

Care



The Future of Remote Care Technology and Older Adults

Connection is Everything

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EXECUTIVE SUMMARY

Covid-19 from the very outset produced the worst of times for older adults. Not only were seniors suddenly isolated from family – they were also isolated from each other and from their care providers of all types, notably physicians. The result was a sharp increase in social isolation and loneliness as well as a deterioration of health status and a surprising rise of ageism. Ad-hoc alternatives to in-person connection became the order of the day. Telehealth reimbursement was quickly (and perhaps permanently) overhauled to encompass ad-hoc options, giving new life to the telehealth industry. Seniors were able to connect to providers via telehealth phone calls and FaceTime; chatbots, Zoom and Skype filled other gaps in symptom identification and delivery of care. Telehealth utilization rose, but by June 2020, leveled off as in-person visits ramped up.

Gaps in connectivity for older adults came into focus, including lack of broadband access at home and in senior living, plus lack of appropriate technology and training of older adults. It was complex to set up a secure telehealth visit – a problem for both providers and patients. As a result of the experiences of older adults and their providers, expectations have climbed – what should or could be the tech-enabled remote care future? It will likely include greater use of analytics to boost understanding of which patients benefit from what type of interaction. There will be growth in the use of AR/VR, chatbot, robotics. AI and voice-enabled categories. Service enhancements will include MD visits inside larger retailers and pharmacies. Finally, care providers will use data to segment their patients' needs and tech readiness by creating a Remote Care Technology Profile. For older adults, the home has again become the hub for life and care.

WHO SHOULD READ THIS REPORT?

- Investors and funds that focus on older adults
- Senior living organizations and professional home and health care companies
- Vendors within or considering entry into the remote care technology categories
- Technology platform providers
- Telecommunication carriers
- Social services and non-profits with focus on older adults
- Health care providers with significant exposure to Medicare-enrollees and aging parents.

ACKNOWLEDGEMENTS

This report is based on research and interviews held with experts and executives from 30 organizations, all of them engaged in deploying, inventing, using, or advising about remote care technology. Excerpts from those conversations are distributed through the document.

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And as always, a heartfelt thanks to Mary Furlong, my long-time colleague for the past 11 years. Without her, I would never have started down the path of my third career.

COVID-19 HARMED THE WELLBEING OF OLDER ADULTS

Gap in technology access widened into connection chasm

Covid-19 slammed into the world like a 2020 locomotive. It was the worst of times. Suddenly all of the technology gaps and communication weaknesses across society were exposed. Abrupt policy changes and lockdowns rippled through communities and countries – globally. Doctors could not see patients in person. Hospitals canceled elective procedures, emptied rooms to receive Covid-19 patients and clamped down on allowing visitors and volunteers inside. Seniors lost connections in every aspect of their lives as the result of:

- **Halting in-person social experiences.** As individuals retreated into their homes, apartments, or rooms in senior living – quality of life experiences dwindled or disappeared. Social get-togethers were deemed risky and as a result, virtually disappeared. Restaurants emptied and then closed. Gyms closed and religious services were halted.
- **Severing in-person connections with their families.** In the early stages of the pandemic, [warnings about the risk of travel](#) emerged early, often, and specifically included older adults (regardless of health status) and people with compromised immune systems. The result was an escalation of fear of both travel, contact, and an unanticipated but now well-documented [increase in ageism](#).
- **Closing the doors of senior living and nursing homes to visitors.** The virus initially appeared and then raged throughout nursing homes. By March, it's rapid spread prompted most senior living organizations, including CCRCs and Assisted Living Facilities, to shut the doors to visitors. By October the [resulting illness and deaths](#) in nursing homes represented more than 40% of all Covid-19 deaths. Yet to be determined – what proportion of those were related to the absence of family to visit and help these residents.

Life-threatening results were quickly documented

As the pandemic continued, researchers began to document the consequences of these actions for older adults. The data began to accumulate that showed first the immediate results and later the longer-term impact of cutting off social connections, healthcare appointments (including cancer treatments) and more. The pandemic was:

- **Producing social isolation and loneliness at unprecedented levels.** The Surveys, including those from the [NORC at the University of Chicago](#) and [University of Michigan](#), are emerging that identify the degree to which older adults had disruptions in care or were lonelier due to lack of social contacts with others (see **Figure 1**).

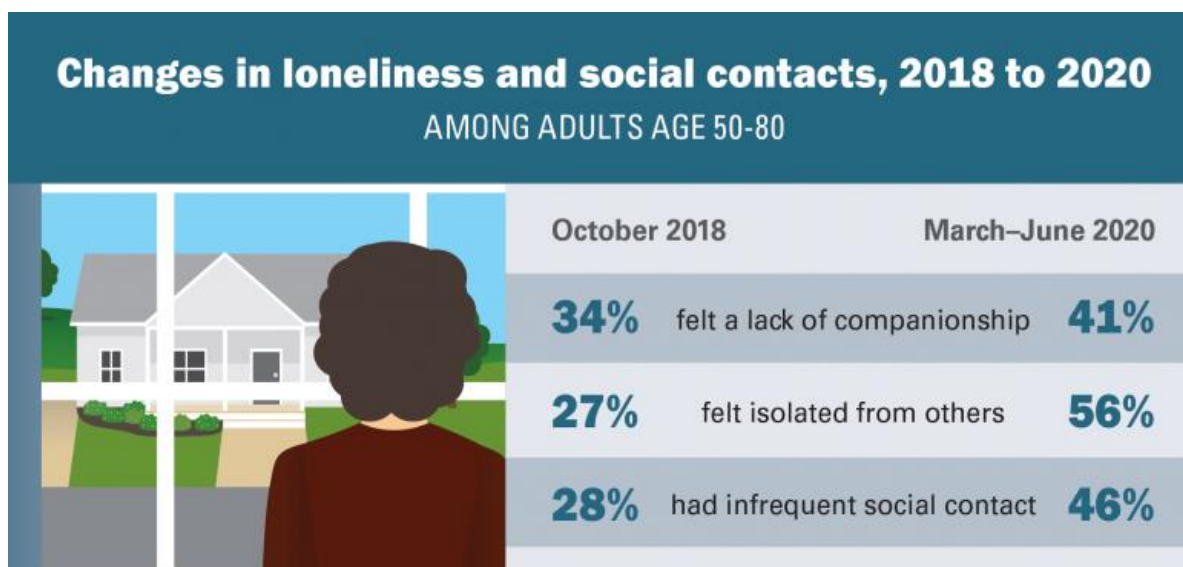


Figure 1 University of Michigan Survey June 2020 Source: [University of Michigan](#)

- Breaking the in-person connection with health-related providers.** During the initial months of the pandemic, visits to doctors and hospitals plummeted (see **Figure 2a,2b**). [Small hospitals, particularly in rural areas](#), began closing. Both [hospitals](#) and [physician practices](#) lost considerable revenue during the pandemic, with 97% of surveyed practices reporting a negative financial effect. While telehealth visits rose during that time, they did not make up for the drop of in-person Fee for Service (FFS) visits.

