Technology for Aging

2020 Market Overview

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FORWARD

In 2020, a modest category becomes mainstream. It took the aging of the baby boomers and the sheer size of the aging population to turn a 2009 market niche into a 2020 major market category. That category is less about products specifically designed for older adults as it is about the marketing of many existing offerings as useful to them. This includes smartphones, tablets, smart home technology, Voice First hardware and virtual assistants, and in-home sensors. Each of those devices is enabled for older adults by either more targeted marketing and packaging, enabling software, or bundling into solutions for in-home caregiving and/or healthcare.

The older adult market presents a challenge and an opportunity. Large players like Samsung, Amazon, and BestBuy see a market opportunity worth seizing. In 2020, Medicare Advantage plans began covering some in-home technology to help seniors remain independent – and the use of digital health technologies, including remote patient monitoring and remote consultation, continued to grow. During 2020, hearing technology advances and changes in buying patterns will further disrupt that industry.

What's new? The title, for one. Useful technology for 'aging in place' is also useful for those aging in senior living communities – or any other place. Almost every line in this Market Overview has been updated to reflect current demographic data about older adults, policy changes, as well as inclusion of new data about what tech they own and/or prefer. To make space for interesting new examples, some previous offerings were removed to enable inclusion of 25 recent entrants (some winners of innovation competitions).

A pandemic crisis pushes the technology accelerator. This report was initially posted on March 5 – prior to the widespread news of the Covid-19 pandemic and its implications. From a technology perspective, when the entire country is homebound and older adult are without access to face-to-face doctor appointments, no visitors in senior living, and social isolation in the extreme, technologies noted in this report become more useful than ever. And some technologies, like telehealth, find a tipping point in a hurry.

What else has happened since the last update? In March of 2019, a new White House report "**Emerging Technologies to Support an Aging Population**" was published, suggesting many new technologies that are needed, some in process of being developed or released, to help older adults remain independent. The Appendix at the end of the report lists many of these suggested product/offerings. Looking over this list, perhaps some entrepreneurs will study it and see an innovation opportunity for their current or new business. Please advise if that happens!

Here's to the year of 2020 that ends with balance and safety for all.

Laurie M. Orlov

WHO SHOULD READ THIS REPORT?

This report was revised in March 2020, adding **25** new companies and updating products, services, websites, and apps. It serves as a market overview with a single purpose: it is intended to describe the need for, and the current market of, offerings to help aging adults live full lives in their homes of choice. As such, it is relevant to:

- Vendors and entrepreneurs marketing to baby boomers and seniors
- Social networking sites targeting baby boomers or seniors
- Advocacy and tech training groups
- Retirement Communities that serve independent adults
- Senior living communities, and long-term care providers
- Senior housing developers
- Home care and home health agencies
- Geriatricians
- Hospitals and integrated service delivery networks
- Government agencies and policy makers
- Geriatric care managers (Aging Life Care)
- Naturally Occurring Retirement Communities (NORCs)
- Startup incubators
- Venture capital and angel investors interested in the boomer/senior market
- Caregivers, seniors, and family members

"Every venture firm or corporate venture group should read this and create an investment thesis around these trends – Mary Furlong, CEO, Mary Furlong and Associates

THE CONTEXT OF AGING – EVERYBODY'S DOING IT, MOSTLY AT HOME

The majority of older adults today live in their own homes – with 76% of aged 65-69 and 68% of those aged 80 and over. Not surprisingly, the majority (76%) would like to stay there or may be forced by finances to do so. After age 65, the likelihood of living alone increases sharply (see **Figure** 1). For those who live in cities, after age 80 they want to live in their own home or nearby. However, as the calculators of net worth by age indicate, unless a home is sold, there will not be enough to pay for seniors' potential health costs when they are in their 80's or 90's.

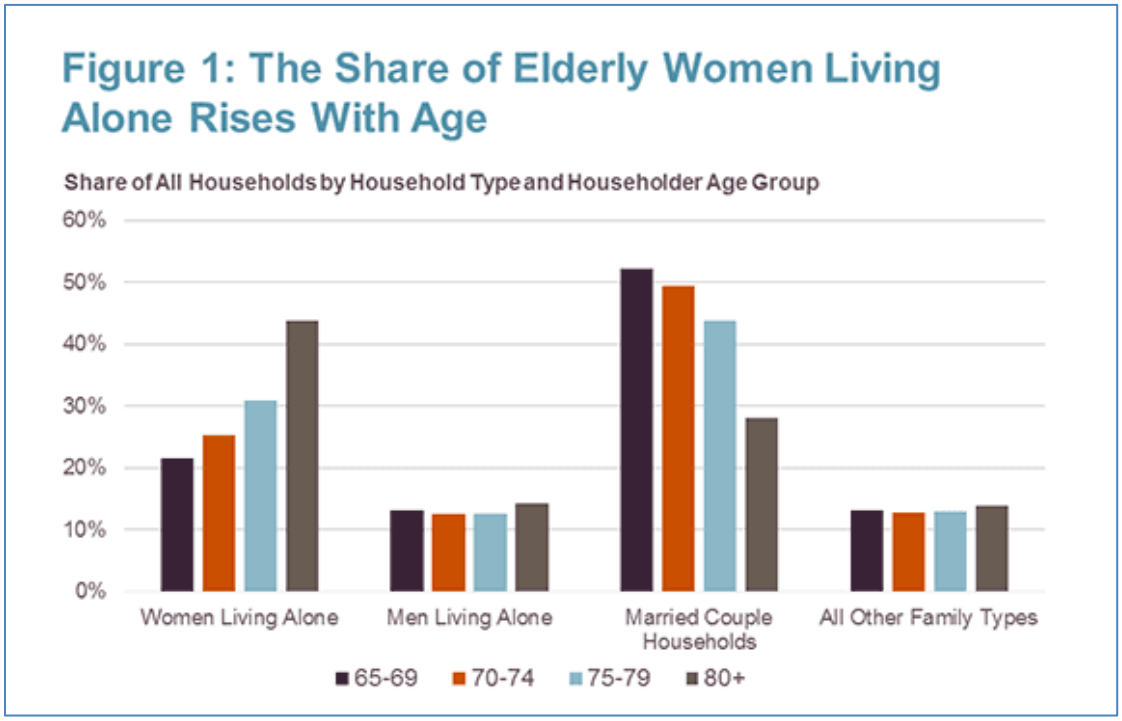


Figure 1 Source: JCHS Housing America's Older Adults 2018

Within that context, aging in place reflects the desire or ability to successfully age and remain in their home of choice, whether it is a private home, condo, apartment, or group settings. These group options includes variants of senior living – in 2019 which reached its lowest occupancy level in eight years and is viewed as out of reach by most middle class homeowners. Aging at home is further underpinned by the very recent growth of interest in the mature market. During 2019 and into 2020, new product introductions were presented at multiple events, including the following, CES 2020, Voice of Healthcare Summit, and pitch events run by AARP in 2019 and at CES in 2020. Even if startups fail, they represent a sharpening focus on caregiving and age-related spaces. Three factors drive a wave of interest in caregiving, home care and aging in place:

Rising health costs and health policy drives care into the home. As Medicare penalties for hospital readmissions grow, hospitals seek to better control their destiny in the face of closings. They are providing outpatient clinics and buying rehab facilities (aka skilled nursing facilities, or SNFs) and managing hospital-to-home care transitions. Insurers try to reduce readmissions with improved care coordination and care transition programs. During 2019, Medicare

reimbursement for use of telehealth technology remote visits. And out-of-pocket healthcare spending rises as people age – for medications, hearing aids and end-of-life care.

Paid home care picks up where families and senior housing leave off. On average, home care fills a care gap of 20-27 hours per week at a presumed lower cost ($22.50/hour paid to agency), than a move to assisted living. However, non-medical home care work (or personal care aide) has been one of the fastest growing job categories in the US, and costs rose 7.1% in 2019, according to Genworth. Pay to the worker averages around $12/hour for the worker. And for much of the industry, median caregiver turnover rate reached 82% in 2018 and staffing challenges are top of mind for home care agencies (see **Figure 2**). As the projected shortage of home care workers worsens – especially in urban areas in which workers cannot afford to live – shortage predictions are dire, predicted to amount to 7.8 million unfilled jobs by 2026.

