing food access or locating food resources versus providing dietary recommendations within a digital tool) and communicating how a digital health solution links to other important aspects of care.[15]

Health care providers and health plan leaders also must seek to establish greater trust that underlies the relevance and use of digital health solutions. The US health care system has a fraught history of mistreatment, discrimination, and racism directed toward people of color, which continues to adversely affect care and treatment today, including ongoing mistrust of the health care system. In terms of digital health, trust is further complicated by well-publicized data breaches involving health care and other digital systems.[16] Therefore, digital health cannot be separate from ongoing health equity programs and interventions within health care settings. At the core of health equity efforts must be ongoing and reciprocal relationships in the community, including direct relationships with community members, partners, and organizations.

Access

In addition to motivation and trust, the people who use a health care tool or platform must have the necessary equipment and internet connections to use technology for their health care. They need access to an internet-ready device, such as a smartphone, tablet, laptop, or desktop computer. Ideally, the device should not be shared, and it should therefore enable privacy and security. The device also should have the latest software needed to operate the technology with ease.

Those implementing digital health tools should understand the types of devices that individuals will use for access and any limitations that they face. With this awareness, health care providers and plans can target approaches to user needs and connect communities with existing resources, such as those identified in the Additional Resources section of this brief.

Digital health solutions also should be smartphone-friendly, including features such as mobile optimization of websites and availability of apps in both Android and iOS platforms. Fifteen percent of US adults access the internet exclusively via a smartphone. These users are more likely to be individuals under the age of 30 and come from extremely low-income households (with less than $30,000 in annual income), or come from Latinx backgrounds.[17]

Patients also require adequate internet connectivity. Ideally, internet access would come through affordable, high-quality broadband at home that has enough speed and bandwidth. While a growing share of Americans have a high-speed internet connection at home, almost a quarter (23%) do not. Among those without a high-speed internet connection at home, nearly half (45%) cite financial barriers as the reason for not subscribing to high-speed internet.[18] Those without high-speed internet at home may either have options for internet access outside of the home (such as at school or a public library), rely on limited cellular data plans through their smartphones, or lack internet access entirely.

In addition to understanding whether intended users have available internet access, health care providers and health plan leaders must understand existing and potential issues that may affect connectivity. These issues include:

- **Interruptions in internet access.** Intermittent access to the internet often stems from an unaffordable internet subscription or cell phone bill some of the time.
- **Limitations on bandwidth.** Users often face limits on how much data can be downloaded or uploaded from their device.
- **Limitations on data speed.** Many times, digital health technologies require high-speed connections.

Digital Literacy

Even among those who are interested in using digital health solutions and have sufficient access to computers and other devices, 52 million adults in the US do not have the digital literacy skills needed to use them properly.[19] Digital literacy includes having confidence and experience with using digital health solutions. Digital literacy skills range from basic, such as being able to find a website or send an email, to more advanced, such as being able to navigate multiple interfaces and share data between platforms. Digital literacy can encompass not only skills but also positive attitudes and beliefs about one's ability to use and get value from using digital technology.[20]

Those who lack the abilities to use existing platforms and tools on their own are more likely to be older, experience increased challenges accessing education, and come from a racial or ethnic minority background — given similar underlying structural barriers within our society. Health care providers and payers need to identify training or support needs for specific populations and deliver training that is tailored to that group's needs (see case study).

Health care providers and payers should understand the range of skills required for specific populations to engage with digital health tools and identify potential skill or knowledge gaps that can lead to insufficient adoption of technology. The list in Table 1 offers a pragmatic approach to assessing users' digital skills (see page 6).[21]

CASE STUDY

Improving Digital Health Readiness

A federally qualified health center based in urban Los Angeles mostly cares for patients at or below the federal poverty line. The center's patient population is racially and ethnically diverse, and nearly half of its patients are better served in a language other than English. The staff knew from prior evaluations that most of their patients preferred in-person to remote visits. To avoid an interruption in critically needed medical care during the COVID-19 pandemic, it was crucial for the center to develop effective strategies to understand and address existing and emerging barriers to telemedicine.

The health center assessed these barriers by surveying a representative sample of patients. The staff made sure to conduct outreach and data collection in the patients' preferred language, and to include patients with varying levels of engagement in their care.

