

Adults with One or More Functional Disabilities — United States, 2011–2014

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Nearly 40 million persons in the United States have a disability, as defined by responses to six questions recommended by the U.S. Department of Health and Human Services as the national standard for identifying disabilities in population-based health surveys (1). Although these questions have been used to estimate prevalence of functional disabilities overall, as well as types of functional disabilities (disability type), no study has yet investigated the characteristics of U.S. adults by number of disability types. Knowing the characteristics of persons living with multiple disability types is important for understanding the overall functional status of these persons. CDC analyzed data from the family component of the National Health Interview Survey (NHIS) for the years 2011–2014 to estimate the percentage of adults aged 18–64 years with one, two, three, or four or more disability types, by selected demographic and socioeconomic characteristics. Overall, 22.6 million (11.9%) working-age adults were found to have any disability, and in this population, most (12.8 million) persons had only one disability type. A generally consistent pattern between increasing indicators of low socioeconomic status and the number of disability types was observed. Understanding the demographic and socioeconomic characteristics of working-age adults with disabilities, including those with multiple disability types, might help to further the inclusion of persons with disabilities in public health programs and policies.

NHIS is a continuous, in-person household survey that is nationally representative of the civilian, noninstitutionalized U.S. population.* Final response rates for the family component ranged from 73.1% to 81.3% during 2011–2014. NHIS includes six questions[†] recommended by the U.S. Department of Health

and Human Services to identify disabilities in six disability type categories: hearing, vision, cognition, mobility, self-care, and independent living.[§] Disability was assessed for 130,455 adults aged 18–64 years, of whom 2,441 were excluded because of missing information on any of the six questions,[¶] resulting in a final analytic sample of 128,014 persons. Persons who responded “yes” to any of the six questions were classified as having a disability

[§] Respondents were categorized as having a disability if they answered “yes” to any of the following six questions: 1) “Are you deaf or do you have serious difficulty hearing?” (hearing); 2) “Are you blind or do you have serious difficulty seeing, even when wearing glasses?” (vision); 3) “Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions?” (cognition); 4) “Do you have serious difficulty walking or climbing stairs?” (mobility); 5) “Do you have difficulty dressing or bathing?” (self-care); and 6) “Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor’s office or shopping?” (independent living).

[¶] Estimates of disability in this report might differ from other disability estimates derived from this data set because of analytical differences (e.g., treatment of missing responses).

INSIDE

- 1026 Influenza Vaccination Coverage Among Health Care Personnel — United States, 2015–16 Influenza Season
- 1032 Local Mosquito-Borne Transmission of Zika Virus — Miami-Dade and Broward Counties, Florida, June–August 2016
- 1039 Notes from the Field: Measles Outbreak of Unknown Source — Shelby County, Tennessee, April–May 2016
- 1041 Announcement
- 1042 QuickStats

Continuing Education examination available at http://www.cdc.gov/mmwr/cme/conted_info.html#weekly.

* <http://www.cdc.gov/nchs/nhis/>.

[†] Based on section 4302 of the Affordable Care Act, the Department of Health and Human Services issued data collection standard guidance to include a standard set of disability identifiers in all national population health surveys (<https://aspe.hhs.gov/datacncl/standards/aca/4302/index.pdf>).



and as having a specific disability type if they responded “yes” to the question corresponding to that disability type. For each person who had any disability, the number of disability types was calculated by summing the number of “yes” responses to the six questions. Persons with “no” responses to all six questions were classified as having no disability.

Data were weighted to account for the probability of selection and nonresponse; weights were divided by four to account for combining 4 years of data. Prevalence and 95% confidence intervals (CIs) were calculated for any disability, disability type, and number of disability types (one, two, three, four or more**), as well as demographic (age [18–44, 45–64 years]; sex; race/ethnicity [non-Hispanic white, non-Hispanic black, Hispanic, non-Hispanic other]) and socioeconomic status variables among adults with no disability, any disability, and one, two, three, or four or more disability types. Socioeconomic status variables were income-to-poverty ratio^{††} (<1.00, 1.00–2.00, ≥2.00); labor force status (in the labor force [employed, looking for work], not in the labor force [retired, student, or homemaker; not working because of health reasons or disability; other]); and education level (less than high school, high school/GED/some college, associate degree, college degree). Statistical software was used to account for the complex survey design of NHIS.

