

Occupational Differences Among Employed Adults Who Met 2008 Federal Guidelines for Both Aerobic and Muscle-strengthening Activities: United States, 2008–2014

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Abstract

Objective—This report presents national estimates of occupational differences among employed adults meeting the 2008 federal guidelines for both aerobic and muscle-strengthening activities performed during leisure time from 2008 through 2014.

Methods—Using pooled data from the 2008–2014 National Health Interview Survey, age-adjusted percentages of currently employed adults aged 18–64 who met the 2008 federal physical activity guidelines for leisure-time aerobic and muscle-strengthening activities are shown by occupation, sex, race and Hispanic ethnicity, education, and hours worked in the week before the survey interview.

Results—Among all employed adults aged 18–64, those in production and related occupations were the least likely to meet the 2008 federal physical activity guidelines for both aerobic and muscle-strengthening activities performed during their leisure time. Across occupation categories, men were more likely than women to meet the guidelines. Non-Hispanic white adults in professional, teaching or social service, sales, and services occupations were more likely than non-Hispanic black or Hispanic adults in those occupations to meet the guidelines. In production and related occupations, Hispanic adults were less likely to meet the guidelines than non-Hispanic adults; in managerial occupations, by contrast, all adults were equally likely to meet the guidelines regardless of their race and ethnicity. The likelihood of meeting the guidelines uniformly increased as education increased across every occupation category. Lastly, employees in professional, services, and sales occupations who worked 50 hours or more in the last week were more likely to meet the guidelines than their counterparts who worked fewer hours. In production and related occupations, by contrast, the number of hours worked in the last week was unrelated to whether adults met the guidelines.

Conclusion—Occupational differences in meeting the 2008 federal guidelines for both aerobic and muscle-strengthening activities by sex, race and ethnicity, and education suggest that disparities in leisure-time physical activities across occupations and socioeconomic strata exist.

Keywords: work • employment • leisure-time physical activity • National Health Interview Survey

Introduction

Previous studies have demonstrated that regular participation in physical activity lowers the risk of many chronic conditions, disability, and mortality (1,2). The 2008 U.S. Department of Health and Human Services (HHS) physical activity guidelines recommend that, for substantial health benefits, adults perform at least 150 minutes per week of moderate physical activity, or 75 minutes per week of vigorous physical activity, in addition to muscle-strengthening activities 2 or more days per week (3). Healthy People (HP) 2020 considers adequate physical activity a “leading health indicator,” with 20.1% being the 2020 target for meeting physical activity guidelines among adults (4,5). Physical activity that meets these guidelines can be recreational and take place strictly during leisure time; it can be occupational and take place during the performance of work (including household tasks); and it can include walking or cycling specifically for transportation or commuting, an activity that is simultaneously nonleisure and nonoccupational.

Occupational physical activity contributes less to *total* physical activity



than it once did, due in large part to historical and technological changes in the nature of work in the United States. Since the 1960s, the United States has shifted from a goods production economy, which required moderate-intensity physical activity from a majority of workers, to a service economy requiring minimal physical activity from most workers, such that a majority now perform work that is largely sedentary (6–8). Consequently, most adults who currently meet the 2008 federal physical activity guidelines do so by participating in leisure-time physical activity (LTPA).

Even though LTPA and occupational physical activity both contribute to total physical activity, they may not be equivalent activities, and even more importantly, may not have comparable health benefits. Although previous research has consistently demonstrated that LTPA has positive benefits across a variety of health outcomes, findings regarding the health benefits of occupational physical activity have been somewhat mixed (9–13), with some studies concluding that occupational physical activity can have less than positive effects on various health outcomes, as well as on mortality (14,15). Thus, even among adults who are physically active on the job every workday, those who engage in LTPA are likely to report better health than those who do not.

Understanding occupational differences in LTPA is important because a job defines how the average person spends much of his or her day, including both work and nonwork time. Work attributes vary across occupations and may affect participation in LTPA. Examples of such variation include the kind or amount of physical exertion (or lack thereof) expended while at work and the number of hours worked per week (e.g., part- or full-time work, as well as overtime). These occupation-related factors may create constraints that act as barriers to participation in LTPA (16,17): Adults who are employed in physically demanding occupations or who work long hours may be too tired or not have the time to engage in LTPA once their workday is over, ultimately

resulting in poorer health outcomes for U.S. workers in particular occupations.

Using the most recent data available, this report examines the extent to which employed U.S. adults aged 18–64 met the federal government’s physical activity guidelines for both aerobic and muscle-strengthening activities, by their occupation and other selected demographic and socioeconomic characteristics.

Methods

Data source

Data in this report are from the combined 2008–2014 National Health Interview Survey (NHIS), a multipurpose, cross-sectional health survey of the U.S. civilian noninstitutionalized population based on a stratified multistage sampling design of U.S. households (18). NHIS is conducted continuously for the National Center for Health Statistics by trained interviewers from the U.S. Census Bureau. Data are collected in person at the respondent’s home using computer-assisted personal interviewing, but follow-ups for completing interviews may be conducted over the telephone if necessary. The main objective of NHIS is to monitor the health of the U.S. population through the collection and analysis of data on a broad range of health topics. More information on NHIS is available from: <http://www.cdc.gov/nchs/nhis.htm>.

The survey consists of both a core set of questions that remain relatively unchanged from year to year as well as supplemental questions that are not asked every year (19). The core consists of four main components: Household Composition Section, Family Core, Sample Child Core, and Sample Adult Core. The Household Composition Section collects basic demographic and relationship information about all household members of all families living in a household at the time of interview. The Family Core, which is administered separately for each family in the household, collects sociodemographic and basic health information about all family members.

The Sample Adult Core obtains additional information on the health of one randomly selected adult (the “sample adult”) in the family. The sample adult generally responds for himself or herself, but in rare instances when the sample adult is mentally or physically incapable of responding, proxy responses are accepted. The Sample Adult Core collects information on health conditions, functional limitations, health behaviors (including LTPA), access to and use of health care services, and current employment characteristics (including occupation). The 2008–2014 NHIS Sample Adult data files include a total of 215,462 respondents; of these, 118,507 were aged 18–64 and currently employed during the week before the NHIS interview.

