Meaningful access
Investing in technology for aging well in New York City

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January 22, 2021

The COVID-19 pandemic has been uniquely tough on older adults. About 80 percent of deaths attributed to the disease have occurred among people ages 65 and above. While more than half of these deaths nationwide occurred in residents of long term care facilities, the subsequent precautions dramatically affected community-dwelling older adults. The governor's New York on Pause plan isolated most older New Yorkers at home, particularly those who live alone. With senior centers, libraries, restaurants, and other institutions that older adults depended on remaining closed or operating with restrictions, many older adults have had their lives severely curtailed. Even when restrictions loosened on businesses as infection and hospitalization rates declined in the summer, increased risk to older adults kept most senior centers and services closed and older adults at home even as younger people resumed many of their normal activities. With cases rising again at the end of 2020, the city's health commissioner reinstated a "stay at home" order for people over 65.

The pandemic has prompted New Yorkers to mediate many of their social and professional activities through technology, including telephone communication, text messaging, and virtual conferencing technology like Zoom. More fortunate New Yorkers with access to a broadband internet connection, devices suitable for virtual communication, and working knowledge on how to function online readily adapted their daily lives to the restrictions imposed by the pandemic. Older New Yorkers who lack these important resources and capacities have been left at greater likelihood of isolation and loneliness and face further challenges in meeting basic needs.

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The sudden shift to online life due to the pandemic has left behind the one out of three New Yorkers age 60 and above who do not have access to the internet at home. Older adults lag behind every other age group in internet access and adoption. For older adults who have lower incomes, live alone, have lower levels of formal education, and have limited proficiency in English, the digital divide is even wider. Importantly, access to an internet connection among older adults is more sharply divided along socioeconomic class lines than it is for younger people.

That said, the digital divide refers not just to having an internet connection at home, but to meaningful access to the internet. Meaningful access must include three elements. The first is access to a device with the necessary functionalities to meet a person's needs; for virtual communication this means a device with a functioning camera and microphone. The second is an internet connection with sufficient bandwidth for the tasks a person wants to do online. The third is having the skills that are necessary to use the internet to meet one's needs. All three elements must be present for access to the internet to be meaningful. While having a device connected to broadband confers access, this access is not meaningful without skills for *using* the internet. Likewise, having an outdated device or an internet connection that is too slow will limit access to important functionalities that are standard for modern internet use.

In addition, research shows that for older adults, understanding how the internet can be useful to them is a motivator for internet use. Younger people grew up with the internet and do not question its usefulness. But education and training about the uses of the internet as well as how to use it are both necessary to get more older adults online.

The pandemic has revealed the importance of being able to meet basic needs, communicate and socialize, and maintain health remotely. It also hit older adults the hardest, a group that, on average, has the least ability to meet their basic needs, connect with the outside world, and maintain an acceptable quality of life remotely. While internet access was once an optional functionality for older adults, it is now a key part of aging well.

Investing in getting older adults connected is critical to ensuring the health and safety to older New Yorkers. Unconnected older adults are in danger of being left behind by the hugely promising advances in the field of telehealth that could give them unprecedented access to health services. Older adults who depended on getting together in person with friends and family found themselves tragically isolated without internet access. This is especially true for homebound older adults and for those rendered effectively homebound by the pandemic due to fear of going out in public. And although New York's vaccine information and distribution system purports to put older adults near the front of the line, getting there requires a facility with technology that the oldest adults are least likely to have. This means that this system is likely to result in people with more resources pushing to the head of the line.

This paper draws on demographic analysis of older adults who lack access to the internet at home, a review of the research literature on how older adults use the internet, conversations with dozens of providers of services to older New Yorkers, and interviews with experts to paint a picture of who unconnected older adults are, outline how to invest in closing the digital divide for older New Yorkers, and detail why this is a critical and worthy investment.

Who are unconnected older New Yorkers?

Internet connectivity at home among older adults is lower, on average, than for every other age group. Fully 36 percent of New Yorkers with no internet connection at home are age 60 and above, though this age group is just 20 percent of the city's population. This translates to 474,000 older New Yorkers living in households without internet access. Within the older adult population there is a notable difference in usage between "younger" and "older" older adults. Half of New Yorkers age 80 and above lack access to the internet at home, while just a quarter of those age 60-79 do.[1]

In addition to Census data measuring *connectivity* at home, national surveys have measured internet *use* by age. The share of older people who use the internet has been steadily increasing, driven by younger cohorts, who were already using the internet, aging into the 60+ age category. Older adults are also adopting the internet at a faster rate than other age groups. A Pew survey on internet use among older adults nationwide showed that in the year 2000, just about one-fifth of older adults used the internet, while three-quarters do so today. Meanwhile, three-quarters of Americans ages 18-24 already used the internet in the year 2000, and today their use is nearly universal.[2]

While internet use will likely continue to increase among older New Yorkers, it is also likely to continue to lag among those who face significant challenges such as limited English proficiency and lower levels of formal education. Internet use is also subject to cohort effects, as people are more likely to have facility with the dominant technology in place when they were growing up. Occupation is also linked to probability of internet use, with a sharp divide between white- and blue-collar occupations. Internet use spread first among knowledge workers and later among production workers, resulting in differences in internet proficiency among workers in different professions that can persist into older age in this precise cohort.

Cohort effects are responsible for the overall lower level of internet access and use among older adults and the significant difference between "younger" and "older" older adults in terms of access and use. But there is also considerable variation among older adults of the same cohort. Besides age, the four major demographic characteristics associated with lacking an internet connection at home are lower levels of formal education, limited English proficiency (LEP), lower income, and living alone or only with a spouse rather than in a multigenerational household. All of these characteristics are linked to a person's socioeconomic position. For instance, knowledge workers are more likely than production workers to have higher levels of formal education, to speak English well, and to have earned more income, which predisposes them to having all three conditions for meaningful access to the internet.

