Green Collar Workers: An Emerging Workforce in the Environmental Sector

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Abstract

Objective—We describe the socio-demographic, occupational, and health characteristics of "green collar" workers, a vital and emerging workforce in energy-efficiency and sustainability.

Methods—We linked data from the 2004–2012 National Health Interview Surveys (NHIS) and US Occupational Information Network (O*NET). Descriptive and logistic regression analyses were conducted using green collar worker status as the outcome (n=143,346).

Results—Green collar workers are more likely than non-green workers to be male, age 25–64y, obese, and with high school education. They are less likely to be racial/ethnic minorities and employed in small companies or government jobs.

Conclusions—Green collar workers have a distinct socio-demographic and occupational profile, and this workforce deserves active surveillance to protect its workers' safety. The NHIS-O*NET linkage represents a valuable resource to further identify the unique exposures and characteristics of this occupational sector.

Keywords

Green collar workers; National Health Interview Survey (NHIS); US Occupational Information Network (O*NET)

INTRODUCTION

The "green collar" workforce is a unique and emerging field of workers in the United States (US) and worldwide. "Green" jobs include those whose tasks seek to increase sustainability

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and to decrease waste, energy use, and pollution (1–3). This workforce includes newly created jobs and also encompasses the "greening" of existing jobs to improve their impact on both the environment and the worker (4). With the imminent concerns of climate change and environmental resource scarcity, this workforce is critical in creating the resources and infrastructure to implement effective approaches for prevention, mitigation, and resource conservation (5).

Green collar workers serve in all sectors of industry. They may include professionals (e.g. environmental consultants, green building architects, environmental, systems, or nuclear engineers, and environmental lawyer) or workers from manufacturing and construction industries (e.g. solar panel installers, construction workers for green buildings and renewable energy plants, or factory workers who make materials for green building). Waste management, hazardous materials clean-up, and recycling jobs are another classification of the green collar workforce. Other examples include organic farmers, environmental educators, public transit workers, and green vehicle engineers. Green collar jobs have grown due to recent increasing demands for eco-friendly jobs.

In addition to rising commercial interests in the green collar industry, the workforce has garnered increasing global political support and endorsement. For example, the green collar workforce received recognition with the 2007 US Green Jobs Act (6, 7). This Act sought to create a worker training program in the areas of energy efficiency and renewable energy as well as launch a national research program to track energy-related workforce trends. The green collar workforce gained further attention in a report from the University of California Berkeley (8) that found, per unit of energy, the renewable energy economic sector (only one part of the green economy) creates more jobs than the fossil-fuel energy sector. Similar rapid growth has been reported in the sustainable and energy-efficient industries in Europe (5). It is clear that great strides are being made worldwide to expand this workforce that provides critical environmental benefits.

Despite the increasing importance of these jobs and their recent growth in the US economy and abroad, there is limited epidemiologic information on the workforce in terms of its characteristics and background (1, 3, 9–12). While these jobs seek to increase conservation and sustainability, the workers themselves are not free from harmful occupational exposures (13). As has been said previously, "When environmental concerns predominate, there is the possibility that risk can be transferred to workers" (14). In addition to traditional occupational hazards, this new US workforce segment faces unique exposures and job requirements that may put them at greater risk (13, 14). Green jobs may involve known safe tasks (if performed appropriately) that are used for a green purpose, whereas others may involve new techniques or materials for which training and safety control measures have not yet been fully developed. For example, it has been shown that some green building construction (e.g. Leadership in Energy and Environmental Design [LEED] standards) uses more complex design elements that can increase worker risk over traditional construction methods (15). Additionally, exposures such as those of collecting recyclable or hazardous waste in cleanup projects may present a particular chemical or physical hazard to this workforce.

