Housing for an Aging Population

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ABSTRACT

We use the American Housing Survey to examine the distribution and occupancy of homes that have, or could be modified to have, accessibility features that allow seniors to successfully remain in the community as they age. Despite the aging population and the growing need for accessible housing, the U.S. housing stock is woefully inadequate: fewer than 4% of housing units could be considered livable by people with moderate mobility difficulties, and a miniscule fraction are wheelchair accessible. Recent construction is no more likely to be accessible than homes built in the mid-1990s, suggesting that the housing market is not responding to the aging demographic profile. Only a small fraction of seniors, even among those with mobility difficulties, and even among recent movers, live in suitable homes. Modifications that potentially improve accessibility are more likely undertaken by households with a senior, but only once that senior develops mobility difficulties.

The share of the U.S. population age 65 and older has grown disproportionately over the past century, and that trend is projected to continue for several decades to come. In the 2010 decennial census, 13% of the population was age 65+, but this is projected to increase to 21% in 2040 (U.S. Census Bureau, 2014). Furthermore, there is an aging profile even within the older population, with people age 85+ becoming an increasing fraction of those age 65+.

Most older adults express a desire to remain in their homes and community for as long as they can. For example, a widely reported 2010 AARP survey found that 88% of respondents age 65 or above agreed with the statement "What I'd really like to do is stay in my current residence for as long as possible," and 92% agreed with "What I'd really like to do is remain in my local community for as long as possible."[1] Other research has corroborated the important emotional benefits that seniors derive from a sense of attachment to and familiarity with their home and community.[2]

This has important implications for the U.S. housing stock as the process of aging is associated with an increasing likelihood of disability. Data from the American Community Survey (ACS) show that disability is much more prevalent among the senior population, and the rates rise rapidly with age. As illustrated in Figure 1, 17% of individuals age 65 to 74 have serious difficulty walking or climbing stairs, but this rises to 53% for those age 85 or above. Thus, if this aging population is to remain in the community, they will require housing that is suitable for people with mobility difficulties. The need is even greater for seniors living alone because they will not have other household members around to help them.

Accessibility-improving housing features are not only remedial but have been shown to help prevent disabilities. Falls are a common adverse health event for older adults that can lead to injury,

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hospitalization, and disability.[3] Devices such as grab bars in the shower and rails along steps are specifically designed to assist in mobility and to prevent falls. Homes with fewer steps and wide doors and hallways are easier to navigate and can therefore also prevent falls. Eriksen, Greenhalgh-Stanley, and Engelhardt (2015) find that home accessibility features reduce the likelihood of a fall requiring medical treatment by 20 percentage points for elderly widows and widowers. Their findings are corroborated by randomized controlled trials.[4] Thus, as well as being helpful to those with mobility difficulties, having accessibility features in the home can prevent such difficulties from occurring in the first place.

The benefits of accessible housing further extend to financial savings from the cost of long-term care services that provide assistance with essential aspects of life. An aging population will increase the demand for long-term care services. The cost of these services is far higher in an institutional setting compared with care that is provided at home, and is rising more rapidly in the former.[5] Not surprisingly, the likelihood of residing in a nursing home rises rapidly with age,[6] and nursing home residents are disproportionately likely to have disabilities.[7] Accessible housing features can reduce spending on institutional long-term care by helping seniors and their caregivers with performing activities of daily living in their own homes, and thus avoid costly nursing homes. For example, a caregiver can more easily assist a person with mobility difficulties in moving from room to room when there are wide doorways in the home. Most of the care provided to older adults is informal, coming from family and friends—most commonly, spouses and adult daughters (Kaye, Harrington, & LaPlante, 2010). Although unpaid, the economic value of these informal services is substantial, and has been estimated by the Congressional Budget Office to be worth more than the value of all formal long-term care services.[8] The reduction in caregiver effort offered by appropriate structural elements may affect the decision to seek formal paid care, whether in the home or otherwise.

A related issue is that most seniors do not have the resources to pay for the high cost of long-term care out of pocket, nor do they have long-term care insurance (Brown & Finkelstein, 2011). Instead, two thirds of long-term care expenditures are covered by Medicaid and Medicare.[9] In recent years, Medicaid
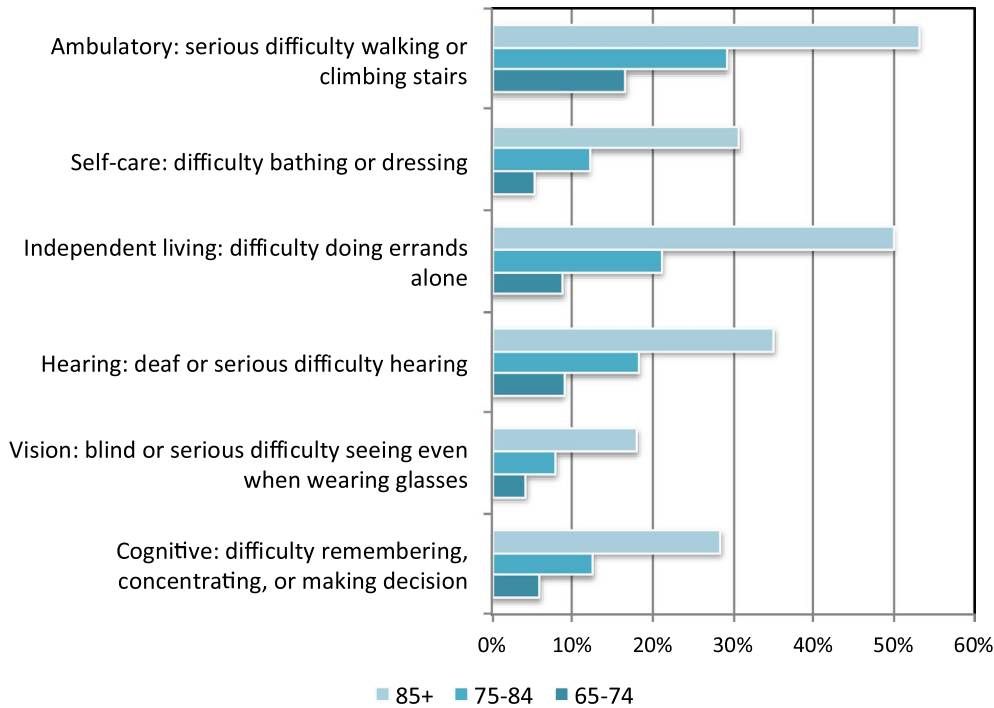

Figure 1. Prevalence of disability in 2010, by age. Source: ACS 1-year estimates from 65+ in the United States: 2010, page 43, by U.S. Census Bureau, 2014, Washington, DC: U.S. Government Printing Office.

funding for long-term care services has been shifting away from nursing homes toward home and community-based services.[10] This has been coupled with a downward trend in the fraction of seniors residing in nursing homes.[11] With the ratio of the nonworking to working population rising, continued reductions are critical for the economic sustainability of these social insurance programs.[12] But such reductions cannot take place without housing that is aging appropriate.

Despite a growing body of research documenting the financial, health, and emotional benefits of aging in the community, little is known about the degree to which the national housing stock has the features to support this strategy. In this article, we use the American Housing Survey (AHS) to examine the distribution and changing occupancy of homes that have, or could potentially be modified to have, the accessibility features that would allow seniors with mobility difficulties to successfully age in their homes. We focus on mobility difficulties because a home's structural features are most likely to aid or hinder mobility, as opposed to other forms of disability (seeing, hearing, or cognitive difficulties). Furthermore, mobility difficulties are the most common type of disability that older adults face (see Figure 1).

In defining housing accessibility, we focus primarily on three composite measures, corresponding to increasing levels of accessibility, developed using the 2011 AHS module on housing modifications. The three levels correspond to: (a) homes that are not yet accessible but have essential structural elements that make them potentially modifiable, (b) homes that are appropriate for individuals with moderate mobility difficulties, and (c) homes that are accessible to wheelchair users. This is similar in concept to measures used in other countries for assessing and certifying a dwelling's accessibility; for example, the UK uses three categories—visitable, accessible and adaptable, and wheelchair-accessible; Australia uses a silver, gold, and platinum framework; and New Zealand uses a 3-, 4-, and 5-star rating system. Whereas other researchers have analyzed the 2011 AHS housing modifications module (e.g., Harvard Joint Center for Housing Studies, 2014), our three-level approach provides a way to simply summarize the accessibility of a home in an intuitive manner.

Our data analysis address the following questions:

1. What types of homes are modifiable or accessible?
2. Which seniors live in modifiable or accessible homes?
3. Which seniors move into modifiable or accessible homes?
4. What kinds of households make accessibility-enhancing home improvements?

With the first wave of the Baby Boom generation having reached 65 in 2011, the need is growing for housing that allows older adults to remain in their homes and communities as they age. The remainder of this article shows that the existing residential housing stock falls woefully short in facilitating this goal.

Data and Methods

American Housing Survey (AHS)

The AHS is a biennial panel survey of housing units conducted by the U.S. Census Bureau. It captures detailed information on both the housing unit and its occupants, and is considered to be the most comprehensive national housing survey in the United States. Starting in 2009, the AHS has incorporated the six core disability questions used in the ACS that address ambulatory, self-care, independent living, hearing, visual, and cognitive difficulties for each household member. For 2011 only, the AHS added a topical module with information on the presence of specific accessibility features. Coupled with the core AHS, these data provide a unique opportunity to examine the suitability of the U.S. housing stock for older adults to age in place.

Since the AHS is a panel of housing units and not households, we are unable to track households from wave to wave if they move out. However, we can study the characteristics of households who move into AHS-surveyed units between waves, and we can study home improvements made by households who remain in their homes from wave to wave.

Measures of Accessibility

We follow the methodology described in Bosher, Chan, Ellen, Karfunkel, and Liao (2015) in establishing three levels of housing accessibility based on the 2011 AHS. These three levels were created following an examination of American and international housing accessibility standards, a review of the relevant literature, and interviews with disability and housing design experts to ascertain which features are critical for accessibility.

