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Data Shop, a department of Cityscape, *presents short articles or notes on the uses of data in housing and urban research. Through this department, the Office of Policy Development and Research introduces readers to new and overlooked data sources and to improved techniques in using well-known data. The emphasis is on sources and methods that analysts can use in their own work. Researchers often run into knotty data problems involving data interpretation or manipulation that must be solved before a project can proceed, but they seldom get to focus in detail on the solutions to such problems. If you have an idea for an applied, data-centric note of no more than 3,000 words, please send a one-paragraph abstract to david.a.vandenbroucke@hud.gov for consideration.*

Measuring Disability

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The views expressed in this article are those of the authors and do not represent the official positions or policies of the U.S. Department of Housing and Urban Development or the U.S. government.

Abstract

Housing policy researchers studying the intersection of housing and disability must understand the relative strengths and limitations of the various types of administrative and survey data that can be used to identify persons with disabilities. This article describes traditional ways that disability has been measured in U.S. Department of Housing and Urban Development (HUD) administrative data and in relevant federally funded household surveys in the United States, while also highlighting newly available linked administrative survey data that can better identify persons with disabilities who participate in HUD-assisted housing programs. The article addresses various methods of measuring disability, including measures that are common across data sources (such as the sequence of six disability questions now included in the American Community Survey, American Housing Survey, and other federally funded surveys) and measures that are unique to specific sources of data (including HUD administrative data linked with population health surveys that include more detail on activity, functional, and social limitations). The article also discusses the strengths and limitations of various measures.

Introduction

Persons with disabilities represent a sizable and diverse population in the United States. Recent estimates suggest that 40 to 53 million Americans living in the community have some form of ambulatory, cognitive, developmental, intellectual, mental health, or sensory disability (Courtney-Long et al., 2015; Lauer and Houtenville, 2017a). In many cases, disability is associated with poverty (Brucker, Mitra et al., 2015). Persons with disabilities face a number of housing-related challenges, including disproportionately high levels of participation in federal rental housing assistance programs, reduced access to accessible and safe housing units, and lower levels of homeownership (Brucker and Houtenville, 2014); Brucker, Helms, and Souza, 2016; Hoffman and Livermore, 2012; Martin et al., 2011). Housing policy researchers must therefore consider disability status as a key demographic variable of interest.

Conceptual Models of Disability

Historically, disability has been defined using different conceptual models, which, in turn, led to the development of distinct measures to identify persons with disabilities. The medical model of disability posits that disability is caused by disease, injury, or other health conditions. Persons with any impairment are therefore considered to have a disability, regardless of whether their impairment is associated with limitations in their daily lives (WHO, 1980). Disability can alternatively be considered as a function of the social environment. The social model of disability suggests that an environment that is not inclusive of all persons and that limits participation for persons with impairments can result in disability (Shakespeare and Watson, 2001). A final conceptual model of interest is the International Classification of Functioning, Disability and Health (ICF) model developed by the World Health Organization. The ICF model integrates the models mentioned previously by considering impairments, functional limitations (such as difficulty walking), and participation restrictions (such as restrictions in employment) as equally important in defining disability. The ICF model has been adopted as an international standard for measuring disability (Altman, 2001; WHO, 2001).

In addition to the conceptual models described previously, specific definitions of disability exist that government programs have operationalized to meet legislative directives, eligibility criteria, and administrative necessity. Some examples of these definitions, included within HUD-assisted housing administrative data, are described in the following section.

Data Sources

Housing policy researchers seeking to explore empirical data that include measures of disability have the option of using administrative data, survey data, or some combination of the two.