Variables of interest

LTPA information is obtained from a series of questions in the Sample Adult Core that ask about frequency and duration of vigorous-intensity physical activities (“that cause heavy sweating or large increases in breathing or heart rate”), light or moderate-intensity physical activities (“that cause only light sweating or a slight to moderate increase in breathing or heart rate”), and muscle-strengthening activities (“such as lifting weights or doing calisthenics”). These questions are all phrased in terms of current leisure-time behavior and lack a specific reference period (e.g., “How often do you do vigorous leisure-time physical activities for at least 10 minutes that cause heavy sweating or large increases in breathing or heart rate?”). Thus, no information is obtained regarding *how long* the respondent has been engaging in LTPA. Answers could be provided in any time unit (per day, per week, per month, or per year). Roughly 2% of currently employed sample adults aged 18–64 refused to answer or did not know how much time they spent performing LTPA, and, thus, could not be coded ($n = 2,507$).

Responses to these questions were used to identify sample adults who, in their leisure time, performed muscle-strengthening activities two or more

times per week *and* participated in either moderate-intensity aerobic physical activity for at least 150 minutes per week or vigorous-intensity aerobic physical activity for at least 75 minutes per week (or an equivalent combination)—in other words, the group of adults who met the 2008 physical activity guidelines for *both* muscle-strengthening and aerobic activities (available from: <http://www.health.gov/PAGuidelines/>), who are the focus of this report. Percentages of employed adults aged 18–64 who met the muscle-strengthening activity guidelines but not the aerobic guidelines; who met the aerobic activity guidelines but not the muscle-strengthening guidelines; and who did not meet either set of guidelines (because they “never” engaged in aerobic or muscle-strengthening activities, were unable to do these activities, or engaged in lesser amounts of activity that did not satisfy the guideline requirements) are shown in [Figure 1](#) but not in subsequent figures.

The HHS federal guidelines for physical activity were released in 2008 and served as the basis for formulating the HP 2020 physical activity objectives (5). Note that these guidelines include all types of aerobic and muscle-strengthening activities and are not restricted to LTPA alone. Because NHIS physical activity questions ask only about LTPA, the estimates presented in this report may underestimate the proportion of U.S. adults who meet the HP 2020 physical activity objectives. The terms “2008 federal guidelines,” “2008 guidelines,” or “guidelines” are used interchangeably to refer to the *2008 Physical Activity Guidelines for Americans*.

The Sample Adult Core also obtains information from respondents on their employment status during the week before the interview as well as their current industry and occupation. All currently employed respondents were asked the name of their employer, the type of industry in which they worked, the kind of work they did (i.e., their occupation), and the important activities they performed while on the job. Their verbatim responses were subsequently assigned to four-digit industry and

occupation codes by Census Bureau coding specialists. The two-digit detailed occupation recode available on the 2008–2014 public-use NHIS Sample Adult files was used to assign respondents to one of six occupation categories. This six-category indicator is intended to distinguish between occupations in which persons are more likely to rely on mental attributes or thought processes (e.g., managerial, professional, and teaching or social services work) rather than physical attributes or repetitive and routinized processes (e.g., services, sales, and production and related work). Given previous research (20–22), the former occupations are likely to be more sedentary and the latter less so, with adults in the production and related occupations category being least sedentary and most likely to be engaged in on-the-job physical labor (although the placement of transportation workers—including long-haul truck drivers—in this category may weaken this effect). Note that this six-category occupation indicator is not intended to be a direct measure of physical activity at work—at best, it can only imply such activity. Roughly 2% of all employed sample adults aged 18–64 did not supply enough information to receive a four-digit Census occupation code ($n = 2,264$) and could not be coded to one of the following occupational categories. The final sample size for this study included 113,871 adults aged 18–64 with complete information on occupation and LTPA. Numbers in parentheses indicate the weighted, age-adjusted percentage of these adults in each occupational category:

- Managerial occupations: Chief executives; legislators; advertising, marketing, promotions, public relations, and sales managers; operations specialties managers; and other management occupations (9.3%).
- Professional occupations: Business and financial specialists; computer, mathematical, architectural, and engineering occupations; life science, physical science, and social science occupations; lawyers and judges; health care diagnosing and treating

practitioners; health technologists and technicians; and other practitioners and technical occupations (17.0%).

- Teaching or social service occupations: Counselors, social workers, religious workers, and all education, training, and library occupations (8.2%).
- Services occupations: Legal support workers (e.g., paralegals), health care support workers (e.g., assistants and aides), and office or administrative support workers; arts, design, entertainment, sports, and media occupations; all protective service occupations; food preparation and serving-related occupations; and personal care and service occupations (32.4%).
- Sales occupations: Retail sales workers and sales representatives (services, wholesale, and manufacturing) (10.5%).
- Production and related occupations: Grounds maintenance workers; farming, fishing, and forestry occupations; construction and extraction workers; installation, maintenance, and repair occupations; all production occupations; and all transportation and material moving occupations (22.6%).

See [Technical Notes](#) for a detailed breakdown of how this six-category occupation indicator is created.

