

## A Platform for Aging in Place: The Increasing Potential of High-speed Internet Connectivity

*Christopher Baker*  
AARP Public Policy Institute

*Liz Seegert, MA*  
Center for Health, Media and Policy, Hunter College

**Information and communication services, delivered over a high-speed Internet connection, increase the potential for older adults to live independently, safely, and comfortably in their own homes. However, few older adults have a home Internet connection that can support these services. Federal, state, and local policy makers should promote high-speed Internet connectivity as an aging-in-place solution.**

### An Aging-in-place Disconnect

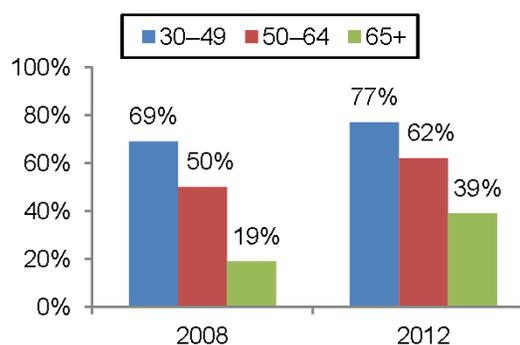
Older adults represent the fastest growing segment of the U.S. population, a trend that will have an unprecedented impact on society. High-speed Internet connectivity, often referred to as “broadband,” supports a growing array of applications and services with significant potential to help older adults live more independent and meaningful lives. In fact, the availability and use of these technologies and services may mean the difference between aging in place and aging elsewhere.

Unfortunately, many older adults do not have access to, or cannot afford, the high-speed Internet connectivity necessary to support many of the most promising aging-in-place solutions. Older adults are less likely than any other age group to have high-speed Internet access at home (See Figure 1).<sup>1</sup> As a result, millions of older adults lack an important platform to keep pace with our evolving health care system, maintain optimal health, and age comfortably in their own homes at lower cost.

### Emerging Aging-in-place Solutions

Improvements in network technology in recent years have led to higher-speed Internet connections and access to applications with larger data requirements, such as videoconferencing, audio and video streaming, and cloud data storage.<sup>2</sup> The integration of these and other technologies with various devices and systems in the home creates opportunities to expand access to primary and preventive health care, and to make that care more efficient, flexible, and cost-effective for consumers, clinicians, and family caregivers.

**Figure 1**  
High-speed Internet at Home, by Age



Source: Pew Internet & American Life Project Surveys, April 2008 and April 2012

Some of the more promising applications involve video-based virtual visits with clinicians and family caregivers, automation of routine home activities, and in-home monitoring for older adults with limitations in activities of daily living.

### Virtual Visits

Two-way video conferencing, or virtual visits, reduce logistical and time constraints for routine exams or office visits, while still providing clinicians with real-time verbal and visual assessments. Videoconferencing allows consumers and providers to interact in ways that a telephone call cannot.<sup>3</sup> Access to specialists is one of the greatest benefits of remote medical care; specialists from anywhere in the world can be conferenced in without the time, expense, or travel considerations required for in-office consults.<sup>4</sup>

In Cleveland, Ohio, residents of Judson Manor, a retirement home community,

access high-definition, multipoint videoconferencing to engage in 10- to 15-minute virtual visits with their health care professionals from the comfort of their homes. These diagnostic and treatment services are enabled by the local community's ultra-high-speed network and provided as part of a project conducted by researchers at Case Western Reserve University.<sup>5</sup>

### Home Health Monitoring

Remote or home health monitoring refers to the use of information and communication technologies to enable health monitoring beyond the traditional clinical settings. Remote monitoring encompasses a broad range of technologies and interactions, from a telephone call with a health care provider to a more advanced system of Internet-connected monitoring devices and in-home sensors.

Remote health monitoring can help improve chronic disease management

### Chronic Conditions Challenge the Independence of an Aging Population

- There are more than 40 million adults aged 65 and older in the United States, and every day another 10,000 adults reach that milestone.
- The vast majority of older adults want to continue living in their own homes for as long as possible.\*
- Older adults suffer disproportionately from significant and costly chronic diseases, such as hypertension, diabetes, or arthritis.\*\*
- Among adults aged 65 and older, 84 percent have at least one chronic condition, and 45 percent have two or more.\*\*\*
- Chronic diseases account for 70 percent of all deaths in the United States and 75 percent of its health care spending.\*\*\*\*

\* T. Keenan, "Home and Community Preferences of the 45+ Population" (Washington, DC: AARP, November 2010).