Though race and ethnicity are often effective predictors of disparity, in this case, disparities in having a home internet connection are most associated with differences in education, income, and household composition. Older adults of different races but of similar levels of formal education are more similar to one another in terms of having a home internet connection.

Of the 474,000 older New Yorkers who are unconnected, 43 percent have less than a high school degree and an additional 35 percent have no more than a high school degree. Fully 85 percent of older adults with a bachelor's

degree or higher had an internet connection at home, compared to 57 percent of those with less than a high school degree.

Older adults who live alone or with just their spouse are less likely to have access to the internet at home, though this effect is much more pronounced for people with lower levels of formal education. Among older adults with a bachelor's degree or higher who live alone or with their spouse, 82 percent have access to the internet at home, compared with 91 percent of those with the same level of education who live in a multigenerational household. However, while just 36 percent of older adults with less than a high school degree who live alone have access to the internet at home, 80 percent of older adults of the same education level who live in multigenerational households do. The significantly higher average levels of access among older adults who live in multigenerational households is likely the result of the presence of younger internet users in their households.

Most New Yorkers with less than a high school degree also have limited proficiency in English; 62 percent of New Yorkers with less than a high school degree are LEP. Four out of five of these speak one of three languages: half are Spanish speakers, another 18 percent are Chinese-language speakers, and 11 percent speak Russian.

Education level is also closely related to income. Nationally, 87 percent of older adults age 65 and above with an annual income of $75,000 or more have broadband access at home, compared to just 27 percent of those earning less than $30,000.[3]

Implications for programs seeking to expand internet access to older adults

The demographic analysis above presents a snapshot of the general characteristics of unconnected older New Yorkers. This next section outlines how those characteristics affect meaningful access to the internet. These reasons form the basis for designing interventions that reach the most affected populations. Policies and investments intended to get more older adults online will not make a significant impact unless they are designed for the people who are most likely to be disconnected: older adults who are lower income, have lower levels of formal education, live alone or with a spouse, or have limited proficiency in English.

Age and cohort differences
The first set of considerations concern the cohort-level differences between "younger" and "older" older adults with respect to their motivation for and capacity to use the internet. The internet is ubiquitous in the United States today, so it is easy to forget that it only became widely accessible in 1989 with the invention of the World Wide Web. This makes the internet itself a Millennial. As a result, people older than 50 likely did not experience it until they were adults. And it was not until 2002 that the share of people in the United States who use the internet crossed the 50 percent mark. Most parts of the world did not reach that threshold until a decade later.[4] This strong cohort-level association with internet use means that current digital-native generations are likely to enter older age with high levels of internet use. These data point to greater adoption among future cohorts of older adults, as the last non-digital native cohort is now entering older age.

But even among the non-digital natives, there are significant differences by age: most people in their sixties have very different needs, lifestyles, and life experiences than people in their eighties, who are in fact a full generation older. For example, people in their sixties today are more likely to be employed, which means that they likely use the internet at least for work-related activities and are more likely to use those technology skills in their personal lives, as well. In contrast, people who are a generation older may have never had an opportunity to put the internet to use.

Another important age-related difference concerns the increasing prevalence with higher age of cognitive, visual, and physical limitations that make it more challenging to use the internet. Among adults in their sixties, just 5 percent report cognitive impairment and 4 percent report visual impairment, compared with 20 percent and 12 percent, respectively, for people in their eighties and 39 percent and 23 percent, respectively, among people in their nineties. People with cognitive and visual impairments face greater barriers to internet access and would require more adaptations.

Immigrants
Interventions that seek to increase internet connectivity among immigrants must address issues of cultural and linguistic diversity. Two out of three older immigrants in New York City have limited proficiency in English, with considerable variations by country or region of origin. Linguistic barriers can make it difficult to access relevant information online.

Helping older immigrants cross the linguistic barrier is a task that is particularly suited for connector institutions that have relevant linguistic ability and cultural knowledge and that have the trust of their communities. Depending on the community these connector institutions can include local community-based organizations, religious organizations, and public libraries. Many older adults who live with children who are in the public schools may also be reached through programs aimed at connecting children and their families to the internet.

Connectivity among LEP older adults may be further limited by the high prevalence of low literacy in this population. People who have low literacy levels in any language may need to be reached through more specialized programs that are designed for people with little history of traditional schooling.

Income
At the most basic level, low income is a significant barrier to being able to afford smartphones, computers, tablets, or other devices as well as the monthly fee for an internet connection. The United Nations Broadband Commission has adopted a "1 for 2" standard for affordability of broadband connection, which stipulates that 1 GB of broadband should cost no more than 2 percent of a person's average monthly income.[5] This level of broadband is considered basic by international standards. In the United States, the average monthly bill for basic internet service runs to $60, which is about 2 percent of income for a household earning $40,000.[6] This is unaffordable to the vast majority of older adults who are unconnected; 69 percent of unconnected older adults live in households with an income of $40,000 or less.[7]

The main program available to help lower-income people afford to connect to the internet is the Federal Communications Commission's (FCC) Lifeline program, popularly known for the "Obama phone." Lifeline provides a Wi-Fi-enabled device and a subsidy of up to $9.25 per month for qualifying participants earning up to

130 percent of the federal poverty level or who participate in certain federal assistance programs, such as the Supplemental Nutrition Assistance Program (SNAP), Medicaid, Federal Public Housing Assistance, Supplemental Security Income (SSI), the Veterans and Survivors Pension Benefit, or certain Tribal Programs.[8]

However, these low-cost programs provide limited bandwidth and have monthly data use limitations, making them of limited use for older adults looking to connect to online activities. In fact, the plans available to lower-income customers though Lifeline provide only half the capacity needed for common uses today, such as streaming movies and virtual conferencing. Minimum internet speed guidelines that the FCC requires internet service providers to meet are currently set at 20 mbps download/3 mbps upload for broadband and just 3G for mobile connections, while standard internet connections suitable for such activities run at around 50/5 for broadband and 4G for mobile.