Demographic variables

Estimates are shown with respect to several antecedent or demographic characteristics that are associated with either LTPA or occupation, such as sex, age, race and Hispanic ethnicity, education, and hours worked in the last week (before the interview). Most of these characteristics reflect the respondent’s status at the time of interview. Additionally, several characteristics (i.e., race and Hispanic ethnicity, education, and hours worked in the last week) are based on information obtained in either the Household Composition or the Family Core components of the NHIS interview, where a knowledgeable adult family member responded on behalf of sample

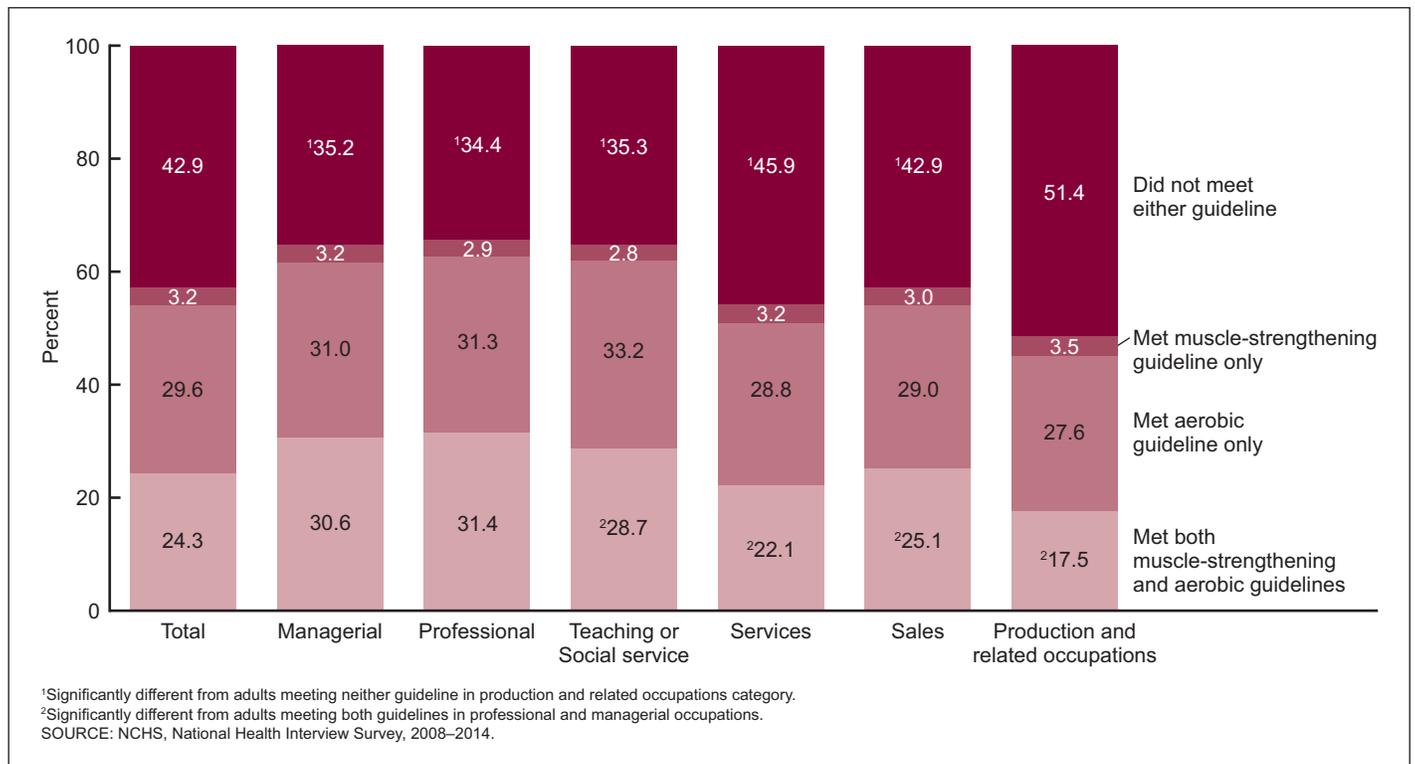


Figure 1. Age-adjusted percent distribution of participation in leisure-time aerobic and muscle-strengthening activities that met 2008 federal physical activity guidelines among employed adults aged 18–64, by type of occupation: United States, 2008–2014

adults not taking part in these portions of the interview.

Race and Hispanic ethnicity refers to adults who indicated a single race group; separate estimates are shown for Hispanic, non-Hispanic white, and non-Hispanic black persons. Adults in other race and ethnicity groups and those who are of multiple race are not included due to smaller sample sizes. Education is a three-level categorical variable (high school graduate, General Educational Development high school equivalency diploma, or less; some college but no degree; and bachelor's degree or higher), indicating the highest level of school completed or highest degree received at the time of interview. Education is shown for all employed adults, including those who may still be continuing their education.

Statistical analysis

The estimates presented in this report are based on data from the Sample Adult files of the 2008–2014 NHIS. Respondents with missing data or unknown information were excluded from the analysis. Over this survey

period, the conditional response rate for the Sample Adult interview was 79.3%; the final response rate was 62.3%. The 7 years of data were combined to increase the reliability of estimates for some of the smaller population subgroups. Reliability of estimates was evaluated using the relative standard error (RSE), which is the standard error divided by the estimate. Estimates with an RSE greater than 30% and less than or equal to 50% are preceded by an asterisk (*) and should be used with caution. No RSEs are greater than 50%.

Estimates are calculated using the sample adult sampling weights (adjusted for the number of survey years combined in the analysis) and are representative of the noninstitutionalized population of U.S. adults aged 18–64. Unless otherwise indicated, all estimates are age adjusted using the projected 2000 U.S. population aged 18–64 as the standard population and age groups 18–24, 25–34, 35–44, 45–54, and 55–64 (23,24). All estimates and standard errors used to create the figures in this report were calculated using SAS-callable SUDAAN version 11.0.0,

a software package that accounts for the complex sample design of NHIS (25). Estimates were compared using two-sided *t* tests at the 0.05 level. Terms such as “greater than” and “less than” indicate a statistically significant difference. Terms such as “not significantly different” or “no difference” indicate that no statistically detectable differences were seen between the estimates being compared.