Although unprecedented in its ability to portray the accessibility of the nation's housing stock, the 2011 housing modification module does have some drawbacks that should be noted. Many of the questions focus on whether a housing unit has a specific feature (e.g., a ramp) anywhere in the home, rather than whether there is an overall accessible route to key areas, such as a bathroom, that would include no steps and adequate turning radius for users of wheelchairs and walkers. The responses are self-reported by individuals who may not know, for example, what it means for kitchen countertops to be wheelchair accessible. In addition, several features required by U.S. accessibility regulations are not included.[13] Therefore, any summary accessibility measures constructed from the 2011 AHS data will have shortcomings, as further described in Bosher et al. (2015). Nevertheless, we believe that the three summary measures described below help to illustrate the extent to which the physical attributes of the U.S. housing stock are suitable for aging.

Level 1—Potentially modifiable: A home that has some essential structural features for accessibility, but may not be accessible without further modifications. This includes the ability to enter the home from the exterior without having to climb up or down steps, and the presence of either an elevator inside the unit, or both a bathroom and a bedroom on the entry level.

Level 2—Livable: A home that has a minimum level of accessibility such that a person with moderate mobility difficulties can live in the home. This includes all of the elements in Level 1 plus an accessible bathroom with grab bars, and no steps between rooms or rails/grab bars along all steps.

Level 3—Wheelchair accessible: A home that is accessible to a wheelchair user. This includes all of the elements in Levels 1 and 2 above, but removes the possibility of any steps between rooms, even if grab bars are present, and adds extra-wide doors or hallways; door handles and sink handles/levers; wheelchair-accessible electrical switches, outlets, and climate controls; and wheelchair accessible countertops, cabinets, and other kitchen features.

These levels are outlined in Table 1 along with the specific AHS variables that are used in constructing the measures. Note that for brevity we use the term *accessibility* to refer to all three levels, even though a home achieving only the first level would not necessarily be accessible to those with mobility disabilities without further modification. It is also worth mentioning that whereas Level 3 may seem

Table 1. Housing features included in the three summary measures of accessibility.

Housing feature	AHS variables used	Level 1: Potentially modifiable	Level 2: Livable	Level 3: Wheelchair accessible
Ability to enter home without climbing up or down steps or stairs	NOSTEP	X	X	X
Bathroom on entry level or elevator in unit	HMENTBTH HMELEVATE	X	X	X
Bedroom on entry level or elevator in unit	HMENTBD HMELEVATE	X	X	X
Wheelchair-accessible bathroom with handrails/grab bars installed	HMBROOM HMBRL		X	X
No steps between rooms, or handrails/grab bars along all steps	HMLEVEL HMNDRLS		X	
No steps between rooms	HMLEVEL			X
Extra-wide doors or hallways	HMXDR			X
Wheelchair-accessible electrical outlets, switches and climate controls	HMOUTLET HMSWITCH HMCLCTRL			X
Wheelchair-accessible countertops, cabinets, and other kitchen features	HMCOUNT HMCAB HMKIT			X
Door handles instead of knobs on all doors	HMHNDLE			X
Handles or levers for any sink faucets instead of knobs	HMSKLVR			X

AHS: American Housing Survey.

unnecessary for anyone who is not using a wheelchair, the features included can be extremely helpful for anyone with mobility limitations. For example, a person using a walker or who requires assistance from a caregiver when walking often needs as much space as a wheelchair user to maneuver around, and a person who fatigues easily may want to sit down at a wheelchair-accessible-height kitchen countertop to prepare meals, even if he or she does not normally use a wheelchair (Bosher, Chan, Ellen, Karfunkel, & Liao, 2015).[14] In our analyses below, we only include housing units for which we were able to calculate a value for all three measures, resulting in an analysis sample of 142,665 units (92% of the 2011 AHS sample).[15]

Table 2 displays descriptive statistics for the 2011 AHS housing units. The first row shows the fraction of homes that reach each of the three summary accessibility levels described above. The levels are cumulative in that a home reaching Level 3 necessarily reaches Levels 1 and 2 as well. About one third of units are potentially modifiable (Level 1), but fewer than 4% are livable for people with moderate mobility difficulties (Level 2). And only a tiny fraction of 1% are wheelchair accessible (Level 3).

The remaining rows present similar information for a variety of building and location characteristics. A slightly greater share of the renter-occupied units meet the Levels 2 and 3 criteria compared with owner-occupied units, but, strikingly, both public housing and privately owned subsidized rental housing (identified through administrative records from the U.S. Department of Housing and Urban Development) are far more likely to reach each of the three levels. Units occupied by households that receive a housing voucher, on the other hand, are similar to rental units overall.

We capture housing quality or housing cost by allocating each rental unit to a percentile of its census region's monthly rent plus utilities distribution, and each owned unit to a percentile of its census region's housing price distribution (based on self-reported market home value).[16] Homes in the lowest rental quartile are most likely to meet the criteria for all three accessibility levels, although units in the highest rental quartile are not far behind. Units in large multifamily buildings are more likely to meet the criteria for all three levels, whereas mobile homes and units within smaller multifamily buildings are less likely. Homes with less than 1,000 square feet are more likely to achieve Levels 2 and 3. The share of accessible units is strongly correlated with building age, with the fraction of potentially modifiable units among those built in 2000 or after rising to more than 40%, and the fraction of livable units rising to 5%. The Northeast region and, to a lesser extent, the Midwest have fewer accessible units than the South and West do. The prevalence of Level 2 and 3 units is greater in nonmetropolitan areas. Within metropolitan areas, Level 1 and 2 units are more prevalent in the suburbs, whereas Level 3 units are more prevalent in central cities.

Senior and Senior Disabled Households in the AHS

Given our interest in an aging population, we focus much of our analysis on households that have at least one household member age 65 or above. This individual may or may not be the householder who answers all of the AHS questions. We also focus attention on households with disabled seniors.

Since 2008, the U.S. Census Bureau has collected disability information on these six disability types in the ACS and the AHS:

- Ambulatory—having serious difficulty walking or climbing stairs.
- Self-care—having difficulty bathing or dressing.
- Independent living—because of a physical, mental, or emotional problem, having difficulty doing errands alone such as visiting a doctor's office or shopping.
- Hearing—deaf or having serious difficulty hearing.
- Vision—blind or having serious difficulty seeing, even when wearing glasses.
- Cognitive—because of a physical, mental, or emotional problem, having difficulty remembering, concentrating, or making decisions.

Table 2. Housing unit descriptive statistics.

	Number of housing unit observations	Weighted count of housing units	Fraction of housing units in each row that reach:		
			Level 1: Potentially modifiable (%)	Level 2: Livable (%)	Level 3: Wheelchair accessible (%)
All 2011 housing units	142,665	120,492,157	32.96	3.74	0.15
Occupancy status					
Renter-occupied	49,611	36,425,709	31.31	4.04	0.18
Owner-occupied	79,564	72,959,525	33.65	3.67	0.13
Vacant	11,643	9,196,975	33.30	3.17	0.20
Seasonal	1,847	1,909,948	36.46	3.27	0.07
Unit received government rental assistance					
Public housing	2,208	936,632	41.56	15.33	0.45
Housing voucher	2,373	1,946,564	34.07	5.68	0.14
Privately owned, subsidized	3,822	1,065,973	41.37	15.95	0.94
Rent + utilities (rental units only)					
Lowest quartile	14,190	9,927,908	35.05	6.61	0.29
Quartile 2	13,127	9,861,414	28.10	3.16	0.17
Quartile 3	14,073	10,160,977	28.61	2.49	0.09
Highest quartile	14,487	10,059,571	33.02	3.71	0.26
Market value (owned units only)					
Lowest quartile	18,048	19,731,366	30.70	3.24	0.10
Quartile 2	20,755	20,174,220	37.45	3.89	0.10
Quartile 3	23,416	20,819,139	35.28	3.81	0.16
Highest quartile	24,190	19,697,644	31.75	3.46	0.15
Building type					
Single-family home	96,661	83,301,679	35.52	3.60	0.12
Mobile home	5,184	7,942,542	17.74	1.64	0.00
Two to four units in building	13,315	9,634,751	25.85	2.98	0.18
Five to nine units in building	8,650	5,811,378	25.55	3.09	0.14
10 to 49 units in building	12,781	9,519,637	28.31	4.04	0.22
50+ units in building	6,072	4,280,527	47.69	12.25	0.82
Housing unit size					
Less than 1,000 sq. ft.	31,049	25,893,204	31.03	4.27	0.21
1,000 to 1,500 sq. ft.	31,455	28,098,873	33.12	3.61	0.16
1,500 to 2,000 sq. ft.	24,173	22,086,554	37.11	3.38	0.11
Over 2,000 sq. ft.	38,346	33,786,224	33.50	3.66	0.15
Building age					
Built before 1920	8,110	7,992,753	14.07	1.52	0.15
Built in 1920s	5,531	4,777,663	17.37	1.41	0.00
Built in 1930s	5,284	4,914,191	19.08	1.68	0.00
Built in 1940s	8,288	7,055,876	27.50	2.42	0.04
Built in 1950s	15,304	12,279,069	34.75	3.57	0.10
Built in 1960s	17,525	14,003,267	36.90	3.90	0.06
Built in 1970s	24,987	22,544,888	35.62	3.74	0.10
Built in 1980s	19,578	15,329,250	36.03	4.80	0.18
Built in 1990s	18,620	14,839,810	34.89	4.52	0.25
Built after 2000	19,438	16,755,390	40.08	4.94	0.36
Census region					
Northeast	19,506	21,478,958	18.12	2.68	0.09
Midwest	34,356	27,100,184	23.77	3.76	0.21
South	44,640	45,391,805	40.97	3.80	0.15
West	44,163	26,521,210	40.66	4.47	0.15
Urban status					
Central cities	44,017	34,072,719	30.38	3.26	0.17
Suburbs	86,629	58,092,167	34.36	3.82	0.11
Nonmetropolitan areas	12,019	28,327,271	33.19	4.15	0.21

Source: Authors' calculations from the 2011 American Housing Survey.