\*\* National Center for Health Statistics, "Use of the Internet for Health Information: United States, 2009," NCHS Data Brief 66 (July 2011), pp. 1–8.

\*\*\* Ibid.

\*\*\*\* Centers for Disease Control and Prevention. *Rising Health Care Costs Are Unsustainable*. April 2011.

through better data collection, more frequent consumer/clinician interactions, and more timely interventions.<sup>6</sup> For example, regular collection of blood pressure, weight, heart rate, or glucose levels provides clinicians with a more accurate and complete picture of health status or disease progression.<sup>7</sup> Daily health reports can be accessed by family or professional caregivers, or uploaded to a person's electronic health record.<sup>8</sup>

Remote health monitoring programs have helped to reduce hospital readmission rates; they also are associated with shorter lengths of stay, lower costs, improvement in some physiologic measures, higher rates of satisfaction, and better medication adherence.<sup>9</sup> Studies of home monitoring programs show specific improvements in the management of hypertension, congestive heart failure, and diabetes.<sup>10</sup>

High-speed Internet connectivity has the potential to expand the capacity of remote health monitoring to track and manage the health and safety of older adults. The greater capacity can improve the quality of potential monitoring solutions by enabling more advanced, data-intensive applications, such as real-time, three-dimensional monitoring of a patient's gait to detect the risk of falling, or remote visual monitoring to detect medication reactions or behavioral issues.<sup>11</sup>

### Home Automation

Innovative "smart homes" integrate technology and services to help older adults maintain health status or to alert professional or family caregivers to abnormal situations, as well as to assist the visually, hearing, or cognitively impaired.<sup>12</sup> Programmable sensors can turn off the stove after a certain period of time; track when the medicine cabinet is opened; monitor movement—or lack of it—which may indicate a fall or other adverse health event; or even track how frequently a person gets up in the middle

of the night. Specific algorithms trigger alerts or call for emergency help.<sup>13</sup> Although many of these individual applications do not require large amounts of bandwidth by themselves, the simultaneous use of multiple services and applications may require high-speed connectivity to operate effectively.

### Caregiver Support

Tens of millions of Americans provide unpaid care—either full time or part time—for an older adult or person with chronic or disabling conditions. While caregiving for a family member can be a rewarding experience, the emotional, physical, and financial burdens of juggling family, work, and caregiving can also be overwhelming.

A recent AARP Public Policy Institute report noted the importance of clinician and family caregiver interaction and information sharing, and called for developing new approaches that blend technical and communication skills training.<sup>14</sup>

To help ease the burden on strained family caregivers and clinicians, the Institute of Medicine (IOM) recommended exploring the use of assistive technology devices and applications.<sup>15</sup> The IOM believes that technology may help family caregivers keep older adults independent and safe.

As part of a pilot project in Kansas City, Kansas, family caregivers of people living with dementia use in-home video monitoring technologies to help them manage difficult or disruptive behavior.<sup>16</sup> An initial version of the pilot project provided family caregivers with a laptop computer and a remote control to capture their caregiving experiences on video. A team of health care professionals reviewed these recordings on a weekly basis, and then met with the family caregiver, either in person or by

telephone, to discuss better ways of handling difficult situations.

Building on the success of the first pilot project, researchers at the University of Kansas Medical Center have initiated a second pilot project to explore more advanced technology and how it might help family caregivers provide better care in the home.<sup>17</sup> The project will have access to Kansas City's new ultra-fast fiber-optic network and use a more sophisticated in-home monitoring system capable of supporting the use of high-definition video and a range of real-time applications.

**Policy makers should act now to ensure that all citizens have affordable access to high-speed connectivity**

As the U.S. population continues to age, high-speed networks can be a valuable platform to make the world more accessible, providing convenient pathways to the resources, activities, and services that empower older adults to live healthy, independent, and meaningful lives.

