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Prevalence of Cardiovascular Health by Occupation: A Cross-Sectional Analysis Among U.S. Workers Aged ≥45 Years

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Abstract

Introduction—Identification of groups with poor cardiovascular health (CVH) can inform where and how to target public health efforts. National prevalence estimates of CVH were derived for clinical (blood glucose, total cholesterol, blood pressure) and behavioral (BMI, diet quality, physical activity, smoking) factors among U.S. workers aged ≥45 years.

Methods—This cross-sectional analysis included 6,282 employed black and white men and women aged ≥45 years enrolled in the national population-based REasons for Geographic And Racial Differences in Stroke study from 2003 to 2007. Each CVH factor was scored as ideal (2), intermediate (1), or poor (0) according to American Heart Association criteria, and summed to define optimal composite scores: CVH (sum, 10–14), clinical (sum, 5–6), and behavioral (sum, 6–8) health. Occupational data were collected 2011–2013. Analyses were conducted in 2016.

Results—Only 14% met ideal criteria for all three clinical health factors, and none met ideal criteria for all four behavioral health factors. Sales and low status office workers had a low prevalence of optimal CVH. Service workers in protective services and the food preparation and serving occupations had a low prevalence of optimal clinical health; computer and healthcare support workers had a low prevalence of optimal behavioral health.

Conclusions—The prevalence of optimal CVH among middle-aged and older workers in the U.S. is low, but considerable differences exist by occupation. Targeted public health interventions

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may improve the CVH of at-risk older workers with different clinical and behavioral risk factor profiles employed in diverse occupational settings.

INTRODUCTION

Evidence shows that individuals who reach middle age with ideal cardiovascular health (CVH) enjoy a substantially reduced lifetime risk of cardiovascular disease (CVD).[1] Yet, CVD occurs among more than half (53%) of those aged <60 years, and circulatory diseases are a leading cause of death and permanent disability among workers.[2,3] Deteriorated health and disability is the leading cause of premature retirement in the U.S.[4] Understanding how the CVH profile of the U.S. workforce varies could call attention to modifiable social and environmental conditions at work that may influence the adoption of healthy lifestyles in at-risk groups, informing where and how to target and coordinate community and worksite public health efforts to reduce the burden of CVD.

The prevalence of cardiovascular risk factors among workers employed across diverse sectors of the U.S. economy has been previously reported from national population surveys, such as the National Health and Nutrition Examination Survey, National Health Interview Survey, and Behavioral Risk Factor Surveillance System,[5–7] but non-comparability of clinical definitions, reliance on self-reported clinical risk factor data (National Health Interview Survey, Behavioral Risk Factor Surveillance System), or focus on only a subset of risk factors yield an incomplete understanding of the CVH profile of the U.S. workforce. The American Heart Association's (AHA's) criteria for defining CVH[8] was applied to an existing cohort of 6,282 employed older (aged ≥45 years) men and women within the REasons for Geographic And Racial Differences in Stroke (REGARDS) study to generate national estimates of the CVH profile of middle aged and older workers—the fastest-growing segment of the U.S. workforce.[9] Adjusted prevalence ratios of coronary heart disease (CHD) or stroke (CHD/stroke) were also computed to inform the extent of the need for secondary and tertiary prevention within different segments of the U.S. workforce.

METHODS

Study Sample

The REGARDS study is a large national population-based cohort of 30,239 non-Hispanic black and non-Hispanic white men and women aged ≥45 years enrolled from 2003 to 2007 by completing a computer-assisted telephone interview, a clinical exam, and self-administered questionnaires.[10] The study was designed to provide equal representation of men and women, and oversampled black individuals and people living in the "stroke belt/buckle" of the U.S. (Georgia, Alabama, North Carolina, South Carolina, Tennessee, Arkansas, Mississippi, and Louisiana). Consent was obtained verbally by phone and later in writing during the clinical exam. The IRB at the University of Alabama at Birmingham approved the study methods.

The sample was drawn from the REGARDS occupational ancillary study, comprising 17,648 participants who consented verbally and completed an occupational survey by computer-assisted telephone interview from 2011 to 2013 (87% response rate among those

still enrolled).[11] The ancillary study was approved by IRBs at the University of Alabama at Birmingham and National Institute for Occupational Safety and Health. Participants were eligible for inclusion if they were employed at least part-time at enrollment when clinical and covariate data were collected (n=7,532).

