

# Examining and Addressing Telemedicine Disparities Through the Lens of the Social Determinants of Health: A Qualitative Study of Patient and Provider During the COVID-19 Pandemic.

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## Abstract

*Accelerated use of telemedicine during the COVID-19 pandemic enabled uninterrupted healthcare delivery while unmasking care disparities for several vulnerable communities. The social determinants of health (SDOH) serve as a critical model for understanding how the circumstances in which people are born, work, and live impact health outcomes. We performed semi-structured interviews to understand patients and providers' experiences with telemedicine encounters during the COVID-19 pandemic. Through a deductive approach, we applied the SDOH to determine telemedicine's role and impact within this framework. Overall, patient and provider interviews supported the use of existing SDOH domains to describe disparities in Internet access and telemedicine use, rather than re-framing technology as a sixth SDOH. In order to mitigate the digital divide, we identify and propose solutions that address SDOH-related barriers that shape the use of health information technologies.*

## Introduction

The rapid shift towards the use of telemedicine enabled widespread healthcare delivery and expanded healthcare access in the United States (U.S.) during the COVID-19 pandemic. However, this digital transition also unveiled broad disparities in care access and care quality for marginalized groups and raised concerns that telemedicine may further exacerbate health inequities in these communities.<sup>1,2,3</sup> Specifically, populations with limited resources needed to engage in telemedicine, including health insurance, broadband, or smartphone ownership, may face greater challenges to accessing telemedicine.<sup>4</sup> Additionally, individuals with lower digital literacy and older adults may struggle to participate in telemedicine because of limited experience with these technologies.<sup>5</sup>

Telemedicine disparities are often described via patient factors, i.e., race/ethnicity, sex, and age. However, social determinants of health (SDOH) may be a more useful framework. SDOH are non-medical conditions that include education access and quality, healthcare access and quality, neighborhood and built environment, the social and community context, and economic stability, and are believed to account for nearly half of all health outcomes.<sup>6</sup> The SDOH provides a critical framework for understanding how the *circumstances* in which people are born, work, live, worship, and age may influence health outcomes and reflect actionable targets for addressing disparities. For example, healthcare access is largely influenced by whether an individual has health insurance, and uninsured individuals are more likely to have fractured access to healthcare, worse self-reported health, and higher mortality.<sup>7,8</sup> Similarly, those living in disadvantaged and rural neighborhoods that are farther from healthcare facilities have decreased use of preventive services, thus increasing their risk of poor health outcomes.<sup>9,10</sup>

Although telemedicine may help to reduce disparities in healthcare access by addressing geographic barriers related to transportation or financial obstacles related to paid sick leave, telemedicine engagement is limited for populations adversely impacted by the SDOH.<sup>11</sup> While some have argued that Internet access should be classified as a sixth SDOH, others believe that technology and digital literacy are intertwined with each SDOH.<sup>12,13,14</sup> The role of telemedicine as a SDOH remains to be determined.<sup>15</sup> We applied the SDOH framework to analyze interviews about telemedicine experiences with the goal of determining whether telemedicine and information technology more broadly should be considered an independent SDOH domain or whether they are sufficiently well described by existing SDOH domains. Our broader goal was to use this analysis to assess whether mitigating the digital divide requires a focus on addressing technology disparities narrowly or from a broader SDOH perspective. Therefore, we leveraged our findings to examine the present state of telemedicine use through the SDOH framework and offer potential solutions directed at bridging the digital gap.

## Methods

The data from this study were derived from a larger project that examined patient and provider experiences with telemedicine during the COVID-19 pandemic. Adult patients and primary care providers across four large academic medical centers in three U.S. states (NY, NC, FL) were recruited to participate in semi-structured interviews between March and October 2021. Patients were aged 18 years or older, English or Spanish speaking, able to participate in a video or telephone interview, and diagnosed with one or more chronic diseases (Asthma, Chronic Obstructive Pulmonary Disease, Congestive Heart Failure, Diabetes, and Hypertension). Providers were physicians or nurse practitioners who worked in an ambulatory internal medicine or primary care setting at one of four academic medical centers. To ensure that the sample was representative and diverse, the researchers used maximum variation sampling during recruitment of participants. Factors that were considered during recruitment included age, race, ethnicity, practice location, and level of experience with technology use. Local clinical champions at each medical center assisted with participant recruitment. The parent study also had a stakeholder advisory board with representatives that included informatics experts, patients, providers, practice leaders/administrators, and insurance payers who provided guidance on the interview guides and strategies to recruit participants. This study was approved by the Biomedical Research Alliance of New York Institutional Review Board.