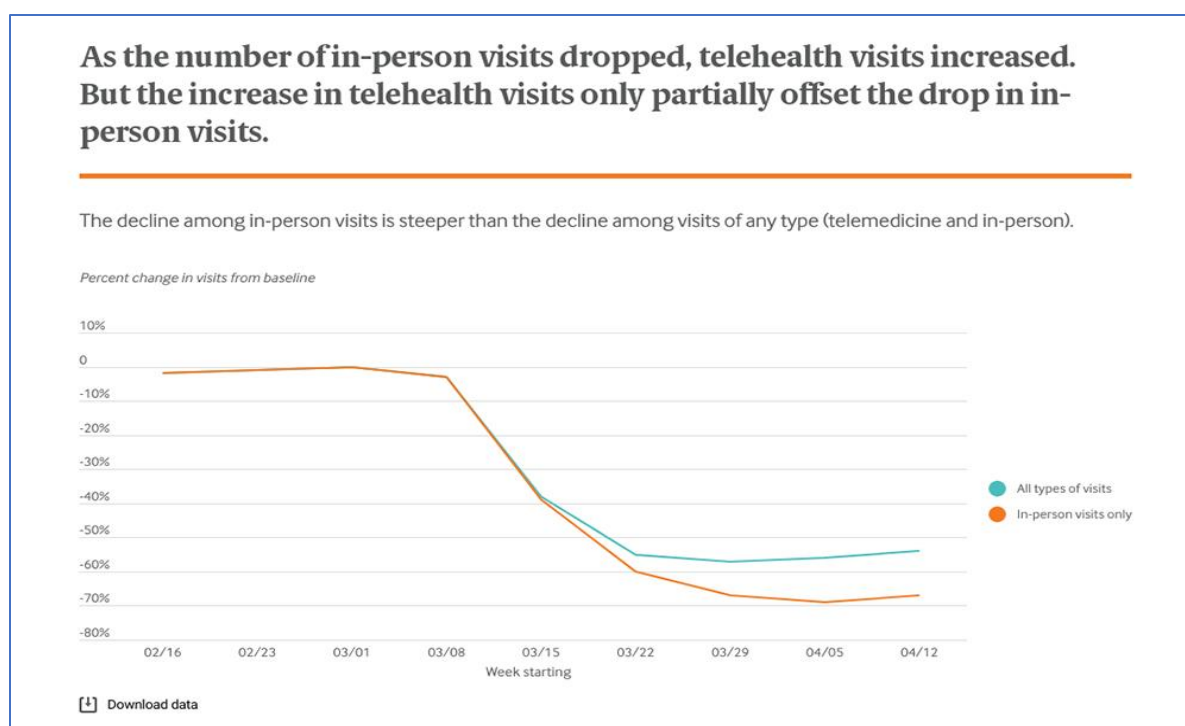


Figure 2a In-person visits vs. telehealth, early Covid-19 Source: [Commonwealth Fund](#)

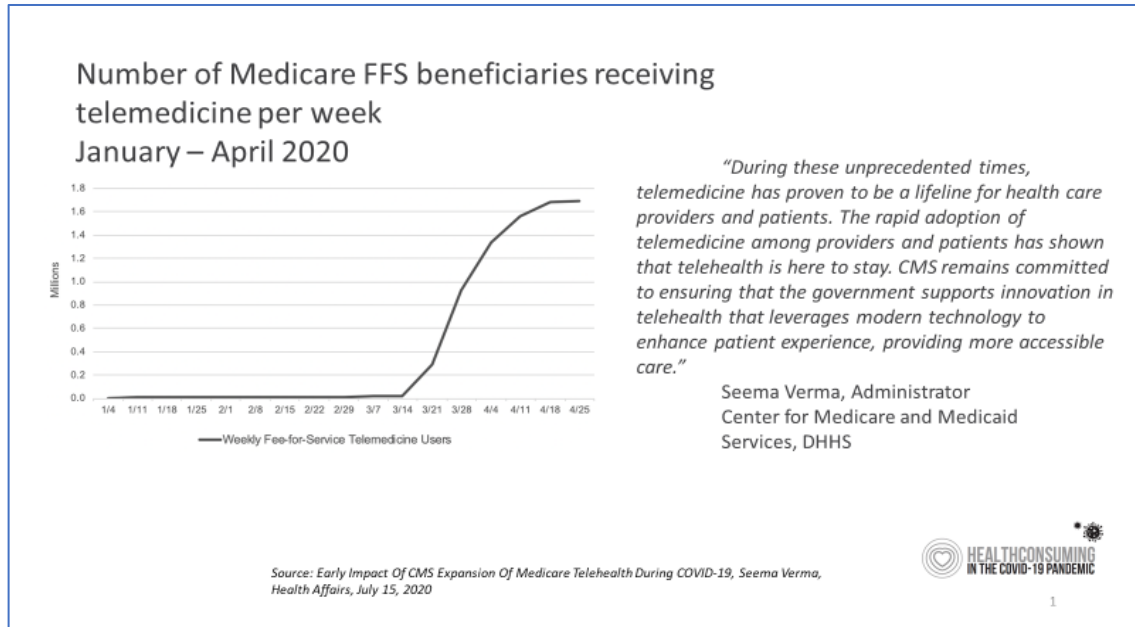


Figure 2b Medicare beneficiaries receiving FFS telemedicine per week **Source: CMS**

- **Exacerbating untreated health problems and creating new ones.** Multiple health conditions went untreated in the first months of the pandemic, including [heart disease](#), [stroke](#), and [diabetes](#). As of June 30, a [CDC survey of 4975 adults](#) indicated that 40.9% had delayed or avoided medical care, including both urgent care and visits to the emergency room. For some older adults, in addition to other untreated conditions, loneliness brought an increase in [depression](#) and even [suicide risk](#).

Organizations scrambled to respond to the plight of elderly

Life was transformed for people and organizations. Older generations were cut off from their families. Hospitalizations were notably more prevalent among the oldest (see **Figure 3**). Senior living companies, especially nursing homes, but including all sizes and shapes, were caught in the triple bind of no-visitors, worsening worker shortages, and of course the potential (and actual) spread of the virus to their residents. Photos showed older people waving through windows at families on the street. Stories of depression and anxiety were the order of the day.

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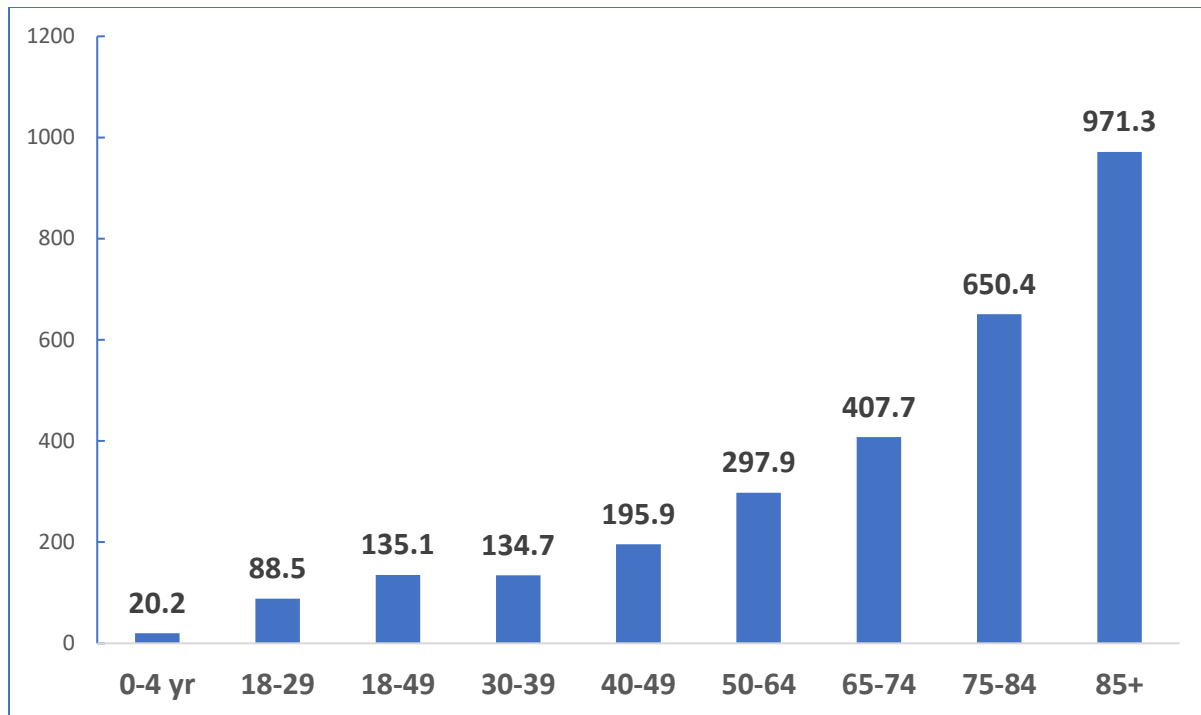


Figure 3 [Hospitalization rate due to Covid-19 per 100K population](#) by age Source: CDC

- **Ad-hoc connections became the order of the day.** Attempts to find workarounds for families and seniors cut off from each other ranged from selfie sticks and cellular Wi-Fi hotspots to free care collaboration software to free music technology for use in senior living organizations. Staff members were reported to run around with iPads enabling family check-ins from outside of buildings. For those communities with weak or no Wi-Fi, true creativity and or new tools were required.
- **Technology suddenly loomed large in importance, making gaps apparent.** Restrictions on visitations in senior living suddenly became a nationwide de facto policy. Technologies like Zoom, FaceTime, Skype (now upgraded with Skype Meet), Microsoft Teams, Ring Central, Google Meet, GoToMeeting/Webinar, Verizon BlueJeans, and more suddenly became the connective tissue that linked families together and enabled business groups to meet – including home care, home health care and healthcare workers.