Caregiving – a dilemma of high costs and demand for workers. The most recent data indicates that 22% of adults age 85+ need help with personal care. As families and seniors compare the costs of aging at home to aging in a senior living community, the cost projections begin to look similar – with the median monthly cost of full-time home care now at $4290, versus $4051 per month for senior living, according to Genworth Financial.

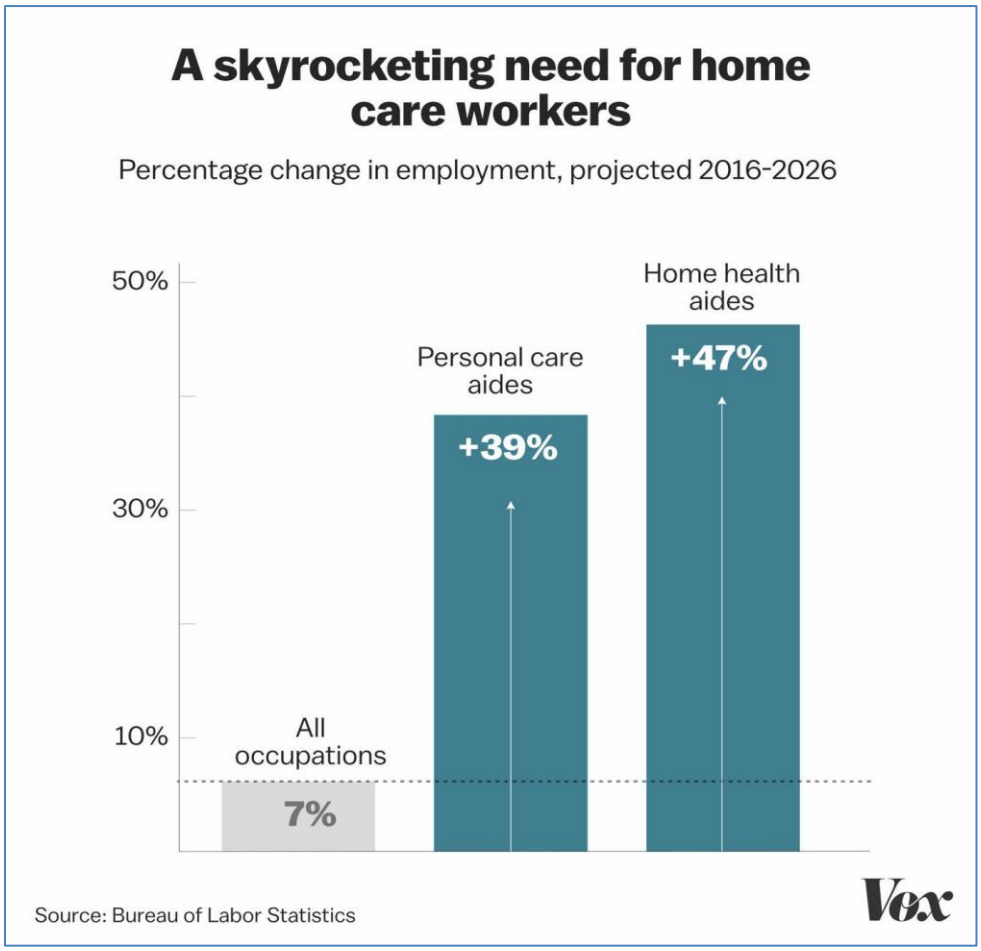


Figure 2 Source: Bureau of Labor Statistics

Data breaches and scams worsen, and so does the risk to seniors. The closing of physical locations like Social Security offices or bank branches has yet to accelerate the urgency of helping offline seniors to move online. Seniors and their families should be cautious, however, as 2019 also turned out to be another memorable year for data breaches, most notable were Marriott (hackers got into 500 million SPG accounts). In October, 2019, the FTC presented its report, Protecting Older Consumers, to Congress showing the sharp difference in fraud loss for the oldest population (see **Figure 3**). In addition, financial exploitation of the elderly is on the rise, creating more opportunity for caregiver involvement and use of scam avoidance technology.

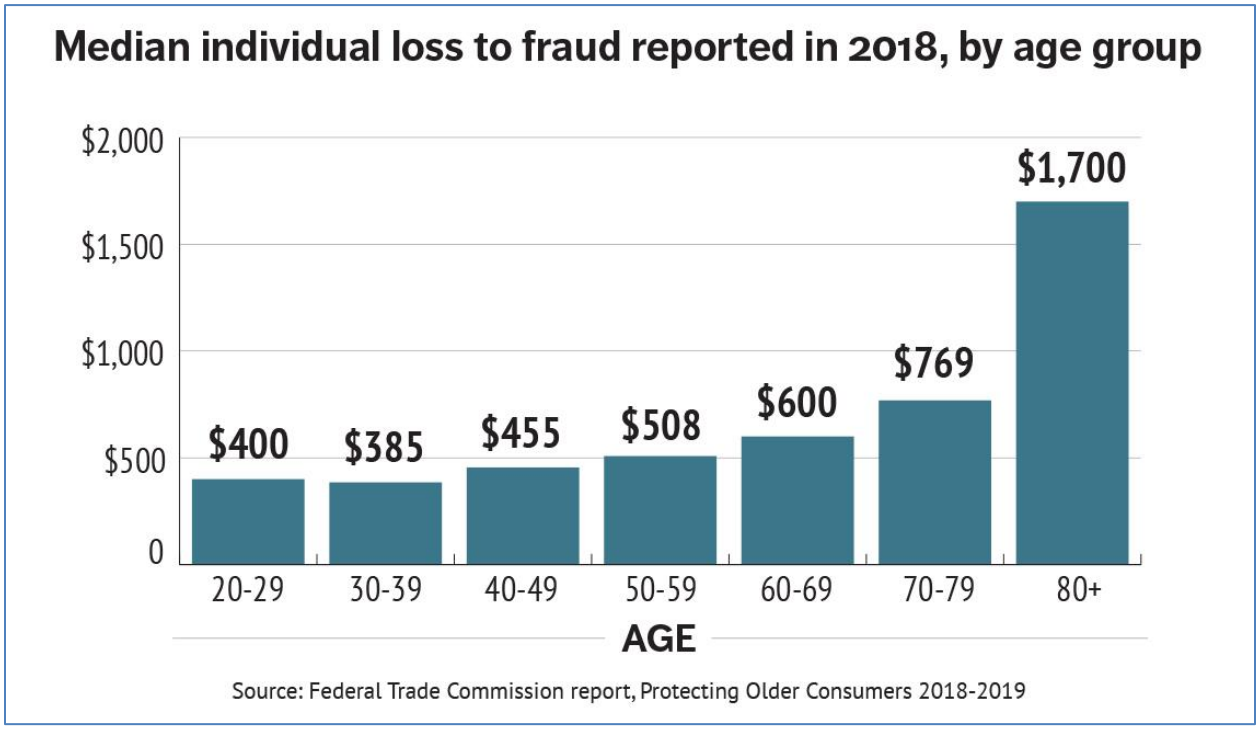


Figure 3 Protecting Older Consumers 2018-2019 Source: Federal Trade Commission

DID YOU KNOW *Facebook exposed the telephone numbers linked to 419 million user accounts in 2019?*

Stark consumer economic realities challenge senior living occupancy... Average net worth of the 75+ inclusive of home equity is $200,000 (see **Figure 4**). Low level of savings slows moves to assisted living, where move-in age is closer to mid-80's (see **Figure 5**). With more than half of assisted living residents aged 85+, this has become a frailer demographic, needing help with multiple ADLs. But boomers are right behind them – and will be even less able to move in. They have simply not saved enough – holding an average retirement savings portfolio in their 70's of $186,800. That's not enough to live on after retirement and later afford more than a few years at a private assisted living community with an average nationwide monthly now at $4091.

…And life expectancy at age 65 is still substantial, especially for women. For example, in 2018 updated life expectancy, used in pension fund calculations, projects that women aged 65, on average, can expect to live until they are 86.7; men can expect to live on average to be 84. Worried about outliving their savings, for 25% of workers, 80 is the new 65. The combination of limited savings and longer life expectancy has raised fear of outliving assets. Being unable to afford more than a few years of assisted living averaging $48,000/year may keep seniors at home**.** Average age assisted living is 22 months, with 59% moving to a skilled nursing facility.