Strengths and limitations of data

The estimates presented are based on data collected from a nationally representative sample of civilian noninstitutionalized U.S. adults. Using 7 years of combined data yielded a large sample size, providing reliable estimates for smaller population subgroups. Survey questions that were the sources for the variables used in the analysis did not change during these 7 years. Additionally, no significant change was seen in the prevalence of LTPA during 2008–2014—approximately 21% of U.S. adults aged 18 and over met the federal physical activity guidelines for both

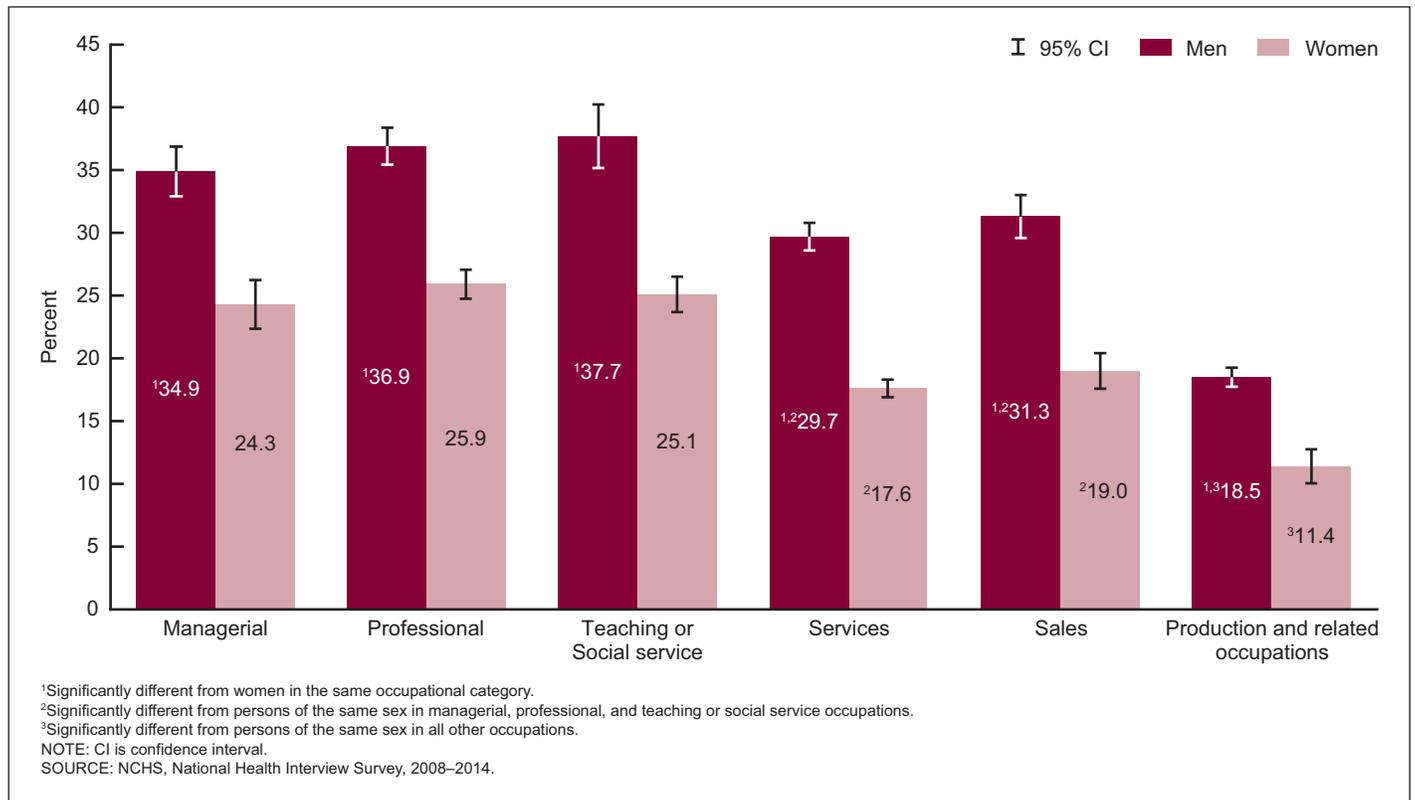


Figure 2. Age-adjusted percentage of employed adults aged 18–64 who met both aerobic and muscle-strengthening federal guidelines through leisure-time physical activity, by sex and type of occupation: United States, 2008–2014

muscle-strengthening and aerobic activities in each survey year.

There are several limitations to this study. NHIS obtains information from most respondents via an in-person interviewing process, with a typical interview averaging about 1 hour. As a result, all NHIS data are based on subjective self-reports collected from Sample Adult respondents. Self-reporting enhances data accuracy to the extent that respondents willingly provide information. However, respondents may provide incorrect information due to recall issues, because they did not understand the question, or because they have different cultural definitions of some of the concepts used in the survey questions. As with all surveys, respondents also may inflate self-assessments of their LTPA to avoid embarrassment or to create a favorable impression on the interviewer. Additionally, although proxy answers are accepted when the sample adult is physically or mentally incapable of self-response, these few sample adults

were not employed and, therefore, not included in the analytic sample.

Furthermore, NHIS is a cross-sectional survey that does not obtain retrospective information from sample adults regarding either their occupation history or how long they have been engaging in LTPA. Consequently, the estimates presented in this report can only be used to understand the extent to which occupation (reflected in the six categories used here) and LTPA vary together; causality or directionality in the occupation–LTPA relationship cannot be determined from NHIS data. As previously noted, the estimates in this report are also based on physical activity performed during respondents' leisure time; no information was obtained regarding occupation-related, transportation-related, or other types of physical activity performed during nonleisure time. Thus, *total* physical activity is underestimated to an unknown extent. Lastly, NHIS does not routinely collect information on other factors that might influence a worker's opportunities to engage in LTPA, such

as performing shift work, working at night, having flexible work schedules, or having access to employer-provided health promotion programs (including fitness facilities in the workplace, gym discounts, and other similar programs).

Results

Figure 1 shows weighted and age-adjusted percent distributions of participation in leisure-time aerobic and muscle-strengthening activities that met the 2008 federal physical activity guidelines for all currently employed adults aged 18–64, and then type of occupation. Overall, 42.9% of employed adults did not meet either guideline, 3.2% met the muscle-strengthening guideline only, 29.6% met the aerobic guideline only, and 24.3% met both guidelines.

