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Association between longest-held occupation and Social Security Disability Insurance benefits receipt

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Abstract

Introduction: The cost of the Social Security Disability Insurance (DI) program has increased over time though recent reports showed that disability incidence and prevalence rates have started declining. We explored whether occupation was one of the risk factors for the rising number of disabled workers who received DI benefits during 1992–2016.

Methods: We used a cohort of 16 196 Health and Retirement Survey respondents between the age of 51 and 64 years who were followed from their date of entry until they received DI benefits, died, reached full retirement age, or reached the end of the follow-up period (2016). We used the extended stratified Cox proportional hazard model. Because one-third of the respondents in our cohort did not report their longest-held occupation, we used a multiple-imputation method.

Results: The hazard of receiving DI benefits was 51%, 78%, 81%, and 85% higher among workers with longest-held occupations in sales, mechanics and repair, protective services, and personal services, respectively than among workers with longest-held occupations in the reference managerial occupation. The hazard of receiving DI benefits was more than double among workers with longest-held occupations in the construction trade and extractors, transportation operation, machine operators, handlers, and food preparation than among workers with the longest-held occupation in the reference managerial occupation.

Conclusion: Improving the overall working conditions in these occupations would help reduce worker suffering and the number of applicants for DI benefits, thereby reducing the burden of workplace injury and illness on the DI program.

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CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

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John D. Meyer declares that he has no conflict of interest in the review and publication decision regarding this article.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

Keywords

Cox proportional hazard model; Health and Retirement Survey; longest-held occupation; multiple imputation; Social Security Disability Insurance

1 | INTRODUCTION

The Social Security Administration (SSA) runs two of the largest federal disability programs in the United States: the Social Security Disability Insurance program (DI, hereafter) and the Supplemental Security Income (SSI) program. DI benefits are paid to workers—or their family members—with a disability expected to last at least 1 year or result in death. To be eligible for these benefits workers must have a record of paying Social Security payroll taxes and work experience of at least 7 years if they are older than 50. The work experience requirement varies from 2 to 6.5 years for workers younger than 50.[1] The SSA also has a "disability freeze" policy that eliminates the years of low earnings due to disability when computing DI amounts.[2] The program is financed through the Federal Insurance Contributions Act by a payroll tax on more than 80% of working adults, including the self-employed, who are covered by the Social Security system, as well as by employers.[3] A worker can apply for DI benefits at any age before the full retirement age. DI benefits are paid from the disability trust fund under Title II of the Social Security Act.[4]

The cost of the DI program has increased over time. For instance, DI payments to recipients grew from 0.57% of the gross domestic product in 2001 to 0.70% in 2019. The per capita DI payment per year (total DI payment/total population) rose from $267 in 2001 to $400.4 in 2019, in 2012 dollars. The number of disabled workers and dependents receiving DI benefits payments increased from 6.9 million at the end of December 2001 to 9.9 million at the end of December 2019.[5] There are additional financial implications of Social Security receipt because after 2 years DI beneficiaries automatically qualify for Medicare benefits.[6] However, recent reports showed that, after a period of rapid growth, disability incidence and prevalence rates have started declining.[7,8]

Previous studies have identified four major factors that might affect the growth in DI enrollment: economic, policy, demographic, and workplace factors. Several studies showed that economic factors such as the business cycle, past income and benefits, expected DI benefits relative to wages, and unemployment rate affect the likelihood of workers to apply for DI benefits.[9–13] Changes in policies such as stringency of the DI screening process,[10,14] the four-level appeal process for applicants who are initially denied DI benefits, congressional reforms beginning in 1984 that expanded the eligibility criteria to include difficult-to-verify health problems,[15–17] and lack of incentives for workers to return to work, are also thought to have contributed to a period characterized by rapid growth of individuals who applied and qualified for DI benefits. Demographic factors include the decline in the average age of DI claimants, the potential impact of the baby boom generation as the cohort reached their peak disability years that start around age 50,[10] and the rapid increase in the share of women in the paid labor force.[15]

Very few studies examined the impact of workplace factors on the cost of the DI program. Bresnitz et al[18] examined if DI applicants in Pennsylvania suffered from workplace injury or illness using a convenience sample of 240 consecutive first-time applicants. Their results showed that 11% of DI awardees had work-related conditions. OLeary et al[19] used matched New Mexico Workers' Compensation Administration data and Social Security data to examine if workers with lost-time injuries, compared to workers with medical-only injuries, had a higher probability of receiving DI benefits. Their results showed that workers with lost-time injuries were two times more likely to receive DI benefits from 9 to 15 years after injury, controlling for personal and workplace factors.