In addition to known and emerging risks associated with green collar jobs, these workers may also have unique socio-demographic and health characteristics that contribute to their occupational health and wellbeing (16, 17). By 2030, there will be an estimated 40 million jobs in the growing renewable-energy and energy-efficiency industries (18). A better understanding of the green collar workforce and its exposures and risks is essential to improve worker health and to protect workers. Worker health is directly tied to worker productivity and economic gains; therefore, identifying and addressing worker health disparities specific to the green collar workforce is necessary to ensure a productive future for the green collar industry.

In order to describe the socio-demographic and occupational characteristics, health conditions, health behaviors, and risk factors of this emerging green collar workforce, we conducted a large data linkage using the 2004–2012 National Health Interview Surveys (NHIS) (19) and the US Occupational Information Network (O*NET) (20).

METHODS

Data Sources

The NHIS is an annual, cross-sectional household survey of the US non-institutionalized population utilizing a multi-stage, clustered sample design. The NHIS contains important data on employment status and occupation type, as well as self-reported demographics, health conditions, and health behaviors. All NHIS participants who were currently working or who had worked in the last 12 months during the study period were included (n=143,346) in the analyses.

O*NET is a public resource funded by the US Department of Labor; it provides occupational data on over 900 jobs (20). For these jobs, O*NET contains data on the job characteristics, work environment and various task requirements of workers, occupations, and the workforce itself as well as workplace exposures. O*NET data have previously been linked by other investigators to national health surveys to investigate job characteristics and health (21). O*NET uses the standard occupational classification (SOC) codes and job titles (22, 23). The O*NET SOC code takes the form, 1 2 – 3 4 5 6. 7 8, with each digit representing a specific occupational classification. The first two digits of the SOC code represent the major group; the third digit represents the minor group; the fourth and fifth digits represent the broad occupation; the sixth digit represents the detailed occupation; and the seventh and eighth digits represents an extension or variation of the detailed occupation. For example, major group codes end with 0000 (e.g., 47–0000, Construction and Extraction Occupations), minor groups end with 000 (e.g., 47–2000, Construction Trades Workers), and broad occupations end with 0 (e.g., 47–2020, Brickmasons, Blockmasons, and Stonemasons).

Using a systematic approach of reviewing the literature, compiling and sorting job titles, and defining job tasks, O*NET researchers identified 215 O*NET-SOC green collar jobs (24, 25). A list of job titles in which some of these kinds of workers are engaged in green activities is shown in Table 1. These jobs included any that had at least one associated "green" task (e.g., providing green services or producing green goods). This classification,

therefore, includes a wide range of jobs from those with exclusively green tasks (e.g., solar panel installers) to those with few green tasks (e.g., personal financial advisors counseling clients on "green" investments).

Data Linkage

We linked the 4-digit occupational code variable (OCCUPN) available in the NHIS (i.e., digits 3 4 5 6) with the 8-digit O*NET SOC code (i.e., 1 2 – 3 4 5 6). When the O*NET SOC code had a seventh and eighth digit ending in .00, this was considered an exact match with the NHIS data and labeled as green or non-green. However, when the seventh and eighth digit had an extension beyond .00, such as .01, .02, etc., we further investigated if each of these detailed occupations were all green, all non-green, or "mixed-green" collar workers. For example, if an O*NET broad occupational group had three different extensions of the seventh and eighth digit codes (e.g., .01, .02, and .03) of which two were classified as green and one was classified as non-green, then the NHIS occupational code was labeled as mixed-green to indicate that the parent job title had mixed jobs.

Dependent Variable

The main outcome of interest was the green collar status of employed workers (i.e., green collar, non-green collar) obtained from O*NET and classified as described above. Those workers considered to be mixed-green collar as mentioned above were included in the non-green collar category in these analyses.

