The House Next Door: A Comparison of Residences by Disability Status Using New Measures in the American Housing Survey

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Abstract

Using new measures in the American Housing Survey, we document housing differences by disability status. We compare housing and neighborhood characteristics for people with and without disabilities using multivariate analyses to control for individual-level characteristics. Our impact estimates suggest that people with disabilities live in housing units and neighborhoods with significantly less desirable characteristics. Low-cost mortgages and housing voucher receipt, however, have positive effects on the housing and neighborhood characteristics of people with disabilities. Other forms of housing assistance, particularly subsidized housing and rent control, are associated with less desirable residences.

Introduction

Researchers have documented the struggles of working-age people (18 to 64 years old) with disabilities in terms of their employment, health insurance coverage, access to health care, and poverty status. No one has yet researched the state of housing for this group, however, perhaps in part because of data limitations. Now, because of the inclusion of disability-related questions in the 2009 American Housing Survey (AHS), this issue can be analyzed in detail for the first time. Understanding the housing needs of working-age people with disabilities is crucial to developing housing policies for this population, such as the Section 811 program. By analyzing the differences in housing between adults with and without disabilities, we can identify areas in which housing for people with disabilities is lacking and assess the effect of housing policies on the likelihood that people with disabilities will have poor or unstable housing.

Most of the existing literature on housing and disabilities focuses on elderly people or children with disabilities. This article is intended to fill the knowledge gap on the housing status of working-age people with disabilities. We also focus on this population because it represents a large and growing segment that relies heavily on state and federal government programs. In 2008, approximately 19 million working-age people had disabilities (U.S. Census Bureau, 2008). In that same year, the federal government spent nearly $360 billion, or approximately $19,000 per person, on programs and services that working-age people with disabilities used (Livermore, O'Toole, and Stapleton, 2010). Although federal spending on housing-related programs represented only about 1 percent ($3.8 billion) of these expenditures, people with disabilities represent a disproportionate share of those who need housing assistance. For example, the U.S. Department of Housing and Urban Development (HUD) estimates that 40 percent of homeless individuals in shelters have a disability (HUD, 2010). We also focus on working-age people with disabilities because they are the target of recent efforts to promote employment, reduce poverty, and reduce reliance on income assistance, primarily from the Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI) programs. Such efforts, however, are unlikely to be effective if many of these individuals are in poor or unstable housing situations. Recent research has suggested that 1.1 million (HUD PD&R, 2008) to 1.4 million (Nelson, 2008) households with a working-age person with a disability had "worst-case" housing needs in 2005. This worst-case status is defined as low-income household members paying more than one-half of their incomes in rent, living in severely substandard housing, or both.

Before the release of the 2009 AHS, researchers made use of supplements to the AHS, the American Community Survey (ACS), and other large national data sets to find basic housing information on people with disabilities. Studies have identified differences in housing quality for households with and without members with disabilities, including the number of people per room, unit size, the number of families in the home, whether the unit is a mobile home, and neighborhood amenities (National Council on Disability, 2010; White, Peaslee, and LaQuatra, 1994). Other researchers have compared household surroundings such as urbanicity, local crime, density, access to transportation, racial and age composition of neighborhood residents, and mobility barriers for working-age people with disabilities (National Council on Disability, 2010) and for elderly people (Beard et al., 2009; Freedman et al., 2008; Gilderbloom and Markham, 1996; Keysor et al., 2010).

The new disability-related questions in the 2009 AHS included questions on health-related functional impairments and on disability-income receipt. Specifically, the survey asked if a household member has a physical or mental condition that causes difficulties with hearing, vision, cognitive functions, walking or climbing stairs, self-care, or performing errands. Other questions focused on SSI receipt and disability payments (defined as SSDI, workers' compensation, veterans' disability compensation or pension, or other disability payments). These questions enable us to examine housing differences by self-reported disability status (problems with one of the six specific activities or disability-income receipt).

Disability status may be associated with a range of housing characteristics. This analysis focused on some characteristics that have been addressed in previous research and others that have not. We examine two housing areas:

- **Housing quality**. Overall rating, size, rooms per person, square feet per person, manufactured/mobile home, amenities (for example, appliances, cooling, safety devices, and garage), and deficiencies (for example, problems with the physical structure, equipment breakdowns, plumbing problems, and rodents).
- **Neighborhood quality**. Overall rating, Area Median Income (AMI), average fair-market rent, community services available, benefits (proximity to public transportation, stores, and police protection), and problems (for example, crime, noise, odors, and surrounding building and road conditions).

To help explain our findings, we also examined responses to questions about the reasons for choosing a particular residence.

For this study, we conducted multivariate analyses of the likelihood of particular housing and neighborhood features while controlling for sociodemographic characteristics. In particular, we assessed the extent to which aspects of housing and neighborhood quality differ between working-age people with and without disabilities, holding income and other household characteristics constant. We also compared the AHS estimates of the number of working-age people with disabilities with estimates from the Current Population Survey (CPS) and the ACS. All three surveys contain identical disability questions, which enabled us to assess the extent to which the AHS fully captures the noninstitutional population with disabilities. One concern is that the AHS does not survey those living in noninstitutional group quarters; the percentage of residents with disabilities in some types of noninstitutional group quarters is very high (HUD, 2008).

Our findings indicate that, with other characteristics (including income) held constant, working-age individuals with disabilities live in lower quality housing and lower quality neighborhoods than their nondisabled counterparts. These results are consistent with other research showing that, holding income constant, working-age people with disabilities are more likely to face a range of material hardships, which may be in part because of the higher costs and reduced household efficiency associated with activity limitations and disability (She and Livermore, 2007). Further, previous studies on elderly people with disabilities found similar results; these studies focused on a subset of the housing characteristics analyzed here, although they often used different data sources and methods (as discussed in the following section).

We also assessed the extent to which housing assistance influenced housing and neighborhood outcomes. Our results suggest that, in general, housing assistance programs are relatively more beneficial for people with disabilities than for people without disabilities. Of the five housing assistance types considered, low-cost mortgages and housing vouchers were the most beneficial for people with disabilities.

The remainder of this article is organized as follows: In the next section, we describe previous research related to disability and housing. In Data and Methods, we discuss the 2009 AHS and its new disability measures. In Findings From the Multivariate Analyses, we present our findings on the association between disability and housing and neighborhood characteristics, controlling for important covariates such as income and household size. In Housing Assistance, we examine the role that housing assistance plays in the housing characteristics of people with disabilities. In the final section, we conclude and discuss the policy implications of our findings.

Disability and Housing Characteristics

Disability is likely to affect housing and neighborhood characteristics in a number of ways. First, disability may limit a person's income and assets, which in turn limits his or her housing options. Working-age people with disabilities are much more likely to have low incomes and to experience long-term poverty than those without disabilities (She and Livermore, 2009). Poverty occurs primarily because of the disability's effect on earnings, the primary source of income for most working-age individuals.[1] Limited income and assets can restrict people with disabilities to low-cost, low-quality housing options. It can also inhibit their ability to save and purchase their own homes, thereby reducing the control and incentives they might have to make home improvements. Second, disability can affect perceived housing and neighborhood quality through its effect on the individual's needs. For example, individuals with disabilities might require specific modifications to make their housing safe and accessible. They might also require community services such as accessible public transportation. If the available affordable housing cannot meet such needs, people with disabilities will be more likely to perceive their housing and neighborhoods to be of lower quality. Third, people with disabilities may find it difficult to address housing deficiencies (such as maintenance issues) that arise, which may lower their housing quality. Mobility, sensory, and cognitive limitations might affect an individual's ability to identify and address housing problems, and low income may limit a person's ability to purchase maintenance services.

A number of researchers have analyzed the relationship between disability and housing characteristics. Periodic HUD reports estimate worst-case housing needs, the most recent of which estimated that approximately 1 million nonelderly households with disabled members have worst-case needs, making disabled households, at a 36-percent rate, the most likely of any family type to fall into this category (HUD, 2011).[2] Disability advocacy groups have also examined the housing status of people with disabilities; one group found that housing affordability is the greatest need facing disabled households and that 41 percent of such households have trouble affording their housing costs (National Council on Disability, 2010). An older study, which revealed that households with disabilities have higher housing-to-income ratios, reached the same conclusion (White, Peaslee, and LaQuantra, 1994).

Other studies on the relationship between housing and disability have shown that, among elderly people, disability is associated with poor economic conditions (Beard et al., 2009; Freedman et al., 2008), neighborhood mobility barriers (Freedman et al., 2008; Keysor et al., 2010), a lack of transportation facilitators (Keysor et al., 2010), and higher levels of crime or perceived crime (Beard et al., 2009; Clark et al., 2009). These studies involved diverse populations, but all focused exclusively on individuals who are age 55 and older. A study conducted by Newman (2003) estimated the effect of disability on the number of unmet housing needs and dwelling modifications for

[1] Disability can negatively affect earnings through its effect on one's productivity and ability to work and through its effect on human capital development (for example, limiting education because onset occurred during childhood).

