Chapter

COVID-19, Telehealth and Access to Care

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Abstract

Telehealth has become increasingly prominent during the COVID-19 pandemic, highlighting limitations in access to care for older adults less fluent in information technology (IT). Although the 20 percent disparity in IT use between younger and older adult cohorts remains unchanged over several decades, insurers, institutional and independent providers of health care have made increasing use of IT for patient communication. Data demonstrate an age-related decline in the frequency of IT use for accessing health care. Restrictions on reimbursement for the use of the telephone for accessing health care during the COVID-19 pandemic are discussed as a barrier to access to care. Recommendations are made for assessment of media most available to older adults for accessing health care, as well as providing funding to support increased access to care.

Keywords: COVID-19, older adults, access to health care, information technology (IT), FACETS

1. Introduction

The COVID-19 virus (SARS-CoV-2) was first identified in December of 2019 [1]. COVID-19 spread rapidly, and by the end of January 2020, the World Health Organization (WHO) had officially labeled the COVID-19 outbreak a pandemic [2]. At risk populations were soon identified, including older adults [3–6]. In an effort to contain the growth of the contagion, in early 2020 shelter in place practices were adopted in many countries, forcing the closure of routine businesses including schools, restaurants, and outpatient healthcare facilities [7–11]. Patient care rapidly shifted to virtual contact using telehealth platforms including internet-based videoconferencing software [12]. In the United States (US), the Center for Medicare and Medicaid Services (CMS) made changes liberalizing standards allowing reimbursement for videoconferencing telehealth, increasing access to care [13, 14]. However, the rapid shift to telehealth brought to the forefront an access to care issue that had been simmering for some time: compared with younger age cohorts, most adults over the age of 65 make limited use of information technology (IT) [15–18]. The intersection of the rapid growth of telehealth, age-related declines in IT utilization, and access to care is a growing area of concern for the health care systems with strong implications for the future of healthcare delivery.

2. COVID-19: background and description

In December of 2019, a new coronavirus was identified in Wuhan, China. Based on symptom presentation, it was called SARS-CoV-2, and based on the date of identification was later called COVID-19. COCVID-19 spread rapidly. On January 30, 2020 the World Health Organization (WHO) officially declared COVID-19 a public health emergency of international concern, assigning it the status of a pandemic [2]. The first identified symptoms of COVID-19 included fever, cough, fatigue, dyspnea, sore throat, headache, conjunctivitis and gastrointestinal issues. Loss of the senses of smell and taste were soon added to the symptom list. More severe reactions included acute respiratory failure and death [10]. Disproportionate severe acute respiratory symptoms appeared in patients with cardiovascular comorbidities [19–21], which were eventually understood as a consequence of SARS-CoV-2 infecting the host using the angiotensin converting enzyme 2 (ACE2) receptor [22], which is expressed in several organs, including the lung, heart, kidney, and intestine, as well as endothelial cells [23]. It was found that SARS-CoV-2 can directly infect engineered human blood vessel organoids in vitro, and vascular derangements in COVID-19 might reflect endothelial cell involvement by the virus [22].

2.1 COVID-19: epidemiology and treatment

COVID-19 transmission appears to occur primarily from direct person to person contact, but infection can also occur through contact with contaminated environmental surfaces. Hand hygiene, wearing personal protective equipment (especially masks covering the nose and mouth) and maintaining social distance (of at least six feet) were soon recommended. COVID-19 testing rapidly evolved using nasal swab, tracheal aspirate or bronchoalveolar lavage samples [11]. A variety of interventions have been employed, but as of the time of this writing, there are no clinically approved vaccines or specific therapeutic drugs available for COVID-19, and quarantine is the only intervention that appears to be effective in decreasing the contagion rate [7–11]. COVID-19 is currently treated with available antiviral drugs, and in severe cases, supportive care including oxygen and mechanical ventilation [24, 25].