Independent Variables

Independent variables included: age (18–24, 25–64, or 65+ years), gender (male or female), race (Black, White, or other), ethnicity (Hispanic or non-Hispanic), educational attainment (less than high school [HS], HS, or more than HS), insurance status (insured or not insured), US region (Northeast, South, Midwest or West), requirement for special equipment (yes or no), functional limitations (yes or no), body mass index (BMI) (underweight, normal, overweight, or obese), hearing impairment (yes or no), vision impairment (yes or no), size of company (1–9, 10–24, 25–49, 50–99, 100–249, or 250+ employees), type of employment (private, federal, local or state government, or self-employed), and more than one job (yes or no).

Statistical Analyses

Using the linked dataset, we conducted descriptive analyses of these workers, as well as univariate and multivariable logistic regressions with green collar worker status as the outcome. These multivariable analyses were controlled for the independent variables listed above. Statistical analyses were conducted using SAS v9.3 and accounted for complex weighted survey design. To protect NHIS participant confidentiality, data linkage and analyses were conducted at the secure Research Data Center (RDC) of the National Center for Health Statistics (NCHS). Institutional Review Board approval for this study was granted by the University of Miami Institutional Review Board.

RESULTS

Table 2 presents the prevalence of socio-demographic and occupational characteristics of all workers, green collar workers, and non-green collar workers. Approximately 20% of workers were classified as green collar, meaning that over 26 million US workers are involved in jobs with at least one green task. The largest differences between green collar and non-green collar workers were in the distributions of gender and the type of employer: green collar workers were more likely to be male (76% vs. 48%) and employed in the private sector (84% vs. 73%).

The unadjusted and adjusted odds of being a green collar worker (vs. non-green collar) are presented in Table 3. Adjusting for all covariates, the following groups were significantly more likely to be green collar workers: 25–64 year olds (vs. 18–24 year olds; odds ratio [OR]=1.38; 95% confidence interval=1.30–1.46); males (vs. females; OR=3.27; 3.13–3.41); those with a HS education or less (vs. HS+; OR_{HS}=1.37; 1.32–1.43; $OR_{<HS}$=1.27; 1.20–1.35); those living outside the Northeast US ($OR_{Midwest}$=1.15; 1.08–1.22; OR_{South}=1.12, 1.06–1.18; OR_{West}=1.10; 1.04–1.17); the obese (OR=1.13; 1.08–1.18); and those with hearing impairment (OR=1.11; 1.05–1.17). The following groups were significantly less likely to be green collar workers: Blacks (OR=0.92; 0.87–0.97); Hispanics (OR=0.91; 0.86–0.96); the uninsured (OR=0.79; 0.75–0.83); those employed in smaller companies (vs. 250+ employees; $OR_{1-9employees}$=0.64; 0.61–0.68; $OR_{10-24employees}$=0.72; 0.68–0.76; $OR_{25-49employees}$=0.81; 0.76–0.86; $OR_{50-99employees}$=0.84; 0.81–0.91); those employed in government jobs ($OR_{federal}$=0.53; 0.47–0.60; OR_{state}=0.37; 0.33–0.41; and OR_{local}=0.44; 0.40–0.48); those who were self-employed (OR=0.77; 0.71–0.83); and those with more than one job (OR=0.81; 0.76–0.87).

We also repeated the analyses with the three level outcome of green, mixed-green, and non-green (data not shown), which demonstrated that mixed-green workers, who make up 10% of the workforce, tend to resemble the green collar workers or be somewhere in between green and non-green. Similar to green collar workers, mixed-green workers were more likely to be non-Hispanic White, males, aged 25–64 years, with a high school education or less, overweight or obese, and less likely to have more than one job. In contrast to green collar workers, mixed-green workers were more likely to be employed in smaller companies in the private sector.