Measures

Participants were defined as having CHD if they reported at enrollment having a prior CHD diagnosis (myocardial infarction, coronary artery bypass grafting, angioplasty, or stenting) or if electrocardiogram findings showed evidence of myocardial infarction. Stroke cases were identified from participants responding yes to the question: Have you ever been told by a physician that you had a stroke? CHD/stroke criteria were met by 716 participants.

Ideal, intermediate, and poor cardiovascular health profiles were constructed from AHA's Life's Simple 7 (LS7) framework based on seven modifiable risk factors for CVD.[8] The framework classifies and scores three clinical (fasting blood glucose [BG], total cholesterol, and blood pressure [BP]) and four behavioral (BMI, diet quality, physical activity [PA], and smoking) risk factors as ideal (2), intermediate (1), and poor (0) according to standard criteria, and defines ideal CVH as achieving a score of ideal on all seven factors. Composite measures of overall CVH (LS7), clinical health (three factors), and behavioral health (four factors) were computed from the sum of the individual risk factor scores, with composite scores ranging from 10–14 (LS7), 5–6 (clinical), and 6–8 (behavioral) classified as "optimal," composite scores ranging from 5–9 (LS7), 2–4 (clinical), and 3–5 (behavioral) classified as "moderate," and composite scores ranging from 0–4 (LS7), 0–1 (clinical), and 0–2 (behavioral) classified as "inadequate." AHA risk factor classification criteria were replicated as closely as possible (Appendix A).

At enrollment, a clinical exam was performed by a nationwide network of trained healthcare professionals (Examination Management Systems, Incorporated, Irving, TX) using a standardized protocol for data collection and the handling, storage, and shipment of blood to a central laboratory at the University of Vermont.[12] After being seated for 5 minutes, participants' BP was taken twice using a standard protocol and mean values for systolic and diastolic BP were used in analyses. Total cholesterol, BP, and BG were classified according to AHA criteria; however, modifications were made for those with non-fasting BG (mg/dL): <140 (ideal), 140–199 or <140 treated (intermediate), and ≥200 or ≥140 treated (poor), consistent with diagnostic criteria for oral glucose tolerance testing.[13]

Participants' BMI was computed from body weight and height measured during the clinical exam. PA was assessed from the response to the question: How many times [per week] do you engage in intense physical activity, enough to work up a sweat? PA was scored "ideal" for a response of ≥4 times, intermediate for 1 to 3 times and poor for 0. Smoking was assessed from responses to questions about smoking history and tobacco use. BMI and cigarette smoking were classified according to AHA criteria.

Dietary quality for the 12 months preceding enrollment was based on participant responses on the self-administered Block Food Frequency Questionnaire.[14] Participants were instructed to return the completed questionnaire in a self-addressed stamped envelope (72%

response). Dietary quality was classified according to AHA criteria with one modification: For the 1,518 participants (87% free of CHD/stroke) whose questionnaire was fully or partially incomplete, a score of intermediate was assigned because attainment of "ideal diet" in accordance with AHA guidelines is rarely observed in population-based samples in the U.S.[15] Diet information for the cohort was found in prior analyses to not be missing at random, and results have been found to be similar whether participants missing diet information were excluded, or were all assumed to have a poor or intermediate diet.[16]

An occupational survey was administered during routine biannual telephone follow-up. Standard narrative data were collected for type of industry, job title, and main job duties for the job held at enrollment, and Census occupation codes were assigned as detailed elsewhere.[11] A standard crosswalk was downloaded from the Department of Labor's National Crosswalk Service Center (www.xwalkcenter.org/) and used to convert U.S. Census occupation codes to broad and major aggregate Standard Occupation Classification codes.[17] Farming, fishing, and forestry was combined with construction and extraction owing to small numbers.