Through this survey, the health center learned that many patients were not able to schedule telephone or video visits because they had difficulty logging on to and using the patient portal. Patients communicated that the password requirements were difficult and that not all of the web pages were translated into their preferred language. Some patients were not able to participate in video visits because they did not own a device with a camera, so staff connected them with the city library, which provides low-income members of the community with free and low-cost devices.

To help patients use remote care tools, such as the patient portal and video visits, staff developed and conducted trainings in multiple languages. They offered trainings online and in-person, when possible. The health center also continued to prioritize hiring and retaining staff fluent in priority languages to increase the cultural relevance of their work. Through approaches like these, the health center used patient experiences to inform their implementation of telemedicine and improved adoption among patients who would have otherwise been excluded.

Table 1. A Digital Literacy Checklist

CAN THE USER DO THE FOLLOWING?

Foundational

- Turn on device.
- Use available device controls, such as a touchscreen, mouse, and keyboard.
- Use menu settings, such as changing the volume or increasing the font size to make text easier to read.
- Connect to a Wi-Fi network.
- Find and open apps.
- Use an internet browser.
- Update and change passwords.

Communications

- Use email, messaging apps, text messages, social media, and video to communicate with others.

Information

- Use a search engine to find news, health information, and other information of interest.
- Recognize the trustworthiness of online information.
- Stream or download online movies, music, games, books, and other content.

Transactions

- Access and use public services and assistance online, such as applying for services and paying bills.
- Purchase goods or manage money and financial transitions securely online.

Problem solving

- Use online resources, including online tutorials, FAQs, and forums, to solve problems and search for information.

Safety and privacy

- Keep online accounts secure and private using robust passwords and privacy settings.
- Assess risks and threats involved in being online.
- Recognize and avoid suspicious links in emails, websites, and social media.

Many digital literacy skills also are gained or supported through relationships, such as the availability of technical support from a trusted friend or family member. Other people can teach individuals specific skills that help bridge gaps and help them gain confidence in their abilities. For example, an adult child might help an older parent create a user account and password and log in to an online patient portal. Over time, after going through the process with their children, older parents may learn to log into the patient portal on their own.

More direct consideration of the processes for engaging loved ones or trusted individuals is critical for addressing digital health inequities. In parallel, health care providers and health plans must be prepared to support users who do not want to share sensitive information with those who provide them with digital support. They can do this by asking patients if they need help accessing their health information, who helps them with this access, and if they need support retaining control of their personal information.

While family members and caregivers may help with specific applications, health care providers and health plans should still pay attention to developing and maintaining long-term and ongoing organizational support for digital health solutions. At a minimum, organizations can provide robust and well-trained technical support for the digital health solutions that they implement, such as through a health system help desk. Even with these support structures in place, it is important to note that ensuring universal access to digital health technology also requires alternate channels, when needed, such as through call centers or other support offered to all patients. For example, users who lack the digital literacy to engage in video telemedicine visits may prefer to engage in telephone or face-to-face visits.

To meet individuals where they are across the digital skills spectrum, organizations also can partner with public libraries and other community organizations to provide comprehensive digital skills as well as literacy education and training (see the Additional Resources section for various organizations' ideas to support this work). Trainings within these organizations are often tailored to the needs of specific populations, such as trainings provided in patients' preferred languages. Overall, a longer-term view on digital skill building and support — both within and outside of the health care setting — is critical to reinforcing access, interest, and motivation to adopt and use digital health.

Finally, sufficient digital literacy skills are enabled by a suitable physical environment in which to use a tool or platform. For example, people living in crowded or congregate settings may be reluctant to participate in video visits with a clinician due to the potential for others to overhear sensitive conversations. Alternately, some people may only have online access in a public space, such as a library or a common area in their residence, which poses privacy and security issues. Therefore, the context and environment should be considered up front when planning for technology implementation (e.g., combining video visits with secure chat or texting functionality).

Conclusion

Digital health equity depends on technology implementers enabling diverse communities to engage with and use digital health. As health providers and health plan leaders devise ways to implement these digital health products and services, they must keep top of mind the strategies presented in this brief.