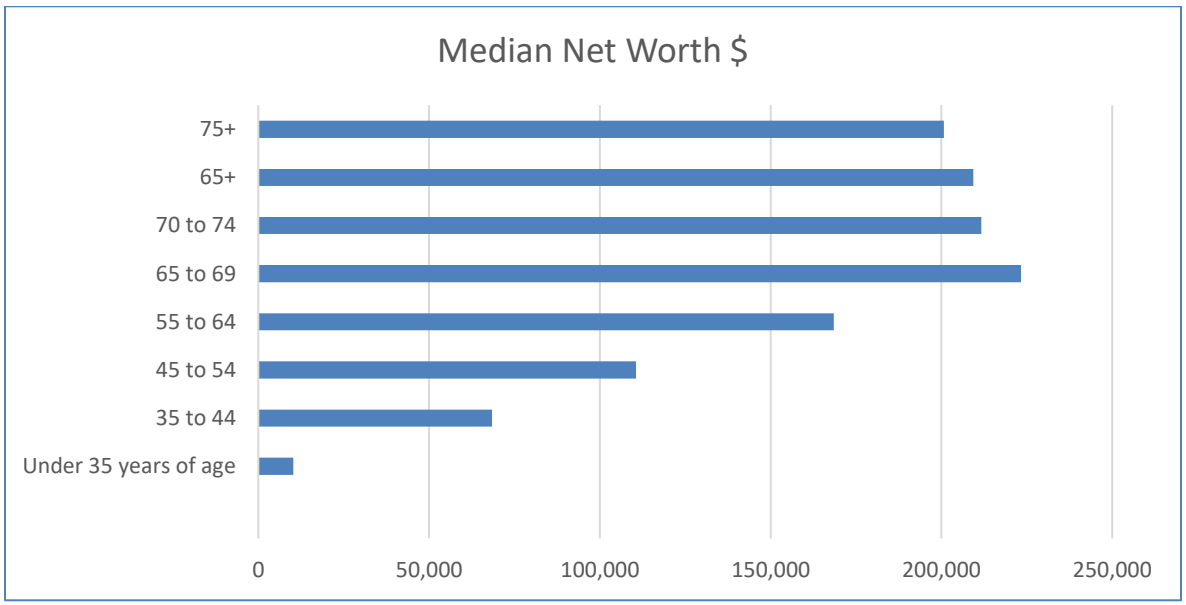


Figure 4 Median Net Worth Americans by Age **Source:** WalletHack January 2020

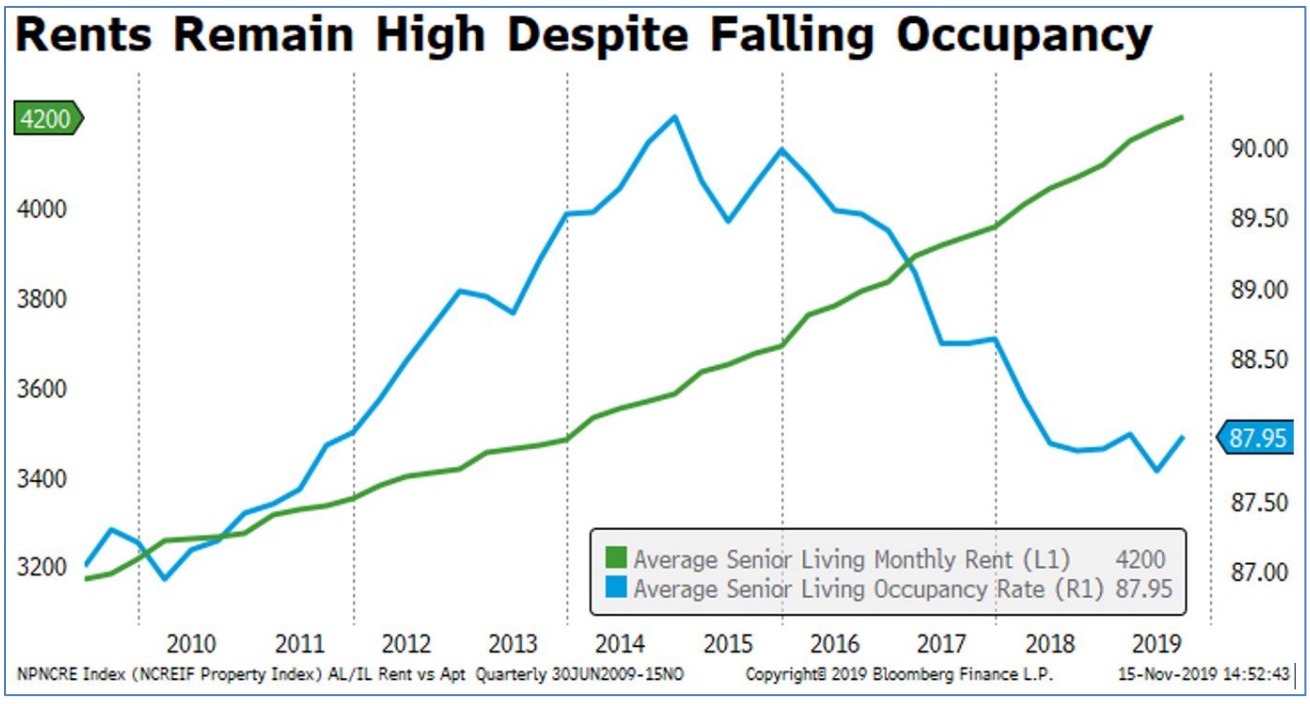


Figure 5 Senior living rents versus occupancy (Source: Bloomberg)

Investors and Policy Makers Care More about Caregiving and Technology

Caregiving demands of an aging population drive policy change in 2019. In January, 2019, the coordinating body for Health IT (ONC) released interoperability advice, connecting people to their care, that requires representing the relationship between a patient and another person (provider, caregiver, or family member). In February, ONC proposed a further rule change that would allow individuals to securely and easily access structured Electronic Health Information using applications for smartphones and other mobile devices. Furthermore, Medicare Advantage and Medicaid plans are more likely to cover PERS devices and other in-home technology.

White House Report in 2019 offered useful suggestions that deserve follow-up. The release of the 2019 White House report in March added new emerging categories of technology to enable living independently, including dental hygiene, critical for older adults (See **Appendix** at the end of this document). The report also made recommendations about boosting adoption, noting that design of' 'zero-effort' technologies should include an 'adequate assessment of user needs, usability analysis, and studies…and needs-finding through interaction with older adults.'

Despite enablers, tech adoption by older adults has not kept pace. The surveyed ubiquity of technology has led to a belief that it is everywhere it needs to be, with media assumptions about the benefit of smartphones and online tools, ownership of devices, or access to broadband speeds. But barriers remain. For example, with smartphone adoption of the 70+ at just 62%, device complexity, price, poor usability, forced obsolescence combined with lack of standardized professional training have created big barriers to broadening smartphone usage of an aging population, particularly for individuals aged 70+. (See **Figure 6 and Figure 7**).

Older Adult Device Adoption through 2019

Device	Age 65+	Age 70+	Source
Cellphone (not smartphone)	39%		Pew 2019
Smartphone	53%	62% 40% (age 74-91)	AARP 2019 Pew 2019
Wearable	17% (age 50+)	11%	AARP 2019 Pew 2019
Tablet	49%	40%	AARP 2019
Computer (Desktop, Laptop)	71%	73%	AARP 2019 Census 2017
Use the Internet	73%	44-60%	Pew 2019
Home broadband	59%	N/A	Pew 2019
Smart Speaker	19%	12%	AARP 2019 Pew 2019
Need help with setup/tech training	73%	N/A	Pew 2017
Very confident re: privacy	12%	13%	AARP 2019

Figure 6 – Tech Adoption, Source, age 65+, age 70+
Enablers/Barriers to Tech Adoption and Older Adults

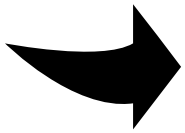
Key Enablers for Tech Adoption	Key Barriers to Tech Adoption
ONC Interoperability – including family, caregivers of patient	Device ownership and trust of technology, especially fraud-related
White House recommendations for 'zero-effort technologies', specialized training	Availability of standardized training programs across US
Smartphone-wearables to track wellness, motivate activity	Perceived value and training among older users
Medicare Advantage reimbursement changes to support device use	Device management forced obsolescence, upgrades, software versions
Discounts available for broadband (low-income)	Standard price of home broadband
Voice First (Amazon speakers, Google Assistant) broad visibility, deployment	Concerns about privacy with always listening devices

Figure 7 Tech Adoption – Enablers and Barriers in 2020

Medicare Advantage changes will feature tech-enabled home care services. Besides further cementing consumer commitment to support aging at home, A far-reaching change began in 2018 to expand benefits for the chronically ill and further resulted in changes to Medicare Advantage plans (currently covering a third of Medicare beneficiaries). These plans are beginning to cover in-home services and technology devices in 2020. This change will no doubt drive interest in labor-saving caregiving technology in both home care and senior living settings.