Statistical Analysis

Statistical analyses were performed in 2016 using SAS, version 9.3. Prevalence data were weighted by the inverse probability of sampling to account for oversampling of blacks and individuals residing in the stroke belt/buckle. Revised analytic weights were applied reflecting sampling probabilities for the occupational ancillary study subsample, as described and performed for other national surveys.[18,19] When examining differences by occupation group, CHD/stroke prevalence was derived from the full sample (n=6,282) and the prevalence of composite LS7 factors were derived among those free of CHD/stroke (n=5,566). Adjusted prevalence ratios (APRs) were computed using weighted proportional hazards regression (SURVEYPHREG procedure) with no event time data, as described by Lee in 1994.[20] Separate models were run to calculate APRs for each of the three CVH groups. For continuous smoking variables, testing for occupation differences was performed using weighted linear regression (SURVEYREG procedure). All APRs adjusted for age, race, sex, and region (stroke belt versus other). Significance was defined by exclusion of the null from 95% CIs. In statistical testing, each occupation was compared with all other groups combined to highlight those occupations with exceptionally high or low prevalence.

Sensitivity analysis were performed, restricted to those aged 45–64 years, to examine the influence of the oldest workers in the sample (aged ≥65 years) on the findings. An additional sensitivity analysis was performed without the exclusion of 716 workers with CHD/stroke as a way to assess the possible impact of health-related selection into or out of occupations. A final sensitivity analysis was performed additionally adjusting for income and education to evaluate the extent to which the prevalence of the LS7 is patterned by occupation independent of background SES.

RESULTS

The study sample comprised 6,282 participants after exclusions for small numbers (military, n=3) and missing any of the following: enrollment job (n=823), occupation code (n=13),

clinical/behavioral data (n=303), and CHD/stroke (n=108). Compared with the study sample, those excluded were more likely to be older (34.8% vs 20.2% aged ≥65 years), female (55.1.9% vs 51.7%), have lower income (29.3% vs 23.7% <$35,000), lower education (43.7% vs 47.8% college graduates), and were more likely to have higher CHD/stroke prevalence (15.9% vs 11.4%); they did not differ in race, region, and composite CVH measures. The sample represents a population of >91.5 million U.S. workers.

Sociodemographic, clinical, and behavioral health characteristics of participants are shown overall and by CHD/stroke status in Table 1. The sample was approximately half male and majority white. Forty percent were aged 45–54 years and nearly one third were aged ≥65 years. Approximately half were college graduates, one third had a household income of ≥ $75,000, and nearly 20% lived in the stroke belt region. Participants were primarily wage employed, with more than half employed in management and professional occupations, nearly one quarter employed in sales, office, and administrative support, and <10% in each of the remaining three broad occupation categories. For most (73%), the enrollment job was the job held the longest.

More than three quarters of middle-aged and older workers in the U.S. satisfied ideal criteria for BG and smoking; however, <40% satisfied ideal criteria for remaining factors: cholesterol (38%), BP (32%), BMI (29.3%), PA (31.2%), and quality diet (0%) (Table 1). Workers with CHD/stroke had a higher prevalence of poor glucose, hypertension, and were more likely to be overweight, but also had a lower prevalence of “poor” (uncontrolled) cholesterol, and were more likely to attain ideal PA levels and recently quit smoking cigarettes, compared with those without evidence of CHD/stroke.

Within broad occupation categories, natural resources, construction, and maintenance occupations had a significantly lower prevalence of CHD/stroke (APR=0.60), compared with all other groups combined (Figure 1). Within the major categories, significantly higher prevalence of CHD/stroke was found for personal care (APR=2.05) and business/finance (APR=1.80) occupations. CHD/stroke risk was lower among managers (APR=0.58) and occupational groups requiring skilled manual labor (i.e., installation, maintenance, and repair) (APR=0.45).

Among middle-aged and older workers free of CHD/stroke, 14% satisfied the criteria for ideal on all three clinical factors and none satisfied the criteria for ideal on all four behavioral factors (10% excluding diet quality) (Figure 2). The prevalence of ideal CVH (i.e., satisfying ideal criteria for all LS7) was 0%, or 3% excluding diet quality.

Composite CVH measures (LS7, clinical, behavioral) among those free of CHD/stroke are shown overall and by broad and major occupation in Table 2. The prevalence of optimal composite LS7 was nearly one third overall, and was significantly higher for managers, architects, and engineers. Significantly lower prevalence of optimal LS7 was found for those employed in sales, office, and administrative support combined and all service occupations combined. The overall prevalence of optimal clinical health was 42% and was significantly lower among service occupations, especially among protective service and food preparation and serving occupations. Prevalence of optimal behavioral health was 19.2% overall and

significantly higher for scientists. Optimal behavioral health was significantly lower for sales, and office and administrative support occupations combined, computer and math sciences, and healthcare support occupations. Results for the prevalence of individual LS7 components are reported in Appendix B.