** Because of small sample sizes, persons with four, five, or six disability types were combined into a single category.

†† Income-to-poverty ratio is the ratio of family income to the federal poverty threshold, given family size and number of children.

Overall, 22.6 million (11.9%) working-age adults had any disability; among these 22.6 million persons, 51.0% had a mobility disability and 38.3% had a cognitive disability (Table 1). Most (12.8 million) of those with any disability had only one disability type; the most common disability type was mobility (33.5%), followed by hearing (24.4%), and cognition (23.1%). A total of 4.8 million working-age adults had two disabilities, 2.7 million had three disabilities, and 2.2 million had four or more disabilities (data not shown). Among adults with two or more disabilities, the most common types were mobility, independent living, and cognition (Table 1).

Compared with working-age adults with no disability, a higher percentage of those with any disability were aged 45–64 years or non-Hispanic black; no differences were observed for sex. As the number of disability types increased, the percentages of adults who were aged 45–64 years or non-Hispanic black increased. Disparities in indicators of low socioeconomic status were noted for those with any disability compared with those with no disability (less than a high school education [26.9% versus 13.1%], income-to-poverty ratio <1.00 [29.2% versus 13.3%], and in the labor force but looking for work [16.2% versus 7.5%]) (Table 1) (Table 2). As the number of disability types increased, the prevalence of low socioeconomic status indicators generally increased as well. For example, the prevalence of being in the labor force but looking for work was 7.5% (no disability), 13.8% (one type), 21.4% (two types), 29.0% (three types), and 26.4% (four or more types) (Table 2). Similar observations were noted for income-to-poverty ratio <1.00 and having less than a high school education.

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TABLE 1. Sociodemographic characteristics among adults aged 18–64 years, by disability status and number of functional disability types* — National Health Interview Survey, United States, 2011–2014

