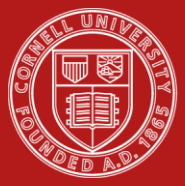

Cornell University
ILR School
Employment and Disability Institute

A Guide to Disability Statistics from the American Community Survey (2008 Forward)

CRRLD
Center *for* Rehabilitation Research *using* Large Datasets

utmb Health

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Table of Contents

Introduction

This User Guide focuses on the information relevant to disability contained in the American Community Survey (ACS), a nationally representative survey of households and "group quarters" (GQ) populations conducted by the U.S. Census Bureau. The ACS is a valuable source of disability information, making it possible for researchers and policymakers to track changes in prevalence rates, employment and economic indicators across states and over time. It provides vital information on how the labor market and the social and policy environments may influence the status and economic well-being of the population with disabilities. The ACS offers researchers and others a tremendous amount of population-based information that can be used in a myriad of ways, from identifying potential populations and localities in need of services to providing baseline measures for comparison to other studies. The ACS is invaluable for the purposes of monitoring the progress of the population with disabilities and is an important component of the nation's efforts to reach the goals of full participation, independent living, and economic self-sufficiency for the population with disabilities.

Cornell University produced the original series of User Guides to disability data sources as a part of its Rehabilitation Research and Training Center on Disability Demographics and Statistics designed to bridge the divide between the sources of disability data and the users of disability statistics. This ACS User Guide is an update and extension of the original guide written by Robert Weathers in 2005. It has been produced in collaboration with the University of Texas Medical Branch under funding from the National Institutes of Health, and contains valuable information on the disability population that can be used to inform rehabilitation researchers and other disability data users. The purpose of this User Guide is to provide:

1. A guide to the disability information available in the American Community Survey (ACS);

2. A discussion of the strengths, limitations and unique features of the survey;
3. Examples of estimates based on analysis of the ACS Public Use Microdata Sample (PUMS) dataset, the anonymized ACS data the Census Bureau makes publically available for researchers. Estimates include the size of the population, the prevalence rate, the employment rate, and measures of economic well-being that may be of interest to rehabilitation researchers
4. A brief "quick start" section that includes basic information and informative resources to facilitate researcher's ability to perform analysis of the ACS PUMS data. (See Appendix A)

The ACS is an annual survey and provides national, state, and local level data on demographic, social, economic, and housing characteristics as well as detailed information on the population living in institutionalized and non-institutionalized "group quarters" (GQ). In past decades, these were collected in the Decennial Census long form survey. As of 2010, the Decennial Census will only field the basic short form survey, focusing on the collection of the basic population count information, and the ACS will replace the Decennial long form survey for the purpose of collecting in-depth and detailed population and housing information. The ACS includes six questions that are used to identify the population with disabilities as well as two questions focused on identifying veterans with service-connected disabilities.

Many features of the ACS are useful to rehabilitation researchers, policymakers, disability service providers, and the disability advocacy community. First, the ACS contains a unique combination of data on disability, demographic characteristics, economic well-being, and employment. Second, the sample size and the design of the ACS allows users to examine a variety of annual disability statistics at the national, state, metropolitan statistical area (MSA), and county level. Third, although the ACS has undergone several alterations to its survey design and the content and phrasing of its disability questions that currently limit the feasibility of looking across time (see limitations below), it is possible

to estimate trends in various disability statistics at a level of geographic detail (i.e., the county level) that is not possible in any other national survey. In 2005, the ACS was implemented in Puerto Rico as well (referred to as the Puerto Rico Community Survey –PRCS). Also, as of 2006 the ACS includes a sample of the population living in group quarters (GQ). Group quarters include such places as college residence halls, residential treatment centers, skilled nursing facilities, group homes, military barracks, correctional facilities, and workers' dormitories. Several types of GQ house significant populations with disabilities. These strengths of the ACS allow users to track changes to the disability population so that services can be better targeted to the population, publicly and privately funded disability programs can be more effectively administered, and new programs can be evaluated. In recent years, the ACS matured and stabilized, allowing for estimates across time from 2008 forward.

While the ACS can provide knowledge about a wide variety of topics, it has some limitations. First, the ACS is limited to six basic questions that are used to identify the disability population. These questions provide insight into several relatively specific impairments but fail to identify other common impairments and disability types, including mental illness and upper body impairments such as disabling back injuries. These questions also do not allow for the identification of specific health conditions (e.g., cancer, paralysis, or HIV/AIDS) or the cause of a disability. Second, the ACS definitions do not explicitly include the societal and environmental factors that may contribute to a disability, such as discrimination and lack of reasonable accommodations. Third, although the ACS sample does include group quarters, the sample sizes are small and the publically available ACS data does not provide information regarding the *type* of group quarters. For example, it is not possible to distinguish the population in correctional facilities from nursing homes, limiting the usefulness of this information. Finally, due to changes in the disability question design (in 2003 and 2008) and sampling (in 2005), examining disability over time is problematic except within specific short time periods.

ACS Background, Methodology and Definitions

The survey methodology can have an important impact on the information that a survey collects on the population with disabilities. Mathiowitz (2000) provides a good review of the general methodological issues as well as those specific to the population with disabilities. The purpose of this section is to describe the development of the ACS, the methods used by the ACS to collect information on the population, and the precise definitions used to describe the population with disabilities. This guide will focus on the most recent ACS survey and methodology as of 2009. Please refer to the earlier ACS User Guide (Weathers, 2005) for details regarding the earlier versions of the ACS.

Purpose of the ACS

The ACS is a continuous data collection effort by the U.S. Census Bureau that is used to produce annual estimates at the national, state, and local level on the characteristics of the United States population. The ACS collects information on an annual basis from approximately 3 million household addresses in the United States and an additional 36,000 addresses in Puerto Rico. From 2006 forward, it includes 2.5 percent of the population living in Group Quarters.

The U.S. Census Bureau has three main objectives for the ACS (U.S. Census Bureau, 2003). The first objective is to provide federal, state and local governments with an information base for the administration and evaluation of government programs. The second objective is to use the ACS as a replacement for the Decennial Census long form so that the Decennial Census efforts can focus solely on counting the population. The third objective is to provide data users with timely information each year on demographic, housing, social and economic statistics that can be compared across states, communities, and population groups.

Table 1 is a list of the topics covered in the ACS. Later in this document, we focus on disability, employment and economic measures; however, any of the topics listed below can potentially be examined with respect to disability using the ACS.

Table 1

ACS Survey Topics

Basic (Population)	**Financial (Housing)**	**Economic (Population and Housing)**
• Age	• Business on Property	• Class of Worker
• Sex	• Cost of Utilities	• Food Stamps Benefit
• Hispanic Origin	• Condominium Fee	• Health Insurance
• Race	• Insurance	• Income
• Relationship	• Mobile Home Costs	• Vehicles Available
	• Mortgage	• Work Status Last Year
Social (Population)	• Real Estate Taxes	• Industry
• Ancestry	• Rent	• Journey to Work
• Citizenship Status	• Tenure	• Occupation
• Disability	• Value of Property	• Place of Work
• Educational Attainment		• Labor Force Status
• Fertility	**Physical (Housing)**	
• Grandparent caregiving	• Number of people	
• Language Spoken	• Acreage	
• Marital History	• Agricultural Sales	
• Marital Status	• Bedrooms	
• Military Service Period	• House Heating Fuel	
• Place of Birth	• Kitchen Facilities	
• School Enrollment	• Plumbing Facilities	
• Residence 1 Year Ago	• Telephone Service	
• BA/BS Field of Degree	• Rooms	
• Veteran Status	• Units in Structure	
• VA Service-Connected Disability Rating	• Vehicles Available	
• Year of Entry to U.S.	• Year Moved Into Unit	
	• Year Structure Built	

Note. Reprinted from U.S. Census Bureau (2012). ("Questions on the form and why we ask" http://www.census.gov/acs/www/about_the_survey/questions_and_why_we_ask/)

Development of the ACS

The development of the ACS began in the 1990s, and the survey went through several testing phases prior to full implementation, this Guide will focus on its history since 2003. For more background on the ACS prior to 2003, please see the previous ACS User Guide (Weathers, 2005). The ACS is designed to produce reliable estimates at the national level as well as for small geographic areas (e.g., counties and congressional districts). It differs from the Decennial Census in that it collects data on a continuous basis and produces reliable estimates by pooling the data over one-year, three-year, or five-year periods, depending upon the size of the area and other considerations. Full implementation of the ACS occurred in 2005 and included three million household addresses per year, 2.5 percent of those living in Group Quarters per year, and 36,000 addresses in Puerto Rico per year. As of June of 2011 the ACS sample has been further increased to 3.54 million households per year.

Universe and Sample Design

The ACS collects data each year from a nationally representative sample drawn from the universe of U.S. households and the population living in a sample of "Group Quarters" as described below.

The ACS utilizes a two-stage stratified sample design. Population estimates based upon the sample have some degree of sampling error and non-sampling error. Standard errors and confidence intervals that account for the sample design describe the degree of uncertainty in the estimates due to sampling error and some forms of non-sampling error. Appendix B provides 1) additional information on the sample design for the ACS and the ACS PUMS; 2) describes the efforts that the Census Bureau uses to minimize non-sampling error, and 3) references the documents that describe the techniques used to compute standard errors.

Data Collection Methodology

Household Sample Data Collection

The survey uses three different methods to collect data from households:

1. A survey delivered by mail to a household member who is responsible for completing it and mailing it back to the Census;
2. A telephone survey conducted by a Census Bureau employee using Computer Assisted Telephone Interview (CATI) technology; and
3. In-person interviews using Computer Assisted Personal Interview (CAPI) technology. A person referred to as the "householder," usually the person who either owns the housing unit or who pays the rent for the housing unit, is responsible for completing the ACS questionnaire for the household.

The Census Bureau first attempts to administer all of the questionnaires by mail. Approximately six weeks after the questionnaires are mailed, the Census Bureau begins conducting telephone interviews for all households who have not responded by mail and have a telephone number. The Census Bureau then identifies a sub-sample of households that do not respond by mail or telephone and a trained Census Bureau field representative is sent to these households to conduct in-person interviews. This multi-method approach, combined with the legal obligation for recipients to respond to the survey, results in high response rates, generally between 97 to 98 percent.

Group Quarters Sample Data Collection

The GQ data collection is performed by a U.S. Census Bureau Field Representative and is divided into two phases. The first phase is the Group Quarters Facility Questionnaire (GQFQ), a facility-level interview with the facility contact person or administrator. The GQFQ determines the facility type,

population size and obtains a list of all residents, which is used as the basis of the sample of persons to be interviewed.

The second GQ data collection phase is the person-level interview. All residents of small GQs (15 or fewer residents) are interviewed. A sample of ten residents from each large GQ is systematically selected. The ACS GQ survey is a bilingual (English/Spanish) booklet for collecting person level information. The survey does not include housing questions, but does ask about food stamp benefits. The Field Representative assembles the appropriate number of survey packages and records location information on the sampled individuals (i.e., room number). The preferred method of data collection is face-to-face with the sampled resident. Other approaches can be used, such as telephone interviews or leaving the survey with the resident or the GQ facility contact to distribute. When surveys are left, the Field Representative returns to collect completed surveys within two days. The Field Representative also ensures that the sample residents are mentally and physically able to understand and complete the survey on their own, and some cases may perform a proxy interview with a relative, guardian or GQ contact for the sampled resident.

Definitions

A description of the survey questions and the population used to produce data on disability, demographics, employment, and economic well-being are shown in Table 2.