Restricting the analysis to those aged 45–64 years had limited impact on overall and broad between-occupation differences in CVH profiles (Appendix C). The inclusion of CHD/stroke cases generally reinforced distinctions between those occupation groups with optimal versus inadequate CVH profiles (Appendix D). Additional adjustment for income and education slightly attenuated contrasts in the major occupational group differences, but the broad occupation differences were mostly unchanged despite likely overspecification of statistical models due to covariation between occupation, income, and education (Appendix E).

DISCUSSION

National estimates of the prevalence of AHA's LS7 were generated for older U.S. workers who compose the fastest-growing segment of the U.S. workforce.[21] Although employed individuals are often healthier than the general population, a phenomenon known as "healthy worker effect,"[22] findings showed that ideal CVH among older workers free of CVD is low. These results are consistent with other investigations evaluating the prevalence of cardiovascular risk factors among U.S. workers.[7,23] The findings additionally showed that the national prevalence of CHD/stroke is 11.6% among workers aged ≥45 years, representing >10.6 million workers. Study findings underscore the need for effective primary and secondary prevention in high-risk segments of the working population.[24]

This study found CHD/stroke and CVH to vary significantly by broad and major occupation group. Managers had a lower prevalence of CHD/stroke as well as a higher prevalence of optimal CVH. CVH profiles were more favorable for those employed in management and professional occupations and less favorable for those employed in service occupations or in sales, office, and administrative support positions. The broad and major occupation groups represent distinct social and environmental conditions of work, including job autonomy and work schedule demands, linked empirically to cardiovascular disease, including indirectly through behavioral pathways.[25–28]

There is increased recognition that health promotion programs should consider "upstream" social and environmental determinants, including job demands and workplace characteristics.[29–31] In 2009, NIH and the Centers for Disease Control and Prevention convened a multidisciplinary workshop to outline the conceptual framework and research needs addressing prevention through the integration of workplace health promotion and health protection (from occupational hazards),[32] which was adopted as a policy statement by AHA.[33] An important workshop theme corroborated by findings from this study is the disproportionate risk factor clustering of some groups of workers employed in the low wage service sector of the labor market, who are often employed by small firms[34] and accrue a disproportionate share of the costs attributed to workrelated fatal and non-fatal injuries and illnesses.[35]

Although smoking behaviors are generally adopted by young adulthood before strong workplace ties are formed, research shows that smoking cessation, relapse, and intensity vary by occupation[36–38] and are influenced by many of the same employment conditions associated with obesity and low leisure time PA—occupational stressors such as shift work, long work hours, high job demands, and low autonomy.[39–41] The measurable impact of legislative and other smoke-free workplace policies on higher quit rates among workers,[42] and concomitant reductions in secondhand smoke exposure among their non-smoking peers,[43] illustrate the type of coordination and action needed among diverse public health stakeholders working in and outside the workplace to improve CVH among workers.

Emerging evidence suggests that barriers faced by low-wage workers to increase leisure time PA, improve diet, and maintain a healthy BMI include time poverty, job stress, workplace injury, and excessive physical job demands (e.g., prolonged standing).[31,44] Correspondingly, population-level health policies should augment workplace-centered policies to advance the health of the most vulnerable segments of the workforce. Examples include food and beverage procurement policies,[45] universal smoke-free policies,[42] living wage legislation,[46,47] paid sick leave,[48] and restrictions on mandatory overtime.[49] Additionally, workplace policies and programs are needed to reduce job hazards to conditions such as sedentary work, workplace psychosocial stressors, and shift work associated with CVD risk factors and events.[27,28,50] Finally, communitybased programs are needed that simultaneously address health protection and health promotion to serve workers in the growing contingent workforce and in small firms.[51,52]

Strengths of the study include the large national population-based sample of older black and white men and women employed among 77% of U.S. Census occupations. This is the first investigation of AHA's LS7 in a national sample with biometric measures, allowing for the identification of the CVH profile of older understudied workers, including blacks, women, and those employed in the growing service sector. The definition for CHD was partially based on self-report, but included electrocardiogram evidence.