Characteristic	Overall population (N = 128,014 [†]) % (95% CI)	Disability status % (95% CI)		No. of functional disability types % (95% CI)			
		No disability (n = 112,417 [†])	Any disability (n = 15,597 [†])	1 (n = 8,730 [†])	2 (n = 3,342 [†])	3 (n = 1,908 [†])	≥4 (n = 1,617 [†])
Disability status							
Any disability	11.9 (11.6–12.2)	— [§]	— [§]	— [§]	— [§]	— [§]	— [§]
Cognitive	4.6 (4.4–4.7)	— [§]	38.3 (37.3–39.3)	23.1 (21.9–24.3)	46.4 (44.3–48.4)	55.5 (52.8–58.2)	87.4 (85.4–89.1)
Hearing	3.0 (2.8–3.1)	— [§]	24.8 (24.0–25.6)	24.4 (23.3–25.5)	19.6 (18.1–21.2)	21.7 (19.7–23.8)	41.9 (39.0–44.9)
Mobility	6.1 (5.9–6.3)	— [§]	51.0 (50.0–52.0)	33.5 (32.2–34.7)	58.7 (56.6–60.8)	82.9 (80.7–85.0)	96.0 (94.8–97.0)
Vision	2.5 (2.4–2.6)	— [§]	20.8 (19.9–21.7)	14.4 (13.4–15.5)	20.2 (18.6–21.9)	24.1 (22.0–26.2)	54.9 (52.0–57.7)
Self-care	1.7 (1.6–1.8)	— [§]	14.6 (13.9–15.3)	0.8 (0.6–1.1)	8.7 (7.6–10.0)	41.0 (38.5–43.5)	73.7 (71.1–76.1)
Independent living	3.6 (3.4–3.7)	— [§]	30.1 (29.2–31.1)	3.9 (3.4–4.4)	46.3 (44.4–48.2)	74.9 (72.5–77.1)	91.7 (90.0–93.2)
No disability	88.1 (87.9–88.3)	— [§]	— [§]	— [§]	— [§]	— [§]	— [§]
Age group (yrs)							
18–44	57.6 (57.1–58.1)	60.7 (60.2–61.3)	34.3 (33.3–35.3)	37.7 (36.3–39.1)	32.0 (30.1–33.9)	27.9 (25.6–30.2)	27.6 (24.9–30.5)
45–64	42.4 (41.9–42.9)	39.3 (38.7–39.8)	65.7 (64.7–66.7)	62.3 (60.9–63.7)	68.0 (66.1–69.9)	72.1 (69.8–74.4)	72.4 (69.5–75.1)
Sex							
Male	49.1 (48.9–49.4)	49.1 (48.9–49.4)	49.1 (48.3–49.9)	51.3 (50.1–52.4)	46.7 (44.9–48.6)	45.0 (42.4–47.5)	46.7 (44.1–49.3)
Female	50.9 (50.6–51.1)	50.9 (50.6–51.1)	50.9 (50.1–51.7)	48.7 (47.6–49.9)	53.3 (51.4–55.1)	55.0 (52.5–57.6)	53.3 (50.7–55.9)
Race/Ethnicity							
White, non-Hispanic	64.5 (63.8–65.2)	64.1 (63.4–64.9)	67.3 (66.2–68.4)	68.7 (67.4–70.1)	66.8 (64.9–68.7)	64.7 (62.1–67.3)	63.3 (60.3–66.1)
Black, non-Hispanic	12.6 (12.1–13.1)	12.1 (11.6–12.6)	16.0 (15.2–16.9)	14.0 (13.1–15.0)	18.0 (16.5–19.6)	19.0 (17.0–21.2)	19.7 (17.4–22.2)
Hispanic	16.4 (15.8–17.0)	16.9 (16.3–17.6)	12.8 (12.0–13.7)	13.2 (12.2–14.3)	11.6 (10.5–12.8)	12.1 (10.6–13.7)	13.9 (12.2–15.8)
Other, non-Hispanic [¶]	6.5 (6.2–6.8)	6.8 (6.5–7.2)	3.8 (3.5–4.3)	4.0 (3.5–4.5)	3.6 (3.0–4.3)	4.2 (3.2–5.5)	3.1 (2.4–4.1)
Education level**							
Less than high school	14.9 (14.5–15.3)	13.1 (12.7–13.6)	26.9 (25.9–27.8)	23.7 (22.5–25.0)	29.5 (27.7–31.3)	30.4 (28.2–32.6)	35.0 (32.3–37.7)
High school/GED/some college	22.8 (22.4–23.3)	22.4 (21.9–22.8)	26.1 (25.2–26.9)	25.4 (24.4–26.5)	26.8 (25.0–28.8)	26.3 (23.9–28.8)	27.5 (24.9–30.2)
Associate degree	29.8 (29.4–30.2)	29.4 (29.0–29.9)	32.2 (31.3–33.2)	32.4 (31.2–33.6)	32.5 (30.4–34.6)	33.0 (30.6–35.4)	29.8 (27.1–32.6)
College degree	32.5 (31.8–33.2)	35.1 (34.3–35.9)	14.9 (14.2–15.6)	18.5 (17.5–19.5)	11.3 (9.9–12.7)	10.4 (8.6–12.5)	7.7 (6.2–9.6)
Income-to-poverty ratio^{††}							
<1.00	15.2 (14.7–15.8)	13.3 (12.8–13.8)	29.2 (28.1–30.3)	24.3 (23.1–25.6)	33.4 (31.4–35.5)	35.9 (33.4–38.5)	40.0 (37.1–43.0)
1.00 to <2.00	17.8 (17.3–18.2)	16.8 (16.4–17.3)	24.6 (23.6–25.7)	22.8 (21.6–24.0)	26.4 (24.4–28.5)	27.6 (25.3–30.1)	27.6 (24.9–30.4)
≥2.00	67.0 (66.2–67.7)	69.9 (69.1–70.6)	46.2 (44.9–47.5)	52.9 (51.4–54.4)	40.2 (37.9–42.5)	36.4 (33.7–39.2)	32.4 (29.4–35.5)
In the labor force^{§§}							
Yes	78.1 (77.7–78.4)	82.6 (82.3–82.9)	44.8 (43.6–45.9)	59.6 (58.3–60.9)	33.4 (31.5–35.4)	20.2 (18.1–22.4)	13.8 (11.6–16.3)
No	21.9 (21.6–22.3)	17.4 (17.1–17.7)	55.2 (54.1–56.4)	40.4 (39.1–41.7)	66.6 (64.6–68.5)	79.8 (77.6–81.9)	86.2 (83.7–88.4)