Administrative Data

HUD administrative data capture detailed information about all household members participating in HUD-assisted programs, including HUD's three main program categories—public housing (PH),

Housing Choice Voucher (HCV), and multifamily (MF) programs. In all cases, the amount of information collected about disability is negligible, as data collection processes generally only include a yes-no question about disability.[1] Program staff are directed to gather information about disability status for every member of a HUD-assisted household as residents enter housing assistance and with every annual recertification.[2]

For households that participate in the PH or HCV program category, a person is considered to have a disability if they have—

- A disability as defined in section 223 of the Social Security Act.[3]
- A physical, mental, or emotional impairment, which is expected to be of long-continued and indefinite duration, substantially impedes his or her ability to live independently, and is of such a nature that such ability could be improved by more suitable housing conditions.
- A developmental disability as defined in section 102 of the Developmental Disabilities Assistance and Bill of Rights Act.[4]
- Acquired immune deficiency syndrome (AIDS) or any condition that arises from human immunodeficiency virus, the etiologic agent for AIDS.

The definition of disability used in MF programs varies according to specific programs, but generally overlaps with the definition used by PH and HCV programs.[5]

Household-level information on disability is aggregated and reported within the annually released "A Picture of Subsidized Households": (1) the percentage of households younger than age 62 in which the head, spouse, or co-head has a disability; (2) the percentage of households age 62 or older in which the head, spouse, or co-head has a disability; and (3) the percentage of all persons in assisted households who have a disability (HUD, 2016). Access to HUD restricted-use data, including the binary disability indicator, is accessible for researchers using HUD's data license process.[6]

Survey Data

Recognizing the need to standardize methods for measuring disability across household and population-based surveys, federal statistical agencies began proceedings in 2008 to develop and adopt a standardized series of questions to measure disability. The finalized metric that transpired from these discussions, alongside more comprehensive measures of disability, is discussed in the

[1] The disability data field is included in HUD FORM 50058 (*Family Report*), HUD MTW FORM 50058 (*MTW Family Report*), and HUD Form 50059 (*Owner's Certification of Compliance with HUD's Tenant Eligibility and Rent Procedures*).

[2] Program directives are outlined in the Housing Choice Voucher Program Guidebook (https://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/programs/hcv/forms/guidebook), Public Housing Occupancy Guidebook (https://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/programs/ph/rhiip/phguidebook), and the Occupancy Requirements of Subsidized Multifamily Housing Programs (https://portal.hud.gov/hudportal/HUD?src=/program_offices/administration/hudclips/handbooks/hsgh/4350.3).

[3] Pub. L. 74-271, 49 Stat. 620, § 223. 42 U.S.C. 423. August 14, 1935.

[4] Pub. L. 106-457, 114 Stat. 1957, § 102. November 7, 2000.

[5] For more detail, consult appendix F of Lloyd and Helms (2016).

[6] For more information, see huduser.gov/portal/research/pdr_data-license.html.

following sections. Additionally, given the recent availability and promotion of the use of linked survey and administrative data for research purposes (for example, the Evidence-Based Policymaking Commission Act of 2016),[7] the following discussion highlights available data sources of interest to housing policy researchers.

Survey Data: Six-Question Screener

The adoption of the ICF model of disability is tied closely to the development of a series of survey questions currently used by many federally funded household surveys. A sequence of six questions, initially developed by the U.S. Census Bureau and the National Center for Health Statistics (NCHS) for inclusion in the American Community Survey, was designed to identify the population with disabilities (Sirken, 2002). The questions, shown in exhibit 1, include a mix of activity, functional, and sensory limitation questions. Persons identifying as having any one of these limitations are considered to have a disability. In 2010, Section 4302 of the Patient Protection and Affordable Care Act[8] mandated that all federally funded population-based health surveys adopt this standardized set of questions to identify people with disabilities.

As of 2017, these six questions are now available in many cross-sectional population-based surveys including the American Community Survey, American Housing Survey, Annual Social and Economic Supplement of the Current Population Survey, and the National Health Interview Survey (NHIS). Panel surveys such as the Survey on Income and Program Participation also include the six questions.

The benefit of the six questions is that they facilitate the standardized incorporation of disability measurement into federally funded population surveys. As an improvement over prior questions that narrowly focused solely on economic, medical, or social factors, the six questions reflect a broader understanding of disability as a condition which reflects the interaction of an individual person's health condition with his or her environment, a concept widely accepted by disability researchers.