Regrettably, current Internet infrastructure in much of the United States is inadequate to support the widespread use of an increasingly diverse set of promising applications, services, and devices for aging in place. Millions of Americans live in areas where high-speed Internet access is unavailable at any price.<sup>18</sup> In other areas of the country, where high-capacity Internet access is available, it is typically costlier and slower than in many other developed nations.<sup>19</sup>

Annual reports to Congress continue to show that high-speed Internet deployment in the United States has not occurred in a reasonable and timely manner.<sup>20</sup> Moreover, traditional cable and telephone companies—the dominant Internet service providers in the United States—face little competitive pressure to increase their connection speeds, cut

their prices, or expand their networks into rural areas.<sup>21</sup>

Rather than just waiting for private companies to act, policy makers should consider proactive strategies to ensure citizens everywhere have affordable network connectivity that can reliably and consistently deliver all of the applications and services they want and need now and in the future. Already, hundreds of cities and towns across the United States have started their own high-speed networks.<sup>22</sup> This group includes more than 40 communities in 13 states that offer 1 gigabit per second Internet speeds, which is nearly 100 times faster than the typical broadband Internet connection in this country.<sup>23</sup> However, major commercial Internet providers oppose this type of local government involvement and have convinced 19 state legislatures to adopt restrictions that prevent or discourage cities or towns from owning or operating high-speed Internet networks.<sup>24</sup>

**Policy makers should promote high-speed connectivity as an aging-in-place solution**

Policies to facilitate aging in place often focus on long-term care and health services in the home; safe, affordable, and accessible housing; transportation options; and the availability of nearby services. However, practitioners and policy analysts increasingly recognize that addressing the needs of a rapidly aging population will require more comprehensive and coordinated strategies, including new and innovative approaches to making aging in place a more realistic option for many people.<sup>25</sup> The goal of universal, affordable high-speed connectivity should be an aging-in-place priority as well.

Federal, state, and local policy makers should promote high-speed Internet connectivity as an aging-in-place solution:

- Make the goal of universal, affordable high-speed connectivity a top aging-in-place priority and integrate it into the decisions, policies, and actions that occur across various areas and levels of government to facilitate aging in place.
- Convene policy summits or conferences, or other appropriate forums, to draw attention to high-speed connectivity as increasingly essential infrastructure for supporting aging in place, family caregiving, and optimal health.
- Conduct pilot projects that specifically demonstrate the potential of high-speed connectivity as a platform to help people age in place more successfully.

---

### Endnotes

<sup>1</sup> K. Zickuhr and M. Madden, *Older Adults and Internet Use: For the First Time, Half of Adults Ages 65 and Older Are Online*. (Washington, DC: Pew Internet & American Life Project, 2012). Accessed at [http://pewinternet.org/~/media/Files/Reports/2012/PIP\\_Older\\_adults\\_and\\_internet\\_use.pdf](http://pewinternet.org/~/media/Files/Reports/2012/PIP_Older_adults_and_internet_use.pdf).

<sup>2</sup> C. Baker, *A Connection for All Ages: Enabling the Benefits of High-Speed Internet Access for Older Adults*. (Washington, DC: AARP, March 2013). Accessed at <http://www.aarp.org/home-family/personal-technology/info-03-2013/benefits-of-high-speed-internet-access-for-older-adults-AARP-ppi-cons-prot.html>.

<sup>3</sup> Institute of Medicine, *The Role of Telehealth in an Evolving Healthcare Environment Workshop Summary* (T. A. Lustig, Ed.) (Washington, DC: The National Academies, 2011).

<sup>4</sup> A. K. Hall, M. Stellefson, and J. M. Bernhardt, “Healthy Aging 2.0: The Potential of New Media and Technology,” *Preventing Chronic Disease* 9(E67) (2012). doi:10.5888/pcd9.110241.

<sup>5</sup> National Science Foundation, *Next Generation High Definition Videoconferencing Will Provide Immediate Public Benefits*, January 31, 2013. Accessed at [http://www.nsf.gov/discoveries/disc\\_summ.jsp?cntn\\_id=126700&org=NSF](http://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=126700&org=NSF).

<sup>6</sup> H. G. Kang, D. F. Mahoney, H. Hoening, V. A. Hirth, P. Bonato, I. Hajjar et al, “In Situ Monitoring of Health in Older Adults: Technologies and Issues,” *Journal of the American Geriatrics Society* 58(8) (2010), pp. 1579–1586. doi:10.1111/j.1532-5415.2010.02959.x.

<sup>7</sup> M. Crawford, “Smart Homes Lay Foundation for Aging-in-place,” *Future Age* 8(4) (2009), pp. 36–38.

<sup>8</sup> J. Najjar and J. A. Bourquard, “High Tech Health Care,” *State Legislatures* 38(10) (2012).

<sup>9</sup> Institute of Medicine, *Digital Infrastructure for the Learning Health System* (Washington, DC: National Academies Press, 2011), pp. 1–4.; Center for Technology, Aging, *Technologies for Remote Patient Monitoring for Older Adults* (Oakland: Center for Technology and Aging, 2010), pp. 1–30.