Although all six types of disability become more prevalent with age (see Figure 1), the 2011 AHS questions on accessibility features are largely relevant to people with mobility-related difficulties, and mostly irrelevant to people with only communicative or cognitive difficulties. Whereas Federal housing accessibility regulations do include features that are targeted to people with sensory impairments such as flashing alarms and tactile cues, these features are relatively easy to install when needed, compared with structural features such as a bathroom on the entry level. In any event, information on such features is not available in the AHS. Therefore, seniors with ambulatory disabilities will be the main focus of our analysis below. We also use a broader definition of disability to include self-care or independent living difficulties as well—that is, an individual who has serious difficulty walking or climbing stairs, or difficulty bathing, dressing, or doing errands alone, is considered disabled. This broader definition captures some additional limitations that might be helped by physical housing characteristics.[17]

The AHS 2011 module on housing modifications has some additional disability information asked at the household level, but is not specific to individual household members. For example, we know whether a household member uses a wheelchair, but in a multiperson household we cannot identify which of the household members uses it. In particular, given our focus on aging, we do not know whether an older adult is the one using the wheelchair. Therefore, the results presented below do not make use of these additional disability variables.[18] That said, we note that 5.5% of respondents who reported in 2011 that *no one* in their household has serious difficulty walking or climbing stairs also reported that someone in their household uses a mobility device (manual or motorized wheelchair, scooter, cane, walker, etc.). This strongly suggests that mobility-related disabilities are underreported in the AHS.[19] Using the broader definition of disability that includes self-care and doing errands alone, the fraction of those reporting mobility device use but no disability falls to 5.0%.

Table 3 presents descriptive statistics for the 2011 AHS households that reside in our analysis sample of housing units. The first column shows households in all of the 2011 occupied units, with the individual demographic characteristics referring to those of the householder (the respondent). The second column shows all households with at least one member age 65+ (about one quarter of all households). We refer to these as *senior households*, and the individual characteristics shown in the table refer to those of the oldest person in the household. In columns three and four, we further restrict to households with a disabled member age 65+, using the two versions of disability described above. We refer to these as *senior disabled households* and, analogously, the individual characteristics here refer to the oldest disabled household member.

In the first three rows we see that senior households are more likely than other households to live in accessible homes at all three levels, and those with disabled seniors even more so. However, the fractions are still remarkably small: only about 15% of disabled senior households reside in homes that are livable for those with moderate mobility difficulties (Level 2).

The homeownership rate among senior disabled households is about 75%, which is lower than the 81% rate for all senior households, but still higher than the population average of two thirds. Senior disabled households are more likely to receive government rental assistance than either seniors as a whole or the general population. Unsurprisingly, older households are more likely to have long tenure, with over two thirds having lived in their home for 10 years or more. The vast majority of seniors are the householder or his or her spouse, with only 5% (7% for disabled households) living in a home where their child is the householder. Accordingly, only a small fraction moved into their home at a different time from the householder. Over 40% of senior disabled households consist of a person living alone, suggesting perhaps an even greater need for accessible housing features.

Compared with households in general, senior households are disproportionately White, and have lower levels of education and household income. Compared with all senior households, disabled senior households are more likely to be Black and less likely to be Asian. They also tend to be older, with less education and household income.

Table 3. Household descriptive statistics.

			Households	
	All (%)	With a member age 65+ (%)	Member age 65+ who has an ambulatory, self-care, or independent living disability (%)	Member age 65+ who has an ambulatory disability (%)
			Percentage of households in the column sample with the row characteristic	
Home accessibility				
Level 1: Potentially modifiable	32.87	39.01	43.64	44.40
Level 2: Livable	3.79	8.83	14.53	14.56
Level 3: Wheelchair accessible	0.15	0.42	0.84	0.90
Tenure				
Renter occupied	33.30	18.61	24.96	25.10
Owner occupied	66.70	81.39	75.04	74.90
Unit received government rental assistance				
Public housing	0.86	0.85	1.51	1.61
Housing voucher	1.78	1.31	2.36	2.23
Privately owned, subsidized	0.97	1.57	2.84	3.00
Occupancy length*				
Less than 2 years	20.82	7.26	8.63	8.50
2 to 5 years	18.87	9.85	11.23	11.41
5 to 10 years	19.54	14.83	14.11	13.81
More than 10 years	40.76	68.06	66.03	66.28
Moved in later than householder		4.42	5.92	5.66
Moved in before the householder		0.91	1.30	1.32
Oldest 65+ (disabled) person's relationship to householder				
Householder or spouse of householder		91.30	87.85	88.30
Parent of householder		5.01	7.19	7.21
Other relationship		3.69	4.96	4.49
Household composition				
Lives alone	26.67	37.30	41.07	40.73
Any resident < 18 years old	33.02	6.98	5.56	5.30
Age*				
65 to 75 years old	11.44	51.19	34.89	36.65
75 to 85 years old	7.19	33.61	37.31	36.93
≥ 85 years old	3.03	15.20	27.79	26.43
Race/ethnicity*				
White, non-Hispanic	70.10	77.77	77.03	76.97
Black, non-Hispanic	12.29	9.87	11.45	11.63
Asian, non-Hispanic	3.87	3.17	1.89	1.87
Hispanic of any race	11.80	7.56	7.48	7.42
Other non-Hispanic race	1.94	1.63	2.14	2.11
Immigration status*				
Native-born, U.S. citizen	86.84	88.75	89.74	89.85
Foreign-born, U.S. citizen	6.74	7.84	7.37	7.35
Non-U.S. citizen	6.42	3.40	2.89	2.80
Education*				
Nonhigh school graduate	12.94	22.33	30.55	30.12
High school graduate	25.84	30.88	32.60	32.47
Some college, no bachelor's degree	30.27	23.47	21.41	22.28
Bachelor's degree	30.95	23.32	15.44	15.12
Household income (median = $46,911)				
Lowest quartile	24.49	34.45	44.61	44.10
Quartile 2	25.01	30.34	28.72	29.09
Quartile 3	25.12	21.03	16.96	17.38
Highest quartile	25.38	14.18	9.72	9.43
Number of household observations	129,175	31,518	9,096	7,986
Weighted count of households	109,385,234	26,966,169	7,597,684	6,650,919

Source: Authors' calculations from the 2011 American Housing Survey.
*Refers to the householder in column 1, the oldest household member in column 2, and the oldest disabled household member in columns 3 and 4.

Empirical Strategy

We conduct multivariate analyses using the AHS housing unit and household data to describe the types of homes that are modifiable or accessible, and the characteristics of households that live in and move to such homes. We also examine the characteristics of households that undertake major improvements that potentially enhance accessibility. For ease of interpretation, we present regression estimates from linear probability models.[20]

Findings

What Types of Homes Are Modifiable or Accessible?

Table 4 shows a multivariate analysis of the likelihood that a home achieves each of the three accessibility levels, based on building and location characteristics. The coefficients are generally consistent with the patterns in Table 2. After adding in other controls, renter-occupied units are no more likely to be potentially modifiable or livable than owner-occupied units; however, the correlation between government rental subsidies and accessibility remains large and significant. Controlling for other characteristics, both public housing and subsidized private rental units are about 2.5 times more likely than owner-occupied units (9.9 and 9.4 percentage points, respectively) to reach Level 2 (livable), and units occupied by households that receive housing vouchers are almost 50% more likely (1.9 percentage points). Subsidized private rental units are about 3 times more likely to be wheelchair accessible than owner-occupied units. Homes in the lowest quartile of rents or market value (the reference groups for renters and for owners, respectively) are more likely to achieve accessibility Levels 1 and 2.

The type of building clearly makes a difference. Mobile homes are far less likely than other housing types to be accessible. Homes within buildings with 50+ units are 39% (13.0 percentage points) more likely than single-family homes to be potentially modifiable, whereas those within two- to 49- unit buildings are from 13 to 34% (4.4 to 11.2 percentage points) less likely. This U-shaped pattern for building size likely reflects the lack of an elevator in smaller multifamily units, which would prevent any home on an upper floor from achieving Level 1. Whereas almost three quarters of units in buildings with 50+ units have an elevator, fewer than 1% of units in two- to nine-unit buildings have one. For Levels 2 and 3, there is a less clear pattern, but units in 50+-unit buildings are twice as likely to be livable and over 4 times as likely to be wheelchair accessible as single-family homes. By unit size, those of less than 1,000 square feet (the reference group) are most likely to achieve accessibility Levels 1 and 2.

Building age has an almost monotonically increasing effect on achieving Level 1, with homes built from 2000 onward being 56% (18.5 percentage points) more likely to be potentially modifiable than those built before 1920. For the higher levels of accessibility, the magnitude of the building age effects are also large in the later decades: compared with homes from before 1920, homes built in the 21st century are 85% (3.2 percentage points) more likely to be Level 2, and over 1.5 times (0.2 percentage points) as likely to be Level 3. We ran some additional models that only control for year of construction, using 5-year dummies before 2000 and single-year dummies since 2000. The coefficients suggest that after large gains in the early to mid-1990s, soon after the passage of the Americans With Disabilities Act, which mandated various housing accessibility requirements, there has been no change in the number of accessible homes being built in recent years, despite our aging population.

Regional differences exist, with homes in the Northeast (the reference group) being least likely to be accessible. Somewhat surprisingly, homes in the suburbs and nonmetropolitan areas are more likely than those in central cities to achieve Levels 1 and 2, even after controls for building age and type, and nonmetro area homes are more likely to be wheelchair accessible.

Which Seniors Live in Modifiable or Accessible Homes?

We investigate the characteristics associated with living in an accessible home. Table 5 shows linear probability models of whether a household lives in a home that is suitable for aging, as summarized

Table 4. What types of homes are modifiable or accessible? Sample includes all housing units in 2011.