The genetic structure, pathogenic mechanism, and clinical characteristics of COVID-19 have been studied extensively [26, 27]. Vaccination against COVID-19 is widely believed to be the most promising path to resolution of the pandemic [28]. Having proven effective against similar coronaviruses SARS-CoV and MERS-CoV, monoclonal antibody vaccination is being pursued by a number of laboratories [29–33].

2.2 COVID-19: psychological impact

In addition to the physical threat posed by COVID-19, the pandemic has also had a significant worldwide psychological impact. During the initial stage of the CoViD-19 pandemic, acute psychological reactions were observed among the general population, healthcare workers, clinical populations, and other at risk groups [34–36]. Psychological triage has long been recognized as an essential care component before, during and after emergencies and disasters [12, 37]. Care delivery during the COVID-19 pandemic has been complicated by efforts to shelter in place and minimize personal interactions, leading to a rapid increase in the utilization of telehealth [12].

As the duration of the pandemic grew, increased autonomic arousal in response to fear of contagion soon translated to chronic stress, with consequent elevation in adrenaline and cortisol production, activation of the amygdala, and consequent suppression of activity in the pre-frontal lobe, impairing judgment and impulse control [38–41]. Stress resulting from the effects of the disease itself was multiplied by extended periods of social isolation, further complicated by what has been called an "infodemic:" around the clock news about the pandemic, distributed not only by news media, but also by social media. The widespread use of social media also provided a platform for unprecedented expression of racism, stigmatization, and xenophobia. The intense psychological impact of these combined factors has produced acute panic, anxiety, obsessive behaviors, hoarding, paranoia, and depression, and post-traumatic stress disorder (PTSD) [42].

Populations especially at risk for chronic stress related to COVID-19 include frontline healthcare workers who are at higher risk than other for contracting the disease, and are prone to burnout, anxiety, fear of transmitting infection, feelings of incompatibility, depression, increased substance-dependence, and PTSD. Along with psychiatric patients and marginalized communities, children isolated by school closures and parents responsible for additional child care during school hours, as well as assisting children with distance learning have also been identified as at-risk populations for chronic stress. The psychosocial needs of older adults have been significantly affected by the pandemic [42].

2.3 COVID-19 and older adults

Older adults have been identified as a high risk population for severe or fatal responses to COVID-19 [43, 44]. Older adults demonstrate higher peaks of viral load in response to COVID-19, and are in the highest risk group for comorbidities including hypertension, cardiovascular disease, diabetes, chronic respiratory disease, and chronic kidney disease, all of which demonstrate more severe reactions to COVID-19 and higher rates of fatality [3–6]. Increasing the risks associated with COVID-19 for older adults, many patients with hypertension, diabetes, and chronic kidney disease are prescribed medications containing angiotensin-converting enzyme (ACE) inhibitors and angiotensin II receptor blockers. These medications upregulate the ACE-2 receptor, which (as discussed above) is the specific receptor used by the SARS-CoV-2 virus to enter host cells [3, 22, 23].

3. COVID-19 and telehealth

The unprecedented social, economic and healthcare challenges presented by COVID-19 include the significant strain on medical center resources, and the need to deliver healthcare at a distance. Telemedicine is a growing methodology that makes possible timely healthcare delivery while minimizing exposure to protect medical practitioners and patients. The combination of these factors quickly led to the rapid adoption of telehealth during the COVID-19 pandemic [45]. Following system-wide expansion of virtual urgent care staff at a large health system at the epicenter of the COVID-19 outbreak in the United States, in a six week period between March 2nd and April 14th 2020 telemedicine visits for urgent healthcare delivery increased 683 percent. The majority of urgent care visits shifted to telemedicine (56.2%), and the utilization of telemedicine was found to be highest among patients 20 to 44 years of age [46]. U.S. healthcare organizations report consistent expansion of telehealth adoption during the 3 phases of the U.S.

COVID-19 pandemic: (1) stay-at-home outpatient care, (2) initial COVID-19 hospital surge, and (3) post-pandemic recovery [47].