* Six functional disability types are serious difficulty in cognition, hearing, mobility, and vision, and any difficulty in self-care and independent living.

† Unweighted denominator.

§ Not applicable.

¶ Other, non-Hispanic includes those of multiple races.

** For persons aged ≥25 years.

†† Income-to-poverty ratio is the ratio of family income to the federal poverty threshold, given family size and number of children.

§§ Persons were considered in the labor force if they were employed or looking for work and were considered not in the labor force if they were retired, a student, a homemaker, not working because of health reasons or disability, or other.

Discussion

Findings in this analysis indicate that approximately 12% of working-age adults have any disability, and among this population, most (approximately 60%) have only one disability type. Although the rank order of specific disability types varied by number of disabilities, among adults with multiple disabilities, difficulties in mobility, cognition, and independent living were the most common types.

Considerable socioeconomic disparities exist between working-age adults with any number of disability types and those without disability. The largest percentage point increase

in indicators of low socioeconomic status generally occurred among adults with only one disability type compared with none. For example, among persons aged 18–64 years with one disability type, the prevalences of living in poverty (income-to-poverty ratio <1.00), having less than a high school education, and of being in the labor force but looking for work were approximately twice as high as among those without disability. A generally consistent pattern of increasing prevalence of these low socioeconomic status indicators as the number of disability types increased was observed.

TABLE 2. Status in the labor force among adults aged 18–64 years, by disability status and number of functional disability types* — National Health Interview Survey, United States, 2011–2014

Labor force status	Overall population (N = 128,014 [†]) % (95% CI)	Disability status % (95% CI)		No. of functional disability types % (95% CI)			
		No disability (n = 112,417 [†])	Any disability (n = 15,597 [†])	1 (n = 8,730 [†])	2 (n = 3,342 [†])	3 (n = 1,908 [†])	≥4 (n = 1,617 [†])
In the labor force[§]							
Employed	91.9 (91.6–92.2)	92.5 (92.2–92.7)	83.8 (82.8–84.8)	86.2 (85.1–87.3)	78.6 (75.8–81.1)	71.0 (65.1–76.3)	73.6 (66.4–79.8)
Looking for work	8.1 (7.8–8.4)	7.5 (7.3–7.8)	16.2 (15.2–17.2)	13.8 (12.7–14.9)	21.4 (18.9–24.2)	29.0 (23.7–34.9)	26.4 (20.2–33.6)
Not in the labor force[¶]							
Retired, student, or homemaker	63.1 (62.2–63.9)	80.6 (79.9–81.3)	22.2 (21.2–23.3)	35.6 (33.7–37.5)	18.1 (16.2–20.2)	9.5 (7.7–11.7)	7.4 (6.0–9.1)
Not working because of health reasons or disability	29.6 (28.8–30.4)	11.0 (10.5–11.6)	72.9 (71.7–74.1)	58.0 (55.8–60.1)	77.9 (75.8–79.8)	87.4 (85.0–89.4)	88.8 (86.9–90.4)
Other	7.3 (6.9–7.7)	8.4 (7.9–8.9)	4.8 (4.3–5.4)	6.5 (5.5–7.6)	4.0 (3.2–5.0)	3.1 (2.3–4.1)	3.8 (2.8–5.0)

Abbreviation: CI = confidence interval.