<sup>10</sup> Institute of Medicine, *The Role of Telehealth in an Evolving Healthcare Environment Workshop Summary* (T. A. Lustig, Ed.) (Washington, DC: The National Academies, 2011).

<sup>11</sup> National Science Foundation, *Sensor Network to Protect the Elderly* (December 6, 2012). Accessed at [http://www.nsf.gov/discoveries/disc\\_summ.jsp?cntn\\_id=126247](http://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=126247); Monash University, *Potential Telehealth Benefits of High Speed Broadband* (2011). Accessed at [http://www.dbcde.gov.au/\\_data/assets/pdf\\_file/0009/145584/Potential-telehealth-benefits-of-high-speed-broadband.pdf](http://www.dbcde.gov.au/_data/assets/pdf_file/0009/145584/Potential-telehealth-benefits-of-high-speed-broadband.pdf).

<sup>12</sup> Economics Statistics Administration, National Telecommunications and Information Administration, *Exploring the Digital Nation* (R. M. Blank & L. E. Strickling, Eds.) (Washington, DC: U.S. Department of Commerce, 2011), pp. 1–72.

<sup>13</sup> J. Najjar and J. A. Bourquard, “High Tech Health Care,” *State Legislatures* 38(10) (2012).

<sup>14</sup> S. Reinhard, C. Levine, and S. Samis, *Home Alone: Family Caregivers Providing Complex Chronic Care* (Washington, DC: AARP Public Policy Institute, October 2012).

<sup>15</sup> K. M. Daniel, C. L. Cason, and S. Ferrell, “Emerging Technologies to Enhance the Safety of Older People in Their Homes,” *Geriatric Nursing* 30(6) (2009), pp. 384–389.

<sup>16</sup> C. Ast, *New Study Uses Technology to Help Families Caring for Alzheimer’s Patients* (June 14, 2012). Accessed at <http://www.kumc.edu/news-listing-page/kristine-williams-develops-in-home-monitoring-system.html>.

<sup>17</sup> MozillaIgnite, *In-Home Monitoring in Support of Dementia Caregivers* (October 4, 2012). Accessed at <https://mozillaignite.org/apps/380/>.

<sup>18</sup> Federal Communications Commission, *In the matter of inquiry concerning the deployment of advanced telecommunications capability to all Americans in a reasonable and timely fashion, and possible steps to accelerate such deployment pursuant to section 706 of the Telecommunications Act of 1996, as amended by the Broadband Data Improvement Act*, Eighth Broadband Progress Report (Washington, DC, 2012). Accessed at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-12-90A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-12-90A1.pdf).

<sup>19</sup> E. Porter, “Yanking Broadband from the Slow Lane,” *New York Times* (May 7, 2013). Accessed on May 8, 2013 at <http://www.nytimes.com/2013/05/08/business/google-project-may-spur-broadband-competition.html>.

<sup>20</sup> FCC. Eighth Broadband Progress Report. (2012).

<sup>21</sup> D. Talbot, “When Will the Rest of Us Get Google Fiber?” *MIT Technology Review* (February 4, 2013). Accessed at <http://www.technologyreview.com/news/510176/when-will-the-rest-of-us-get-google-fiber/>.

<sup>22</sup> K. Finley, “Why Your City Should Compete With Google’s Super-Speed Internet,” *Wired* (May 28, 2013). Accessed on May 29, 2013, at <http://www.wired.com/wiredenterprise/2013/05/community-fiber/>.

<sup>23</sup> See the Institute for Local Self-Reliance’s Community Network Map at <http://www.muninetworks.org/communitymap>. Accessed on May 29, 2013.

<sup>24</sup> O. Sylvain, “Broadband Localism,” *Ohio State Law Journal* 73(4) (2013).

<sup>25</sup> Bipartisan Policy Center, *Housing America’s Future: New Directions for National Policy* (Washington, DC: 2013). Accessed at [http://bipartisanpolicy.org/sites/default/files/BPC\\_Housing%20Report\\_web\\_0.pdf](http://bipartisanpolicy.org/sites/default/files/BPC_Housing%20Report_web_0.pdf).

Insight on the Issues 84, July, 2013

AARP Public Policy Institute,  
601 E Street, NW, Washington, DC 20049  
[www.aarp.org/ppi](http://www.aarp.org/ppi).

202-434-3910, [ppi@aarp.org](mailto:ppi@aarp.org)

© 2013, AARP.

Reprinting with permission only.