"Many of our clients have 'Obama phones' and therefore have very limited internet," says Masiel Veras, director of the neighborhood-based Naturally Occurring Retirement Community (NNORC) program at Isabella Geriatric Center. "A lot of my clients who have the updated version of the 'Obama phone' are able to have WhatsApp but use their data on that and therefore are reluctant to go on Zoom for fear of using up their data."

"The data allowance on these plans is laughable," says Alex Glazebrook, director of operations at Older Adult Technology Services (OATS), a nonprofit that provides technology training and assistance to older adults and senior centers. "Monthly data limits through Lifeline are enough to stream maybe a movie and a half a month." He added that the data limitations are only enough for four to five hours of Zoom a month, depending on video quality.

These restrictions mean that Lifeline customers only have access to poor quality internet service. Glazebrook warns that in addition to being insufficient, poor internet access can also turn older adults off from using the internet at all. "If people have a bad experience [with the internet], like a movie buffering endlessly or the Zoom cutting out, that can really be a deterrent," he says. "That's a factor that most people don't consider, but that we encounter all the time when working with older adults."

Moreover, the subsidy does not each everyone who needs it. Based on the income guidelines alone, the Lifeline subsidy is available only to individuals earning $17,226 or less, meaning that fewer than half of older New Yorkers living in households earning less than $40,000 can qualify.[9] The exceptions are higher-income residents of public housing and veterans participating in pension programs. Yet even accounting for the approximately 81,000 older adults living in New York City Housing Authority (NYCHA) developments and the 11,000 who receive veterans' pension benefits, there is still a need for financial assistance for thousands of unconnected older New Yorkers who cannot afford internet service and do not qualify for subsidies.[10]

Household composition
Older adults living alone or with a spouse are less likely to have someone readily at hand who can help them connect to and use the internet, a key facilitating condition for adoption. This is evident in the large gap between the connectivity rates of older adults who live alone or with a spouse and those who live with other family members. This is especially true for people with lower levels of formal education who may not have the

skills to independently find the information they need to get connected to the internet or to understand how to use it effectively.

As is the case with unconnected older immigrants, community-based institutions like senior centers, public libraries, and religious organizations could assist older adults who do not have someone at home to help them connect.

COVID may have pushed more older adults to connect online

Anecdotal evidence from media articles and other conversations indicates that the social isolation precipitated by the COVID-19 pandemic has prompted more older adults to become internet users. While national data on this are not yet available, a survey of technology use among providers conducted in May 2020 by the New York City Department for the Aging (DFTA) demonstrated a significant increase in participation in online activities among people connected to the city's extensive network of senior centers.[11] The department's survey revealed that 55 percent of senior centers were providing virtual activities, up from just 18 percent before the pandemic.

The older adult services network's first major push into remote service began with telephone reassurance calls. These began as a grassroots effort in several organizations and soon thereafter were adopted as an official mandate from DFTA. Nearly all senior center staff members—including kitchen staff—made calls to center members to inquire about their health, mood, and needs and to inform them about remote activities. By May 2020, 90 percent of senior centers were doing telephone reassurance calls. Also, 63 percent of senior centers were sending their members reassurance emails.

These calls were a major distribution channel for information about virtual programming. Among older adults who participated in virtual programming, 85 percent heard about it through telephone calls and the rest through word of mouth.

Senior centers provided a range of remote activities through various media. Three out of every four offered phone-based programming, while 62 percent offered virtual programming through Zoom. A quarter offered exercise classes, 16 percent offered nutrition programming, and a quarter held socialization events like virtual lunches, birthday parties, and other social activities.

DFTA's Geriatric Mental Health Initiative has also successfully transitioned to remote service. A project of ThriveNYC, the program places therapists in senior centers two days a week to see clients. The program is currently available in 20 percent of the city's senior centers. Currently 52 percent of participants are receiving virtual therapy sessions, compared to 20 percent at the beginning of the pandemic. The rest are receiving mental health services over the telephone.[12] Tobi Abramson, the director of geriatric mental health at DFTA, says that being able to access therapy remotely has resulted in fewer missed appointments.

Senior centers serve a population that is older and poorer, on average, than the general population of older New Yorkers. Three out of four providers who responded to DFTA's survey said that lack of devices or internet access was a barrier for three out of four of their members. Providers said that many of their members told them that even if they had the devices, they wouldn't know how to use them.

In Brookdale's conversations with senior center directors, we found that offering tech support to senior center members has been a major challenge. Centers that had computers available for members' use once depended on interns to help older adults get online in person. But this has been difficult to do remotely. One senior center started a tech drop-off service where members can drop off their devices and have a staff person download needed software or adjust settings, sanitize the device, and return it to the member.

Senior center directors found wide variability in their members' facility with technology; while some struggle with basic tasks, others are adept at internet research and virtual communication. This variability in skills could open the door to peer-to-peer learning among senior center members. "I'm thinking that seniors can help seniors get comfortable with technology," says Irene Friedland, a social worker with Project FIND. "We have both extremes: very active zoom users, including teachers, and folks who are afraid to do anything new with their smartphones." Peter Swanson, the director of the adult day care program at Riverdale Senior Services, points out that because older adults have such different skill sets and needs, help should be tailored to individual needs. "Supporting people with technology is an individual thing tailored to their unique situation," he says. "It often doesn't translate well to a group setting when people have different devices and familiarity."

The difficulties with technology are not limited to the members. Fully one-third of centers that responded to DFTA's survey said their staff did not have smartphones or computers that were adequate for running virtual events, and a quarter said that their staff need tech training. Many center directors say that this was also the case for equipment located at the centers. "Senior centers are so technologically behind," says Sharon Asherman, director of the senior center program at the Riverdale Y. "We are ten years behind other institutions."

As with older adults themselves, senior centers across the city have had different experiences with transitioning to remote service. While some centers struggle with getting the right equipment and having staff trained on virtual communication, others have been able to find new opportunities during the pandemic. Marcie Gitlin, director of the Center for Adults Living Well at the Y of Washington Heights, mentioned that through hosting virtual activities they have been able to bring in more instructors to lead virtual classes and attract new members who may not have been comfortable going to a senior center previously.