* Six functional disability types are serious difficulty in cognition, hearing, mobility, and vision, and any difficulty in self-care and independent living.

[†] Unweighted denominator.

[§] Estimated only among persons in the labor force.

[¶] Estimated only among persons not in the labor force.

Disability is a multidimensional concept involving factors related to both the person, reflected in difficulties with basic actions (i.e., cognition, hearing, mobility, and vision), and the person's interaction with their environment, reflected in complex activity limitations (i.e., independent living and self-care) (2). The conceptual relationship between these two domains has been described as one in which complex activities require the execution of basic actions (2), and a reported limitation in both domains might indicate an increased severity of disability. Thus, the findings that difficulty in independent living and self-care are infrequent among persons with only one type of disability is expected.

Disability is a complex concept and adults with disabilities are a heterogeneous group; however, many within this group have in common the experience of limitation to full participation in society (3). Other research has indicated that having any disability, measured dichotomously, is associated with disparities in such factors as socioeconomic status and health (2–5). This report expands on previous work by measuring the number of disability types a person might experience at one time, further demonstrating a pattern of decreasing socioeconomic status as the number of disabilities increases. Programs and policies designed to improve social participation for adults with disabilities might improve socioeconomic status for this population. Federal policies such as the Americans with Disabilities Act^{§§} aim to prevent employment discrimination and support full participation in society for persons living with disability. In addition, given the known association between socioeconomic status and health (6–10), the national health goals outlined in *Healthy People 2020*^{¶¶} include specific objectives intended

to encourage increased community participation and employment for persons with disabilities.

The findings in this report are subject to at least five limitations. First, NHIS data are self-reported or reported by a family member or proxy respondent and might be subject to reporting or recall bias. Second, the final response rate for the family component ranged from 73.1%–81.3%; therefore, the findings might reflect some response bias. Third, because NHIS is cross-sectional, causality cannot be determined; it is not known whether low socioeconomic status precedes disability onset, follows it, or both. Fourth, NHIS does not include persons living in institutional settings or group homes, which might systematically exclude persons with disabilities, because persons residing in these settings are more likely to have disabilities. Finally, some persons might not be identified using this disability measure, including those with disabilities other than those measured by these six questions and those with moderate disabilities, because four of the questions ask only whether or not a respondent has “serious” difficulty. Because these last two limitations can result in an underestimation of the disability prevalence among all U.S. adults, the estimates reported here are likely to be conservative.

This report demonstrates that lower socioeconomic status disproportionately affects working-age adults living with disability, although the temporal relationship is unknown. These disparities increase as the number of disability types increases, but are evident even among adults with only one disability type. Understanding the demographic and socioeconomic characteristics of working-age adults with disabilities, including those with multiple disabilities, might help to further the inclusion of persons with disabilities in public health programs and policies, thereby increasing their social participation.

^{§§} <https://www.ada.gov/pubs/adastatute08.htm>.

^{¶¶} <https://www.healthypeople.gov/>.

References

Summary

What is already known about the topic?

Approximately 40 million persons in the United States have a disability, as measured by six questions recommended by the U.S. Department of Health and Human Services as the national standard for use in population-based health surveys. These questions have been used previously to assess functional disability overall and individual disability types.

What is added by this report?

This is the first study to investigate the characteristics of U.S. adults by number of functional disability types. Overall, 22.6 million (11.9%) working-age adults have any disability; most (12.8 million) have only one type of disability. A generally consistent pattern was observed of increasing prevalence of indicators of low socioeconomic status (income-to-poverty ratio <1.00, having less than a high school education, and being in the labor force but looking for work) as the number of disability types increased.

What are the implications for public health practice?

Understanding the demographic and socioeconomic characteristics of working-age adults with disabilities, including adults with multiple disabilities, might help to further the inclusion of persons with disabilities in public health programs and policies, thereby increasing their social participation.

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