We explored whether longest-held occupation was one of the factors for the rising number of workers who received DI benefits between 1992 and 2016. As indicated by Moore and Hayward,[20] Li et al,[21] and Gueorguieva et al,[22] longest-held occupation could capture the cumulative potential impact of workplace risk factors on health, and consequently on disability. Occupation can affect an individual's health and likelihood of disability through exposure to specific physical job conditions such as chemicals,[23] manual labor, noise, or heat.[24–26] Occupation may also affect disability through indirect mechanisms via income, access to health insurance, and psychosocial factors such as prestige and job satisfaction,[27–29] and job demand and control.[26,30] As a result, relative to workers in low-risk for workplace injury and illness and low-stress occupations, workers in high-risk for workplace injury and illness and high-stress occupations might be forced to leave the labor force and apply for and receive DI benefits at a younger age. Rutledge et al[31] developed a Health Mismatch Index that is the share of workers in their current occupation who report health related difficulties that would prevent them from performing at least one essential requirement for their occupation. They found that the most common difficulties in required abilities that result in health mismatch were lifting 25 lbs, standing for 1 hour, or hearing well in a conversational setting. Furthermore, occupations with a high index paid lower earnings, were more exposed to hazardous environments, and placed less emphasis on high performance and problem-solving. Occupations with higher rates of workers who experienced at least one difficulty with a job requirement had a higher share of workers receiving DI benefits within a 16-month period.

The objective of this study was to estimate the association between longest-held occupation and the hazard rate of receiving DI benefits. We hypothesized that the hazard of receiving DI benefits would vary significantly among workers with different longest-held occupations. The results of this study can improve our understanding of the potential long-term effects of occupation on the receipt of DI benefits and help develop occupation-specific prevention strategies aimed to reduce both worker suffering and the resulting societal costs. As to our knowledge, this is the first study that examined the association between longest-held occupation and DI benefits receipt.

2 | DATA AND MEASUREMENT OF VARIABLES

2.1 | Data and study population

We used the Health and Retirement Study (HRS) conducted by University of Michigan. The HRS is a longitudinal panel study that surveys a representative sample of Americans over

age 50. With support from the National Institute on Aging and the SSA, the HRS collects data on labor force participation and the health transitions that individuals undergo toward the end of their work lives and in the years that follow. The study is described in detail in "Growing Older in America: The Health and Retirement Study" (available at http://www.nia.nih.gov/health/publication/growing-older-america-health-and-retirement-study/preface). Since the first time it was conducted in 1992, the HRS has collected information on individuals' occupation, income, assets, pension plans, health insurance, disability, physical health and functioning, cognitive functioning, and health care expenditures. The original sample of respondents has been reinterviewed every 2 years since 1992. By adding new cohorts and continuously growing the sample, the HRS has become the largest and most representative longitudinal panel study of Americans over age 50 and their spouses. Population weights are provided for use with the study samples. We used the RAND HRS Longitudinal File 2016 (V1)[32] that allows comparability across survey waves. More information about the data can be found at http://hrsonline.isr.umich.edu/index.php.

We used data from all five HRS cohorts for the period 1992–2016. Respondents entered the HRS sample during the first wave in which they were interviewed, and new respondents entered the sample during each wave. Therefore, respondents could be 51 or older at the time of their first interview. There were 13 waves of interviews in our data (1992, 1993/94, 1995/96, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014, and 2016). If respondents skipped interviews, their response from the latest wave in which they participated would provide information about their DI benefits status. Respondents exited our sample before the end of 2016 if they received DI benefits, died, reached full retirement age, or requested to be permanently removed from the HRS sample. Those who remained in our sample until the end of 2016—the last year for which we had access to data—were censored at that point and were therefore considered to have exited the sample for reasons other than those described above.