Limitations

This study has several limitations. The analysis was based on a cross-sectional assessment of participants' employment and health at enrollment, obscuring temporal relationships. Analyses produced few statistically significant results for those employed in manual occupations, where a smaller number of participants were employed. Occupational data were collected a median of 6.5 years after enrollment, so the sample excludes participants who withdrew from the study, who remained active but declined participation in the ancillary study, or who reported inconsistencies in their employment data.[12] Self-reports of PA focused on weekly frequency counts of highintensity activity and did not account for lower activity intensity and duration. Although revised sample weights were applied to account for actual sampling probabilities for the ancillary study subsample, residual sampling bias in the national prevalence estimates cannot be ruled out. Occupation groups with a disproportionate share of whites and blacks may be over-or underrepresented in the sample; findings are not expected to be generalizable to older workers from other racial groups.

CONCLUSIONS

The main findings highlight significant CHD/stroke burden among older U.S. workers, which is underscored by a generally poor CVH profile among workers free of CHD/stroke. Sustaining the workability of older workers who desire to work past the formal age of retirement, or for whom continued work is an economic imperative, is critical. Targeted primary and secondary prevention efforts are needed that consider the social and environmental conditions of work among at-risk older workers employed in diverse occupational settings.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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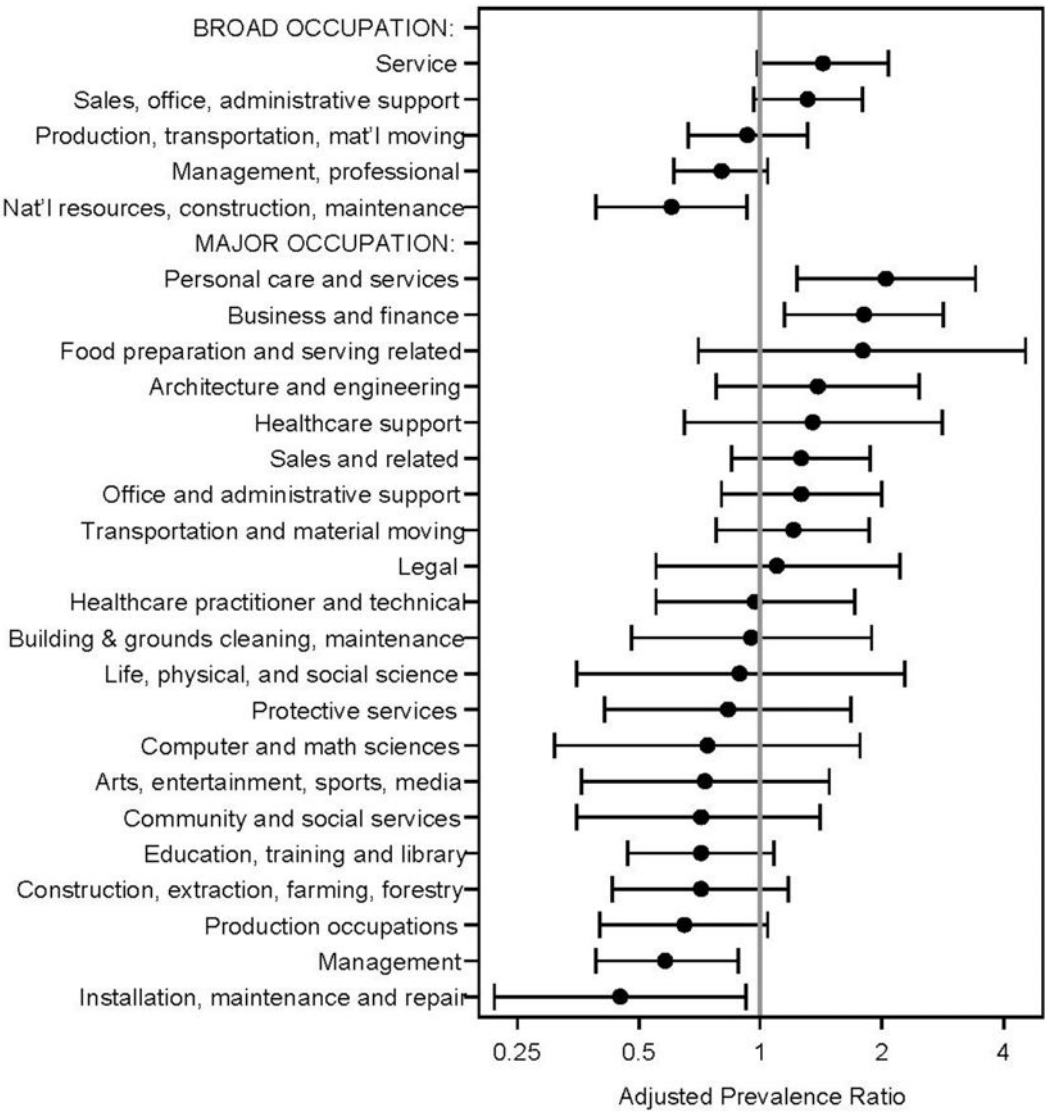