Digital health usage grows in some categories. The Digital Health Summit at CES 2020 was bigger than ever – with 4000 exhibitors across 2.7 million square feet and attended by many of the 175,000 CES 2020 attendees. And technology for older adults could be found, innovators exhibited, with a number of offerings that could be of benefit if broadly marketed and resold. In addition, adoption of online digital health tools continues to rise, notably in the growth of consumer access to online information (see **Figure 8**). While wearables were now more popular in 2019 for adults aged 55+, seniors aged 65+ are still unlikely to own them.

Fall detection innovations moved off body, into the room. More offerings emerged recently seeking to detect falls without a wearable on the body. These include an AI-enhanced video tool, **SafelyYou; Vayyar's Walabot Home, Essence SmartCare**, and Starkey's **Livio** hearing aid. Fall prevention could include detection of changes in movement, as with **BioSensics** (on the body), and **StaySmartCare** (in the room with infrared and radar).



***DID YOU KNOW** that one in four adults age 65+ falls each year? According to the CDC, the estimated medical cost of falls across the U.S. healthcare system is $50 billion annually.*

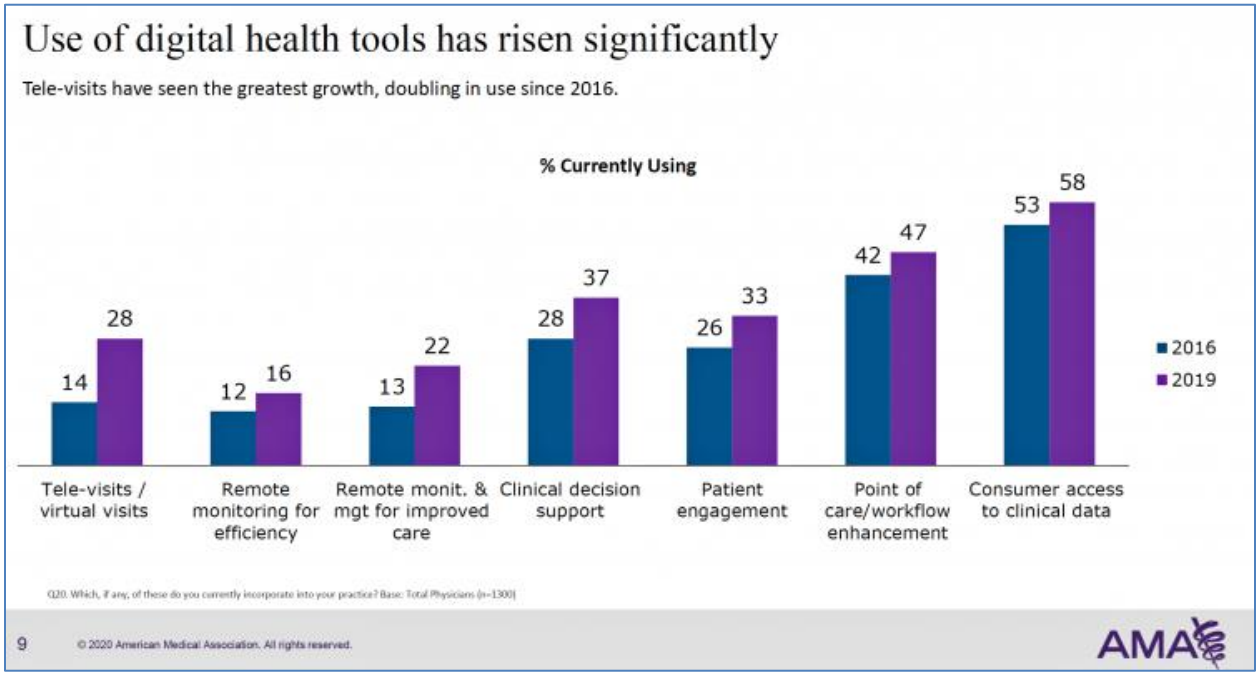


Figure 8 Source: American Medical Association February 2020

TECHNOLOGY UNDERPINS, DOES NOT REPLACE SERVICE OR FAMILY ROLES

The categories of technology offerings required to age successfully include independent market segments – each useful – but together, they complete a puzzle for a fulfilling and interactive life for older adults, enabled as needed with the support of families and caregivers (see **Figure 9**):

Communication and engagement. For baby boomers and younger, life is unthinkable without web surfing, Facebook, smartphones, and texting. As 2020 began, tech vendors like Samsung and BestBuy both honed the opportunity for a line of technology for older adults. Larger, brighter and more expensive smartphones like the Samsung Galaxy Fold or the iPhone 11 Pro Max compete with today's general purpose tablets. The newest versions of voice-first interfaces (like Alexa, Google Assistant, Siri or Bixby) raise the bar on in-home tech experiences for the growing numbers owning the devices. For the one-third of 65+ individuals with hearing loss, attractive and functional hearables add to a disrupted hearing technology market, along hearing aids that are more attractive, lower cost, or more available through direct-to-consumer channels.

Safety and security. The ability to remain at home depends on whether the home is free from obstacles and dangers, especially for the 46% of women aged 75+ who live alone. Basic home alarm systems for fire and flood are mandatory, but today seniors can also be served by smart home sensors (IoT), many announced during 2019 and early 2020. PERS vendors that get monthly fees from their PERS and call center businesses will increasingly link to other services that can be voice-enabled, for example **MobileHelp-LifePod**. Innovative approaches to fall detection are also entering the market (like **Essence**'s radar or **SafelyYou**'s AI/Video offering) .

Health and wellness. The risks associated with obesity and lack of exercise only worsen with age. Health-related technology received significant attention at the CES 2020, with an increasing focus on personalization. Even HIMSS, largely focused on the non-consumer Health IT market, included a number of technologies that involve patients directly. Sensor-based home monitoring technology has increasingly been marketed as remote patient monitoring (RPM). In November, 2019, CMS finalized rules for reimbursing telehealth and remote patient monitoring (RPM), which could invigorate physician adoption.

Learning and contribution. Experts have noted that once the basic needs of communication, safety, and health are addressed people have both the need and capacity for more. This includes learning, staying aware and active in society, contribute through volunteering and growing numbers of older workers. They also are leaving a legacy of stories (not just money) for those who love them. In addition, a 2019 study showed the benefits of telling their stories for seniors with dementia. Due to labor shortages and the percent (one in five) of workers aged 65+, AARP and OATS help an older person obtain skills to prepare them to find a job.

Caregivers care about technology – wish it supported them more effectively. According to a recent study by Cambia Health, 64% of surveyed caregivers use at least one digital tool to help them with caregiving. Forty-one percent expressed interest in using a tool that would connect them to experts, as well as a health guide via chat to answer questions. But 25% of responders expressed concerns about data privacy, a growing worry in the face of numerous hacks and identity thieves today. Other concerns raised included 'too many tools' and lack of awareness.