Overall, the information for 42 053 respondents was included in the RAND 2016 (V1) file at different years during the 25-year-long study period. We excluded 2327 respondents with zero weight (ie, nonrespondents and respondents residing in nursing homes), 1095 respondents younger than 51 years old, 467 respondents who received DI benefits before their first interview, and 11 951 respondents who reached their full retirement age (over age 65 for those born in 1939 or earlier, over age 66 for those born between 1940 and 1956, and over age 67 for those born after 1957) at the time of entry into the survey. We limited the upper age boundary to the full retirement age because DI benefits automatically convert to retirement benefits after the full retirement age. We also excluded 6598 respondents with less than 7 years of work experience. As indicated above, work experience of at least 7 years for workers older than 50 is one of the requirements to receive DI benefits.[1] Finally, we excluded 173 respondents with military occupation and 326 respondents with missing information on age, race or ethnicity, education, smoking status, or alcohol consumption. After these exclusions, our sample included 19 116 respondents and 73 637 person-year observations.

2.2 | Outcome variable

The outcome variable was receiving DI benefits (received income from DI benefits), occurring on or after the first interview year but before or on the last interview year, 2016. As mentioned above, respondents who received DI benefits before their first interview were excluded from the study. Whenever the year for first receipt of DI benefits was missing, we replaced it with the year during which DI benefits were reported.

2.3 | Primary explanatory variable

Longest-held occupation was our primary explanatory variable. We used longest-held occupation instead of current occupation for two reasons. First, longest-held occupation may best represent a worker's job history and capture the long-term effects of employment on physical health, mental health, income, and social status of workers.[21,33] Second, compared with current occupation longest-held occupation is less likely to be affected by the current health status of workers. Survey respondents will choose their current occupations based on their current health status which might be the result of their longest-held occupation. For example, if a worker is currently in a clerical job due to back pain caused from working 10 years in a physically demanding construction job and applies for DI benefits, we cannot associate this incidence to her or his current clerical occupation.

We used the occupation code for the job with longest reported tenure to measure longest-held occupation. Longest-held occupation can be the current job, a past job held since the first HRS interview, or a job reported in the job history data. One of the advantages of HRS is that it collects information about both the current and the longest-held jobs in each respondent's lifetime. Respondents could report different longest-held occupations during the follow-up periods, potentially resulting in multiple occupations for a single respondent. In such cases, we used the last reported longest-held occupation. The publicly available RAND HRS data have 17 occupational categories, 16 of which we included in our analysis (military was excluded). The wording in this text is an abbreviated version of the wording used in the RAND HRS data. Table S1 lists the full names of all 16 major occupations, as well as the detailed occupations included in each major occupation. Roughly one-third of the respondents did not report their longest-held occupation. Excluding respondents with missing longest-held occupation might bias our results. Therefore, we used a multiple imputation method to replace missing values, assuming that the values were missed at random. Details are presented in the method section below.

2.4 | Covariates

We searched the literature for guidance on selecting appropriate covariates that might affect the probability of receiving DI benefits. OL'eary et al[19] included age, sex, employer size, preinjury earnings, and two-digit industry category in their study that examined the impact of lost-time workplace injury on take-up of DI benefits. Burkhauser et al[34] included demographics (sex, race or ethnicity, education, marital status), health status (type of work-limiting health condition), and policy (availability of employer accommodation and differences in DI benefits across different states) variables in their study on factors that affect the timing of the decision of workers to apply for DI. Autor and Duggan[15] found differences in the percentage of individuals receiving DI benefits by age, race, education, health

conditions (by diagnosis group), the magnitude of wage relative to the DI benefits, the screening process for receiving DI benefits, and the unemployment rate.

On the basis of these studies, we included sociodemographic, lifestyle, and regional variables as covariates, all of which are described below in further detail. Sociodemographic variables included sex, age, race or ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, and non-Hispanic others), marital status (married or had a partner; separated, divorced, or widowed; and never married), and years of schooling. We also included the following variables related to lifestyle conditions as covariates: smoking, alcohol consumption, and obesity. We did not include income in the model because it is highly correlated with the longest-held occupation, and is "downstream" in the causal pathway between occupation and receiving DI benefits. To control for regional differences in unemployment rate, DI screening process, and wage differences, we included four regional dummies (northeast, midwest, South, and West). Two types of time scale can be used in a Cox regression model: time since the intervention (such as diagnosis, injury) and age.[35] In this study, we used age as a time scale because we were interested not only in workers who had received DI benefits but also at what age. We measured age from the date of birth until the year a respondent received DI benefits, died, reached full retirement age, requested to be permanently removed from the sample, or reached the end of the follow-up period (2016), whichever came first.

