

## Prevalence of Coronary Heart Disease or Stroke Among Workers Aged <55 Years — United States, 2008–2012

Sara E. Luckhaupt, MD<sup>1</sup>, Geoffrey M. Calvert, MD<sup>1</sup> (Author affiliations at end of text)

Cardiovascular disease accounts for one in three deaths in the United States each year, and coronary heart disease and stroke account for most of those deaths (1). To try to prevent 1 million heart attacks and strokes by 2017, the U.S. Department of Health and Human Services launched the Million Hearts initiative, promoting proven and effective interventions in communities and clinical settings. In workplace settings, cardiovascular disease can be addressed through a Total Worker Health program, which integrates occupational safety and health protection with health promotion. To identify workers likely to benefit from such a program, CDC analyzed data from the National Health Interview Survey (NHIS) for the period 2008–2012 to estimate the prevalence of a history of coronary heart disease or stroke (CHD/stroke) among adults aged <55 years by selected characteristics, employment status, occupation category, and industry of employment. The results of that analysis showed that 1.9% of employed adults aged <55 years reported a history of CHD/stroke, compared with 2.5% of unemployed adults looking for work, and 6.3% of adults not in the labor force (e.g., unemployed adults who stopped looking for work, homemakers, students, retired persons, and disabled persons). Workers employed in service and blue collar occupations were more likely than those in white collar occupations to report a history of CHD/stroke. Two industry groups also had significantly higher adjusted prevalence ratios (aPRs) for CHD/stroke: *Administrative and Support and Waste Management and Remediation Services*\* and *Accommodation and Food Service*.† Workers in these occupation and industry groups

might especially benefit from a Total Worker Health approach to reducing the risk for CHD/stroke.

NHIS collects information about the health of the noninstitutionalized, civilian population in the United States, using nationally representative samples. Interviews are initiated in person with telephone follow-up when the interview cannot be completed in person. Questions about a history of CHD/stroke (defined as self-reported history of stroke or coronary heart disease [including angina and myocardial infarction] or both),§ employment status, industry, and occupation are asked of randomly selected adults. NHIS obtains verbatim responses from employed adult respondents (aged ≥18 years) regarding their industry (employer's type of business) and occupation (employee's type of work). These responses are reviewed by U.S. Census Bureau coding specialists, who assign 4-digit industry codes based on the 2007 North American Industrial Classification System.¶

§ Respondents were asked, "Have you ever been told by a doctor or other health professional that you had [condition]?" This question was asked separately for CHD, angina, myocardial infarction (heart attack), and stroke.

¶ Available at <http://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2007>.

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\*Includes industries such as business support services, travel arrangements and reservation services, investigation and security services, services to buildings and dwellings (except cleaning during and immediately after construction), landscaping services, waste management, and remediation.

†Includes industries such as traveler accommodation, recreational vehicle parks and camps, rooming and boarding houses, restaurants and other food services, and bars.



For this analysis, an employment status variable was created with three categories: currently employed, unemployed, and not in the labor force. Adults were classified as unemployed if they reported that they were looking for work, whereas adults not in the labor force included unemployed adults who stopped looking for work, homemakers, students, retired persons, and disabled persons. Occupations were grouped into four categories: white collar, service (e.g., hairdresser, nurse's aide, and cook), blue collar (e.g., construction worker, factory worker, and truck driver), and farm. For analyses by industry, the 21 simple 2-digit industry recodes provided in the NHIS public dataset were used, which are based on codes for the 2-digit North American Industrial Classification System. Industry categories with fewer than 10 cases were grouped into the *Other/Unknown* category.

Weighted data were used to produce national estimates. Point estimates and estimates of corresponding variances were calculated using statistical software to account for the complex sample design. Statistical significance was determined at  $p < 0.05$ . Prevalence estimates were based on data collected by NHIS surveys during 2008–2012 from 91,331 adult respondents aged <55 years. Annual adult response rates ranged from 60.8% to 66.3%. For calculation of aPRs for industries, each category was compared with all other industry categories combined (e.g., workers employed in *Wholesale Trade Industries* were compared with workers employed in all other categories combined). To account for differences in workforce demographics by occupation and industry, aPRs

based on occupation and industry were adjusted for sex and age. Differences in prevalence were considered significant if their 95% confidence intervals (CIs) did not overlap, and aPRs were considered significant if their CIs did not include 1.00.

