

Physical Demands of Work, Exits From the Workforce, and Participation in Disability Programs

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In 2016, the Bureau of Labor Statistics (BLS) launched a 3-year effort to survey U.S. employers regarding the requirements of work. The new survey, the Occupational Requirements Survey, captures physical demands, education and skill requirements, and other requirements of work. Coinciding with the release of the new BLS data is the second wave of the redesigned Survey of Income and Program Participation (SIPP), a rich household survey that allows for measuring transitions from the workforce and transitions to disability programs. Using the combined data, I find that adverse health events during the course of the SIPP are associated with exits from the workforce in general and especially among individuals in physically demanding work. This research brings together two new and important federal data sources to foster improved understanding of physical work requirements and their role in predicting workforce exit and participation in disability programs.

Keywords: Occupational Requirements, Health Shocks, Employment, Disability, Social Security

This paper examines the effect of health shocks on exits from the workforce and on receipt of disability benefits. There are two recently developed data sources to address these topics: The Census Bureau's redesigned Survey of Income and Program Participation (SIPP) and the new Occupational Requirements Survey (ORS) from the Bureau of Labor Statistics (BLS). The longitudinal nature of the SIPP allows for examining exits from the workforce and transitions to disability benefits. In addition, the SIPP includes a number of variables that capture health shocks in the observation period (for example, hospitalizations), occupational information on the employed, and a large set of socioeconomic variables to serve as control variables. The ORS is a new survey of establishments that measures the physical, cognitive, and environmental requirements of jobs and occupations in the economy. From the ORS, the strength requirements (sedentary, light, medium, heavy, and very heavy) of different occupations were used and occupational data from the ORS are matched to SIPP respondents using Census crosswalks of SIPP occupation codes and the Standard Occupational Classification (SOC) system that underpins the ORS data.

A large literature exists on the role of health and health shocks on labor supply and disability receipt. In their systematic review of the literature, Prinz, Chernew, Cutler, and Frakt (2018) find negative health shocks are important drivers of retirement and disability receipt in both the United States and Europe. Another systematic review of the literature (Rijn, Robroek, Brouwer, & Burdorf, 2013) found that poor health had clear associations with exits from work and receipt of disability benefits. A recent paper by Dobkin, Finkelstein, Kluender, and Notowidigdo (2018) found sharp economic consequences of a particular health shock, namely, hospitalizations. For example, those authors find employment is 12-15 percent lower relative to mean levels before hospital admission.

In this paper, the effects of hospitalization (and other health shocks) were also examined but with a focus on the role of the physical demands of work. With regard to exits from work, individuals whose occupations require heavy or frequent lifting or other physical tasks may be less likely to return to work following a serious shock such as a hospitalization. Such individuals may also be more likely to receive disability benefits for two reasons: generally the health shock may allow them to meet the disability standards in one of the several disability programs in the United States and because the largest disability program (Social Security) employs rules directly related to the strength requirements of past work. For example, one step in the sequential process of disability determination used by the Social Security Administration (SSA) is to assess whether a person can perform their past work as they describe it or as it is generally performed in the national economy (Johns, 2009). A person whose past work involved substantial strength may be unable to perform that work following a health shock. The ORS is well suited for this analysis because it uses strength definitions that match those used by SSA, and the ORS is designed to be used by SSA in future disability determinations (Gittleman, Monaco, & Nestoriak, 2016).

Methods

Data/Sample

The first two waves of the 2014 SIPP panel are used in this study. The first wave was fielded in 2014 and it collected data on respondents at the time of the survey and for the months in calendar year 2013 (the reference period). The second wave was fielded in 2015 and collected data at the time of the survey and for months in 2014 (the reference period). SIPP is designed to represent the civilian noninstitutionalized population residing in the 50 states and the District of Columbia.

The observation period for this study is two years, from January 2013 through December 2014. A sample of individuals who at the beginning of the observation period are employed, not receiving any type of disability benefit, and who are ages 25 to 59 were included in this study. Women who gave birth to a child in 2013 or 2014 are excluded; these individuals will have high levels of health care utilization and lower labor supply but these outcomes may not reflect a deterioration in health. The two dependent variables in this study (left work and disability received) are based on whether an individual is no longer employed as of December 2014 and whether an individual receives a disability benefit from any source in December 2014.

