Tech-Enabled Home Care:

What is it? What could it be?

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EXECUTIVE SUMMARY

Growing life expectancy and shrinking assets limit options of older adults in late life, leaving those who may need care more likely to receive it at home. The biggest constraint for this industry is scarcity of willing workers. Although a greater role for technology is envisioned by many, the highly fragmented home care industry has made incremental progress in achieving it. As the industry matures, standard practices and tech-enablement have begun to take shape. With the coming age wave, venture capitalists have been intrigued and funding has exploded, exceeding $200 million by 2016 year end. Tech-enabled innovations can be categorized as helping firms source effectively, manage for retention and provide measurable value. The future of tech-enabled home care will present opportunities and challenges, both for new entrants and long-time players. Checklists, wearables and sensors will help raise the standard of care delivery; worker certification, information and tools will become service differentiators; contracted partnerships will smooth discharge-to-homecare processes.

WHO SHOULD READ THIS REPORT?

This report is relevant to:

- Policy makers and government agencies
- Health care organizations focused on improving care transitions
- Vendors within or considering entry into the market for care-related technologies
- Technology platform providers
- Telecommunication carriers
- Professional home care service providers
- News media
- Social services and non-profits focused on home-delivered care
- Professional geriatric care managers
- Caregivers, seniors, and family members

This report is based on 21 qualitative interviews held with leading experts from each of the segments represented in the report: non-medical care, home health care, geriatric care as well as technology vendors. Special thanks goes to Andrea Cohen, CEO, Houseworks, who provided detailed feedback about the document as well as the visual graphic for the hypothetical process described in Appendix I.

HAS THE FUTURE OF HOME CARE TECHNOLOGY ARRIVED?

As of 2016 year end, longevity is up, income of seniors is not. The recent data published by the CDC notes that, while life expectancy at birth has shortened slightly, US life expectancy at age 65 was unchanged – still more than 20 years for women, 18 for men (see **Figure 1**)[1]**.** But averages don't tell the whole story. As of the last census count, 46% of women age 75+ live alone.[2]

US Life Expectancy at age 65

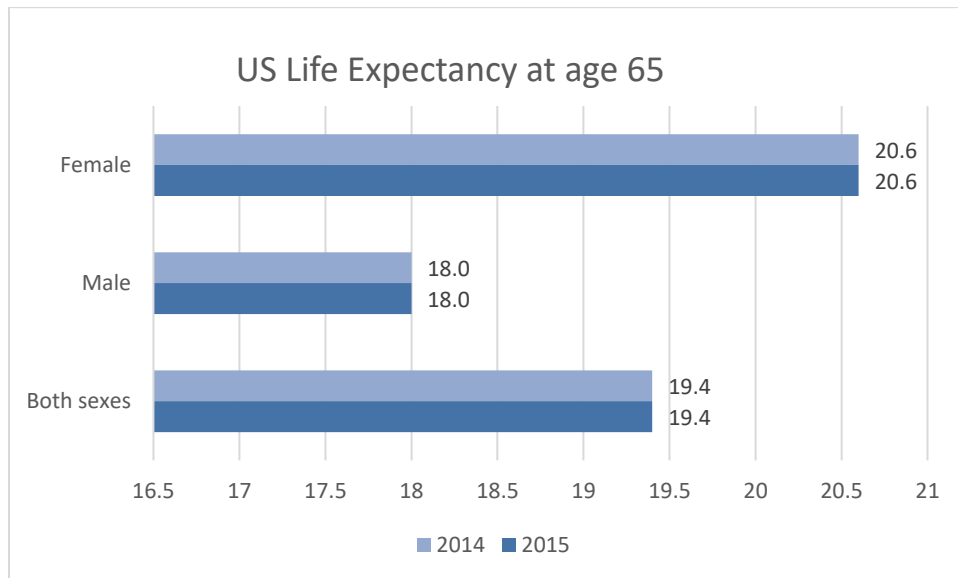|	2014	2015
Female	20.6	20.6
Male	18.0	18.0
Both sexes	19.4	19.4

Figure 1 Life Expectancy at 65, Source CDC, December 2015

Median net worth of oldest adults defers or prevents moves to assisted living. With a median net worth of $156,714, inclusive of home equity, the population aged 75+ cannot afford a long stay in senior living communities.[3] These rents average $3628/month, but swell to $5000/month for memory care – and much more in some urban areas.[4] According to the Alzheimer's Association, as many as 50% of residents residing in assisted living have some sort of dementia or cognitive impairment.[5] For those at risk of wandering, living in a memory care unit boosts the costs beyond $5000/month, exhausting a 75-year-old's assets in just two years. The result? Those who want to move to assisted living communities may defer their move until they are in their mid-80's – consider that the average age of an Assisted Living (AL) resident is 87 and the average stay is 22 months.[6] According to the CDC, 59% of residents move to skilled nursing facilities (SNFs) from Assisted Living.[7]