“The pandemic shone a spotlight on the fact that physicians and hospitals can be flying blind when their patients are at home.” – BJ Boyle, Vice President, GM, **PointClickCare**

- **In response, policy makers shook the technology foundations.** CMS changed rules abruptly, making reimbursement of telehealth equivalent to an in-person visit, something years of lobbying and industry pressure could not make happen. In addition to reimbursement changes, CMS introduced and extended the **CMS Interoperability Rule** that enabled the deployment of interfaces between otherwise incompatible systems. From

making health and social technologies free and widely available to rapidly ramping up innovations across the healthcare technology industry, organizations responded and moved into action, even working more effectively with each other.

Connections for older adults matter now more than ever

- **Growth of solo agers and elder orphans leads to risks of isolation.** In recent years two new categories within aging have emerged. These include “elder orphans” – older people without a spouse or children on whom they can depend and “solo agers” – older adults without children, living alone. According to one 2016 health [study](#), 22% of older adults in the US currently or are at risk. These individuals may face financial insecurity, health concerns, and worry about being [alone if something should happen to them](#).
- **Isolation risks depression and poor health management...** While loneliness is linked to serious health problems and earlier death, the reverse may also be true. Older adults with multiple activity-limited chronic diseases may be at greater risk for social isolation and loneliness. This trend worsened during the pandemic (see **Figure 4**). Organizations sought ways to reach out to older adults who were literally unreachable based on self-isolation from fear or from no-visitor lockdowns in senior living communities.

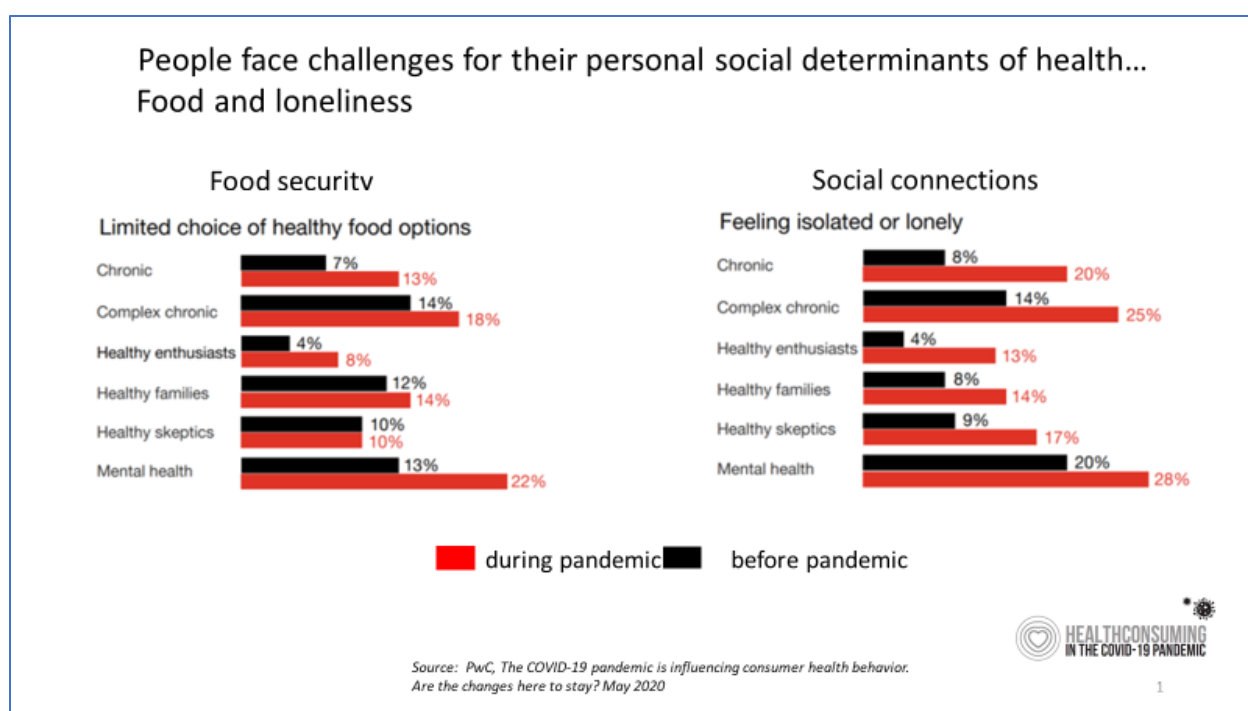


Figure 4 Feeling isolated or lonely worsened during pandemic

Source: PwC

- **...Poor health management risks decline, disease, even death.** As [Dr. Romeo Vitelli](#) noted in *Psychology Today*, “Age-related medical issues can also lead to greater psychological distress, including depression, and this can lead to people feeling even lonelier. Medical problems such as arthritis, cardiovascular disease, or cancer, can make many older adults feel more disabled and helpless.” Combinations of risk factors can lead to a cycle of worsening loneliness and decline.

Paths for connecting the Disconnected During Covid-19

Vendors scrambled at the beginning of the pandemic, participating in a wide variety of options to boost connection capabilities:

- **The television again offered a path of health and care connection.** Seniors who lack technology or Internet access likely own TV sets. [Independa](#) has long provided connectivity in senior living through its customized [Smart TV](#). And new entrant [MedSign](#) offers a device that is a hub around the TV, enabling a telehealth session, “Talk to the Doctor” that is activated through a remote control, including a ‘keyhole’ app that enables a caregiver to look in on the care recipient.

“There are 260 telehealth companies eating out of the same bowl. We offer an alternative for communicating with doctors or loved ones.” – Thomas Conroy, CEO, **MedSign**

- **Tech-enabled care organizations set up in-bound and outreach contacts.** For example, a firm like Constant Companion can be set up to make each day calls each day through a [voice device like Amazon Alexa](#). And as used by Commonwealth Care Alliance, [LifePod can be configured to reach out](#) to an isolated care recipient multiple times per day.

“With CCA, staff gets routine responses to voice-based ‘Covid’ questions – depending on the response, that creates a critical alert, call center response and a follow-up phone call to the member.” – Alan Bugos, Executive VP of Technology and Engineering, **LifePod**

- **FaceTime, Zoom and Teams became staples in the telehealth toolkit.** Seeing the opportunity, in April [Zoom created an encrypted version](#) known as [Zoom for Healthcare](#). Seeing the opportunity, [Microsoft Teams](#), and [Webex](#) all have healthcare versions. But some cautions have been noted with FaceTime, the [free version of Skype](#), as well as email over privacy and [HIPAA compliance](#).

“For telehealth, the overwhelming news is video visits – the doctor’s office in your living room. 23% of our ambulatory activity is telehealth. But a video call with the doctor is only the beginning.” – Joseph Kvedar, President, **American Telemedicine Association**

- **During the pandemic, providers needed to train themselves as well as provide care.** Clinicians had to boost their own [telehealth knowledge](#) – but so did patients. In fact, a 2018 study had scoped the capability of older adults, noting that millions of older adults lacked

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technology to participate beyond use of a phone (see **Figure 3**). That was no doubt a factor in the CMS ruling to reimburse telehealth through any and all means, including the phone.

“Before the pandemic, telehealth addressed only 3-7% of the population, and now reaches 30%. Providers could divert the potentially infected before they arrive at the hospital, versus having them sit in the waiting room. – Mark VanderWerf, Former CEO Telemedicine, Banner Health

Table 1. National Prevalence of Telemedicine Unreadiness in US Adults Older Than 65 Years in 2018 by Mode of Telemedicine Visit ^a				
Reason for unreadiness	No., millions (%)			
	Video visits	Video visits with social support ^b	Telephone visits	Telephone visits with social support ^b
Any unreadiness	13.0 (38)	10.8 (32)	6.7 (20)	5.5 (16)
Unreadiness owing to any inexperience with technology	10.1 (30)	8.3 (25)	0.3 (1)	0.2 (1)
Has no internet-enabled devices or does not know how to use them	1.9 (6)	1.5 (4)	NA	NA
Has not emailed, texted, or gone online in a month	8.2 (24)	6.8 (20)	NA	NA
Has no telephone (cell phone or other)	NA	NA	0.3 (1)	0.2 (1)
Unreadiness owing to any physical disability	6.8 (20)	5.5 (16)	6.6 (20)	5.4 (16)
Difficulty hearing	0.8 (2)	0.7 (2)	0.8 (2)	0.7 (2)
Difficulty communicating	2.1 (6)	1.6 (5)	2.1 (6)	1.6 (5)
Probable dementia	2.5 (7)	1.8 (5)	2.5 (7)	1.8 (5)
Possible dementia	2.3 (7)	1.9 (6)	2.3 (7)	1.9 (6)
Difficulty seeing	0.5 (1)	0.4 (1)	NA	NA

Abbreviation: NA, not applicable.