Dependent variable:	Level 1: Potentially modifiable (1)	Level 2: Livable (2)	Level 3: Wheelchair accessible (3)
Occupancy status			
(Reference group: owner occupied)			
Renter occupied	0.0084	−0.0011	−0.0008+
	(0.0053)	(0.0022)	(0.0005)
Seasonal	0.0496**	−0.0080*	−0.0013
	(0.0097)	(0.0041)	(0.0008)
Vacant	0.0077	−0.0082**	−0.0002
	(0.0051)	(0.0021)	(0.0004)
Unit received government rental assistance			
Public housing	0.0733**	0.0989**	0.0019
	(0.0142)	(0.0059)	(0.0012)
Housing voucher	0.0178+	0.0187**	−0.0002
	(0.0098)	(0.0041)	(0.0008)
Privately owned, subsidized	0.0529**	0.0939**	0.0058**
	(0.0134)	(0.0056)	(0.0012)
Rent + utilities (rental units only)			
(Reference group: lowest quartile)			
Quartile 2	−0.0523**	−0.0140**	0.0000
	(0.0058)	(0.0024)	(0.0005)
Quartile 3	−0.0611**	−0.0213**	−0.0009+
	(0.0058)	(0.0024)	(0.0005)
Highest quartile	−0.0471**	−0.0129**	0.0005
	(0.0059)	(0.0025)	(0.0005)
Market value (owned units only)			
(Reference group: lowest quartile)			
Quartile 2	−0.0051	−0.0035+	−0.0007+
	(0.0043)	(0.0018)	(0.0004)
Quartile 3	−0.0400**	−0.0066**	−0.0003
	(0.0045)	(0.0019)	(0.0004)
Highest quartile	−0.0730**	−0.0111**	−0.0006
	(0.0047)	(0.0020)	(0.0004)
Building type			
(Reference group: single family homes)			
Mobile home	−0.2751**	−0.0372**	−0.0025**
	(0.0056)	(0.0023)	(0.0005)
Two to four units in building	−0.0443**	0.0015	0.0012**
	(0.0051)	(0.0021)	(0.0004)
Five to nine units in building	−0.1119**	−0.0059*	0.0003
	(0.0063)	(0.0026)	(0.0005)
10 to 49 units in building	−0.0888**	0.0047*	0.0011*
	(0.0054)	(0.0022)	(0.0005)
50+ units in building	0.1301**	0.0791**	0.0067**
	(0.0072)	(0.0030)	(0.0006)
Housing unit size			
(Reference group: Less than 1,000 sq. ft.)			
1,000 to 1,500 sq. ft.	−0.0191**	−0.0038*	−0.0001
	(0.0039)	(0.0016)	(0.0003)
1,500 to 2,000 sq. ft.	−0.0016	−0.0079**	−0.0005
	(0.0045)	(0.0019)	(0.0004)
Over 2,000 sq. ft.	−0.0274**	−0.0056**	−0.0003
	(0.0044)	(0.0019)	(0.0004)
Building age			
(Reference group: built before 1920)			
Built in 1920s	0.0147+	−0.0020	−0.0015*
	(0.0076)	(0.0032)	(0.0007)
Built in 1930s	0.0095	−0.0000	−0.0014*
	(0.0075)	(0.0031)	(0.0007)
Built in 1940s	0.0684**	0.0053+	−0.0010
	(0.0069)	(0.0029)	(0.0006)

(*Continued*)

Table 4. (*Continued*).

Dependent variable:	Housing unit		
	Level 1: Potentially modifiable (1)	Level 2: Livable (2)	Level 3: Wheelchair accessible (3)
Built in 1950s	0.1365**	0.0158**	−0.0003
	(0.0061)	(0.0025)	(0.0005)
Built in 1960s	0.1587**	0.0177**	−0.0009+
	(0.0060)	(0.0025)	(0.0005)
Built in 1970s	0.1475**	0.0152**	−0.0006
	(0.0056)	(0.0023)	(0.0005)
Built in 1980s	0.1540**	0.0290**	0.0005
	(0.0060)	(0.0025)	(0.0005)
Built in 1990s	0.1575**	0.0300**	0.0015**
	(0.0061)	(0.0025)	(0.0005)
Built after 2000	0.1853**	0.0316**	0.0024**
	(0.0060)	(0.0025)	(0.0005)
Census region (Reference group: Northeast)			
Midwest	0.0412**	0.0110**	0.0011**
	(0.0039)	(0.0016)	(0.0003)
South	0.2033**	0.0093**	0.0004
	(0.0037)	(0.0015)	(0.0003)
West	0.1972**	0.0173**	0.0006
	(0.0040)	(0.0017)	(0.0003)
Urban status (Reference group: central cities)			
Suburbs	0.0319**	0.0103**	−0.0002
	(0.0030)	(0.0013)	(0.0003)
Nonmetro areas	0.0311**	0.0170**	0.0010**
	(0.0036)	(0.0015)	(0.0003)
Constant	0.1207**	0.0105**	0.0012*
	(0.0069)	(0.0029)	(0.0006)
Observations	142,453	142,453	142,453
Adjusted R^2	0.081	0.019	0.003

Weighted ordinary least squares regressions. Standard errors shown in parentheses.
**$p < .01$; *$p < .05$; +$p < .10$.

by each of the three accessibility levels. The first set of columns shows results for households with at least one person age 65+. When there is more than one household member age 65+, we use the characteristics of the oldest person in the regression. The middle set of columns is for households with at least one age-65+ person with an ambulatory, self-care, or independent living disability, and the final set is for households with at least one age-65+ person with an ambulatory disability.

Our goal is to isolate the individual characteristics that may affect this outcome; however, we also include tenure status, census region, and urban status as controls (the final rows of the table). For all three subsamples, renters are significantly more likely to live in accessible homes.

Turning to resident characteristics, being disabled clearly increases the likelihood of a senior residing in an accessible home: by 65% (5.7 percentage points) for livable homes, and by 67% (0.3 percentage points) for wheelchair-accessible homes.

Long tenure in the home has a large negative effect on the likelihood of living in an accessible home. In the three subsamples, the likelihood of residing in a Level 2 home falls by more than two thirds when the occupancy length is greater than 10 years, and the likelihood of a wheelchair-accessible home is at least 1.5 times lower. This strongly suggests that people are aging in unsuitable homes, and that seniors have to either move or make housing modifications to live in homes that support aging.

Table 5. Which seniors live in modifiable or accessible homes? Sample includes all households with a member age 65+ grouped by level of disability.