Three variables based on the SIPP represent health events in this study: being hospitalized in calendar year 2013 or calendar year 2014, visiting medical providers more than five times in 2013 or 2014, and taking a prescription medication on a daily basis in either year. Treatments undertaken during the observation period to deal with health problems will be referred to as health shocks (note: treatments during the period may reflect health effects from shocks and from base-level health). Several other variables from the SIPP, reflecting socioeconomic status, will be used as control variables. These include mutually exclusive categories of educational attainment (no high school degree, high school degree only, some college but no degree, associate degree, bachelor's degree, and advanced degree), sex, age, race, marital status, region, and coverage by health insurance.

For this study, it is important to characterize the physical requirements of work. The ORS defines strength requirements of work as sedentary, light, medium, heavy and very heavy. In general, the definitions are based on "how much weight a worker is required to lift or carry, how often, and whether standing or walking is required as part of the workday" (BLS, 2019, p.15). A job that requires that a worker only lift or carry 10 pounds or less may be classified as sedentary provided that level of weight only has to be lifted or carried, at most, occasionally and provided that standing or walking occurs less than or equal to 1/3rd of the workday. If a job requires that a worker must lift or carry 21-50 pounds occasionally, 11-25 pounds frequently, or 1-10 pounds constantly then work would be classified as medium strength. Definitions of other strength levels are provided in BLS (2019). Nationally, BLS estimates the following distribution of strength requirements for civilian workers in the United

States: 26.6 % (Sedentary), 26.6 % (Light), 35.5 % (Medium), 9.6% (Heavy), and 1.7 % (Very Heavy). As examples, using broad occupational groups, BLS notes that sedentary work is common in office and administrative support occupations, light work is common in education, training, and library occupations, medium work is common in food preparation and serving occupations, and medium to heavy work is common in construction and extraction occupations (BLS, 2019b).

BLS collects strength requirements at the job level but publishes information at the occupational level. Occupations will have tendencies with regard to the physical requirements of work, but not all jobs within an occupation will have the same strength requirements. For example, among librarians, 63.4 percent of workers have a strength requirement of light and 36.6 percent of workers have some other strength level (BLS, 2019b). BLS, as well as other federal agencies, use the Standard Occupational Classification (SOC) system; under this system, occupations can be described at the detail level (6-digit SOC) or rolled up to be described at broad levels (2-digit SOC). For example, the 6-digit occupation of librarian is part of the broader 2-digit occupational category of Education, Training, and Library Occupations.

The Bureau of the Census establishes a person's occupation in the SIPP by using survey responses on work activities and by using coding experts at Census or auto-coding computer programs. Census also provides crosswalks between SIPP occupations and the SOC categories. Thus, it is possible to assign each job of a SIPP respondent to a 6-digit and a 2-digit SOC occupation. With a respondent's SOC occupation, information from the ORS can then be inputted. As noted above, not all jobs in a SOC category have the same strength level and, thus, one could pick a general tendency within the SOC occupation by using the *modal* strength level from the ORS. For example, if the SIPP respondent is a librarian, he or she would be classified as doing light work because light work is the modal strength level for librarians from the ORS. For thinly-populated detailed (6-digit level) occupations, the BLS does not publish modal values in the ORS. In these cases, the published modal values in the ORS for the 2-digit occupation of the SIPP respondent could be used. For example, the BLS does not publish modal values for the 6-digit SOC occupation of Actuaries. For a SIPP respondent who is an actuary, the respondent is assigned a strength level of sedentary because that is the modal strength level in the ORS for the broader 2-digit SOC occupation of Computer and Mathematical Occupations.

Data Analysis Procedures

For this study, strength categories were collapsed into two groups: a) sedentary/light occupations (if the modal value from the ORS is sedentary or is light) and b) medium strength or higher (if the modal value from the ORS is medium, heavy, or very heavy). Using this approach to assign strength levels to SIPP respondents, 51.49 percent were classified as having sedentary or light work and 48.51 percent as having medium strength or higher physical demands of work. This approach offers a straightforward way to divide workers, roughly evenly, into those with modest physical requirements and those with more substantial physical demands. For ease of exposition, individuals employed in jobs that are of medium strength or higher group can be regarded as holding physically demanding jobs but it is important to acknowledge that sedentary and light occupations have some physical demands and that there is heterogeneity in each group in terms of physical demands.