^a Estimates used complete case analysis for missingness; the number of missing cases never exceeded 16 (<0.2% of sample) for any criterion.

^b With social support assumes that older adults are telemedicine ready if they have a child in the household or 2 or more people in their social network.

Figure 3 [National Prevalence of Telemedicine Unreadiness age 65+ 2018](#) Source: JAMA Network

The Rise – and Fall – and Rise of Telehealth

Covid-19 hit the healthcare and technology industries as a [Black Swan](#) event – they didn’t see it coming – but the impact was immediate, far-reaching, and not yet understood. Telehealth utilization exploded during the early days of the pandemic – even in the form of a phone call. Then in Q3, usage declined (see **Figure 4**).

“We hooked up all rooms at the Baycrest long-term care with Smart Big-screen TVs that had other apps, and we directed a “robot” with a stand for sessions with health providers and family members – including an iPad, large speaker and some digital health devices. This was put together very quickly. – Mel Barsky, Director of Business Development, CABHI

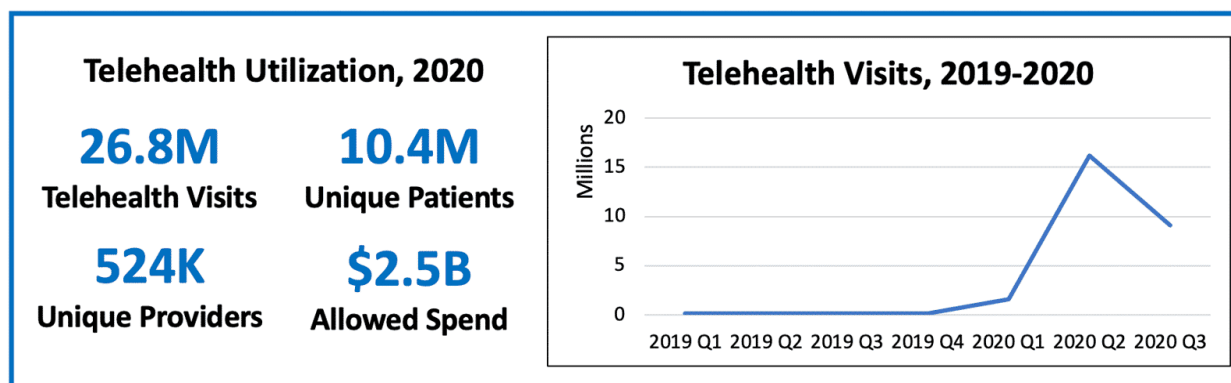


Figure 4 [Telehealth utilization](#) climbed sharply and declined by Q3 2020 **Source: CMS**

Since then, utilization has leveled off. And then telehealth [visits began to decline by July 2020](#). Primary care clinicians were [struggling to provide telehealth to their patients](#), finding they have to both train the patient on how to use the technology to interact and then conduct the session itself. Meanwhile as utilization slows and in-person visits pick up, hospital systems are trying to ‘right-size’ capacity of both in-person and telehealth (see **Figure 5**). After months of falling revenue, providers today are likely assessing the optimal mix of virtual and in-person visits. [Some experts are trying to sort out](#) why one type of visit may be important and under what circumstances.

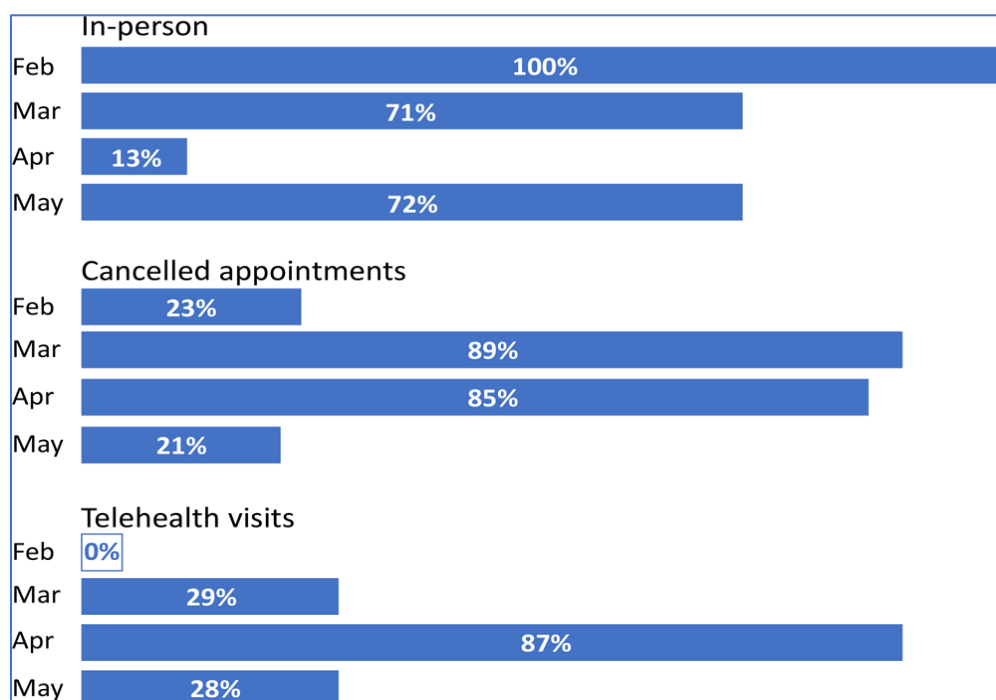


Figure 5 Telehealth compared to in-person visits – July, 2020, **Source: CDC**

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After the deluge. By June, both providers and patients showed concerns about [telehealth experiences](#), finding they have to both train the patient on how to use the technology to interact (not reimbursable) and then conduct the session itself. Early in the pandemic, privacy concerns were secondary to conducting the session (see **Figure 6**). By July, telehealth usage began to show signs of leveling off (see **Figure 7**).

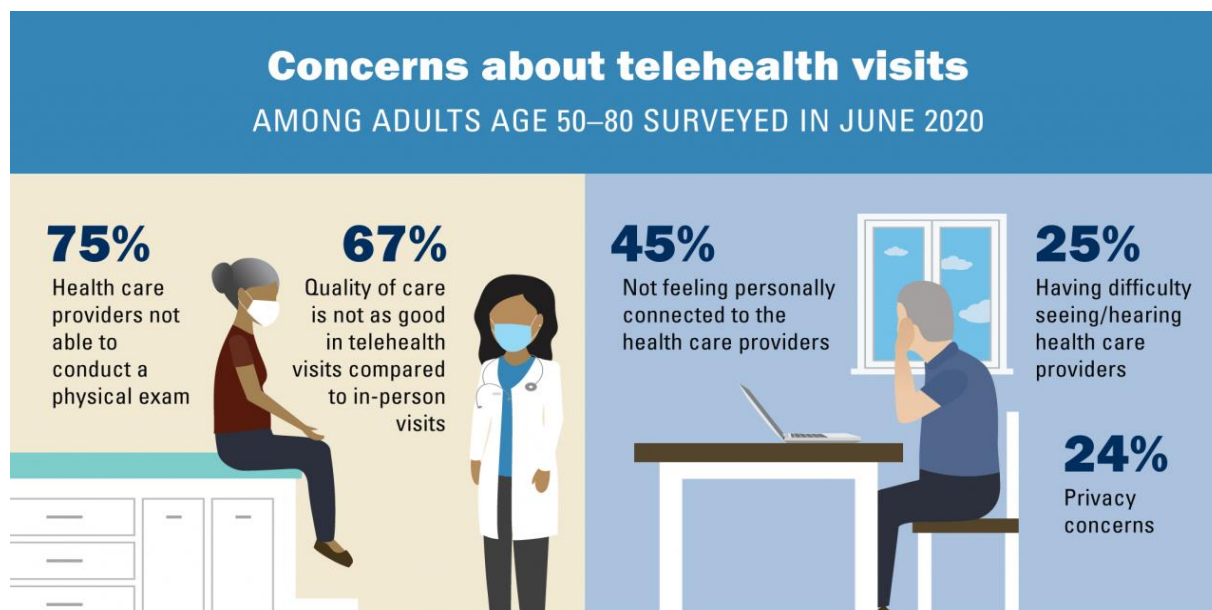


Figure 6 [National Poll on Healthy Aging](#)