Table 2

Disability Definitions from the 2009 American Community Survey

Description	PUMS Variable Name	Question	Population
Hearing difficulty	DEAR	Q17a. Is this person deaf or does he/she have serious difficulty hearing?	All ages

Visual difficulty	DEYE	Q17b. Is this person blind or does he/she have serious difficulty seeing even when wearing glasses?	All ages
Cognitive difficulty	DREM	Q18a. Because of a physical, mental, or emotional condition, does this person have serious difficulty concentrating, remembering, or making decisions?	Ages 5 and older
Ambulatory difficulty	DPHY	Q18b. Does this person have serious difficulty walking or climbing stairs?	Ages 5 and older
Self-care difficulty	DDRS	Q18c. Does this person have difficulty dressing or bathing?	Ages 5 and older
Independent Living difficulty	DOUT	Q19. Because of a physical, mental, or emotional condition, does this person have difficulty doing errands alone such as visiting a doctor's office or shopping?	Ages 15 and older
Disability recode	DIS	If a person responds "yes" to one or more of the six questions above (Q17a to Q19), then the Census classifies the person as having a disability.	All Ages
Veteran Service-Connected Disability Rating	DRATX	Q28a. Does this person have a VA service-connected disability rating? (checkbox-yes/no)	All Veterans
Veteran Service-Connected Disability rating	DRAT	Q28b. What is this person's service-connected disability rating? : 0 percent; 10 or 20 percent; 30 or 40 percent; 50 or 60 percent; 70 to 100 percent; Not reported	Veterans with a rating

Disability. The ACS has undergone a number of minor and major changes to its disability questions. For a history of the changes to the disability questions since 2003, please see Appendix C. Significant changes were also made in 2008 to other ACS questions and response categories, including those regarding employment status and the number of weeks worked in the past 12 months (used to calculate full-time/full-year employment status), that impact estimates related to those topics. Because of these

changes, comparisons cannot be made with previous year estimates.[1] This section will focus on the development of the 2008 survey questions currently in use.

A number of disability data users voiced dissatisfaction with the disability questions contained within the Census 2000 and the ACS. By 2003, a number of issues with the questions had been discovered including evidence of apparent misinterpretation of two of the disability questions on the part of respondents (Stern, 2003; Stern & Brault, 2005). As a result, the Office of Management and Budget Interagency Committee created an ACS Subcommittee on Disability Measurement, with the National Center on Health Statistics taking the lead in determining the adequacy of the Census disability questions. The subcommittee "found that surveys could identify certain aspects of disability and estimate a population who would be likely to experience restrictions in participation due to physical, social and other environmental barriers." The subcommittee used the International Classification of Functioning, disability and health (ICF) as a basis for developing a new set of questions. Appendix D contains a description of ICF concepts.

The work group identified four basic areas of functioning that identified the largest proportion of the population with disabilities: vision, hearing, mobility, and cognitive function (Brault, Stern & Raglin, 2007). They also determined that there were elements that could be used to identify service needs and independent living, specifically the ability to move around the community without assistance (independent living) and the ability to bathe and dress oneself (self-care). Versions of these questions were then cognitively tested to determine both the validity and the impact of the use of different terms and qualifiers (see Miller & DeMaio (2006) for more details on the cognitive testing). As a result of these efforts, the subcommittee developed an alternate group of six disability questions. These new

[1] For a summary of all changes to the ACS 2008 survey see the following Census Bureau 2006 Content test summary: http://www.census.gov/acs/www/Downloads/methodology/content_test/SummaryResultsACS2006ContentTest.pdf

questions were designed to better identify specific portions of the population of persons with disabilities, and to clearly define disability as a functional limitation that may increase a person's risk of participation limitation.

The six new disability questions then underwent a content testing and were compared against the 2003 disability questions as a control. A content re-interview test was used to evaluate the variance in question response to investigate longer term measures of disability and functioning. The proposed questions were found to have a "simple response variance" equal to or lower than the control questions in addition to lower item non-response rates. In conclusion, "the proposed changes result in better questions, in terms of reliability and response and their ability to better identify the population of persons with disabilities" (Brault, Stern, & Raglin, 2006, p. iii).

The six new disability questions were integrated into the 2008 ACS questionnaire and are described in the first section of Table 2. Note that the Census Bureau refers to each of the individual types as "difficulty" while in this report the term "disability" is used.[2] A person is defined as having a hearing disability if they responded "yes" to Q17a and a visual disability if they responded "yes" to Q17b. Both of these questions (Q17a, Q17b) are asked of all household members regardless of age and are consistent with the *impairment* concept from the ICF (See Appendix D). People ages 5 and older are asked about physical, mental, or emotional conditions that resulted in serious cognitive impairments (Q18a-cognitive disability) such as concentrating, remembering, or making decisions; ambulatory difficulties (Q18b) - walking and climbing stairs.

[2] The Census Bureau frequently refers to these questions as "difficulties" while the overall category is referred to as "disability." In this document we refer to all types as "disabilities."

The ACS also includes a question (Q18c) consistent with the ICF *activity limitations* concept regarding difficulties in the performance of activities of daily living: difficulty dressing or bathing. The remaining disability question (Q19) is consistent with the ICF *participation restriction* concept. It asks if a physical, mental or emotional condition affects participation in usual life activities such as going outside the home alone to visit a doctor's office or going shopping (ages 15 and older).

The ACS uses these six questions to identify seven disability categories that are described in Table 1a. The Census Bureau created a seventh category, referred to as a *disability*, as a "yes" response to one or more of the six disability questions. This definition is similar to the ICF use of the term disability in that it includes impairments, activity limitations, or participation restrictions. As noted previously, these six questions are different from those asked in the previous iteration of the ACS in the period 2003-2007. For more information on the evolution of the disability questionnaire items on the ACS see Appendix C.

In addition to these six defined disability categories in 2008, in that year the Census Bureau also introduced veteran's service connected disability questions. These items are for all surveyed persons who have ever served on active duty in the U.S. Armed Forces, military reserves, or National Guard. The first question (Q28a) asks if the person has a VA service–connected disability rating. If the response is "yes," a follow-up question (Q28b) is asked regarding what the person's actual service-connected disability rating is (0 percent, 10 or 20 percent, 30 or 40 percent, 50 or 60 percent, 70 percent or higher).

Demographics. Data on demographics are drawn from the "list of residents" section of the ACS and include age, gender, race, and ethnic origin. Each household member is listed and their name is associated with the numerical order in that list. Person 1 is the "householder" - the person living or staying at the address in whose name the house or apartment is owned, being bought or rented. The survey repeats each question for every person in the household who lived or stayed at the address for

more than 2 months in the past 12 month period. Table 3a below provides the question text, response categories and the 2009 variable names for each demographic characteristic used in the estimates later in this report. Note that it does not include all the demographic characteristics available in the ACS data (See Table 1 above).

Table 3a

Demographic Definitions from the 2009 American Community Survey

Census Term	**PUMS Variable Name**	**Question**	**Population**
Relationship	REL (RELP in 2010)	Q2. How is this person related to Person 1? Mark (X) ONE box. Husband or wife, Adopted son or daughter, Brother or sister, Biological son or daughter, Stepson or stepdaughter, Father or mother, Grandchild, Parent-in-law, Son-in-law or daughter-in-law, Roomer or boarder, Unmarried partner, Other relative, Housemate or roommate, Foster child, Other nonrelative ** REL variable also identifies Institutionalized Group Quarters population and Non-institutionalized Group Quarters population. *** Variable name changed to RELP in 2010 ACS PUMS data***	All
Gender	SEX	Q3. What is person 1's sex?	All
Age	AGEP	Q4. What is person 1's age and what is this person's date of birth?	All
Race (detailed)	RAC2P, RAC3P	Q6. What is person 1's race? Mark (X) one or more boxes. Responses include the following: White; Black or African-American or Negro; American Indian or Alaska Native (print name of enrolled or principal tribe); Asian Indian; Chinese; Filipino; Japanese; Korean; Vietnamese; Other Asian (Print Race); Native Hawaiian; Guamanian or Chamarro; Samoan; Other Pacific Islander (Print Race Below); Some other race (print race).	All
Census Race Recode	RAC1P	The Census Bureau recoded to the following: White Alone; Black or African American Alone; American Indian Alone; Alaska Native Alone; American Indian and Alaska Native Alone; Asian Alone; Native Hawaiian or Other Pacific Islander Alone; Some other race alone; or two or more races. Alone means that this category was the only race category selected. The householder is allowed to select one or more races for a household member. See Census website for details of race recode.	All

Additional Race Recode	RAC1P recode	American Indian Alone, Alaska Native Alone, and American Indian and Alaska Native Alone are grouped into one category in this paper and called American Indian or Alaska Native.	All
Hispanic Origin	HISP	Q5. Is person of Hispanic, Latino or Spanish origin? Responses include the following: No, not of Hispanic, Latino or Spanish origin; Yes, Mexican, Mexican Am., Chicano; Yes, Puerto Rican; Yes, Cuban, Yes, other Spanish/Hispanic/Latino -Hispanic, Latino or Spanish origin Print origin, for example, Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.	All
Hispanic Recode	HISP recode	Recoded to 1 if Yes to question Q5 above, 2 if No.	

The ACS includes several questions on education (See Table 3b). Two of the questions are related to recent participation in an educational program (Q10a, b) and a third queries the person's highest level of educational attainment at the time of the survey. For persons who have a bachelor's degree there is an additional question regarding the specific major(s) studied (Q12.).

Table 3b

Education Definitions from the 2009 American Community Survey

Census Term	**PUMS Variable Name**	**Question**	**Population**
School enrollment	SCH	Q10a. At any time IN THE LAST 3 MONTHS, has this person attended school or college? Include only nursery or preschool, kindergarten, elementary school, home school, and schooling which lead to a high school diploma or a college degree. Responses include the following:: No, has not attended in the last 3 months ; Yes, public school, public college; Yes, private school, private college, home school	All
Grade level attending	SCHG	Q10b. What grade or level was this person attending? Responses include the following: Nursery school, preschool; Kindergarten; Grade 1 through 12 – Specify grade 1 – 12; College undergraduate years (freshman to senior) Graduate or professional school beyond a bachelor's degree (for example: MA or PhD program, or medical or law school)	All
Educational Attainment	SCHL	Q11. What is the highest level of schooling this person has completed? If currently enrolled, mark the previous grade or highest degree received.	All
Educational Attainment Recode:	SCHL recode		All
Less than High School		Responses: No schooling completed; Nursery school; Kindergarten; Grade 1 through 11 –Specify; 12th grade no diploma	
High School		Responses: Regular high school diploma; GED or alternative credential	All
Greater than High School		Responses: indicates at least some college or higher education	All
Bachelor's Degree Major	FOD1P, FOD2P	Q12. This question focuses on this person's BACHELOR'S DEGREE. Please print below the specific major(s) of any BACHELOR'S DEGREES this person has received. (For example: chemical engineering, elementary teacher education, organizational psychology) [codes up to 2 majors]	holder of a BA degree

Source: Author's adaptation from ACS website: http://www.census.gov/acs/www/UseData/Def.htm

Employment Measures. The Census Bureau's definition of employment status is drawn from two questions. The employment reference period is defined as the week before the date that the householder completed the questionnaire. Table 3c describes the ACS information on the employment status of each household member age 15 and older. A household member is considered employed if he met one of the two following criteria: (1) is "at work" during the reference period—that is, worked as a paid employee, worked in his or her own business or profession, worked on his or her own farm, or worked 15 or more hours as an unpaid worker on a family farm or business; or (2) was "with a job but not at work" during the reference period—that is, he or she had a job but temporarily did not work at that job during the reference period due to illness, bad weather, industrial dispute, vacation or other personal reasons. Institutionalized people as well as those whose only activity was work around the house or unpaid volunteer work are not classified as employed.