Screening Questions to Assess Digital Health Readiness

Equitable access to digital tools means that health care providers and health plans maximize the potential benefit so that the people most likely to use a digital tool or service are motivated, can access that tool, and have the right digital literacy skills to use it. Health care providers and health plans can ask potential users the following questions to determine the best fit:

Interest. *How interested are you in using this tool [for the benefit intended]? (Not at all, somewhat, very).* Follow-up question: *What would make you very interested?*

Trust. *How concerned are you about the privacy, security, or confidentiality of your health information being available online?*

Access. *Do you currently have a device that allows you to get on the internet, such as a smartphone, tablet, or computer?*

Connectivity. *In the past 12 months, how often have you had your telephone [and/or internet] service turned off at any time?*

Skills (communication). *In the last month, how often did you send messages by texting? Email? (Most days, some days, or rarely)*

Skills (information, transactions, or problem solving). *In the last month, how often did you use your device (smartphone, tablet, or computer) for something besides texting or email? (Most days, some days, or rarely)*

Accessibility (environment). *Do you have a private and secure place to [use digital health]? Private means not at risk of someone inadvertently seeing or hearing anything you don't want them to see or hear while you are [using digital health]. Secure means not using a public internet connection or a public shared computer terminal, such as at a public library.*

Sources: "**Guidance: Essential Digital Skills Framework**," updated April 23, 2019. ***Digital Instruction Guide for Health and Care in Wales*** (PDF). Wales Co-operative Centre. July 2019

About the Authors

Courtney R. Lyles, PhD, is a health services researcher and associate professor in the UCSF Department of Medicine as well as in the Department of Epidemiology and Biostatistics. Adrian Aguilera, PhD, is an associate professor in the School of Social Welfare at UC Berkeley and the Department of Psychiatry and Behavioral Sciences at UCSF. He directs the **Digital Health Equity and Access Lab (dHEAL)**. Oanh Nguyen, MD, MAS, is an assistant professor in the UCSF Department of Medicine and hospital medicine physician at San Francisco General Hospital. Urmimala Sarkar, MD, MPH, is a professor in the UCSF Department of Medicine and a primary care physician at Zuckerberg San Francisco General Hospital's Richard H. Fine People's Clinic. Drs. Lyles and Sarkar cofounded **UCSF S.O.L.V.E. Health Tech**, an academic program that partners with digital health companies to adapt technology for marginalized and minoritized patients and the settings that serve them.

Acknowledgments. The authors would like to thank Marika Dy and Sarah Lisker for their support with this issue brief.

About the Foundation

The **California Health Care Foundation** is dedicated to advancing meaningful, measurable improvements in the way the health care delivery system provides care to the people of California, particularly those with low incomes and those whose needs are not well served by the status quo. We work to ensure that people have access to the care they need, when they need it, at a price they can afford.

CHCF informs policymakers and industry leaders, invests in ideas and innovations, and connects with changemakers to create a more responsive, patient-centered health care system.

ADDITIONAL RESOURCES

The following resources were developed by health care providers, government, academia, nonprofits, foundations, and community groups to provide further guidance on helping patients better adopt digital tools.

Digital Health Readiness

- San Francisco Mayor's Office of Housing and Community Development: **Digital equity intake questions**

Access to Devices and Internet

- National Digital Inclusion Alliance: **Free and low-cost internet plans**
- **PCs for People**
- **Lifeline Support** program
- Local libraries: Access to digital resources and services[22]
- **AT&T Access** program
- **Comcast Internet Essentials** program

Basic Digital Literacy Resources

- Goodwill Community Foundation: How-tos on internet skills in **English** and **Spanish**
- Public Library Association: **Computer courses**
- San Francisco Mayor's Office of Housing and Community Development: **Tips**