DISCUSSION

In the US currently, the green collar labor force is comprised of a diverse group of workers engaged in a variety of jobs and tasks and representing all economic sectors and occupational categories. This emerging workforce will be a key component in the effort to improve environmental sustainability and conservation. Without this workforce, their job activities and work products, the necessary resources and framework to carry out long term sustainable environmental strategies will be limited. To our knowledge, this study is the first to describe and evaluate the socio-demographic, occupational, and health factors of the green collar workforce using a large, nationally representative sample or workers. Our results show that these workers have a unique socio-demographic profile, and as previous

work from our research team indicates, unique health conditions as well (26, 27). Specifically, the current study shows the typical green collar worker to be a non-Hispanic White male in the middle age range (25–64 years) who is obese and who has a high school education or less.

Additionally, US green collar workers are less likely to be employed in small companies (those under 100 employees), the federal government, or to be self-employed. This employment pattern runs contrary to the theory that small companies are the most innovative and contribute the most jobs to the economy, a position that has been challenged in recent reports (28, 29). The fact that green collar jobs are predominantly found in larger organizations may be an advantage to these workers; larger companies often provide greater benefits and more comprehensive working conditions oversight. The higher rates of green workers in larger organizations may be supported by the lower rates of medically uninsured in the green collar workforce (at least prior to the introduction of the Affordable Care Act). Because green collar workers may be subject to unique and potentially harmful occupational exposures, this issue may be of particular importance to them. Despite lower rates of higher education, green collar workers are less likely to have more than one job. This may also indicate better working conditions and better pay that reduce the need for supplemental employment. Indeed, a report from 2006 demonstrated that green jobs provided good wages, health insurance, and benefits, as well as a sense of meaningful work and job satisfaction (17).

Strengths/Limitations

There are a few limitations of our analysis to consider. The first is the possibility of the misclassification of occupational category using the information available in the O*NET database. This is demonstrated by the group of workers classified as mixed-green collar whose job characteristics or occupational sector may classify them variously in either green or non-green jobs. The results of additional analyses using this mixed-green collar category indicate that including them in the non-green category may underestimate the differences between green and non-green workers. As there is increasing "greening" of existing occupations (4), as opposed to creation of new green occupations, this group of mixed-green collar workers may expand and deserves further examination and surveillance in the future. A second limitation is that the NHIS is cross-sectional and relies on self-reported measures which may be subject to recall and temporality bias.

Despite these limitations, there are some significant strengths of our study. First, the NHIS provides a population-based nationally representative sample of US adults to study green collar workers, which has not been done previously (although findings may not generalize to other countries). Another strength of the study is the quality of the occupational data on over 900 US jobs in the O*NET database which is regularly updated. It is important to note that these data are ecological, however, and we are unable to make assumptions about the exposures of an individual based on their assignment to a particular job title. The use of linked data from NHIS and O*NET is another major strength of this study by allowing for the identification of green collar jobs in a major US national health survey system.

Furthermore, the linkage of these large datasets represents a novel tool for further investigation of this emerging workforce.

CONCLUSIONS

This study is the first to describe the unique socio-demographic, occupational, and health characteristics of the average green collar worker in the US. With an increase in environmentally-related occupations as well as the "greening" of existing jobs, it is vital that we continue to research the characteristics and workplace exposures of these workers. This workforce plays an important role in repairing and preventing damage to the environment; however, this does not mean that the workers themselves are protected from harmful exposures and practices. This growing industry, therefore, deserves careful surveillance to ensure that the safety of workers is not compromised. Comparing exposures and worker health to multiple industries and work sectors can also help to identify health disparities. Results from future analyses can serve as a platform for future public health strategies and interventions to maximize green collar worker health. The linkage between NHIS and O*NET offers a valuable resource to further assess key characteristics of green collar workers as well as trends in this important workforce.