Figure 1.

Adjusted prevalence ratios for coronary heart disease/stroke by broad and major occupation group among U.S. workers aged ≥45 years. In statistical testing each employment group was compared with all other groups combined; bars indicate 95% CIs.

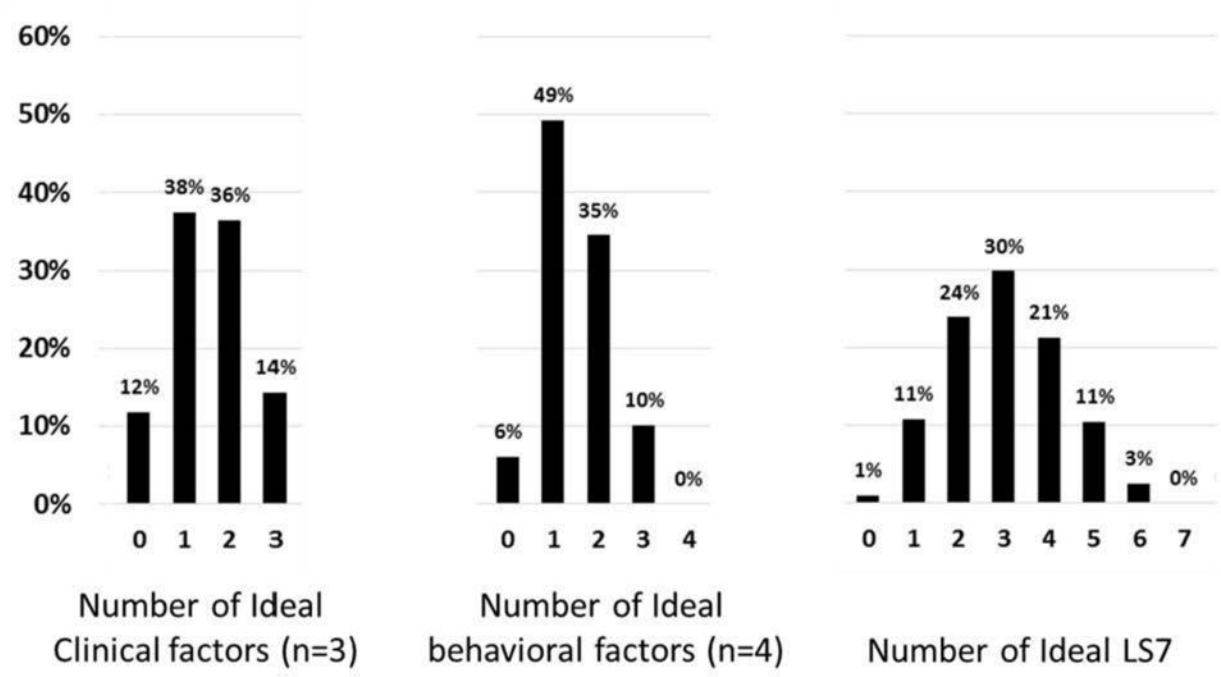

Figure 2.

The proportion of U.S. workers aged ≥45 years free of coronary heart disease/stroke by the number of ideal cardiovascular risk factors for three clinical factors, four behavioral factors, and all seven LS7 factors.