What about SNFs? Skilled nursing facility (SNF) care is much more expensive – the median price for a private room, for example, in Massachusetts is $12,015/month. Stays are shorter and a substantial percentage will die within the first 12 months.[8] Approximately 1.4 million reside in SNFs as of 2014.[9]
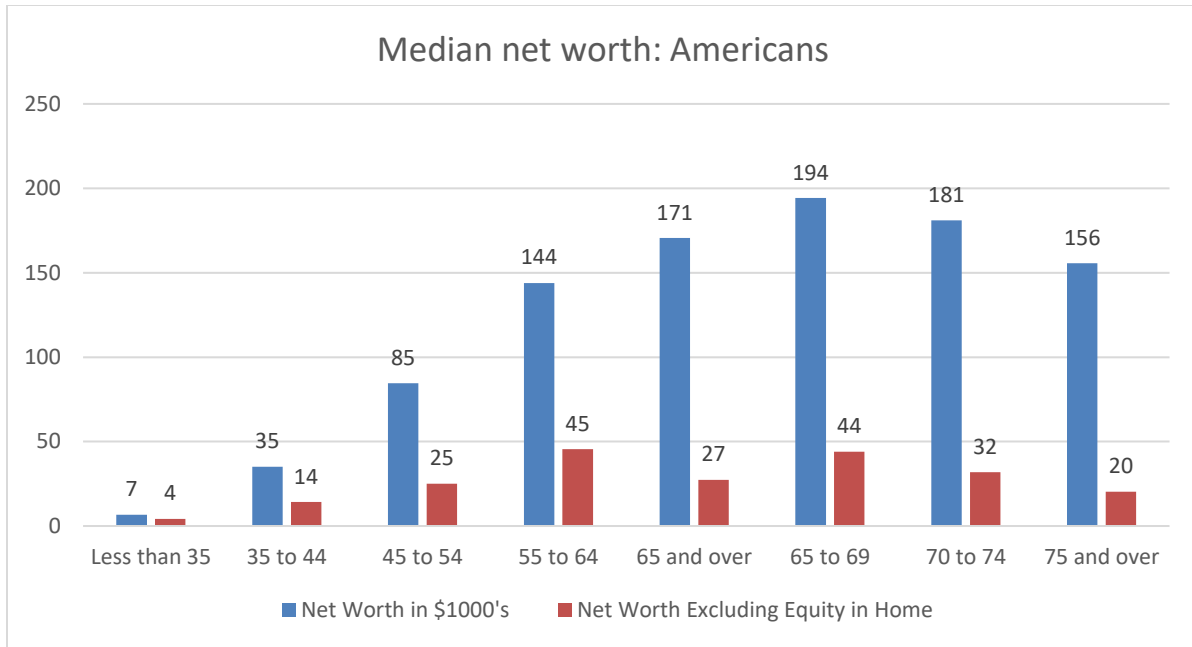
Median net worth: Americans

	Less than 35	35 to 44	45 to 54	55 to 64	65 and over	65 to 69	70 to 74	75 and over
Net Worth in $1000's	7	35	85	144	171	194	181	156
Net Worth Excluding Equity in Home	4	14	25	45	27	44	32	20

Figure 2 Median Net Worth Aged 75+   Source: The Motley Fool, December, 2016 and US Census

For the rest, the only option is to remain at home.   But remaining at home may not be an attractive option as baby boomers age into their 80s and beyond. As AARP predicted in 2013, by the time the boomers arrive in their 80's, just nine years from now, there would be a population deficit of prospective care providers aged 46-64[10] (see **Figure 3**). In some US counties in 2013, that 'stranded' status – too few caregivers for the population aged 80+ – has already arrived.[11]
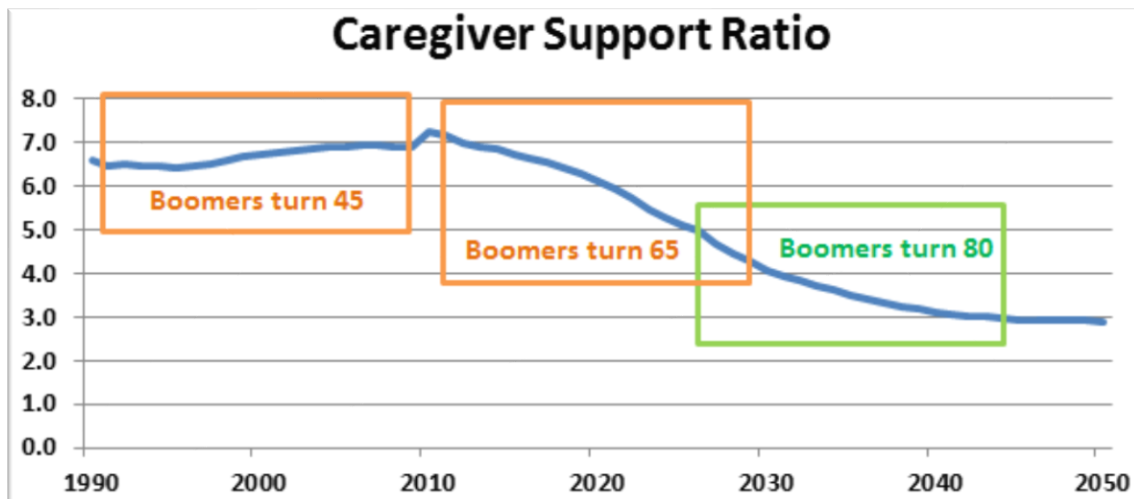

Figure 3 AARP "Aging of the Baby Boom and the Growing Care Gap, 2013"