[2] The study also notes that the data on which the numbers are based (the 2009 AHS) likely underestimate the number of households with members with disabilities compared with other surveys, such as the ACS, implying that the number of disabled households with worst case needs may be even higher.

elderly people. Newman's study was based on data from a one-time supplement to the 1995 AHS that contained information on disability and housing modifications. In the supplement, disability was defined as (1) difficulty entering and exiting the home; (2) difficulty getting around inside the home; (3) difficulty with personal activities; (4) difficulty seeing; (5) difficulty hearing; or (6) use or need of special modifications, equipment, or assistance. Using counts of difficulties as a proxy for disability, Newman estimated that each difficulty is associated with a 10-percent increase in the number of unmet needs and a 7-percent increase in the number of dwelling modifications.

Data and Methods

In this section, we first describe the disability measures in the AHS and compare disability prevalence rates in the AHS to rates in two large, nationally representative surveys. We then measure demographic characteristics, housing characteristics, and neighborhood characteristics by disability status. Finally, we outline our estimation strategy for subsequent regression analyses.

Disability Measurement in the AHS

The AHS is the largest regular national housing survey in the United States (U.S. Census Bureau, 2004).[3] Conducted every 2 years by the U.S. Census Bureau on behalf of HUD, the AHS is designed to provide data on housing units between the decennial censuses, which also produce housing data. The 2009 AHS surveyed more than 53,000 housing units, representing a cross-section of all U.S. housing, excluding group quarters such as barracks, dormitories, prison wards, group homes, and assisted-living facilities (HUD, 2011). The AHS focuses on the housing unit itself, the surrounding area, and the household's inhabitants, if applicable.

Because the AHS represents all U.S. housing units, it includes vacant housing units in the sample, with information about each vacant unit gathered from neighbors, landlords, and rental agents. In our study, however, we exclude all vacant units. In addition, although the AHS is representative at the household level, information is gathered for every occupant of each housing unit, making it possible to conduct individual-level analyses. For our study, we analyzed data at both the individual and household levels, although we present only the individual-level estimates in what follows.[4] The sample of individuals used in this analysis includes only those of working age (18 to 64 years old). In the household-level analysis, we included only households with at least one member between ages 18 and 64.

The standard core of the AHS first included disability questions in 2009.[5] The survey asked respondents the following six questions regarding the existence of disabling limitations among all adult household members older than age 16:

[3] The AHS has two components: National Data and Metropolitan Data. For this article, we use the National Data; all references to the AHS are to the National Data.

[4] Household-level estimates are available from the authors upon request.

[5] Before the 2009 AHS, supplements containing disability-related questions were added to the 1978 and 1995 surveys.

1. Is anyone in this household deaf, or do they have serious difficulty hearing?
2. Is anyone in this household blind, or do they have serious difficulty seeing, even when wearing glasses?
3. Because of a physical, mental, or emotional condition, does anyone in this household have serious difficulty concentrating, remembering, or making decisions?
4. Does anyone in this household have serious difficulty walking or climbing stairs?
5. Does anyone in this household have serious difficulty dressing or bathing?
6. Because of a physical, mental, or emotional condition, does anyone in this household have difficulty doing errands alone, such as visiting a doctor's office or shopping?

To attribute the limitation to specific household members, an affirmative answer to any of these questions was followed by the question, "Who is that?" Hereafter, we refer to the limitations mentioned in these six questions as (1) hearing, (2) visual, (3) cognitive, (4) ambulatory, (5) self-care, and (6) independent-living disabilities, respectively. The AHS also asked respondents two questions regarding disability-income receipt: (1) "Did _____ receive any disability payments, such as SSDI, workers' compensation, veterans' disability, or other disability payments?" and (2) "Did _____ receive any SSI payments?" Any household member who had income from either source, for purposes of this analysis, is a person who received a disability payment.

Exhibit 1 shows disability prevalence rates at the individual and household levels, based on AHS data. To make these rates nationally representative, we used sample weights to calculate estimates. The unweighted sample sizes for these statistics are also included in exhibit 1. Disability prevalence rates are uniformly higher at the household level because a household needs only one working-age member with one of the six limitations to be considered a household with a disability. Of the individual sample and household sample, 6.0 and 10.1 percent, respectively, reported having at least one of the six limitations. Ambulatory disability was the most common, with 3.3 percent of individuals and 5.9 percent of households reporting this limitation. The least common limitations

Exhibit 1

Disability Prevalence Among Individuals Age 18 to 64 and Households With Members Age 18 to 64

Disability Measure	Individuals		Households	
	(N)	(%)	(N)	(%)
Hearing disability	69,305	1.2	36,705	2.2
Visual disability	69,308	0.8	36,706	1.4
Cognitive disability	69,255	1.9	36,673	3.4
Ambulatory disability	69,285	3.3	36,688	5.9
Self-care disability	69,285	0.7	36,689	1.4
Independent-living disability	69,283	1.7	36,690	3.0
Any of the six limitations	69,225	6.0	36,656	10.1
Disability-payment receipt	65,519	4.7	36,817	7.8
Any of the six limitations or disability-payment receipt	65,040	8.7	36,540	13.9

Source: 2009 American Housing Survey

were vision and self-care. Independent of limitations, approximately 4.7 percent of individuals and 7.8 percent of households reported receiving disability payments. Aggregating responses across all limitations and disability-payment receipt, 8.7 percent of individuals and 13.9 percent of households had a disability or a household member with a disability.

The six functional limitation questions in the 2009 AHS are similar to those in the CPS and ACS in 2009. A federal interagency workgroup for the 2000 Decennial Census developed these questions, which are becoming the new survey standard for identifying disability (Adler et al., 1999). Although the limitation questions in all three surveys are almost identical, the sampling methodologies differ substantially. As noted previously, the AHS does not sample those living in group quarters, but the ACS does sample this group (Weathers, 2009). The CPS sample is limited to the noninstitutionalized population, but it includes members of the armed forces living in civilian housing units. Consistency in the questions across the three surveys enables us to compare their disability prevalence rates if we limit the ACS and CPS samples to include only the noninstitutionalized, nongroup-quarters population to make them comparable to the AHS.

Exhibit 2 shows the individual-level disability prevalence rates based on the AHS, CPS, and ACS for the noninstitutionalized, nongroup-quarters population. The rates based on the AHS are lower than those from the CPS, and both of these rates are lower than those based on the ACS.[6, 7] Differences in survey context and data collection methodology likely contribute to the differences in prevalence estimates across surveys (Brault, 2010). For example, the ACS uses three data collection

Exhibit 2

Rates of Disability Prevalence for Individuals Age 18 to 64, by Data Source

Disability Measure	AHS (N = 135,442,153)	CPS (N = 189,087,636)		ACS (N = 186,851,396)	
	Weighted Percent	Weighted Percent	Percentage-Point Difference From AHS	Weighted Prevalence	Percentage-Point Difference From AHS
Hearing disability	1.20	1.47	0.27***	2.06	0.86***
Visual disability	0.80	1.08	0.28***	1.70	0.90***
Cognitive disability	1.92	2.90	0.98***	3.99	2.07***
Ambulatory disability	3.29	4.24	0.95***	5.17	1.88***
Self-care disability	0.75	1.24	0.49***	1.72	0.97***
Independent-living disability	1.68	2.49	0.81***	3.35	1.67***
Any of the six limitations	5.96	7.84	1.88***	9.91	3.95***

ACS = American Community Survey. AHS = American Housing Survey. CPS = Current Population Survey.

**Indicates significance at the 10-percent level, two-sample t-test. **Indicates significance at the 5-percent level, two-sample t-test. ***Indicates significance at the 1-percent level, two-sample t-test.*

Sources: 2009 American Housing Survey; 2009 Current Population Survey; 2009 American Community Survey

[6] We also calculated individual-level disability prevalence rates based on the AHS without sample weights and with an alternate sample weight; all weighting mechanisms produced similar statistics.

[7] Similarly, Pelletiere and Nelson (2011) found that among nonelderly adults between the ages of 18 and 61, household disability prevalence rates based on the AHS were lower (10.0 percent) than those based on the ACS (16.1 percent).

modes sequentially to elicit high response rates; respondents are contacted first by mail, then by telephone, and finally in person (U.S. Census Bureau, 2010b). Using multiple survey modes may be particularly valuable in facilitating the participation of people with disabilities. The AHS and CPS use only two collection modes each; neither uses mailed surveys. Further, the presence or absence of a field representative may affect responses. Field representatives may clarify questions and obtain more accurate responses, or respondents may understate disabilities while in a field representative's presence because of social stigmas (Brault, 2009).