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Table 1

Green collar job titles as defined by US Census occupation titles that match green collar job codes in the US Occupational Information Network

US Census Occupation Code	Job Title
0020	General and operations managers
0050	Marketing and sales managers
0220	Construction managers
0140	Industrial production managers
0300	Engineering managers
0360	Natural sciences managers
0510	Purchasing agents and buyers, farm products
0520	Wholesale and retail buyers, except farm products
0620	Human resources, training, and labor relations specialists
0840	Financial analysts
0850	Personal financial advisors
1020	Computer software engineers
1300	Architects, except naval
1320	Aerospace engineers
1350	Chemical engineers
1360	Civil engineers
1410	Electrical and electronics engineers
1420	Environmental engineers
1460	Mechanical engineers
1510	Nuclear engineers
1600	Agricultural and food scientists
1610	Biological scientists
1710	Atmospheric and space scientists
1720	Chemists and materials scientists
1740	Environmental scientists and geoscientists
1840	Urban and regional planners
1920	Chemical technicians
1960	Other life, physical, and social science technicians
2100	Lawyers, Judges, magistrates, and other judicial workers
2550	Other education, training, and library workers
2630	Designers
2810	News analysts, reporters and correspondents
2820	Public relations specialists
3540	Other healthcare practitioners and technical occupations
3830	Fish and game wardens
4850	Sales representatives, wholesale and manufacturing

US Census Occupation Code	Job Title
5240	Customer service representatives
5520	Dispatchers
5600	Production, planning, and expediting clerks
5610	Shipping, receiving, and traffic clerks
6010	Agricultural inspectors
6120	Forest and conservation workers
6210	Boilermakers
6250	Cement masons, concrete finishers, and terrazzo workers
6260	Construction laborers
6320	Operating engineers and other construction equipment operators
6350	Electricians
6400	Insulation workers
6510	Roofers
6520	Sheet metal workers
6530	Structural iron and steel workers
6600	Helpers, construction trades
6660	Construction and building inspectors
6720	Hazardous materials removal workers
6740	Rail-track laying and maintenance equipment operators
6760	Miscellaneous construction and related workers
6800	Derrick, rotary drill, and service unit operators, oil, gas, and mining
6840	Mining machine operators
7000	First-line supervisors/managers of mechanics, installers, and repairers
7100	Electrical and electronics repairers, industrial and utility
7210	Bus and truck mechanics and diesel engine specialists
7330	Industrial and refractory machinery mechanics
7340	Maintenance and repair workers, general
7360	Millwrights
7410	Electrical power-line installers and repairers
7610	Helpers--installation, maintenance, and repair workers
7700	First-line supervisors/managers of production and operating workers
7710	Aircraft structure, surfaces, rigging, and systems assemblers
7720	Electrical, electronics, and electromechanical assemblers
7730	Engine and other machine assemblers
7740	Structural metal fabricators and fitters
7750	Miscellaneous assemblers and fabricators
7900	Computer control programmers and operators
7950	Cutting, punching, and press machine setters, operators, and tenders, metal and plastic
7960	Drilling and boring machine tool setters, operators, and tenders, metal and plastic

US Census Occupation Code	Job Title
8030	Machinists
8600	Power plant operators, distributors, and dispatchers
8610	Stationary engineers and boiler operators
8630	Miscellaneous plant and system operators
8640	Chemical processing machine setters, operators, and tenders
8650	Crushing, grinding, polishing, mixing, and blending workers
8740	Inspectors, testers, sorters, samplers, and weighers
9120	Bus drivers
9130	Driver/sales workers and truck drivers
9200	Locomotive engineers and operators
9240	Railroad conductors and yardmasters
9600	Industrial truck and tractor operators
9620	Laborers and freight, stock, and material movers, hand
9720	Refuse and recyclable material collectors

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Table 2

Prevalence of socio-demographic factors for workers 18 years and older, by Green Collar and non-Green Collar status, National Health Interview Survey 2004–2012