A retrospective observational cohort study found an 8729 percent increase in telehealth visit utilization between March 4 and March 31, 2020 during the COVID-19 pandemic compared to the same period the previous year (2019), with patients reporting higher satisfaction for telehealth visits than in-person visits. The authors of the study concluded that patient satisfaction with telemedicine is high and is not a barrier toward a paradigm shift away from traditional in-person clinic visits [48]. A literature review of 35 research studies published from 2019 to May 2020 demonstrated the effectiveness of telemedicine as a healthcare delivery platform. The authors of the literature review concluded that the effectiveness of virtual healthcare delivery suggests increased integration of digital technologies into healthcare in the near future [49].

3.1 Disparities in IT utilization

Significant disparities in IT utilization have long been associated with numerous variables, including ethnicity, age, and socioeconomic status (SES) [15, 17]. People with intellectual and developmental disabilities also utilize IT at a significantly lower rate than the general population [50], despite organized efforts to engage young adults with intellectual disability with social media and other IT [51]. Disparities in IT utilization and access have been described as the digital divide [52], digital inequality [53, 54], and digital diversity [55].

In addition to variables including ethnicity, disability, and SES, everyone is affected by the process of aging. In the United States, the number of adults over the age of 65 is expected to more than double from 46.5 million today to over 98 million (nearly 25% of the population) by the year 2060 [56, 57]. People over the age of 65 utilize health care at a significantly higher rate than members of younger age cohorts: 136% of the under 65 group's use of Emergency Department admissions, 263% for inpatient discharges, and 241% for outpatient office visits [58]. Median health care costs for people over the age of 65 are 167% the costs for people 64 and younger [59]. Although older adults' IT use has increased during the last twenty years, it continues to trail behind that of younger age cohorts by at least 20% [15–17], as shown in **Table 1**.

The current disparity in IT utilization between age groups remains consistent with that reported over a decade ago by the U.S. Census Bureau and Bureau of Labor Statistics [15, 18, 55, 60, 61].

3.2 Default utilization of IT by insurers: potential barriers to care

Paradoxically, in the face of a substantial and growing body of research data demonstrate disparities in IT utilization between groups associated with numerous variables including age, SES, ethnicity, disability, and educational experience [62],

Age in years	Access to home high speed internet
18–34	79.2%
35–44	83.2%
45–64	79.1%
65 and older	59.2%

Table 1.
IT access and utilization by age: Data from U.S. Census Bureau, 2016.

over the past decade Medicare and private insurers have increasingly defaulted to the use of IT (websites, MyChart, text messaging) for communication with patients [63–65]. Similarly, hospitals, regional health centers, university teaching hospitals, and local medical clinics have done so [66, 67], in the absence of any data indicating that the populations they serve have fluency with IT [18].

Based on research data demonstrating disparities in IT utilization [15–18, 50–54], the default use of IT for communication with all patients may create a barrier to care for some patient populations. The potential consequence is that patient populations most in need of health care (including older adults) will find it most difficult to access [18, 55, 60, 61]. For older adults, CMS tracks potential access to care issues including economic disparity [68], but it has not addressed IT fluency among older adults [15–18, 55, 60, 61, 69].

4. Communication with patients and outcomes: assessment of IT utilization by patient populations

Effective treatment and good outcome rely upon effective communication with patients. Better communication with patients produces better health outcomes and increased ratings of satisfaction by patients and providers of care [70, 71]. Paradoxically, over the past decade health care organizations have defaulted to the use of IT for patient communication, in the absence of any data supporting patient utilization of IT for the purpose of communication with health care providers. With one exception [18, 60, 69, 72], health care protocols, especially for working with older adults, have not included frequency of internet or IT utilization as a specific area of assessment or treatment [18, 55, 60, 61, 69, 72–74]. In fact, the American Psychological Association's (APA's) 21 Guidelines for psychologists working with older adults [75] do not specifically include familiarity with the assessment and treatment of technology challenges or barriers for older adults as a guideline [18, 55, 60, 61, 69].