Dances for a Variable Population (DVP), an organization that provides free movement classes designed for people of all ages and physical abilities, had no remote offerings before March 2020 and moved all of its classes to virtual or telephone. Following this transition, the number of participants has increased, with most of the increase due to people joining by telephone. DVP has found that over time, more of their telephone-only clients switched to virtual. DVP even hired one of their teaching artists to provide tech support for the organization and their participants. DVP director Naomi Goldberg Haas said that having this tech support made a big difference in terms of adapting the organization's programs to virtual and telephonic platforms and helping older adults adjust to the new formats.

DOROT, an organization that runs programs for older adults, has long had a combination of in-person, online, and telephonic activities. Participation in their popular University Without Walls program has doubled and they now serving 600 older adults through the program. The organization has also doubled the number of online programs they offer. Their Caring Calls telephone reassurance program offers wellness calls with links to social services that have resulted in 600 people being connected to services remotely. This is despite the fact that the organization's members are significantly older than average: 57 percent are over 80, including a quarter who are in their nineties.[13]

Organizations that already had robust online offerings before the pandemic saw big increases in participation. For instance, Older Adult Technology Services (OATS), an organization that provides technology training and support for older adults and specializes in virtual activities, is currently serving 50,000 older adults with online activities, a fivefold increase from last year. Self Help Community Services, which has been running its Virtual Senior Center program since 2005, has seen their participation increase from 300 participants monthly before COVID to more than 1,000.

Most senior center directors we spoke to agreed that getting older adults who are unfamiliar with technology to take up virtual activities took a lot of hand-holding at first, but the effort to teach their members the new technology was worthwhile for them. "Once they understand how to use the internet, they love it!" says Naomi Goldberg Haas, the director of DVP. "Not as much as in-person classes, but well enough. Seeing people over the screen reduces isolation. It's been so important to see people and say hello."

Many of the senior center staff and directors we interviewed agreed that once the pandemic is over, the "new normal" of services for older adults will be a combination of in-person and remote. This will require that senior centers have the right tech support to both train staff and help older adults. Having a tech support person on staff has proven valuable for DVP and other organizations, while others have relied on external support like that provided by OATS. "The aging network is suffering the digital divide as much as our clients are," says Marianne Nicolosi, executive director of the Bay Ridge Center. "We may need to rely heavily on OATS for now, but we'll need to have something local for our seniors."

The hybrid in-person and remote service model of the senior center of the future will also require DFTA to rethink the way it measures volume and effectiveness of services. The agency's pre-pandemic evaluation model counted only activities and services rendered within the walls of senior centers by counting the number of meals provided or the number of people who participated in exercise classes. Remote programming and a greater online presence can potentially increase the number of people who are effectively served by individual centers, but their impact outside their walls will be harder to measure with current metrics.

This may be a good time for DFTA to shift its performance measurement system from focusing on services provided by individual centers to setting system-wide goals. This could reduce competition and increase cooperation among senior centers as well as reduce the pressure to claim "credit" for services that may be better rendered through partnerships with other community-based organizations. System-wide support should also aim to reduce disparities among senior centers, especially those that may be left further behind by a push toward more activities and services mediated through the internet.

Models explaining internet adoption among older adults

The pandemic has highlighted the importance of being able to connect with others and find information remotely. Before COVID, many older adults were able to access community and information through senior centers, public libraries, and other forms of in-person interaction, perhaps supplemented with telephone calls. But while virtual communication is an imperfect substitute for in-person interactions, it has been an important link for those with meaningful access to the internet. "The digital divide is getting bigger," says Lorraine Voytek, director of the technology program at DOROT. "Before, people who did not use technology could at least come in person to the center. Now, those people are lost."

With older adults being the single largest population with a large share of people who lack meaningful access to the internet, it is important to understand how older adults adopt technology and the barriers they face in doing so.

National surveys indicate that many older adults don't even try to use the internet. The Pew Research Center found that 35 percent of people who are not online say that the internet is not relevant to their lives; they are not interested, do not want to use it, or have no need for it. Another 32 percent say they don't know how to use the internet.[14]

Notably, evidence from the same survey shows that having someone at home who can both demonstrate the uses of the internet and provide tech support may provide the support some older adults may need to get online. Just 23 percent of respondents who said they did not use the internet lived in a household where someone else uses it.[15]

These survey results, along with the experiences we have collected of senior centers that have been running virtual and telephonic programs during the pandemic, support the findings of a growing body of academic research that show that older adults have distinct motivations, barriers, and expectations around internet use compared with younger people. Insights from this body of work and from the experience of older adult services providers on the ground point to the need to craft internet access strategies that meet the particular needs of older adults. Internet adoption messaging and interventions designed without regard to age are not likely to make many inroads among older adults.

Three models from our review of internet adoption literature in the field of information systems stand out for identifying a set of attitudes, influences, and beliefs that help explain a person's propensity to adopt the internet.[16]

The first stipulates that a person's propensity for adopting the internet depends on three factors: the degree of confidence a person has in their ability to navigate the digital world, how difficult they perceive using the internet to be, and the degree to which their peers encourage them to use the internet. These factors shape a person's intention to become an internet user. Given facilitating conditions such an internet connection, a device, and someone to help them learn how to use the internet, a person may make the leap toward becoming

an internet user. But importantly, the presence of facilitating conditions alone will not make someone an internet user if they do not have the intention to make the leap. Similarly, intentions without facilitating conditions will also prevent someone from using the internet.

A second model frames a person's intention to become an internet user as a set of beliefs. One set of beliefs are attitudinal and revolve around the perceived utility of the internet for practical matters, recreation, and as a status symbol among their peers. A second set of beliefs are normative and focus on whether they feel that they have support from friends, family, or others if they run into trouble when using the internet. The final set consists of control beliefs that include general beliefs about advances in technology, real or perceived monetary cost of being an internet user, perceived difficulty of using the internet, and self-confidence in navigating a new skill.