Source: University of Michigan

“We let 1000 flowers bloom” with [regard to insurance plans](#). [But] there's an infrastructure investment” involved with virtual care, including getting people access to the Internet. – Dr. Donna Shelley, NYU School of Global Public Health

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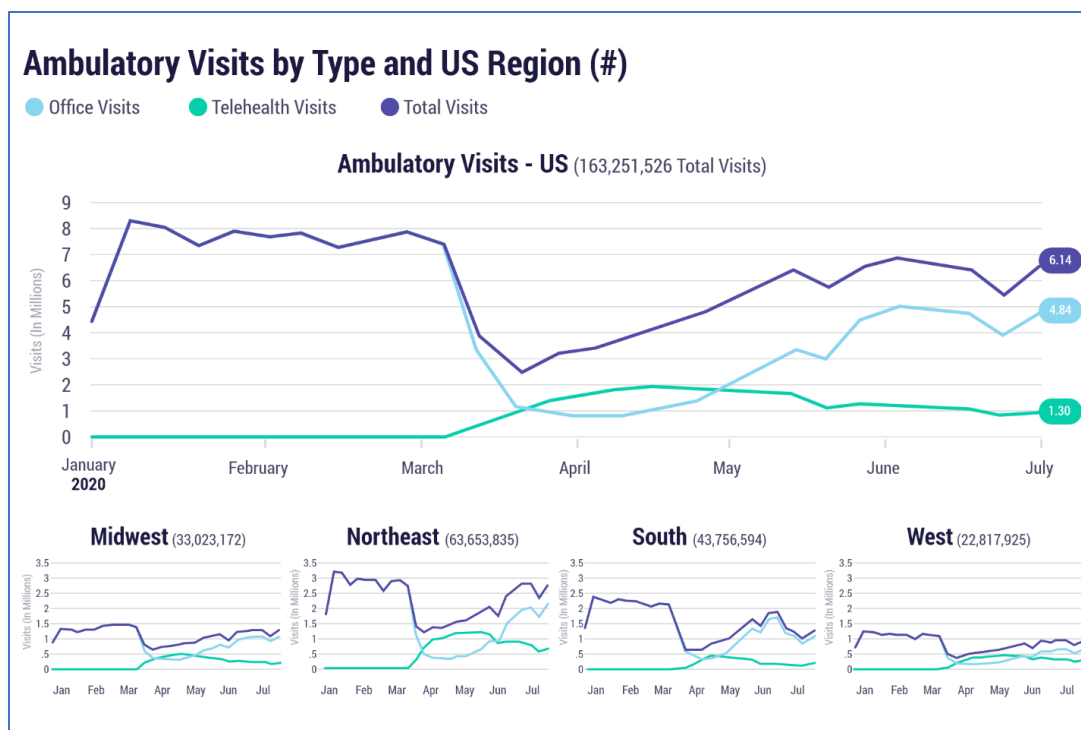


Figure 7 Epic Health Research Networks, July 2020. Source: [Stat Health Newsletter](#)

CLOSING TECH GAPS MAKES WAY FOR THE FUTURE

The Covid-19 severing of in-person connections delivered innovative responses from the healthcare, home healthcare and [senior living industries](#). They have produced solutions that are not in-person, yet still can enable contact between those who need care and those who provide it. This is referred to as ‘Virtual care,’ the ability to use technology to enable [real-time access to health care services and support](#). For the purposes of this report, we are including ‘virtual’ as real-time, described as synchronous, Remote Care Technology. What has or hasn’t changed?

Asynchronous connections matter too. Remote care connections that involve the asynchronous transmission of information are just as important as the real-time, synchronous ones. For example, a telehealth interaction between a doctor and patient is made more effective if it follows data delivery from a Remote Patient Monitoring (RPM) system. The data can indicate changes in status outside of a baseline or normal pattern, causing the care provider to offer specific guidance in the telehealth interaction (see **Figure 8**).

Telehealth	Remote Patient Monitoring (RPM)
Personal Emergency Response	Reporting, Analytics
Chatbots and online care	Remote care management
Virtual (Synchronous)	Asynchronous

Figure 8 Synchronous versus Asynchronous remote care technology

Overall consumer satisfaction with telehealth is still a work-in-progress. J.D. Power released a new study of telehealth user satisfaction in [October 2020](#) that indicated 52% of users encountered at least one barrier to use. These included: tech audio issues, confusing technology requirements, and limited services. In addition, satisfaction was lower among those with the lowest reported health status. Doctors themselves may have preconceptions about telehealth, or even lack appropriate training and skills, as addressed in this [September, 2020 document](#).

“In June 2019 at a digital health conference held at Georgetown University, a med student told the audience that he did not get telemedicine or telehealth training as part of his medical school education.” – Rene Quashie, VP Policy and Regulatory Affairs, **Consumer Technology Association**)

Voice tech in the smarter home is the future now. During the pandemic, the chatter about telehealth grew louder. But there was another in-home groundswell underway – the use of voice technologies, becoming smarter behind the scenes in a [world fearful of touch](#). Amazon still dominates in [smart speakers](#) and [usage among younger people grew](#) during the pandemic (see **Figure 9**). During the pandemic, more than [half of smart device owners used voice commands once per day](#). Speaking smart home commands that are well-understood – like turn on the lights, change the temperature, and monitor doors – are voice-enabled and simple to use. Amazon Care and [Care Hub](#) are new offerings intended to serve seniors and care provider markets.

“The real magic will be when proactive voice tech can be connected to the television. Excuse me, Caroline, there is a fire in the hallway.” – Stuart Patterson, Co-Founder and Advisor, LifePod

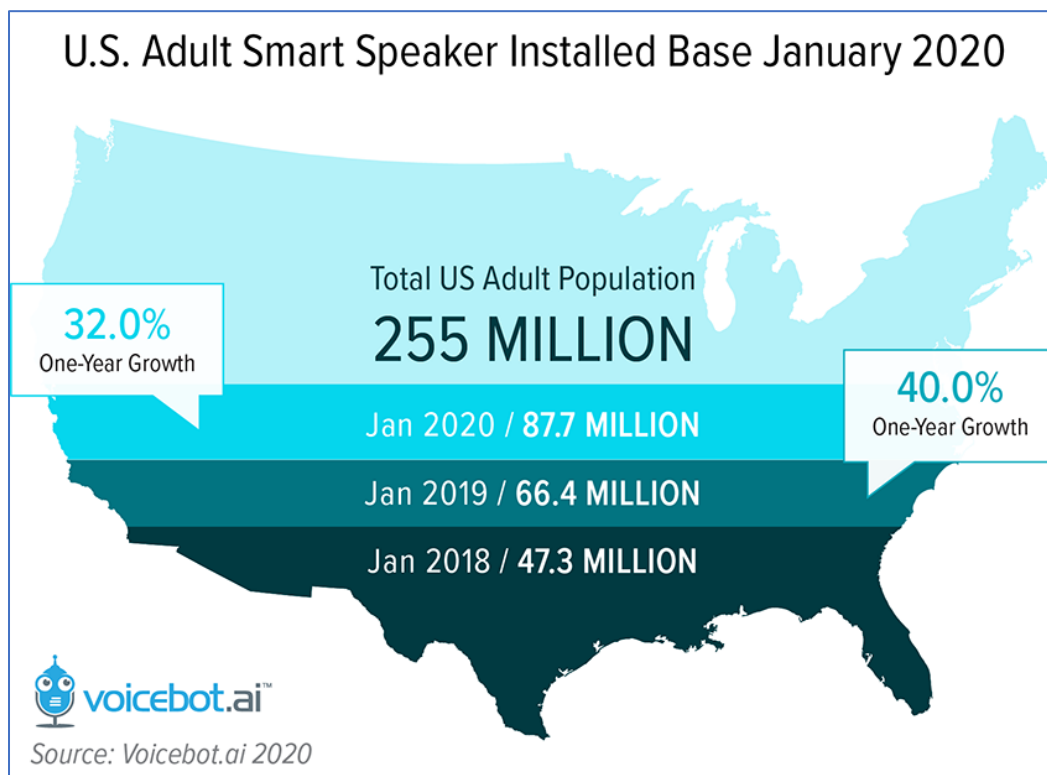


Figure 9 Smart Speaker Ownership in 2020

CLOSING THE GAPS – CONNECTIVITY, POLICY, TRAINING

Closing the Connectivity Gap

Technology was essential for many adults stuck at home during the pandemic, providing some social connection, access to online shopping, home delivery services, and requests for transportation. But it also became apparent that some older adults who were shut out from these due to limitations in vision, hearing, dexterity, and even dementia. And for some, technologies were not affordable – median income of a household age 75+ is \$34,925. What are the key dimensions that need to be addressed moving forward?