In general, IT has not been included as area of assessment or treatment in healthcare protocols [18, 55, 60, 61, 69, 72, 74]. Most of the research exploring IT utilization has come from the IT sector [76–88]. Most IT assessment instruments assess the person's perception of their own proficiency with various technologies [89–95]. These instruments and studies assess factors determining a person's decision to use specific technologies, or self-perceived proficiency in using specific technologies, but none of them assesses the person's frequency of actual IT use or perhaps more importantly, the person's frequency of different kinds of IT use, information necessary for individualized treatment planning using media that allows effective communication with the specific patient to facilitate better treatment outcomes [18, 55, 60, 61, 69]. The Functional Assessment of Currently Employed Technology Scale (FACETS, Appendix 1) [18, 69] was designed specifically to meet those previously unaddressed needs.

4.1 The Functional Assessment of Currently Employed Technology Scale (FACETS): description, reliability and validity

The Functional Assessment of Currently Employed Technology Scale (FACETS) is a 10-item questionnaire that can be completed in one to three minutes. It asks two questions in each of 5 functional IT domains: Home, Social, E-commerce, Health Care, and Technical [18, 60, 69]. For each question there are 6 optional answers, characterizing the respondent's frequency of use for the specific type of IT referenced in the question. Higher scores are associated with more frequent utilization of IT. A subtotal score for each functional domain is derived from summating the scores for the two questions in that domain. The combined total of the subtotal scores from each of the functional domains yields an overall FACETS score. Higher utilization of IT across domains produces a higher overall FACETS score. High reliability and validity have been found for FACETS, including multiple group factor analysis, McDonald's omega, Cronbach's alpha coefficient, and confidence intervals for alpha and omega [69].

4.2 FACETS outcome research

FACETS outcome research has been conducted with populations of varied age, ethnicity, socio-economic status, household income, and educational level. Respondents who had been diagnosed with, or demonstrated any symptoms of, any neurocognitive disorder, including Alzheimer's Disease, Neurocognitive Disorder with Lewy Bodies, or Vascular Neurocognitive Disease were screened and excluded from research samples. Among other variables, age groups were used to assess potential differences in IT utilization between age groups. Age groups were established based on age per decade, except those younger than 30 and those older than or equal to 80, each of whom formed their own group. The age groups were defined as 18 to 29, 30 to 39, 40 to 49, 50 to 59, 60 to 69, 70 to 79, and 80 or older. The seven age groups are summarized in **Table 2**.

FACETS outcomes indicate that the strongest effect on IT utilization is for differences in age. Older respondents consistently score lower in each of the five FACETS functional domains, and although almost all respondents report access to a computer (93.3%) and access to the internet (93.5%), the age effect is consistent with previous data indicating lower internet and IT utilization with increasing age [15, 17, 18]. FACETS outcome data also indicate that the decline in IT utilization associated with increasing age advances differently for each domain, suggesting that IT use is not a homogenous category. The frequency of IT utilization in the Home domain showed the weakest correlation with age, while frequency of IT utilization in the Health Care domain showed the highest association with age. **Figure 1** shows the differing patterns of decline in frequency of use for the five domains.

Although the frequency of IT utilization declines with age in all domains, the Health Care domain shows the steepest decline, which also occurs earlier than declines in the other domains. Although previous research indicated that the 20% discrepancy in IT utilization between younger age cohorts and people aged over 65 has not changed since 1985 [16], FACETS data indicate that discrepancies in the frequency of IT utilization continue to increase with greater age beyond the age of

Group	Age in years
1	18 to 29
2	30 to 39
3	40 to 49
4	50 to 59
5	60 to 69
6	70 to 79
7	80 or older

Table 2.
FACETS age group cutoff points [18].

