Health systems have adopted telemedicine with remarkable speed not only for Covid-19–related care, but also for chronic disease management. But without proactive efforts to ensure equity, the current wide-scale implementation of telemedicine may increase disparities in health care access for vulnerable populations with limited digital literacy or access, such as rural residents, racial/ethnic minorities, older adults, and those with low income, limited health literacy, or limited English proficiency. To ensure that the current telemedicine implementation does not exacerbate health disparities, the authors propose four key actions for clinicians and health system leaders: (1) proactively explore potential disparities in telemedicine access, (2) develop solutions to mitigate barriers to digital literacy and the resources needed for engagement in video visits, (3) remove health system–created barriers to accessing video visits, and (4) advocate for policies and infrastructure that facilitate equitable telemedicine access. Without taking these actions now, health care systems risk creating telemedicine programs that exclude vulnerable populations.

Over the past few weeks, our primary care practices (UCSF General Internal Medicine Practice, an academic medical center practice with three clinics, and Richard Fine People’s Clinic at Zuckerberg San Francisco General Hospital, an urban safety-net practice) have transitioned almost entirely from in-person to remote patient visits. This ramp-up in telemedicine has occurred with remarkable speed across the country,1 underscoring its necessity in response to social distancing measures during the Covid-19 crisis. It has been facilitated by rapid changes to reimbursement policies for telemedicine by the Centers for Medicare & Medicaid Services,2 with other payers following suit.
Currently, most health systems are using a combination of video and telephone visits; notably, video communication is associated with higher patient understanding and satisfaction compared with telephone communication.\textsuperscript{3,4} This is particularly important to consider in primary care — where ongoing relationships and clear communication are essential to successful chronic disease management — and among populations with limited digital access or digital literacy (the ability to use and understand information from digital devices), who are already less likely to use digital health tools.\textsuperscript{5,6}

As primary care clinicians, we are already seeing early signs of disparities in access to care delivered through telemedicine. This has alarming implications for inadequate chronic disease management that may result in increased disparities in clinical outcomes as some patients disproportionately lose frontline access to primary care.

Every clinician and health system cares for vulnerable patients that may have limited digital literacy or access. Within the United States, these digital barriers are found more frequently in rural populations, older adults, racial/ethnic minority populations, and those with low socioeconomic status, limited health literacy, and limited English proficiency.\textsuperscript{7-9} For example, among American adults >65 years old, who constitute 18% of the American population and are most likely to need chronic disease management, only 55\textendash}60% own a smartphone or have home broadband access.\textsuperscript{10,11} While 73% use the Internet, only 60% are able to send an email, fill out a form, and find a website.\textsuperscript{7,11} Similarly, nearly 1 in 8 Americans lives in poverty; low-income individuals have lower rates of smartphone ownership (71%), home broadband access (59%), Internet use (82%), and basic digital literacy (53%).\textsuperscript{7,10,11} Considered together, at least 1 in every 4 Americans may not have digital literacy skills or access to Internet-enabled digital devices to engage in video visits.\textsuperscript{10,11}

Given this, we worry that like many prior innovations,\textsuperscript{12,13} the most vulnerable patients will be least likely (if ever) to benefit from this telemedicine implementation.

Beyond gaps in digital access or literacy, many of these populations also disproportionately experience worse health outcomes for common chronic diseases seen in primary care.\textsuperscript{14} When the Covid-19 pandemic started, it was anticipated certain populations might be at higher risk of being affected by the virus and its health, social, and economic consequences.\textsuperscript{15,16} Unfortunately, early reports have already confirmed this higher risk, with Covid-19 mortality being disproportionately high among low-income, minority populations.\textsuperscript{17,18} Now that telemedicine is the default for delivery of primary care — and is likely to remain so for the near future — it is imperative that we proactively evaluate and address disparities in access to telemedicine to limit the already worsening health outcomes and health disparities.

Our two large practices care for diverse populations. At the UCSF General Internal Medicine Primary Care Practice, there are 141 clinicians (71 resident physicians, 52 attending physicians, 6 fellows, 12 nurse practitioners). The practice cares for approximately 27,000 patients, of whom 31% are ≥65 years old, 9% have a non-English language preference, 53% are racial/ethnic minorities, 12% are insured by Medicaid, and 24% are insured by Medicare. At Richard Fine People’s Clinic at Zuckerberg San Francisco General Hospital, there are 85 clinicians (46 resident physicians, 30 attending physicians, 1 fellow, 8 nurse practitioners) who care for approximately 9,200 patients. Of these patients, 25% are ≥65 years old, 44% have a non-English language preference, 84% are racial/
ethnic minorities, and nearly 100% are covered by government-sponsored plans (36% Medicaid, 18% Medicare, 44% San Francisco health access plans).