3 | METHODS

Because we were interested in examining how quickly respondents received DI benefits, we used a survival analysis instead of a binary outcome model. Specifically, we used the extended Cox proportional hazard (PH) survival model[36] to estimate the association between longest-held occupation and the likelihood of receiving DI benefits:

$$h\left(t, X\right) = h_0\left(t\right)\exp\left(\sum_{i=1}^{n} \beta_i X_i\right)$$

where h_0(t) is the baseline hazard, X is a vector of covariates, β is a 0 vector of regression coefficients to be estimated from the data, and t is age. We estimated hazard ratios (HRs) and 95% confidence intervals (CIs) for each longest-held occupation and other covariates using the above equation. Because obesity and alcohol consumption change through time, we considered these variables as time-varying in our estimation.

Thirty-one percent of respondents in our sample had missing values for longest-held occupation. Excluding those observations might reduce the statistical power of the model and lead to a potential bias if the observations were systematically different from the remaining observations. We used a multiple imputation[37] method to address potential problems caused by missing values. Multiple imputation is a simulation-based method that replaces missing values with reasonable multiple values based on a selected model.[38] We imputed longest-held occupation using chained equations by assuming that the variable was missing at random.[39] Because longest-held occupation is a categorical variable, we used a multinomial logistic model. We used the following variables for imputing longest-held

occupation: sex, age, race or ethnicity, alcohol consumption, obesity, marital status, years of schooling, annual income, and region. We also included the outcome variable, DI benefits receipt, and the Nelson-Aalen estimate of the baseline cumulative hazard in our imputation model.[38,40,41] We generated five unique imputed values for each missed longest-held occupation. To check the validity of the imputed results, we compared the distributions of longest-held occupation from the observed values, imputed values, and combined values (ie, the combined observed and imputed values) using the "midiagplots" command in STATA.

The Cox PH model assumes that the HR is independent of time. In other words, the model assumes that the HRs for any two individuals is constant over time. We tested the validity of this assumption using the "phtest" command in STATA, which tests the PH assumption using the Schoenfeld residuals. See Cleves et al[38] and Kleinbaum and Klein[42] for a more detailed explanation.

As shown above, receiving DI benefits, death, and reaching full retirement age are competing events. To test the robustness of our results to these competing events, we used a competing risk analysis, based on the Fine and Gray subdistribution hazard function. Competing risk analysis is a special type of survival analysis that aims to correctly estimate the hazard of an event in the presence of other competing events.[43]

4 | RESULTS

We followed a cohort of 19 116 HRS respondents (with 73 637 observations) from their date of entry into the sample (at age 51–64) until DI benefits receipt, death, full retirement age, their request to be permanently removed from the sample, or the end of the follow-up period (2016), whichever came first.

When checking the validity of the imputed values for missing longest-held occupation, we found that the distributions of the observed, imputed, and combined values were very similar, indicating that the imputed values followed the distribution of the observed values. The results are presented in Figure S1. When testing for the PH assumption of the Cox model, we found that all variables, except marital status, satisfied the PH assumption (Table S2). Therefore, we stratified our estimation by the martial status variable.

Table 1 presents the characteristics of the sampled respondents. The share of male respondents was 52% and the average age was 54 years. Seventy-six percent of the respondents were non-Hispanic White, 11% were non-Hispanic Black, and 8% were Hispanic. Seventy-five percent of the respondents were married or had a partner, 18% were separated, divorced or widowed, and only 7% were never married. The mean of years of schooling was 13.4. Nearly one-third of the respondents were obese, 55% smoked, and 71% consumed alcohol. Eighteen percent of the respondents had a managerial longest-held occupation and 20% had a professional occupation, followed by clerical at 15%. We followed the respondents in our sample on average for 6.4 years (ranging from a minimum of 1 year to a maximum of 15 years). Of the 19 116 respondents in our sample, 1523 (8%) received DI benefits during the follow-up period.

Table 2 presents the multiple imputation estimates of the Cox PH regression model stratified by marital status. The HRs are presented in the second column and the 95% CI values in the third column of Table 2.