				With an ambulatory, self-care, or independent living disability			With an ambulatory disability		
	Level 1: Potentially modifiable	Level 2: Livable	Level 3: Wheelchair accessible	Level 1: Potentially modifiable	Level 2: Livable	Level 3: Wheelchair accessible	Level 1: Potentially modifiable	Level 2: Livable	Level 3: Wheelchair accessible
Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Age 65+ household member has:[a]									
Ambulatory, self-care, or independent living disability	0.0374** (0.0065)	0.0571** (0.0038)	0.0028** (0.0009)						
Ambulatory disability				0.0574** (0.0151)	0.0154 (0.0108)	0.0057* (0.0029)			
Occupancy length[a] (Reference group: less than 2 years)									
2 to 5 years	0.0281* (0.0131)	−0.0015 (0.0076)	−0.0035+ (0.0018)	0.0567* (0.0229)	0.0031 (0.0164)	−0.0090* (0.0043)	0.0448+ (0.0245)	−0.0143 (0.0175)	−0.0124** (0.0048)
5 to 10 years	0.0071 (0.0123)	−0.0332** (0.0072)	−0.0027 (0.0017)	0.0033 (0.0222)	−0.0500** (0.0159)	−0.0051 (0.0042)	0.0082 (0.0239)	−0.0590** (0.0172)	−0.0083+ (0.0047)
More than 10 years	−0.0596** (0.0111)	−0.0739** (0.0065)	−0.0062** (0.0015)	−0.0435* (0.0197)	−0.1036** (0.0141)	−0.0142** (0.0037)	−0.0464* (0.0211)	−0.1105** (0.0151)	−0.0164** (0.0041)
Lives alone	−0.0005 (0.0065)	0.0200** (0.0038)	−0.0006 (0.0009)	0.0061 (0.0121)	0.0246** (0.0087)	−0.0040+ (0.0023)	0.0139 (0.0129)	0.0290** (0.0093)	−0.0036 (0.0025)
Any resident <18 years old	−0.0299** (0.0111)	−0.0235** (0.0065)	−0.0034* (0.0015)	−0.0643** (0.0233)	−0.0403* (0.0167)	−0.0069 (0.0044)	−0.0689** (0.0254)	−0.0386* (0.0183)	−0.0074 (0.0050)
Age[a] (Reference group: age 65–75)									
Age 75–85	0.0674** (0.0061)	0.0483** (0.0035)	0.0022** (0.0008)	0.0429** (0.0120)	0.0572** (0.0086)	0.0024 (0.0023)	0.0491** (0.0127)	0.0597** (0.0091)	0.0023 (0.0025)
Age 85+	0.0897** (0.0083)	0.0804** (0.0048)	0.0086** (0.0011)	0.0625** (0.0132)	0.0903** (0.0094)	0.0133** (0.0025)	0.0688** (0.0140)	0.0945** (0.0101)	0.0145** (0.0028)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Race/ethnicity[a]									
(Reference group: White non-Hispanic)									
Black, non-Hispanic	−0.0320** (0.0095)	−0.0369** (0.0056)	−0.0036** (0.0013)	−0.0024 (0.0170)	−0.0468** (0.0122)	−0.0086** (0.0032)	0.0067 (0.0180)	−0.0419** (0.0129)	−0.0093** (0.0035)
Asian, non-Hispanic	−0.0642** (0.0172)	−0.0455** (0.0101)	−0.0030 (0.0023)	−0.0841* (0.0394)	−0.0895** (0.0282)	−0.0080 (0.0075)	−0.0805+ (0.0420)	−0.0821** (0.0301)	−0.0109 (0.0082)
Hispanic of any race	0.0699** (0.0112)	−0.0199** (0.0066)	−0.0032* (0.0015)	0.0834** (0.0206)	0.0042 (0.0147)	−0.0100* (0.0039)	0.0898** (0.0220)	0.0152 (0.0158)	−0.0111* (0.0043)
Other non-Hispanic race	0.0274 (0.0212)	0.0049 (0.0124)	−0.0051+ (0.0029)	0.0803* (0.0352)	0.0386 (0.0253)	−0.0103 (0.0067)	0.1109** (0.0379)	0.0484+ (0.0272)	−0.0113 (0.0074)
Immigration status[a]									
(Reference group: non-U.S. citizen)									
Native born, U.S. citizen	0.0590** (0.0160)	0.0379** (0.0093)	0.0023 (0.0022)	0.1044** (0.0318)	0.0643** (0.0228)	0.0030 (0.0060)	0.1090** (0.0345)	0.0797** (0.0247)	0.0032 (0.0068)
Foreign born, U.S. citizen	0.0484** (0.0175)	0.0197+ (0.0102)	0.0021 (0.0024)	0.0577 (0.0353)	0.0389 (0.0253)	0.0020 (0.0067)	0.0483** (0.0383)	0.0451 (0.0275)	0.0028 (0.0075)
Education[a]									
(Reference group: nonhigh school graduate)									
High school graduate	0.0112 (0.0077)	0.0105* (0.0045)	0.0040** (0.0010)	0.0479** (0.0131)	0.0191* (0.0094)	0.0096** (0.0025)	0.0483** (0.0141)	0.0191+ (0.0101)	0.0106** (0.0028)
Some college, no bachelor's degree	0.0218** (0.0083)	0.0170** (0.0049)	0.0030** (0.0011)	0.0237 (0.0149)	0.0379** (0.0107)	0.0099** (0.0028)	0.0253 (0.0159)	0.0459** (0.0114)	0.0108** (0.0031)
Bachelor's degree	0.0328** (0.0088)	0.0194** (0.0051)	0.0022+ (0.0012)	0.0667** (0.0168)	0.0465** (0.0121)	0.0078* (0.0032)	0.0598** (0.0182)	0.0460** (0.0131)	0.0066+ (0.0036)
Household income									
(Reference group: lowest quartile)									
Quartile 2	0.0021 (0.0072)	−0.0003 (0.0042)	−0.0003 (0.0010)	0.0203 (0.0131)	−0.0069 (0.0094)	−0.0043+ (0.0025)	0.0329* (0.0140)	−0.0047 (0.0100)	−0.0045 (0.0027)
Quartile 3	−0.0186* (0.0085)	0.0000 (0.0050)	−0.0013 (0.0012)	−0.0043 (0.0165)	−0.0038 (0.0118)	−0.0062* (0.0031)	−0.0074 (0.0175)	−0.0088 (0.0126)	−0.0058+ (0.0034)
Highest quartile	−0.0126 (0.0100)	0.0148* (0.0058)	0.0004 (0.0014)	0.0380+ (0.0206)	0.0465** (0.0147)	−0.0027 (0.0039)	0.0554* (0.0223)	0.0453** (0.0160)	−0.0011 (0.0044)
Renter occupied	0.0438** (0.0080)	0.0469** (0.0047)	0.0030** (0.0011)	0.1305** (0.0140)	0.0666** (0.0100)	−0.0006 (0.0027)	0.1272** (0.0149)	0.0563** (0.0107)	−0.0011 (0.0029)
Census region									
(Reference group: Northeast)									
Midwest	0.0576** (0.0083)	0.0240** (0.0049)	0.0019 (0.0011)	0.0617** (0.0158)	0.0436** (0.0113)	0.0054+ (0.0030)	0.0515** (0.0169)	0.0401** (0.0121)	0.0044 (0.0033)
South	0.2378** (0.0076)	0.0337** (0.0045)	0.0036** (0.0010)	0.2271** (0.0146)	0.0614** (0.0104)	0.0104** (0.0028)	0.2275** (0.0154)	0.0627** (0.0111)	0.0117** (0.0030)
West	0.2247** (0.0085)	0.0448** (0.0050)	0.0037** (0.0012)	0.1995** (0.0163)	0.0472** (0.0117)	0.0086** (0.0031)	0.1978** (0.0174)	0.0451** (0.0125)	0.0103** (0.0034)

(Continued)

Table 5. (*Continued*).

	Level 1: Potentially modifiable	Level 2: Livable	Level 3: Wheelchair accessible	With an ambulatory, self-care, or independent living disability			With an ambulatory disability		
				Level 1: Potentially modifiable	Level 2: Livable	Level 3: Wheelchair accessible	Level 1: Potentially modifiable	Level 2: Livable	Level 3: Wheelchair accessible
Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Urban status (Reference group: central cities)									
Suburbs	0.0554**	0.0168**	−0.0019*	0.0893**	0.0153+	−0.0061*	0.0991**	0.0103	−0.0062*
	(0.0068)	(0.0040)	(0.0009)	(0.0126)	(0.0090)	(0.0024)	(0.0135)	(0.0097)	(0.0026)
Nonmetro areas	0.0278**	0.0079+	−0.0020+	0.0660**	−0.0120	−0.0052+	0.0708**	−0.0112	−0.0056+
	(0.0079)	(0.0046)	(0.0011)	(0.0146)	(0.0105)	(0.0028)	(0.0156)	(0.0112)	(0.0031)
Constant	0.1257**	0.0064	0.0016	0.0018	0.0118	0.0048	0.0439	0.0190	0.0116
	(0.0220)	(0.0129)	(0.0030)	(0.0440)	(0.0315)	(0.0083)	(0.0450)	(0.0323)	(0.0088)
Observations	31,518	31,518	31,518	9,096	9,096	9,096	7,986	7,986	7,986
Adjusted R^2	0.063	0.052	0.005	0.065	0.049	0.01	0.069	0.049	0.011

Weighted ordinary least squares regressions. Standard errors shown in parentheses.
[a]Refers to the oldest household member in columns 1–3, and the oldest disabled household member in columns 4–9.
** $p < .01$; * $p < .05$; + $p < .10$.

Seniors living alone will not have other household members to help them, and we find that they are about 20% more likely to reside in Level 2 homes in all three subsamples, although there is no significant effect for the other levels. In additional models (not shown in the table), we found that among those not living alone, there is no significant difference between households where the (disabled) senior is the parent or parent-in-law of the householder and households where the (disabled) senior is the householder or the householder's spouse.

A child in the home generally reduces the likelihood that the home is accessible for seniors, including seniors with disabilities. For example, the likelihood of residing in a livable unit falls by more than one quarter in each of the subsamples when a child is present. Children are possibly an indicator that the senior is living in a multigenerational family, with more household members to assist with mobility difficulties, and reducing the need for accessibility-improving housing features.[21] It may also diminish the role of the senior in making housing-related decisions such that accessibility-improving housing features (either by modifications or by moving) are less likely.

Age is the strongest predictor of whether someone lives in an accessible home of any level. For example, compared with 65– to 75-year-olds (the reference group), seniors age 75–85 are 55% (4.8 percentage points) more likely to reside in a livable home, whereas those age 85+ are 91% (8.0 percentage points) more likely. This age pattern suggests that seniors are moving to more accessible homes as they age and/or they are modifying their homes to make them more accessible. The age pattern is also true for the disabled subsamples.

Black and Asian seniors and disabled seniors are generally less likely than their White counterparts to live in accessible homes. Hispanic seniors are more likely to live in potentially modifiable homes, but generally less likely to live in homes that reach accessible Levels 2 and 3. Seniors who are U.S. citizens are more likely to live in homes of Levels 1 and 2 compared with noncitizens (the reference group). Among disabled seniors, the positive effect is limited to native-born U.S. citizens.

Education level has a generally increasing impact on the likelihood of residing in a livable or wheelchair-accessible home among all three subsamples. For example, disabled seniors with a bachelor's degree are almost one third (4.6 percentage points) more likely to reside in livable homes compared with disabled seniors who did not graduate high school. This finding has several possible nonmutually exclusive interpretations. More-educated disabled seniors could be more likely to move to accessible homes or invest in housing modifications because they are more likely to recognize the value of accessible housing, or they may have a longer time horizon over which to capture these benefits given that education is correlated with longevity, or they may simply have more resources to make such accessibility-enhancing moves or investments. By capturing permanent income, education is arguably a better indicator of economic resources than current income for this age group is, as we are not able to measure retirement assets (or any assets besides housing) in these data.[22] Consistent with this interpretation, we find that household income quartile is generally insignificant, except for the highest quartile. Given a negative association between education and disability, it is troubling that the least educated (and thus the most likely to become disabled) are less likely to live in accessible homes.

Overall, the Table 5 results suggest some sensible patterns of allocation, with older and more disabled seniors as well as those living alone more likely to occupy accessible homes. However, it is concerning that seniors with long tenure, particular those who are disabled, are not moving to accessible housing or making appropriate modifications.

Which Seniors Move Into Modifiable or Accessible Homes?

We directly investigate whether seniors who move are in fact moving into accessible homes. Table 6 shows that the fraction of recent movers living in accessible homes is indeed substantially higher than average. Among seniors overall, 15.2% of those who moved into their homes since 2009 are in livable homes (compared with 8.8% on average), and 1.1% are in wheelchair-accessible homes (0.4% on average). For disabled seniors, these rates increase to almost a quarter in livable homes and over 2.1% in wheelchair-accessible homes (compared with 14.5% and less than 1% on average, respectively).

Table 6. Housing accessibility of recent movers.