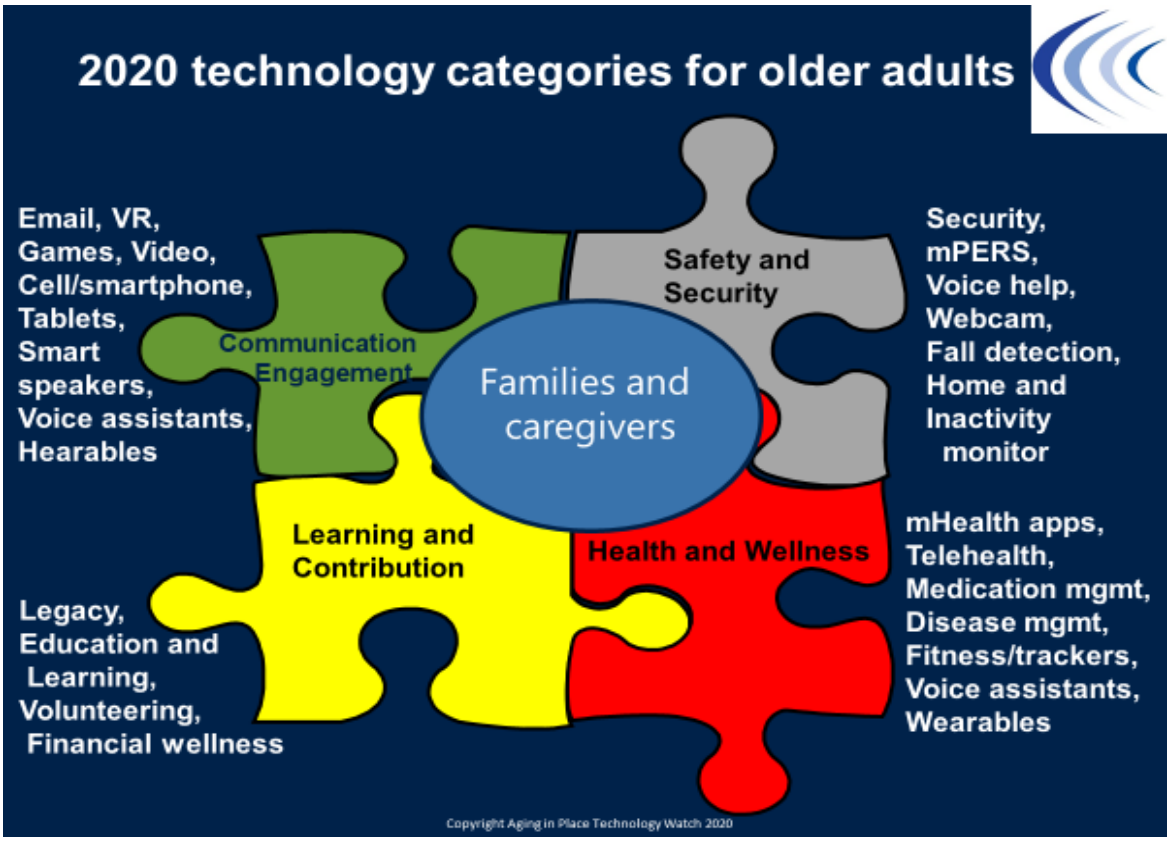


Figure 9 The interdependency of technologies for older adults

Complex Markets Require a Channel Strategy and Good Design

One go-to-market channel is not enough. Depending on the product or service, it may need a mix of resellers/distributors, face-to-face, and online sales. As the 2019 Pew Internet/Broadband Survey showed, 27% of the 65+ market is still not online. If that population needs a technology or service, caregivers will peruse online sites, depending on need, like Best Buy's Aging in Place, FirstStreetOnline or AbleData. New entrants must form partnership early – at the pilot stage with channels like these or PERS dealers who resell medical alert devices, for example.

What do caregivers and older adults need? The caregivers of older adults are sometimes surveyed, but rarely about tech needs. The Catalyst survey showed the importance of tools for care coordination and finding care workers; plus a smarter, lower cost PERS device that would serve as more of a caregiver communication platform. As caregivers, professionals, and families seek alternatives to better serve older adults at home, what are the requirements for making technologies both useful and likely to reach the intended market?

- **Technologies must be well-supported and intuitive.** Most people have a laundry list of frustrations with technology, regardless of age. The failure of previous direct-to-consumer approaches underscored the fallacy of inventor-centric thinking that 'if we create it, they will buy it from us' or at least find it Amazon. But what if it is a device fitting into a Wi-Fi home network with other devices, a printer, a few voice devices and a

webcam? Instead, remote configuration and support partners must be a major part of the offering – or doom the user and family to frustration and tech abandonment.

- **Device and app vendors must be capable of integration and extension.** Despite standards initiatives, task force recommendations or ONC Interoperability (2019), many of today's gadgets still don't communicate – especially with each other's proprietary systems or data sets (like Electronic Health Records). So mobile health devices, apps or medication reminders may be useful, but touch a tiny aspect of the whole person. Patients struggle to get their own records in a transferrable form upon discharge.

- **Privacy and security features will be built into design of software and websites.** Cybercrimes targeting the elderly have ballooned to a cost of $650 million in annual losses, and that includes only those that are self-reported. For safety-oriented apps and sites that include the role of the senior, it's critical to verify identify among provider and user roles. Two-factor authentication will likely as part of online (and future voice) health-related services.

- **Costs to consumers must be affordable.** As tech becomes more usable and useful, consumers and families will look for ways to acquire technology like Wi-Fi or medical alert devices. A fragmented set of discounts/subsidies are available for Wi-Fi. Some insurers now reimburse for PERS and telehealth. But family will still play a supportive role in acquiring technology. High speed internet enables engagement with grandchildren and powers voice-first tech like Amazon Echo or Google Assistant**.** These tools enable home automation and reduce social isolation, both in senior living and individual homes.

- **Upgrades will be invisible or painless.** Consumers already gravitate towards software applications that mostly work with ones they already use, including Gmail, Facebook, FaceTime, YouTube or Skype and now Google Assistant – regardless of device. With content increasingly in the cloud, upgrade processes will be more seamless than the old 'No Going Back, You Must Upgrade or Else!' style. Personalized user interfaces (like Amazon and Netflix), recognizable across devices, will increasingly be a design norm.

Technology Trends that May Help Older Adults

Across all consumer devices, wireless charging pads and stands have made coping with mobile technology easier. Connections are less likely to wear out before the device is retired. Across many devices today, consumers will find assistive features (for vision and hearing limitations) that are built in. Older adults would benefit greatly if vendors and stores selling devices (or providing training) spent time introducing them to those features (See **Figure 10**).

Pattern recognition and analytics augments simple monitoring. Pattern analysis, dashboards, and predictive analytics have permeated tech innovation for years, including healthcare, but have been slow to enter the world of caregiving for older adults. That is changing – and new entrants, for example, **StaySmartCare**, **SafelyYou** and **EnvoyatHome** are pioneering use of pattern analysis to indicate issues that caregivers need to address. During 2020, more will be announced.

Wearables became more visible – on the wrist and in the market. The Apple Watch Series 4 disrupted the senior wearables market with its built-in ECG and fall detection, as well as Apple's partnership with insurers. That created revenue growth for Apple, but also more opportunity for Apple watch-based alternatives like **Fall Call Solutions**. And as a result of Apple's more senior-capable offering, emergency watches (PERS) with call center integration, like **MobileHelp,** and **UnaliWea**r, got a boost. As the overall market continues to grow, expect more smart wearables like **Freedom Guardian's** smart watch, **MobileHelp Smart**, and **TrelaWear** smart jewelry.

Voice first technology – it's everywhere and in everything. In 2019, Voice First represented a category of technologies like smart speakers and voice assistants. Now health organizations and providers are moving forward with voice-enabled interfaces to everything from hospital rooms, appointment scheduling, doctors note-taking, prescription requests, and even discharge instructions. The ability to ask Mayo Clinic a question or get an update on a prescription will be a notable benefit to older adults who own smart speakers or have phone-based assistants. Expect moving forward that older users to be willing to trade concerns about privacy with an always-listening device against the benefit of this easiest interaction mode of speaking.

Amid market disruption, hearables market begins to resonate – and grow. The hearing technology market is seeing disruption from multiple angles. Smart hearables were news at CES 2020, including AI-enabled hearing aids with fall detection, better and adjustable noise cancellation – especially interesting for older adults in noisy restaurants. Add integration with voice capabilities like Siri, Google Assistant, and Alexa and the ability to stream audio content directly to in-ear devices. With the introduction of Over-the-Counter Hearing aid sales (and recommended guidelines), coupled with the beginnings of insurance reimbursement, those with mild-to-moderate hearing loss are likely to benefit from many of these changes.