Based on our experiences at these two primary care practices, we describe challenges we have encountered thus far in ensuring equitable access to telemedicine. We outline four key actions that clinicians and/or health systems should consider in order to address this issue (Table 1). Below we describe solutions our practices have begun implementing in response to the Covid-19 pandemic to ensure equity.

### Proactively Explore Potential Disparities in Telemedicine Access

At our practices, we have started data collection to evaluate whether there has been a change in the pattern of patients accessing care before and after the rapid implementation of telemedicine related to the Covid-19 pandemic. For example, at our academic primary care practice, we extracted data about visit encounters and patient characteristics from the electronic health record to examine changes in clinic access among populations that may have barriers to accessing telemedicine, including patients with older age, reporting a language preference other than English, insured by Medicare or Medicaid, or identifying as a racial/ethnic minority.

> These early signs of disparities in access heighten the importance of identifying patient populations that are at risk of poor access as well as ongoing monitoring of access disparities.

When we compare a 2-week period before telemedicine implementation (February 17–28) to a 2-week period after implementation (March 23 – April 3), video visits increased from 3% (of a total...
weekly average of ~1,000 visits) to 80% (of a total weekly average of ~550 visits), and telephone visits increased from 0% to 16%. Notably, the proportion of visits with populations at risk for limited digital literacy/access have decreased significantly, including among these patient groups: ≥65 years old (41% to 35%, P=0.002), non-English language preference (14% to 7%, P<0.001), insured by Medicare (43% to 22%, P<0.001) or Medicaid (17% to 10%, P<0.001) (Figure 1).

FIGURE 1

Patient Visits by Age, Language, and Insurance Before and After Telemedicine Scale-Up

This chart shows the proportion of patient visits seen by age, language preference, and insurance type prior to (2/17–2/28/2020) and after (3/23–4/3/2020) scaled-up telemedicine implementation to address the Covid-19 pandemic at the UCSF General Internal Medicine Primary Care Practice (P=0.002 for age ≥65 and P<0.001 for other comparisons). A significantly smaller proportion of visits after scaled-up telemedicine implementation were with vulnerable patients.

Source: The authors
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When examined by race/ethnicity, we also see that patients identifying as Non-Hispanic White, and Other represented a higher proportion of visits while all other groups (Black/African-American, Latinx, and Asian/Pacific Islander) were a smaller proportion of visits (P=0.006) (Figure 2). These
Early signs of disparities in access heighten the importance of identifying patient populations that are at risk of poor access as well as ongoing monitoring of access disparities, particularly as practices continue to change their workflows on a daily to weekly basis. While these numbers are very concerning, given anecdotal reports from around the country of lower visit volumes in primary care, we believe they likely are not unique.

FIGURE 2

**Patient Visits by Race/Ethnicity Before and After Telemedicine Scale-Up**

This chart shows the proportion of patient visits seen by patient race/ethnicity prior to (2/17–2/28/2020) and after (3/23–4/3/2020) scaled-up telemedicine implementation to address the Covid-19 pandemic at the UCSF General Internal Medicine Primary Care Practice (P=0.006 using chi-squared test). A smaller proportion of visits with vulnerable populations occurred after implementation.

Source: The authors

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Develop Solutions to Mitigate Barriers to Digital Literacy and the Resources Needed for Engagement in Video-Visits

While the majority of adults in the United States own smartphones, having access to a video- and data-enabled device does not guarantee having the digital skills to use a specific video application to conduct a visit. Patient-facing health apps have poor usability for populations with limited health literacy; additionally, few digital health tools explicitly consider digital literacy, health literacy, age, or English proficiency in their design. Most health systems do not provide training or teaching to populations on how to use these tools, though studies have shown this to be an effective approach for ensuring adoption of digital health tools. To address this, at our academic practice we have started an outreach program to all patients ≥65 years old; staff members contact patients with scheduled visits by phone and walk them through setting up our video platform application and practice connecting to the video.

To achieve this time-intensive work and offload clinical administrative staff, we have recruited members of our health system community who have newly available time (e.g., clinical research coordinators, medical students) to help. At our safety-net practice, we have created video tutorials as well as sample workflows (Figure 3) about how to set up and conduct video visits. At both sites, these changes have been inclusive of the language needs in our patient populations. To develop and disseminate materials (e.g., video tutorials), clinicians and health systems can consider partnering with local organizations, including libraries and community-based organizations as well as patient advocacy/advisory groups, many of whom have longstanding expertise in digital literacy training.
Strategies to mitigate resource barriers include helping patients obtain devices (e.g., used/refurbished laptops or iPads, low-cost phones, and plans through the Lifeline program\textsuperscript{27}) and increasing access to broadband Internet (e.g., low-cost commercial services available to seniors and low-income adults). Broadband access has been shown to be a crucial determinant in use of digital health tools, such as patient portals.\textsuperscript{28} Lack of broadband access is also likely to pose a barrier to video visits, as broadband often facilitates better video quality and does not usually come with a...
monthly cap on data download/upload compared to cell phone data. Given this, health systems could make patients aware of newly free or reduced-cost broadband Internet expansion occurring in many parts of the country. The National Digital Inclusion Alliance maintains a list of nationwide broadband plans that are <$20/month. Many local governments have also collected resources about low-cost Internet for their residents.