The six questions have some limitations. First, when applied to the working-age population, the six questions fail to identify up to one-third of persons who receive public disability benefits, such as Social Security Disability Insurance or Supplemental Security Income (Burkhauser, Houtenville

Exhibit 1

Standardized Set of Disability Questions Used in Federally Funded Surveys

Limitation Type	Questions
Activity limitations	• Do you have difficulty dressing or bathing? • Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor's office or shopping?
Functional limitations	• Do you have serious difficulty walking or climbing stairs? • Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?
Sensory limitations	• Do you have serious difficulty hearing? • Are you blind or do you have serious difficulty seeing even when wearing glasses?

[7] Pub. L. 114-140, 130 Stat. 317. March 30, 2016.

[8] Pub. L. 111-148, 124 Stat. 119, § 4302. March 23, 2010.

and Tennant, 2014). Second, the six questions do not provide sufficient detail about either specific types of disabilities or the severity of disabilities. Researchers seeking information about persons with specific types of conditions, such as intellectual or developmental disabilities or psychiatric conditions, must use a broader array of questions. In addition, although some researchers have used the two activity limitation questions as proxies for severity (Brucker, Houtenville, and Lauer, 2015), additional detail, which is available from using a longer set of questions, can improve the measurement of severity. The next section describes examples of surveys that include some of these more detailed measures. Lastly, prior research suggests that population prevalence estimates vary slightly across surveys due to sampling strategies and instrument design features. When comparing disability prevalence for adults using these six questions across the American Community Survey, Annual Social and Economic Supplement of the Current Population Survey, NHIS, and Survey on Income and Program Participation, Lauer and Houtenville (2017b) found the highest estimates (17 percent) of disability in NHIS and the lowest (12 percent) in the Annual Social and Economic Supplement of the Current Population Survey.

Of importance for housing policy researchers, however, is how the measures of disability mentioned previously are integrated with available housing data. The inclusion of the six questions in the American Community Survey can help researchers interested in examining the association of disability with housing information, including financial and occupancy characteristics. The six-question screener is also incorporated into the American Housing Survey, a biannual, nationally representative survey that collects information about housing conditions, costs, supply, and demand in the United States (Eggers and Moumen, 2011). The inclusion of the six questions on other surveys that attempt to measure participation in public programs, such as federal rental assistance (for example, the Annual Social and Economic Supplement of the Current Population Survey and the Survey on Income and Program Participation), may also be of interest to housing policy researchers, although some underreporting of program participation is known to limit results (Gordon et al., 2005).

Survey Data: Expanded Measures of Disability

Researchers seeking more detailed information about disability can access a number of surveys, including the National Survey on Drug Use and Health (NSDUH) and the Medical Expenditures Panel Survey (MEPS). Each of these surveys contains more detailed questions about disability, including those that can be used to identify persons with specific conditions or persons with disabilities that vary in levels of severity. The NSDUH includes information not only about substance use disorders, but also about mental health conditions. The MEPS includes detailed information about health-related expenditures, including special healthcare needs. Both surveys, however, include only a limited amount of information about housing characteristics. This article highlights one population health survey that is particularly relevant for housing policy researchers, given its recent linkage with HUD administrative data: NHIS.

Prior to the adoption of the six-question disability screener, the nation's largest population health survey, the NHIS, utilized dozens of questions to assess disability. Although the NHIS now also includes the six-question screener, researchers interested in examining disability in more depth or from a historical perspective can utilize two detailed measures of disability that were

operationalized by NCHS: Basic Actions Difficulty (BAD) and Complex Activity Limitation (CAL) (Altman and Bernstein, 2008). These measures are based on the concept of disability as a multidimensional health problem associated with physical, mental, or social limitations.

The BAD disability metric measures disability by assessing the primary functioning that is necessary for a person to accomplish daily tasks, maintain independence, and successfully participate in social activities. NHIS data do not cover the full range of functional levels for all classes of basic actions, but the available questions can identify a range of difficulty levels in the following core areas of functioning, including movement and sensory, emotional, and cognitive functioning.

The CAL metric measures disability based on an individual's physical, mental, and emotional functioning as it integrates and coexists with participation in the environment and social world. More than other traditional disability measures, this method captures social participation. The elements identified in the CAL metric that are available in the NHIS include questions based on self-care, social limitation, and work limitation.