Across occupations, 51.4% of adults employed in production and related occupations did not meet either guideline through LTPA, followed by adults employed in services (45.9%), sales (42.9%), managerial (35.2%),

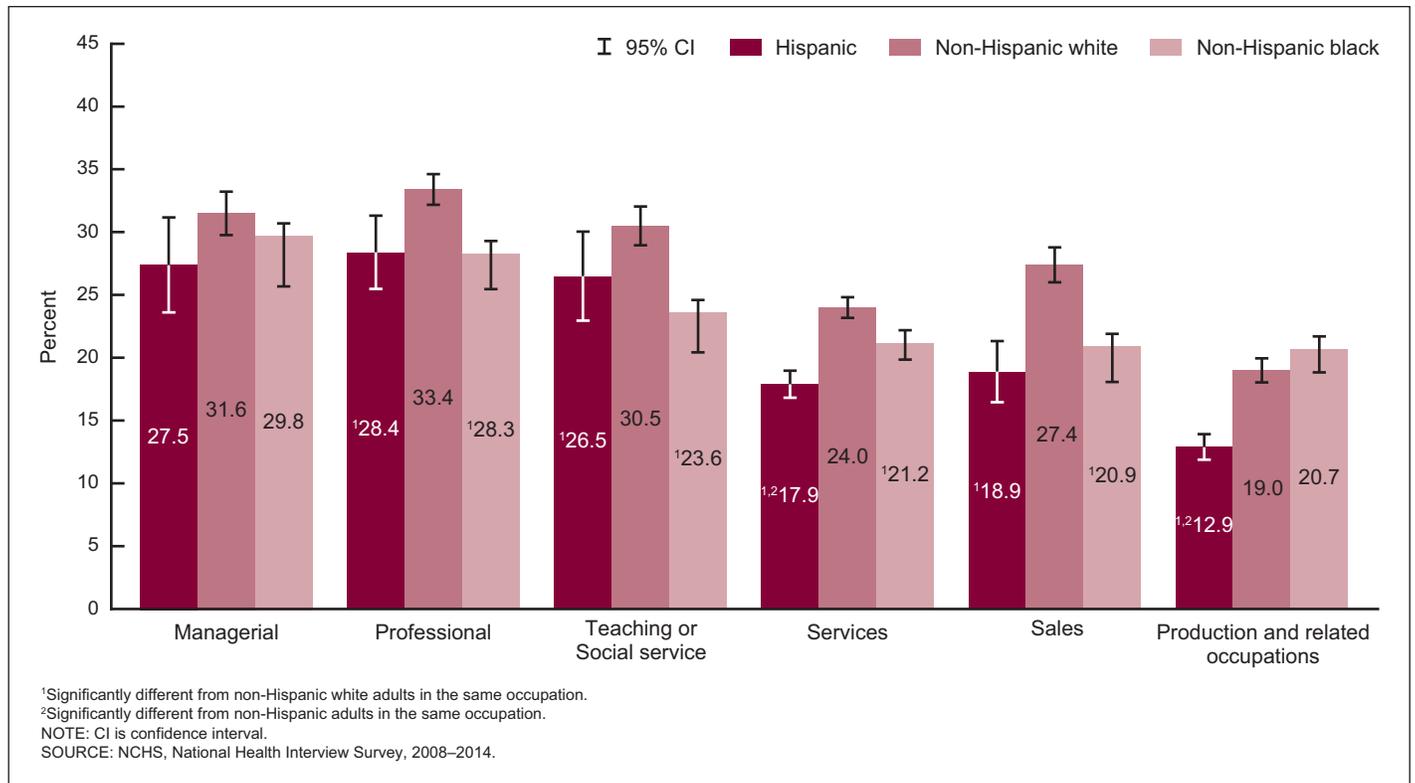


Figure 3. Age-adjusted percentage of employed adults aged 18–64 who met both aerobic and muscle-strengthening federal guidelines through leisure-time physical activity, by race and ethnicity and type of occupation: United States, 2008–2014

professional (34.4%), and teaching or social service occupations (35.3%).

Conversely, adults employed in professional (31.4%) and managerial (30.6%) occupations were most likely to meet the guidelines through LTPA, followed by adults employed in teaching or social services (28.7%), sales (25.1%), services (22.1%), and production and related occupations (17.5%).

Occupational differences by sex

Across all occupations, men were more likely than women to meet the 2008 federal guidelines for both aerobic and muscle-strengthening activities (Figure 2). Men employed in managerial (34.9%), professional (36.9%), and teaching or social service (37.7%) occupations were equally likely to meet the guidelines, followed by men in services (29.7%), sales (31.3%), and production and related occupations (18.5%). A similar pattern was seen among women: Those employed in managerial (24.3%), professional (25.9%), and teaching or social service

(25.1%) occupations were equally likely to meet the guidelines, followed by women in services (17.6%), sales (19.0%), and production and related occupations (11.4%).

Occupational differences by race and ethnicity

In general, non-Hispanic white adults were more likely than either non-Hispanic black or Hispanic adults to meet the guidelines for both aerobic and muscle-strengthening activities (Figure 3). This was particularly true in professional, teaching or social service, and sales occupations. Regarding services occupations, non-Hispanic white adults (24.0%) were more likely to meet the guidelines than non-Hispanic black adults (21.2%), who in turn were more likely to meet the guidelines than Hispanic adults (17.9%). This pattern was less pronounced and not significant among managers, however. Lastly, in production and related occupations, non-Hispanic black (20.7%) and non-Hispanic white (19.0%) adults were equally likely to

meet the guidelines, and both were more likely to do so than Hispanic adults (12.9%).