Characteristics	Total Population			Green Collar			Non-Green Collar[a]		
	NHIS sample size[b]	Percent[c]	95% CI	Number[b]	Percent[c]	95% CI	Number[b]	Percent[c]	95% CI
Total	**143,346**	**100.0**	**--**	**27,432**	**20.2**	**19.9 – 20.5**	**115,914**	**79.8**	**79.5 – 80.1**
Male	71,267	53.8	53.5 – 54.1	19,847	75.7	75.1 – 76.3	51,420	48.3	47.9 – 48.6
Female	72,079	46.2	45.9 – 46.5	7,585	24.3	23.7 – 24.9	64,494	51.7	51.4 – 52.1
White	111,347	82.2	81.7 – 82.6	21,868	83.4	82.8 – 84.1	89,479	81.8	81.4 – 82.3
Black	21,864	11.7	11.3 – 12.1	3,714	10.8	10.2 – 11.3	18,150	12.0	11.6 – 12.4
Other	10,135	6.1	5.9 – 6.3	1,850	5.8	5.4 – 6.2	8,285	6.2	5.9 – 6.4
18–24y	15,120	12.9	12.5 – 13.2	2,374	10.4	9.8 – 10.8	12,836	13.5	13.1 – 13.9
25–64y	121,754	83.4	83.1 – 83.8	24,116	86.7	86.2 – 87.3	97,638	82.6	82.2 – 83.0
65+y	6,382	3.7	3.6 – 3.8	942	2.9	2.7 – 3.2	5,440	3.9	3.8 – 4.0
Non-Hispanic	116,458	85.7	85.3 – 86.1	22,341	85.5	84.9 – 86.1	94,117	85.7	85.3 – 86.2
Hispanic	26,888	14.3	13.9 – 14.7	5,091	14.5	13.9 – 15.1	21,797	14.3	13.8 – 14.7
HS+	89,386	63.4	62.9 – 63.9	15,619	57.3	56.4 – 58.1	73,767	64.9	64.4 – 65.4
HS	36,036	26.0	25.6 – 26.4	8,163	30.9	30.2 – 31.6	27,873	24.8	24.4 – 25.2
<HS	17,049	10.6	10.3 – 10.9	3,539	11.8	11.3 – 12.3	13,510	10.3	10.0 – 10.6
Insured	115,259	82.4	82.1 – 82.8	22,554	83.9	83.3 – 84.5	92,705	82.0	81.7 – 82.4
Uninsured	27,653	17.6	17.2 – 17.9	4,822	16.1	14.5 – 16.7	22,831	18.0	17.6 – 18.3
Northeast	23,762	18.0	17.4 – 18.6	4,159	16.6	15.8 – 17.4	19,603	18.4	17.8 – 19.0
Midwest	32,538	24.3	23.5 – 25.1	6,663	25.8	24.6 – 27.0	25,875	23.9	23.2 – 24.6
South	52,096	35.8	35.0 – 36.5	9,983	36.1	35.0 – 37.3	42,113	35.6	34.9 – 36.4
West	34,950	21.9	21.3 – 22.6	6,627	21.5	20.7 – 22.3	28,323	22.1	21.4 – 22.7
Yes, Special Equipment	2,227	1.5	1.5 – 1.6	399	1.5	1.3 – 1.7	1,828	1.5	1.5 – 1.6
No, Special Equipment	140,867	98.5	98.4 – 98.5	27,001	98.3	98.5 – 98.7	113,866	98.5	98.4 – 98.5
Yes, Any functional Limitations	31,869	22.0	21.7 – 22.4	5,743	21.0	20.4 – 21.6	26,126	22.3	21.9 – 22.6
No, Any functional Limitations	111,056	78.0	77.6 – 78.3	21,624	79.0	78.4 – 79.6	89,432	77.7	77.4 – 78.1