Results

Characteristics from the SIPP of the study population by physical demands of work (sedentary/light or medium strength or higher) are displayed in Table 1. Those in physically demanding jobs were more likely, over the study period, to have left work (defined as not having any job in December 2014) and to have received disability (from any federal, state, or private program in December 2014). With regard to health shocks, the patterns vary: those in physically demanding jobs were more likely to be hospitalized but less likely to have a high number of medical visits or to use a prescription drug on a daily basis. One of the strongest patterns in the data relates to physical demands and educational attainment, with workers with limited education clustering in physically demanding jobs. For example,

Table 1*Percent with Characteristic, by Physical Demands of Work*

Characteristic	Sedentary or Light	Medium strength or higher
Left Work	5.29 (0.28)	7.38 (0.36)
Disability Received	0.94 (0.12)	2.15 (0.18)
Hospitalization	8.95 (0.38)	10.43 (0.35)
> 5 Medical Visits	27.24 (0.59)	21.67 (0.50)
Daily Prescription Drug	51.93 (0.61)	46.24 (0.59)
Did Not Finish High School	2.08 (0.16)	14.77 (0.42)
High School Degree Only	15.99 (0.45)	35.10 (0.60)
Some College, No Degree	15.60 (0.43)	19.36 (0.51)
Associate's Degree	9.20 (0.36)	11.44 (0.43)
Bachelor's Degree	33.92 (0.63)	13.75 (0.48)
Male	47.22(0.47)	62.60 (0.49)
Age (Mean)	42.47 (0.10)	42.32 (0.10)
Black	10.35 (0.33)	12.54 (0.33)
Married	66.07 (0.66)	59.52 (0.64)
Insured	90.90 (0.39)	75.12 (0.59)
South	35.56 (0.57)	36.52 (0.51)
West	23.85 (0.49)	22.92 (0.46)
Midwest	21.52 (0.45)	22.39 (0.46)
Weighted Population	51,400,000	48,400,000

Notes. Based on SIPP respondents who in the month of January 2013 are 25-59, employed, and not receiving any disability benefits. Left Work and Disability Received are (1,0) variables reflecting the absence of any job in December 2014 and the presence of any disability benefit (federal, state, or private) in December 2014. Hospitalization, > 5 Medical Visits, and Daily Prescription Drug use are 1 if utilization measure occurred in 2013 or 2014, 0 otherwise. Standard errors are in parentheses

the most common level of educational attainment among individuals with physically demanding employment is a high-school diploma with no college (35.10 percent); the most common level, among those with sedentary/light employment, is a bachelor's degree with no advanced degree (33.92 percent). There were no strong patterns with regard to age or region of the country, but those in physically demanding work are more likely to be black and less likely to be married or have health insurance.

Moving from simple descriptive statistics presented in Table 1, the effects of health shocks using linear regression (Table 2) were considered. Twelve separate linear regressions were performed for two dependent variables (left work and received disability), three alternative measures of health shocks (hospitalization, more than five visits to a medical provider, and daily use of a prescription drug), and two populations (sedentary/light and medium strength or higher). Each linear regression includes control variables for educational group, sex, age, race, married status, region of country, and having health insurance.

Table 2

Effects of Health Shocks on Leaving Work and Receiving Disability by Model and Physical Demands of Work

<u>Linear Probability Model: Coefficients</u>			
Sedentary or Light (Panel 1)			
Dependent Variable	Hospitalization	> 5 Medical Visits	Prescription Drugs
Left Work	0.03177***	0.02361***	0.02148***
Disability Received	0.01922***	0.00765**	0.00296
Medium strength or higher (Panel 2)			
Left Work	0.07809***	0.05476***	0.03932***
Disability Received	0.04291***	0.04148***	0.02835***
<u>Logit Model: Odds Ratios</u>			
Sedentary or Light (Panel 3)			
Dependent Variable	Hospitalization	> 5 Medical Visits	Prescription Drugs
Left Work	1.645***	1.549***	1.574***
Disability	3.300***	2.118***	1.402
Medium strength or higher (Panel 4)			
Left Work	2.380***	2.039***	1.797***
Disability	3.409***	4.491***	4.688***