The prevalence of a history of CHD/stroke among all adults aged <55 years was estimated to be 2.8% (Table 1), including 2.0% for coronary heart disease and 1.0% for stroke. The prevalence among employed adults was 1.9%. The prevalence was higher among both unemployed adults (2.5%) and adults not in the labor force (6.3%). Among adults who were employed, men and current and former smokers were significantly more likely than women and those who had never smoked to report a history of CHD/stroke. The prevalence of CHD/stroke among workers increased in each higher age group, and workers with a college degree were less likely than workers with less education to report a history of CHD/stroke.

After adjusting for sex and age, workers in service (aPR = 1.53) or blue collar (aPR = 1.40) occupations were more likely than those in white collar occupations to report a history of CHD/stroke (Table 2). Two industries had significantly higher adjusted aPRs: *Administrative and Support and Waste Management and Remediation Services* (aPR = 1.47) and *Accommodation and Food Service* (aPR = 1.37) (Table 3).

## Discussion

The aim of this study was to identify workers with a greater potential to benefit from programs designed to reduce the risk for CHD/stroke. Because age, the strongest predictor of CHD/

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**TABLE 1. Prevalence of a history of coronary heart disease or stroke among adults aged <55 years, by selected characteristics and employment status — National Health Interview Survey, United States, 2008–2012**

Characteristic	No.	All adults aged <55 yrs			Employed		Unemployed		Not in labor force	
		%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	
<b>Total respondents (2008–2012)</b>	<b>91,331</b>	<b>2.8</b>	<b>(2.7–3.0)</b>	<b>1.9</b>	<b>(1.8–2.1)</b>	<b>2.5</b>	<b>(2.2–3.0)</b>	<b>6.3</b>	<b>(5.8–6.8)</b>	
<b>Survey year</b>										
2008	13,991	2.7	(2.4–3.1)	1.9	(1.6–2.3)	2.6	(1.4–4.7)	6.1	(5.1–7.3)	
2009	17,928	2.9	(2.6–3.3)	2.1	(1.8–2.5)	2.5	(1.7–3.8)	6.1	(5.1–7.2)	
2010	17,435	2.9	(2.6–3.3)	2.0	(1.7–2.3)	2.9	(2.1–4.0)	6.5	(5.5–7.7)	
2011	20,793	2.7	(2.5–3.0)	1.8	(1.6–2.1)	2.5	(1.9–3.4)	5.9	(5.2–6.8)	
2012	21,245	2.8	(2.5–3.1)	1.8	(1.6–2.1)	2.2	(1.5–3.0)	6.7	(5.7–7.9)	
<b>Sex</b>										
Men	41,522	3.1	(2.9–3.4)	2.2	(2.0–2.5)	2.8	(2.2–3.5)	8.8	(7.8–9.9)	
Women	49,870	2.5	(2.3–2.7)	1.6	(1.4–1.8)	2.3	(1.8–2.9)	5.0	(4.5–5.5)	
<b>Age group (yrs)</b>										
<35	40,542	0.8	(0.7–1.0)	0.6	(0.5–0.8)	1.3	(1.0–1.8)	1.3	(1.1–1.7)	
35–39	12,627	2.0	(1.7–2.3)	1.4	(1.2–1.7)	3.9	(2.5–6.1)	4.3	(3.4–5.4)	
40–44	12,531	3.5	(3.1–3.9)	2.3	(1.9–2.8)	4.5	(3.1–6.5)	8.9	(7.2–10.9)	
45–49	12,852	4.9	(4.5–5.4)	3.3	(2.9–3.8)	4.2	(2.9–6.1)	12.8	(11.2–14.6)	
50–54	12,840	7.0	(6.4–7.6)	4.5	(4.0–5.1)	4.3	(2.9–6.4)	17.2	(15.4–19.1)	
<b>Race/Ethnicity</b>										
White, non-Hispanic	48,673	2.8	(2.6–3.0)	2.0	(1.8–2.2)	3.0	(2.3–3.8)	6.3	(5.7–7.0)	
Black, non-Hispanic	14,447	3.9	(3.5–4.3)	2.4	(2.1–2.9)	2.2	(1.6–3.0)	9.8	(8.6–11.1)	
Asian, non-Hispanic	6,119	1.3	(1.0–1.7)	1.1	(0.8–1.5)	1.0	(0.4–2.5)	1.9	(1.1–3.2)	
Other, non-Hispanic	2,124	4.2	(3.1–5.7)	2.4	(1.5–3.8)	1.7	(0.5–5.5)	10.2	(7.2–14.4)	
Hispanic	20,029	2.3	(2.1–2.5)	1.6	(1.4–1.9)	2.3	(1.7–3.1)	4.3	(3.7–5.1)	
<b>Education (age ≥25 yrs)</b>										
Less than high school diploma	11,042	5.4	(4.9–6.0)	2.7	(2.2–3.3)	4.5	(3.3–6.3)	10.9	(9.6–12.5)	
High school diploma or GED certificate	18,705	4.5	(4.1–4.8)	2.9	(2.5–3.3)	3.9	(2.9–5.2)	10.7	(9.4–12.1)	
Some college	23,184	3.5	(3.2–3.9)	2.5	(2.2–2.9)	3.0	(2.2–4.2)	8.6	(7.5–9.7)	
College degree	23,672	1.4	(1.3–1.6)	1.4	(1.2–1.6)	1.6	(0.9–2.7)	2.2	(1.6–3.0)	
<b>Household income (% of poverty level)</b>										
<100%	17,202	4.9	(4.4–5.4)	2.5	(2.0–3.0)	3.1	(2.5–3.9)	8.6	(7.6–9.7)	
100%–199%	18,315	3.3	(3.0–3.7)	2.0	(1.7–2.3)	2.9	(2.0–4.1)	6.9	(6.0–8.0)	
200%–399%	25,964	2.6	(2.4–2.9)	2.1	(1.8–2.3)	2.2	(1.5–3.2)	5.7	(4.7–6.8)	
≥400%	28,933	1.9	(1.7–2.1)	1.7	(1.5–2.0)	1.5	(0.9–2.5)	3.0	(2.4–3.9)	
<b>Health insurance</b>										
Yes	68,745	2.9	(2.7–3.1)	1.9	(1.8–2.1)	2.4	(1.9–3.0)	7.0	(6.4–7.6)	
No	22,322	2.5	(2.3–2.8)	2.0	(1.8–2.3)	2.8	(2.2–3.4)	4.1	(3.4–4.8)	
<b>Smoking status</b>										
Current smoker	20,366	4.4	(4.0–4.8)	2.8	(2.4–3.2)	3.0	(2.3–3.9)	10.6	(9.5–11.7)	
Former smoker	13,219	4.6	(4.2–5.1)	3.2	(2.8–3.7)	4.2	(2.8–6.4)	12.0	(10.3–13.8)	
Never smoker	57,305	1.8	(1.6–1.9)	1.3	(1.2–1.5)	1.9	(1.5–2.5)	3.4	(3.0–3.9)	
<b>Length of unemployment*</b>										
<12 months	4,590	—	—	—	—	2.4	(2.0–3.0)	—	—	
≥12 months	2,770	—	—	—	—	2.7	(2.1–3.6)	—	—	