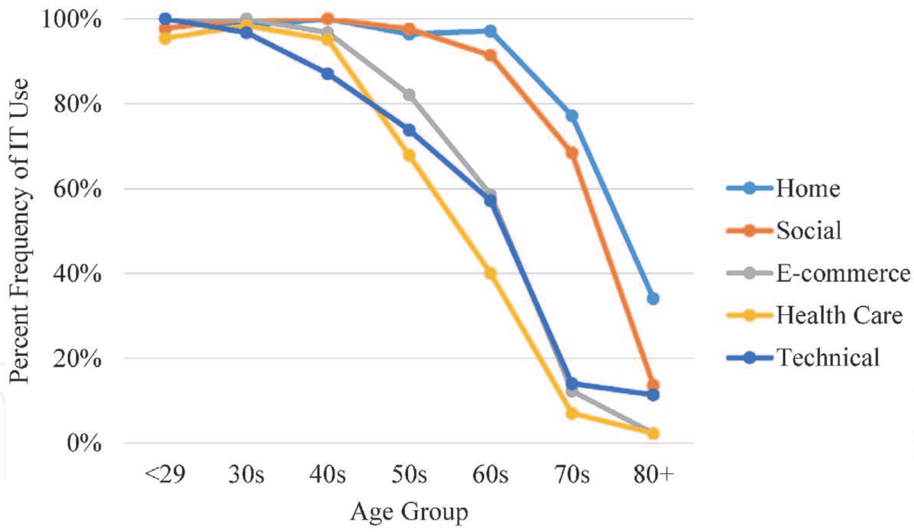

Figure 1.
Frequency of IT use for each FACETS domain by age group [18].

Domain	Age under 29	Age 30 to 39	Age 40 to 49	Age 50 to 59	Age 60 to 69	Age 70 to 79	Age over 80
Health Care	95	98	95	68	40	7	2

Table 3.
% IT utilization of health care by age [18].

65. This is a significant finding, suggesting that people over 65 years of age are not a homogenous population [18].

Specifically, the frequency of IT utilization for communicating with doctors, clinics and insurers declines most rapidly with age. In comparison with cohorts up to age 40, the frequency of IT utilization for communication with insurers and health care providers declined 28% by age 50, 58% by age 60, 93% by age 70, and 98% by age 80. The demonstrated decline in IT utilization with increasing age is consistent with earlier research [15–17], but importantly provides more detailed information about the age at which the rate of decline is greatest, and about preferences regarding IT utilization for communicating with health care providers at different ages [18].

5. IT and access to health care

Older adults use IT less than younger age cohorts specifically for accessing health care. While 95–98% of people under the age of 50 prefer to use IT to communicate with health care providers and insurers, only 7% of people over the age of 70 and only 2% of people over the age of 80 do so [18]. These data are shown in **Table 3**.

The decline in the use of IT for accessing health care with increasing age is more dramatically apparent when viewed graphically, as in **Figure 2**.

For example, even though they state that are capable of doing so, adults in age group 4 (50–59) prefer not to use IT to communicate with insurers or doctors. The distinction between the respondent's self-perceived ability to use IT as oppose to their willingness to use it is especially important in the context of health care, and has not previously been addressed. FACETS scores for members of older age groups (aged 70 to 79, and those over 80) whose health care utilization is highest [58, 59]

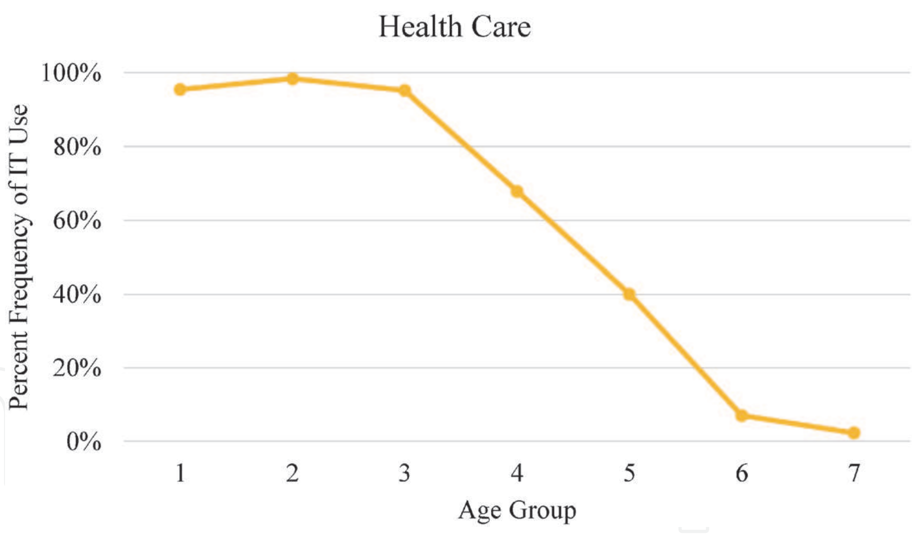

Figure 2.
% frequency of IT use for accessing health care by age group [18].