Smartphone market saturates – and some prices drop. Only 2 major vendors, Samsung and Apple, compete in the US smartphone market and the overall space is clearly saturated. The top smartphone apps in 2020 cross platforms – those used by more than 50% of smartphone users include YouTube, Facebook, Google Search, Google Maps, Gmail, Facebook Messenger and Google Play. But for the general consumer marketplace, there is some optimism about smart flip phones and their potential comeback. In addition, consumers are owning smartphones far longer, than 2 years – and may not see a reason to upgrade to a pricier device.

ADVICE TO VENDORS: IT'S TECH-ENABLED SERVICES, NOT PRODUCTS

Probably the biggest issue that keeps more of today's technology out of the homes of seniors is the difficulty of marketing to them ("We are not old!") and their afraid-to-interfere adult children. Therefore, it's important to sell through knowledgeable channels, appropriate websites AND pricing right for resale and possible white labeling. Vendors must find:

The right customer or referral – families and service providers partners. Direct-to-consumer marketing of products and services takes deep pockets just for the advertising – note the growing number of ads for low-cost hearing aids. For early stage companies, start locally – get to know a local home care agency, senior living company, or home security company. What they have in common? Entry into the home.

Standards enable users and integrators to cross tech boundaries. Times are changing – as in this smart home interoperability initiative – a recognition that, despite intense competition, consumers likely own a wide variety of devices and software that should be able to work better together. Amazon launched a similar initiative for voice offerings like smart speakers and voice assistants. Therefore, ensure that the new offering works across multiple platforms and comes in multiple form factors – voice, smartphone, web, for example.

Access to ongoing training and refreshers – much work needed. To be sure, the oldest are likely to approach smartphones as another variation of flip phones – until they can learn of their utility in a store, online, from their family, or in community training centers. Automatic updates and application software changes push users back for refreshers to avoid considerable frustration. Despite the efforts of senior centers and other non-profits like NCOA and its Online Banking training, training services lag the pace of tech change and rapid growth of threats, including hackers' ability to pinpoint location and/or steal identifying information.

The real user need – a service problem solved. Seniors and their adult children may not imagine on their own what to do with sensor networks, web cams, or smart speakers. A home security company could someday help explain the benefits, for example, of care coordination, when selling tech to a home health agency. Instead of offering point products out of context, vendors should fit solution descriptions, service provider stories, and senior support processes along the continuum of needed care and socialization. This necessitates a grasp of the decision points that spike need and interest, using these as part of websites and marketing (see **Figure 10**).

Identify the right channel – it's about an ecosystem and indirect selling. The right channel depends on the complexity of the product and the target user. Reseller partnerships can extend reach, service configurations and specific geographies. For example, PERS vendors may market through multiple regional service providers, but prices can vary for local markets. Retailers like Best Buy's Aging in Place may provide white label options for home care agencies, pharmacies, senior housing organizations or insurance partnerships, many of these adding voice activation.

Partnerships matter – first as announcement-ware. Fresh posted announcements of partnerships are indicators of forward business motion. For example, announcements of transportation partnerships to help older adults sprouted like weeds – but we may never see an announcement if they are weeded out. A few examples: **Lyft Concierge** and Medicare Advantage plans, Humana and **Philips** or LifePod and MobileHelp.

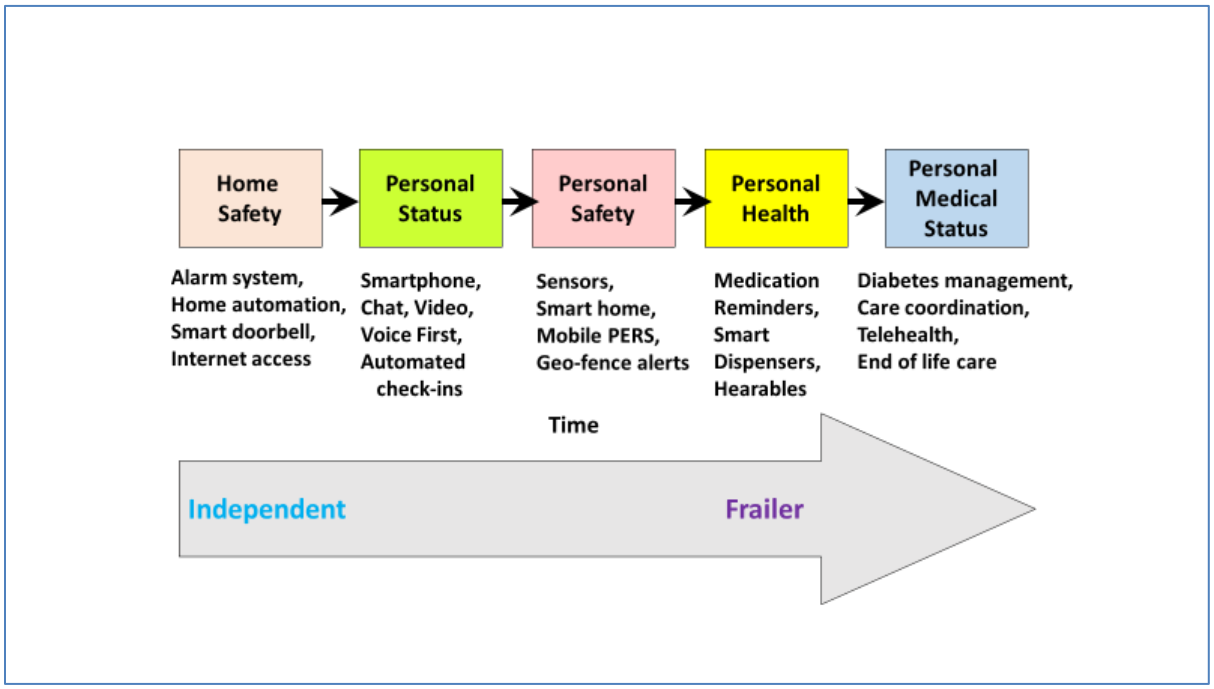


Figure 10 Technology needs of older adults evolve over time

Senior-focused non-profits matter. From AARP's Innovation Labs and media channels, to the local tech fair, each play a role in helping startups gain awareness and get their offerings into the market. The American Society on Aging (ASA) runs a national event each year called Aging in America – with a large presence of attendees in the social services and vendors who are potential partners. Regional lifelong learning organizations run tech fairs like San Diego Oasis are a great way to help development teams learn about the end customer and what they care about. And national organizations like the National Council on Aging (NCOA) plan to increase use of technology to improve awareness of their service offerings like Benefits Checkup.

"Every technology is of value to older adults – for example, new technologies like conversational AI and personalization algorithms can help create a customer segments of one with personalized solutions to each individual older adult." – Saeed Elnaj, CIO, National Council on Aging

HOW DOES THE TECHNOLOGY MARKET FOR OLDER ADULTS EVOLVE?

The marketplace of products and services today is still fragmented, with ever-shifting cottage industries comprised largely of startups, challenged by channel complexity and end user resistance. According to AARP's Longevity Economy projections, the 50+ population will control 51% of technology spending by 2030, just a decade away. That market will be dominated by new tech likely introduced by the largest players who will acquire startups that matter. Benefits of new tech will accrue to all, but challenge users at every intro. Service providers, caregivers for older adults, and senior living organizations will need to keep up (see **Figure 12**).

What are the key trends to watch in 2020?

As 2020 began, trends that became apparent in 2019 come into sharper focus. The market for technology for older adults will continue to grow, but it increasingly looks like the market of technology for all consumers, not just the elderly, is the one to watch. Consider that:

It's still Digital Health, now more useful to older adults. The dream of reimbursement is becoming a reality. Especially interesting? Remote patient monitoring (RPM) during an epidemic, which persists as the way to replace or supplement institutional care for in-home care by hospital/health systems and medical practices. And regulation changes in the past year are have begun to turn the adoption tide. Also at HIMSS and the Digital Health Summit, vendors are beginning to learn that older people, consumers of a significant portion of healthcare spending, will need many of the Digital Health technology categories.