Another measure of employment is referred to as "full-time full year" employment. It is defined by the Census Bureau as working 50 to 52 weeks in the previous 12 months and at least 35 hours per week during that period. Note that as the ACS is continuously collected the 12 month period usually will span across two years – if completed in July 2009 the period would span the period July 2008 through July 2009.

Table 3c

Employment Definitions and PUMS variables (2009 American Community Survey)

Census Term	**PUMS Variable Name**	**Question**	**Ages**
Employment status		Q29a. LAST WEEK, did this person work for pay at a job (or business)?	Ages 15 and older
		Q29b. LAST WEEK, did this person do ANY work for pay, even for as little as one hour?	Ages 15 and older

		Q35b. LAST WEEK, was this person TEMPORARILY absent from a job or business?: Yes, on vacation, temporary illness, maternity leave, other family/personal reasons, bad weather, etc.)	Ages 15 and older
Employment Status recode	ESR	Employed if ESR=1 .Civilian employed, at work 2 .Civilian employed, with a job but not at work 4 .Armed forces, at work 5 .Armed forces, with a job but not at work Not employed if ESR=3 .Unemployed or 6 .Not in labor force	
Number of weeks worked	WKW	Q39a. During the PAST 12 MONTHS (52 weeks), did this person work 50 or more weeks? Count paid time off as work. Q39b. How many weeks DID this person work, even for a few hours, including paid vacation, paid sick leave, and military service?: 50 to 52 weeks; 48 to 49 weeks; 40 to 47 weeks; 27 to 39 weeks; 14 to 26 weeks;13 weeks or less	Ages 15 and older
Number of hours worked	WKHP	Q40. During the PAST 12 MONTHS, in the WEEKS WORKED, how many hours did this person usually work each WEEK? Usual hours worked each WEEK:	Ages 15 and older
Employment Definitions			
Employed: Reference Period	ESR recode	The person is classified as employed if they respond "yes" to Q29a, Q29b, or Q35b. [ESR=1,2,4,5]	Ages 15 and older
Employed: Full-time year round	ESR, WKW, WKHP recode	At least 50 weeks during the previous year and at least 35 hours per week. Determined by condition that weeks worked is greater than or equal to 50 (from Q39a) and usual hours per week is greater than or equal to 35 hours (from Q40).	Ages 15 and older

Source: Author's adaptation from ACS website: http://www.census.gov/acs/www/UseData/Def.htm

Income and Poverty Data. The economic well-being measures use information from the ACS on annual income, family size, family composition, household size, and household composition. Table 3d describes the income measures and summarizes the method used by the Census Bureau to construct a poverty measure.

Table 3d

ACS Economic Well-Being Measures and Related Variables (2009 American Community Survey PUMS data)

Census Term	**PUMS Variable Name**	**Question**	**Ages**
Income	PINCP (total person's income)	(Person Section) Q47a-h. Asks the person to list the amount of income received from the following sources: wages, salary, commissions, bonuses, or tips from all jobs (before deductions for taxes, bonds, dues or other items); self-employment income from own non-farm businesses or farm businesses, including proprietorships and partnerships (net income after business expenses); interest, dividends, net rental income, royalty income, or income from estates and trusts; Social Security or Railroad Retirement; Supplemental Security Income (SSI); any public assistance or welfare payments from the State or local welfare office; retirement, survivor or disability pensions (not including social security); and any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support or alimony (not including lump sum payments such as money from an inheritance or the sale of a home).	Ages 15 and older
Income and earnings adjustment factor	ADJINC	Adjustment factor for income and earnings dollar amounts (6 implied decimal places) Note: The value of ADJINC inflation-adjusts reported income to dollars of the current survey year. ADJINC applies to variables FINCP and HINCP in the housing record, and variables INTP, OIP, PAP, PERNP, PINCP, RETP, SEMP, SSIP, SSP, and WAGP in the person record.	NA
Poverty	POVPIP (person level)	The Census Bureau used information on the family income and household composition, along with standard poverty thresholds, to construct a poverty measure. See the Census Bureau website http://www.census.gov/hhes/www/poverty/poverty-cal-in-acs.pdf for details.	All ages except unrelated HH members below the age of 15.
Household Size	NP	The sum of all people who the householder reports living in the housing unit.	All ages
Household Income	HINCP	The sum of income for each household member age 15 and older in the household unit.	All ages

Source: Author's adaptation from ACS website: http://www.census.gov/acs/www/UseData/Def.htm

The income measure uses income received in the past 12 months (i.e., income received in the year preceding the completion of the survey) from each individual household member. For a household that completes the survey in July 2009, the year is July 2008 to June 2009. The questions are located in the "person" section of the survey. Questions 47a through 47h are used to collect information on the

sources of income. Table 3d comprehensively lists the types of income included in calculating person's total income. The annual total income is the sum of all of the income sources for the household member.

The poverty measure is computed using poverty threshold standards indexed to current dollars for that data year using poverty factors based upon the Consumer Price Index (CPI-U). The family is used as the income sharing unit, with family income being the sum of total income from each family member living in the household. The poverty threshold depends upon the size and composition of the family, taking into account the age of the householder (i.e., the person who owns or pays rent for the housing unit and who fills out the ACS questionnaire for the household) for one-member families and two-member families, as well as the number of related children under the age of 18. Family income is compared to the relevant poverty threshold to determine the family's poverty status.[3] For household members who are unrelated to the head of household, the poverty threshold is based upon the person's own total income and uses a different threshold. A poverty measure is not created for unrelated household members who are under the age of 15 because the ACS does not collect income information from persons under the age of 15.

Note that poverty statistics do not adjust for expenses that are the result of a health condition or a disability (e.g., personal assistance, equipment, and medications). For these reasons, household income relative to the poverty line is substantially limited as an indicator of a household's poverty if the household contains a person with a disability. Additionally poverty measures do not adjust for in-kind benefits, such as health insurance, food stamps, housing, transportation, and child-care.

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[3] For more information regarding how the Census Bureau calculates poverty status see page 100 in the *American Community Survey Puerto Rico Community Survey 2009 Subject Definitions:*
:http://www.census.gov/acs/www/Downloads/data_documentation/SubjectDefinitions/2009_ACSSubjectDefinitions.pdf

Dissemination

The U.S. Census Bureau disseminates thousands of ACS summary data tables to the public for a wide variety of geographic levels including national, state, metropolitan statistical area (MSA), and county. It also provides tables for larger towns and cities (with total populations of 65,000 or more for single-year estimates and 20,000 for three-year "pooled" estimates), and down to the Census Block level in the five-year pooled estimates. Pooled data utilizes multiple years of data (3 or 5) to provide a larger sample size that will produce more reliable estimates for smaller geographic areas or smaller populations. Due to the changes made to the disability questions, three-year pooled estimates (based on ACS 2008-2010 data) are available as of Fall 2011, and five-year estimates will be available in 2014 (based on ACS 2008-2012 data). The ACS summary statistics and detailed data tables can be accessed through the Census Bureau's American Factfinder website.[4] The Factfinder summary tables provide users with data aggregated to various geographic levels; however, they cover only a few topics and demographic breakdowns, which can limit their usefulness.

The ACS Public Use Microdata Sample (PUMS) is also available from the U.S. Census Bureau. The PUMS contains data at the household level and person level, allowing users to produce customized statistics not available from the American Factfinder tables. The ACS PUMS data are a subsample of the full ACS data and include approximately one percent of the housing units and one percent of the GQ persons in the United States and Puerto Rico (the ACS samples approximately 2.5 percent of the population annually). All people residing in PUMS Housing Units (HUs) are included in the PUMS data. According to the Census Bureau, estimates based on the ACS PUMS files, such as those included

[4] U.S. Census Bureau American Factfinder: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

in this document, may differ slightly from the ACS summary tables produced by the Census Bureau because they are subject to additional sampling error and further data processing operations[5].

The Census Bureau uses procedures to assure the confidentiality of respondents included in the PUMS data. The smallest identifiable geographical area available is a Public Use Microdata Area (PUMA) that contains a minimum total population of 100,000 people. In most cases, rural PUMAs are based on counties (or county equivalents), while urban PUMAs are usually based on city boundaries, census tracts or metro areas. Typically a large county of 400,000 would be divided into four PUMAs, each containing approximately 100,000 people. If a county contains fewer than 100,000 people it is generally combined with other adjoining small-population county areas until it meets the area minimum 100,000 person PUMA criteria. All PUMAs are nested within state boundaries and generally each PUMA is geographically contiguous.[6]

PUMS data are available for 2000 through 2010. Single-year, as well as three- and five-year, PUMS data files are available. The multi-year PUMS provide larger sample sizes in situations where a single year sample is inadequate for analysis; however, the geographic specificity of these multi-year files is still limited to the PUMA level. Due to changes in the disability questions in 2008, the five-year PUMS files do not include disability at this time. Disability variables will be included in the 2008–2012 five-year PUMS that will be available in in early 2014. For individuals without access to statistical packages or the needed computational resources the Census Bureau's DataFerrett application (http://dataferrett.census.gov) also allows users to perform basic ACS PUMS data analysis on the web.

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[5] See *American Community Survey Accuracy of the Data (2009)* http://www.census.gov/acs/www/Downloads/data_documentation/Accuracy/ACS_Accuracy_of_Data_2009.pdf)

[6] For more information regarding the PUMA creation guidelines, see 2010 Public Use Microdata Areas (PUMAs) http://www.census.gov/geo/puma/puma2010.html .

Note that other major and minor changes to the ACS survey, data collection and sampling methodologies have occurred over time and these alterations, and their implications, are described below.

Changes to the ACS and Implications

The ACS has evolved over time and will likely continue to do so in the future. Many of these changes resulted in data "seams" that have significant impacts on the measurement of disability. These changes include alterations to sampling, sample size, and the disability questions, and the Census Bureau recommended not comparing disability estimates across these seams. These changes included:

- 2003: alterations to the structure of the disability questions (see Weathers, 2005)
- 2005: the ACS housing sample size was increased and sampling methodology altered. The previous sample only included addresses in approximately half of the county/county equivalents, while the new sample included addresses in all 3,143 counties/equivalents.
- 2006: institutionalized and non-institutionalized Group Quarters were sampled..
- 2008: major changes to the set of six disability questions and those regarding employment status during the reference week and the number of weeks worked in the past 12 months (used to calculate full-time/full year employment status)

For a more detailed history of the ACS disability question sets, see Appendix C. For a summary of all changes specific to the ACS 2008 survey see the following Census Bureau 2006 content test document: http://www.census.gov/acs/www/Downloads/methodology/content_test/SummaryResultsACS2006ContentTest.pdf For a synopsis of all ACS question changes across its history see: http://www.census.gov/acs/www/methodology/questionnaire_changes/

The 2008 changes result in lower overall disability estimates that are different from previous years. See Tables C1 and C2 in Appendix C for working age prevalence rate estimates in 2007 and 2008. The revised questions are more focused than the previous versions, allowing more accurate identification of specific issues or problems. The ability to distinguish between visual and hearing impairments was a major improvement, and the ambulatory disability question provides more specific information on persons with mobility issues. Thee new question set does not identify persons with upper body disabilities or those with back problems, however, and people with mental illness or learning disabilities are also unlikely to be identified by any of the current questions. Unless these issues result in self-care or independent living disability, persons with such issues would not be identified as having a disability.