indicate that they almost never utilize IT for communication with insurers or doctors [18].

5.1 Insurers and IT

The FACETS outcome research data demonstrate that the default use of IT media (videoconferencing, websites, MyChart, text messaging) by insurers, health care agencies or providers for communicating with older adult patients is ineffective, making health care least accessible to the population with the greatest health care needs, older adults [58, 59]. The FACETS outcome research data also suggest that the default use of IT by Medicare, private insurers, and providers of health care for communicating with their patient populations might create a barrier to care and communication, which in turn might lead to poor health outcomes and lower satisfaction ratings by patients and providers of care [70, 71].

Despite these data, Medicare and private insurers continue to make increasing use of websites for communication with patients [63–65, 69]. This trend is shared by hospitals, regional health centers, university teaching hospitals, and local medical clinics [66, 67]. This is somewhat alarming, in the absence of any data indicating that the populations they serve have fluency using the internet or with IT [60, 74].

5.2 Looking forward: IT and younger age cohorts

One of the arguments employed in defense of the increasing use of IT media by Medicare, insurers and health care providers is that younger age cohorts are more IT fluent and in time, those lacking IT fluency will no longer be part of the population. The data demonstrate that this is a flawed premise. For example, the highest internet users in the 1985 U.S. Census Bureau study (age 30–35) are now in the low internet user category in the U.S. Census Bureau 2016 findings (now aged 63–68).

This finding appears paradoxical, and invites investigation and speculation. Data from FACETS outcome research suggest that the high IT users of 1985 did not stop using the internet as they aged, but rather, that adoption of new IT platforms including those for accessing the internet is lower among increasingly older cohorts. The lower rate of new IT adoption with age might reflect reduced neuroplasticity with increasing age [96–98], or detachment from newly introduced technologies after retirement, and/or lack of access to and/or training in the use of novel IT.

Perhaps more importantly, these findings suggests that high IT utilization is tied less to a specific individual consistently over time than it is tied to a person's age at the time novel IT is introduced. Younger people appear to adopt new IT & use it more consistently than older people, even if the older people were high IT users when they were young. This is especially relevant in the context of introducing new or evolving IT for communicating with patient populations. The FACETS outcome research data indicate that older adults continue frequent use of IT that is familiar, likely adopted prior to age 40 or 50, while people over the age of 70 demonstrate much lower utilization of IT introduced after they were in mid-life. Late-life introduction of novel IT appears to dramatically decrease the likelihood that it will be utilized. In the context of access to care, the introduction of novel IT by Medicare and health care providers for patient communication with populations over the age of 70 is likely to represent a future barrier to care even for people who currently belong to younger age cohorts [18].

5.3 Insurers, IT and other age-related issues

It is important to recall that no symptoms or diagnosis of neurocognitive disorder had been observed in any of the participants in the study, including but not limited to Vascular Neurocognitive Disease, Neurocognitive Disorder with Lewy Bodies, or Alzheimer's Disease. In 2015 the global number of people diagnosed with neurocognitive disease was 46.8 million, and 50 million in 2017. It is expected that by 2030, the number of people with neurocognitive disease will exceed 75 million, and by 2050 it will exceed 131.5 million [99–101]. The progressive organic deterioration characteristic of neurocognitive disease correlates with decreasing episodic memory [102, 103], making it even more challenging for older adults with neurocognitive illness to learn how to utilize new IT in order to communicate with health care providers or insurers. The use of IT for communicating with patients in this population may be neither practical nor realistic, and potentially creates a barrier to access to care [18].