Households in 2011	(%)	Households with a member age 65+	
		Who also has an ambulatory, self-care, or independent living disability (%)	Who also has an ambulatory disability (%)
Fraction living in homes that are:			
Level 1: Potentially modifiable	39.01	43.64	44.40
Level 2: Livable	8.83	14.53	14.56
Level 3: Wheelchair accessible	0.42	0.84	0.90
Who had moved in since 2009			
Fraction living in homes that are:			
Level 1: Potentially modifiable	46.37	55.06	55.34
Level 2: Livable	15.20	24.25	24.21
Level 3: Wheelchair accessible	1.14	2.08	2.17

Source: Authors' calculations from the 2011 American Housing Survey.

Nevertheless, these rates are still remarkably low: over three quarters of disabled seniors who move end up in a home that is not suitable for people with moderate mobility difficulties.

The models in Table 7 are identical to those in Table 5 except we narrow the estimation samples to only seniors who moved in since 2009. Some of the same patterns emerge. Seniors and disabled seniors living alone are more likely to move into potentially modifiable or livable homes. Advanced age and higher education remain positive predictors. Black and Asian seniors as well as non-U.S. citizens are less likely to move into accessible homes.

Which Households Make Accessibility-Enhancing Home Improvements?

Another channel by which seniors can occupy accessible homes is via modifications and home improvements. Since the AHS has only fielded the housing modifications module in one survey year, we are unable to directly compare units over time. However, the AHS 2013 asks owner-occupants about home remodeling and major improvements and replacements in the last 2 years. We identified a set of modifications that could potentially be accessibility enhancing: added or remodeled a bathroom or kitchen; created a bedroom; added/replaced doors or windows, driveways, or walkways. Between 2011 and 2013, 12.4% of homes that had no change of householder and that were not potentially modifiable underwent such modifications. For potentially modifiable but nonlivable homes, the share is 11.4%, and for livable but non–wheelchair-accessible homes the share is 10.2%.

Table 8 shows models of whether a potentially accessibility-enhancing modification was made between 2011 and 2013, estimated on owner-occupied homes that were not accessible in 2011 and in which there was no change in householder. We can see that having a disabled household member is an important predictor of modifications for homes that were not accessible or potentially modifiable in 2011: a resident with an ambulatory (or self-care or independent living) disability increases the likelihood of a potentially accessibility-enhancing modification by about 20%. However, senior age, by itself or interacted with disability, does not matter in addition to disability. This suggests that households are waiting until a member develops a disability before making modifications, rather than making modifications that might prevent the onset of a disability.

Other variables that significantly increase the likelihood are square footage, occupancy length and education level of the householder, household income, and children residing in the home. Black and Asian householders are less likely to make these modifications, but there is no significant effect by Hispanic ethnicity or U.S. citizenship. Those living in multiunit buildings or newer homes are less likely to make such modifications.

Table 7. Which seniors move into modifiable or accessible homes? Sample includes recently moved in households with a member age 65+.

	Housing unit is…			Who also has an ambulatory, self-care or independent living disability			Who also has an ambulatory disability		
				Housing unit is…			Housing unit is…		
	Level 1: Potentially modifiable	Level 2: Livable	Level 3: Wheelchair accessible	Level 1: Potentially modifiable	Level 2: Livable	Level 3: Wheelchair accessible	Level 1: Potentially modifiable	Level 2: Livable	Level 3: Wheelchair accessible
Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Age 65+ household member has:									
Ambulatory, self-care, or independent living disability	0.0754** (0.0190)	0.0847** (0.0134)	0.0083* (0.0042)						
Ambulatory disability				−0.0012 (0.0448)	−0.0056 (0.0387)	0.0069 (0.0134)			
Occupancy length[a] (Reference group: less than 2 years)									
2 to 5 years	0.0548** (0.0178)	−0.0026 (0.0126)	0.0009 (0.0039)	0.1084** (0.0308)	0.0107 (0.0266)	−0.0081 (0.0092)	0.0647* (0.0324)	−0.0352 (0.0279)	−0.0144 (0.0099)
Lives alone	0.0948** (0.0198)	0.0957** (0.0140)	0.0054 (0.0043)	0.0748* (0.0359)	0.0878** (0.0310)	0.0153 (0.0108)	0.0898* (0.0378)	0.0924** (0.0325)	0.0118 (0.0115)
Any resident <18 years old	−0.0368 (0.0265)	−0.0450* (0.0187)	−0.0049 (0.0058)	−0.1710** (0.0533)	−0.0754 (0.0460)	−0.0010 (0.0159)	−0.1827** (0.0585)	−0.0713 (0.0503)	−0.0000 (0.0178)
Age[a] (Reference group: age 65 to 75)									
Age 75–85	0.0405* (0.0195)	0.0472** (0.0138)	0.0090* (0.0043)	0.0343 (0.0342)	0.0852** (0.0295)	0.0291** (0.0102)	0.0660+ (0.0361)	0.0973** (0.0311)	0.0266* (0.0110)
Age 85+	0.0967** (0.0260)	0.1388** (0.0184)	0.0181** (0.0057)	0.0409 (0.0370)	0.1857** (0.0320)	0.0345** (0.0111)	0.0447 (0.0398)	0.1982** (0.0343)	0.0419** (0.0121)
Race/ethnicity[a] (Reference group: White non-Hispanic)									
Black, non-Hispanic	−0.0844** (0.0274)	−0.0701** (0.0194)	−0.0109+ (0.0060)	−0.0931* (0.0449)	−0.0395 (0.0388)	−0.0087 (0.0134)	−0.0792+ (0.0473)	−0.0060 (0.0407)	−0.0095 (0.0144)
Asian, non-Hispanic	−0.0959* (0.0459)	−0.0857** (0.0325)	0.0045 (0.0101)	−0.1508+ (0.0875)	−0.1571* (0.0755)	0.0022 (0.0262)	−0.1309 (0.0905)	−0.1508+ (0.0779)	−0.0049 (0.0276)

(Continued)

Table 7. (Continued).

Dependent variable:	Housing unit is…			Who also has an ambulatory, self-care or independent living disability — Housing unit is…			Who also has an ambulatory disability — Housing unit is…		
	Level 1: Potentially modifiable	Level 2: Livable	Level 3: Wheelchair accessible	Level 1: Potentially modifiable	Level 2: Livable	Level 3: Wheelchair accessible	Level 1: Potentially modifiable	Level 2: Livable	Level 3: Wheelchair accessible
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	(0.0315)	(0.0223)	(0.0069)	(0.0601)	(0.0519)	(0.0180)	(0.0643)	(0.0553)	(0.0196)
Other non-Hispanic race	−0.0739 (0.0716)	−0.0760 (0.0507)	−0.0143 (0.0157)	−0.0559 (0.1492)	−0.0923 (0.1289)	−0.0107 (0.0447)	0.0117 (0.1810)	−0.0490 (0.1557)	−0.0013 (0.0551)
Immigration status[a] (Reference group: non-U.S. citizen)									
Native born, U.S. citizen	0.1132** (0.0357)	0.0525* (0.0253)	0.0040 (0.0078)	0.2513** (0.0757)	0.0978 (0.0654)	−0.0013 (0.0227)	0.2569** (0.0803)	0.1191+ (0.0691)	−0.0034 (0.0244)
Foreign born, U.S. citizen	0.1201** (0.0411)	0.0495+ (0.0291)	0.0067 (0.0090)	0.3429** (0.0867)	0.1176 (0.0749)	−0.0061 (0.0259)	0.3368** (0.0928)	0.1332+ (0.0798)	−0.0061 (0.0283)
Education[a] (Reference group: nonhigh school graduate)									
High school graduate	0.0640** (0.0235)	0.0067 (0.0167)	0.0138** (0.0052)	0.1046** (0.0377)	0.0003 (0.0326)	0.0205+ (0.0113)	0.0666 (0.0407)	−0.0066 (0.0350)	0.0186 (0.0124)
Some college, no bachelor's degree	0.0359 (0.0251)	0.0398* (0.0178)	0.0096+ (0.0055)	0.1304** (0.0419)	0.1359** (0.0361)	0.0255* (0.0125)	0.1188** (0.0446)	0.1542** (0.0383)	0.0292* (0.0136)
Bachelor's degree	0.0262 (0.0265)	0.0586** (0.0187)	0.0110+ (0.0058)	0.1252** (0.0475)	0.1314** (0.0410)	0.0387** (0.0142)	0.1335** (0.0506)	0.1484** (0.0436)	0.0458** (0.0154)
Household income (Reference group: lowest quartile)									
Quartile 2	0.0469* (0.0215)	0.0211 (0.0152)	−0.0004 (0.0047)	0.0188 (0.0371)	0.0220 (0.0320)	0.0111 (0.0111)	0.0470 (0.0395)	0.0447 (0.0339)	0.0041 (0.0120)
Quartile 3	0.0130 (0.0261)	0.0220 (0.0185)	−0.0120* (0.0057)	0.0539 (0.0463)	0.0523 (0.0400)	−0.0114 (0.0139)	0.0723 (0.0479)	0.0711+ (0.0412)	−0.0166 (0.0146)
Highest quartile	0.0744* (0.0327)	0.0553* (0.0231)	−0.0076 (0.0072)	0.0999 (0.0679)	0.1340* (0.0586)	0.0113 (0.0203)	0.1589* (0.0733)	0.1390* (0.0630)	0.0063 (0.0223)
Renter occupied	0.1030** (0.0188)	0.0755** (0.0133)	0.0061 (0.0041)	0.2376** (0.0334)	0.1296** (0.0289)	0.0142 (0.0100)	0.2360** (0.0351)	0.1059** (0.0302)	0.0118 (0.0107)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Census region (Reference group: Northeast)									
Midwest	0.0351	0.0469*	−0.0071	0.0327	0.1044*	0.0236	0.0496	0.0588	0.0246
	(0.0276)	(0.0195)	(0.0060)	(0.0486)	(0.0420)	(0.0146)	(0.0517)	(0.0445)	(0.0157)
South	0.1716**	0.0394*	−0.0019	0.0911*	0.0957*	0.0244+	0.1061*	0.0729+	0.0257+
	(0.0249)	(0.0176)	(0.0055)	(0.0435)	(0.0375)	(0.0130)	(0.0456)	(0.0393)	(0.0139)
West	0.1537**	0.0208	−0.0069	0.0850+	−0.0282	−0.0009	0.0797	−0.0519	−0.0006
	(0.0262)	(0.0186)	(0.0058)	(0.0473)	(0.0409)	(0.0142)	(0.0505)	(0.0434)	(0.0154)
Urban status (Reference group: central cities)									
Suburbs	0.0760**	0.0181	0.0029	0.0680*	0.0313	−0.0051	0.0911*	0.0347	−0.0075
	(0.0196)	(0.0139)	(0.0043)	(0.0342)	(0.0295)	(0.0102)	(0.0362)	(0.0311)	(0.0110)
Nonmetro areas	0.0615*	0.0107	0.0079	0.0825*	0.0378	0.0307*	0.0982*	0.0481	0.0269*
	(0.0239)	(0.0169)	(0.0052)	(0.0410)	(0.0354)	(0.0123)	(0.0438)	(0.0377)	(0.0133)
Constant	−0.0082	−0.0966**	−0.0090	−0.1421	−0.1913*	−0.0546+	−0.1708	−0.1940*	−0.0377
	(0.0509)	(0.0360)	(0.0112)	(0.1086)	(0.0938)	(0.0325)	(0.1075)	(0.0924)	(0.0327)
Observations	3,474	3,474	3,474	1,143	1,143	1,143	1,029	1,029	1,029
Adjusted R^2	0.068	0.100	0.012	0.108	0.103	0.029	0.104	0.107	0.032