Voice first interfaces will be ubiquitous. For older adults, voice-enabled interactions will be preferred when they are possible and when cloud-based services are accessible. Why? Because it is easier for them – enabling the transformation from typing, pinching, zooming and glass screen frustration into a services world in which what you say should get you what you need. As happened with IoT apps, voice interfaces will be added to every feasible device (and new car), whether it makes sense or not as with hackable dishwashers or 'peak stupid' toasters. Older adult users may not want easily hacked or always listening devices, though. And they are also not enamored with self-driving or electric cars.

Hearing technology markets will be further disrupted – users win. Consumer Report's 2018 survey found that nearly one-third of people who reported difficulty with hearing did not visit or delayed seeing a professional. Reasons vary, but often include denial of hearing loss, perception of stigma associated with hearing aids, and concerns about cost. As lower-cost options grow – hearables, retail and at-home self-service/self-fitting and purchasing of hearing aids, individuals with hearing loss may opt in to alleviating hearing loss earlier than the typical 7-year wait.

Caregiver shortages will boost interest in home monitoring technology. The intersection of three simultaneous trends of aging alone at home, worsening caregiver shortages and turnover, and the percentage of adult children working, interest in monitoring technology in the home will grow, including web cameras, sensors, smart doorbells or voice-first tools.

Virtual reality and robotics usage will continue and grow. The press loves to write about robots and seniors. Still largely at the anecdote stage, widespread use of care-related robots in the

home or in senior living communities hasn't happened and is not expected for years. On the other hand, virtual reality tool possibilities expanded during 2019, particularly in the area of caregiver training (**Embodied Labs**) and more senior living communities are deploying virtual reality (**MyndVR**).

The absence of widely available tech training and support should prompt innovators. It's not just seniors who need help. The proliferation of devices, persistence of AARP Tek Training workshops, the growth of the Best Buy's Geek Squad into Total Tech Support (any device) – all point to one conclusion. New technology requires training and support – and profit for companies that can deliver cost effectively. With the aging of baby boomers, newer offerings like Support.com (any connected device) will tailor messages to reach an older adult audience.

Category Changes 2020 and beyond	Current	Moving Forward
Digital health, Remote Patient Monitoring	MD resistance, limited reimbursement	CMS reimbursement, expansion of mHealth
Voice First technology	Smart Speakers	Ubiquitous voice assistants
Hearing technology	High price hearing aids, sold by audiologists	DTC, hearables, low cost hearing aids, self-service
Caregiver technology	Assisting care workers, time recording, PERS	In-home supplement to care, sensors, voice tech
PERS, fall detection	On body pendant, private pay	In-room sensing, insurance reimbursed
Virtual reality for seniors	Experimental	Programmatic, caregiver training
Tech training for Seniors	Fragmented, senior center	Standard in retail, online

Figure 12 Where is the market heading for technology and older adults?

About the Author:

Laurie M. Orlov, a tech industry veteran, writer, speaker and elder care advocate, is the founder of **Aging in Place Technology Watch,** a market research consultancy that provides thought leadership, analysis and guidance about technologies and related services that enable boomers and seniors to remain longer in their home of choice. In addition to her technology background and years as a technology industry analyst, Laurie was a certified long-term care ombudsman and received a graduate certificate in geriatric care management from the University of Florida.

In her previous career in the technology industry, Laurie held senior positions in IT organizations, followed by 9 years as a leading industry analyst at Forrester Research. While there, she was often the first in the industry to identify technology trends and management strategies. 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 and was a participating expert on the Think Tank for The Philips Center for Health and Well-Being; the Personal Connected Health Alliance Aging Task Force; AARP Inclusive Technology Roundtable 2019. She also testified before the US Senate on the role of technology for older adults. Her perspectives have been quoted in California Healthline, Forbes, AARP Magazine, the New York Times, and the Wall Street Journal. She has a graduate certificate in Geriatric Care Management from the University of Florida and a BA in Music from the University of Rochester. Her other most recent research reports include **Voice, Health and Wellbeing 2020; The Future of Voice First Technology and Older Adults (2018);** and **Tech-Enabled Home Care (2017).**

2020 Technology Categories and Vendors (Examples)

For inclusion as an example-only technology to facilitate aging in place, the vendor meets two of these criteria (those firms listed are only examples, not an exhaustive list). Because of growth of relevant technology announcements during 2019-20, more startups, including pre-launch and innovation award winners are included than previous versions. In addition, please note that the "**" entries can be new for this publication of the 2020 Market Overview, though they may have been in business previously but were not included in the 2019 report. The criteria:

a) Incorporate messaging to and about boomers and/or seniors – or their family or professional caregivers.
b) Is expected to be available across the continent, not just in a single region.
c) Addresses one or more categories described in this document.

	Sub-Category	Purpose	Platform	Contact
Category: Communication				
Amazon Echo Show	Cloud-based voice hub	Screen with voice-enabled AI access	Appliance	Amazon.com/ Echo
Embodied Labs	Virtual Reality	Caregiver training	Experience Headset	embodiedlabs. Com
Connected Living	Senior Living	Engagement of residents	Suite of software	ConnectedLiving. Com
Google Home	Cloud-based voice hub		Appliance	store.google.com
grandPad	Senior tablet	Simplified interface	Android	grandpad.net
iN2L	Engagement System	Games, health, movies, spiritual content	PC Workstation	in2l.com
GreatCall Jitterbug Phones	Feature, smart phones	Simplified keypads connect to Call Center	Android smartphone	greatcall.com
JoyforAll Pets	Robotics	React and respond to touch	Toy	joyforall.com
Starkey Livio AI	Hearing aid	Activity tracking, personalized	Hearing aid	starkey.com
MyndVR	Virtual reality	Assisted Living	Experience Headset	myndVR.com
LG Exalt LTE**	Best Flip phone with camera	Good speaker	Android flip phone	LG.com/US
Oticon	Hands-free calls	Internet connected for IoT controls	Streaming to wireless hearing aids	oticon.com
Nuheara	Hearables	IQ Buds Boost, Max	Hearing aid, Google, Siri Integration	nuheara.com
Phonak AudeoM**	Hearing aid	Integrated with Samsung phones	Acts like a wireless headset	phonak.com
Rendever	Virtual Reality	Senior engagement	Experience Headset	rendever.com
SingFit	Music Therapy	Dementia care	Activities, sing-along	Singfit.com
Category: Home Safety, Security				
Care Predict Home	Wearable	Senior health monitoring	Predictive analytics	carepredict.com
Envoy at Home**	Sensors plus iPhone app	Scans environment	Continuous checking of sensors for issues	Envoyathome.com
Essence Care@Home	IoT/PERS	In-home IoT devices	Alerting platform	essence-grp.com
GrandCare	IoT Monitoring	Remote caregiving	Touchscreen, portal	grandcare.com

	Sub-Category	Purpose	Platform	Contact
Best Buy Lively App**	Mobile PERS	Lively Wearable 2	Call Center	greatcall.com
GreatCall Lively Mobile Plus	MobilePERS	PERS with fall detection available	Mobile PERS	greatcall.com
LifeStation MobileLTE**	MobilePERS	Uses LifeStation call center	Bluetooth-enabled device, voice prompts	lifestation.com
Locate Motion**	Wander management	Pattern tracking for Dementia, Autism	Wearable with SenSights Dashboard	locatemotion.com
MobileHelp Smart Watch	PERS Watch	Samsung health integration	Wearable	mobilehelp.com
Philips Cares and Lifeline	Smartphone app, PERS	Manage care circle for Philips products	Mobile App and PERS	lifeline.philips.com
SafelyYou	Fall detection	Memory Care	Video camera-based	safely-you.com
Speak2**	Engagement platform	Voice First for Senior Living	Daily schedule, care plan alerts,assistance by voice	Speak2software.com
TrelaWear**	MobilePERS	PERS Jewelry	Paired with Mobile Help response center	Mobilehelp.com
TruSense	IoT Monitoring	Voice-enabled passive monitoring; GPS tracker	Amazon Echo interface	mytrusense.com
UnaliWear	Mobile PERS watch	Voice-enabled mobile PERS	Bluetooth low energy	unaliwear.com
Vayyar Home**	Fall Detection	Wall-mounted	Low-powered radio wave	Walabot.com/ walabot-home
Vidapoint**	Mobile PERS	Global service offering	120 countries	globalwirelesshealth .com
Category: Health Wellness				
AppliedVR**	Virtual Reality	Pain education & management	Distraction and coping tools for pain	Appliedvr.io
Aiva Health				
HandsFree Health**	Voice assistant	Voice-enabled, health assistant	HIPAA compliant reminders	Handsfreehealth
Kardia Band	Wearable wristband	Creates report of cardiac pattern	EKG monitor wristband for Apple Watch	alivecore.com
Livongo	Diabetes App	Portal plus app	Integrates trackers	livongo.com
Medminder	Cellular	7-day, 4-dose per day reminder trays	Prefilled trays from pharmacy	medminder.com
MediSafe	Medication compliance app	Notifies 'Medifriend' if doses are missed	Deployed in partnership with pharma, research	medisafe.com