Building on these models, the Center for Research and Education on Aging and Technology Enhancement (CREATE), a university research consortium, developed a model that also incorporates elements that are generally more specific to older adults, such as psychomotor, cognitive, and perceptual skills.[17]

These insights from research highlight that of the three elements of meaningful access to the internet—access to suitable devices, a strong internet connection, and the right training and support—the last leg requires programming and interventions that are specifically adapted to the needs of older adults. The following section will discuss how this adaptation can be done.

How older adults use the internet

The models above demonstrate that perceived utility, peer support, and confidence are the main determinants of whether an older adult is likely to adopt the internet, given basic facilitating conditions like a proper device and internet connection. Yet a person's age, level of education, income, and language ability heavily influence whether and how they find the internet to be a useful tool, whether they think of themselves as being capable of using the internet, and whether they have internet users in their social circles who may serve as peer supports.

In terms of age, research on technology adoption shows that older people are more likely to adopt the internet if they perceive its usefulness for improving their quality of life.[18] Importantly, perceived usefulness is a stronger predictor of adoption among older people than it is among younger people. For older adults, perceiving the internet as a useful tool is an even greater predictor of adoption than perceived ease of use; older adults will put in the effort to learn how to use the internet if there is enough of a motivating factor.[19]

Motivating factors for using the internet can include readily accessing information, goods, and services, as well as communicating with others. However, the extent to which any one use for the internet is a motivating factor for adoption is likely to differ greatly for people of different demographic backgrounds. For instance, people with the financial means to travel often may find it convenient to learn how to buy airplane tickets online, but those who rarely travel may be satisfied with occasionally using the services of a travel agency. Online banking may appeal to people who own various types of financial accounts and have investments to manage, but people

with a basic checking account may prefer to do their banking in person. Likewise, the appeal of social media as a tool for connecting with people from all over the world may be greater for some than others.

The primacy of utility among motivators of internet adoption by older adults indicates that promoting adoption begins with identifying a potential user's needs and demonstrating how the internet can be useful in helping that individual meet those needs. Among the plethora of potential uses for the internet, there are three that are likely to fall into the category of needs essential to maintaining or increasing quality of life: meeting basic needs, maintaining health, and social interaction. The COVID-19 pandemic has created a clear need to have the ability to get these needs met remotely, and many older adults have been especially isolated because they do not have the resources and ability to have their needs met online.

One example of how the internet can help an older adult meet basic needs is by allowing them to order and get groceries, prescriptions, and other needed goods and services delivered. New Yorkers with the means to get things delivered to their homes could minimize interactions with others during the pandemic. Marketing research has shown that online shopping is an activity that internet users of all ages are likely to engage in.[20]

However, online shopping is generally available to people only if they have a credit card or a debit card connected to a bank account. Like internet access, lacking a bank account is most closely associated with low income and low levels of formal education. More than one in four people with less than a high school degree in the New York metropolitan area are unbanked, as are one in five people who earn less than $15,000 per year.[21]

People without bank accounts have more limited online shopping options. SNAP eligibility provides the most options, since in New York State, most major grocery store chains and online grocers such as Amazon and FreshDirect accept Electronic Benefits Transfer (EBT) cards as a payment method. However, EBT customers are limited as to the kinds of items they can purchase, per USDA guidelines. Some, like FreshDirect, impose a minimum order amount, which may be a barrier for people who have a low balance on their EBT card. Gift cards are another payment option available to unbanked older adults, but spending is limited by the amount loaded on the gift card.

Because of these limitations, many older adults who did not have access to the internet during the pandemic or the means to shop for groceries online depended on the assistance of mutual aid groups and neighbors who delivered groceries to them, as well as grocery stores that accept both phone orders and payment on delivery.

For the more than 450,000 older New Yorkers who are employed, technology skills interventions could also help them get the skills they need to stay employed. Such programs could create a supportive environment to expand older adults' capacity to function in the workplace and allow entrepreneurs to use the internet to expand their businesses.

Telehealth shows great promise to help older adults maintain access to health care services

The most rapidly growing use of the internet is helping older adults connect to medical providers. Critically, new developments in telehealth indicate its potential to help older adults manage chronic conditions like diabetes, arthritis, and hypertension, seek preventative care, and avoid disruptive emergency department visits. But of course, these benefits are only available to people who have meaningful access to the internet.

Telehealth expanded tremendously during the COVID-19 pandemic. Telemedicine visits went from constituting an almost negligible 0.1 percent of medical visits nationwide in January 2020 to a peak of about 14 percent of all visits in April 2020, before leveling off at about 8 percent of visits by the end of the year.[22] Here in New York City, the public hospital system run by the Health and Hospitals Corporation (HHC) reports that the number of billable virtual visits increased from 500 in January 2020 to almost 57,000 in the first three weeks of the pandemic and 235,000 by June 2020.[23] Telemedicine penetration was greatest for mental health providers; 44 percent of all mental health visits nationwide were remote.[24]

This greatly expanded access was made possible by a set of provisions through the two federal coronavirus relief bills in March 2020 and a series of waivers that loosened regulations on who can get telehealth and how, as well as requiring insurance providers to cover telehealth visits. The Coronavirus Preparedness and Response Supplemental Appropriations Act passed by Congress on March 6, 2020, included a waiver removing restrictions on Medicare providers, allowing them to offer telehealth services to beneficiaries regardless of whether the beneficiary is in a rural community. A few days later, the president's emergency declaration under the Stafford Act prompted the Center for Medicaid and Medicare Services (CMS) to expand the telemedicine waiver to allow Medicare beneficiaries to receive telehealth services in any healthcare facility as well as from their homes. Later that month, the second coronavirus relief bill passed by Congress, the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) encouraged the use of telehealth for home health services. CMS also amended its previous waiver to pay providers at the same rate as in-person visits as opposed to the lower rates authorized by the previous waiver.