To assess the extent to which the populations with disabilities in the three surveys are similar, we developed descriptive statistics for the sample with disabilities in the AHS, CPS, and ACS (exhibit 3). The ACS statistics are based on published estimates (U.S. Census Bureau, 2010a); the samples over which the ACS statistics were calculated varied by age. To make the statistics comparable across surveys, we used these same age groups to compute the AHS and CPS statistics (as noted in parentheses for each variable). Exhibit 3 indicates that people who reported limitations in the CPS and ACS have similar, although generally statistically different, characteristics compared with those who reported limitations in the AHS. Given the size of the CPS and ACS, which provide estimates for more than 300 million people overall and more than 30 million people with disabilities, statistics across the surveys would have to be nearly identical to avoid being statistically different. Therefore, the small percentage differences suggest that the populations with disabilities are similar across the three surveys.

Exhibit 3

Individual-Level Characteristics of People With Disabilities Identified via the Six Questions on Functional Limitations, by Data Source

Individual Characteristic	AHS	CPS		ACS	
	Disabled (%)	Disabled (%)	Percentage-Point Difference From AHS	Disabled (%)	Percentage-Point Difference From AHS
Male (age 18–64)	48.6	49.5	– 0.9***	49.7	– 1.1***
Less than high school diploma (age 25+)	24.8	26.1	– 1.3***	27.6	– 2.8***
High school diploma or GED (age 25+)	34.0	36.0	– 2.0***	34.2	– 0.2
Some college or associate's degree (age 25+)	25.3	24.2	1.1***	25.1	0.2
Bachelor's degree or higher (age 25+)	15.9	13.6	2.3***	13.1	2.8***
Employed (age 16+)	22.1	19.4	2.7***	23.0	– 0.9***
Below 100 percent of the federal poverty level (age 16+)	21.2	20.2	1.0***	21.0	0.2

ACS = American Community Survey. AHS = American Housing Survey. CPS = Current Population Survey. GED = General Educational Development degree.

**Indicates significance at the 10-percent level, two-sample t-test. **Indicates significance at the 5-percent level, two-sample t-test. ***Indicates significance at the 1-percent level, two-sample t-test.*

Sources: 2009 American Housing Survey; 2009 Current Population Survey; 2009 American Community Survey (American FactFinder, Table B18101)

Descriptive Statistics

Our analysis focuses on comparing the housing-related characteristics of working-age people with and without disabilities. We defined a person with a disability as someone of working age who reported having any of the six limitations or receiving disability income. Accordingly, we limited our analytic sample to working-age individuals who responded to all six limitation questions and the disability-income questions.[8] This restriction led us to exclude 479 people who were missing information for one or more of the six limitation questions, 4,185 who were missing information on disability-income receipt, and 26 who were missing information on both sets of questions.[9] Of the remaining 65,040 people, 8.7 percent (5,564 people) had a disability, according to our definition.

The demographic characteristics of people with and without disabilities differ significantly (exhibit 4). Compared with people without disabilities, those with disabilities are significantly older, reflecting

Exhibit 4

Demographic Characteristics, by Disability Status

Demographic Characteristic	People With Disabilities (N = 5,564)	People Without Disabilities (N = 59,476)	Difference
Age (years)	47.8	40.7	7.1***
Less than high school diploma (%)	18.4	9.5	8.9***
High school diploma (%)	67.2	60.5	6.7***
College degree or higher (%)	14.4	30.0	– 15.6***
Married (%)	45.4	60.6	– 15.2***
Male (%)	47.7	48.3	– 0.5
Non-U.S. citizen (%)	3.6	10.2	– 6.6***
White (%)	78.0	81.9	– 3.9***
African American (%)	16.5	10.8	5.7***
Other race[a] (%)	5.5	7.3	– 1.8***
Hispanic (%)	12.6	16.0	– 3.4***
Household income ($)	47,273	82,592	– 35,319***
Interest-income receipt (%)	14.4	20.9	6.5***
City (%)	28.7	27.9	0.8
Northeast (%)	18.0	18.2	– 0.2
Midwest (%)	22.2	22.4	– 0.2
South (%)	39.0	36.2	2.8***
West (%)	20.9	23.2	– 2.3***

[a] *Other race represents all races other than White and African American.*

**Indicates significance at the 10-percent level, two-sample t-test. **Indicates significance at the 5-percent level, two-sample t-test. ***Indicates significance at the 1-percent level, two-sample t-test.*

Note: Estimates are based on individual-level data.

Source: 2009 American Housing Survey

[8] Of the 53,350 households interviewed for the AHS, 45,057 are occupied (HUD, 2011). Multiple people may reside in a housing unit, resulting in a sample of more than 113,000 individuals. From this sample, we included only those between the ages of 18 and 64 (69,730 people) and with nonmissing information on key variables (65,040 people).

[9] We excluded 6.7 percent of AHS respondents because of missing information on key disability variables. Based on the information available, rates of disability prevalence among excluded respondents were similar to or lower than the rates among included respondents: for those missing information on receipt of disability income, 5.4 percent reported any of the six limitations (compared with 6.0 percent in the sample), and for those missing information on limitations, 5.0 percent received disability income (compared with 4.7 percent in the sample).

the higher prevalence of functional limitations with age. People with disabilities also have lower education levels, are less likely to be married, are more likely to be U.S. citizens, and are more likely to be non-Hispanic or non-White compared with their nondisabled counterparts. People with disabilities have household incomes of less than 60 percent of those without disabilities. People with disabilities also were less likely to reside in households receiving interest income from savings, money market funds, or other interest-bearing accounts. Differences in household income and savings are likely related to the lower average education level of people with disabilities, coupled with a lower marriage incidence (and thus, no spousal earnings or assets). Working-age people with disabilities also are significantly less likely to be employed compared with those without disabilities,[10] and the lack of earnings is likely the primary reason for the observed differences in income and savings. Location, relative to both the city and the region of the country, is similar for both groups.

Exhibit 5 shows housing characteristics by disability status. People with disabilities reported lower satisfaction ratings with their housing unit than did their nondisabled counterparts. Ratings are subjective, ranked on a scale between 0 and 10, with higher ratings indicating higher satisfaction levels. Satisfaction might vary by disability status; a person with disabilities might have different housing needs and preferences than a person without a disability, which could affect their subjective ratings. Examining specific housing aspects more closely, however, suggests that these lower ratings are justified: people with disabilities have smaller housing units and are more likely to live in a manufactured or mobile home than people without disabilities. The former group, on average, also has fewer amenities, such as a dishwasher, washing machine, clothes dryer, central

Exhibit 5

Average Housing Characteristics, by Disability Status

Housing Characteristic	People With Disabilities	People Without Disabilities	Difference
Unit rating (10-point scale)	7.93	8.25	– 0.32***
Square footage	1,704	2,067	– 363***
Rooms per person	2.56	2.35	0.21***
Square feet per person	768	781	– 13
Manufactured or mobile home (%)	9.3	4.7	4.6***
Number of amenities	6.17	6.99	– 0.82***
Any of the 10 deficiencies (%)	47.7	38.1	9.6***
Number of deficiencies	0.81	0.55	0.26***

**Indicates significance at the 10-percent level, two-sample t-test. **Indicates significance at the 5-percent level, two-sample t-test. ***Indicates significance at the 1-percent level, two-sample t-test.*

Notes: Estimates are based on individual-level data. Sample sizes vary based on the count of nonmissing responses for the housing characteristic variables. Unit ratings are between 0 and 10, with higher ratings indicating higher satisfaction levels. Amenities include a dishwasher, washing machine, clothes dryer, central air conditioning, garbage disposal, stove or oven, fire extinguisher, carbon monoxide detector, smoke detector, and garage. The 10 deficiencies include holes in the floor, large areas of peeling paint, evidence of rodents, inside leaks, outside leaks, recent toilet breakdowns, incomplete plumbing, unsafe drinking water, open cracks in the foundation, and rooms missing electrical outlets. See exhibit A–1 for a complete list of summary statistics for all amenities and deficiencies, by disability status.

Source: 2009 American Housing Survey

[10] In 2009, the employment rate of people between the ages of 16 and 64 with disabilities was 35 percent compared with a rate of 77 percent among those without disabilities (Rehabilitation Research and Training Center on Disability Statistics and Demographics, 2010).

air conditioning, garbage disposal, stove or oven, fire extinguisher, carbon monoxide detector, and garage.[11] People without disabilities have greater numbers of all such amenities, although the gaps between the two groups in the shares with a dishwasher, garbage disposal, and garage are the largest. People with disabilities are also more likely, on average, to live in units with at least one deficiency and with more deficiencies, such as these 10: holes in the floor, large areas of peeling paint, evidence of rodents, inside leaks, outside leaks, recent toilet breakdowns, incomplete plumbing, unsafe drinking water, open cracks in the foundation, and rooms missing electrical outlets.[12] The largest differences exist for evidence of rodents, open cracks, indoor leaks, and outdoor leaks. People with and without disabilities have similar amounts of square footage per person in their housing units; the fact that people without disabilities have larger residences may reflect a higher number of occupants in nondisabled households.