Among non-Hispanic white adults, professionals (31.6%) and managers (33.4%) were equally likely to meet the guidelines, while professionals (but not managers) were more likely than teaching or social service workers (30.5%) to do so. Moreover, non-Hispanic white adults in all three of these occupations were more likely to meet the guidelines than sales workers (27.4%), services workers (24.0%), and workers in production and related occupations (19.0%). Among non-Hispanic black adults, managers (29.8%) and professionals (28.3%) were more likely to meet the guidelines than workers in the remaining occupational categories (who were statistically indistinguishable from one another). Among employed Hispanic adults, managers (27.5%), professionals (28.4%), and teaching or social service workers (26.5%) were more likely to meet the guidelines than services (17.9%) and sales workers (18.9%),

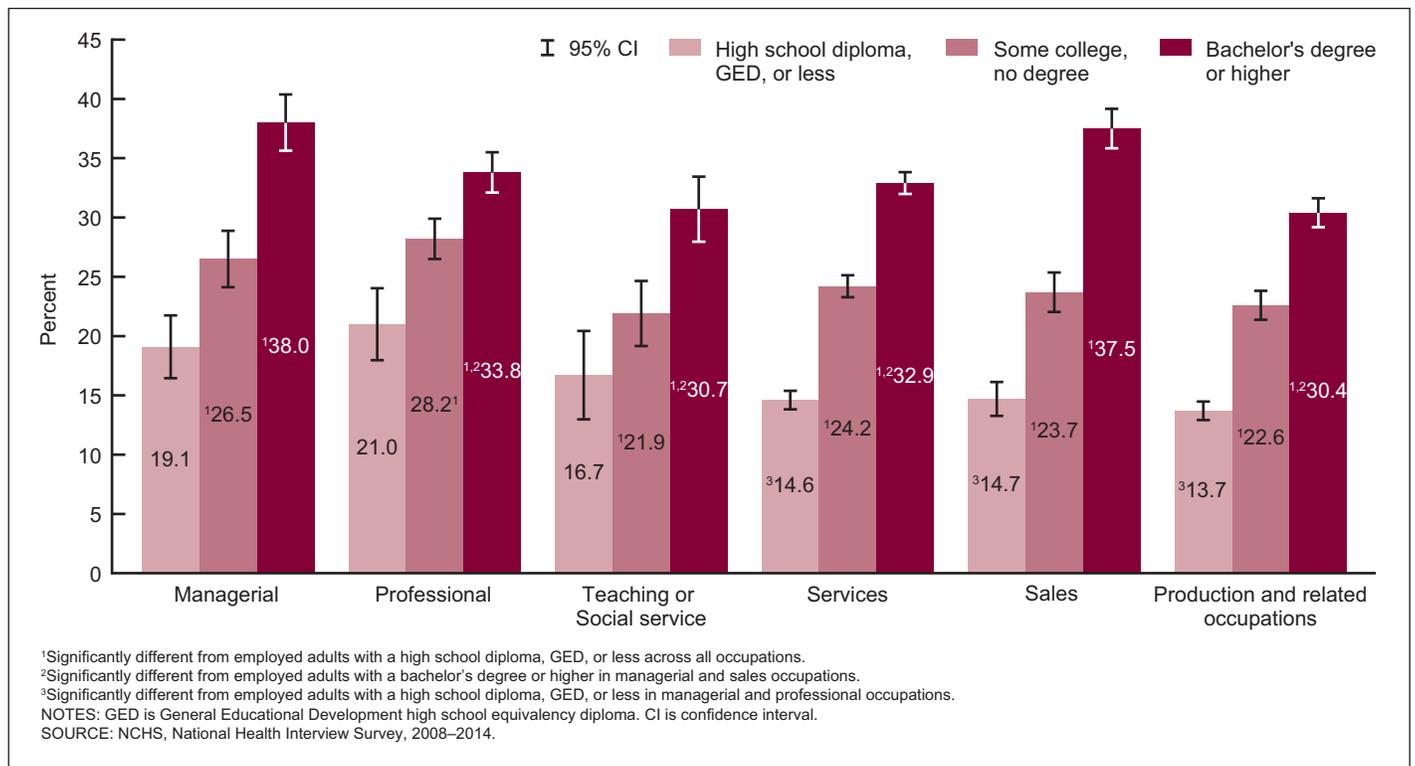


Figure 4. Age-adjusted percentage of employed adults aged 18–64 who met both aerobic and muscle-strengthening federal guidelines through leisure-time physical activity, by education and type of occupation: United States, 2008–2014

followed by workers in production and related occupations (12.9%).

Occupational differences by education

As education increased, the chances of meeting the 2008 federal guidelines for both aerobic and muscle-strengthening activities increased across occupations (Figure 4). Managers (38.0%) and sales (37.5%) workers with a bachelor's degree or higher were equally likely to meet the guidelines, and both groups were more likely to meet the guidelines than college graduates employed in the remaining occupations. Among employed adults with the least education, professionals (21.0%) and managers (19.1%) were more likely than those in services (14.6%), sales (14.7%), and production and related (13.7%) occupations to meet the guidelines.

Occupational differences by hours worked

Adults in professional, services, and sales occupations who worked 50 hours

or more in the last week were more likely than their counterparts who worked fewer hours to meet the 2008 federal guidelines for both aerobic and muscle-strengthening activities (Figure 5). In managerial occupations, adults working 50 hours or more in the last week (35.5%) were more likely than adults working 35–49 hours (28.4%) to meet the guidelines. Note that the percentage for managers working 50 hours or more also is higher than the percentages for those working 1–19 and 20–34 hours, but these are not statistically different because there were relatively fewer part-time managers. In teaching or social service occupations, adults working 50 hours or more in the last week (33.2%) were more likely to meet the guidelines than adults working 20–34 hours (27.7%) or 35–49 hours (27.2%), but were not statistically different from adults working 19 hours or fewer. In production and related occupations, the number of hours worked last week was unrelated to whether adults met the guidelines.

Among adults working 50 hours or more in the last week, professionals

(37.6%) were as likely as managers (35.5%) and more likely than adults in teaching or social service (33.2%), services (28.6%), sales (31.8%), and production and related (17.6%) occupations to meet the guidelines. Among adults working fewer than 20 hours in the previous week, teaching or social service workers (33.1%), professionals (28.9%), and managers (29.5%) were equally likely to meet the guidelines, and more likely than workers in services (23.0%), sales (23.3%), and production and related (16.1%) occupations to meet the guidelines.