**Abbreviations:** CI = confidence interval; GED = General Educational Development.

\* Counts only include unemployed adults.

stroke, cannot be modified, the study focused on prevalence differences among workers aged <55 years by selected characteristics, employment status, occupation category, and industry of employment. Although employed adults aged <55 years had a lower prevalence of a history of CHD/stroke than unemployed adults or adults not in the labor force, several groups of workers with higher prevalence of CHD/stroke were identified. The higher prevalence might, in part, be caused by occupational risk factors (i.e., characteristics of the workplace or job), but the prevalence of preexisting illness or risk factors among persons in different industries and occupations is unknown.

Occupational CHD/stroke risk factors can include work stress (2), shift work (2), exposure to particulate matter (3), noise (4), and secondhand smoke (5). Health professionals and employers should take these factors into account when planning workplace interventions to prevent CHD/stroke. These factors might have both direct physiologic effects on cardiovascular health and indirect effects by influencing behavioral risk factors such as smoking and obesity. Some evidence indicates that workplace hazards such as job strain might pose more potent risk to workers in lower-income households, perhaps because of an interaction with adverse exposures in the community,

**TABLE 2. Prevalence of a history of coronary heart disease or stroke among adult workers aged <55 years, by occupation category — National Health Interview Survey, United States, 2008–2012**

Occupation category	Unweighted sample size	Estimated no. of cases	% (95% CI)	aPR (95% CI)
White collar	37,416	1,057,000	1.6 (1.5–1.8)	Referent
Service	13,792	476,000	2.2 (1.8–2.6)	1.53 (1.27–1.85)
Farm	540	16,000	1.9 (1.0–3.6)	1.23 (0.63–2.41)
Blue collar	13,306	625,000	2.6 (2.3–3.0)	1.40 (1.19–1.65)

Abbreviations: aPR = adjusted prevalence ratio; CI = confidence interval.

combined with fewer health-enhancing opportunities (e.g., health care, a healthy diet, and exercise facilities) (6).