LS7, American Heart Association's Life's Simple 7 framework

Table 1

Sociodemographic, Clinical, and Behavioral Health Characteristics of U.S. Workers Aged ≥45 Years

Characteristic	Full sample n=6,282[a] %	Evidence of coronary heart disease/stroke	
		Yes n=716 %	No n=5,566 %
Sex			
Women	51.9[b]	34.8	54.2
Men	48.1	65.2	45.8
Race			
Black	11.9	10.4	12.1
White	88.1	89.6	87.9
Age			
45–54 years	40.1	19.2	42.9
55–64 years	29.6	26.1	30.1
≥65 years	30.3	54.7	27.1
Education			
≤High school graduate	21.9	25.4	21.5
Some college	26.3	27.5	26.2
College graduate	51.7	47.1	52.3
Household income[c]			
<$35,000	21.4	25.0	20.9
$35,000–$74,999	34.5	30.9	35.0
≥$75,000	36.7	35.6	36.9
Residence by U.S. region[d]			
Stroke-belt	17.7	17.0	17.8
Other 40 contiguous states	82.3	83.0	82.2
Type of employment			
Self-employed	25.1	33.0	24.0
Wage employed	74.9	67.0	76.0
Broad occupation group			
Management and professional	56.9	51.6	57.6
Service	9.5	11.8	9.0
Sales, office, administrative support	22.5	26.4	22.1
Natural resources, construction, maintenance	4.3	3.2	4.6
Production, transportation, material moving	6.8	7.0	6.8
Blood glucose[e]			
<100 mg/dl (goal)	76.1	61.1	78.1
100–125 mg/dl or treated to goal[f]	16.5	22.3	15.8
>125 mg/dl	7.4	16.6	6.2
Total cholesterol			
<200 mg/dL (goal)	38.3	19.5	40.8

Characteristic	Full sample n=6,282[a] %	Evidence of coronary heart disease/stroke	
		Yes n=716 %	No n=5,566 %
200–239 mg/dL or treated to goal[f]	50.2	71.8	47.3
≥240 mg/dL	11.5	8.6	11.9
Blood pressure (mmHg)			
Systolic <120 and diastolic <80 (goal)	32.0	14.1	34.3
Systolic 120–139 or diastolic 80–89; treated to goal[f]	53.7	63.9	52.4
Systolic ≥140 or diastolic ≥90	14.3	22.0	13.3
Smoking			
Non-smoking (or quit >12 months)	88.3	86.8	88.5
Former smoker and quit ≤12 months	1.0	2.1	0.9
Current smoker	10.7	11.1	10.7
BMI			
<25 kg/m^2	29.3	26.0	29.7
25–29.99 kg/m^2	37.3	41.4	36.8
≥30 kg/m^2	33.4	32.6	33.5
Physical activity (PA)			
>4 times per week of intense PA	31.2	36.7	30.5
1–3 times per week of intense PA	41.2	35.2	42.0
None PA	27.5	28.1	27.5
Dietary quality[g]			
Satisfy 4–5 quality goals	0.0	0.0	0.0
Satisfy 2–3 quality goals	38.2	37.4	38.4
Satisfy 0–1 quality goals	61.8	62.6	61.6

[a] Values (n) in the table header are the unweighted sample size.

[b] Values (%) in the table represent the weighted prevalence.

[c] Unweighted number who did not report a household income: n=465 (409 without and 56 with coronary heart disease/stoke).

[d] The stroke-belt region is located in the southeastern U.S., comprising the following states: NC, SC, GA, TN, AL, LA, MS, AR.

[e] Unweighted number within sample who did not have a fasting blood n=689 (603 without and 86 with coronary heart disease/stroke); these participants were retained, and their non-fasting glucose measures were categorized as follows: <140 mg/dl (ideal), 140–199 mg/dl (intermediate) and >199 mg/dl (poor).

[f] The phrase “treated to goal” applies to participants taking prescription medication to treat the condition in question (e.g., blood glucose) and their corresponding clinical measures were in the lower “goal” or ideal range.

[g] Dietary quality was based on the number of diet goals that were met (up to 5) in accordance with criteria by the American Heart Association.[8] Those missing values for the healthy diet subcomponent (n=1,518) were assigned a value of 1 (intermediate).