Similar to housing characteristics, neighborhood characteristics tend to be more favorable for nondisabled individuals than for those with disabilities (exhibit 6). Individuals with disabilities reported lower overall neighborhood ratings (ratings are a subjective measure, ranked on a scale between 0 and 10, with higher ratings indicating higher satisfaction levels) and live in areas with lower AMIs and lower fair-market rent values, on average. Individuals and households with disabilities reported fewer neighborhood benefits, including access to public transportation, proximity to stores, and satisfactory police protection, than did those without disabilities.[13] People with disabilities also reported more frequent neighborhood problems, including crime, odors, noise, vandalism, trash, proximity to roads in need of repair, and proximity to high-traffic areas (such

Exhibit 6

Average Neighborhood Characteristics, by Disability Status

Neighborhood Characteristic	People With Disabilities	People Without Disabilities	Difference
Neighborhood rating (10-point scale)	7.70	8.09	– 0.39***
Area Median Income ($)	63,668	65,842	– 2,174***
Average fair-market rent ($)	1,014	1,135	– 121***
Community services provided (%)	20.9	17.3	3.6***
Number of benefits	2.39	2.45	– 0.06***
Any of the seven problems (%)	75.5	65.5	10.0***
Number of problems	1.60	1.14	0.46***

**Indicates significance at the 10-percent level, two-sample t-test. **Indicates significance at the 5-percent level, two-sample t-test. ***Indicates significance at the 1-percent level, two-sample t-test.*

Notes: Estimates are based on individual-level data. Sample sizes vary based on the count of nonmissing responses for the neighborhood characteristic variables. Neighborhood ratings are between 0 and 10, with higher ratings indicating higher satisfaction levels. Benefits include access to public transportation, proximity to stores, and satisfactory police protection. The seven problems include crime, odors, noise, vandalism, trash, proximity to roads in need of repair, and proximity to high-traffic areas.

Source: 2009 American Housing Survey

[11] Means for each housing amenity and deficiency, along with the total number of observations for all variables, are in appendix exhibit A–1.

[12] See footnote 8.

[13] Means for each neighborhood benefit and problem, along with the total number of observations for all variables, are in appendix exhibit A–2.

as four-lane highways and airports) than did nondisabled individuals.[14] People with disabilities, however, were more likely to report living in neighborhoods where community services (daycare and shuttle buses) are provided.

Multivariate Methods

The differences in housing and neighborhood characteristics by disability status, as described previously, represent correlations between each characteristic and disability status. Other variables correlated with disability might similarly affect housing and neighborhood characteristics. For example, people with disabilities in general have lower education levels than people without disabilities; it is therefore possible that low education (rather than disability status) is driving the relationship between disability and negative housing and neighborhood characteristics. Likewise, people with disabilities are less likely to be married, and the lack of spousal income (rather than disability status) might be lowering their housing quality. Unmarried individuals also may have sole responsibility for housing maintenance. The same may be true of many other characteristics, particularly income. To control for other individual and household characteristics, we produced regression-adjusted estimates of the likelihood of experiencing selected housing and neighborhood characteristics, taking into account age, education, marital status, gender, race, ethnicity, U.S. citizenship, household income, interest-income receipt (proxy for savings), region, urbanicity, and the number of people in the household. To account for correlation within households, we calculated regressions using standard errors clustered at the household level.[15]

We estimated an ordinary least squares (OLS) regression model for each housing and neighborhood characteristic. These characteristics include those shown in exhibits 5 and 6: (1) housing unit rating, (2) square footage, (3) rooms per person, (4) square feet per person, (5) whether unit is a manufactured or mobile home, (6) number of housing amenities, (7) presence of any housing deficiencies, (8) number of housing deficiencies, (9) neighborhood rating, (10) AMI, (11) average fair-market rent in neighborhood, (12) community services provided, (13) number of neighborhood benefits, (14) presence of any neighborhood problems, and (15) number of neighborhood problems. The basic model is

$$Y_j = a + B_1 \text{ Disability Status} + B_2 \text{ Age} + B_3 \text{ Education} + B_4 \text{ Marital Status} + B_5 \text{ Gender} + B_6 \text{ Race} + B_7 \text{ Ethnicity} + B_8 \text{ Citizenship} + B_9 \text{ Household Income} + B_{10} \text{ Interest Income} + B_{11} \text{ Region} + B_{12} \text{ Urbanicity} + B_{13} \text{ Number in Household} \quad (1)$$

where $j = 1, \ldots, 15$ represents the 15 outcomes of interest.

We estimated each model separately, resulting in 15 initial regression models. For ease of interpretation and comparison, we estimated all regressions as OLS models. In the case of binary variables (mobile home, any housing deficiencies, any community services, any neighborhood problems), we also estimated logistic regression models. The odds ratios produced from logistic regression

[14] Means for each neighborhood benefit and problem, along with the total number of observations for all variables, are in appendix exhibit A–2.

[15] For more information on clustering, refer to Cameron and Trivedi (2005).

models (available upon request) are similar in direction and magnitude to OLS estimates. We also estimated additional models to explore differences based on the severity level of the disability. All estimates were weighted to account for the AHS sample design.

We used the available data in the AHS to control for many confounding variables in our analysis, but we were unable to observe or control for many other factors. We included controls for household income in our analysis and a proxy for savings (interest-income receipt). Our analyses, however, do not account for expenditures and needs. If two otherwise similar households have the same income, but one has higher medical needs and costs related to disability, that household might have less money to pay for housing. People with disabilities may also have limited housing options if they must live near family members or friends who assist them, or if they face discrimination in the housing market; however, we did not control for either family proximity or discrimination in this analysis. Finally, our analysis does not permit us to attribute causality. We have estimated relationships between disability and housing and neighborhood conditions, but these relationships are not necessarily causal.

Findings From the Multivariate Analyses

The descriptive statistics presented in the previous section suggest that disability is associated with poorer housing and neighborhood characteristics. Other variables that are correlated with disability, however, might be driving those relationships. To explore this issue, we estimated a set of regression models that control for individual and household characteristics that might also be correlated with housing and neighborhood characteristics.

The first column of exhibit 7 presents coefficient estimates on the disability variable in a series of regression models that estimate the likelihood of reporting particular housing and neighborhood characteristics. The second column shows the simple (unadjusted) differences between people with and without disabilities. Controlling for other characteristics produces largely the same findings on housing characteristics as did the unadjusted statistics. If other characteristics are held constant, living with a disability is associated with a lower housing-unit rating (-0.26 points on a 10-point scale), a greater likelihood of living in a mobile home (+2.5 percentage points), 0.39 fewer amenities, and 0.25 more deficiencies compared with those living without a disability. Living with a disability is also associated with having a unit that is 161 square feet smaller, has 109 fewer square feet per person, and has 0.16 fewer rooms per person compared with living without a disability.

With all else held constant, people with disabilities live in less desirable neighborhoods compared with people without disabilities. Having a disability is associated with a lower overall rating of one's neighborhood (-0.32 points on a 10-point scale), lower AMI, and average fair-market rent, which suggests that people with disabilities live in poorer neighborhoods. People with disabilities are also significantly more likely to reside in neighborhoods with fewer benefits and are almost 8 percentage points more likely to live in neighborhoods with at least one of the seven problems queried. People with disabilities, however, are also 3.4 percentage points more likely to live in neighborhoods where community services are offered, possibly because of a greater demand for such services among those with disabilities.

Exhibit 7

Relationship Between Disability and Housing and Neighborhood Characteristics

	Regression-Adjusted Difference	Unadjusted Difference
Housing characteristic		
Unit rating (10-point scale)	– 0.26***	– 0.32***
Square footage	– 161***	– 363***
Rooms per person	– 0.16***	0.21***
Square feet per person	– 109***	– 12
Manufactured or mobile home (%)	2.5***	4.6***
Number of amenities	– 0.39***	– 0.82***
Any of the 10 deficiencies (%)	9.4***	9.6***
Number of deficiencies	0.25***	0.27***
Neighborhood characteristic		
Neighborhood rating (10-point scale)	– 0.32***	– 0.39***
Area Median Income ($)	– 730***	– 2,174***
Average fair-market rent ($)	– 53***	– 121***
Community services (%)	3.4***	3.6***
Number of benefits	– 0.03***	– 0.06***
Any of the seven problems (%)	7.8***	11.0***
Number of problems	0.37***	0.47***

**Indicates significance at the 10-percent level, two-sample t-test. **Indicates significance at the 5-percent level, two-sample t-test. ***Indicates significance at the 1-percent level, two-sample t-test.*

Notes: Estimates are based on individual-level data. Sample sizes vary based on the count of nonmissing responses for the housing and neighborhood characteristic variables. The statistics represent coefficients on the disability variables in a series of separate ordinary least squares regressions. Full regression estimates are available from the authors on request. Amenities include a dishwasher, washing machine, clothes dryer, central air conditioning, garbage disposal, stove or oven, fire extinguisher, carbon monoxide detector, smoke detector, and garage. The 10 deficiencies include holes in the floor, large areas of peeling paint, evidence of rodents, inside leaks, outside leaks, recent toilet breakdowns, incomplete plumbing, unsafe drinking water, open cracks in the foundation, and rooms missing electrical outlets. Benefits include access to public transportation, proximity to stores, and satisfactory police protection. The seven problems include crime, odors, noise, vandalism, trash, proximity to roads in need of repair, and proximity to high-traffic areas.