Discussion

Across the six broad occupational categories used in this report, adults employed in managerial, professional, and teaching or social service occupations—representing the more sedentary occupations—were more likely to meet the 2008 federal guidelines for both aerobic and muscle-strengthening activities performed during their leisure time than adults in the remaining, less sedentary

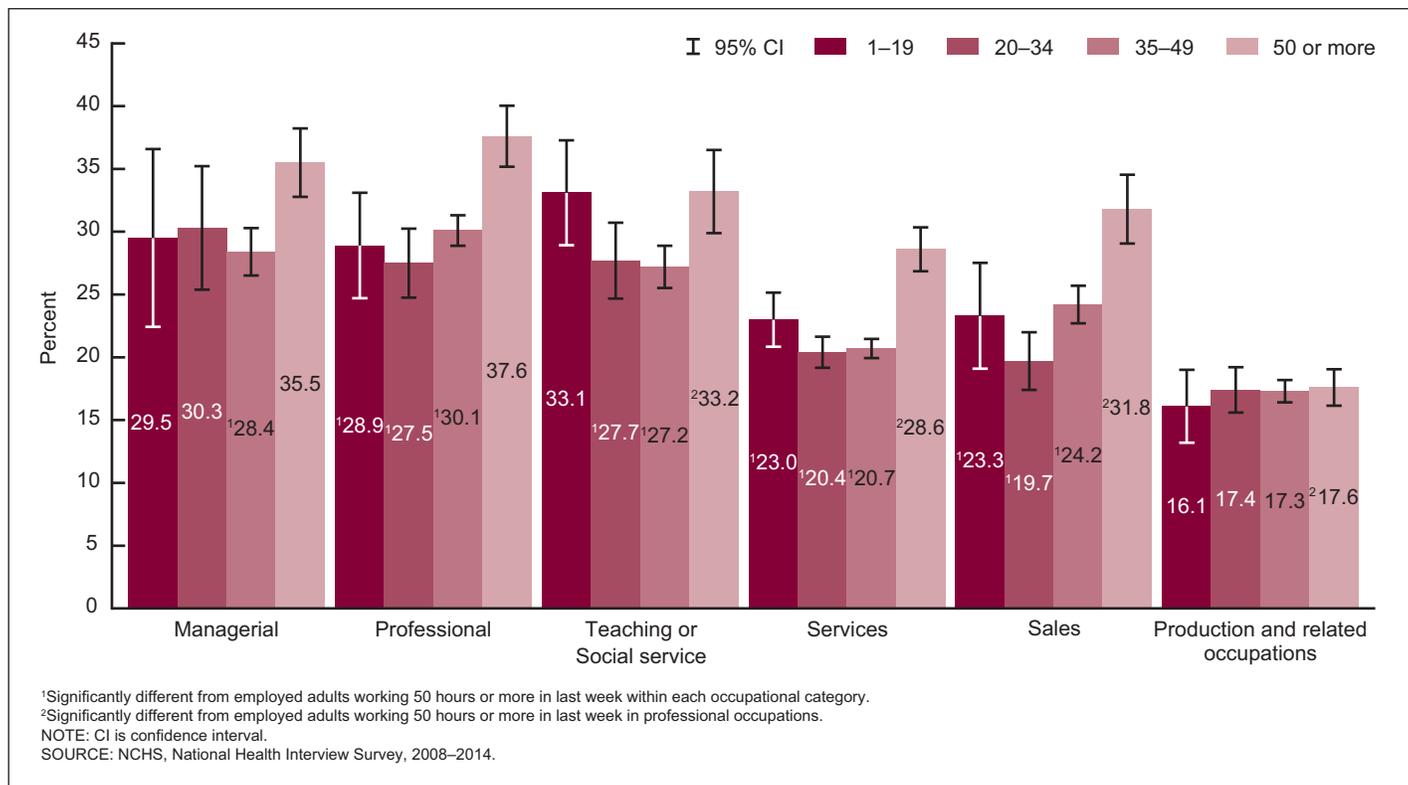


Figure 5. Age-adjusted percentage of employed adults aged 18–64 who met both aerobic and muscle-strengthening federal guidelines through leisure-time physical activity, by hours worked in last week and type of occupation: United States, 2008–2014

occupations. Adults employed in production and related occupations were the least likely to meet these guidelines, as previous research has also found (7,8,21,26). Employed men were more likely to meet the guidelines than employed women, and non-Hispanic white adults in professional, teaching or social services, sales, and services occupations were more likely than non-Hispanic black or Hispanic adults in those occupations to meet the guidelines. In production and related occupations, Hispanic adults were less likely to meet the guidelines than non-Hispanic adults, and in managerial occupations, adults were equally likely, regardless of their race and ethnicity, to meet the guidelines. The likelihood of meeting the guidelines uniformly increased as education increased. Lastly, employees in professional, services, and sales occupations who worked 50 hours or more in the last week were more likely than their counterparts working fewer hours to meet the guidelines. In teaching or social service occupations, adults working 50 hours or more were more likely to meet the guidelines than

adults working 20–49 hours, as were managers working 50 hours or more compared with managers working 35–49 hours. In production and related occupations, the number of hours worked last week was unrelated to whether adults met the guidelines. Thus, working longer hours did not constitute a barrier to meeting the guidelines for both aerobic and muscle-strengthening activities performed during leisure time.

This report suggests that many employed adults are meeting the HP 2020 objective regarding physical activity—specifically, that 20.1% of all adults meet aerobic and muscle-strengthening federal guidelines by 2020—while engaging in LTPA (4). However, some occupational differences in meeting these guidelines during LTPA still remain. For example, adults in managerial and professional occupations exceeded the guidelines, and, thus, the HP 2020 objective, at more than 30%. However, Hispanic adults and women employed in several occupational categories (services, sales, and production and related occupations) were less likely to meet the guidelines

during LTPA than their counterparts in managerial, professional, and teaching or social service occupations. Employed adults with a high school education or less were also less likely to meet the guidelines through LTPA than adults with more education, regardless of their occupation. In contrast, across all occupations—including production and related occupations—employed adults who had either attended or graduated from college were, in most instances, already well above the HP 2020 target based on their LTPA alone.