Home care can fill some of the care gap, but there are no single provider offerings. The home care industry is both booming and fragmented -- it still lacks a dominant industry player**.** In a study released in December 2015, the U.S. Bureau of Labor Statistics (BLS) stated that the compound annual growth rate for home care services, particularly personal care aides, between 2014 and 2024 would be nearly five percent, the highest among all industries.[12] Compare the number of workers that provide direct care (home health aides and personal care aides) to retail – these jobs are low-paying at approximately $11/hour and most would say the work is physically more difficult than other low-paying categories.[13]
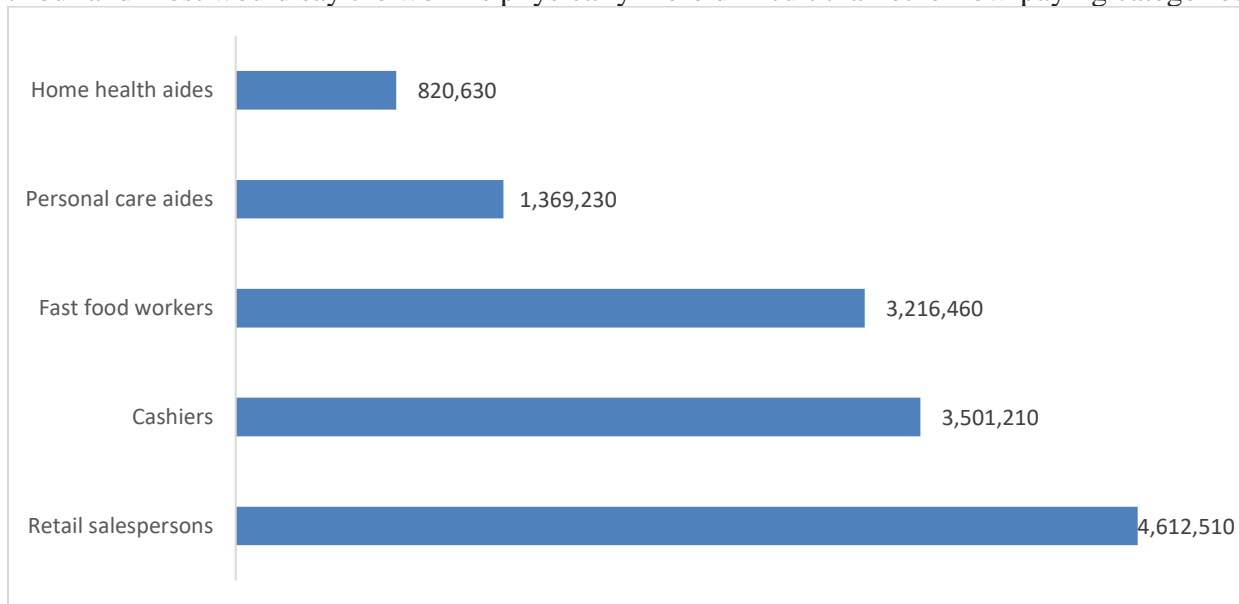

Figure 4 Numbers of people employed in low-paying occupations

In 2012, the future of home care technology was imagined

During 2012, a total of 315 managers representing a broad swath of home care workers were surveyed for a research report sponsored by **Philips**, **Microsoft**, and **LivHOME**.[14] This online survey was created and circulated over several months, with a goal to assess the depth of technology use in their businesses. The results were indicative of the **primitive** state of in-home technology deployment: Cellphones and desktops dominated, with only 24% of managers carrying laptops. Text messaging was a major means of communicating with staff or other managers**.** Although there were often-mentioned home care systems deployed to track hours, billing, payroll and regulatory requirements, these did not have outward-facing portals (only 6%), nor did they provide online status for families – mostly reached by phone and email.

Given the immature status of the industry, interviewees were asked to imagine a different and tech-enabled home and health care world of the future. Given survey responses that imagined the future contrasted sharply with the 2012 reality:

Home Care Status in 2012	2012 Vision for Future Home Care
From…	**To…**
Recipient is treated	Recipient is engaged in their own care
Care recipient (or proxy) integrates own care process	Virtual care is coordinated, integrated on the care recipient's behalf
Repeated assessments at each new care location	Data about recipient is transferred and utilized in next stage of care
Care in the hospital or SNF	Care in the home or setting of choice
Terminology about care status is in the language of provider	Care status is translated into terms that recipient, AL/IL, family understand
Care status is disease-centric	Care status is person-centric, includes self-care, physical activity and ADLs
Incentives favor clinician as primary (and most expensive) care deliverer	With appropriate training and tech support, clinician shares responsibility with home care organizations/staffs
Care is transactional, episodic	Decision-supported, outcome-based
Family initiates inquiries about care	Updated care portals are part of the standard of care
Home monitoring pilots	Home monitoring is standard of care
Discharge to rehab or home	Discharge to home care

Figure 5 The Future of Home Care Technology as seen in 2012

The vision: a different information flow about care

Some of the 2012 research interviewees saw a different tech future – helping to envision a streamlined, linked 'Home Care Information Network, defined as:'

An interconnected set of information about care plan and status, independent of destination, that is about, for, and inclusive of the care recipient, care providers, and designated family members.

Home care workers would be super-charged with useful information. In this nearly five-year-old vision of the future, home care staff would have access to a hierarchy of secure information ranging from medications, health conditions, as well as activities of daily living (ADLs), family members, contacts, social interactions/capability and cognition. Families would have access and be able to securely share pictures, music, and chat conversations – with both the care workers and care recipients.

Care coordination would be an expectation – and was feasible. In 2012, there was no shared data across the care continuum – an elderly person could live at home, with a care companion, in the hospital, in a nursing home, or living in a senior living community. In the envisioned future, there would be some common information built on standard terminology that would be used across each of the transition points – so that care recipients' important information would accompany them.

Informal (unpaid) and formal (paid) care networks would be linked. In 2012, the informal care network, exemplified in software environments like **Caring Bridge** or **Lotsa Helping Hands** would be known resources, available and augmenting the formal caregiving network of home care agencies, private duty workers, geriatric care managers, visiting nurses, and doctors.