Linked Administrative and Survey Data

The NHIS is traditionally used by public health researchers; however, a recent interagency collaborative between HUD and NCHS resulted in a newly available linked data source for researchers interested in housing policy and disability. By linking HUD administrative data from the agency's largest housing assistance programs with NHIS, researchers can now examine disability among HUD-assisted residents for the first time. Preliminary research using these linked data suggests that adults with disabilities are dispersed throughout HUD assistance programs, not only within programs targeting persons with disabilities (Brucker, Helms, and Souza, 2016), suggesting that housing policy researchers who study housing assistance programs must consider disability as a key demographic variable regardless of program focus.[9]

Conclusion

Given the strong association among poverty, housing, and disability, housing policy researchers must consider persons with disabilities as a key population with unique housing needs. Exhibit 2 provides examples of disability prevalence from the key sources mentioned previously.

Due to varying theoretical models and the lack of consistent disability measurement adoption until recently, many measures exist to assess the relationship between disability status and housing across U.S. population-based, household surveys and HUD administrative data. Researchers should cautiously assess the strengths and limitations of disability metrics.

[9] To access this linked data source, researchers can visit https://www.cdc.gov/nchs/data-linkage/hud.htm.

Exhibit 2

Relevant Administrative and Survey Estimates of Disability

Source	Unit of Measure	Percent With a Disability (Year)
American Community Survey	Civilian noninstitutionalized population	13 (2015)[a]
American Housing Survey	Occupied housing units	22 (2015)[b]
Annual Social and Economic Supplement of the Current Population Survey	Civilian noninstitutionalized population	12 (2015)[c]
Picture of Subsidized Housing	HUD-assisted households of age 61 and younger with head or spouse with a disability	34 (2015)[d]
	HUD-assisted households of age 62 and older with head or spouse with a disability	42 (2015)[d]
HUD administrative data linked with National Health Interview Survey	Civilian adults ages 18 and older	44 (2010–2012)[e]
National Health Interview Survey	Civilian noninstitutionalized adults	15 (2014)[f]

[a] *Using the six disability questions screener and data from https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.*
[b] *Using the six disability questions screener and data from https://www.census.gov/programs-surveys/ahs/data/interactive/ahstablecreator.html#?s_areas=a00000&s_year=n2015&s_tableName=Table1&s_byGroup1=a1&s_byGroup2=a1&s_filterGroup1=t1&s_filterGroup2=g1.*
[c] *Using the six disability questions screener and data from King et al. (2010).*
[d] *Using HUD programmatic definitions of disability and data from https://www.huduser.gov/portal/publications/mdrt/disability-designatedHousing.html.*
[e] *Brucker, Helms, and Souza (2016).*
[f] *Lauer and Houtenville (2017b) using the six disability questions screener.*

Appendix A. Data Sources

Administrative Data

A Picture of Subsidized Households: huduser.gov/portal/datasets/assthsg.html.

U.S. Department of Housing and Urban Development restricted-use administrative data: huduser.gov/portal/research/pdr_data-license.html.

Survey Data

American Community Survey: http://www.census.gov/programs-surveys/acs/.

American Housing Survey: https://www.census.gov/programs-surveys/ahs/.

Annual Social and Economic Supplement of the Current Population Survey: http://www.census.gov/programs-surveys/cps/.

Medical Expenditures Panel Survey: https://meps.ahrq.gov/mepsweb/.

National Health Interview Survey: https://www.cdc.gov/nchs/nhis/.

National Survey on Drug Use and Health: https://www.samhsa.gov/data/population-data-nsduh.

Survey on Income and Program Participation: http://www.census.gov/sipp/.

Linked Data

U.S. Department of Housing and Urban Development administrative data linked with National Health Interview Survey: huduser.gov/portal/datasets/nchs-hud-data-linkage.html.

Acknowledgments

A portion of the work on this project was funded by the U.S. Department of Health and Human Services' National Institute on Disability, Independent Living and Rehabilitation Research, cooperative agreement number 90RT5022-01-00.

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