## Measures

The semi-structured interview guides were developed in collaboration with the stakeholder advisory board. The provider interview guide included questions focusing on factors that impacted telemedicine delivery. The patient interview guide included questions about access to and experiences with receiving care using telemedicine during the pandemic.

## Data collection

Participants were individually interviewed via telephone or videoconferencing. Each interview ranged in duration between 20-45 minutes. Interviews were audio recorded and transcribed verbatim. Interviews conducted in Spanish (n=2) were professionally translated to English.

## Analysis

Transcripts underwent an initial round of content analysis with primarily inductive coding although coders used domains from the interview guides as a general framework. Three researchers (KA, JL, KM) independently read and coded transcripts, met to resolve discrepancies and entered final codes using Dedoose (version 9.0.46, Los Angeles, CA). Subsequently, researchers (CW, RM) used deductive coding based on the SDOH framework to examine SDOH factors that influenced participants' experience with telemedicine using pattern coding methodology outlined in Saldana, 2011 by grouping transcripts into the five SDOH domains.<sup>16</sup>

## Results

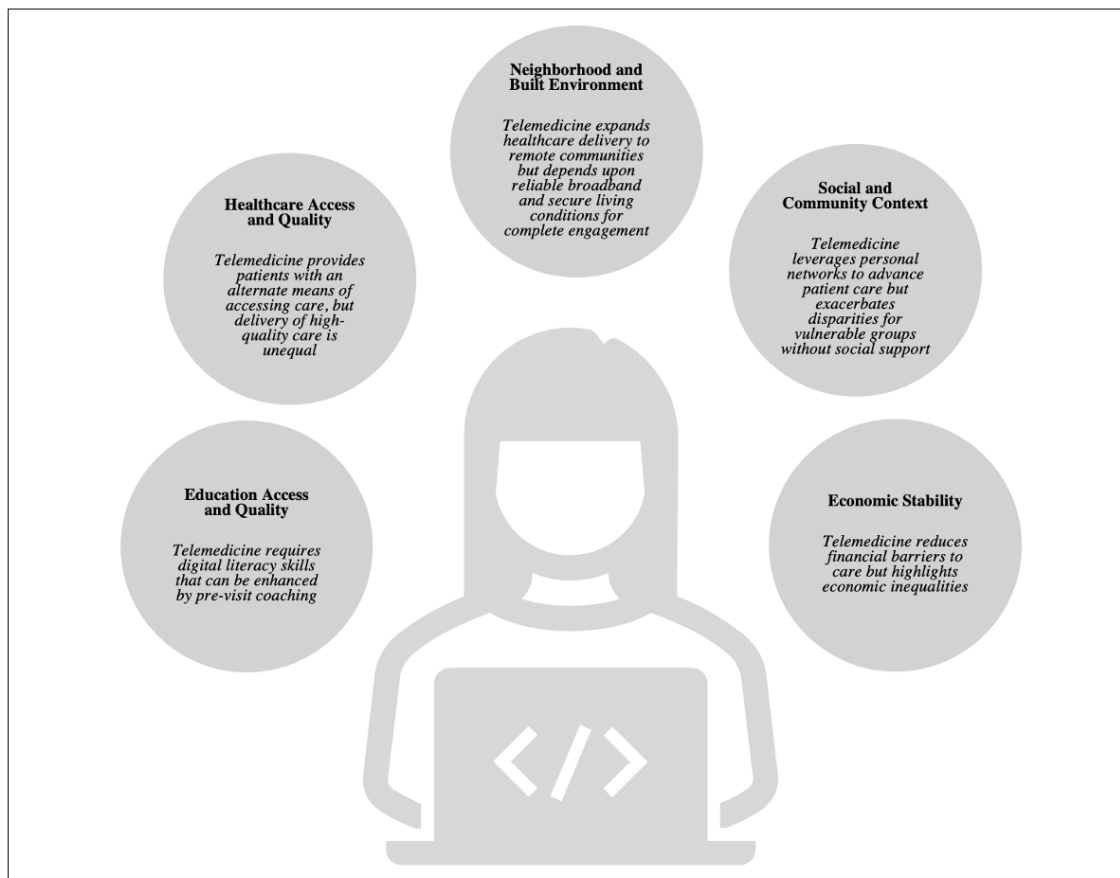
In total, 65 patients (Pt) and 21 providers (Pr) were interviewed (Table 1). A majority of patients (60%) and providers (62%) identified as female. Among patients, 46 reported age >40 years (70%), 17 reported age of 25 to 40 years (26%), and two reported age of 25 years or younger (3%). Among providers, 12 were between ages 40 and 60 years (57%), 6 were between ages 25 and 40 years (29%), and 3 were over the age of 60 years (14%). Twenty-seven patients self-identified as White (42%), 16 as Black (25%), 15 as Latinx (23%), and 1 as Asian (1%). Ten providers self-identified as White (48%), 5 as Asian (24%), 3 as Latinx (14%), and 2 as Black (10%). The numbers of