TECH-ENABLED HOME CARE TODAY – MAKING THE VISION A REALITY

Prior to 2014, incrementalism characterized the industries' pace of change:

Rising wages reflected scarcity in urban areas – and care cost growth became unsustainable.[15] By 2012, shortages of home care workers were beginning to be detected in various parts of the country – and noted the possibility of removal of what was then called the "Federal Companionship Exemption."[16] By the fall of 2015, the Supreme Court ruled that home care workers employed by agencies were subject to the federal minimum wage, as well as overtime laws.[17]

Marketplaces emerged – unique services began to appear. As an alternative to agency-based pricing, **CareLinx** launched in 2011 as one of the first online marketplaces for finding non-agency home care.[18] An overall home care industry was sized at $22 billion in 2011.[19] Most recently, marketplaces like **Care.com** (with **Home Pay**) and **CareLinx** enable a family (not an agency) to be the employer, providing back office payment and tax reporting features as regulations change.

Family portals were established, if not necessarily marketed, by home care agencies. Are family portals the best mechanism to communicate among care recipients, care providers, and families? Maybe. **ClearCare** launched its family portal software in 2011 – and because many home care agencies use the software, they also have ClearCare's online family portal available. Other software companies like **CareTree** and **AlayaCare** also offer family portals.

A maturing market, the home care franchise industry settled into leader ranks

The in-home care market participants, both franchises and centrally managed, have been relatively unchanged and up until the last few years – with few new entrants. And by February, 2015, leaders in that industry (based on the number of US locations) were identified as **Comfort Keepers, Home Instead, Visiting Angels, Right At Home**, and **Home Helpers**. But another view of leadership that included litigation, turnover rates, and employee satisfaction revealed a different top five. By 2016, "Home care is now the No. 1 target for FLSA and collective action lawsuits," – particularly in New York, Ohio, Maryland and Florida. This degree of instability in the industry may have been another signal of opportunity for newer entrants.[20] That may have factored into the rationale used by venture capital groups to step up their investment -- in the last round alone topping $200 million in 2016 alone. (See **Figure 6).**

And by 2017, what does the term 'home care' mean, anyway? The words 'home care' today do not represent a single, homogenous industry. Instead, today the term is used to mean a broad (and sometimes confusing, often overlapping) set of services, most of them private pay. Care is delivered in the home, but can be supplemental care in assisted living or skilled nursing communities. The workers may represent a range of staff member training levels and certifications, from companion to visiting nurse or doctor. 'Home care' is a term used when doctor-prescribed home health care is what is meant. The services are acquired and delivered through franchises, independent companies, state agencies, state-funded companies, hospital owned teams, marketplaces, and even from online bulletin boards like Craigslist.

Company	Launch	Business	Total VC	Last Round	Investors
ClearCare	2010	Software for homecare agencies	$76M	$60M (8/16)	Battery, McKesson, Bessemer Ventures
Care.com	2006	Online service to find caregivers	$157M	$46M (6/16)	Google, IVP, NEA
Honor	2014	Tech-enabled homecare service	$62M	$42M (8/16)	Thrive Capital, Andreessen Horowitz
Hometeam	2013	In-home care to older adults	$43.5M	$5M (2/16)	Oak HC/FT
Seniorlink	2000	Platform for in-home caregivers	$32.5M	$7.5M (10/16)	NewsSpring, Commonwealth Capital
Caremerge	2010	Online tools for senior communities	$20M	$14M (7/16)	Insight Venture, Cambia Health Solutions
Kindly Care	2014	Apps for arranging care	$6M	$3M (10/16)	MHS Capital, Floodgate
Envoy	2012	Concierge service for seniors	$4M	$1M (5/16)	SoftTech VC, Lowercase Capital

Figure 6 2016 VC investment in home care revs up.   Source: **Forbes, November 16, 2016**

Unique service offerings began to differentiate new firms from existing. Partnerships generate buzz – and also new sources of business. Consider the last year's link-ups with transportation firms -- for example, **24Hour HomeCare** partnered with Uber; AARP Services (**Teledoc** and **CareLinx** among others), and **Honor**'s partnerships with disease-specific organizations, and transporting to medical appointments. Startups **Envoy** (a concierge service for seniors and families) supplement service offerings of non-traditional newcomers – and may seek to partner with them. For example, **Family Private Care**, a Florida-based home care agency, announced Safe At Home, a hospital-to-home program. And **Hometeam**, a mobile-app enabled startup, began taking Medicaid reimbursements in New York City.[21]

 "It is simple economics: there is a growing demand for tools and technologies to help caregivers and care recipients. Some companies see the potential, bringing new solutions to market. VCs race to get on board, reinforcing that they're on to something." – Nancy LeaMond, Executive Vice President and Chief Advocacy & Engagement Officer, **AARP**

Discharge to home care – not just home health care – has become a hospital reality. Medicare-certified hospitals are required to provide discharge planning services, ideally begun when a patient is admitted.[22] Too often these services have been no more than a list of external service providers, intermediaries, acute care facilities, and agencies – with no way to verify capacity, vet backgrounds or validate claims of expertise. Because readmissions are tracked and associated with penalties – hospitals have Medicare-provided incentives to create new strategies. These include placing a patient in observation status which is not included as 'admitted' and therefore not as 'readmitted' if the patient returns. Hospitals are also formalizing a Medicare-reimbursed program for discharge-to-home.[23] This trend has encouraged home care companies to more aggressively market themselves and establish hospital contracts to be preferred providers.[24]

"One of our biggest concerns – more and more payers may use home care, threatening skilled care." – Ed Buckley, **Select Data**