Controlling for covariates, there was no statistically significant difference in the hazard of receiving DI benefits between male and female workers. Controlling for other covariates, the hazard of workers who were non-Hispanic Black and non-Hispanic others receiving DI benefits was 42% (95% CI, 1.21–1.67) and 78% (95% CI, 1.30–2.44), respectively, higher than non-Hispanic White workers. One additional year of schooling decreased the hazard of receiving DI benefits by 6% (95% CI, 0.92–0.97). The hazard of smokers to receive DI benefits was 79% (95% CI, 1.55–2.08) higher than nonsmokers. The coefficients of the obesity and alcohol consumption variables were statistically significant, but the HRs were very close to one. After controlling for other covariates, there was no statistically significant difference in the hazard of receiving DI benefits by region.

Most of the coefficients of longest-held occupations were statistically significant. To accommodate comparison, we present HRs for longest-held occupations from Table 2 in Figure 1 below in ascending order. After controlling for covariates, there was no statistically significant difference in the hazard of receiving DI benefits between workers with longest-held occupation in the reference managerial occupation and workers in private household services; farming, forestry, and fishing; professional; or clerical. The hazard of receiving DI benefits among workers with longest-held occupations in sales, mechanics and repair, protective services, and personal services was between 1.51 and 1.85, compared with that of workers in the reference occupation. The hazard of receiving DI benefits was more than double among workers with longest-held occupations in food preparation services, handlers, machine operators, transportation operators, and construction trade and extractors than that of workers in the reference occupation. The hazard of receiving DI benefits was 65% higher for workers with longest-held occupation in health services than workers in the reference occupation but the difference was not statistically significant at the 90% level of confidence ($P > 0.10$; Figure 1).

We checked the robustness of our results for competing risk events and the multiple imputation method used. First, we estimated a competing risk regression analysis by considering death and full retirement age as competing events to receiving DI benefits, and the results for longest-held occupation are presented in Figure S2. Second, we checked the robustness of our results for multiple imputation, and we present the stratified Cox regression results without imputed longest-held occupation in Figure S2. In both cases, the essentials of our findings were unchanged.

5 | DISCUSSION

The cost of the DI program has increased through time. A better understanding of the factors that have led to a higher number of DI applicants would help address the root causes of disability, thereby providing opportunities to reduce worker suffering and the costs of the DI program. Various factors such as economic, policy, demographic, and those relating to the workplace were previously identified as reasons for the growth of the DI program. In this

study, we examined the relationship between longest-held occupation and the hazard of receiving DI benefits before the full retirement age, controlling for covariates.

The results of the study showed that there were statistically significant differences in the hazard of receiving DI benefits among workers with different longest-held occupations. The results also showed that workers who reported longest-held occupations associated with higher rates of workplace injury or illness had an increased hazard of receiving DI benefits compared with workers with lower rates of workplace injury or illness. The hazard of receiving DI benefits among workers with the longest-held occupation in sales, mechanics and repair, protective services, and personal services was 51% (95% CI, 1.00–2.26), 78% (95% CI, 0.91–3.48), 81% (95% CI, 0.94–3.48), and 85% (95% CI, 1:20–2.87), respectively, higher than among workers with the longest-held occupation in the reference occupation. The hazard of receiving DI benefits was more than double among workers with longest-held occupations in food preparation services, handlers, machine operators, transportation operators, and construction trade and extractors than among workers with longest-held occupations in the reference occupation. The hazard of receiving DI benefits was particularly high among workers with longest-held occupations in construction trade and extractors, machine operators, handlers, and transportation operators. For instance, the hazard of receiving DI benefits was 124% and 107% higher, respectively, among workers with longest-held occupations in construction trade and extractors and transportation operators than among workers with longest-held occupation in the reference occupation. The injury and illness rates reported by the Bureau of Labor Statistics supported our results. In 2016, the incidence of nonfatal workplace injuries and illnesses per 10 000 full-time equivalent workers was 229.3 and 169.2 among workers in the transportation operators and construction trade and extractors occupations, respectively, compared with 43.9 among workers in the office and administrative occupations. The incidence rate for occupations related to machine operators, handlers, and mechanics and repair were also around 176 per 10 000 full-time equivalent workers.[44]

The results of this study have important implications. Improving worker safety and health for workers in construction trade and extractors, transportation operators, machine operators, handlers, food preparation services, personal services, protective services, mechanics and repair, and sales occupations would help to reduce the hazard of receiving DI benefits significantly. This in turn would help reduce the burden of workplace injury and illness on the Social Security system. Further research might explore preventable workplace hazards in these occupations. Assessing occupational characteristics[31,45] and employer provided accommodations[34] by occupation might suggest which working conditions lead to high injury and DI rates.