**Table 1.** Participant characteristics

Characteristics	Patients (n=65)	Providers (n=21)
<b>Age group, n (%)</b>		
<25	2 (3)	-
25-40	17 (26)	6 (29)
41-60 (65)	32 (49)	12 (57)
>60 (65)	14 (21)	3 (14)
<b>Female, n (%)</b>	39 (60)	13 (62)
<b>Race/Ethnicity, n (%)</b>		
Black	16 (25)	2 (10)
White	27 (42)	10 (48)
Asian	1 (1)	5 (24)
Hispanic	15 (23)	3 (14)
<b>Location, n (%)</b>		
Florida	21 (32)	8 (38)
New York	24 (37)	7 (33)
North Carolina	20 (31)	6 (29)

patients and providers were uniformly represented across the three sampled states.

By analyzing transcripts through the lens of all five SDOH domains (1) Education Access and Quality, 2) Healthcare Access and Quality, 3) Neighborhood and Built Environment, 4) Social and Community Context, and 5) Economic Stability), we demonstrated how telemedicine can both improve and exacerbate healthcare disparities in these domains (Figure 1).<sup>17</sup>



**Figure 1.** Patient and provider telemedicine experiences examined through the lens of the social determinants of health.

1) Telemedicine requires digital literacy skills that can be enhanced by pre-visit coaching (Education Access and Quality).

Patients and providers shared that some health systems provided patients with guidance and coaching on how to access telemedicine portals. Clinical workflows were modified to accommodate digital patient navigation such that “[clinical secretaries] would call [patients] and get their copay, and that sort of thing, and then the next person would talk to them and get them online, and it was a process..Now most of my patients know what they're doing” (Pr 15, FL). One patient shared, “So, I think what my facility did for me, [was] giving really good instructions..I automatically felt like I had expertise and I was comfortable right away” (Pt 37, FL). Step-by-step instructions distributed to patients before their visits increased their confidence in their technological skills. Some patients also role-played with family members to build their digital self-efficacy: “Like when my sister went to do it, she and I practiced a Zoom call so that she would know what to do when she got the instructions, and she wouldn't be nervous” (Pt 37, FL).

Not all practices developed streamlined protocols to onboard patients to telemedicine platforms, which created frustrations for patients and providers alike. “[Doctors] have to be able to tell you what to do with your phone because you have no idea what the background is of the person that you're talking to, whether they're really proficient, whether this is brand new to them” (Pt 37, FL). Providers acknowledged telemedicine’s role in driving disparities. The patients who are “detrimentally impacted by telemedicine...are the health illiterate, the ones I can't get hold of on telemedicine 'cause they don't know how” (Pr 4, FL) and who have to be rescheduled to an in-person visit. One

provider shared “*I spent ten minutes trying to teach this patient on the phone how to download Zoom and then get that all started and she, between her and her spouse, still couldn't figure out the camera*” (Pr 12, FL). Coaching patients to successfully access telemedicine portals requires coordinated pre-visit workflows that build upon basic digital literacy skills.