Check-ins, checklists and care recipient risk scoring augment traditional home care processes. In August, 2016, results announced from a Harvard study demonstrated the benefit of a structured check-list about care recipient status at Right At Home franchise locations.[25] The check-list queried whether the client seemed different, for example: "Has there been a change in mobility, eating or drinking, toileting, skin condition or increase in swelling?" Interviewees noted that the questions prompted observations that could help prevent worsening of conditions that could lead to hospitalization.[26]

Meanwhile, **Penrose Senior Care Auditors** launched in 2014 to enable families to verify that care for seniors was appropriate – using its own recruited auditors and record the results in a system.[27] And in 2015 Philips announced results that correlated data from its in-home sensors and pendant usage to predict fall risk and the potential of readmission to the hospital.[28]

"Home care recipients may have dementia – through GPS and an application on a device, systems and services will track whether a door is open." – Roula Vrsic, Chief Marketing Officer, **SOTI**

"The client has changed. More people on complex medication regimens; kids of seniors have complex needs and live further apart, some in mixed marriages – 20 in a family versus five." – Andrea Cohen, CEO, **Houseworks**

Firm	Announced Service	What it Is	Announced Partnerships
AARP Products & Services (ASI)	CareConnection (Portal for Family Caregivers)	Portal for Family Caregivers	with Teladoc, CareLinx, UHC, BistroMD, Hometeam
Honor	In-store Mini Care Consultation	Safety Assessment	Walmart
Comfort Keepers	grandPad	Customized senior tablet	grandPad, Kubi
Right At Home	CareSensus	Predictive Analytics	Philips, tablet in the home
LivHome	24-Hour Remote Care	Acacia Care Network	Kubi Robotic Platform

Figure 7 Examples of announcements from 2015 and 2016

Traditional home care companies see challenges

The home care industry players interviewed for this report and franchise managers at a 2016 Home Care Association of America (HCAOA) event in Anaheim were very aware of the new companies and their well-publicized innovations and partnerships.[29] There was agreement that the new entrants' tech-assisted offerings sounded interesting – and potentially threatening in very specific geographies to their future business. They were also concerned about the eye-popping level of VC-based funding received

by such a small handful of players whose funders saw age 65+ longevity statistics as a future booming market opportunity.

Worried about future marginalization and loss of business – but told "don't sell yet." In such a fragmented industry, where even the leading firm may not have more than 1% of the total market, insiders believe that their own businesses may not be immediately threatened by startups, and that change in the industry is inevitable, with or without any impact from the new companies. As home care M&A advisor Scott Osborne noted: "Just as Uber transformed the taxi industry, so too, the misguided theory goes, it will transform traditional care coordination by creating a caregiver recruiting and retention advantage amid an ever-tightening labor market. But the owner-operator is irreplaceable."[30]

"You cannot Uber-ize home care – there are 17,000 companies in the US. The new companies differ only in terms of capitalization. The key to driving down cost – will be families and privately-paid caregivers. They will manage the care." – Carl Hirschman, CEO, **CareTree**

Future-facing firms envision a boost to home care's value proposition

Population and demand changes are inevitable – get over it. Some think that traditional home care agencies and new players have an opportunity to learn from each other – thus enabling an inefficient industry to scale.[31] They acknowledge the need to find new ways to provide oversight – including methods that combine in-home technology with remotely-delivered oversight. The solutions will need to link family and professional care, link non-homecare services with home care offerings, and convert data into exception-based information.

"Communities of care, social support and services need to transform care at home. They will be inclusive of meals, transportation, social clubs and activities – not 10 apps on your phone." – Andrew Macfarlane, CEO, **CareZapp**

"Family caregivers will not want updates from any technology hour-by-hour. They will only want to be notified if something happens that's relevant to their loved one." – Gail Hunt, **National Alliance for Caregiving**

TECH-ENABLED HOME CARE 2017 – SCARCITY DRIVES INNOVATION

In-home care is an essential service for many families today – and as seniors live longer, despite and also with frailties, the benefits grow, even as the price tolerance may not grow in parallel. As a result, like other industries that have struggled with shortages and inefficiencies, change is underway, though it might be behind the scenes at some large providers. New and existing firms will take advantage of all of the capabilities available – including online marketplaces, structured and collected data and predictive analytics, risk analysis, electronic connections with repeat clients (like hospitals) and partners (like transportation and meal services). With an expanded toolkit that includes owned and partnered technology capability, in-home care companies will be able to:

Source Effectively

Sourced from agencies AND marketplaces. Home care agencies will increasingly study marketplaces as a way to augment staff to accommodate shortages. Home care workers, on the other hand, will accept assignments that accommodate their schedules. Services that may have been done by home care workers (including meals, transportation, errands) may be delivered by other types of 'on demand' services. Caregiver recruiting will be rethought – to enable better matching, flexible team formation. As one executive observed, consolidation does not add to caregiver supply. And pay ranges grow in relation to skill, not to demand (see **Figure 8**).