**Remove Health System–Created Barriers to Accessing Video Visits**

Some barriers to video visits have been artificially created by inflexible health system processes or workflows. Examples of this include requiring that patients are enrolled in the patient portal, no plan for interpreter inclusion, and failing to elicit technical or logistical challenges when scheduling video visits. In some health systems, patient portal enrollment is a requirement for video visits. Because it is well documented that vulnerable populations are less likely to use patient portals, this requirement almost ensures inequitable access. One of our practices previously had this policy but has since revised its approach to offer video visits to every patient — even those who have not activated their patient portals. Several colleagues have noted that many patients without prior portal use have expressed interest and successfully engaged in video visits, consistent with literature that patients are interested and willing to do video visits with a clinician they already know.

> Patient-facing health apps have poor usability for populations with limited health literacy; additionally, few digital health tools explicitly consider digital literacy, health literacy, age, or English proficiency in their design.

Adequate language interpreter access in video visits should be guaranteed. Many video applications have the capability of calling out to telephone interpreters. Our health systems have created brief tip sheets and instructions to help ensure all providers know how to use this resource. In addition to on-demand access to telephone interpreters and scheduling of American Sign Language interpreters to join a visit via video, we are working with our health system on innovative ways to automatically dispatch staff interpreters to join visits as video interpreters.

For many patients, participating in a video visit may require planning to ensure availability of a family member/friend to help navigate technical challenges or access to a video-enabled device, private location, or adequate Internet or data bandwidth. This type of planning may be necessary if individuals share devices with others, live in a group setting without a private room, or do not have reliable access to electric outlets to keep devices charged. Health systems should actively screen for these types of barriers to video visits when scheduling visits and work with their patients to mitigate these barriers. For example, scheduling on a day and time that considers their restrictions may help. Alternatively, though video visits are preferable, if they are ultimately not possible, systems could determine whether some patients are better served by telephone or in-person visits instead.
With their firsthand experience, frontline clinicians may be more aware than leadership of telemedicine barriers. We have spoken to several clinicians who have adapted their own clinical practice in an attempt to ensure outreach to all patients. However, system-wide changes are required to facilitate more expedient and sustainable approaches to ensuring telemedicine access for all patients. These changes cannot occur without system leadership awareness and buy-in. Therefore, although system and practice leaders are busy, frontline clinicians should sound the alarm early about potential disparities in telemedicine access so that leaders can facilitate changes to reduce disparities now and actively consider the impact of any future changes on equity.

Advocate for Policies and Infrastructure that Facilitate Equitable Telemedicine Access

We strongly recommend all clinicians advocate for changes at local, state, and federal policy levels that: (1) expand low-cost or free broadband Internet access temporarily (and potentially permanently)\(^33\); (2) fund equipment purchase and development of digital infrastructure for federally qualified community health centers that may have had fewer telemedicine services prior to Covid-19\(^34,35\); and (3) ensure pay parity for both telephone and video visits by all payers (especially Medicaid). Through several federal actions including Section 1135 waivers, many state Medicaid programs have expanded telehealth, but it has not been systematic and often lags behind Medicare’s policies.\(^36\) Given its patient population, Medicaid changes are crucial to ensuring equity. Partnering with or supporting organizations working on these efforts — either by organizing within the medical community for digital access and literacy or expanding capacity for government, nonprofit, and community-based organizations to do this work — can be effective ways to advocate for long-term changes that support telemedicine equity.

We strongly recommend all clinicians advocate for changes at local, state, and federal policy levels.”

We hope these early findings and recommendations will guide clinicians, health systems, and policy leaders as they continue to ramp up support for telemedicine services. With estimates that some social distancing measures may need to continue for at least 1 year,\(^37\) it is clear that telemedicine will continue to play an increasingly prominent role in health care delivery. Assuming payers continue telemedicine reimbursement, it is also likely that patients and clinicians will want to continue some care delivery via telemedicine after the Covid-19 crisis.\(^38\) Still, even with all of the demands associated with the coronavirus pandemic, we need to keep equity at the forefront. Disparities in access to telemedicine care today can easily exacerbate the preexisting challenges in providing primary care and chronic disease management for vulnerable populations. By employing simple, effective strategies for increasing the reach and adoption of digital health now, we may mitigate disparities resulting from the current crisis and be better positioned to ensure more equitable telemedicine in the future.
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