Characteristics	Total Population			Green Collar			Non-Green Collar[a]		
	NHIS sample size[b]	Percent[c]	95% CI	Number[b]	Percent[c]	95% CI	Number[b]	Percent[c]	95% CI
Yes, Hearing Impairment	15,353	11.2	11.0 – 11.5	3,425	13.2	12.7 – 13.7	11,928	10.7	10.4 – 11.0
No, Hearing Impairment	127,946	88.8	88.5 – 89.0	24,000	86.8	86.3 – 87.3	103,946	89.3	89.0 – 89.6
Yes, Visual Impairment	9,674	6.7	6.5 – 6.9	1,695	6.3	5.9 – 6.7	7,979	6.8	6.6 – 7.0
No, Visual Impairment	133,590	93.3	93.1 – 94.5	25,727	93.7	93.3 – 94.1	107,863	93.2	93.0 – 93.4
Underweight	1,896	1.4	1.3 – 1.5	252	1.0	0.8 – 1.1	1,644	1.5	1.4 – 1.6
Normal Weight	49,420	35.9	35.5 – 36.2	8,284	30.5	29.8 – 31.2	41,136	37.2	36.8 – 37.6
Overweight	50,024	36.4	36.1 – 36.8	10,678	39.8	39.1 – 40.6	39,346	35.6	35.2 – 35.9
Obese	36,680	26.3	26.0 – 26.7	7,535	28.7	28.0 – 29.4	29,145	25.7	25.3 – 26.1
1–9 employees	35,793	26.1	25.7 – 26.5	5,808	22.0	21.4 – 22.6	29,985	27.1	26.7 – 27.5
10–24 employees	20,170	14.9	14.6 – 15.1	3,689	14.0	13.5 – 14.5	16,481	15.1	14.8 – 15.4
25–49 employees	15,794	11.8	11.6 – 12.1	3,028	11.8	11.3 – 12.2	12,766	11.9	11.6 – 12.1
50–99 employees	14,746	10.9	10.6 – 11.1	2,866	10.8	10.3 – 11.2	11,880	10.9	10.6 – 11.1
100–249 employees	16,900	12.4	12.2 – 12.6	3,749	14.1	13.6 – 14.6	13,151	12.0	11.7 – 12.2
250–499 employees	9,245	6.7	6.5 – 6.9	2,292	8.5	8.2 – 8.9	6,953	6.2	6.1 – 6.4
500–999 employees	6,679	4.8	4.7 – 5.0	1,546	5.8	5.4 – 6.1	5,133	4.6	4.4 – 4.8
1000+ employees	17,319	12.4	12.1 – 12.7	3,443	13.0	12.4 – 13.6	13,876	12.2	11.9 – 12.6
PRIVATE Employee	107,011	75.4	75.0 – 75.8	22,982	84.1	83.5 – 84.6	84,029	73.2	72.8 – 73.6
FEDERAL Employee	3,811	2.5	2.4 – 2.7	561	1.9	1.7 – 2.1	3,250	2.7	2.6 – 2.8
STATE Employee	8,777	5.8	5.6 – 6.1	778	2.7	2.4 – 2.9	7,999	6.6	6.3 – 6.9
LOCAL Employee	10,196	7.2	7.0 – 7.4	1,090	3.9	3.6 – 4.1	9,106	8.0	7.8 – 8.3
SELF-EMPLOYED	12,563	9.1	8.9 – 9.3	1,971	7.5	7.1 – 7.9	10,592	9.4	9.2 – 9.7
Self-Employed, incorporated	3,424	30.4	29.4 – 31.5	619	34.5	31.9 – 37.1	2,805	29.6	28.4 – 30.8
Self-Employed, not incorporated	9,013	69.6	68.5 – 70.6	1,336	65.5	62.9 – 68.1	7,677	70.4	69.2 – 71.6
Yes, Have more than one job	12,316	8.7	8.4 – 8.9	1,884	6.9	6.5 – 7.3	10,432	9.1	8.9 – 9.4
No, Have more than one job	130,455	91.3	91.1 – 91.5	25,511	93.1	92.7 – 93.5	104,944	90.9	90.6 – 91.1

[a] Includes "mixed-green collar" workers

[b] Sample size from the National Health Interview Survey for the years 2004–2012