"The problem is not the caregiver shortage – it's making the right match to bring the client his or her best day. The match (caregiver, resources, technology) measured by the client experience is our industries great opportunity." – Ken McCord, **Comfort Keepers**

"In five years, there will be just two or three private home care marketplaces, used by commercial health care companies (hospitals, Medicare, senior living) trying to backward integrate into home care." – David Inns, CEO, **GreatCall**
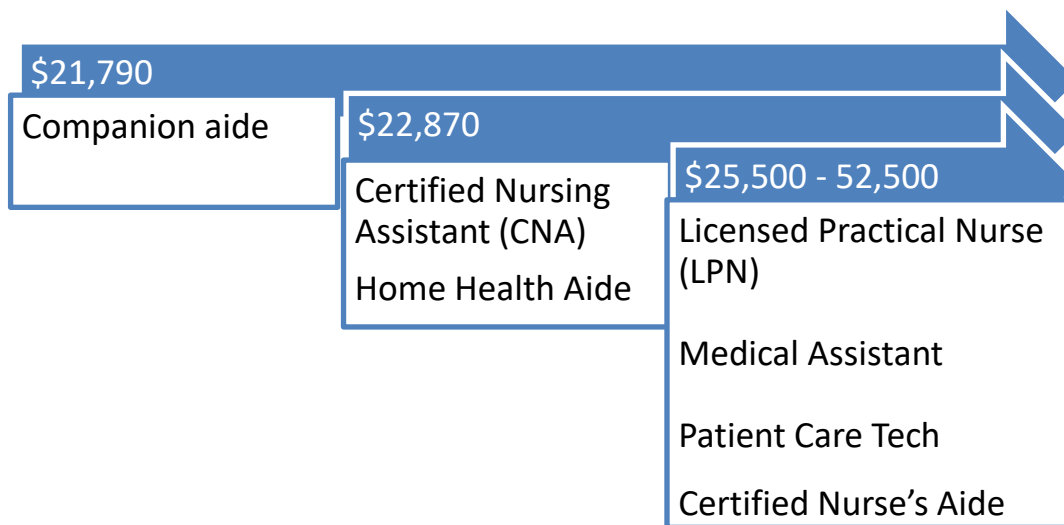

$21,790
Companion aide

$22,870
Certified Nursing Assistant (CNA)
Home Health Aide

$25,500 - 52,500
Licensed Practical Nurse (LPN)

Medical Assistant

Patient Care Tech

Certified Nurse's Aide

Figure 8 Companion aide career paths and pay range**;** Source: BLS, Payscale.com/US

Manage For Retention

The turnover statistics on home care workers are daunting – of 701 providers surveyed by Home Care Pulse's Benchmarking Study, turnover averaged 61% in 2015, with turnover of 100% at the poorest performing agencies.[32] Wages are a factor in high turnover – home care companion aides are among the lowest-paid jobs in the US, though efforts to change are underway. According to the wage-tracking website Payscale, home care companion aide, paid an average of $10.48/hour, is first a step along a possible career path whose next step is Certified Nursing Assistant, starting at only slightly more pay, but also including other career options:[33]

"Focus on the caregiver experience -- attract, recruit, hire, on-board, orient. How to change the fact that the caregiver is more tightly associated with the client than the office?" -- Betty Harris, Vice President RightTEAM, **Right At Home**

Beyond training – how to become the employer of choice? As one top executive noted, agencies must be more respectful of what caregivers want. For example, if hospital discharge to home-care becomes a standard tactic, home care retention can improve with more predictable assignments that fulfill the contracted relationship. Being respectful of what people want may include smarter scheduling based on stated preferences, assignments selected via smartphone, and offering transportation to-from assignments for workers that may not own cars or be able to afford transportation.

"There are opportunities to help more people remain healthy at home, but additional incentives to get more people out of facilities are needed. Remote monitoring will be an important tool for agencies to better address consumer preferences and for using the talent more effectively." – Steve Landers, President & CEO, **Visiting Nurse Association Health Group**

Overseen and supplemented with remote monitoring technologies. In-person care hours may become too expensive for families and too scarce for agencies. One of those ideas being piloted be to add technology for remote monitoring through devices placed in the home, such as the Right At Home/Philips pilot placing an iPad and sensors in the home.

"During the Philips pilot we could watch a care recipient's urinary tract infection come into fruition – bathroom visits had doubled from 8/day to 16/day – and that was without predictive analytics." – Mike Flair, VP Franchise Business Solutions, **Right At Home**

"Activity can be monitored with sensors and used to predict for example, as activity declines, a CHF patient may be having a flare-up." – Mike Dempsey, **Secora Care**, MIT Lecturer

Provide measurable value

Support of caregivers, families, care recipients AND partners is expected. Tech-enabled home care's evolution will evolve, not transform, over time**.** The existing home care franchises and small agencies are not going to fold up their tents and go home. While consolidation is inevitable, the real change will be in their use of any technology infrastructure to provide more efficient and effective care of an aging population. Regulation has made that efficiency a requirement. And family expectations of the nature of care, including transparency of information and ceilings on what they are willing to pay, will drive incremental but noticeable change as:

Marketplaces are used to expand supply and lower cost. The obvious role of marketplaces is to expand apparent supply through registrants sourced online and from multiple geographies, versus the limits of individuals recruited only by agencies. They offer an option for the consumer family to review and select a caregiver from a database of possible caregivers – versus having one selected for them. But these online systems can help reduce the cost of care by leaving out agency's middleman payment processing role. For example, **Care.com's HomePay**ᔆᴹ and the **CareLinx** caregiver-direct models handle the payment process for the family that employs selected caregivers.

"Large providers have to fill sizable contracts across multiple geographies. We can curate the supply side across those geographies – remembering that caregivers are free agents. Agencies will not go away – they will start servicing a smaller share of the total pie." – Sherwin Sheik, CEO, **CareLinx**

'Sharegiving' – links informal and formal care networks. Families want to contribute their time and money, even long-distance care support – and with tech-enabled home care they can receive continuous or exception-based notification of care recipient status. But the home care industry has not traditionally tapped into the informal care networks established by non-profits such as **CaringBridge** (establishing circles of care) or the **Cancer Action Network** – a cancer-related advocacy non-profit staffed with volunteers. However, as **Honor** demonstrated with its partnership licensing training content from the American Cancer Society for its Care Pros, partnerships with non-profits can happen.