2) *Telemedicine provides patients with an alternate means of accessing care, but delivery of high-quality care is unequal (Healthcare Access and Quality).*

Telemedicine allowed patients to access care, especially when they were physically unable to attend in-person appointments. One patient shared that telemedicine was useful on “*days when my feet have just been so swollen, I could barely put on...all the shoes that I own*” (Pt 6, NC). Some patients recognized that telemedicine was inaccessible for those with visual or audio impairments. Video visits were especially difficult for patients with language barriers, given the technical challenges with integrating interpreters. A provider stated “*there's no way for me to bring the third party [interpreter] in through the waiting room on the video visit. So that's something that we're still struggling through is to how to still offer video visits to our patients with a different language and offer them the same kind of services*” (Pr 13, NY).

Providers shared that telemedicine made it easier to provide routine, follow-up care when in-person assessments were not required. “*Being able to take care of things over the phone, over video without having the patients comes in directly. And so for some of my patients who require frequent—kind of, frequent touches, frequent visits and so on, that's actually, in some ways, been a Godsend. Just the ability to call them frequently*” (Pr 7, NY). However, providers felt that there were specific clinical conditions that demanded an in-person evaluation and raised concerns about delivering the same quality care using telemedicine: “*on the negative side, if I have a patient who is not eating well, or not cleaning themselves well, or you know, if they're having some sort of ADL [Activities of Daily Living] issue and I can't see them, I don't smell them, you know, they're showing me this much [limited view on video] of themselves*” (Pr 15, FL). Therefore in-person visits were emphasized when needed; “*we say listen, there are times when this might be the right visit for us. But it does not substitute for me seeing you in the office where I can examine you and do what else I need to do for you*” (Pr 13, NY).

3) *Telemedicine expands healthcare delivery to remote communities but depends upon reliable broadband and secure living conditions for complete engagement (Neighborhood and Built Environment).*

Patients positively described telemedicine’s expansion of healthcare services to patients living in difficult-to-reach communities (e.g., rural areas) “*that cannot visit and maybe don't live nearby to a healthcare facility*” (Pt 30, NC). Patients recognized that the “*lack of Internet access, you know, could be an issue... so [telemedicine] kind of has pluses or minuses*” (Pt 12, FL).

Providers similarly acknowledged the impact of unreliable broadband access on disparities in telemedicine use; there were a lot of patients “*who are very underserved by high-speed internet...[who] don't have enough broadband to be able to do video*” (Pr 16, NC). Unfortunately, not all patients had access to secure living conditions that allowed for appropriate telemedicine engagement. One provider observed that “*patients sometimes don't have privacy to have video visits at home, so you can't ask them everything and you're not getting a full story*” (Pr 6, NY).

4) *Telemedicine leverages personal networks to advance patient care but exacerbates disparities for vulnerable groups without social support (Social and Community Context).*

Patients and providers praised telemedicine for the ability to involve family members and care team staff in a patient’s healthcare management. One patient shared that when her son-in-law developed a rash,

“*[my daughter and son-in-law] just went online and did a telemedicine call without even having a doctor... they loved the convenience, they love the ability to pull it up right there on the computer...she met the doctor, she sat in [on her husband's appointment]*” (Pt 37, FL).

Providers also felt that care coordination for patients living in assisted facilities improved with telemedicine: “*with the elderly, whenever they were in assisted living, there was always a nurse helping me out. In fact, I was able to do some reconciliation of medications with the nurses. They are sitting there in their medical record...and say well they shouldn't be on this, so then please send me a note saying to stop it*” (Pr 14, FL).

Some patients, particularly older adults, shared their difficulties accessing telemedicine without a social network to assist them: “*I live alone and it's very difficult for me to understand technology so that makes things difficult*” (Pt 1, NY). One provider observed that “*the patients that I know, you know, have some technology problems and literacy problems who do make it on to Telehealth are always with a family member who is more literate in these issues.*” (Pr 8, NY). Another provider shared that patients who were able to connect to digital platforms were “*the lucky ones [who] had grandchildren with smartphones*” (Pr 5, FL).