Future Changes

As with all survey instruments, further changes to questionnaire items are likely to occur, methodologies change, and estimates are likely to be affected, just as they were in 2005 when the sample was increased and new sampling methodology was implemented, or when the disability questions were revised in 2003 and 2008. When performing analysis across years with any data source, it is important to carefully examine the specific questions, variable names, and values included in the analysis to confirm that changes have not occurred during that period. The ACS has seen changes in a number of questions and variables over the years, and it is never safe to assume that specific questions have remained unchanged. The current version of the six ACS disability questions may stabilize now that they (or minor variants) have been integrated into a number of other major surveys including the 2009 American Housing Survey (AHS) and are going to be used in the upcoming fielding of the Survey

of Income and Program Participation (SIPP). A slightly modified version of the six questions was adopted in June 2008 in the monthly Current Population Survey (CPS). [7] This standardization across multiple surveys may make changes to the disability questions less likely. Despite the apparent advantages to utilizing identical questions across different surveys, prevalence rates can vary significantly (Rietschlin & MacKenzie1, 2004). This variation may potentially be due to differences in sampling, data collection methodologies as well as the topical focus of the survey (i.e., health vs. economic focus) among other factors.

ACS Description of Disability Population

In this section we present tables with estimates derived from the ACS PUMS as examples of what is available. Tables include national prevalence rates across all ages, as well as outcomes including employment, poverty, and health insurance calculated specifically for the working-age population (ages 21 to 64). State level estimates illustrate differences across states in prevalence and employment rates as well as group quarter's estimates. All estimates provided below are based on the author's analysis of the 2009 ACS PUMS data and most are excerpted from the 2009 Disability Status Reports (Erickson, Lee, & von Schrader, 2011). See www.DisabilityStatistics.org for additional ACS PUMS-based estimates including access to the most recent annual Disability Status Reports.

Each table below includes a percentage estimate and a population estimate ("Number") along with the 90% margin of error (MOE) provided to illustrate sampling variability. The "Base population" column contains the estimated number of individuals upon which the calculation is based. For

[7]The 2008/2009 National Health Interview Survey includes a split-ballot format to test the ACS and CPS disability question variants. For more information on this testing see the following CDC document Disability Questions Tests 2008/2009 File (7/15/2010): ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2009/srvydesc_disbtest.pdf

percentages, this is the denominator. The “Sample Size” is the number of survey participants used to calculate the statistic.

Note that when developing PUMS based estimates it is important to realize that due to the ACS sampling and weighting procedure each person in the ACS PUMS data actually represents a number of people in the population. To adjust for this each person and housing unit has a weight variable associated with it. In order to develop valid PUMS based estimates the data must be “weighted” using the appropriate weighting variable that “inflates” the sample estimate to the full population. The person level weight variable (PWGTP) is applied to person level estimates while the housing level weight (WGTP) is used for household level estimates.

Prevalence

As shown in Table 4a, according to the ACS, 36,230,100 (+/- 157,290) million persons with a disability lived in the U.S. in 2009 out of a total population of 302,783,200 non-institutionalized persons, a 12.0 +/-0.05% prevalence rate. This estimate is based on a sample size of 2,979,835. Ambulatory disabilities have the highest prevalence rate at 6.9% followed by independent living (5.4%), cognitive disability (4.8%), hearing disability (3.4%), self-care disability (2.6%), and visual disability (2.1%).Note that the disability types will not sum to the total population number or percentage with a disability as individuals may report more than one disability type (i.e., the types are not mutually exclusive).

Table 4a

Disability Prevalence among Non-Institutionalized People of All Ages in the United States in 2009

Disability Type	Percent	MOE	Number	MOE	Base Population	Sample Size
Any Disability	12.0	0.05	36,230,100	157,290	302,783,200	2,979,835
Visual	2.1	0.02	6,453,300	69,940	302,783,200	2,979,835
Hearing	3.4	0.03	10,221,000	87,460	302,783,200	2,979,835
Ambulatory	6.9	0.04	19,425,100	118,690	281,613,500	2,799,892
Cognitive	4.8	0.04	13,581,200	100,250	281,613,500	2,799,892
Self-Care	2.6	0.03	7,189,100	73,730	281,613,500	2,799,892
Independent Living	5.4	0.04	13,041,100	98,330	240,963,700	2,414,589

Table 4b below provides prevalence rates by age group. Note that the two younger groups are not asked all six disability questions. There is a steady increase in disability prevalence rates as the population ages from 10.4% of the working age population, to a quarter (26.0%) of those ages 65-74 and half of those 75 or older (50.8%).

Table 4b

Disability Prevalence across Age Groups (U.S. Non-Institutionalized Population, 2009)

Age	Percent	MOE	Number	MOE	Base Population	Sample Size
0-4*	0.7	3.29	157,000	11,020	21,169,700	179,963
5-15*	5.1	0.09	2,299,900	42,040	44,761,000	426,632
16-20	5.5	0.14	1,215,700	30,620	21,930,700	201,911
21-64	10.4	0.06	18,382,600	115,670	177,004,700	1,709,245
65-74	26.0	0.27	5,346,000	63,770	20,550,800	253,484
75 and older	50.8	0.33	8,828,900	81,480	17,366,300	208,620

* Note: Children under the age of five were only asked about vision and hearing disabilities. The independent living disability question was only asked of persons aged 16 years old and older.

Table 4c illustrates the prevalence rates for the working-age population by gender, race, and Hispanic/Latino origin. In this age group, disability prevalence is the same for both males and females. Native Americans or Alaskan natives as a category have the highest prevalence rate, with nearly one in five (18%) having a disability as compared to only one in twenty Asians (4.5%). Persons of Hispanic/Latino origin have slightly lower disability prevalence rates than non-Hispanic/Latinos.

Table 4c

U.S Disability prevalence by demographic characteristics (U.S. Non-Institutionalized Population ages 21-64, 2009)

Characteristic	Percent	MOE	Number	MOE	Base Population	Sample Size
Gender						
Male	10.4	0.09	9,107,500	82,720	87,396,200	822,262
Female	10.4	0.09	9,275,100	83,450	89,608,500	886,983
Race						
White	10.1	0.07	13,570,800	100,210	133,865,000	1,349,321
Black/African American	14.1	0.21	2,976,800	47,770	21,165,500	164,366
Native American or Alaska Native	18.0	0.91	248,400	13,860	1,383,800	14,774
Asian	4.5	0.19	391,500	17,400	8,756,800	83,646
Some other race(s)	10.1	0.24	1,195,100	30,360	11,833,600	97,138
Hispanic/Latino origin						
Hispanic/Latino	8.3	0.15	2,162,900	40,780	26,052,200	210,562
Not Hispanic/Latino	10.7	0.07	16,219,600	109,060	150,952,500	1,498,683

A "service-connected disability" is one that has been determined by the Department of Veterans Affairs (VA) to be being a result of disease or injury incurred or aggravated during military service. Table 4d shows that about one in six (17.5%) working-age veterans have a service-connected disability. Nearly a half million (447,800) working-age civilian veterans in the U.S. had the most severe service-connected disability rating (70% or above). Note that a veteran can receive disability compensation for a wide range of conditions, and a veteran with a service-connected disability may not report having one of the six ACS functional or activity limitation disabilities.

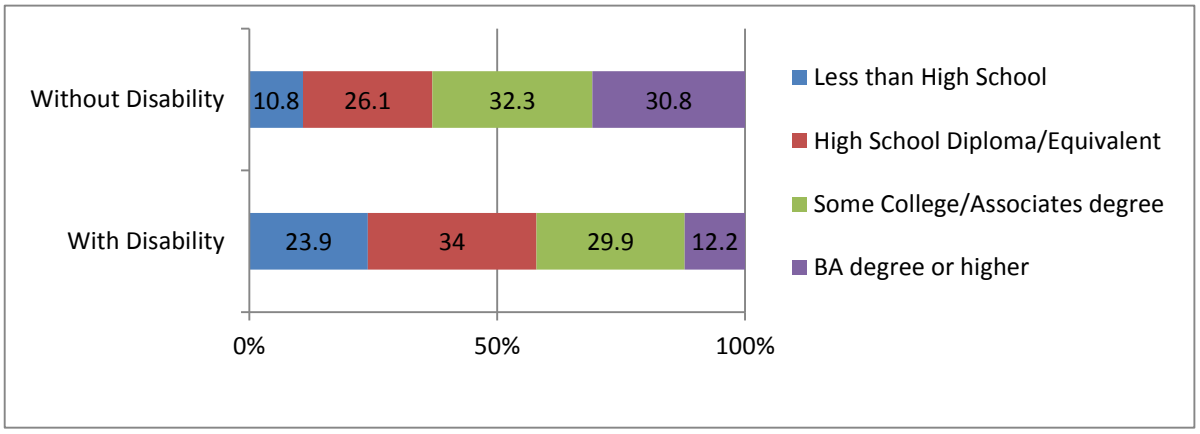
Table 4

Civilian Veterans with a Service-Connected Disability (U.S. Non-Institutionalized Population, ages 21-64, 2009)

Service–Connected Disability	Percent	MOE	Number	MOE	Base Population	Sample Size
Has a service-connected disability rating (0-100%)	17.5	0.21	2,201,900	29,040	12,609,500	132,558
Disability rating of veterans with a service connected-disability						
0 percent	6.9	0.34	153,000	7,680	2,201,900	23,718
10 or 20 percent	35.6	0.63	783,700	17,370	2,201,900	23,718
30 or 40 percent	17.6	0.50	386,400	12,200	2,201,900	23,718
50 or 60 percent	10.7	0.41	235,900	9,540	2,201,900	23,718
70 percent or higher	20.3	0.53	447,800	13,130	2,201,900	23,718

Figure 1 shows the educational attainment of the working-age population by disability status. Nearly one-quarter of persons with disabilities have less than a high school education as compared to only one in ten persons without disabilities. Nearly one-third of persons without disabilities have a Bachelor's degree or higher, while slightly more than one in ten persons with disabilities have a BA or higher degree.

Figure 1. Educational Attainment by Disability Status (U.S. Non-Institutionalized Population ages 21-64, 2009)



ACS Employment and Economic Well-Being Estimates

The 2009 ACS shows that the employment rates for persons with a disability are lower than the employment rates for persons without a disability. Table 5a shows this result for each of the three

employment measures for the working-age population. The first section shows that while 76.8% of the population without a disability was employed during the reference week, only 36.0% of the population with a disability was employed during that period. The same pattern holds for full-time/full-year employment rates with 57.0% of persons without disabilities working FT/FY as compared to 22.5% of persons with disabilities.

Table 5a

Employment by disability status (U.S. Non-Institutionalized Population ages 21-64, 2009)

Disability Status	Percent	MOE	Number	MOE	Base Population	Sample Size
Reference period employment						
Without Disability	76.8	0.09	121,778,200	237,410	158,622,200	1,528,114
With Disability	36.0	0.31	6,612,900	70,770	18,382,600	181,131
Full Time/Full Year Employment						
Without Disability	57.0	0.08	90,418,700	169,940	158,622,200	1,528,114
With Disability	22.5	0.21	4,130,100	42,950	18,382,600	181,131

The economic well-being of the population with disabilities is substantially worse than that of the population without disabilities based upon the two measures presented in Table 5b. The annual median household income for households that include any working-age person with a disability is $37,200, as compared $60,000 for households that do not contain any working-age persons with a disability. As would be expected, poverty rates are much higher for persons with disabilities, with 26.4% of the population with a disability living below the poverty line as compared to 10.8% of the population without a disability.