Government action to expand access has in turn attracted the attention of private investors. Venture capital firms invested more than $10 billion in telehealth startups in 2020, up from $6 billion in 2019.[25] McKinsey analysts estimate that telehealth could capture $250 billion in health spending, up from $3 billion before the pandemic.[26] Startups and health management companies are scrambling to create app-based platforms for communicating with medical providers, technologies for diagnosing certain medical conditions remotely, and other advances.

Aware of the potential of the telehealth field, policymakers are increasingly recognizing that key regulatory changes enacted during the pandemic to lower restrictions on telehealth should be extended past the end of the public health emergency. Notably, Governor Cuomo's Reimagining New York Commission has made expanding and improving telehealth delivery one of three main policy areas of focus along with enabling internet connectivity and equipping the state's workforce for a digital economy. In Massachusetts, a new law requires insurance companies to cover behavioral telehealth visits under the same conditions as in-person visits.[27]

Of special importance to older adults is telehealth's potential to expand access to preventative care and help manage chronic conditions. NYC Health + Hospitals implemented a texting-based post-discharge symptom monitoring program for patients to self-report symptoms. Certain results would trigger a physician callback, providing more consistently intensive monitoring.[28] Startups are developing new systems to provide asynchronous monitoring of biometric data that can, for example, alert providers to abnormalities in blood glucose levels in their diabetic patients.[29]

Advances in telehealth are a potential game changer for the ability of lower-income people to manage their chronic conditions. Chronic conditions such as obesity, diabetes, and others are more prevalent among lower-income older adults than those with higher incomes. Lower-income people also more likely to suffer greater disability due to poor management of these conditions. Care can be derailed by a lack of a consistent provider, inability to afford needed prescriptions, poor health literacy, inability to get to multiple locations, and many other systemic barriers.

Dr. Gwendolyn Lewis, the chief nursing officer and senior vice president of patient care services at Interfaith Medical Center—a safety net hospital that serves a primarily low-income population—says that gentrification in the Crown Heights and Bedford-Stuyvesant neighborhoods of Brooklyn has displaced many of the hospital's lower-income older patients to neighborhoods far from their medical services providers. "Many of our patients who were displaced are now coming from Staten Island, Queens, Far Rockaway," she says. "One comes from Wappingers Falls, NY. They're living far from their provider, but they're in double jeopardy because they don't have the devices to connect through telemedicine." While some patients go to great lengths to stay connected to care, many others cannot.

Importantly, telemedicine shows promise to reduce emergency room utilization for routine medical needs, which is especially prevalent among lower-income, immigrant, and other uninsured or underinsured patients. One provider found that 14 percent of their telemedicine patients would have sought care at an emergency department if they had not had access to telehealth services.[30] A pilot study in San Diego launched during the pandemic is exploring how telehealth-enabled health monitoring could reduce transfers of nursing home patients to emergency departments.[31]

Despite the potential of telehealth for disadvantaged older adults, many people do not have the skills, equipment, and connectivity to access it. The first problem is that many older adults are not comfortable with the idea of receiving medical services remotely. A recent Harris poll showed that telemedicine is more popular with younger patients. Overall, 65 percent responded that they plan to continue using telemedicine after the pandemic ends. But while half of 35-49-year-olds said they would like to use a combination of in-person visits and telehealth for their medical services, fully two out of every three older adults said that they prefer in-person services. Yet the poll also revealed a hopeful indication: 62 percent of people over 65 say they wanted to use telehealth to ask medical questions.[32]

Sensory and cognitive impairments that correlate with age are also a barrier. One study published in *JAMA* defined people who are "unready" to receive telemedicine services as including those whose hearing or speech impairments make it difficult to use the telephone and those whose vision and other impairments make it difficult to participate in a virtual visit.[33]

Of course, people who lack meaningful access to the internet, including having a connection at home, having devices suitable for virtual communication, and the skills to get online cannot realize the potential benefits of telemedicine. As stated above, those lacking meaningful access to the internet are also the people who have suffered the most from lack of access to care, including people who have lower incomes, less formal education, and low levels of proficiency in English. Without targeted initiatives to expand meaningful access, these populations will be left out of the telemedicine revolution and are likely to continue seeking care in the emergency department and walk-in clinics, as they always have.

One notable community-based effort to expand access to telehealth is happening in Texas. The public library in Pottsboro, Texas, is setting up private, soundproof telemedicine rooms equipped with computers with virtual conferencing capabilities and will soon be adding basic medical equipment like scales and blood pressure cuffs.[34] This effort was made possible by a partnership with the University of Texas medical school and supported through a grant from the National Institutes of Health.[35]

Some providers around the country have also taken a hands-on approach to helping older adults learn how to use telemedicine. One such company based in Boston mails tablets pre-loaded with telehealth communications software to patients who don't have them and coaches them on how to operate it. For patients for whom remote coaching is not enough, they send drivers wearing personal protective equipment to turn on video conferencing for the patient, and then come by later to pick up and sanitize the tablets. Other companies give patients the option to do a "practice visit" with a staff person in advance of their appointment with their doctor. This gives people with access to devices but limited skills the opportunity to be ready for their appointments.

But these high-touch interventions are likely to be too expensive for the public hospitals and other less resourced medical centers that serve lower-income patients. Brooklyn's Interfaith Medical Center was able to secure a grant from the New York Community Trust to send biometric equipment kits to their older patients who are managing two or more chronic conditions. "We send them a pulse oximeter, a glucometer, a scale, and other equipment," says Benjamín Gonzalez, the hospital's associate director of grants management. "But we're strapped for cash. Grants have allowed us to create care partnerships, get more licenses for [telehealth software], and buy tablets for patients and providers. We didn't have the money and staff capacity before [the pandemic], so we couldn't do telemedicine. It's gone from zero to almost all patients being connected at least by telephone."