The study has some limitations. First, while longest-held occupation captures the cumulative impact of an occupation on an individual's health, the term "longest" can be ambiguous[33] and vary from one worker to another. In our study, it ranged from a minimum of 7 years to a maximum of 30 years. Future studies might explore if the impact varies by the length of time individuals spent in their longest-held occupation. Second, the HRS data restricted the analyses to people aged 51 and older. This excluded younger workers who are more likely to be employed in high-risk occupations and more likely to be injured and apply for DI

benefits. In addition to this, due to lack of information, we considered only age and work experience as DI status requirements. Third, the study did not examine why workers in some occupations had a greater hazard of receiving DI benefits compared with workers in other occupations. Future studies might examine why workers with longest-held occupations in construction trade and extractors, transportation operators, machine operators, handlers, food preparation services, and personal services had a relatively higher hazard of receiving DI benefits before the full retirement age. Fourth, the number of respondents who received DI benefits in 2015 and 2016 might be underestimated because there is a lag in adjudicating and certifying DI benefits applications. There is also a fair amount of error in the reporting of DI vs SSI benefits by respondents. As a result, some of the respondents might report DI as SSI and vice versa.[46] However, we do not expect this potential reporting error to be systematically different among respondents in different occupations. Fifth, we measured alcohol consumption and smoking as dichotomous variables due to lack of more specific information. No question was asked about the number of cigarettes respondents smoked per day or week. While HRS asks about the number of days per week alcohol was consumed, around half of the respondents did not answer this question. Finally, covariates such as health insurance, obesity, smoking, and alcohol consumption could be in the causal pathway between occupation and the hazard of receiving DI benefits. Some of the covariates such as sex and years of schooling are also highly correlated with occupation. For instance, more than 85% of respondents in the professional occupation had at least 14 years of schooling compared to only 10% of respondents in the machine operator, food preparation services, and handlers occupations. Including these variables in the model could underestimate the association between longest-held occupation and the hazard of receiving DI benefits, and the results should be considered as a lower bound estimate.

6 | CONCLUSION

The DI program is one of the two largest federal disability programs in the United States. In this study, we examined the association between longest-held occupation and the hazard of receiving DI benefits. The results showed that the hazard of receiving DI benefits among workers with longest-held occupations in construction trade and extractors, transportation operators, machine operators, handlers, and food preparation services was more than twice that of workers with longest-held occupations in the managerial occupation, which was the reference occupation. The hazard of receiving DI benefits among workers with longest-held occupations in personal services, protective services, mechanics and repair, and sales was more than 50% higher than the hazard of receiving DI benefits among workers in the reference occupation. Improving the overall working conditions in these occupations would help reduce worker suffering and the number of applicants for DI benefits, thereby reducing the burden of workplace injury and illness on the DI program.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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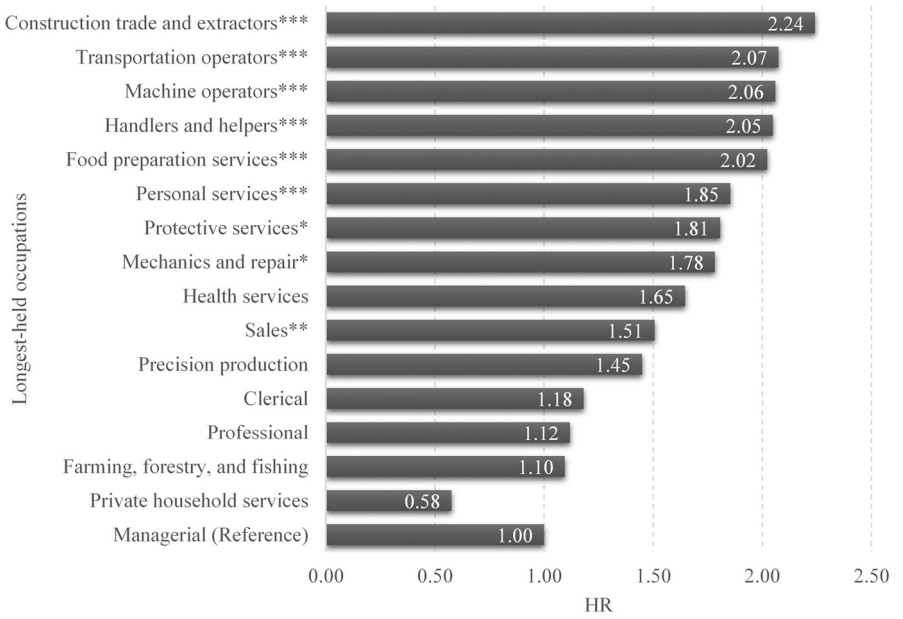

FIGURE 1.