PA, physical activity

Table 2

Composite Risk Factor Prevalence[a] Among Workers Aged ≥45 Years Free of Coronary Heart Disease/Stroke

Occupation group[b,c]	Composite LS7			Composite clinical health			Composite behavioral health		
	Optimal %	Moderae %	Inadequate %	Optimal %	Moderate %	Inadequate %	Optimal %	Moderate %	Inadequate %
Overall	31.1	65.5	3.4	42.0	55.0	2.0	19.2	68.1	12.7
Broad Occupation categories									
Management, professional	36.3	61.5	2.1	45.7	52.7	1.7	22.4	68.3	9.3
Service	19.9	74.4	5.8	28.5	68.2	3.3	14.0	69.1	17.0
Sales, office, administrati ve support	23.1	70.7	6.2	42.4	55.4	2.2	14.0	66.1	19.9
National resources, construction, maintenance	27.2	71.3	1.5	42.0	55.9	2.1	15.9	76.4	7.7
Production, transportation, material moving	30.3	65.7	4.0	41.9	55.6	2.5	17.7	66.6	15.7
Major occupation categories									
Management	39.4	58.0	2.6	46.3	51.8	1.9	25.1	66.9	8.0
Business and finance	26.4	71.6	2.0	46.1	51.8	2.1	13.0	67.8	19.2
Computer and math sciences	24.0	74.1	1.9	41.2	57.5	1.3	4.7	82.7	12.7
Architecture and engineering	47.4	50.1	2.5	55.1	43.7	1.1	23.1	70.5	6.4
Life, physical and social sciences	45.6	53.3	1.1	35.9	62.4	1.7	37.8	55.7	6.5
Community and social services	26.6	71.7	1.7	43.3	55.3	1.4	18.3	66.6	15.0
Legal	33.2	66.6	0.1	39.9	59.8	0.3	21.7	74.6	3.7
Education, training, and library	37.0	61.5	1.5	43.8	55.0	1.1	26.5	66.0	7.5
Arts, entertainment, sports, media	40.4	56.4	3.3	56.6	41.1	2.3	25.8	68.1	6.1
Healthcare practitioner and technical	36.2	61.2	2.6	45.0	52.6	2.4	17.2	72.9	9.9
Healthcare support	15.1	79.8	5.1	37.0	61.3	1.6	4.3	67.3	28.4
Protective services	16.3	70.3	13.4	22.0	75.6	2.4	15.4	62.7	21.9
Food preparation and serving related	19.8	78.2	2.0	21.4	76.1	2.5	10.6	80.5	8.9
Building and grounds cleaning, maintenance	27.5	69.0	3.5	26.6	69.4	3.9	23.3	60.3	16.4
Personal care and services	19.1	76.5	4.5	33.2	62.1	4.6	12.7	75.6	11.7
Sales and related	23.6	67.6	8.8	40.1	56.4	3.5	14.7	66.9	18.4
Office and administrative support	22.6	73.4	4.0	44.4	54.5	1.1	13.4	65.3	21.2
Construction, extraction, farming, forestry	23.8	74.6	1.6	40.3	58.0	1.7	15.3	75.8	8.9
Installation, maintenance and repair	32.1	66.7	1.2	44.6	52.7	2.7	16.8	77.3	5.9

Occupation group[b,c]	Composite LS7			Composite clinical health			Composite behavioral health		
	Optimal %	Moderae %	Inadequate %	Optimal %	Moderate %	Inadequate %	Optimal %	Moderate %	Inadequate %
Production occupations	36.1	59.7	4.2	46.0	50.5	3.6	16.1	68.0	16.0
Transportation and material moving	22.5	73.8	3.7	36.5	62.5	1.1	20.0	64.8	15.3

[a] Prevalence weighted by sex, race, age, and region.

[b] Each occupation group was compared with all other groups combined. Boldface indicates statistically significant ($p<0.05$) group differences, adjusted for sex, race, age, and region.

[c] The broad occupation category “natural resources, construction, and maintenance” includes three major occupation groups: (1) farming, fishing, and forestry, (2) construction and extraction (i.e., mining), (3) installation, maintenance and repair.

LS7, American Heart Association’s Life’s Simple 7 framework