##### 5) *Telemedicine reduces financial barriers to care but highlights economic inequalities (Economic Stability).*

Patients and providers shared that telemedicine reduced financial barriers typically associated with in-person visits, thereby expanding access to underserved communities who were now able to engage in care using video and phone visits. A patient said “*when it comes to telehealth, the same doctor that told you no [to an office visit] will say yes [to seeing you] over the phone*” (Pt 27, NC).

However, patients and providers felt that telemedicine use was contingent on being able to afford “*the necessary equipment to be able to engage,*” (Pt 7, NY) especially for video visits. One patient summarized this: “*I think telemedicine is very geared towards not specific demographics, but certainly, you know, maybe higher socioeconomic status, or people who are able to have the technology on hand*” (Pt 30, NC).

## **Discussion and Conclusions**

Greatly accelerated by the COVID-19 pandemic, telemedicine has been praised for enabling care delivery to remote communities and improving patient satisfaction.<sup>18,19,20</sup> However, individuals with SDOH vulnerabilities (e.g., economic instability, poor technological literacy, lack of high-speed Internet) describe poor telemedicine encounters and less telemedicine use.<sup>21,22</sup> In our analysis, the five SDOH domains captured barriers to telemedicine use as well as the potential implications of telemedicine, suggesting that new information technologies do not need to be considered an independent SDOH domain.<sup>15</sup> Rather, future solutions to mitigate the digital divide should focus on addressing technological disparities that are shaped by the current SDOH framework.<sup>15,17</sup>

### *SDOH #1: Education Access and Quality*

Both our patients and providers reported improved engagement and satisfaction when pre-visit protocols were instituted to onboard patients to telemedicine platforms. Despite tremendous gains in the rates of personal technology ownership, digital equity remains contingent upon digital literacy, or the ability to use, communicate, and interpret information on electronic devices. Literacy barriers are greatest in underserved populations (e.g., racial/ethnic minority groups, older adults, and individuals with limited health literacy or English proficiency) who frequently report poor usability of mobile applications and patient portals.<sup>23,24</sup> Most healthcare systems have patient portals but fewer than one-third of patients actually use them.<sup>25</sup> The vast majority of electronic applications exceed a 9<sup>th</sup> grade reading level and are inaccessible to 20% of U.S. adults who read below a 5<sup>th</sup> grade level.<sup>24</sup> In addition to enhancing the usability of patient interfaces, the adoption of “digital health navigators” may be considered for vulnerable populations, as patient coaching is associated with increased portal use.<sup>25,26,27</sup> Practices should identify the digital needs of their patient population which will inform the navigators’ hiring requirements.<sup>28</sup> Close alignment with the information technology department is needed to ensure that training materials can be embedded within or fully compatible with existing telemedicine platforms and patient portals.<sup>28</sup> Clinical and administrative leadership will be critical for integrating navigators into clinical workflows and devoting staff resources to meet their needs.<sup>28,29</sup> Successful implementation of digital health navigators ultimately requires support at multiple levels and should align with the organization’s commitment to advance health equity in each community.<sup>29</sup> Health systems and community based organizations should also promote regional and local resources that offer digital training (e.g., New York Public Library’s TechConnect, Raleigh Digital Inclusion Programs, The Florida Literacy Coalition) and are widely available to residents.<sup>30,31,32</sup>

### *SDOH #2: Healthcare Access and Quality*

Despite telemedicine’s potential to broaden healthcare delivery, our patients shared that telemedicine access remained inaccessible for certain populations (e.g., individuals with audiovisual disabilities or with limited English proficiency). Among the 20% of Americans who report having a disability, there remain wide disparities in smartphone (72% vs. 88%) and computer ownership (62% vs. 81%) when compared to individuals without disabilities.<sup>33</sup> Americans with disabilities are also three times less likely to report using the Internet.<sup>33</sup>