RECOMMENDATIONS: Getting older adults connected

The COVID-19 pandemic has made the importance of internet access clearer than ever. For many older adults, having access to the internet has been a lifeline that allowed them to seek company, decrease their social isolation, and access needed goods and services during lockdown. But unconnected older adults, especially many of New York's most disadvantaged, struggled to meet basic needs due to their lack of connectivity. This means that public and private investments in technology adoption by older adults is a critical part of protecting the health and safety of New York City's 1.7 million older adults, including the 474,000 who lack internet access at home.

Adopting the internet requires surmounting a gantlet of barriers, including acquiring devices, paying for an internet connection, and getting the skills and supports needed to get online. Huge disparities by income, English proficiency, and level of formal education indicate that more-advantaged people are more likely to have the resources to surmount those barriers.

Beyond affordability, emotional and skills-based barriers are equally formidable. Here, the research on factors that motivate people to adopt a particular technology demonstrates that for older adults, perceiving how a technology may be *useful* to their lives is a more important precondition for adoption than it is for younger people. It also shows that facilitating conditions such as access to an internet connection and a device and support for learning how to use the internet are critical to adoption.

This indicates that programs that seek to increase tech adoption among older adults must be tailored to their needs. The goal of such programs should not be to try to get older adults to use the internet just like young people. It should be to help them understand how technology can help them to meet their needs and improve their quality of life.

Boosting technology adoption among older New Yorkers will require two main types of investments. The first is in targeted programs and provision of devices for getting older adults connected, taking into account the specific challenges they face. The second is in ensuring that essential resources such as medical providers, food distribution centers, senior centers, and disaster communications infrastructure have the capacity to communicate with older adults by any means. This could include telephone, mass media, or other forms of communication.

Build a citywide infrastructure to expand internet adoption and use among older New Yorkers
The COVID-19 pandemic prompted many people to adjust to an online life to an unprecedented degree. For people coming into the pandemic with few tech skills or without someone in their lives to offer tech support, the adjustment to remote life was much more difficult. Many never adjusted at all. Fully 73 percent of adults age 65 and above say they need help using electronic devices, a much higher share than younger cohorts.[36] Research indicates that the leading predictors of technology adoption by older adults are the perceived utility of a technology and the presence of ongoing tech support. Besides affordability, lack of confidence and lack of peer

support are major barriers to adoption. Personal characteristics like age cohort, physical and cognitive abilities, level of formal education, and literacy level intersect with these barriers in important ways.

Programs that look to expand internet adoption among older adults must be tailored to individual needs and take into account the limitations specific to older adults. Importantly, they must create a supportive, tech-positive environment for older adults to encourage adoption and use. Building confidence and supplying support are just as important to adoption as teaching technical skills. These programs should be run by community-based institutions that already have the trust of older adults. This is because older adults may not always seek out services to help them get connected but may take the opportunity to learn if presented with the opportunity at an organization they already trust.

- Fund senior centers, public libraries, public schools, religious institutions, and other community-based programs that have the trust of local communities to develop or bring in programs to help older members of their communities get the skills and support they need to become internet users.
- Expand or develop programs around identifying the needs and interests of older adults first, then teach them the skills they need to get those needs met online.
- Identify, organize, train, and cultivate a corps of older peer leaders with tech knowledge to help older adults in their communities navigate the internet, based in existing community organizations.
- Create tech support hotlines to serve all New Yorkers with federal COVID relief funds or FCC funds to support connectivity. These should be run by nonprofit organizations. Several should target populations who are least likely to have tech experience, including older adults, people with limited proficiency in English, and lower-income New Yorkers.

Invest in technology upgrades, training, and tech support for organizations that touch the lives of older adults
Many organizations, including museums, libraries, religious institutions, and other community-based organizations, play key roles in the lives of many older New Yorkers. Yet our conversations with providers in New York's aging services network revealed, in particular, that few organizations had well-developed remote capacity at the time the pandemic struck. Until the pandemic, organizations that touched the lives of older adults focused on how older adults could physically get to their locations. The pandemic showed the importance of creating on-ramps for remote access to their programs and services, as well. Some organizations, like the Queens and Brooklyn public libraries, have been doing this for a long time through their mail-a-book programs.

Closing disparities among providers of services to older adults will require capacity building across the aging services network. Meanwhile, organizations outside the aging services network should consider what it would take to provide accessible resources to older adults. Moreover, since universal adoption of the internet is unlikely to be achieved in the short term due to multiple barriers, organizations that touch the lives of older adults should not neglect to develop programming designed especially for more accessible technologies such as the telephone and text messaging in addition to developing virtual programming. People with sensory or cognitive impairments, in particular, may not gain the ability to use the internet effectively to meet their needs, or may lose the ability to do so.

- Social service organizations and other organizations running public programs, like libraries and museums, should build ongoing technical support into every program that has an online presence to create an on-ramp for older adults with less confidence in navigating the internet.

- Train program staff on various device operating systems and platforms so they can be a tech resource to their participants.
- Foundations and public agencies should fund the social service and public programs they support to have a technology lead whose responsibility is to help program directors facilitate technology access and capacity and to set performance standards.
- Adapt programs for multiple connection modalities for people with different abilities and levels of technology skills, including visual, textual, and telephonic.
- Ensure that the Chief Technology Officer's NYC Digital Safety program effectively reaches older adults. NYC Digital Safety is an initiative of the CTO's office to train public library staff to answer patron questions about online privacy and security. This training should include sensitivity training on how to work with older adults and others with less knowledge about technology.