6. COVID-19, CMS, IT and access to care

Along with people who have serious underlying health conditions, older adults belong to the cohort most at risk for serious illness reactions to COVID-19, for whom shelter in place is most strongly recommended. People over age 70 have been encouraged not to leave their homes to purchase groceries or perform other routine tasks, but only to leave their homes in the case of a physical emergency [104].

In the context of shelter in place measures to reduce exposure to COVID-19, between February and April of 2020 the Center for Medicare and Medicaid Services (CMS) made a number of policy changes intended to make telehealth more accessible to older adults. These include non-enforcement of policies limiting the patient's location to approved rural facilities, and the HIPAA compliance of the audio-visual platforms used for telehealth communications [13, 105]. While these measures increased access to care to Medicare subscribers with IT fluency, they failed to address access to care for Medicare subscribers who lack IT fluency. As the data demonstrate, 93% of people over the age of 70 and 98% of people over the age of 80 lack IT fluency and do not use the internet to communicate with health care providers, but instead rely entirely on face-to-face or telephone interactions with health care providers [18].

6.1 Advocacy for access to care for older adults during shelter in place

Beginning in March 2020, the American Psychological Association (APA) made repeated appeals to CMS to allow reimbursement for the use of telephonic psychotherapy services during shelter in place [106]. On April 30, 2020, after a series of refusals, CMS agreed to provide reimbursement for the use of routine psychotherapy CPT codes for service provided using the telephone [107, 108]. Although the Medicare policy change is temporary, it makes health care accessible to 95.5% of Medicare subscribers over the age of 70. The policy change was intended to expire when the status of COVID-19 was reduced from a national state of emergency, but legislation is being considered that might make the changes partially or wholly permanent [74].

6.2 Advocacy for making CMS changes permanent

During shelter in place due to COVID-19, the public was encouraged to utilize virtual communications, especially videoconferencing, for access to health care. A growing body of research demonstrates the effectiveness of telemedicine [48, 109–113]. While this is a viable alternative for younger age cohorts, research data demonstrate that older adults make very limited use of, and/or have very limited access to IT for the purpose communicating with health care providers. While the discrepancy in internet and IT use between younger age cohorts and people aged over 65 is generally about 20% [16], mean utilization of IT (internet, web-based interaction) for access to health care by people over the age of 70 is only about 4.5% [18]. In other words, during shelter in place, 95.5% of people over the age of 70 relied exclusively on telephonic contact for access to health care. This finding is of special concern because older adults belong to the cohort most at risk for serious illness reactions to COVID-19 [104]. Limiting reimbursement for telephonic health care represents a barrier to care for older adults [74].

While CMS's decision to reimburse telephonic psychotherapy [108] is an important acknowledgement of the potential barriers to health care IT represents for older adults and makes health care accessible to an average of 95.5% of Medicare subscribers over the age of 70 [18], the change is temporary and will expire when the COVID-19 pandemic has been resolved [114]. Making reimbursement for telephonic psychotherapy services a permanent policy will facilitate better communication with patients, leading to better treatment outcomes [70, 71]. To facilitate better communication between patients and health care providers, routine assessment of IT utilization might be conducted a part of the standardized initial intake evaluation with older adults and other populations, in order to determine the most effective means through which they can access health care. FACETS is a valid and reliable instrument for assessing which media people use for accessing health care [18, 69]. Instruments like FACETS can be employed in order to determine the most effective means through which patients can access health care. Such assessment is especially important for older adults and other populations with limited IT fluency and/or access to IT or high-speed internet.