Source: 2009 American Housing Survey

We used total household income to measure income in our regression models. Regional variables and location relative to the city were also included, which might help adjust for differences in income across regions. These variables, however, still might not capture income relative to a person's location. We estimated regression models using an alternative specification where total household income was replaced by household income relative to AMI. The effects of disability on the outcomes of interest in these regressions (not shown) were similar to or slightly larger than the estimates from the regression models controlling for total income.

The measure of disability used up to this point encompasses many types of disabilities and levels of severity. To explore the differential effects by type of disability, we estimated a regression model that included three new measures of disability in addition to the basic measure ("any disability") used in our previous analyses. The first new measure represents those with multiple disabilities (that is, those who responded affirmatively to two or more of the limitation questions), the second measure represents those who received SSI, and the final measure represents those who received other disability income. The model, a variation of equation (1), is

$$Y_j = a + B_1 \text{ Disability Status} + B_2 \text{ Multiple Limitations} + B_3 \text{ Receipt of SSI} + B_4 \text{ Receipt of SSDI} + B_5 \text{ Age} + B_6 \text{ Education} + B_7 \text{ Marital Status} + B_8 \text{ Gender} + B_9 \text{ Race} + B_{10} \text{ Ethnicity} + B_{11} \text{ Citizenship} + B_{12} \text{ Household Income} + B_{13} \text{ Interest Income} + B_{14} \text{ Region} + B_{15} \text{ Urbanicity} + B_{16} \text{ Number in Household} \quad (2)$$

where j = 1,…,15 represents the 15 outcomes of interest.

Out of the 5,564 individuals who have any type of disability, 1,454 have multiple disabilities, 1,352 received SSI, and 1,791 received disability income such as SSDI or workers' compensation.[16]

Estimates including our four disability measures indicate that those with multiple disabilities experience worse housing and neighborhood characteristics compared with those with our baseline disability measure, a person with one or fewer limitations who does not receive disability income (exhibit 8). Having multiple disabilities is associated with a lower overall housing unit rating, more deficiencies, a lower neighborhood rating, and more neighborhood problems. Similarly, receiving SSI is associated with negative housing and neighborhood outcomes. People who receive SSI live in smaller housing units with fewer amenities, are more likely to live in mobile homes, live in neighborhoods with significantly lower AMIs and fair-market rent values, and are more likely to experience neighborhood problems compared with our baseline disability measure. One exception is that people who receive SSI have a lower probability of any housing deficiencies but no difference in the total number of deficiencies reported compared with those with our baseline disability measure. Overall, the findings suggest that having multiple limitations and/or receiving SSI is associated with a large, negative effect on many housing and neighborhood characteristics, both overall and relative to those with one limitation who do not receive disability income. These two disability measures may be acting as a proxy for disability severity, implying that those with more severe disabilities experience worse housing outcomes.

Those who receive disability income other than SSI report better housing and neighborhood characteristics compared with individuals with disabilities who do not receive this assistance. Because SSDI beneficiaries in general have very severe disabilities, the finding that receipt of non-SSI disability payments has a smaller negative effect on housing and neighborhood characteristics than nonreceipt of disability income was unexpected. Because SSDI, workers' compensation, and veterans' disability compensation are usually awarded to former workers,[17] these individuals may have had greater housing assets before the onset of disability, which allowed them to make better living arrangements compared with those with limitations (no work history is necessary to claim a limitation). Indeed, 65.3 percent of people who receive non-SSI disability income own their home compared with only 43.9 percent of people who receive SSI.

[16] These categories of disability are not mutually exclusive. Of the 5,564 sample members who had a disability, 1,757 had no limitations (666 received SSI, 1,040 received other disability payments, and 51 received SSI and other disability payments), 2,353 had exactly one limitation (1,763 did not receive any disability payments, 240 received SSI, 324 received other disability payments, and 26 received SSI and other disability payments), and 1,454 had multiple limitations (778 did not receive any disability payments, 346 received SSI, 307 received other disability payments, and 33 received SSI and other disability payments).

[17] In general, a person must have worked for a certain amount of time to become an SSDI beneficiary, must be injured on the job to receive workers' compensation, and must have served in the military to receive veterans' disability compensation.

Exhibit 8

Effects of Disability on Housing and Neighborhood Characteristics, by Severity of Disability

Dependent Variable/Parameter	Coefficient on Any Disability	Coefficient on Multiple Limitations	Coefficient on SSI Receipt	Coefficient on Disability-Income Receipt
Housing characteristic				
Unit rating (10-point scale)	– 0.31***	– 0.12*	0.04	0.16***
Square footage	– 142***	0	– 138**	6
Rooms per person	– 0.10***	– 0.05	– 0.21***	0.00
Square feet per person	– 81***	– 38	– 123***	1
Manufactured or mobile home (%)	1.9**	0.9	2.6**	– 0.1
Number of amenities	– 0.33***	– 0.08	– 0.58***	0.24***
Any of the 10 deficiencies (%)	11.0***	6.3***	– 3.3**	– 4.9***
Number of deficiencies	0.25***	0.21***	0.01	– 0.11***
Neighborhood characteristic				
Neighborhood rating (10-point scale)	– 0.34***	– 0.14*	– 0.08	0.20***
Area Median Income ($)	– 642***	201	– 1,135***	471
Average fair-market rent ($)	– 47***	– 7	– 54***	16*
Community services (%)	3.3***	1.4	1.2	– 2.3*
Number of benefits	– 0.03***	– 0.04	0.00	0.03
Any of the seven problems (%)	6.9***	4.5***	3.8***	– 1.9
Number of problems	0.34***	0.22***	0.18***	– 0.14***

SSI = Supplemental Security Income.

**Indicates significance at the 10-percent level, two-sample t-test. **Indicates significance at the 5-percent level, two-sample t-test. ***Indicates significance at the 1-percent level, two-sample t-test.*

Notes: Estimates are based on individual-level data. Sample sizes vary based on the count of nonmissing responses for the housing and neighborhood characteristic variables. The statistics represent coefficients on the disability variables in a series of separate ordinary least squares regressions. Full regression estimates are available from the authors upon request. Amenities include a dishwasher, washing machine, clothes dryer, central air conditioning, garbage disposal, stove or oven, fire extinguisher, carbon monoxide detector, smoke detector, and garage. The 10 deficiencies include holes in the floor, large areas of peeling paint, evidence of rodents, inside leaks, outside leaks, recent toilet breakdowns, incomplete plumbing, unsafe drinking water, open cracks in the foundation, and rooms missing electrical outlets. Benefits include access to public transportation, proximity to stores, and satisfactory police protection. The seven problems include crime, odors, noise, vandalism, trash, proximity to roads in need of repair, and proximity to high-traffic areas.

Source: 2009 American Housing Survey

To better understand why people with disabilities live in less desirable homes and neighborhoods compared with people without disabilities, we examined self-reported reasons for moving, choosing a unit, and choosing a neighborhood. The survey asked respondents who had moved within the 2 years before the interview about their main reason for moving, choosing their current unit, and choosing their current neighborhood. The questions had 16 possible responses for moving and 9 possible responses each for unit choice and neighborhood choice. Many of the responses did not differ by disability status. Similar shares of people with and without disabilities reported moving because of a change in marital status, selecting a housing unit for its yard or construction quality, and selecting a neighborhood for its proximity to leisure activities or the design of the neighborhood.