"From an innovation standpoint, Home Instead is focused on finding and bringing to market 10x opportunities that increase the world's capacity to care. We have the opportunity to not just find and train more paid caregivers, but to get the family, care circle, and seniors themselves involved." – David Weigelt, VP Innovation, **Home Instead Senior Care**

Craft strategic partnerships for resource predictability and improved service. Increasingly, pre-contracted partnerships with suppliers and nurse staff agencies will replace in-house stockpiling and potentially under-utilized staff. It is in the interest of hospitals and long-term care facilities like AL and SNFs to craft contracted partnerships with home care organizations. Because hospitals are incented to discharge-to-home (with appropriate care), they benefit from arranging these partnerships by crafting contracts in advance. Other types of partnerships beyond transportation can include just-in-time meal and supply delivery, durable medical equipment, prescription refills, as well as supplemental staffing.

"Our Concierge offering is an enterprise solution: it allows organizers to request rides on behalf of passengers and can arrange for multiple rides -- whether on-demand or prescheduled."– Gyre Renwick, Head of Enterprise Healthcare Partnerships, **Lyft**

Provide professionals and families with better tools and experiences…With greater longevity comes care complexity. Agencies have tended to bring on resources and equipment to meet every type of need, whether it is staffing a nurse for care assessments or home medical equipment for training staff on its use. Franchises will join together in geographic clusters to leverage what they have – and what they need, supported by tech platforms. And family expectations will continue to rise to match levels of service experiences in other areas of their lives.

"In our surveys of home care agency clients over the past three years, we have not seen a percentage change. The perception of office staff last year was poor and remains that way." – Erik Madsen, COO, **Home Care Pulse**

TECH-ENABLED HOME CARE – LOOKING AHEAD TO 2.0

The fiefdoms and market fragmentation that characterize home care will have to change. Why? Despite chronic diseases and inadequate assets, the population of seniors requiring care will continue to balloon.[34] The implications for the home care industry? Staff resource scarcity and turnover, regulatory and wage pressure, and changing client expectations, provide some early signals. If this period, as one interviewee noted, is Tech-Enabled Home Care 1.0, what did interviewees believe could and should happen over the next five years to accelerate the emergence of Tech-Enabled Home Care 2.0?

1. **A continuum of care will have a continuum of contracted partnerships.** Each side of the partnership will have an upside that makes partnering appealing to business leaders. Hospitals are striving to reduce the risk of readmission through discharged-to-home-care programs. Rather than manage multiple and fragmented relationships, these programs will be formalized with home care companies, who in turn will partner for the service elements they cannot directly provide, such as transportation, meal and supply delivery.

"Discharge programs that extend hospital services will result in multiple contracts with larger home care companies. As care moves into the home, hospitals will focus more on education and prevention." – Kyle Hill, Co-Founder, **Home Hero**

2. **Viewable information and tools for families will be service differentiators.** In its 2016 Caregiver Innovation Frontiers report, AARP presented six categories of technology that would be needed to support family caregivers.[35] Care coordination was one of those categories – and supporting care coordination software is a relatively recent market category. According to AARP, "only 2-3% of patients with chronic conditions have reported receiving support from a care coordinator" – representing a strategic opportunity recognized by the home care industry.

"Transparency and collaboration among agencies across the healthcare continuum has a massive impact on outcomes and costs; it will be a game changer for the home care industry. One company cannot do it all."– Geoffrey Nudd, CEO, **ClearCare Online**

3. **Wearables and sensors will become standard in both home and home healthcare.** While the use of Personal Emergency Response System (PERS) devices has long been accepted, the use of the next generation of so-called fitness wearables and in-home motion sensors will likely be recommended (and perhaps prescribed) by doctors and checked by in-home care providers – noting vital signs, and whether the patient stood up and walked. [**See Appendix I Scenario**]

"We are evolving our thinking beyond the frail and elderly towards managing the aging journey – for the top 10 chronic diseases, the disease period will be decades long. People own their aging journey." – Paul Adams, Senior Director, Product Management, **Philips Home Monitoring**

4. **All home care aides will be certified to provide a higher standard of care.** The government reimburses for home health aides, they are required to have "successfully completed a training program approved by the Secretary."[36] The federal overtime rule in home care may trigger a national standard certification for home care workers and a set of standards applied to care. And home care workers will command the respect that their profession deserves and requires.

"Care managers will become more commonplace, i.e. for long-distance relationships. You wouldn't do your taxes without an accountant." – Jody Gastfriend, VP of Senior Care Services, **Care.com**

5. **Tech-enabled home care services will be self-funding and profitable.** While startups launched in a wave of venture capital investment, they will ultimately need to become profitable -- or be acquired by companies that are profitable. Becoming profitable will be dependent on managing the right mix of work between in-home direct care with tech-enabled oversight and services.

"We can provide 24x7 care that includes video calling, and reminders for medications and events. The goal moving forward will be to increase the number of touches with this active engagement." – Mike Nicholson, Chairman, **LivHome**

6. **Standard check-out home care procedures will be paperless and include checklists.** Home care agencies have long been familiar with home safety checklists – looking for ways to help the care recipient stay safely at home.[37] Moving forward, other home care agencies will review the Harvard study that demonstrated the utility of an interactive voice response (IVR) health status checklist and adopt the checklist approach as a way to help avoid hospital readmission of clients. Graphical interfaces will be provided that make it easier in multi-lingual situations to communicate between care deliverer and family or other providers.