	Sub-Category	Purpose	Platform	Contact
Ōmcare**	Medication compliance hub	Home health	Verification of dose taken	Ōmcare.com
Orbita	Voice-enabled healthcare	HIPAA-compliant Conversational platform	Enterprise software for healthcare systems, groups	orbita.ai
Pillo Health**	Robot	Pill-Dispensing	Companion	Pillohealth.com
Reemo Health	Health Smartwatch, analytics	Remote mobile health platform	Senior living, senior care, healthcare	reemohealth.com
StaySmart Care**	Health monitoring	Sensors, medical devices	Dashboard of status, nurse available	Staysmartcare.com
VitalTech**	Connected Care	Remote patient monitoring	Patient health, wellness	vitaltech.com
Welt Belt**	Men's Health belt	Smart Belt measures sitting, waist circumference	Android, iOS integration	On Amazon.com
Zibrio Smart Scale**	Smart Scale	Measures and tracks balance	AARP Innovation Award 2020	Zbrio.com
Finance/Transportation				
Golden Financial**	Financial services for older adults	Account organization, bill paying	Includes financial care specialists	Joingolden.com
Papa	Family on demand	Transportation, chores, socializing	College students	joinpapa.com
LifeSite	Family records	Caregiving financial records	Store, manage family care documents	lifesite.co
EverSafe	Fraud protection	Seniors and families	Detection and alert system	eversafe.com
Uber Health	Healthcare appt rides	With uberAssist, door-to-help for disabled	Ride-hailing service paid by organizations	uberhealth.com
Intuit Mint	Finance	Manage banking accts, finances	Budget for aging parents	mint.com
Lyft Concierge	Includes healthcare appointment rides	Flexible ride scheduling by sponsor organization	Ride-hailing service paid by organizations	lyftbusiness.com/ healthcare
TrueLink Financial	Financial services for older adults	Protect assets and track payment activity	Payment cards, investment management	truelinkfinancial. Com

Category: Caregiving (Platform, Apps)

Electronic Caregiver**	Smart health home	3D virtual caregiver	Addison Care	Addison.care
Aloe Care**	Digital care assistant	Voice-activated	Care coordination	get.aloecare.com
CareLinx	Non-agency home care marketplace	Families, organizations find workers, rides	Marketplace of registered workers	carelinx.com
Care Predict	Care management	GPS tracking, reporting	Care professionals	carepredict.com
Caring.com	Elder care website	Articles and search tool – all care types	Reviews from users	caring.com
Caremerge	EHR and Engagement Platform	Resident engagement, Calendar	Senior living	caremerge.com
ClearCare	Manage home care agency	Home care agency platform	Manage home care agency tasks, EVV-compliant	clearcareonline.com
K4Connect**	For resident, operators	Engagement, Wellness	Senior living, smart home, voice interface	k4connect.com
Kytera Companion**	Fall detection	Smart remote caregiver	CES Innovation Award 2020	kytera.care
LifePod	Voice First Virtual Caregiver	Proactive voice-enabled care solutions	Voice first care for home and home health, senior living	lifepod.com
Outpatient**	Smartphone app	Caregiver collaboration	Share calendar, status	Getoutpatient.com
PointClick Care	Care management	Cloud platform	Senior living, SNF, home care	pointclickcare.com
Category: Learning/Contribution				
learn@50+	Training	Tech, caregiving, work, skills	Online, workshop Education	learn.aarp.org
LifeBio	Storytelling	Digital life stories	Memoir-writing services	lifebio.com
Memory Well	Storytelling	Digital life stories	Professionally written	memorywell.com
My Heritage	Family history	Stories and family tree	online tool	myheritage.com
OATS	Training	Tech, job skills	Regional workshops	seniorplanet.org
Osher Lifelong Learning	Lifelong learning	Senior-focused courses	Nationwide network	osherfoundation.org
Support.com**	Tech support	Telephone support	Any device	support.com
TimeSlips**	Creative engagement	Senior-focused training	Network of trainers	timeslips.org

Appendix of Recommendations
2019 White House Report
Emerging Technologies to Support an Aging Population – Technology

Theme	Sub-Category	Tech should help with	Examples such as:
Key Activities of Independent Living	**Hygiene: bathing, oral, skin care, including wound prevention, care** **Nutrition: meal preparation, shopping, and eating** **Medication: management and adherence**	**Enable safe bathing, showering** **Maintaining oral health** **Prevent, monitor and care for wounds** **Meet daily nutritional requirements** **Feed oneself** **Maintain therapeutic medication levels**	**Smart showers, self-care monitoring, sensors bacterial monitoring** **Devices for low vision, poor coordination, hearing** **Personalized dental regimens** **Feedback on at-home oral care** **Smart textiles, diabetic socks** **Systems for skin pressure variations, smart bandages** **Disposable, electrochemical sensors for bacteria** **GPS location for price compare** **Virtual assistant food prep** **Robotic feeding systems** **Adherence sensors, wireless pill Organizers, phone intervention, Smarter medication Reconciliation** **link adherence to EHR**
Cognition	**Cognitive monitoring** **Cognitive Training** **Financial Security**	**Assessing abilities** **Enhance baseline** **Provide Cognitive Rehab** **Prevent Exploitation** **Identify older adults with reduced financial capacity**	**Real-time, frequent, unobtrusive** **Research what works** **Explore tele-rehabilitation** **Adapt online banking interfaces** **Review fraud detection, monitor for indicators of exploitation** **Evaluate identification tech, like wearables, biometrics, geolocation** **Make 'Financial Capacity Instrument' more available**
Communication and Social Connectivity	**Hearing** **Translation** **Social Communication**	**Hear in noisy environments** **Expand acceptance** **And implementations of hearing aids**	**Share audio channels between Hearing aids** **Develop open protocols for communication with other tech** **Develop tech to improve performance in noisy rooms** **Add computational power to Interface with other systems** **Develop open protocols for adjustment – today proprietary** **Enable real-time translation for non-English speakers** **Identify interventions to reduce social isolation, loneliness**

		Translate conversations between physicians and patients **Maintain social connections**	**Promote collaboration between Device manufacturers, academia to design products to address social connection starting in design phase** **Add focus on tech for disabled**
Personal Mobility	**Assisted movement** **Rehabilitation** **Monitoring and Safety**	**Navigate home, neighborhood** **Mechanically compensate for reduced strength, mobility** **Enable in-home rehabilitation** **Monitor movement, activity** **Prevent falls**	**Design robust robots with affordable control systems, learning capabilities** **Develop improved wearable mobility systems** **Explore virtual reality for improving independence** **Improve sensor systems, Algorithms for fall recognition, indoor location detection** **Improve sit-stand transfers** **Use tech for fall prevention Training** **Tech for measurement of reaction time** **Correlate fall risk, management of cognitive decline**
Transportation	**Driving** **Public transportation**	**Assess and maintain driving fitness** **Assist navigation, scheduling** **Facilitate access**	**Develop tools to assess fitness** **Enable 'practicing' unexpected scenarios** **Plan accessible routes** **Notify user if about to make wrong decision** **Develop shared neighborhood vehicle access** **Enable personal profiles for real-time travel support**
Access to Healthcare	**Telehealth** **eCare Planning**	**Improve healthcare access and quality** **Provide smoother care transitions** **Provide self-management support** **Improve coordination of care** **Facilitate shared care planning** **Plan care for complex, high risk patients**	**Evaluate telehealth effectiveness and outcomes for older adults** **Monitor home-to-hospital, intervening before readmittance** **Integrate telehealth, RPM, and medication adherence tech** **Optimize care across settings for primary, specialty, acute care, post-acute care, home care** **Adoption of shared enabled care Planning**