Exhibit 9 shows the responses that differed significantly. People without disabilities reported moving or selecting a neighborhood based on a job or school more frequently than people with

Exhibit 9

Reasons for Moving, Choosing a Unit, and Choosing a Neighborhood, by Disability Status

	People With Disabilities	People Without Disabilities	Difference
Main reason for moving	(N = 1,310)	(N = 13,124)	
New job or job transfer (%)	6.0	11.2	– 5.2***
To be closer to work or school (%)	5.0	9.1	– 4.1***
To establish own household (%)	8.3	10.3	– 2.0***
Needed a larger home (%)	7.1	11.9	– 4.8***
Family or personal related (%)	11.2	7.2	4.0***
Main reason for choosing unit	(N = 1,357)	(N = 13,257)	
Financial reasons (%)	31.0	26.6	4.4***
Room layout or design (%)	13.1	16.8	– 3.7***
Main reason for choosing neighborhood	(N = 1,354)	(N = 13,314)	
Convenient to job (%)	9.2	21.9	– 12.7***
Convenient to family (%)	19.8	13.3	6.5***
Good schools (%)	5.1	7.5	– 2.4***

**Indicates significance at the 10-percent level, two-sample t-test. **Indicates significance at the 5-percent level, two-sample t-test. ***Indicates significance at the 1-percent level, two-sample t-test.*

Note: Estimates are based on individual-level data.

Source: 2009 American Housing Survey

disabilities did. Those with disabilities reported moving or selecting a neighborhood to be closer to relatives and friends more often, suggesting that proximity to family may trump other household and neighborhood benefits for this group. We found similar results when we calculated the percentage of people with disabilities by their reason for moving. These differences highlight the unique preferences and needs of those with disabilities, which may contribute to the link between disability and negative housing and neighborhood characteristics. For example, if people with disabilities select units based on financial reasons, it is not surprising that they have few amenities in their homes.

Housing Assistance

People with disabilities often struggle to find accessible and affordable housing that fits their unique needs (Perl, 2008). To assist this population, policymakers have implemented several federal and local housing policies that aim to help people with disabilities find suitable, affordable housing.

The first housing program to specifically aid people with disabilities was established by the Housing Act of 1961. This legislation expanded the eligibility criteria for public housing, previously limited to low-income and elderly people, to include households with an adult member with a disability. In 1990, the federal government allocated funding to create housing exclusively for people with disabilities, known as Section 811 housing. Under Section 811, households in public housing units pay no more for rent than a certain percentage of their income, typically 30 percent, making housing more affordable for qualifying households. The legislation that established Section 811 also established project rental assistance contracts, under which contractors receive subsidies

from the federal government to make up the difference between operating costs and rent received from tenants (capped at approximately 30 percent of a tenant's income). Introduced in 1983 and updated in 1997, further legislation makes people with disabilities eligible to receive housing vouchers to rent units in the private market. Privately owned, subsidized housing also is available to people with disabilities. Subsidized rental differs from housing vouchers in that vouchers are given directly to eligible individuals, whereas in subsidized rental agreements, HUD assists apartment owners in offering reduced rent to qualifying tenants. Public housing, housing vouchers, and subsidized rentals are generally available to people with disabilities whose incomes are below certain limits. The definition of disability varies slightly across programs, but income limits are typically set to earnings below 50 percent of AMI.[18]

People with disabilities may also take advantage of many other housing programs not specifically targeted to this group. One such program is rent control, which exists in certain cities (such as New York, San Francisco, and Los Angeles) and acts as a price ceiling for rent. Another program, operated at the state and local levels, provides low-cost mortgages.

We examined the use of these programs by working-age AHS respondents with and without disabilities. The findings appear in the first three columns of exhibit 10. People with disabilities are significantly more likely to live in public housing units, receive rent subsidies, and use a housing voucher compared with people without disabilities.[19] Participation rates for the two programs (rent

Exhibit 10

Receipt of Housing Assistance, by Disability Status

Housing Assistance Type	Participation Rates (%)			Disability Prevalence (%)		
	People With Disabilities	People Without Disabilities	Difference	Among Those Receiving Assistance	All Individuals Age 18–64	Difference
Public housing	3.3	0.8	2.5***	26.9	8.7	18.2***
Subsidized rent	10.8	2.0	8.8***	33.7	8.7	25.0***
Housing vouchers	4.9	0.8	4.1***	37.0	8.7	28.3***
Rent control	0.8	0.6	0.2	11.2	8.7	2.5
Low-cost mortgage	3.1	2.8	0.3	9.3	8.7	0.5
Any housing assistance	14.6	5.5	9.1***	20.2	8.7	11.5***

**Indicates significance at the 10-percent level, two-sample t-test. **Indicates significance at the 5-percent level, two-sample t-test. ***Indicates significance at the 1-percent level, two-sample t-test.*

Notes: Estimates are based on individual-level data. Sample sizes vary based on the count of nonmissing responses for housing assistance variables.

Source: 2009 American Housing Survey

[18] Section 811 defines a person with a disability as "an individual having a physical, mental, or emotional impairment (1) that is expected to be of long-continued and indefinite duration, (2) that substantially impedes his or her ability to live independently, and (3) is of such a nature that the ability to live independently could be improved by more suitable housing conditions." Section 8 expands this definition to include those unable to participate in substantial gainful activity. Eligibility for people with HIV/AIDS also varies across programs; see Perl (2008).

[19] Although all three programs have provisions targeted toward people with disabilities, the programs also more generally target low-income individuals.

control and low-cost mortgages) that are not specifically targeted to people with disabilities were similar for both groups. Any housing assistance use, defined as participation in at least one of the five programs listed in exhibit 10, is twice as high among those with disabilities (15 percent) as among those without disabilities (6 percent).[20]

Exhibit 10 also shows disability prevalence among those receiving each assistance type. Compared with the general working-age population, disability prevalence rates were very high among those receiving each assistance type, except for rent control and low-cost mortgages. Disability prevalence was about 20 percent among those receiving any housing assistance, compared with about 9 percent among the general population.

As a formal test of the effect of disability on housing assistance, we estimated a linear probability model to examine the relationship between disability and housing assistance use. The independent control variables used in the model include the same variables used in the regression models estimating the likelihood of specific housing and neighborhood characteristics:

$$\text{Receipt of any Housing Assistance} = a + B_1 \text{ Disability Status} + B_2 \text{ Age} + B_3 \text{ Education} + B_4 \text{ Marital Status} + B_5 \text{ Gender} + B_6 \text{ Race} + B_7 \text{ Ethnicity} + B_8 \text{ Citizenship} + B_9 \text{ Household Income} + B_{10} \text{ Interest Income} + B_{11} \text{ Region} + B_{12} \text{ Urbanicity} + B_{13} \text{ Number in Household.} \quad (3)$$

Results presented in exhibit 11 show that having a disability is associated with an 8-percentage-point increase in housing assistance use. Of all variables included in the regression, disability is the most statistically significant (highest t-value) and has the largest coefficient estimate, indicating its importance as a determinant of housing assistance receipt.

Housing assistance may affect housing and neighborhood characteristics. Receipt of housing assistance, or any in-kind transfer, increases income and enables the recipient to invest in other goods, including housing improvements. Conversely, housing assistance may come with restrictions, such as being required to reside in a certain building or location that may be undesirable. Because a nontrivial share of working-age people with disabilities (15 percent) receives housing assistance, we explored the extent to which housing assistance affects the likelihood that this group will report adverse housing and neighborhood characteristics. In exhibit 12, we present the coefficient estimates for the disability variable from two separate regression models. The first model includes control variables for each of the five assistance programs:

$$Y_j = a + B_1 \text{ Disability Status} + B_2 \text{ Age} + B_3 \text{ Education} + B_4 \text{ Marital Status} + B_5 \text{ Gender} + B_6 \text{ Race} + B_7 \text{ Ethnicity} + B_8 \text{ Citizenship} + B_9 \text{ Household Income} + B_{10} \text{ Interest Income} + B_{11} \text{ Region} + B_{12} \text{ Urbanicity} + B_{13} \text{ Number in Household} + B_{14} \text{ Public Housing} + B_{14} \text{ Subsidized Rent} + B_{15} \text{ Housing Vouchers} + B_{16} \text{ Rent Control} + B_{17} \text{ Low-Cost Mortgage} \quad (4)$$

where j = 1,…,15 represents the 15 outcomes of interest.

The second model does not control for housing assistance and was previously presented as equation (1); the regression-adjusted estimates from this model are in exhibit 7.

[20] HUD considers public housing units, Section 8 housing, and households using housing vouchers all as public housing (National Center for Health in Public Housing, 2010). The statistics in exhibit 10 are based on self-reports and, as such, may be inconsistent with official statistics for public housing and other related programs.