[c] Percent (prevalence) estimated from the National Health Interview Survey for the years 2004–2012

Table 3

Odds ratios predicting green collar worker status for workers 18 years and older, unadjusted and adjusted for all other socio-demographic and occupational characteristics, National Health Interview Survey 2004–2012

	Green Collar[a]			
Characteristics	**Unadjusted Odds Ratio**	**Unadjusted Odds Ratio 95% CI**	**Adjusted Odds Ratio**	**Adjusted Odds Ratio95% CI**
Age (Ref = 18–24y)				
25–64y	1.39	1.31 – 1.47	1.38	1.30 – 1.46
65+y	1.00	0.90 – 1.11	0.97	0.87 – 1.08
Gender (Ref = Female)				
Male	3.35	3.21 – 3.49	3.27	3.13 – 3.41
Race (Ref = White)				
Black	0.88	0.83 – 0.93	0.92	0.87 – 0.97
Other	0.93	0.87 – 1.01	0.95	0.88 – 1.03
Ethnicity (Ref = Non-Hispanic)				
Hispanic	1.02	0.97 – 1.06	0.91	0.86 – 0.96
Educational Attainment (Ref = HS+)				
HS	1.41	1.36 – 1.46	1.37	1.32 – 1.43
<HS	1.30	1.23 – 1.37	1.27	1.20 – 1.35
Health Insurance Status (Ref= Insured)				
Uninsured	0.86	0.82 – 0.91	0.79	0.75 – 0.83
Geographic Region (Ref = Northeast)				
Midwest	1.17	1.11 – 1.24	1.15	1.08 – 1.22
South	1.10	1.04 – 1.16	1.12	1.00 – 1.18
West	1.07	1.01 – 1.14	1.10	1.04 – 1.17
Special Equipment Needs (Ref= none)				
Yes, Equipment Needs	0.97	0.82 – 1.11	0.89	0.76 – 1.03
Functional Limitations (Ref = no limits)				
Yes, Any functional Limitations	0.89	0.85 – 0.94	1.02	0.97 – 1.07
Body Mass Index (Ref = normal weight)				
Underweight	0.79	0.66 – 0.95	1.03	0.85 – 1.25
Overweight	1.37	1.32 – 1.43	1.05	1.00 – 1.10
Obese	1.37	1.31 – 1.43	1.13	1.08 – 1.18
Hearing Impairment (Ref=no hearing impair)				
Yes, Hearing Impairment	1.29	1.22 – 1.35	1.11	1.05 – 1.17
Visual Impairment (Ref = No visual impair)				
Yes, Visual Impairment	0.91	0.85 – 0.97	0.99	0.92 – 1.07
Size of Company (Ref 250+ employees)				
1–9 employees	0.69	0.66 – 0.72	0.64	0.61 – 0.68
10–24 employees	0.78	0.74 – 0.82	0.72	0.68 – 0.76

Characteristics	Unadjusted Odds Ratio	Unadjusted Odds Ratio 95% CI	Adjusted Odds Ratio	Adjusted Odds Ratio95% CI
		Green Collar[a]		
25–49 employees	0.84	0.79 – 0.89	0.81	0.76 – 0.86
50–99 employees	0.84	0.79 – 0.89	0.86	0.81 – 0.91
100–249 employees	1.00	0.95 – 1.06	0.97	0.91 – 1.03
Type of Employment (Ref= Private Co.)				
Federal Government	0.63	0.56 – 0.71	0.53	0.47 – 0.60
State Government	0.35	0.32 – 0.39	0.37	0.33 – 0.41
Local Government	0.42	0.39 – 0.46	0.44	0.40 – 0.48
Self-Employed/Family Business without pay	0.69	0.65 – 0.74	0.77	0.71 – 0.83
More than one Job (Ref = no)				
Yes, more than one job	0.73	0.68 – 0.78	0.81	0.76 – 0.87

[a]Reference group is Non-Green