The industry and occupation categories found to be associated with a higher prevalence of CHD/stroke after adjustment for age and sex, *Administrative and Support and Waste Management and Remediation Services* and *Accommodation and Food Service* and service and blue collar occupations, are each characterized by multiple known CHD/stroke risk factors. For example, workers employed in *Administrative and Support and Waste Management and Remediation Services* industries have reported significantly higher rates of job insecurity, a common cause of job stress, compared with all workers combined (7). Workers employed in *Accommodation and Food Service* industries have been reported among those who are significantly more likely to work alternative shifts (8) and significantly more likely to smoke (9). Conversely, workers in industry groups with lower prevalence of CHD/stroke compared with all other workers (e.g., *Education Services* and *Information*) might be more likely to have access to preventive services and less likely

to be exposed to occupational CHD/stroke risk factors.

The findings in this report are subject to at least four limitations. First, all results are based upon self-report of a history of CHD/stroke, which was not validated with medical records. Second, the broad industry and occupation categories used for this analysis aggregate workers who likely have substantially different working conditions. Third, this is a cross-sectional study; therefore,

whether employment in any specific industry or occupation increases or decreases the risk for CHD/stroke cannot be determined. Finally, because the annual response rate was only 60.8%–66.3%, nonresponse bias might have affected the results.

Addressing the risk for CHD/stroke among workers might involve a Total Worker Health approach. Traditionally, health protection programs have focused squarely on safety, with the goal to reduce worker exposures to risk factors in the work environment, whereas workplace health promotion programs have focused exclusively on personal lifestyle factors. A growing body of science supports the effectiveness of combining these efforts through workplace interventions that integrate health protection with health promotion (10). CDC has developed several resources that might help employers implement Total Worker Health programs in their worksites.\*\* This information

\*\* Additional information available at <http://www.cdc.gov/niosh/twh>.

**TABLE 3. Prevalence of a history of coronary heart disease or stroke among employed adults aged <55 years, by industry category — National Health Interview Survey, United States, 2008–2012**

Industry category*	Unweighted sample size	Estimated cases (in thousands)	Prevalence (95% CI)	aPR† (95% CI)
Wholesale Trade	1,560	81	2.9 (1.9-4.3)	1.34 (0.90-2.00)
Public Administration	3,356	152	2.8 (2.2-3.6)	1.22 (0.93-1.60)
Administrative and Support and Waste Management and Remediation Services	3,113	135	2.7 (2.1-3.5)	1.47 (1.11-1.96)
Transportation and Warehousing	2,617	123	2.7 (2.0-3.5)	1.14 (0.86-1.51)
Utilities	564	26	2.6 (1.4-4.8)	1.00 (0.54-1.86)
Real Estate and Rental and Leasing	1,188	51	2.5 (1.7-3.8)	1.17 (0.78-1.75)
Manufacturing	6,328	271	2.4 (1.9-3.0)	1.02 (0.82-1.27)
Agriculture, Forestry, Fishing, and Hunting	899	34	2.3 (1.4-3.6)	1.12 (0.70-1.77)
Other Services (except Public Administration)	3,269	118	2.2 (1.6-3.0)	1.20 (0.88-1.64)
Construction	4,261	169	2.1 (1.6-2.8)	0.97 (0.74-1.27)
Health Care and Social Assistance	9,381	286	1.9 (1.6-2.2)	1.12 (0.93-1.35)
Retail Trade	6,769	221	1.8 (1.5-2.2)	1.11 (0.90-1.37)
Accommodation and Food Service	4,978	147	1.8 (1.3-2.4)	1.37 (1.03-1.81)
Arts, Entertainment, and Recreation	1,332	41	1.8 (1.1-2.8)	0.99 (0.62-1.58)
Professional, Scientific, and Technical Service	4,417	115	1.5 (1.1-2.0)	0.71 (0.53-0.96)
Other/Unknown	1,701	37	1.4 (0.8-2.2)	0.64 (0.39-1.07)
Education Services	6,053	121	1.2 (0.9-1.5)	0.60 (0.46-0.78)
Information	1,564	30	1.1 (0.6-1.9)	0.58 (0.33-0.99)
Finance and Insurance	3,053	44	0.8 (0.5-1.3)	0.43 (0.27-0.70)

Abbreviations: aPR = adjusted prevalence ratio; CI = confidence interval.