Notes. Dependent variable means: 0.0529, 0.0094 for left work, received disability among those with sedentary/light; 0.0738, 0.0215 among those with medium strength or higher work. Regressions and logits control for several Socioeconomic Status (SES) variables: five categories of educational attainment, sex, age, race, marital status, region, and health insurance coverage. All linear regressions were found to be significant at the 0.0001 level using F-tests. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

To illustrate this approach, first consider Panel 1 of Table 2. In this table, the sample is restricted to individuals from sedentary/light occupations. The value of 0.03177 in the row "Left Work" under the column "Hospitalization" is the estimated slope coefficient of hospitalization in a linear regression predicting whether an individual left work. In other words, for individuals from sedentary/light occupations, a hospitalization increases the probability of leaving work by the end of the two-year study period by 3.177 (or roughly 3.2) percentage points (significant at the .01 level). (For ease of exposition, the intercept and slope coefficients for the control variables from the linear regression are not displayed in Table 2). Note that the 3.2 percentage point effect of hospitalization is large relative to the overall mean of the dependent variable (Table 1 indicates that about 5.3 percent of those in sedentary or light employment exited work).

Continuing in the row "Left Work" in Panel 1 of Table 2, the slope coefficients for alternative measures of health shocks, was viewed using linear regression with aforementioned control variables. For individuals from sedentary/light occupations, having five or more medical visits increased the probability of leaving work by 0.02361 or roughly 2.4 percentage points (significant at the .01 level). A

roughly similar magnitude (0.02148 or about 2.1 percentage points) is found when daily use of a prescription drug as the measure of a health shock was entered into the regression model.

The second row of Panel 1 of Table 2 ("Disability Received") showed the slope coefficients from linear regressions for each of the health shock variables where the dependent variable is receipt of disability benefits instead of leaving work (again each regression includes control variables). Among individuals from sedentary/light occupations, a hospitalization increased the probability of drawing disability at the end of the two-year study period by 0.01922 or about 1.9 percentage points (significant at the .01 level). This effect is very large relative to the overall mean of the dependent variable (Table 1 indicates less than 1 percent of light or sedentary workers draw disability at the end of the period). The linear regression in which the health shock is defined as more than five visits to a medical provider in a year reveals that the health shock increases the probability of receiving disability by 0.00765 or 0.765 percentage points. The prescription drug measure has a positive coefficient (0.00296) but it is not statistically significant. Thus, overall, results in the first two rows of Panel 1 of Table 2 indicate that, even among individuals from sedentary/light occupations, health shocks (regardless of whether it is a hospitalization, multiple medical visits, or daily use of a prescription drug) are strongly and significantly associated with exiting work and, except for prescription drug use, health shocks are strongly and significantly associated with receiving disability.

Panel 2 of Table 2 shows results that use the same linear regression specifications used for Panel 1 but use the sample of workers from medium strength or higher occupations (instead of sedentary or light). For workers in these more physically demanding jobs, there are clear and large effects of health shocks on exits from work and receipt of disability. A hospitalization increases the probability of an exit from work over the two-year period by 0.07809 or about 7.8 percentage points. This is a large effect given the overall mean – about 7.4 percent of individuals from medium strength or higher occupations left the workforce over the two-year study period (Table 1). The effects of the other health shocks on leaving work are also large (about 5.5 and 3.9 percentage points for the medical visits and daily prescription drug use respectively). Similarly, the effects on receipt of disability are large. Hospitalization and a high number of medical visits are each associated with a roughly 4 percentage point increase in disability receipt, where the overall mean (from Table 1) is only about 2 percent. The daily use of prescription drugs is associated with a smaller, but still large, effect on disability receipt (about a 2.8 percentage point increase). All health shock effects are statistically significant at the 0.01 level for those from medium strength or higher occupations.

The lower two panels of Table 2 (Panel 3 and Panel 4) present results from 12 logit regressions instead of 12 linear regressions. The logit regressions use the same dependent, health shock, and control variables as used in the linear regressions. The only difference is the logit regressions use a functional form that is sometimes preferred for dependent variables that take on values of 1 or 0. Results from logit regressions are often displayed using odds ratios. Odds represent the ratio of the probability of an outcome occurring (leaving work) to the probability of the outcome not occurring (not leaving work). The odds ratio, in turn, reflects the odds for one group relative to the odds of another group. An odds ratio greater than one indicates the group has higher odds of the outcome.