7. Conclusions

Although people over the age of 65 account for only 9% of the world's population, they account for 30 to 40 percent of COVID-19 cases and 80 percent of COVID-19 deaths [114]. Despite these statistics, people over the age of 65 have been excluded from more than half of COVID-19 trials seeking effective treatments, and from all of the vaccine trials [114]. These data speak to the healthcare system's tendency to overlook the needs of older adults. Hospitals, community health clinics, government-funded health agencies and private practices might also conduct similar assessments to build a larger data base that informs decisions about which media are most effective for communicating with older adult patients. A larger broad-based sample might also provide valuable information about the ways in which older adults access social contact, financial management, and other business functions. At the time of this writing, the COVID-19 pandemic remains unresolved. However, it is increasingly apparent that older adults rely heavily upon telephonic access to health care, emphasizing the importance of permanent changes that liberalize CMS telehealth policy.

Conflict of interest

No conflict of interest is declared by the author.

Declarations

This work received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. The sole author, Charles M. Lepkowsky, PhD, wrote this chapter in accordance with the Ethical Principles of the American Psychological Association. Accordingly, patient identifiers were intentionally minimized. The author accepts responsibility for the conception and design of the chapter, acquisition, analysis, and interpretation of data, drafting, writing, editing and final approval of the version published. The author is accountable for ensuring that any questions regarding the accuracy or integrity of all parts of the chapter were thoroughly investigated and resolved.

Appendix 1: Functional Assessment of Currently Employed Technology Scale (FACETS)

Age: _______ ◯ Male/◯ Female ◯ Hispanic ◯ African American ◯ Asian ◯ Other

Household Income: ◯ < $25,000 ◯ < $50,000 ◯ < $100,000 ◯ < $150,000 ◯ > $150,000.

Degree: ◯ N/A ◯ High School ◯ Some college ◯ AA ◯ Bachelor's ◯ Post graduate.

Access to a computer at home? ◯ Yes/◯ No **Access to internet at home?** ◯ Yes/◯ No.

Instructions: Check the response that most accurately completes each

A.	**Home Domain**						
1.	I send email...	◯ **Never**	◯ **A few times a year**	◯ **A few times a month**	◯ **Once a week**	◯ **A few times a week**	◯ **Daily**
2.	I find, open & close files in my computer...	◯ **Never**	◯ **A few times a year**	◯ **A few times a month**	◯ **Once a week**	◯ **A few times a week**	◯ **Daily**

A.	**Home Domain**						
Home Domain Subtotal							
B.	Social Domain						
3.	I send text messages using a smart phone ...	○ **Never**	○ **A few times a year**	○ **A few times a month**	○ **Once a week**	○ **A few times a week**	○ **Daily**
4.	I post on social media (e.g., facebook, twitter) ...	○ **Never**	○ **A few times a year**	○ **A few times a month**	○ **Once a week**	○ **A few times a week**	○ **Daily**
Social Domain Subtotal							
C.	E-Commerce Domain						
5.	I manage my banking and credit card accounts online ...	○ **Never**	○ **Tried, but it did not work**	○ **Got help but did not work**	○ **Only with help**	○ **Can but prefer not to**	○ **Prefer to**
6.	I pay bills and make purchases via the internet ...	○ **Never**	○ **Tried, but it did not work**	○ **Got help but did not work**	○ **Only with help**	○ **Can but prefer not to**	○ **Prefer to**
E-Commerce Domain Subtotal							
D.	Health Care Domain						
7.	I communicate with my doctor or clinic online ...	○ **Never**	○ **Tried, but it did not work**	○ **Got help but did not work**	○ **Only with help**	○ **Can but prefer not to**	○ **Prefer to**
8.	I communicate with my health insurance company online ...	○ **Never**	○ **Tried, but it did not work**	○ **Got help but did not work**	○ **Only with help**	○ **Can but prefer not to**	○ **Prefer to**
Health Care Domain Subtotal							
E.	Technical Domain						
9.	I have installed components (monitors, speakers, mice) ...	○ **Never**	○ **Tried, but it did not work**	○ **Got help but did not work**	○ **Only with help**	○ **Myself, with difficulty**	○ **Myself easily**
10.	I have reset a modem or router in my home ...	○ **Never**	○ **Tried, but it did not work**	○ **Got help but did not work**	○ **Only with help**	○ **Myself, with difficulty**	○ **Myself easily**
Technical Domain Subtotal							
Total FACETS Score							

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