\* North American Industry Classification system, available at <http://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2007>.

† For calculation of aPRs, each industry category was compared with all other industry categories.

**What is already known on this topic?**

Cardiovascular disease (CVD) accounts for one in three deaths in the United States each year. In the workplace setting, CVD can be addressed through Total Worker Health, a program integrating occupational safety and health protection with health promotion to prevent worker injury and illness and to advance health and well-being. Coronary heart disease or stroke (CHD/stroke) account for the majority of deaths from cardiovascular disease.

**What is added by this report?**

Overall, 1.9% of employed adults aged <55 years reported a history of CHD/stroke, compared with 2.5% of unemployed adults looking for work, and 6.3% of adults not in the labor force. After adjusting for sex and age, workers in service and blue collar occupations, and those employed in two industries, *Administrative and Support and Waste Management and Remediation Services* and *Accommodation and Food Service*, had significantly higher prevalence of CHD/stroke.

**What are the implications for public health practice?**

Workers in the industry and occupation categories with increased risk for CHD/stroke might especially benefit from a Total Worker Health approach. Such an approach could integrate control of known occupational CHD/stroke risk factors with health promotion activities. Clinicians should consider the potentially increased risk for CHD/stroke in their working-age patients and take occupation and industry into account when developing prevention and treatment plans.

is also important for clinicians, who should consider the potentially increased occupational risk for CHD/stroke in patients in certain industries and occupations and take their patients' work status, workplace, and occupation type into account when developing prevention and treatment plans.

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Jia Li, MS, Division of Surveillance, Hazard Evaluations, and Field Studies, National Institute for Occupational Safety and Health, CDC.

<sup>1</sup>Division of Surveillance, Hazard Evaluations, and Field Studies, National Institute for Occupational Safety and Health, CDC (Corresponding author: Sara E. Luckhaupt, sluckhaupt@cdc.gov, 513-841-4123)

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## Little Filtered Cigar, Cigarillo, and Premium Cigar Smoking Among Adults — United States, 2012–2013

Catherine G. Corey, MSPH<sup>1</sup>, Brian A. King, PhD<sup>2</sup>, Blair N. Coleman, MPH<sup>1</sup>, Cristine D. Delnevo, PhD<sup>3</sup>, Corinne G. Husten, MD<sup>1</sup>, Bridget K. Ambrose, PhD<sup>1</sup>, Benjamin J. Apelberg, PhD<sup>1</sup> (Author affiliations at end of text)

The burden of death and disease from tobacco use in the United States has been caused overwhelmingly by cigarettes and other smoked tobacco products (1). In the United States, cigarette consumption declined during 2000–2011; however, consumption of cigars more than doubled during the same period (2). The cigar market includes diverse product types manufactured with a variety of shapes and sizes, filters, tips, flavors, and prices (3). Although national estimates of cigar consumption have been reported previously (2,3), data characterizing who smokes different cigar types are limited. A recent analysis from the 2012–2013 National Adult Tobacco Survey (NATS) found that more than one in 20 U.S. adults smoke cigars “every day,” “someday,” or “rarely” (4). This report expands upon those findings, using data from the 2012–2013 NATS to further characterize cigar smokers by the usual type of cigar smoked using the following categories: little filtered cigars (LFCs), cigarillos/other mass market cigars (cigarillos/MMCs), and premium cigars. The findings indicate that among U.S. adults who smoke cigars, 61.8% usually smoke cigarillos/MMCs, 19.9% usually smoke premium cigars, and the remainder, 18.4%, usually smoke LFCs. These data can help to inform public health interventions to reduce the burden of adverse health effects caused by cigar smoking in the United States, including regulation.