Among individuals from sedentary/light occupations (Panel 3), the odds of leaving work by the end of the two year period are 64.5 percent higher for those who are hospitalized compared to those that are not hospitalized (odds ratio of 1.645). Somewhat smaller, but roughly similar effects on leaving work, are observed using the other measures of health shocks. With regard to disability receipt among sedentary or light workers, the odds of receiving disability for those hospitalized are 3.3 times the odds for those not hospitalized. Among the health shock variables, the only effect that is not significant is the effect of daily use of prescription drugs on disability receipt.

Among individuals from medium strength or higher occupations (Panel 4), logit regressions reveal clear and large effects on the dependent variables of leaving work and receiving disability. With regard to leaving work, all health shock variables have roughly similar effects. For example, those who are hospitalized having odds of leaving work that are 2.38 times the odds of those not hospitalized. The effects on disability receipt are particularly notable. For example, for persons with more than five

medical visits, the odds of receiving disability are 4.491 times the odds of those with five or fewer visits. Similar results are found using the prescription drug measure. All effects of the health shock variables are significant at the 0.01 level for workers in physically demanding jobs.

Having established that health shocks have strong effects on leaving work and receiving disability for different measures of health shocks, for both sedentary/light and medium strength or higher occupations, and for different regression functional forms, a series of linear regressions were performed to formally test whether the effects of health shocks are larger for persons in physically demanding occupations. Each linear regression predicts leaving work or receiving disability using three binary (1,0) variables: 1 if the SIPP respondent had medium strength or higher work, 0 if sedentary or light; 1 if the respondent had a health shock (e.g., being hospitalized), 0 otherwise; and 1 if the respondent had medium strength or higher work *and* had a health shock (e.g., being hospitalized), 0 otherwise. The last of these three variables is an interaction term that is created by multiplying a respondent's values for the first two variables. To illustrate, in the first column of Panel 1 of Table 3, the coefficients from a linear regression that predicts leaving work using the three binary variables are displayed and where the health shock is defined based on whether the respondent was hospitalized or not. Reading down the first column, the coefficients from this linear regression are 0.016, 0.038, and 0.042, respectively, and all are statistically significant. For sedentary/light workers, hospitalization increases the probability of leaving work by 0.038 or 3.8 percentage points; for medium strength or higher workers, the effect of hospitalization is to increase the probability of leaving work by 0.08 or 8 percentage points (the effect is found by adding 0.038 and 0.042). In other words, the coefficient on the interaction variable (0.042) indicates that the effect of hospitalization on leaving work is 4.2 percentage points higher for those in medium strength or higher employment. The second column of Panel 1 shows results if the aforementioned control variables are included in the linear regression with the three binary variables – even with the addition of important control variables, the coefficient on the interaction variable is large (0.045 or 4.5 percentage points) and statistically significant, again indicating medium strength or higher workers are more likely than sedentary/light workers to leave work if they are hospitalized. Looking across the last row of the Panel 1, the interaction terms were generally positive and statistically significant for the other types of health shocks, suggesting a general conclusion: when a health shock occurs, those in physically demanding jobs are more likely to respond by leaving work than are those in less physically demanding jobs.

In Panel 2 of Table 3, additional linear regressions were performed but receipt of disability was used as the dependent variable. Examining the last row, all coefficients on the interaction variables across specifications (type of health shock and with or without control variables) are large, positive, and statistically significant. Thus, there is strong support for a conclusion that, when a health shock occurs, those in physically demanding jobs are more likely to seek out and receive disability benefits.

Implications

The findings from this study have implications for a number of program and policy issues in the field of work and health. First, the ability to provide workplace adjustments for individuals following a serious health shock may be successful in some cases but limited in others. Even among those whose work entails modest physical requirements (sedentary or light work), a health shock resulting in hospitalization was associated with exits from work. Workplace adjustments may address functioning for specific tasks, but the advent of very poor health may be a more fundamental determinant of whether an individual can sustain work even in environments where physical requirements are modest. In addition, even among those with modest physical requirements of work, receipt of disability is influenced by health shocks.