Hazard ratio† of receiving DI benefits by longest-held occupation. †Controlling for sex, race or ethnicity, year of education, smoking status, obesity, alcohol consumption, and region and stratified by marital status. ***,**, and * statistical significance at the 1%, 5%, and 10% level, respectively. DI, Disability Insurance

TABLE 1

Distribution of risk factors for receiving DI benefit among HRS respondents aged 51–65 (1992–2016)

Variable	Value[a]
Male (%)	52.1
Age, y	54.4
Race or ethnicity (%)	
Non-Hispanic White	75.7
Non-Hispanic Black	11.1
Non-Hispanic others	5.0
Hispanic	8.2
Marital status (%)	
Married or had a partner	75.2
Separated, divorced, or widowed	18.2
Never married	6.8
Years of schooling (0–17y)	13.4
Obese (BMI > 30) (%)	31.3
Smoking (1 if ever smoked) (%)	55.4
Ever drink alcohol (1 if yes) (%)	71.3
Income quartile	
First	23.8
Second	13.0
Third	27.5
Fourth	35.7
Region (%)	
South	39.9
Northeast	17.1
Midwest	23.4
West	19.7
Longest-held occupation (%)	
Managerial	17.9
Professional	20.7
Sales	8.7
Clerical	14.7
Private household services	0.9
Protective services	1.9
Food preparation services	2.4
Health services	1.7
Personal services	4.6
Farming, forestry, and fishing	2.3
Mechanics and repair	3.9
Construction trade and extractors	4.3
Precision production	3.3

Variable	Value[a]
Machine operators	6.0
Transportation operators	4.2
Handlers and helpers	2.3
Total number of respondents	19 116
Number of respondents who failed (received DI benefit)	1523

Abbreviations: BMI, body mass index; DI, Disability Insurance; HRS, Health and Retirement Study.

[a]Due to rounding, the percentages may not add up to exactly 100%.

TABLE 2

Multiple-imputation estimates: Stratified[a] Cox regression

Variable	Hazard ratio	95% Confidence intervals	
Male	1.14	0.97	1.34
Race or ethnicity			
Non-Hispanic White (Reference)			
Non-Hispanic Black	1.42	1.21	1.67
Non-Hispanic others	1.78	1.30	2.44
Hispanic	0.77	0.58	1.02
Years of schooling (0–17y)	0.94	0.92	0.97
Obese (BMI >30)	1.01	1.01	1.01
Smoking (1 if ever smoked)	1.79	1.55	2.08
Ever drink alcohol (1 if yes)	0.99	0.99	0.99
Region			
South (Reference)			
Northeast	1.01	0.84	1.22
Midwest	0.91	0.77	1.09
West	0.85	0.70	1.03
Longest-held occupation			
Managerial (Reference)			
Professional	1.12	0.73	1.71
Sales	1.51	1.00	2.26
Clerical	1.18	0.79	1.76
Private household services	0.58	0.11	3.12
Protective services	1.81	0.94	3.48
Food preparation services	2.02	1.29	3.18
Health services	1.65	0.86	3.14
Personal services	1.85	1.20	2.87
Farming, forestry, and fishing	1.10	0.62	1.94
Mechanics and repair	1.78	0.91	3.48
Construction trade and extractors	2.24	1.52	3.31
Precision production	1.45	0.81	2.60
Machine operators	2.06	1.41	3.01
Transportation operators	2.07	1.18	3.64
Handlers and helpers	2.05	1.24	3.38
Number of respondents	19 116		
Number of observations	73 637		
Number of respondents who failed (received DI benefit)	1523		
Total analysis time at risk	1 226 046		
Number of imputations	5		

Abbreviation: DI, Disability Insurance.

[a]Results are stratified by marital status.