“Senior living has a history of under-investment in infrastructure, both wireless and physical. Now these are table stakes for new residents and adult children influencers.” – Michael Skaff, COO, Jewish Senior Living Group

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- **Broadband access.** In the 2020 OTI report, [The Cost of Connectivity](#), researchers examined 296 data plans in the US, finding that only 64 of them meet the [FCC definition of broadband](#). According to the report, most of the US plans are in places that lack competition, leading to high prices and hidden fees. In-home and high-speed access to the Internet is still elusive for many in the US. According to Pew Research in 2020, [21 million Americans lack access to broadband](#), as well as 60% of healthcare facilities outside of metropolitan areas. Looked at by age, [27% of the 65+ population lack access to broadband](#). Senior living and nursing homes have long lagged in delivering broadband access though that is likely to change.

“Healthcare has quickly moved from the physical world to the digital world. But we have not solved some of the underlying issues. Broadband, either access or willingness to use, is not there yet.” – Jennifer Walker, Jim Barnett, **AARP Enterprise Strategy Team**

- **Device access.** Even if older adults had at least regional access to broadband, the devices they are using may not be capable of the engagement, healthcare, or smarter home opportunities that would improve quality of life. And a sizable percentage do not own an appropriate device. Even at this late date, user-centered design with older adults in mind is not a tech industry norm. Device cost is still a barrier
- **Training access.** For those older adults who own the right devices to obtain access, have Internet connectivity, they may need assistance in getting started with use of remote care technologies. A popular engagement tool like Zoom has a less than intuitive user interface for the uninitiated, prompting a [9-page guide from Senior Planet](#), as well as senior living organizations [providing a Zoom guide](#). And one of the key requirements for video tools like Zoom or Microsoft Teams is helping people get and/or [position a camera](#).
- **Device management.** According to [AARP’s December 2019 research report](#), 62% of those aged 70+ own a smartphone and 40% own a tablet. But they still might need help with an up-to-date Internet router, managing software upgrades, and avoiding spam and web threats. While smart speakers and voice assistants have improved ease of use and seamless upgrades, both depend on broadband to work properly.

“There is a link between technology use and demographics. For those age 80 and beyond who need care, tech will be easier to use and voice-based, with no learning curve. If there is a learning curve, it will not be learned.” – Jody Holtzman, **Longevity Advisors, LLC**

Closing the Policy Gap

For years, advocates have lamented the so-called digital divide between older adults and tech services they need. The pandemic created a new level of urgency – particularly for telehealth access – and brought renewed pressure for government programs that could boost availability. Moving forward, health and policy advocates are focusing on:

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- **Continued reimbursement of tech alternatives to in-person care.** The expansion of telehealth by CMS during the pandemic enabled providers to tech-enable care in all variants of senior living, skilled nursing facilities, health care and home care settings. Loosening rules on HIPAA compliance and creating that reimbursement parity made that care feasible. Efforts are underway to learn from 2020 and create [policies and related reimbursement codes](#) in the new year that preserve RPM and telehealth capabilities that offered a new revenue stream for physicians during 2020.

“Physicians use our platform with skilled nurses and clinical staff members doing the monitoring (20+ minutes per month) qualifying for Medicare and Medicaid reimbursement to generate additional revenue.” – Michael Webster, VP Business Development, **VitalTech**

- **Governments boost role in expansion of broadband access.** Not unlike the healthcare industry itself, broadband is offered through a fragmented and regional service provider network with [widely varying costs](#). According to Pew Research, numerous state expansion initiatives [have been launched](#), a [federal strategy](#), and some [federal legislation](#) has been crafted. In March of 2020, the [DATA act was signed into law](#), intended to improve accuracy of broadband availability maps, presumably a prerequisite to expand rural broadband access to those who lack it.

“The deployment of broadband is like Tale of Two Cities – senior living community residents with money have it. No one in affordable housing does.” – Ginna Baik, Senior Care Practice Lead, **CDW Healthcare**

- **Governments consider their role in tech inclusion of older adults.** To date, the efforts to enable tech access to devices, training and the Internet have been sporadic and/or regional. The American Society on Aging announced a forum called [Tackling the Digital Divide](#) which includes discussion of targeted government policy campaigns.

“Medicare has approved more codes – there is an opportunity for voice first remote care and engagement tech platforms to power care moving to the homes from acute healthcare settings.” – Shaun Mitra, CEO, **BrioCare**

The Rising Expectations for Remote Care Technology

The pandemic catalyzed simultaneous innovation efforts on multiple fronts – many of the initiatives, especially Wi-Fi adoption, will become fixtures within the emerging remote care technology ecosystem. As 2021 and beyond unfold, there will be a clear need to optimize the work of health and care workers, find the right mix of virtual and in-person based on condition, traits/demographics, or phase of illness. Providers will begin to gain comfort with the AI/machine learning predictors of personal status and future trends. As those changes occur, the Remote Care Technology ecosystem puzzle will begin to take shape (see **Figure 10**).

“Wi-Fi adoption – is moving faster than we ever guessed. An enabler to augment the caregivers. They are the heroes here – we need to keep them safe.” – Jerry Wilmlink, Chief Business Officer, CarePredict

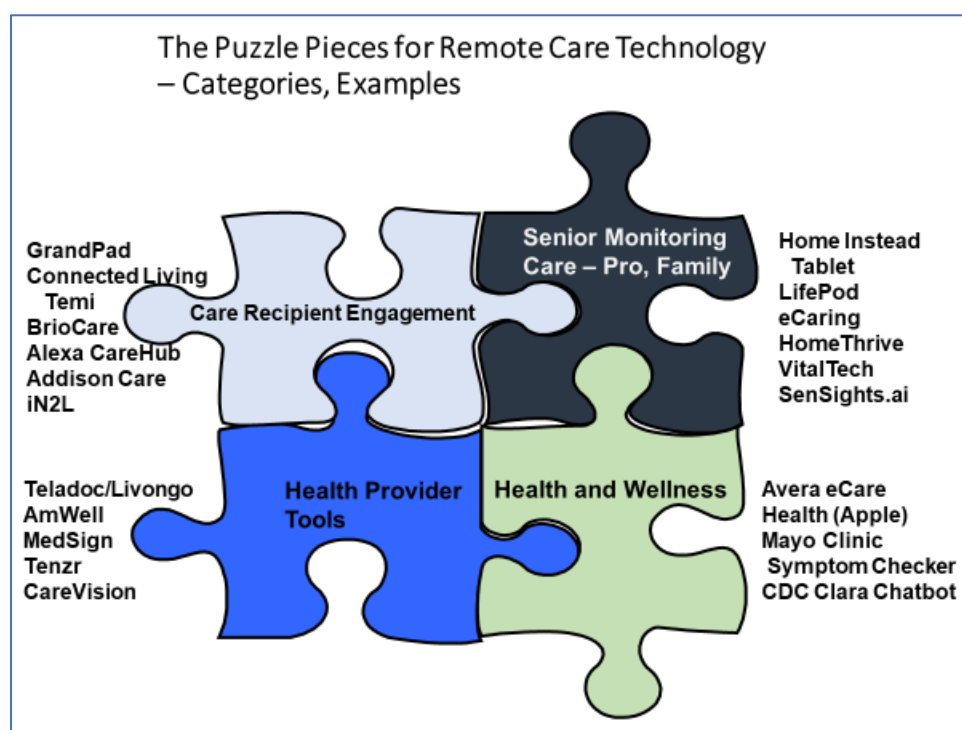


Figure 10 The Remote Care Technology Puzzle - Examples

- **Analytics built on the Internet of Behavior (IoB) drive smart outreach to patients.** According to [recent Gartner Research](#), by 2023, 40% of the world’s population will be tracked digitally to influence behavior, the next era after the Internet of Things (see **Figure 11**). In the healthcare realm, a home blood pressure reading could trigger a call from a nurse, or an in-person interaction with a diabetic may be followed by ongoing engagement. An imported blood sugar reading could produce personalized diet text messages for a diabetic or voice first follow-up tips from the Mayo Clinic Alexa skill.