Weighted ordinary least squares regressions. Standard errors shown in parentheses.
[a]Refers to the oldest household member in columns 1–3, and the oldest disabled household member in columns 4–9.
** $p < .01$; * $p < .05$; + $p < .10$.

Table 8. Which households make accessibility-enhancing home improvements? Sample included owner-occupied units with same householder in 2011 and 2013.

	Not potentially modifiable or accessible	Level 1: Potentially modifiable, but not Level 2: Livable	Level 2: Livable, but not Level 3: Wheelchair accessible	Not potentially modifiable or accessible	Level 1: Potentially modifiable, but not Level 2: Livable	Level 2: Livable, but not Level 3: Wheelchair accessible
Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
At least one resident has:						
Ambulatory, self-care, or independent living disability	0.0250** (0.0092)	0.0110 (0.0134)	0.0611* (0.0274)			
Ambulatory disability				0.0215* (0.0101)	0.0060 (0.0146)	0.0355 (0.0279)
Age 65+	0.0070 (0.0059)	−0.0133 (0.0085)	0.0033 (0.0192)	0.0064 (0.0058)	−0.0137 (0.0083)	−0.0013 (0.0188)
Age 65+ and has ambulatory, self-care, or independent living disability	−0.0127 (0.0128)	0.0130 (0.0180)	−0.0680* (0.0324)			
Age 65+ and has ambulatory disability				−0.0076 (0.0138)	0.0213 (0.0192)	−0.0479 (0.0331)
Occupancy length[a]						
(Reference group: less than 2 years)						
2 to 5 years	0.0274** (0.0077)	0.0294* (0.0115)	0.0116 (0.0266)	0.0277** (0.0077)	0.0297* (0.0115)	0.0125 (0.0266)
5 to 10 years	0.0386** (0.0077)	0.0345** (0.0116)	0.0287 (0.0262)	0.0387** (0.0077)	0.0349** (0.0116)	0.0296 (0.0262)
More than 10 years	0.0560** (0.0075)	0.0476** (0.0113)	0.0351 (0.0252)	0.0562** (0.0075)	0.0478** (0.0113)	0.0370 (0.0253)
Lives alone	−0.0055 (0.0056)	−0.0141+ (0.0084)	0.0331+ (0.0184)	−0.0059 (0.0056)	−0.0142+ (0.0084)	0.0333+ (0.0185)
Any resident <18 years old	0.0153** (0.0053)	−0.0103 (0.0078)	−0.0108 (0.0213)	0.0149** (0.0053)	−0.0104 (0.0078)	−0.0126 (0.0213)
Race/ethnicity[a]						
(Reference group: White non-Hispanic)						
Black, non-Hispanic	−0.0180* (0.0070)	0.0017 (0.0104)	0.0279 (0.0251)	−0.0177* (0.0070)	0.0024 (0.0103)	0.0258 (0.0251)
Asian, non-Hispanic	−0.0338** (0.0125)	−0.0180 (0.0199)	0.0158 (0.0613)	−0.0341** (0.0125)	−0.0175 (0.0199)	0.0123 (0.0614)
Hispanic of any race	0.0047 (0.0082)	−0.0107 (0.0108)	−0.0300 (0.0304)	0.0055 (0.0082)	−0.0105 (0.0108)	−0.0297 (0.0305)
Other non-Hispanic race	0.0065 (0.0155)	−0.0424+ (0.0219)	−0.0617 (0.0465)	0.0067 (0.0155)	−0.0421+ (0.0219)	−0.0627 (0.0466)

	(1)	(2)	(3)	(4)	(5)
Immigration status[a]					
(Reference group: non-U.S. citizen)					
Native born, U.S. citizen	0.0474 (0.0517)	−0.0284+ (0.0150)	0.0058 (0.0101)	0.0443 (0.0517)	0.0051 (0.0101)
Foreign born, U.S. citizen	0.0544 (0.0570)	−0.0296+ (0.0175)	0.0081 (0.0119)	0.0503 (0.0570)	0.0081 (0.0119)
Education[a]					
(Reference group: nonhigh school graduate)					
High school graduate	−0.0038 (0.0232)	−0.0134 (0.0107)	0.0219** (0.0074)	−0.0032 (0.0232)	0.0219** (0.0074)
Some college, no bachelor's degree	0.0174 (0.0240)	0.0032 (0.0108)	0.0325** (0.0075)	0.0190 (0.0240)	0.0325** (0.0075)
Bachelor's degree	0.0025 (0.0256)	0.0194+ (0.0115)	0.0536** (0.0079)	0.0043 (0.0256)	0.0536** (0.0079)
Household income					
(Reference group: lowest quartile)					
Quartile 2	0.0261 (0.0201)	0.0128 (0.0091)	0.0189** (0.0062)	0.0281 (0.0201)	0.0193** (0.0062)
Quartile 3	0.0248 (0.0220)	0.0396** (0.0097)	0.0413** (0.0066)	0.0267 (0.0220)	0.0418** (0.0066)
Highest quartile	0.1323** (0.0262)	0.0722** (0.0109)	0.0890** (0.0075)	0.1348** (0.0262)	0.0892** (0.0075)
Building type					
(Reference group: single-family homes)					
Mobile homes	−0.0615 (0.0483)	0.0129 (0.0168)	0.0067 (0.0088)	−0.0658 (0.0483)	0.0066 (0.0088)
Two to four units in building	−0.0490 (0.0324)	−0.0828** (0.0147)	−0.0817** (0.0088)	−0.0496 (0.0323)	−0.0815** (0.0088)
Five to nine units in building	−0.0867* (0.0410)	−0.0763** (0.0181)	−0.0878** (0.0110)	−0.0894* (0.0409)	−0.0876** (0.0110)
10 to 49 units in building	−0.0795* (0.0322)	−0.0815** (0.0152)	−0.0891** (0.0094)	−0.0801* (0.0321)	−0.0890** (0.0094)
50+ units in building	−0.0564+ (0.0292)	−0.0982** (0.0183)	−0.0875** (0.0140)	−0.0577* (0.0291)	−0.0871** (0.0140)
Housing unit size					
(Reference group: less than 1,000 sq. ft.)					
1,000 to 1,500 sq. ft.	0.0213 (0.0231)	0.0064 (0.0105)	0.0117+ (0.0067)	0.0202 (0.0230)	0.0118+ (0.0067)
1,500 to 2,000 sq. ft.	0.0871** (0.0273)	0.0112 (0.0115)	0.0198* (0.0077)	0.0868** (0.0273)	0.0201** (0.0077)
Over 2,000 sq. ft.	0.0163 (0.0264)	0.0275* (0.0117)	0.0244** (0.0076)	0.0156 (0.0263)	0.0246** (0.0076)

(Continued)

Table 8. (*Continued*).

	Not potentially modifiable or accessible	Level 1: Potentially modifiable, but not Level 2: Livable	Level 2: Livable, but not Level 3: Wheelchair accessible	Not potentially modifiable or accessible	Level 1: Potentially modifiable, but not Level 2: Livable	Level 2: Livable, but not Level 3: Wheelchair accessible
Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
Building age						
(Reference group: built before 1920)						
Built in 1920s	−0.0001	−0.0601*	0.0426	−0.0002	−0.0600*	0.0452
	(0.0120)	(0.0276)	(0.0692)	(0.0119)	(0.0276)	(0.0692)
Built in 1930s	−0.0134	−0.0504+	0.3121**	−0.0131	−0.0507+	0.3129**
	(0.0117)	(0.0273)	(0.0688)	(0.0117)	(0.0273)	(0.0689)
Built in 1940s	−0.0244*	−0.0539*	0.1051+	−0.0243*	−0.0542*	0.1039+
	(0.0110)	(0.0231)	(0.0573)	(0.0110)	(0.0230)	(0.0573)
Built in 1950s	−0.0113	−0.0320	0.0894+	−0.0109	−0.0314	0.0895+
	(0.0098)	(0.0206)	(0.0498)	(0.0098)	(0.0206)	(0.0499)
Built in 1960s	0.0006	−0.0403*	0.1046*	0.0006	−0.0402*	0.1030*
	(0.0097)	(0.0204)	(0.0486)	(0.0097)	(0.0204)	(0.0487)
Built in 1970s	0.0037	−0.0272	0.0518	0.0036	−0.0270	0.0515
	(0.0089)	(0.0197)	(0.0479)	(0.0089)	(0.0197)	(0.0479)
Built in 1980s	−0.0047	−0.0167	0.0605	−0.0047	−0.0167	0.0604
	(0.0098)	(0.0205)	(0.0487)	(0.0098)	(0.0205)	(0.0488)
Built in 1990s	−0.0316**	−0.0547**	0.0668	−0.0317**	−0.0548**	0.0668
	(0.0099)	(0.0207)	(0.0490)	(0.0099)	(0.0207)	(0.0490)
Built after 2000	−0.0753**	−0.0952**	0.0288	−0.0749**	−0.0953**	0.0291
	(0.0099)	(0.0204)	(0.0487)	(0.0099)	(0.0204)	(0.0487)
Census region						
(Reference group: Northeast)						
Midwest	0.0174**	−0.0005	0.0072	0.0175**	0.0002	0.0075
	(0.0062)	(0.0126)	(0.0240)	(0.0061)	(0.0126)	(0.0241)
South	−0.0150*	−0.0138	−0.0326	−0.0149*	−0.0139	−0.0329
	(0.0062)	(0.0114)	(0.0229)	(0.0062)	(0.0114)	(0.0229)
West	−0.0126+	−0.0153	0.0072	−0.0119+	−0.0152	0.0067
	(0.0070)	(0.0122)	(0.0253)	(0.0070)	(0.0122)	(0.0253)