Table 5b

Economic well-being by disability status (U.S. Non-Institutionalized Population ages 21-64, 2009)

	MEDIAN	MOE			BASE POPULATION	SAMPLE SIZE
Annual Household Income						
Without Disability	$60,000	$190			79,747,000	798,887
With Disability	$37,200	$350			14,718,000	155,378
Poverty	PERCENT	MOE	NUMBER	MOE	BASE POPULATION	SAMPLE SIZE
Without Disability	10.8	0.07	16,987,200	111,460	158,005,900	1,522,895
With Disability	26.4	0.29	4,846,900	60,770	18,349,300	180,847

ACS Group Quarter (GQ) Population Estimates

As noted previously another advantage of the ACS is that it includes within its sampling frame both institutionalized and non-institutionalized populations. All estimates prior to this only have included the non-institutionalized population: those residing in housing units or in non-institutionalized GQs. This distinction is made as the institutionalized population is generally not able to participate in activities such as employment, or eligible for the benefits or programs that serve the non-institutionalized population. Table 6 breaks this sample into the three types of housing: housing units, non-institutionalized GQs and institutionalized GQs provides estimates and sample sizes for each housing type. Approximately 298.7 million people live in households, or 97.3% of the total population, while an additional 4 million live in non-institutionalized GQs and 4.2 million live in institutions. The prevalence rate varies greatly across these different housing types. About one in ten persons living in households have a disability (11.8%), while one in five (21.1%) of non-institutionalized GQ residents have a disability. Over half (57.2%) of institutionalized persons have a disability, accounting for 6.3% of the total population with disabilities living in the U.S.

Table 6

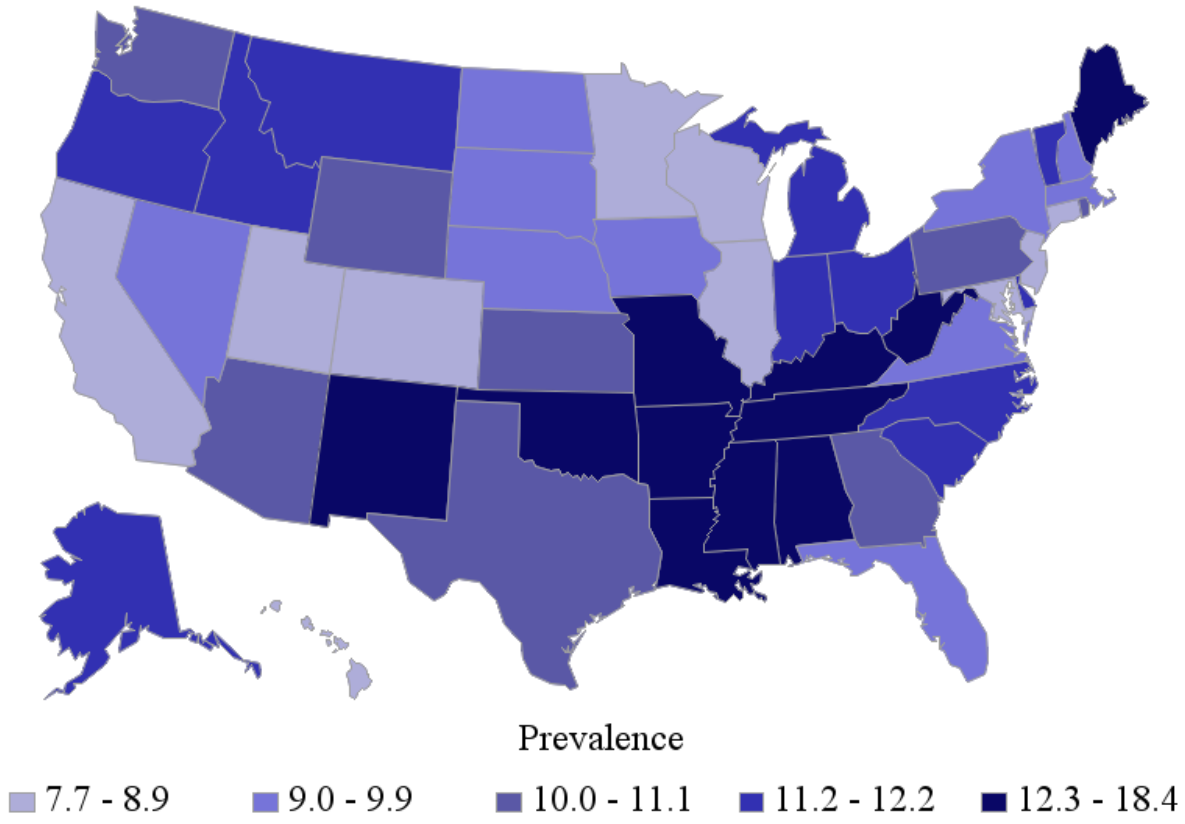
U.S. Total population and population with disabilities by residence type (all ages, 2009)

	Housing Unit Population	Group Quarters Population		Total Population
		Non-Institutionalized	Institutionalized	
Sample Size	2,947,932	31,903	50,893	3,030,728
Population	298,700,000	4,053,800	4,223,300	307,000,000
Percent of population	97.3	1.3	1.4	100.0%
Population with disabilities	35,370,000	856,400	2,414,700	38,641,100
Prevalence rate	11.8	21.1	57.2	12.6
Percent of population with disabilities	91.5	2.2	6.3	100.0%

ACS State Level Estimates

One of the strengths of the ACS is the ability to develop estimates at the state level due to the large sample size the data provides. This section provides some of state estimates of prevalence and employment rates based on the 2009 PUMS data. As can be seen in Figure 2 below there is wide variability in the prevalence rate between states for the non-institutionalized population ages 21-64. The four states with the lowest prevalence rates are Hawaii (7.7%), New Jersey (7.8%), Colorado (8.2%) and Illinois (8.2%). The states with the highest prevalence rates are: Alabama (15.5%), Kentucky (16.4%), Arkansas (17.0%), and West Virginia (18.4%). Puerto Rico has an even higher prevalence rate of 19.1%. For comparison the overall U.S. prevalence rate is 10.1%. See Appendix E for prevalence by state data table.

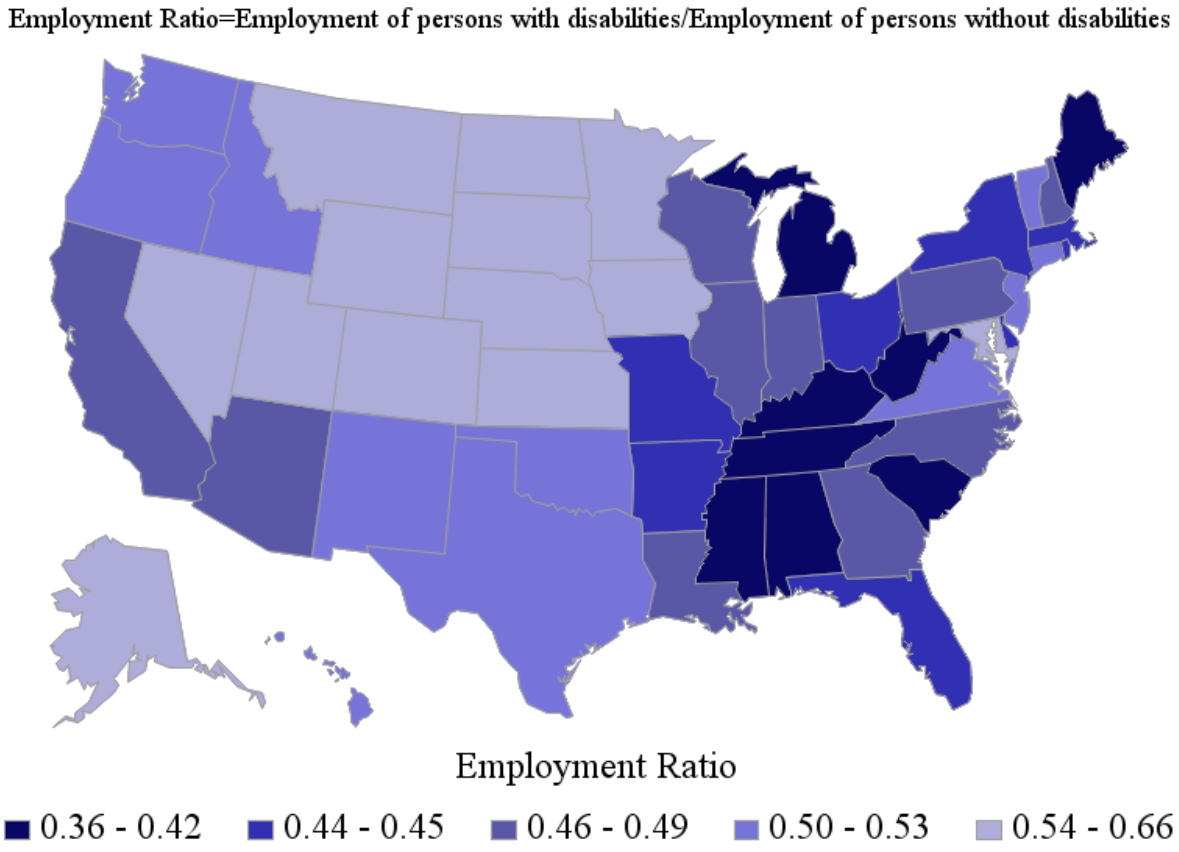
Figure 2. Disability Prevalence rate by state (Non-Institutionalized Population ages 21-64, 2009)



Employment rates also vary greatly by state, as Figure 3 demonstrates. The states with the lowest employment rates for working age (21-64) persons with disabilities are West Virginia (28.0%), Kentucky (28.1%), the District of Columbia (28.3%) and Mississippi (28.7%). The states with the highest employment rates are Alaska (50.2%), Wyoming (50.3%) and North Dakota (56.1). See Appendix F for employment rates for all states. As overall employment rates vary by state due to differences in their economic environment and opportunities, one of the most useful measures of the differences is the employment ratio. The employment ratio is calculated by dividing the employment rate of those with disabilities by the rate of those without disabilities. The higher the ratio the better the relative employment rate is, with a value of 1.0 meaning that persons with disabilities are employed at the same rate as those without. The overall employment ratio in the U.S. is .47, which means that people

with disabilities are employed at slightly less than half the rate of those without disabilities. As can be seen in Figure 3, the employment ratio varies significantly between states. The employment ratio ranges from a low of .36 in the District of Columbia to a high of .66 in North Dakota.

Figure 3. Employment ratio by state (Non-Institutionalized Population ages 21-64, 2009)



Summary and Conclusions

The design of the ACS provides several advantages over other data collection efforts. First, it has gone through a rigorous testing phase. Second, the survey methodology and design result in a high response rate, with estimates supported at the national, state, Metropolitan Statistical Area, and county level. Third, the redesigned disability questions were developed by a federal inter-agency workgroup and subjected to cognitive testing. Fourth, the sample includes both institutional and non-institutional group quarters, which few other surveys include. Finally, the ACS provides a wealth of other potentially interesting data including housing information (i.e., rent, utility costs, etc.) and household composition, as well as employment and economic well-being indicators beyond those presented within this User Guide.

The ACS Public Use Microdata Sample estimates allow users to better understand the population with disabilities, including the size of the population, the prevalence rate, the demographic composition, the employment rate, and economic well-being measures. At the national level, the ACS estimates that there are approximately 303 million non-institutionalized people of all ages in the U.S., of whom 36.2 million are people with a disability, for a disability prevalence rate of approximately 12.0%. The majority of institutionalized persons have a disability, accounting for an additional 4.2 million persons. Compared to the population without disabilities, the population with disabilities is older, more likely to be of African American and Native American decent, and more likely to have an education below the high school level. The employment and economic well-being measures indicate major and persistent disparities between the population with disabilities and the population without disabilities. At the state level, the ACS estimates show significant differences in the prevalence of disability, as well as

employment levels. The differences in employment rates exist both in absolute terms and relative to the population within the state without a disability.

The ACS allows users to examine trends over time. However, due to major changes in the questions used to identify disability as well as changes to the sampling design currently limit the usefulness of the time span available. Time trends from 2008 onwards will be valuable to researchers in the future.

The ACS is a valuable source of disability information. As the ACS data collection effort continues, researchers and policymakers will be able to track changes in prevalence rates, as well as employment and economic indicators across states and over time. These differences may provide vital information on how the labor market environment, the social environment and the policy environment influence the employment and economic well-being of the population with disabilities. The use of the ACS to monitor the progress of the population with disabilities will be an important component of the nation's efforts to reach the goals of full participation, independent living, and economic self-sufficiency for the population with disabilities.