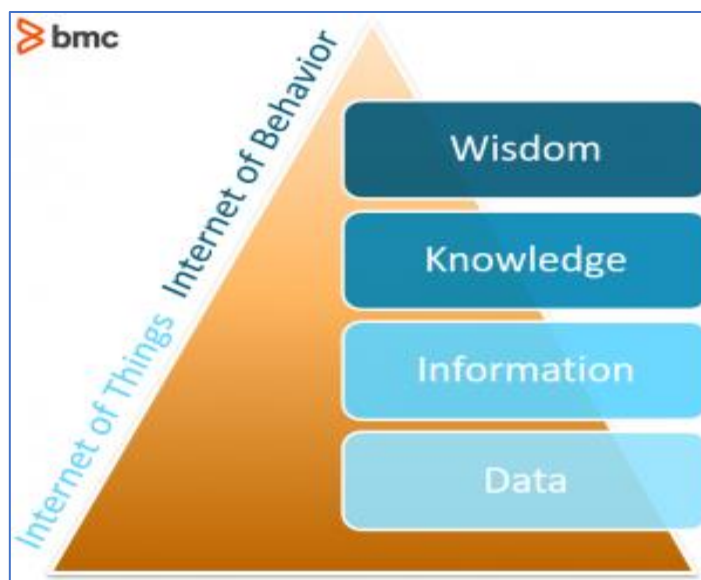


Figure 11 [BMC's representation of the Internet of Behavior](#) (IoB)

- **Virtual visits become standard options when making appointments.** Those using a patient portal to schedule an appointment may see changes – the option on portals to choose a telehealth interaction is now available. The clipboard is retired in favor of pre-filled online profiles. While the waiting rooms may still fill up with patients who need to be there in person, those with fear for their safety, mobility limitations or serious health condition may choose the telehealth option when it is offered.

“Even when Covid-19 fades from the forefront, the investment and adoption in telehealth, new technology-enabled services, and infrastructure propagated in recent months will have a long tail in the years to come.” – Lee Shapiro, Managing Partner at **7Wire Ventures**

- **AR/VR brings doctors, trainers, families into the virtual room.** Augmented and virtual reality is becoming more, well, real. Firms like [Rendever](#) and [MyndVR](#) offer content specifically tailored for senior living communities. From HoloLens [virtual rounds](#) where other doctors can see what the in-room doctor sees, to Embodied Labs' [VR training of caregivers](#), to possible future AR inclusion of family 'present' in the senior's home.

“Covid-19 has driven corporate leaders to re-imagine how to attract talent and train a remote workforce, shifting budgets to offer employees something more connective.” – Carrie Shaw, CEO, **Embodied Labs**

- **Chatbots and portals are personalized and connected to EHR.** As patients sign into a provider network or system, they may [encounter a chatbot](#) capable of making an individual recommendation. For example, the CLARA chatbot, created by the CDC and Microsoft, asked about Covid-19 health symptoms, with algorithms to suggest whether a person should come in for care or stay home. In some systems, these may be voice-enabled and integrated with an EHR.

“During Covid-19 early days, the CDC has delivered 37 million individualized messages using an AI-based COVID-19 chatbot – which has helped control patient volumes in the Emergency Room and Call Centers.” – Dr. David Rhew, Chief Medical Officer, Microsoft

- **AI, robotics, and machine learning capabilities become part of remote care.** Count 2019-2020 as the years AI emerged from the shadows of tech-insiders and research to become (more of) a staple for [healthcare](#) or [senior care](#). For example, Livongo uses AI to interpret collected information from pharmacy benefit managers, clinical laboratories and high Health Stations. Fahad Aziz, co-founder of [CareMerge](#), recently published a vision of the use of AI technology in senior living he called [Smart Aging](#). Today AI-based tools can be used for voice-enabled medical dictation and symptom checking. [Predictions](#) about the use of AI to care for older adults have already emerged (see **Figure 12**).

"Using AI, Caspar makes a behavior model from sensor data, deriving 50 sets of analytics like sleep quality, activity levels, changes in behavior patterns. Caspar uses these wellness analytics to motivate them to move more." Ashutosh Saxena, CEO, Caspar.ai

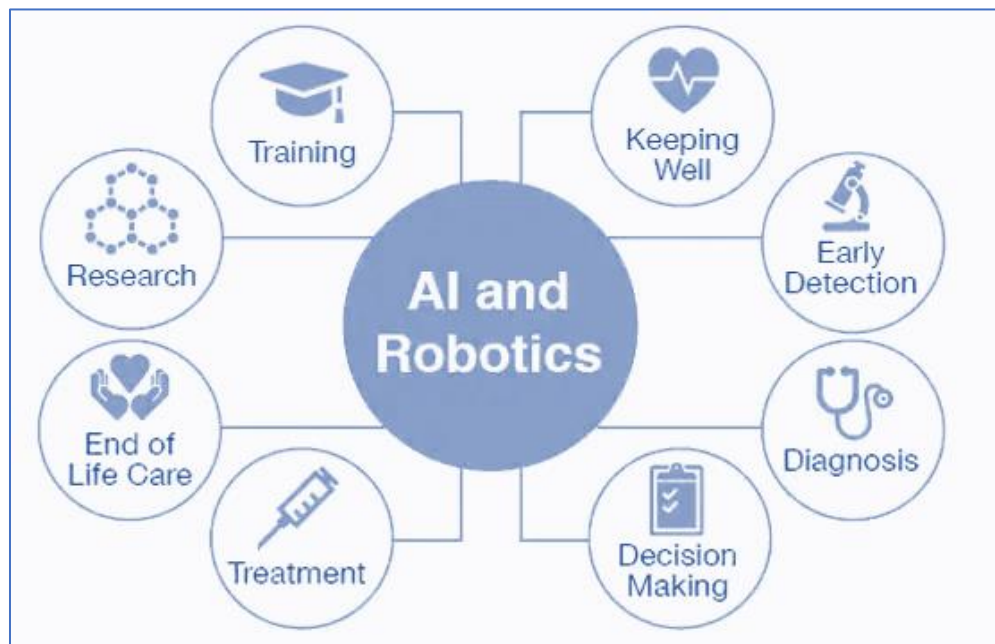


Figure 12 Senior care areas for AI and Robotics Source: [Towards Data Science](#)

- **Hospital at Home gains traction.** Based on patient evaluation and meeting appropriate criteria, Hospital at Home programs have emerged around the United States, with at least 35 programs and [several hundred examples](#). Patients with Congestive Heart Failure, pneumonia, COPD, and a wide number of other conditions can receive full diagnostic testing and appropriate treatment at home. This includes a full set of technology required to support their care, visited regularly by a Hospital at Home physician and eventually be ‘discharged’ to the care of their own doctor.

The Future of Remote Care Technology and Older Adults 2020

*“The hospital may act more like intensive care, home as an extension of the hospital. Discharge will be a continuous event.” – Dor Skuler, CEO, **Intuition Robotics***

- **Home care services add analytics, smart devices, and electronic home care records.** The fragmented home care market, a compilation of 14,000 individual businesses, some franchised, has a heightened in technology since the start of Covid-19. Honor has implemented a technology that figures out what type of jobs its CarePros prefer. HouseWorks has [partnered with eCaring](#) to offer an electronic home care record that sends alerts and enables in-app text or video chat features. [See **Appendix I** for an example vision.] Home Instead has partnered with [GrandPad](#) to deliver their tablet for virtual visits and coordination with the family caregiver.

*“The data we collect helps us provide a more personalized approach to caring for our clients.” – Lisa Weber, Senior Product Manager, **Home Instead***

- **Services optimize care delivery.** Lyft has partnered with Medicaid agencies to [provide access to rides to appointments in 10 states](#). UberHealth enables [ride requests directly from the Cerner EHR](#). In the future, Best Buy’s Geek Squad may even offer delivery [of telehealth technology](#) to the home. And Mobile Help, a PERS company, has a separate sub-brand that offers RPM and telehealth as well as PERS.

*“The big innovation is going to be voice assistance. PERS via voice in the home removes the need for a wearable.” – Bryan Adams, Chief Commercial Officer, **Best Buy Health***

- **Retailers become part of healthcare delivery.** BestBuy acquired [Critical Signal Technologies](#) to enable telehealth in the home. In July, Walmart announced plans to open [Walmart Health centers in 2021](#). That same month Walgreens said it would open doctors’ offices, in [partnership with VillageMD](#), inside Walgreens pharmacies. CVS has Minute Clinics which saw a [surge in telehealth visits during the pandemic](#).