Urban status						
(Reference group: central cities)						
Suburbs	0.0014	0.0013	−0.0213	0.0011	0.0016	−0.0221
	(0.0053)	(0.0078)	(0.0183)	(0.0053)	(0.0078)	(0.0183)
Nonmetro areas	−0.0065	0.0018	0.0141	−0.0067	0.0017	0.0120
	(0.0063)	(0.0090)	(0.0207)	(0.0063)	(0.0090)	(0.0207)
Constant	0.0268	0.1376**	−0.0792	0.0271	0.1377**	−0.0742
	(0.0170)	(0.0298)	(0.0794)	(0.0170)	(0.0298)	(0.0795)
Observations	24,056	10,506	1,841	24,086	10,520	1,841
Adjusted R^2	0.057	0.042	0.066	0.057	0.042	0.064

Note. Unit underwent modification that potentially enhanced accessibility between 2011 and 2013. Weighted ordinary least squares regressions. Standard errors shown in parentheses.
[a]Refers to the householder.
**p < .01; *p < .05; +p < .10.

Discussion and Conclusions

We have documented the startling scarcity of units in the U.S. housing stock that are suitable for aging. Fewer than 4% could be considered livable by people with moderate mobility difficulties, and only a tiny fraction of 1% of homes are wheelchair accessible. Even when we use a far less stringent definition of accessibility—potentially modifiable—only one third of units meet the limited criteria.

When we investigated the factors that predict which homes are likely to reach each of the three accessibility levels, we find that public housing and subsidized, privately owned rental units are far more likely to be accessible, as are homes in the lowest quartile of rents or market value. Whereas newer homes are more likely to be accessible, buildings constructed today are no more likely to be accessible than those built in the mid-1990s are, suggesting that the housing market is not responding to the aging demographic profile.

We have also documented the small fraction of seniors, even among those who are disabled, living in homes that are suitable for aging. Only 15% of households with a disabled senior reside in a home that is livable for people with moderate mobility difficulties. As expected, we find that older and more disabled seniors, as well as seniors living alone, are more likely to live in an accessible home. However, we also find that seniors with long tenure, particularly those who are disabled, are far less likely to live in accessible homes. These seniors are aging in inaccessible homes, including ones that are not even potentially modifiable. The fact that we find so few people, even those with mobility difficulties, living in homes appropriate for aging begs the question of how they are coping.

Given the scarcity of suitable homes, a considerable share of homes would have to be modified, and a large fraction of seniors would have to move in order to accommodate a current or future mobility disability. We find that among seniors and disabled seniors who moved into their home between 2009 and 2011, a substantially greater fraction live in accessible homes, compared with their nonmoving counterparts. Still, even among disabled seniors who move, about three quarters of them move to homes that are *not* livable for people with moderate mobility difficulties. Among homeowners, households with disabled residents are more likely to make potentially accessibility-improving housing modifications, but our results suggest that they are not undertaking improvements before a disability appears, and are thus not taking advantage of the potential for accessible housing features to protect against falls.

Housing that meets the needs of older adults is becoming increasingly important as the U.S. population ages. Seniors express an overwhelming desire to remain in their community as they age rather than move to institutional long-term care. This strategy not only generates substantial financial savings for both households and the public sector, but also affords seniors emotional and health benefits from a sense of attachment to and familiarity with home and neighborhood. To facilitate successful aging, homes should have accessibility features that enable people with mobility difficulties to live independent lives as much as possible, or they should at least have structural elements that permit accessibility modifications at a later date, when needed. In this article, we have documented the limited extent to which this goal is being met.

Further research is needed to understand why so few seniors live in homes that are suitable for aging. The insufficient supply of accessible units, with public housing and government subsidized rental housing disproportionately likely to be accessible, suggests that costs of construction or modification are an important factor. At the same time, very few seniors are undertaking accessibility-enhancing modifications or moving to accessible housing. This could be due to high costs, to their privileging other features of housing above accessibility, to their lack of information about the potential benefits of accessible housing, or to some combination of the three. The appropriate policy intervention will depend on disentangling these reasons.

Notes

1. Keenan (2010).
2. See U.S. Department of Housing and Urban Development (2013) for a summary of this evidence.

3. Centers for Disease Control and Prevention (CDC) data show that in 2013, 2.5 million seniors were treated in emergency departments for fall injuries, most often because of a head injury or hip fracture. Falls are overwhelmingly the most common type of nonfatal injury among those age 65+.

4. Tinetti and Kumar (2010) provide a review of randomized trials focused on prevention of falls.

5. MetLife Mature Market Institute (2012) reports that the 2012 national average annual cost was $81,030 in nursing homes with a semi-private room, and $42,600 in assisted living communities; by contrast, a home health aide costs on average $21 per hour, or $21,840 per year based on 4 h per day, 5 days per week. The Congressional Budget Office (2013) reports that from 2002 to 2012, the cost of nursing homes and assisted living facilities rose by 4.5 and 5.1% per annum, but only 1.6% for home health aides.

6. Based on data from the Medicare Current Beneficiary Survey, just 3.5% of those age 75 to 84 lived in nursing homes in 2010, compared with 13.0% of those age 85+ (Congressional Budget Office, 2013).

7. According to the 2010 ACS, 85% of seniors living in nursing homes had serious difficulty walking or climbing stairs, compared with 24% of those not in nursing homes.

8. Estimates are based on the average hourly wage of a home health aide, and not any forgone earnings of the caregiver. See Congressional Budget Office (2013) for details.

9. This does not include the implicit value of informal care. In general, Medicare pays for services that are short term and that aid recovery from an acute medical care episode. By contrast, Medicaid pays for extended long-term care that may be unrelated to any medical care.

10. The Congressional Budget Office (2013) reports that from 2002 to 2012, Medicaid spending for institutional long-term care grew by 1% per year on average, compared with 8% for community-based care. For Medicare, the analogous rates were 6% versus 8%.

11. The population age 65+ residing in a nursing home fell by 2.1% from 1990 to 2000, and by 19.6% from 2000 to 2010 (U.S. Census Bureau, 2014).

12. With an aging population but little projected change in fertility or immigration rates, the ratio of nonworking-age to working-age population (the dependency ratio) must increase, and there will be relatively fewer people paying into these programs compared with those eligible to draw benefits.

13. These include accessible laundry facilities, parking, and common areas in multifamily buildings such as the lobby and elevators.

14. Beyond physical attributes of homes themselves, neighborhood characteristics and services have been shown to facilitate aging in the community; specifically, walkable streets and transportation options besides driving, access to a wide range of services such as health care and general retail services, and institutions that enhance the ability to participate in community life, such as places of worship, community centers, and libraries (MetLife Mature Market Institute, 2013). We have tried to couple the AHS measures of physical housing attributes in 2011 with information from the 2013 public transportation module, on the assumption that these amenities will have been similar in 2011. This 2013 module includes information on distance to public transit, and whether retail, health care facilities, and entertainment can be reached by public transit or by walking. However, a 50% random sample of 2013 respondents were asked the public transportation module, whereas the other 50% were given the neighborhood module. Further, skip patterns in the survey resulted in many missing values. For example, the walkability questions were only asked of those who reported that they walked around the neighborhood. We are continuing to work on making use of this information.

15. Vacant units were disproportionately likely to have missing values for the accessibility questions.

16. For vacant rental units, the AHS records the rent but not the cost of utilities. To impute rent plus utilities, we calculated the median ratio between the rent plus utilities and the rent alone for each census region. We then multiplied the rent for vacant units by the median ratio in their region to estimate rent plus utilities for these units.

17. In the 2010 ACS, 18.5% of people age 65+ had difficulty doing errands alone, and 11.0% had difficulty with dressing or bathing. Variation by age is shown in Figure 1.

18. When possible, we have reestimated the models presented below using an alternate disability definition whereby a household is counted as disabled if there is a person who uses a mobility device, even if no ambulatory disability is recorded. The results are substantively similar to those that are presented.

19. Eggers and Moumen (2011) reach a similar conclusion when they compare 2009 disability percentages calculated from the AHS and the ACS. They speculate that this is due to the ACS always asking the full set of six disability questions about each household member, whereas the AHS asks the full set only if the respondent first answers yes to the question asking whether anyone in the household has a disability.

20. Logit and probit functional forms gave qualitatively similar results.

21. We tried to further explore whether moving into the home before, after, or at the same time as the householder affected the likelihood of living in an accessible home, but these additional control variables were never statistically significant.

22. With the widespread and growing use of defined-contribution pension plans, retirees may have substantial nonannuitized wealth that would not be reported as income, but would be equivalent to income if an annuity were purchased or regular withdrawals were made.

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Notes on Contributors

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