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Appendix A: Quick Start to Analysis of the ACS PUMS Data

General ACS information:

Main Census Bureau ACS website:
http://www.census.gov/acs/www/

Questionnaire archive:
Contains English and Spanish pdfs of the household and GQ questionnaires as well as the associated instruction guides for all years of the ACS.
http://www.census.gov/acs/www/methodology/questionnaire_archive/

Downloading and working with PUMS data

A Compass for Understanding and Using American Community Survey Data: What PUMS Data Users Need to Know (Feb. 2009):
An excellent resource describing the basics of the ACS and how to work with the ACS PUMS files.
http://www.census.gov/acs/www/Downloads/handbooks/ACSPUMS.pdf

PUMS documentation: http://www.census.gov/acs/www/data_documentation/pums_documentation/

- **Data dictionary**: Provides all variable names, response categories and values for both housing records and person records available in the PUMS
- **Accuracy of the PUMS**: Describes ACS and PUMS sample design, sampling and non-sampling error, data confidentiality and disclosure avoidance measures taken. Also includes: weighting and estimation methodology, standard error calculation including both replicate weight and design factor methods, how to work with dollar amounts, and national and state level design factors (used for calculating generalized standard errors).

Data downloading: http://www.census.gov/acs/www/data_documentation/pums_data/
ACS PUMS data can be downloaded for the entire U.S., or by individual state, including D.C. and Puerto Rico in two formats: SAS data files or comma separated value (.CSV) files. There are two separate files for each geography:

- Population Records: 1 record/person
- Housing Unit Records: 1 record/ Housing unit or GQ person

National level PUMS files: Due to its size both the person and housing data files at the national level are split into two sub-files: a and b.

PUMS data can also be downloaded using the Census Bureau's DataFerrett application. (FERRETT stands for Federated Electronic Research, Review, Extraction, and Tabulation Tool.) DataFerrett provides basic data analysis functionality including the ability to recode data, develop customized tables and create data graphs and maps. It is particularly useful for those without access to statistical packages.
http://dataferrett.census.gov/

Creating Accurate PUMS Estimates: New users of the ACS should fully explore the PUMS documentation to understand how to create estimates from the PUMS data and Standard Error calculations. In particular users should familiarize themselves with the following features of the data.

Population and housing weights:

The appropriate weight variable should always be used when performing analyses:

- Person level weight (for person level analysis i.e. age, disability): PWGTP
- Housing level weight (for housing level analysis i.e. household income): WGTP

To ensure proper use of the weights, compare estimates generated to the "PUMS estimates for user verification" available on the PUMS documentation page (see link above).

Standard Errors: See *Accuracy of the PUMS* documentation for calculation methodology http://www.census.gov/acs/www/data_documentation/pums_documentation/

Identifying housing unit and Group Quarters[8] (GQ) samples:

- Population record file: Use relationship variable: REL (renamed RELP in 2010 PUMS)
- Housing unit record file: Use type of unit variable (TYPE)

Dollar amounts:

Census Bureau provides an inflation adjustment factor variable to multiply and standardize dollar amount variables. There are two different adjustment factors provided which one is used depends upon the specific dollar amount variable to be adjusted. See data dictionary for more information: http://www.census.gov/acs/www/data_documentation/pums_documentation/

Merging person and housing level files:

The variable SERIALNO is used as a key to merge the two person and housing level files together (after sorting by SERIALNO). SERIALNO is a unique Housing unit/GQ person serial number. Note that some housing units may be vacant. There is no need to merge unless the analysis requires both housing and person data – the PUMS data files are large.

Public Use Microdata Area (PUMA) Resources:

State level PUMA maps can be found here:

- PDF versions: http://www.census.gov/geo/www/maps/puma5pct.htm
- ArcView Shape files: http://www.census.gov/geo/www/cob/pu5_2000.html#shp

Identifying where specific locations fall within PUMAs:

The Missouri Census Data Center (MCDC) MABLE/Geocorr2010 is a Geographic Correspondence Engine that provides a crosswalk between a wide variety of geographical areas

[8] Note that for many states the GQ PUMS population sample is small. Estimates may vary significantly from year to year at the state level and for smaller geographies due to the GQ sampling variability (Beaghen & Stern, 2009). Users interested in GQ populations may want to utilize multiyear PUMS files and use caution with regards to sample sizes. See PUMS GQ sample sizes in Table 2 of the appropriate year "PUMS Accuracy of the Data." available under the "Accuracy of the PUMS" heading: http://www.census.gov/acs/www/data_documentation/pums_documentation/

and Census PUMAs. Very useful in determining in which PUMA(s) a specific city, county or other area is located and understanding how the total population is distributed across PUMAs or areas within a PUMA(s): http://mcdc1.missouri.edu/MableGeocorr/geocorr2010.html

Appendix B. ACS Sample Design and Computation of Standard Errors

The population estimates reported in the paper are drawn from a sample and, as with any sample, are subject to sampling and non-sampling error. Standard errors and Margin of Error (MOE) are used to describe the magnitude of sampling error and some forms of non-sampling error. The formulas used to compute standard errors and MOE must take into account the sample design.

The purpose of this technical appendix is to provide a brief description of the ACS sample design as well as the ACS PUMS sample design. It also provides links to Census Bureau documentation regarding how to compute standard errors that account for the ACS and ACS PUMS sample design. Standard errors may be used to construct the Margin of Error. The Census Bureau uses 90% MOE in their tables.

Sample Design

The 2009 ACS sample is designed to identify approximately 3 million housing unit addresses (HUs) in the U.S., 36,000 HUs in Puerto Rico (for the PRCS) and approximately a 2.5 percent sample of the expected number of persons residing in GQ facilities.[9] The sampling frame used for these is the Census Bureau's Master Address File (MAF) - the Bureau's inventory of known living quarters. HU address samples were selected independently for each of the 3,142 counties/county equivalents. There are two phases involved in the HU address sampling. The first phase identifies the sample of HUs to be surveyed. In the second phase, a sub-sample of HUs who have not responded to the mailed survey or the telephone follow-up, are selected for Computer Assisted Personal Interviewing (CAPI).

[9] In 2008 the GQ sampling rate was increased to meet Census Bureau publication thresholds for 16 states with small GQ populations. Beginning in 2011sample size will increase to 3.54 million HU addresses annually.

First Phase Household sampling:

- First Stage Sampling: Each address in the MAF sampling frame is assigned to one of the five representative sampling subframes by block. Each subframe is associated with a specific year. This subframe undergoes further sampling as described below. The purpose of these subframes is to meet the requirement that no address can be in the sample more than once in a five-year period. Also incorporated is a 20 percent sample of "new" HUs (not previously included in the MAF).
- Assignment of blocks to a second-stage sampling stratum: The sampling rates are determined for each stratum for the current sample year. Sampling rates are determined for most blocks of addresses based on the Measure Of Size (MOS) for the smallest sampling entity to which the any part of the block belongs. The seven sampling strata/entities include counties, school districts, places with active and functioning governments, American Indian Areas/Alaska Native Areas/Hawaiian Home Lands (AIANHH), American Indian Tribal Subdivisions with active and functioning governments, minor civil divisions (MCDs) with active and functioning governments in 12 states, and Census designated places in Hawaii only. The overall sampling rate are calculated to yield a target sample size of approximately 3 million HU addresses in the U.S., and 36,000 in Puerto Rico.
- Second Stage sampling rate calculation: A systematic sample of addresses is selected from the second-stage universe within each county/county equivalent.
- Sample month assignment: Each of the selected addresses identified in the second-stage sampling is randomly allocated to one of the 12 months of the year for data collection.

Second-Phase Household Sample Selection:

- This involves the subsampling of un-mailable and/or non-responding addresses. All un-mailable addresses are subsampled at the rate of 2 out of 3. Non-respondent addresses are sampled at rates ranging from 1-in-2 and 1-in-3, with higher rates applied to areas with lower completion levels.

Group Quarters (GQ) sample selection:

All GQs are divided into three strata: Small GQs (with 15 or fewer residents), GQs that were closed on Census day 2000, and large GQ (greater than 15 residents). There are approximately 105,000 small GQ facilities and 73,000 large GQs and an additional 2,400 of unknown size. The small GQ and those closed on Census day 2000 were combined into a single stratum. The small and large GQs had different sample selection methods as described below.

Small GQs:

Small GQs are sampled similarly to the HU's. Address sample and data are collected for all people in the facility. There are two phases: the first identifying the small GQs to be included in the survey and the second phase determining the residents within the GQ to be surveyed in cases where the GQ has a resident population greater than 15.

The first phase sample involves two stages:

- First-stage sample: As with the HU sample small GQs are only eligible for the ACS once every five years. To ensure this all small GQs are systematically assigned to one of five partitions and each of the partitions is rotated over the five year period, becoming the universe for the second stage sample.
- Second-stage sample: GQs are selected from the first stage sample based on the state's target sampling rate. In 2009, most states had a 2.5 percent target sampling rate, while 16 states had higher rates (up to 7.11% in Wyoming) to meet Census Bureau publication thresholds.
- Second phase sample: All residents are eligible to receive a survey if the actual count is 15 or fewer residents. If the actual count exceeds 15, a field subsample of 10 is randomly selected.

Large GQs:

Unlike small GQs and HUs, all large GQs are eligible for sampling every year so there is no partitioning stage. The ultimate sampling units for large GQs are not the facility itself, but rather the people selected in groups of ten to be interviewed within the facility.

- First phase sample: For each large GQ, a GQ Measure of Size (GQMOS) is calculated by dividing the expected population by 10. Groups of 10 people are identified for interview and the number of these groups in a GQ is determined by its GQMOS. For example a GQ with 500 individuals would have approximately 50 groups. The sampling rate across these GQs is based on the state GQ targeted sampling rates. Very large GQs are likely to have multiple "hits" (groups of ten interviews).
- Second phase sample: selection of persons within large GQs. A random selection of a subsample of ten people from the roster is made for each "hit" on a large GQ and all individuals in this subsample receive a survey.

More details regarding the 2009 ACS sample may be found in the document "Accuracy of the Data (2009)" (http://www.census.gov/acs/www/Downloads/data_documentation/Accuracy/ACS_Accuracy_of_Data_2009.pdf). Also see chapters 3 (Frame development) and 4 (sample design and selection) in the ACS Design and Methodology document. (http://www.census.gov/acs/www/Downloads/survey_methodology/acs_design_methodology.pdf)

As noted previously the ACS has a very large sample size, second to only the Decennial Census. Initially, 2,897,256 HU addresses in the U.S. were selected to be potential sample members in 2009, and that resulted in 1,917,748 final completed household interviews. Note that some of the initial addresses

were commercial or non-existent and were not interviewed, while others were non-respondents. After excluding addresses determined to be commercial or non-existent the response rate in the ACS is very high for both HUs and GQ persons, ranging from 97%-98% over the period between 2005-2009.

ACS Public Use Microdata Sample (PUMS). The ACS PUMS file consists of a sample drawn from the ACS sample. The 2009 PUMS data contains 1,314,006 housing unit records and 2,979,656 person records from households and 83,248 person records from GQs. The basic unit for the GQ sample is the individual while the basic unit for the housing unit is the individual household. The population sample includes all persons living in the selected households plus persons selected from the GQ sample.

After stratification and sorting, the Census designed a systematic method of selecting household units and GQ persons. Household level weights and person level weights were then constructed in the PUMS to allow a user to create population estimates.