"Most payers, have come to expect digital, real time proof of service. State Medicaid waiver programs for home and community based services need to recognize the value of technologies that lead to less fraud and better patient outcomes." – Lisa Ferden, **Generations Homecare System**

7. **Families are empowered to participate in and make more decisions.** In the future, families will play a greater role in decision-making, and home care organizations will want them more involved. This can include, but not be limited to tailoring a care plan, identifying and communicating with a circle of care, determining the scope of their own role is in caregiving, and participating in end-of-life decision-making. Consider a few possibilities: [See **Figure 9**].

Home Care Status in 2017	Tech-Enabled Home Care
From…	**To…**
Care recipient (or proxy) still integrates own care process	Care coordination software is adopted as a standard role-based platform
Hospital discharge offers a list of in-home care providers	Using an online system, patients are discharged to contracted in-home care
Assessments are done at each new care location	Data about recipient is online, secure and utilized in next stage of care
Care circle is notified of care status changes	Through online assignments, care circle collaborates to provide care
Care status updates are provided by phone and through portal	Care status is offered via multiple interface options, including voice
Home care check-in, check-out tools track the worker	Condition-specific checklists used to track patient change, predict issues

Figure 9 The Future of Tech-Enabled Home Care as seen in 2017

Interviewees

Paul Adams, Senior Director, Product Management, Philips Home Monitoring
Ed Buckley, CEO, SelectData
Andrea Cohen, CEO, HouseWorks
Mike Dempsey, Founder, Secora, Lecturer, MIT, Harvard
Lisa Ferden, VP IDS, Generations Homecare System
Mike Flair, VP of Franchise Business Solutions, Betty Harris, VP Right Team, Right At Home
Jody Gastfriend, VP Senior Care Services, Care.com
Kyle Hill, Co-founder and CEO, HomeHero
Carl Hirschman, Founder, CareTree.me
Gail Hunt, National Alliance for Caregiving
David Inns, CEO, GreatCall
Dr. Steve Landers, President and CEO of the Visiting Nurse Association Health Group, Inc.
Nancy LeaMond, Executive Vice President and Chief Advocacy & Engagement Officer
Andrew Macfarlane, Co-Founder & CEO, CareZapp
Erik Madsen, COO, Home Care Pulse
Ken McCord, Senior. Director, Operations Services, Comfort Keepers
Mike Nicholson, Executive Chairman, Rick Slager, CEO, LivHome
Geoffrey Nudd, Founder and CEO, Clear Care Online
Gyre Renwick, Head of Healthcare, Government & Education Partnerships, Lyft
Sherwin Sheik, CEO, CareLinx
Roula Vrsic, Chief Marketing Officer, Matthew Reeder, Regional Sales Manager, Soti
David Weigelt, VP Innovation, Home Instead Senior Care

"Adult children are tech-proficient and want to run their parents' care like their businesses." – Andrea Cohen, CEO, HouseWorks

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, as well as testifying before the US Senate in 2015 on the role of technology for aging in place. Her perspectives have been quoted in Business Week, Forbes, Kiplinger, 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 research reports include **Next Generation Response Systems (2013), Challenging Innovators to Design for the 50+ (2014),** and **Baby Steps: Will Boomers Buy Into Mobile Health? (2015)** as well as the annually updated **Technology for Aging in Place Market Overview (2016).**[38]

Appendix I TECH-ENABLED HOME CARE Scenario

OPEN SHIFT

Supervisor scans the morning's check-ins and service requests. Worker is a no show; shift needs to be filled. No available workers can cover.
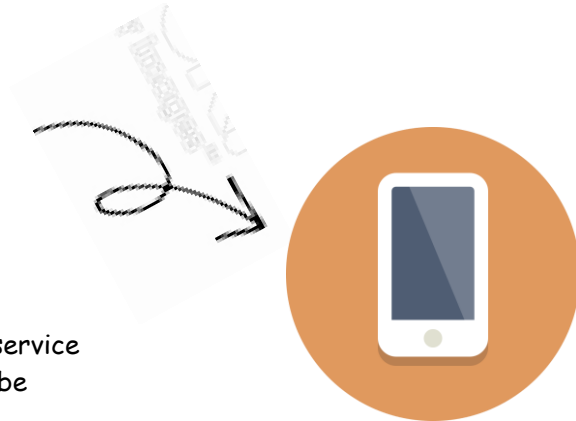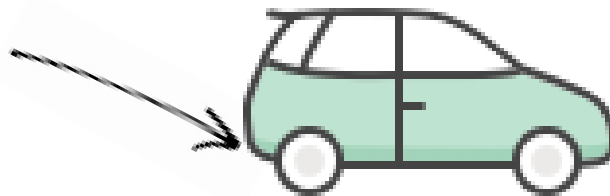
CLICK INTO A MARKETPLACE

He expands search using his *All-Care app*, reviews the skill profiles of the available workers and finds several who are qualified.

REQUEST CAREGIVER

Supervisor pushes out request—signaling the activation light — a button on a standard wearable device that alerts available workers.

IDENTIFY AND DEPLOY WORKER

Supervisor dispatches ride-share service to pick up worker, provides a smartphone-viewable video care plan, dispatches grocery delivery service, and speaks to worker while in route. For filling last minute request, worker gets 'urgent care' pay and incentive points to be traded for goods and services.

COMPLETE SHIFT

Worker rings electronic doorbell. Client 'speaks' a release instruction to her Amazon Echo to let worker in. Worker reviews checklist on the secured tablet, refills meds with client and arranges for immediate med tray delivery. Upon leaving, worker completes tablet-based checklist and uses her smartphone to request a ride pick up. Shift billed to the client's account and the family members are notified.

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