The language divide has been widely demonstrated, with racial/ethnic minority groups and individuals with limited English proficiency less likely to report telemedicine use.<sup>18,34,35,36</sup> Mobile health applications and their instructions for use are often inaccessible for speakers with limited English proficiency, who are also less likely to report having an e-mail address or an active patient portal.<sup>35,37</sup> Consistent with prior findings, patients and providers in our study reported challenges with the integration of language interpreters into video visits which adversely impacted visit quality.<sup>37</sup> Until these technical barriers are addressed, audio visits should be maintained as a care delivery option since they easily enable the incorporation of interpreter lines and are favored by groups reporting limited English proficiency or digital literacy.<sup>37</sup>

To ensure telemedicine equity, it is critical that health portals and applications reflect the linguistic needs of

the communities served.<sup>37</sup> Telemedicine platforms and e-Health content should be designed in accordance with the Web Content Accessibility Guidelines (WCAG) and are published by the World Wide Web Consortium as a means of establishing accessibility standards for web-based content.<sup>38, 39</sup> WCAG advises that all digital content and user interfaces be “understandable,” “perceivable and operable” by individuals with disabilities, and “robust” such that it can be coupled with assistive devices.<sup>40</sup> While accessibility metrics for government sponsored digital devices and content are regulated by most states and the federal government, oversight of private establishments is limited and remains an area for future advocacy in health policy.<sup>41</sup>

### *SDOH #3: Neighborhood and Built Environment*

Since 2016, home broadband use has risen tremendously among rural households, far exceeding gains observed in urban and suburban neighborhoods.<sup>42</sup> Despite its widescale adoption, inconsistent high-speed Internet has been cited as a major issue by nearly one-fourth of rural residents, where its availability has been directly linked to increased telemedicine use.<sup>42, 43, 44, 45</sup> Broadband disparities have also been observed in heavily disadvantaged neighborhoods which may similarly lack the infrastructure needed to support high-speed connectivity.<sup>45</sup> Disadvantaged areas are associated with greater audio visits than video telemedicine visits and reflect the impact of structural inequities on the digital divide.<sup>46, 47, 48, 49</sup> Broadband accessibility and affordability have been cast as federal priorities through President Biden’s Bipartisan Infrastructure Law, which recognizes the extent to which Internet access has become a SDOH and basic necessity that drives overall social, educational, and economic growth.<sup>14, 50</sup> Through the Internet For All Initiative, several active and proposed programs will seek to expand high-speed Internet to underserved areas (BEAD Program), offer grants and funds to states, territories, and Tribes to create broadband infrastructure (ReConnect Program, Tribal Connectivity Broadband Program), and advance digital inclusion (Digital Equity Grants).<sup>50</sup> In addition to a reliable telecommunications infrastructure, housing stability likely influences telemedicine engagement.<sup>51</sup> Individuals experiencing homelessness or living in overcrowded households experience privacy concerns that may disincentivize telemedicine use. In these scenarios, designated space in healthcare facilities that provide on-site digital devices and technical assistance can help to reduce video visit no-shows.<sup>52</sup>

### *SDOH #4: Social and Community Context*

While patients and providers praised telemedicine’s ability to incorporate family members and other care team members into a visit, there was notable concern for older adults, who were viewed as especially disadvantaged by telemedicine. Many participants commented that the “lucky ones” were those with family members to help them connect to digital platforms. Although 61% of adults aged 65+ own a smartphone and 75% report using the internet, almost half of older Americans require assistance navigating their electronic devices.<sup>53, 54, 55</sup> Community outreach efforts are critical to onboarding older adults, who are also more likely to be homebound, susceptible to social isolation, require chronic disease management, and for whom telemedicine is a promising care delivery option.<sup>56, 57</sup> Such partnerships have demonstrated success. For example, through collaborations with the NYC Department for the Aging, T-Mobile, and Older Adults Technology Services from AARP, Connected NYCHA was a widely successful initiative that distributed internet-equipped tablets to older, low income New Yorkers, of whom nearly half reported rarely or never having accessed the Internet at baseline.<sup>58</sup> Using Senior Planet courses from AARP, an intervention group was also offered digital literacy training with their tablets.<sup>59</sup> Compared to control group members who did not receive such instruction, intervention group participants reported significantly greater odds of connecting by email and text, video-chatting, and using their devices to complete something new.<sup>58</sup> Community organizations and senior centers (e.g., NYC Older Adult Centers, North Carolina Senior Center Alliance, Florida Department of Elder Affairs) offer critical social supports that can meaningfully bridge the digital divide in several marginalized groups.<sup>60, 61, 62</sup> A call for such initiatives, which rely on linkages with local partners and stakeholders, should be prioritized in every community.