Exhibit 11

The Effect of Individual Characteristics on the Likelihood of Receiving Housing Assistance

Independent Variable	Estimate (N = 65,040)
Disability (%)	8.0***
Age (years)	0.0***
Less than high school diploma (%)	2.7***
College degree or higher (%)	– 0.5**
Married (%)	– 1.5***
Male (%)	– 1.8***
Non-U.S. citizen (%)	– 2.5***
African American (%)	7.7***
Other race[a] (%)	2.0***
Hispanic (%)	1.9***
Household income	– 0.0***
Interest-income receipt (%)	– 1.3***
Northeast (%)	2.6***
Midwest (%)	0.7**
West (%)	1.4***
City (%)	3.5***
Number in household	0.0

[a] *Other race represents all races other than White and African American. *Indicates significance at the 10-percent level, two-sample t-test. **Indicates significance at the 5-percent level, two-sample t-test. ***Indicates significance at the 1-percent level, two-sample t-test.*

Note: Estimates are based on individual-level data.

Source: 2009 American Housing Survey

The effect of disability on the likelihood of reporting negative housing characteristics is generally dampened when we control for housing assistance (exhibit 12). For example, disability is associated with 0.39 fewer amenities if we do not account for housing assistance, compared with 0.33 fewer amenities if we do account for housing assistance. Similarly, disability is associated with a 0.32-point decline (on a 10-point scale) in the overall neighborhood rating if we do not account for housing assistance, but only a 0.29-point decline if we do account for housing assistance. These findings suggest that housing assistance provides a modest benefit to people with disabilities in terms of their housing and neighborhood. Note, however, that controlling for housing assistance leads to a stronger association between living with a disability and residing in a mobile or manufactured unit.

To assess the effect of particular housing programs on people with and without disabilities, we estimated OLS models including controls for each of the five housing assistance types and interacted the housing assistance variables with the disability indicator,

$$Y_j = a + B_1 \text{ Disability Status} + B_2 \text{ Age} + B_3 \text{ Education} + B_4 \text{ Marital Status} + B_5 \text{ Gender} + B_6 \text{ Race} + B_7 \text{ Ethnicity} + B_8 \text{ Citizenship} + B_9 \text{ Household Income} + B_{10} \text{ Interest Income} + B_{11} \text{ Region} + B_{12} \text{ Urbanicity} + B_{13} \text{ Number in Household} + B_{14} \text{ Public Housing} + B_{15} \text{ Public Housing*Disability} + B_{16} \text{ Subsidized Rent} + B_{17} \text{ Subsidized Rent*Disability} + B_{18} \text{ Housing Vouchers} + B_{19} \text{ Housing Vouchers*Disability} + B_{20} \text{ Rent Control} + B_{21} \text{ Rent Control*Disability} + B_{22} \text{ Low-Cost Mortgage} + B_{23} \text{ Low-Cost Mortgage*Disability}. \quad (5)$$

where j = 1,…,15 represents the 15 outcomes of interest.

Exhibit 12

Differential Effects of Disability on Housing and Neighborhood Characteristics, by Housing Assistance Receipt

Dependent Variable/Parameter	Adjusted, With Controls for Housing Assistance	Adjusted, Without Controls for Housing Assistance
Housing characteristic		
Unit rating (10-point scale)	– 0.25***	– 0.26***
Square footage	– 150***	– 161**
Rooms per person	– 0.14***	– 0.16***
Square feet per person	– 101***	– 109***
Manufactured or mobile home (%)	3.0***	2.5***
Number of amenities	– 0.33***	– 0.39***
Any of the 10 deficiencies (%)	9.5***	9.4***
Number of deficiencies	0.25***	0.25***
Neighborhood characteristic		
Neighborhood rating (10-point scale)	– 0.29***	– 0.32***
Area Median Income ($)	– 740***	– 730***
Average fair-market rent ($)	– 49***	– 53***
Community services (%)	2.8***	3.4***
Number of benefits	– 0.04***	– 0.03***
Any of the seven problems (%)	7.5***	7.8***
Number of problems	0.35***	0.37***

**Indicates significance at the 10-percent level, two-sample t-test. **Indicates significance at the 5-percent level, two-sample t-test. ***Indicates significance at the 1-percent level, two-sample t-test.*

Notes: Estimates are based on individual-level data. Sample sizes vary based on the count of nonmissing responses for the housing and neighborhood characteristic variables. The statistics represent coefficients on the disability variables in a series of separate ordinary least squares regressions. Full regression estimates are available from the authors on request. Amenities include a dishwasher, washing machine, clothes dryer, central air conditioning, garbage disposal, stove or oven, fire extinguisher, carbon monoxide detector, smoke detector, and garage. The 10 deficiencies include holes in the floor, large areas of peeling paint, evidence of rodents, inside leaks, outside leaks, recent toilet breakdowns, incomplete plumbing, unsafe drinking water, open cracks in the foundation, and rooms missing electrical outlets. Benefits include access to public transportation, proximity to stores, and satisfactory police protection. The seven problems include crime, odors, noise, vandalism, trash, proximity to roads in need of repair, and proximity to high-traffic areas.

Source: 2009 American Housing Survey

For people without disabilities, low-cost mortgages were the most beneficial in improving housing characteristics (exhibit 13). For example, receiving a low-cost mortgage is associated with a 0.17-point (on a 10-point scale) increase in housing rating, 0.11 more rooms per person, a 2.0-percentage-point decrease in the probability of living in a manufactured or mobile home, and 0.35 more amenities. Housing vouchers were also associated with significant increases in the number of rooms per person and number of amenities for people without disabilities. Subsidized housing and rent control were associated with negative effects for nearly every housing and neighborhood characteristic considered. Many negative effects were also associated with living in public housing.

For people with disabilities, housing vouchers and low-cost mortgages are the most beneficial housing programs. Receiving a housing voucher is associated with a 0.37-point (on a 10-point scale) increase in housing unit satisfaction rating, 0.56 more amenities, an increase of almost $2,500 in average AMI, an 8-percentage-point increase in the likelihood of having any neighborhood benefits, and a 5-percentage-point decline in the probability of having any neighborhood problems. For people

Exhibit 13

Effects of Housing Assistance Programs on Housing and Neighborhood Characteristics, by Disability Status

Dependent Variable/Parameter	Public Housing	Public Housing x Disability	Subsidized Rent	Subsidized Rent x Disability	Voucher	Voucher x Disability	Rent Control	Rent Control x Disability	Low-Cost Mortgage	Low-Cost Mortgage x Disability
Housing characteristic										
Unit rating (10-point scale)	– 0.09	0.00	– 0.28**	0.24	– 0.05	0.42	– 0.37***	– 0.12	0.17***	0.01
Square footage	– 101	153	– 184	– 54	164	– 188	– 691***	600***	55	98
Rooms per person	– 0.09*	– 0.11	– 0.33***	– 0.06	0.21**	– 0.08	– 0.44***	0.05	0.11***	0.07
Square feet per person	– 11	25	– 129***	– 102	79	– 51	– 270***	164	11	57
Mobile home (%)	– 1.9***	– 2.4*	– 4.5***	– 2.0	– 0.6	– 2.4	0.9***	– 2.3**	– 2.0**	– 3.7
Number of amenities	– 0.75***	0.38*	– 0.73***	– 0.59***	0.45***	0.11	– 1.71***	1.12***	0.35***	0.52
Any of the 10 deficiencies (%)	2.4	– 0.3	– 0.2	– 3.1	0.6	– 7.0	18.1***	1.9	3.8**	– 8.4
Number of deficiencies	0.02	0.10	0.04	– 0.09	0.05	– 0.12	0.48***	– 0.11	0.04	– 0.16
Neighborhood characteristic										
Neighborhood rating (10-point scale)	– 0.44***	– 0.12	– 0.35**	0.33	– 0.10	0.14	0.11	– 0.50	– 0.10	– 0.05
Average AMI ($)	– 2,942***	5,851***	– 272	267	774	1,723	555	2,159	– 372	– 912
Average fair-market rent ($)	2	– 4	– 57***	– 47*	4	19	87***	38	10	– 3
Community services	0.10***	– 0.04	0.06**	– 0.04	– 0.04	0.12**	0.05	0.09	0.01	– 0.02
Number of benefits	– 0.09*	0.07	0.07*	0.04	0.01	0.07	– 0.01	– 0.15	0.02	– 0.06
Any of the seven problems (%)	3.9	– 7.2	6.1**	– 4.1	– 2.2	– 2.8	5.1	4.9	2.2	– 0.2
Number of problems	0.17	0.38*	0.20**	– 0.26*	0.05	0.03	0.24**	0.34	0.05	– 0.05

AMI = Area Median Income.

**Indicates significance at the 10-percent level, two-sample t-test. **Indicates significance at the 5-percent level, two-sample t-test. ***Indicates significance at the 1-percent level, two-sample t-test.*

Notes: Estimates are based on individual-level data. Sample sizes vary based on the count of nonmissing responses for the housing and neighborhood characteristic variables. The statistics represent coefficients on the disability variables in a series of separate ordinary least squares regressions. Full regression estimates are available from the authors upon request. Amenities include a dishwasher, washing machine, clothes dryer, central air conditioning, garbage disposal, stove or oven, fire extinguisher, carbon monoxide detector, smoke detector, and garage. The 10 deficiencies include holes in the floor, large areas of peeling paint, evidence of rodents, inside leaks, outside leaks, recent toilet breakdowns, incomplete plumbing, unsafe drinking water, open cracks in the foundation, and rooms missing electrical outlets. Benefits include access to public transportation, proximity to stores, and satisfactory police protection. The seven problems include crime, odors, noise, vandalism, trash, proximity to roads in need of repair, and proximity to high-traffic areas.