*“The vertically integrated health plan/provider and community organizations know that Mrs. Jones is lonely and does not have diabetes – so they send her chocolate-covered strawberries, following up with a phone call.” – Jane Sarasohn-Kahn, **THINK-Health***

Care Providers: Create a Remote Care Technology Profile

The actions already taken by care providers and technology vendors since the start of Covid-19 are just a prelude to better use of data and technology. The emergency actions taken early pushed many of them forward to do more with predictive analytics, portals, check-ins, and smarter health processes. Moving forward, expect that care providers will have a high-level checklist crafted from data and AI that includes the ability to (**Figure 13**):


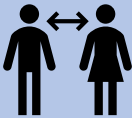


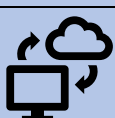


	Identify elder orphans and solo agers	✓
	Identify Social Determinants of Health, referring people to needed social services	✓
	Check in with the socially isolated	✓
	Virtualize the waiting room via personalized portals	✓
	Determine which patients need telehealth virtual visits or RPM	✓
	Offer the capability to import vital signs from a Hub in the Home or retail site	✓
	Know patient's technology capability with personal devices and home broadband	✓

Figure 13 The Remote Care Technology Profile

*“We have a long way to go in caring well for people as they age. We’re working our way up the pyramid by providing foundationally amazing care. This is helping us work toward fixing social isolation and moving up to the happiness level.” – Seth Sternberg, CEO of **Honor***

What the Future of Remote Care Technology Means

Covid-19 gave senior living a wakeup call about its reason for being. Placing residents into social isolation forced organizations to creatively engage and enable them to ‘meet’ each other. Communities will ramp up connectivity to meet a fundamental family expectation.

“There has historically been a huge technology chasm in the market for older adults – huge for them and those who serve them. That changed overnight.” – Scott Moody, CEO, **K4Connect**

Whole person engagement becomes part of a payer business strategy. Assessments of emotional wellbeing become part of insurance plans. Payers use loneliness assessments and outbound targeted calling to the isolated. Approaches are measured to identify ones that scale.

“We have agents who are trained in social work for the payer-provider market – providing access to more than can be provided in a phone call.”—David Inns, CEO, **GreatCall**

The home becomes the hub for life and care. Smarter homes with strategically placed motion sensors will keep older adults safe and healthier. As a result, in-home exercise programs and well-being services blossom.

“In the future, we see care plans remotely delivered in tablet format along with voice-enabled discharge instructions.” Rob Flippo, CEO, **MobileHelp**

Wearables with alerts connect the circle of care. The PERS pendant market is replaced by smart care watches using cellular service. Older adults are freed from pendant stigma. Fall risk is reduced among care watch owners who are connected to 24-hour response centers.

“Device wearers can receive care untethered to a base station, customized care reminders, notifications, access to physician-on-demand and a caregiver app.” – Mark Francis, **ECG**

In-home voice assistants gain traction among older adults. The [Internet of Behavior](#) (IoB) combines with AI algorithms to offer smart advice. Voice assistants speaking to older users by name about their wellbeing becomes commonplace by 2025.

More independent seniors take on peer-to-peer health and care networking. They will offer care and support for other older people. Increasingly, they will engage in clinical trials as “Citizen Scientists” and be asked to co-design applications with developers.

Closing the digital divide becomes a serious priority. Little tech or no tech becomes an unacceptable barrier to engagement and care. This will likely drive changes in the programs AARP (and others) offer in 2021 and beyond.

Resources

[AARP 2019 Survey of technology use among the 50+](#)

[Cathedral Builders Wanted: Constructing a New Vision of Technology for Old Age](#)

[How to Use Zoom – Senior Planet](#)

[JD Power: Telehealth Satisfaction Study](#)

[National Prevalence of Telemedicine Unreadiness age 65+ 2018](#)

[OTI: The Cost of Connectivity](#)

[Pew Research Internet Fact Sheet](#)

[Smart Speaker Ownership by Brand](#)

[Telehealth Competencies – Medical](#)

[The Future of Virtual Health \(2020\) – Deloitte](#)

[Top 5 Senior Living Technology Trends for 2020](#)

[Understanding the Technology Ecosystem for Senior Living & Care, Ziegler](#)

[University of Michigan Poll Loneliness and Social Isolation](#)

About Laurie M. Orlov

Laurie M. Orlov, a tech industry veteran, writer, speaker and elder care advocate, is the founder of **Aging and Health Technology Watch** -- market research, trends, blogs and reports that provide thought leadership, analysis and guidance about health and aging-related technologies and services that enable boomers and seniors to sustain and improve their quality of life. In her previous career, Laurie spent many years in the technology industry, including 9 years at analyst firm Forrester Research. She has spoken regularly and delivered keynote speeches at forums, industry consortia, conferences, and symposia, most recently on the business of technology for boomers and seniors. She advises large organizations as well as non-profits and entrepreneurs about trends and opportunities in the age-related technology market. Her segmentation of this emerging technology market and trends commentary have been presented in the Journal of Geriatric Care Management. Her perspectives have been quoted in Business Week, CNBC, Forbes, Kiplinger, NPR, the Wall Street Journal, and the New York Times, where she was profiled as well. She has a graduate certification in Geriatric Care Management from the University of Florida and a BA in Music from the University of Rochester. Advisory clients have included AARP, Argentum, Microsoft, Novartis, J&J, United Healthcare, CDW, Bose, Cox Communications, Yahoo, and Philips.. She has published research sponsored by the California HealthCare Foundation, Verizon, AARP, among others. Her latest reports include the [2020 Market Overview of Technology for Aging, Voice, Health and Wellbeing 2020](#), and [The Future of Voice First Technology and Older Adults \(2018\)](#). Laurie has been named one of the [Top 50 Influencers in Aging by Next Avenue](#) and one of the [Women leading global innovation on Age Tech 2020](#).

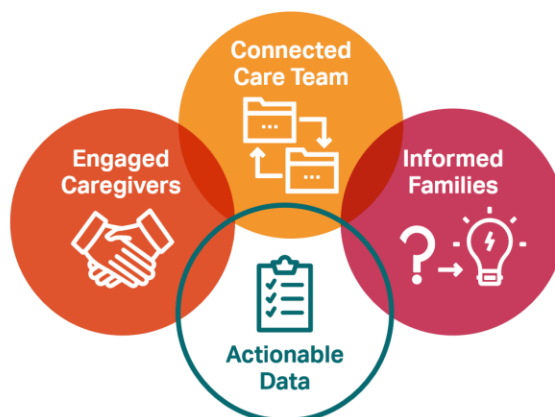
Interviewees for this report came from:

7Wire Ventures
AARP
Mark VanderWerf (formerly Banner Health)
Best Buy Health
BrioCare
CABHI
CarePredict
Caspar.ai
CDW Healthcare
Consumer Technology Association (CTA)
CTA Foundation
eCaring
Electronic Caregiver Group
Embodied Labs
GreatCall
Longevity Advisors, LLC
Home Instead
HouseWorks
Intuition Robotics
Jewish Senior Living Group
Honor
THINK-Health
American Telemedicine Association (ATA)
K4Connect
LifePod
MedSign
Microsoft
MobileHelp
PLC Advisors
PointClickCare
VitalTech

Appendix I

A Vision for Connected Care

When employed to its fullest, remote care technology improves every aspect of how care is delivered in the home. Imagine what's possible when every stakeholder wins. [Source: HouseWorks]



Engaged Caregivers

"I was nervous when I left my last shift—did anything change since yesterday?"



BEFORE

- Review paper logs *after* getting to home
- Multiple calls to the case manager to inquire about care plan changes
- *Piecing it all together*

AFTER

- View digital activity log *before* getting to home
- View required new tasks entered in the digital activity log real time
- *Prepared*



Connected Care Team

"The client is failing. We have to be totally on-top-of this case or she will go to the ER."



BEFORE

- Drive to client's home to pick up and review paper logs
- Check emails and voicemails; sift through scattered notes
- Make multiple calls
- *Reactive, slower response*

AFTER

- View electronic daily and weekly records. Notice trends.
- Download electronic dated and time stamped notes
- Reach out via mobile app communication portal
- *Real-time information, trends over time, fast response*



Informed Families

"I'm frustrated. My mom fell yesterday, I can't piece together what happened and my brother thinks she's fine."



BEFORE

- A different story from the parent, the Caregiver and the agency.
- Mom's getting worse, but my brother refuses to see it.
- Doctor visits are short. We catch up with little time to dive into what's REALLY important.
- *Decisions based on emotion, not fact*

AFTER

- One digital log that tracks everything
- Changes monitored in mobile app
- Doctor receives report ahead of visit that includes vitals, mood and changes in condition
- *Data driven, intentional decision-making*