Support older adults' access to telehealth services

One enduring benefit of the pandemic is the enhanced investment, reimbursement, and regulatory permission for telehealth. Further attention is required to be sure older adults—among the populations who could benefit most—are included in the innovation. Recommendations to this end include:

- The U.S. Dept. of Health and Human Services and its state counterparts should ensure maximum access to telehealth services by maintaining the regulatory reforms introduced by the coronavirus relief bills.
- Pass the federal Telehealth Modernization Act as introduced in November 2020, which would expand coverage of telehealth services under Medicare by automatically allowing all Medicare providers to provide services through telehealth and removing restrictions and limitations on types of services that beneficiaries could receive through telehealth.
- Conduct rapid, targeted information-gathering on specific barriers for telehealth for disadvantaged older adults and programmatic and policy options to address these barriers.
- Support the capacity of NYC Health + Hospitals and other financially distressed New York hospitals to help their lower-income older patients access telemedicine by investing federal, state, and local funds. These hospitals serve some of the most vulnerable older adults in the city, making it crucial that they have the capacity not just to provide telemedicine services, but to assist patients who face barriers to telehealth use.
- Maintain or create alternate telephone-based telehealth services to serve unconnected older adults.
- Train home health aides in how to help their clients use telehealth. The training should not just show them how to use the technology, but should also train them in a client-centered, patient approach that takes into account the clients' interests and their physical or cognitive limitations.
- Invest in programs to get telehealth equipment to highest-risk patients. This can range from biometric equipment designed for patient use to tablets and internet connections for those who can use them.
- Ensure language access for LEP patients seeking telehealth service. A sizable portion of unconnected older adults have limited proficiency in English. Providers report that internet-based telehealth software does not have translation services or that they are limited.

Establish a public-private fund to boost tech support for older adults and organizations that engage them

The COVID-19 pandemic prompted providers of services to older adults to transition their in-person services to remote services and to help their participants make that transition. Providers should be incentivized and supported in building on that experience to create virtual, telephonic, and other programming and resources that older New Yorkers can access remotely.

- Create a public-private fund—with standards, requirements, and technical assistance for smaller programs—to fund public-facing programs to help them expand their online offerings as well as help older adults connect to online offerings.
- A group of foundations should establish a competitive grant program to providers of services to older adults, cultural institutions, and others to create virtual and telephonic programming that targets older adults. This can be new programming or remote versions of their existing in-person programming.
- The grant would pair organizations with consultants with knowledge of the tech needs of older adults to help them make and execute a plan, including making a budget and staffing plan and a list of needed equipment and setting up data collection on outcomes.
- The grant would also provide start-up money for providers to help with the planning phase.
- The application should prompt organizations to identify their strongest programming and their most significant impacts on their communities. The funds should be flexible enough to cover any costs related to their plan, including purchasing equipment, training staff on technology, and paying for an internet connection.
- Separate grants should be made available to evaluators to analyze program data and assess their effectiveness periodically so as to generate recommendations for improvement at the end of each grant cycle.

Bring down the cost of purchasing internet-enabled devices and expand public distribution programs

The cost of purchasing smartphones, laptops, and tablets with the capacity to meet current minimum standards—and replacing them when they become obsolete after a few years—is a major deterrent to internet use and adoption for all but the financially comfortable. In early summer 2020, a promising partnership comprising the NYC Office of the Chief Technology Officer, T-Mobile, and OATS has made 10,000 tablets available to older public housing residents along with tech support from OATS. In the fall, Mayor Bill de Blasio promised to provide 17,000 more devices, but this has not occurred.

- Provide incentives to companies to create low-cost, internet-enabled devices that are easy to use.
- Provide incentives for companies to establish low-cost device leasing programs.
- Establish a nonprofit device leasing program that can purchase devices in bulk at a discount and lease them to lower-income people for a low monthly rate. Lease money should be invested in updated devices. Seed money can come from social impact bonds or community development block grants. This program could also function as an economic development stimulus and, when combined with tech training and support, a jobs creator.

Bring down the cost of connecting to the internet

A basic internet service package costs $60 per month in New York City, on average, making it unaffordable for households earning less than $40,000 a year. Fully 69 percent of unconnected older adults earn less than that amount. The federal Lifeline program provides subsidies for people who earn less than $18,000 a year or participate in certain federal benefits programs, which still leaves thousands of older adults who do not qualify for the program but still cannot afford internet in their homes. Moreover, plans designed for Lifeline customers limit monthly data use, making them impractical for people who want to use them to participate in remote educational or social programs.

- Raise the income limits on the federal Lifeline program.
- Double the minimum service standards for the Lifeline program to 50 mbps download and 5 mbps upload for broadband and 4G for mobile in order to meet current use standards, and adjust the standards annually based on current use needs.
- The NYC Office of the Chief Technology Officer should negotiate with internet service providers for unlimited data plans for Lifeline customers.
- Establish a state or city Lifeline program at higher minimum service standards for people earning up to 250 percent of the federal poverty line.
- Alternatively, the city or state could negotiate with internet service providers to create less expensive service plans, as outlined by Governor Cuomo in his 2021 State of the State address. But as stated above, such programs should also be available to people earning up to 250 percent of the federal poverty line, be subject to the 50/5 or 4G minimum standards, and be revised annually based on current use needs.

Combat ageism and empower older adults as technology users

Perhaps one of the biggest cultural barriers to greater access to technology among older adults is ageism. Inaccurate assumptions about older adults being unable or unwilling to use technology are a chief reason for the lack of investment in technology-based interventions for older adults. In addition, internalized ageism leads older people to believe they can't use the internet or it would not be of use to them.[37] Chief among the concerns is combatting the ageist belief that older adults can't learn new things or are too old to use the internet. Both types of ageism are reinforced by popular depictions of older adults who are inept at technology use.

- DFTA should tackle perceptions of internet use by older adults as part of its broader anti-ageism efforts.
- The NYC Office of the Chief Technology Officer (CTO) should create a resource website for older adults who are just getting started using the internet. The website should emphasize specific practical uses for the internet, like communication, reference, health maintenance, and meeting basic needs. It should also supply quick-start guides to help older adults start using popular software, basic information about internet safety, and links to Lifeline and other internet connectivity subsidy programs. This website should be updated regularly.
- The CTO should partner with DFTA, AARP, OATS, other partners to launch a public awareness campaign targeting older adults that highlights the benefits and uses of the internet.

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Acknowledgments

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