In this study, there was evidence that health shocks had stronger effects for those in physically demanding occupations. Efficient allocation of work supports from programs or policies could suggest a focus on these occupations. For some broad occupational groups, there are detailed occupations with less strenuous physical requirements and employers may have practical options to retain employees by changing their jobs. Alternatively, specific adjustments by employers may in effect reduce the

Table 3

Effects of Physical Requirements of Work, Health Shocks, and Their Interaction on Leaving Work and Receiving Disability

Dependent Variable: Left Work (Panel 1)						
Type of Health Shock						
	Hospitalization		> 5 Medical Visits		Daily Prescription Drugs	
	No SES Controls	With SES Controls	No SES Controls	With SES Controls	No SES Controls	With SES Controls
Medium strength or higher requirements	0.016***	0.005	0.017***	0.003	0.018***	0.002
Health Shock	0.038***	0.032***	0.028***	0.024***	0.025***	0.022***
Interaction	0.042**	0.045***	0.025**	0.030***	0.010	0.016*

Dependent Variable: Disability Received (Panel 2)						
Type of Health Shock						
	Hospitalization		> 5 Medical Visits		Daily Prescription Drugs	
	No SES Controls	With SES Controls	No SES Controls	With SES Controls	No SES Controls	With SES Controls
Medium strength or higher requirements	0.009***	0.005**	0.005***	-0.000	0.001	-0.005**
Health Shock	0.021***	0.019***	0.008***	0.008**	0.004*	0.003
Interaction	0.026**	0.025**	0.034***	0.034***	0.025***	0.026***

Notes. Dependent variable means: 0.0529, 0.0094 for left work, received disability among those with sedentary/light; 0.0738, 0.0215 among those with medium strength or higher work. SES controls are: five categories of educational attainment, sex, age, race, marital status, region, and health insurance coverage. Linear probability models. All linear regressions were found to be significant at the 0.0001 level using F-tests. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

physical demands of work. For example, cashier work is generally rated as medium strength work in the Occupational Requirements Survey, but some employers offer cashiers a sit/stand option. From a public policy perspective, some state Vocational Rehabilitation agencies provide job retention services to businesses and employees following adverse health events (Ben-Shalom, 2016); limited resources may suggest some targeting toward jobs with higher physical demands.

The results with regard to disability receipt are relevant to emerging practices, policy and research on the Social Security disability program. The program is of interest because of its size – projected outlays total approximately \$1.8 trillion over the 2020-2029 period (Congressional Budget Office, 2019) – and because return-to-work policies have had only somewhat modest effects for individuals once they are already on the benefit rolls (see, for example, Mathematica Policy Research, 2018). There has been strong interest in identifying populations that, absent intervention, may enter the Social Security disability rolls (Department of Health and Human Services, 2014). However, early intervention

approaches face practical or operational problems in that populations with poor or limiting health are not always known to employers, insurers, or the government. Hospitalization, however, is a well-defined and observable event around which interventions could possibly be built and studied. There were strong relationships between hospitalizations and exits from work and receipt of disability.

Limitations and Future Research Directions

The current analysis, which uses a two-year period based on the first two waves of the 2014 SIPP, is limited in that there are only a small percentage of individuals who exit work and who receive disability. This may be especially important for disability outcomes, as the process to receive Social Security disability following application can be lengthy. For fiscal year 2014, the Social Security Administration reports that at the initial level of determination, the average processing time is 110 days; for those who appeal an initial denial, the average processing time at the hearing level was 422 days (Social Security Administration, 2015, tables i.12 and 3.27). With a longer observation period, the dependent variables may capture fuller effects of the health shocks. Future research, using new waves of the 2014 SIPP, may be able capture these fuller effects.

In addition, this study only examined health shocks based on utilization of health care services (for example, hospitalization). Utilization variables may, to some extent, capture the presence of one or more chronic illnesses, as opposed to disability. For example, Walker and Roessel (2019) note that common chronic conditions, such as diabetes or obesity, may be present for a number of years before they lead to work or functional limitations. Policy or workplace interventions to better manage chronic conditions would likely involve both patient education and health services, whereas specific functional limitations might be addressed through tailored adjustments to the work environment or physical job requirements. Future research could shed light on this issue by examining other types of health variables. For example, the 2014 SIPP queries respondents directly on their health status and disability status (including the presence of work limitations) in different waves and, thus, health shocks could be defined based on changes in self-reported health and work-limiting disability. Analysis using such variables would round out or complement findings from this study.

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The views expressed here should not be interpreted as the views of the Congressional Budget Office. The author would like to thank Shelley K. Irving, Kristen Monaco, and Karen Stockley for helpful comments.