Endnotes

1. Adriana Krasniasky, Megan Zweig, and Bill Evans, ***H1 2021 Digital Health Funding: Another Blockbuster Year…in Six Months***, Rock Health. July 6, 2021.
2. Sarah Nouri, Elaine C Khoong, Courtney R Lyles, and Leah Karliner, "**Addressing Equity in Telemedicine for Chronic Disease Management During the COVID-19 Pandemic**." *NEJM Catalyst*. May 4, 2020; and Chukwuma N Eruchalu, Margaret S Pichardo, Maheetha Bharadwaj et al. 2021. "The Expanding Digital Divide: Digital Health Access Inequities During the COVID-19 Pandemic in New York City." *J Urban Health* 98 (2): 183–186.
3. Maria A Alkureishi, Zi-Yi Choo, Ali Rahman et al. 2021. "Digitally Disconnected: Qualitative Study of Patient Perspectives on the Digital Divide and Potential Solutions." *JMIR Human Factors* 8 (4).
4. Nouri et al., Addressing Equity in Telemedicine.
5. ***Internet/Broadband Fact Sheet***. Pew Research Center. April 7, 2021; and ***Mobile Fact Sheet***. Pew Research Center. April 7, 2021.
6. ***Digital Divide***. Merriam-Webster Dictionary. Accessed December 15, 2021.
7. *Internet Fact Sheet*, Pew Research; and *Mobile Fact Sheet*, Pew Research.
8. *Internet Fact Sheet*, Pew Research.
9. ***Healthy People***. National Center for Health Statistics. May 25, 2021.
10. Devlon N Jackson, Neha Trivedi, and Cynthia Baur. 2021. "Re-Prioritizing Digital Health and Health Literacy in *Healthy People 2030* to Affect Health Equity." 2021, *Health Commun* 36 (10): 1155–1162.
11. Sunny C Lin, Courtney R Lyles, Urmimala Sarkar, and Julia Adler-Milstein. 2019. "Are Patients Electronically Accessing Their Medical Records? Evidence From National Hospital Data." *Health Aff (Millwood)* 38 (11): 1850–1857; Courtney R Lyles, Eugene C Nelson, Susan Frampton et al. 2020. "Using Electronic Health Record Portals to Improve Patient Engagement: Research Priorities and Best Practices." *Ann Intern Med* 172 (11 Suppl): S123–S129; Sarah Nouri, Julia Adler-Milstein, Crishyashi Thao et al. 2020. "Patient Characteristics Associated with Objective Measures of Digital Health Tool Use in the United States: A Literature Review." *J Am Med Inform Assoc* 27 (5): 834–841; and Jasmine DeSilva, Rachel Prensky-Pomeranz, and Megan Zweig. 2021. *Digital Health Consumer Adoption Report 2020*. San Francisco: Rock Health.
12. Charles M Wray, Janet Tang, Sachin Shah et al. 2021. "Sociodemographics, Social Vulnerabilities, and Health Factors Associated with Telemedicine Unreadiness Among US Adults." *J Gen Intern Med* 1–3.
13. Nouri et al., "Patient Characteristics." ; Megan Zweig, Jen Shen, and Lou Jug, "**Healthcare Consumers in a Digital Transition**." Rock Health. August 27, 2018. Accessed December 15, 2021; and Emily A Vogels, "**Digital Divide Persists Even as Americans with Lower Incomes Make Gains in Tech Adoption**." Pew Research Center. June 22, 2021.
14. Urmimala Sarkar, Gato I Gourley, Courtney R Lyles et al. 2016. "Usability of Commercially Available Mobile Applications for Diverse Patients." *J Gen Intern Med* 31 (12): 1417–1426.
15. Alkureishi et al., "Digitally Disconnected."
16. Rama A Salhi, Mahshid Abir, and Bisan A Salhi, "**No Patient Left Behind: Considering Equitable Distribution of Telehealth**." *Health Affairs*. April 20, 2021; and Lina Tieu, Urmimala Sarkar, Dean Schillinger et al. 2015. "Barriers and Facilitators to Online Portal Use Among Patients and Caregivers in a Safety Net Health Care System: A Qualitative Study." *J Med Internet Res* 17 (12): e275.
17. Andrew Perrin, ***Mobile Technology and Home Broadband 2021***. Pew Research Center. June 3, 2021.
18. *Internet Fact Sheet*, Pew Research.
19. Saida Mamedova and Emily Pawlowski. 2018. *A Description of U.S. Adults Who are Not Digitally Literate*. Washington, DC: National Center for Education Statistics.
20. Courtney R Lyles, Jill Y Allen, Dolly Poole, et al. 2016. "'I Want to Keep the Personal Relationship With My Doctor': Understanding Barriers to Portal Use Among African Americans and Latinos." *J Med Internet Res* 18 (10): e263.
21. *Essential Digital Skills 2021: Technical*. 2021. London: Ipsos MORI.
22. ***Access to Digital Resources and Services: An Interpretation of the Library Bill of Rights***, American Library Association, accessed December 15, 2021.