To further assure the privacy of individual and household information, the U.S. Census Bureau limits the geographic detail provided in the files. The smallest identified unit is the Public Use Microdata Area (PUMA). The Census Bureau also applies "confidentiality edits" The confidentiality edit involves introducing a small degree of uncertainty into the estimates of ACS characteristics. This includes matching person records based upon a set of key characteristics and swapping their data. The methods used maintain the quality and usefulness of the data.

Sampling and Non-Sampling Error

Both sampling error and non-sampling errors introduce some degree of uncertainty into estimates. Sampling error occurs when population characteristics are estimated based upon a sample and are not based upon the entire population. Because many samples may be drawn from a population, and each sample can produce a different estimate, there is always some degree of uncertainty when samples are used to estimate characteristics of a population. The variability of estimates drawn from

samples, sometimes referred to as uncertainty, is described by standard errors. Standard errors are used to construct confidence intervals, which describe the likelihood that a particular estimate falls within a certain range of estimates.

Non-sampling error results from other forms of error and includes errors keying in data, errors editing the data, misinterpretation of questions by respondents, non-random non-response to the survey or survey questions, and other factors. To the degree that the error occurs at random, additional variability will arise in the estimates and the standard errors will describe the variability due to this non-sampling error. However, non-sampling errors may occur in a systematic manner (i.e., non-random errors). Systematic errors that arise in the data collection process are not described by standard errors. Thus, it is important to assess the role of systematic non-sampling errors that may arise in an estimate.

The Census Bureau attempts to minimize systematic errors by researching and analyzing new sampling techniques, questionnaire designs, and data collection and processing procedures. The ACS also uses other methods to minimize systematic error, such as following up on mail non-respondents during the CATI and CAPI phases. Information on potential ACS non-sampling errors that are identified by the Census Bureau are posted on the ACS website under "errata," which may be found at the following address: http://www.census.gov/acs/www/UseData/Errata.htm.

Calculation of Standard Error

Due to the complex sample design of the ACS special techniques are required to properly calculate standard errors (SE). There are two basic methods that the Census Bureau provides for calculating SEs: the *direct standard error* and the more basic *generalized standard error*. The *generalized standard error* calculation utilizes the *design factors* that the Census Bureau provides and is the technique used for developing the SE and Margin of Errors (MOE) provided in this guide. A more accurate but more computationally intensive method is referred to as *direct standard errors*. This

method utilizes the 80 replicate weights associated with each person and household level observation in the PUMS data. For full details of the ACS PUMS design and information on the methods for calculating standard errors, design factor tables, and examples of SE calculations see "PUMS Accuracy of the Data (2009)." (http://www.census.gov/acs/www/Downloads/data_documentation/pums/Accuracy/2009AccuracyPUMS.pdf .)

Appendix C. ACS Disability Question Set History

Since the ACS was first fielded in 2000, there have been three variants of the disability questions. In 2003 the question structure was altered to address some issues discovered with the original questions. In 2008 the entire set of six questions was completely replaced with a new set. This new set of questions has been used up through 2012 at the time of this writing.

ACS 2000-2002

Between 2000 and 2002, the disability questions used the Census 2000 wording and structure:

Q15. Does this person have any of the following long lasting conditions:

a. Blindness, deafness, or a severe vision or hearing impairment?

b. A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying?

Q16. Because of a physical, mental, or emotional condition lasting 6 months or more, does this person have any difficulty in doing any of the following activities:

a. Learning, remembering, or concentrating?

b. Dressing, bathing, or getting around inside the home?

{Page break on survey}

c. (Answer this if the person is 16 YEARS OLD OR OVER.) Going outside the home alone to shop or visit a doctor's office?

d. (Answer this if the person is 16 YEARS OLD OR OVER.) Working at a job or business?

An analysis of the data by Stern and Brault (2005) suggests that some of the people responding to Questions 16c and 16d may not have understood that it was linked to the introductory sentence on the

previous page, "Because of a physical, mental, or emotional condition lasting 6 months or more, does this person have any difficulty in doing any of the following activities…?" Some sample members may have responded as if the introductory sentence did not exist, which can lead to a different interpretation of the question. For example, without the introductory sentence, a person may misinterpret Question 16d as instead asking, "Are you working at a job or business?" A "yes" to this interpretation of the question would indicate that they are currently working, not that they have a health condition that makes it difficult for them to work at a job or business. Therefore, it is possible that these last two questions may have incorrectly identified some people without a disability as being people with a disability.

ACS 2003 changes:

In an attempt to address these issues described above the Census Bureau restructured the disability questions in 2003 as follows:

Q15. Does this person have any of the following long lasting conditions:

c. Blindness, deafness, or a severe vision or hearing impairment?

d. A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying?

Q16. Because of a physical, mental, or emotional condition lasting 6 months or more, does this person have any difficulty in doing any of the following activities:

a. Learning, remembering, or concentrating?

b. Dressing, bathing, or getting around inside the home?

Answer Question 17 only if this person is age 15 or older. Otherwise skip to question for Person 2 on page 10.

Q17. Because of a physical, mental, or emotional condition lasting 6 months or more, does this person have any difficulty in doing any of the following activities:

a. Going outside the home alone to shop or visit a doctor's office?

b. Working at a job or business?

While this change may appear to be minor, there was a major change in the prevalence rates for the employment disability and the go-outside-the-home disability. Significantly lower employment rates and economic well-being estimates were also found for the population with disabilities between the 2002 ACS and the 2003 ACS especially for the population with disabilities identified by the two altered questions (Weathers, 2005, Appendix C.). The differences are large, and it is possible that the difference is due to a change in the structure of the survey.

Users should be aware that differences between estimates from the ACS disability data before the 2003 survey may differ from the 2003 ACS estimates because of this difference in the questionnaire. The difference is likely to affect the ACS overall disability definition, the go-outside-the-home disability definition and the employment disability definition. It is likely that the other four disability questions were not affected by the change in the questionnaire and may be used to estimate changes over time.

ACS 2008 Changes

Major changes were made to the ACS disability questions in 2008. The changes were both a conceptual and empirical break from the previous ACS disability questions. The U.S. Census Bureau made these changes to better identify specific portions of the population of persons with disabilities, and to more clearly define disability as a functional limitation that may increase a person's risk of participation limitation. These changes made to the disability questions mean that the population identified in 2008 is *different* from that identified in previous years and the results *should not be compared*. The Census Bureau's American Community 2006 content test found that the new set of six disability questions had equal or better reliability and higher response rates than the previous ACS question set.

Below are the current disability questions used in the 2008-2011 ACS. The question numbers are those used for the 2008 version of the survey.

Q16a. Is this person deaf or does he/she have serious difficulty hearing?

Q16b. Is this person blind or does he/she have serious difficulty seeing even when wearing glasses?

Answer question 17a – c if this person is 5 years old or over.

Q17a. Because of a physical, mental, or emotional condition, does this person have serious difficulty concentrating, remembering, or making decisions?

Q17b. Does this person have serious difficulty walking or climbing stairs?

Q17c. Does this person have difficulty dressing or bathing?

Answer question 18 if this person is15 years old or over.

Q18. Because of a physical, mental, or emotional condition, does this person have difficulty doing errands alone such as visiting a doctor's office or shopping?

The major changes from the previous ACS disability questions used between 2003-2007 and the 2008 questions are:

- Duration of limitation was removed and the term "serious" is used to focus on longer term/more severe impairments.
- Employment Disability question is no longer asked.
- Vision and Hearing Disabilities (was Sensory Disability) were separated into two independent questions and the population includes children under the age of 5.
- Cognitive Disability (was Mental Disability): dropped "learning" as an activity, added the activity "making decisions."
- Ambulatory Disability (was Physical disability) is now limited to mobility related activities; "reaching, lifting, or carrying" activities dropped.

- Self-Care Disability (was Self-Care disability): no longer includes phrase "Because of a physical, mental, or emotional condition." The new question is limited to dressing and bathing activities, and the "getting around inside the home" activity is dropped.
- Independent Living Disability (was Go-Outside-Home disability): dropped both the time restriction "lasting 6 months or more" and the phrase "Outside the home."

The 2008 questions resulted in a lower overall disability prevalence rate than the previous set of questions (10.4% as compared to 12.8%), although the separate hearing and vision disability questions resulted in a higher prevalence rate than the pre-2008 sensory disability question.

Table C1

US Non-institutionalized population ages 21-64 prevalence rate: ACS 2007

Disability Type	Percent	MOE	Number	MOE	Base Population	Sample Size
Any Disability	12.8	0.05	22,295,000	89,200	174,206,000	1,692,615
Sensory	2.9	0.02	5,033,000	43,700	174,206,000	1,692,615
Physical	7.9	0.04	13,789,000	71,200	174,206,000	1,692,615
Mental	4.7	0.03	8,273,000	55,700	174,206,000	1,692,615
Self-Care	2.3	0.02	4,056,000	39,300	174,206,000	1,692,615
Go-Outside-Home	3.4	0.03	5,931,000	47,400	174,206,000	1,692,615
Employment	7.6	0.04	13,297,000	70,000	174,206,000	1,692,615

Table C2

US Non-institutionalized population ages 21-64 prevalence Rate: ACS 2008

Disability Type	Percent	MOE	Number	MOE	Base Population	Sample Size

Any Disability	10.4	0.06	18,312,900	115,430	175,368,200	1,693,675
Visual	1.9	3.29	3,314,200	50,380	175,368,200	1,693,675
Hearing	2.3	0.03	3,990,400	55,220	175,368,200	1,693,675
Ambulatory	5.4	0.05	9,498,200	84,400	175,368,200	1,693,675
Cognitive	4.1	0.04	7,213,700	73,840	175,368,200	1,693,675
Self-Care	1.8	3.29	3,240,900	49,820	175,368,200	1,693,675
Independent Living	7.6	0.04	13,297,000	70,000	174,206,000	1,692,615

See Brault, 2009 (pages 12-16) for a detailed comparison between the 2007 and 2008 disability questions and Census. For a summary of all changes to the ACS 2008 survey see the U.S.Census Bureau documentation regarding the 2006 ACS content testing.

Appendix D. International Classification of Functioning, Disability and Health (ICF) concepts

The 2008 ACS disability questions used the International Classification of Functioning, disability and health (ICF) as the basis for their development. In this section we describe the ICF related concepts of *impairment*, *activity limitation, participation restriction*, and *disability* (see WHO, 2001). A prerequisite to each of these concepts is the presence of a health condition. Examples of health conditions are listed in the International Classification of Diseases, Tenth Edition (ICD-10) and they encompass diseases, injuries, health disorders, and other health related conditions.

An *impairment* is defined as a significant deviation or loss in body function or structure. For example, the loss of a limb or vision loss may be classified as impairments. In some surveys, impairments are defined as long lasting health conditions that limit a person's ability to see or hear, limit a person's physical activity, or limit a person's mental capabilities.

An *activity limitation* is defined as a difficulty an individual may have in executing activities. For example, a person who experiences difficulty dressing, bathing or performing other activities of daily living due to a health condition may be classified as having an activity limitation. In some surveys, activity limitations are identified based upon a standard set of activities of daily living questions (ADL's).

A *participation restriction* is defined as a problem that an individual may experience in involvement in life situations. For example, a working-age person with a severe health condition may have difficulty participating in employment as a result of the physical environment (e.g., lack of reasonable employer accommodations) and/or the social environment (e.g., discrimination). In some surveys, participation restrictions are identified by questions that ask whether the person has a long lasting health condition that limits his or her ability to work, or whether a health conditions affects his or her ability to go outside his or her home to go shopping, to church or to the doctor's office.