Lastly, while more than one-half of adults employed in production and related occupations met neither guideline, and less than one-fifth met both guidelines during their leisure time, note that adults employed in physically demanding or active jobs may be less likely to engage in LTPA, which represents only a part of total physical activity. Because respondents' physical activity performed in the workplace cannot be directly assessed using NHIS, occupational physical activity remains an unmeasured variable. However, the indicator used in this analysis is

structured to distinguish occupations that are likely to be more sedentary (e.g., managers and professionals) from those that are less sedentary and more active (e.g., workers in production and related occupations). The findings in this report, therefore, suggest that a person's occupation—specifically, the type of work performed on the job—may constitute a barrier to meeting federal guidelines for both aerobic and muscle-strengthening activities through LTPA. This may have consequences for morbidity, disability, and mortality, particularly if LTPA has more health benefits than occupational physical activity, as several previous studies have concluded (9–15).

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Technical Notes

The [Table](#) shows how the two-digit detailed occupation recodes available for the National Health Interview Survey's 2008–2014 public-use Sample Adult files (OCCUPN1) were collapsed into the six occupation categories used in this analysis.

Table. Occupation recode values in public-use Sample Adult files, associated response labels, and resulting analysis category: National Health Interview Survey, 2008–2014

OCCUPN1 value	Response label	Occupation category
1	Chief executives, general and operations managers, and legislators	Managerial
2	Advertising, marketing, promotions, public relations, and sales managers	Managerial
3	Operations specialties managers	Managerial
4	Other management occupations	Managerial
5	Business operations specialists	Professional
6	Financial specialists	Professional
7	Computer specialists	Professional
8	Mathematical science occupations	Professional
9	Architects, surveyors, and cartographers	Professional
10	Engineers	Professional
11	Drafters, and engineering and mapping technicians	Professional
12	Life scientists	Professional
13	Physical scientists	Professional
14	Social scientists and related workers	Professional
15	Life, physical, and social science technicians	Professional
16	Counselors, social workers, and other community and social service specialists	Teaching or social service
17	Religious workers	Teaching or social service
18	Lawyers, judges, and related workers	Professional
19	Legal support workers	Services
20	Postsecondary teachers	Teaching or social service
21	Primary, secondary, and special education schoolteachers	Teaching or social service
22	Other teachers and instructors	Teaching or social service
23	Librarians, curators, and archivists	Teaching or social service
24	Other education, training, and library occupations	Teaching or social service
25	Art and design workers	Services
26	Entertainers, performers, and sports and related workers	Services
27	Media and communication workers	Services
28	Media and communication equipment workers	Services
29	Health diagnosing and treating practitioners	Professional
30	Health technologists and technicians	Professional
31	Other health care practitioners and technical occupations	Professional
32	Nursing, psychiatric, and home health aides	Services
33	Occupational and physical therapist assistants and aides	Services
34	Other health care support occupations	Services
35	First-line supervisors and managers of protective service workers	Services
36	Firefighting and prevention workers	Services
37	Law enforcement workers	Services
38	Other protective service workers	Services
39	Supervisors of food preparation and serving workers	Services
40	Cooks and food preparation workers	Services
41	Food and beverage serving workers	Services
42	Other food preparation and serving related workers	Services
43	Supervisors of building and grounds cleaning and maintenance workers	Services
44	Building cleaning and pest control workers	Services
45	Grounds maintenance workers	Production and related
46	Supervisors of personal care and service workers	Services
47	Animal care and service workers	Services
48	Entertainment attendants and related workers	Services
49	Funeral service workers	Services
50	Personal appearance workers	Services
51	Transportation, tourism, and lodging attendants	Services
52	Other personal care and service workers	Services
53	Supervisors of sales workers	Sales
54	Retail sales workers	Sales
55	Sales representatives, services	Sales
56	Sales representatives, wholesale and manufacturing	Sales
57	Other sales and related workers	Sales
58	Supervisors of office and administrative support workers	Services
59	Communications equipment operators	Services

Table. Occupation recode values in public-use Sample Adult files, associated response labels, and resulting analysis category: National Health Interview Survey, 2008–2014—Con.

OCCUPN1 value	Response label	Occupation category
60	Financial clerks	Services
61	Information and record clerks	Services
62	Material recording, scheduling, dispatching, and distributing workers	Services
63	Secretaries and administrative assistants	Services
64	Other office and administrative support workers	Services
65	Supervisors of farming, fishing, and forestry workers	Production and related
66	Agricultural workers	Production and related
67	Fishing and hunting workers	Production and related
68	Forest, conservation, and logging workers	Production and related
69	Supervisors of construction and extraction workers	Production and related
70	Construction trades workers	Production and related
71	Helpers in construction trades	Production and related
72	Other construction and related workers	Production and related
73	Extraction workers	Production and related
74	Supervisors of installation, maintenance, and repair workers	Production and related
75	Electrical and electronic equipment mechanics, installers, and repairers	Production and related
76	Vehicle and mobile equipment mechanics, installers, and repairers	Production and related
77	Other installation, maintenance, and repair occupations	Production and related
78	Supervisors of production workers	Production and related
79	Assemblers and fabricators	Production and related
80	Food processing workers	Production and related
81	Metal workers and plastic workers	Production and related
82	Printing workers	Production and related
83	Textile, apparel, and furnishings workers	Production and related
84	Woodworkers	Production and related
85	Plant and system operators	Production and related
86	Other production occupations	Production and related
87	Supervisors of transportation and material moving workers	Production and related
88	Air transportation workers	Production and related
89	Motor vehicle operators	Production and related
90	Rail transportation workers	Production and related
91	Water transportation workers	Production and related
92	Other transportation workers	Production and related
93	Material moving workers	Production and related
94	Military-specific occupations (<i>excluding</i> active-duty Armed Forces personnel)	Services

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