Source: 2009 American Housing Survey

with disabilities, benefits associated with low-cost mortgages include an average 154-square-foot increase in housing unit size, a 6-percentage-point lower probability of living in a mobile home, and 0.87 more amenities.

For many of the outcomes considered, housing assistance program benefits differ between people with and without disabilities. For example, among those without disabilities, low-cost mortgages are associated with 0.35 more amenities, but for people with disabilities they are associated with 0.87 more amenities, an effect that is more than twice as large. In general, the only significant differences in outcomes between people with and without disabilities were more favorable effects of housing assistance for people with disabilities. Previous research has shown that people with disabilities spend a larger share of their income on housing compared with people without disabilities. If people with disabilities use the remainder of their income to purchase other basic necessities (such as food, clothing, medical needs, and transportation), they may be unable to spend higher proportions of their income on housing. Therefore, targeted housing assistance may grant this population the ability to obtain better housing that was not previously possible. Further, people with disabilities are in worse housing and neighborhoods on average, so more room for improvement in housing likely exists for this population.

Conclusions

Using data from the 2009 AHS, we quantified the differences in housing and neighborhood characteristics for people with and without disabilities. We found that, compared with their nondisabled counterparts, working-age people with disabilities are more likely to reside in smaller, lower rated housing units, manufactured or mobile homes, and homes with fewer amenities (such as a dishwasher, central air conditioning, or a garage) and more deficiencies (such as evidence of rodents, leaks, and open cracks). People with disabilities were also more likely to live in lower rated neighborhoods with lower AMIs, lower fair-market rent values, fewer benefits (such as access to public transportation, stores, and satisfactory police protection), and more problems (such as neighborhood crime, roads in need of repair, and heavy street noise). These differences persisted when we measured disability at the household level. Further, housing and neighborhood characteristics generally became less desirable as the severity of a person's disability—or number of limitations—increased.

It is perhaps not surprising that people with disabilities are more likely to report living in poorer quality housing and neighborhoods than those without disabilities, even after controlling for income and other characteristics. As noted previously, other research has shown that this population experiences other types of material hardships at significantly higher rates than people without disabilities. Those with disabilities also are more likely than others to experience long-term poverty and homelessness. High rates of poverty, especially long-term poverty, likely reduce housing quality for these individuals, but other consequences of disability may also lead to poor-quality housing. For example, people with disabilities may have more costs related to health and personal care than their nondisabled counterparts, and therefore might have to make a choice between purchasing disability-related necessities or having better housing. Disabilities might also make it difficult for a person to identify and fix housing deficiencies, such as structural problems and rodent infestations.

For all of these reasons, housing support for people with disabilities is warranted. Indeed, some policies are already in place to help people with disabilities secure affordable housing that meets their needs. Our findings suggest that such assistance improves the living conditions of those with disabilities. Housing vouchers and low-cost mortgages, for example, appear to be associated with improved housing characteristics for people with disabilities.

We did not, however, examine the costs, or quantify the full benefits, of such housing assistance in this study, partly because it is difficult to do so accurately.[21] Many HUD services and programs are for use by people with disabilities and other groups, such as elderly people, making it difficult to isolate the costs for people with disabilities only. Housing assistance benefits are also hard to quantify because the value of these benefits is not available in the AHS, which only asks whether respondents receive various housing assistance types. The AHS also lacks information on the length of time a person has received housing assistance. Further, housing assistance may provide many indirect benefits beyond the dollar value of the assistance. For example, having a secure residence and a place to store belongings may make it easier for a person to obtain stable employment, higher wages, and other employment benefits. But despite the limits of this study, our findings suggest that housing assistance improves the housing and neighborhood conditions of those people with disabilities.

[21] A variety of methods may be used to estimate the value of housing costs, but these methods all produce a wide range of estimates. According to Johnson, Renwick, and Short (2010), the median values of housing assistance received (regardless of disability status) range from $1,920 to $6,564 per year.

Appendix

Exhibit A-1

Detailed Housing Characteristics

	People With Disabilities		People Without Disabilities	
	(N)	(Average)	(N)	(Average)
Unit rating (10-point scale)	5,444	7.93	57,601	8.25
Square footage	4,948	1,704	54,165	2,067
Rooms per person	5,564	2.56	59,476	2.35
Square feet per person	4,948	768	54,165	781
Manufactured or mobile home	5,564	0.09	59,476	0.05
Amenities in housing unit				
Working dishwasher	5,564	0.53	59,476	0.71
Working washer	5,564	0.80	59,476	0.87
Working dryer	5,564	0.77	59,476	0.85
Central air conditioning	5,564	0.58	59,476	0.67
Garbage disposal	5,534	0.40	59,364	0.54
Stove/oven	5,564	0.99	59,476	1.00
Fire extinguisher	5,501	0.44	58,506	0.48
Smoke detector	5,539	0.92	59,144	0.95
Carbon monoxide detector	5,483	0.33	58,576	0.39
Garage	5,563	0.57	59,465	0.71
Number of amenities	5,564	6.17	59,476	6.99
Deficiencies in housing unit				
Holes in floor	5,564	0.02	59,476	0.01
Large area of peeling paint	5,564	0.05	59,476	0.02
Evidence of rodents	5,564	0.22	59,476	0.17
Inside water leaks (past year)	5,544	0.12	59,141	0.08
Outside water leaks (past year)	5,543	0.14	59,139	0.10
Toilet breakdowns (last 3 months)	5,536	0.04	59,154	0.02
Incomplete plumbing facilities	5,564	0.01	59,476	0.01
Water unsafe for drinking	5,514	0.11	59,146	0.08
Open cracks	5,564	0.09	59,476	0.05
Rooms missing electrical outlets	5,564	0.02	59,402	0.01
Any of the 10 deficiencies	5,485	0.48	58,764	0.38
Number of deficiencies	5,485	0.81	58,764	0.55

Notes: Estimates based on individual-level data. Several of the questions on amenities and deficiencies have missing values, and many values are missing across different individuals. The total number of amenities and deficiencies includes only respondents who do not have missing values for any of these variables. Amenities include a dishwasher, washing machine, clothes dryer, central air conditioning, garbage disposal, stove or oven, fire extinguisher, carbon monoxide detector, smoke detector, and garage. The 10 deficiencies include holes in the floor, large areas of peeling paint, evidence of rodents, inside leaks, outside leaks, recent toilet breakdowns, incomplete plumbing, unsafe drinking water, open cracks in the foundation, and rooms missing electrical outlets.

Source: 2009 American Housing Survey

Exhibit A-2

Detailed Neighborhood Characteristics

	People With Disabilities		People Without Disabilities	
	(N)	(Average)	(N)	(Average)
Neighborhood rating (10-point scale)	5,442	7.70	57,569	8.09
Area Median Income ($)	5,564	63,668	59,476	65,842
Average fair-market rent ($)	5,564	1,014	59,476	1,135
Community service provided	5,564	0.21	59,476	0.17
Neighborhood benefits				
Public transportation in the area	5,469	0.55	58,088	0.55
Neighborhood stores within 1 mile	5,522	0.96	58,852	0.97
Satisfactory police protection	5,452	0.88	58,307	0.93
Number neighborhood benefits	5,367	2.39	57,243	2.45
Neighborhood problems				
Serious neighborhood crime in last year	5,499	0.24	58,616	0.18
Bad odors	5,542	0.10	59,011	0.05
Abandoned/vandalized buildings within 1/2 block	5,443	0.12	57,908	0.06
Trash in street within 1/2 block	5,471	0.15	58,046	0.08
Roads within 1/2 block need repairs	5,459	0.46	57,951	0.39
Heavy street noise	5,543	0.33	59,013	0.22
Heavy transportation within 1/2 block	5,480	0.22	58,098	0.17
Any of the seven neighborhood problems	5,378	0.75	57,345	0.64
Number neighborhood problems	5,378	1.60	57,345	1.14

Notes: Estimates based on individual-level data. Several of the questions on benefits and problems have missing values, and many values are missing across different individuals. The total number of benefits and problems includes only respondents who do not have missing values for any of these variables. Benefits include access to public transportation, proximity to stores, and satisfactory police protection. The seven problems include crime, odors, noise, vandalism, trash, proximity to roads in need of repair, and proximity to high-traffic areas.

Source: 2009 American Housing Survey

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