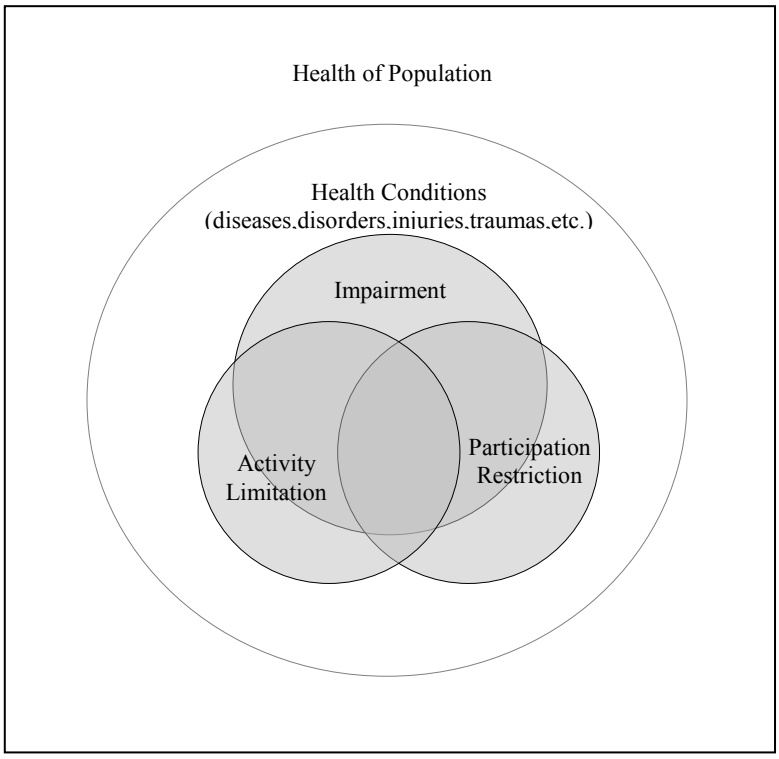
The final ICF concept that used is a *disability*. The term disability is used to describe the presence of an impairment, an activity limitation and/or a participation restrictions. This concept is similar to the definition used in the Americans with Disabilities Act of 1990 (ADA). The ADA defines a disability as "a *physical or mental impairment that substantially limits one or more of the major life activities, a record of such an impairment, or being regarded as having such an impairment."*

While these concepts may seem to follow a progression—that is, an impairment leading to an activity limitation leading to a participation restriction—it is not necessarily the case. It is possible that a person may have a participation restriction without an activity limitation or impairment. For example, a person diagnosed as HIV positive may not have an evident impairment or activity limitation but may not be able to find employment due to discrimination resulting from his health condition. Similarly, a person with a history of mental illness, but who no longer has a loss in capacity or activity limitation, may also be unable to finding employment due to discrimination resulting from his health condition.

Figure 1 provides a useful summary of the ICF concepts. It illustrates that while there is an overlap across these concepts, it is possible that one of them can occur without a relation to the others. The

universe of the ICF is the health of the population as a whole. The shaded area of Figure 1 illustrates the ICF concept of a disability.

Simplified Conceptual Model of Disability Using ICF Concepts



Appendix E. Disability Prevalence rate by state

(non-institutionalized population ages 21-64, 2009)

LOCATION	PERCENT	MOE	NUMBER	MOE	BASE POPULATION	SAMPLE SIZE
United States	10.4	0.06	18,382,600	115,670	177,004,700	1,709,245
Alabama	15.5	0.51	417,500	14,130	2,688,000	27,080
Alaska	12.0	1.07	50,700	4,620	421,700	3,648
Arizona	10.3	0.36	377,400	13,670	3,673,600	33,723
Arkansas	17.0	0.68	274,900	11,430	1,621,000	15,814
California	8.4	0.14	1,791,600	29,920	21,451,300	201,116
Colorado	8.2	0.36	245,800	11,080	3,006,600	29,080
Connecticut	8.6	0.45	174,400	9,330	2,037,200	19,843
Delaware	11.2	1.01	56,700	5,280	508,100	4,728
District of Columbia	10.0	1.12	37,600	4,300	376,200	3,536
Florida	9.9	0.21	1,029,900	22,600	10,365,300	101,880
Georgia	10.5	0.29	593,300	17,110	5,661,400	54,412
Hawaii	7.7	0.7	58,800	5,430	762,900	7,616
Idaho	11.2	0.78	96,100	6,880	859,900	8,528
Illinois	8.2	0.23	613,000	17,510	7,484,700	71,810
Indiana	11.3	0.38	414,900	14,270	3,668,100	36,918
Iowa	9.4	0.48	158,800	8,250	1,692,400	16,802
Kansas	10.6	0.55	170,100	9,160	1,611,000	15,527
Kentucky	16.4	0.54	409,800	13,950	2,500,400	24,817
Louisiana	13.0	0.48	332,900	12,720	2,557,500	24,733
Maine	14.4	0.85	111,800	6,810	777,900	7,184
Maryland	8.4	0.35	284,100	11,900	3,367,300	32,773
Massachusetts	9.2	0.33	361,300	13,390	3,919,600	37,541
Michigan	11.9	0.31	684,200	18,290	5,755,700	55,854
Minnesota	8.4	0.36	259,900	11,390	3,087,600	29,896
Mississippi	15.1	0.64	245,400	10,870	1,624,800	15,848
Missouri	12.6	0.41	430,600	14,490	3,426,500	33,534
Montana	11.8	0.99	66,400	5,700	562,100	4,999
Nebraska	9.2	0.66	93,900	6,840	1,017,000	9,896
Nevada	9.0	0.53	138,900	8,310	1,541,500	15,186
New Hampshire	9.2	0.74	72,500	6,000	792,100	7,593
New Jersey	7.8	0.27	396,400	14,100	5,099,900	49,612
New Mexico	12.3	0.71	138,600	8,230	1,126,400	10,408
New York	9.1	0.19	1,042,400	22,760	11,487,400	107,488
North Carolina	11.7	0.32	635,600	17,640	5,419,700	53,578
North Dakota	9.2	1.08	34,200	4,120	373,400	3,755

Ohio	12.0	0.29	798,100	19,750	6,651,000	66,036
Oklahoma	15.2	0.57	313,200	12,270	2,060,400	20,078
Oregon	11.2	0.48	252,300	11,120	2,255,100	21,821
Pennsylvania	11.0	0.27	795,900	19,790	7,216,700	69,949
Rhode Island	10.2	0.89	62,800	5,570	613,600	5,914
South Carolina	12.2	0.46	317,200	12,450	2,601,400	25,926
South Dakota	9.7	1.01	43,900	4,670	451,600	4,424
Tennessee	13.9	0.41	510,000	15,690	3,665,800	36,130
Texas	10.3	0.19	1,439,200	26,680	13,995,400	132,863
Utah	8.3	0.52	125,600	7,940	1,508,600	14,474
Vermont	11.4	1.11	41,900	4,210	368,400	3,512
Virginia	9.3	0.31	429,800	14,610	4,636,300	45,613
Washington	10.7	0.36	426,700	14,480	3,980,000	38,745
West Virginia	18.4	0.8	195,800	8,890	1,063,300	10,385
Wisconsin	8.9	0.33	294,400	11,240	3,291,700	33,445
Wyoming	11.1	1.18	35,500	3,870	319,500	3,174
Puerto Rico	19.1	0.56	424,500	13,100	2,228,000	17,275

Appendix F. Employment rate by state and disability status

(non-institutionalized population ages 21-64, 2009))

	WITH DISABILITIES			WITHOUT DISABILITIES			
Location	Employment rate	MOE	Sample Size	Employment rate	MOE	Sample Size	Employment Ratio
United States	**36.0**	**0.31**	**181,131**	**76.8**	**0.09**	**1,528,114**	**0.47**
Alabama	30.0	1.63	4,327	74.8	0.66	22,753	0.40
Alaska	50.2	4.36	404	77.7	1.34	3,244	0.65
Arizona	33.9	1.77	3,544	73.4	0.56	30,179	0.46
Arkansas	34.6	2.08	2,827	76.8	0.83	12,987	0.45
California	34.2	0.81	16,991	74.3	0.23	184,125	0.46
Colorado	46.7	2.31	2,438	78.7	0.56	26,642	0.59
Connecticut	41.7	2.71	1,662	79.8	0.67	18,181	0.52
Delaware	35.8	4.61	512	80.1	1.36	4,216	0.45
District of Columbia	28.3	5.33	341	78.0	1.63	3,195	0.36
Florida	32.9	1.06	10,536	74.6	0.33	91,344	0.44
Georgia	34.6	1.42	5,957	75.4	0.44	48,455	0.46
Hawaii	41.1	4.65	593	80.3	1.09	7,023	0.51
Idaho	38.5	3.60	969	75.7	1.12	7,559	0.51
Illinois	36.3	1.41	6,282	76.5	0.37	65,528	0.47
Indiana	36.0	1.71	4,275	77.0	0.53	32,643	0.47
Iowa	47.0	2.46	1,632	84.0	0.58	15,170	0.56
Kansas	44.7	2.76	1,651	81.7	0.74	13,876	0.55
Kentucky	28.1	1.61	3,965	74.7	0.69	20,852	0.38
Louisiana	35.0	1.89	3,451	76.3	0.65	21,282	0.46
Maine	33.8	3.01	1,037	81.0	1.02	6,147	0.42
Maryland	44.0	2.13	2,797	81.0	0.51	29,976	0.54
Massachusetts	34.8	1.82	3,305	79.8	0.49	34,236	0.44
Michigan	30.4	1.27	6,564	71.7	0.46	49,290	0.42
Minnesota	44.3	2.23	2,543	82.0	0.52	27,353	0.54
Mississippi	28.7	2.09	2,660	74.9	0.85	13,188	0.38
Missouri	35.6	1.67	4,320	78.5	0.54	29,214	0.45
Montana	45.5	4.43	577	78.6	1.33	4,422	0.58
Nebraska	45.8	3.73	937	84.7	0.86	8,959	0.54
Nevada	40.9	3.02	1,474	75.4	0.83	13,712	0.54
New Hampshire	39.3	4.16	706	82.0	1.04	6,887	0.48
New Jersey	40.2	1.78	3,795	77.8	0.44	45,817	0.52
New Mexico	37.0	2.97	1,331	74.7	1.00	9,077	0.50
New York	33.9	1.06	10,154	76.4	0.30	97,334	0.44
North Carolina	34.9	1.37	6,442	76.2	0.45	47,136	0.46

North Dakota	56.1	6.15	367	85.4	1.39	3,388	0.66
Ohio	34.0	1.21	7,683	76.5	0.40	58,353	0.44
Oklahoma	40.2	2.01	3,249	78.5	0.71	16,829	0.51
Oregon	38.1	2.22	2,416	74.7	0.70	19,405	0.51
Pennsylvania	36.3	1.23	7,444	78.1	0.37	62,505	0.46
Rhode Island	36.6	4.40	584	80.6	1.22	5,330	0.45
South Carolina	30.1	1.87	3,235	74.7	0.66	22,691	0.40
South Dakota	45.8	5.45	411	83.3	1.34	4,013	0.55
Tennessee	30.2	1.47	5,205	75.7	0.55	30,925	0.40
Texas	39.8	0.94	14,272	77.1	0.27	118,591	0.52
Utah	43.3	3.20	1,236	77.9	0.81	13,238	0.56
Vermont	44.2	4.77	384	83.6	1.27	3,128	0.53
Virginia	39.6	1.71	4,292	80.0	0.45	41,321	0.50
Washington	39.1	1.71	4,076	76.7	0.51	34,669	0.51
West Virginia	28.0	2.16	1,919	74.2	1.00	8,466	0.38
Wisconsin	40.3	1.92	3,007	81.6	0.48	30,438	0.49
Wyoming	50.3	5.21	352	82.5	1.40	2,822	0.61
Puerto Rico	22.8	1.37	3,436	57.6	0.78	13,839	0.40