### *SDOH #5: Economic Stability*

Significant income disparities exist in mobile technology and home broadband ownership. While three-fourths of lower income Americans own a smartphone, greater than 95% of higher income Americans have a smartphone. Unfortunately, large gaps in ownership and access disproportionately impact vulnerable populations, likely the same populations that experience access to care barriers, thus limiting their engagement with telemedicine. The broadband gap is even wider: only 57% of lower income Americans report home broadband ownership in contrast to 92% of higher income Americans, with financial costs cited as the main limitation to its adoption.<sup>53</sup> When digital devices and technologies are readily available, telemedicine use increases.<sup>44, 63, 64</sup> In one VA study, the distribution of data-enabled tablets to veterans reporting barriers to in-person care resulted in nearly 80% of participants successfully engaging in telemedicine visits, including veterans with complex medical needs and those residing in remote areas.<sup>64</sup>

In our study, patients and providers reported that telemedicine reduced financial barriers associated with in-person visits; however they recognized that use of telemedicine invariably depends on the affordability of its supporting technologies. As healthcare systems continue to adapt telemedicine into their care models, it is imperative to identify and assist vulnerable groups for whom telemedicine use is associated with financial hardships. Connecting underserved groups with initiatives such as The Affordable Connectivity Program and Lifeline Program for Low Income Consumers sponsored by the Federal Communications Commission has the potential to ameliorate ownership disparities of electronic devices while subsidizing costs for Internet or telephone services.<sup>65,66</sup> While smartphone use continues to rise, nearly 20% of lower income and 3% of higher income Americans own a cellphone without smartphone capabilities.<sup>67</sup> As telemedicine services remain favored, public and private insurers should maintain payment parity for different telemedicine modalities (video and audio visits) to avoid exacerbating health inequities in the most disadvantaged groups.<sup>68,69,70</sup> Telemedicine offers an affordable care delivery option that may ultimately reduce both direct (e.g., transportation expenses associated with in-person visits) and indirect (e.g., absenteeism) healthcare costs.

### *Limitations*

Our study has some limitations. Recollections of telemedicine encounters by patients and providers may be subject to recall bias and self-selection bias despite engaging a diverse cohort of participants. Our findings may not be applicable to other regions of the country where telemedicine experiences may differ and may not be generalizable to patients outside of academic medical centers. Interviews were conducted between March, 2021 and October, 2021 and may not reflect current telemedicine trends and policies. Despite these limitations, our study has several strengths. Robust sampling of patients and providers across medical practices in three states (NY, NC, FL) with urban and rural affiliates reflects a diversity of perspectives. Through deductive analysis, we evaluated telemedicine experiences and its role in shaping health disparities during the pandemic through the paradigm of the SDOH framework, a priority area of Healthy People 2030, Centers for Disease Control and Prevention, and the World Health Organization.<sup>6,17,71</sup>

### *Conclusions*

Addressing the role of telemedicine in the context of the SDOH is essential to reducing inequities associated with the burgeoning use of digital technologies in healthcare delivery. Several studies have extensively described health disparities by race and ethnicity, yet it would be preferable to avoid using race and ethnicity as a surrogate marker of risk. Rather, future studies should emphasize and investigate the factors or conditions, i.e., SDOH, that contribute to observed differences in health outcomes. Proposals like President Biden's Bipartisan Infrastructure Bill target the specific circumstances that frame longstanding health inequities by rolling out broadband infrastructure to disadvantaged areas, where residents are disproportionately minoritized, lower income, or rural.<sup>72,73,74</sup> Digital technology use has increased tremendously over the past decade and is now increasingly debated as a sixth SDOH.<sup>13,14,67,75</sup> Advancements in health equity will require linkages between public and private sectors to address the *conditions* that shape the use of these devices and will serve as a critical metric by which we measure our commitment to eliminating disparities in the quality of care delivered.

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