The 2012–2013 NATS is a stratified, national, random-digit–dialed landline and cellular telephone survey of 60,192 noninstitutionalized U.S. civilian adults aged ≥18 years. The survey response rate was 44.9% (landline = 47.2%; cell phone = 36.3%). Respondents who now smoked cigars every day, some days, or rarely\* were asked the following questions about the attributes of the cigar they usually smoked: 1) “Do you usually smoke a cigar, cigarillo, or little filtered cigar that has...A spongy filter/A plastic tip/A wooden tip/No filter or tip?”; and 2) “What is the name brand of the cigar, cigarillo, or little filtered cigar that you usually smoke?” LFC smokers were defined as those reporting their usual cigar had a spongy filter, or was from a manufacturer that primarily or exclusively manufactures LFCs. Premium cigar smokers were

defined as those reporting their usual cigar did not have a filter or tip and the name of their usual brand was a brand name of a hand-rolled cigar (5) or a cigar described by the manufacturer or merchant as containing high-grade tobaccos in the filler, binder, or wrapper. Cigarillo/MMC smokers were defined as those reporting their usual cigar did not have a filter and the usual brand was not premium.†

Data were weighted to provide nationally representative estimates. Estimates of usual cigar type among current cigar smokers were calculated overall and by sex, age, race/ethnicity, U.S. Census region,<sup>§</sup> education, annual household income, and sexual orientation. Estimates of cigar smoking frequency and cigarette smoking status (former, current, or never cigarette smoker) were calculated by usual cigar type.¶ Estimates with a relative standard error of ≥40% were omitted. Differences between groups were assessed using t-tests (p<0.05).

Among the 7.3% of U.S. adults who smoke cigars “every day,” “someday,” or “rarely,” more than half (52.5%) reported information that could be used to assign a usual cigar type. Of these

† The 2012–2013 NATS asked a third question about the size of the usual cigar smoked. Whereas respondents who reported using a little filtered cigar or a premium brand tended to report a consistent length for their usual cigar, cigarillo/MMC smokers did not; hence, length information was not used to assign usual cigar type. Among current cigar smokers, 48% could not be assigned a usual cigar type because of insufficient information. Two sources accounted for more than 90% of the missing data. Two thirds not assigned a usual cigar type responded “I do not have a usual size of cigar” to a question about length of the usual cigar smoked and were not asked the cigar filter/tip or brand questions; more than 80% of these users reported smoking cigars rarely. Another 27% reported smoking a cigar that did not have a filter or tip, but did not provide a usual cigar brand, and consequently could not be distinguished as a cigarillo/MMC or premium cigar smoker.

§ *Northeast*: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. *Midwest*: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. *South*: Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. *West*: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

¶ Respondents who reported smoking ≥100 cigarettes in their lifetime and reported now smoking every day or some days were recoded as current cigarette smokers. Respondents aged 18–29 years who reported not smoking ≥100 cigarettes in their lifetime but reported now smoking cigarettes every day or some days were recoded as current smokers. Respondents who reported smoking ≥100 cigarettes in their lifetime and reported now smoking not at all were recoded as former cigarette smokers. Respondents who reported not currently smoking at all and reported not smoking ≥100 cigarettes in their lifetime were recoded as never cigarette smokers.

\* Respondents aged ≥30 years had to have reported smoking ≥50 cigars in their lifetime to be asked the questions about cigar attributes, whereas respondents aged 18–29 years did not.

cigar smokers, 61.8% usually smoke cigarillos/MMCs, 19.9% usually smoke premium cigars, and 18.4% usually smoke LFCs (Table). Cigarillos/MMCs were the usual cigar of most men and most women. Premium cigars were the usual cigar of 23.9% of men, and LFCs were the choice of more women (35.3%) than men (14.5%) ( $p < 0.05$ ). Cigarillos/MMCs were the usual cigar of 72.1% of young adults (aged 18–29 years) but were less popular among older adults. However, an estimated 15.1% of persons aged 18–29 years smoked premium cigars,

which was comparable to LFCs (12.8%). By race/ethnicity, cigarillos/MMCs were the usual type among cigar smokers who were non-Hispanic black (82.6%), among whom premium cigar smoking was the usual type for only 5.2%. In contrast, among non-Hispanic whites, 26.7% reported premium cigars as their usual choice. In the Northeast, unlike other regions, premium cigars were the usual cigar of more cigar smokers than were LFCs. Higher educational levels and annual household income generally were associated with lower prevalence of usual

**TABLE. Selected characteristics of current cigar smokers\* aged ≥18 years who identified a usual type of cigar smoked, by usual cigar type — National Adult Tobacco Survey, United States, 2012–2013**

Characteristic	Little filtered cigars <sup>†</sup>		Cigarillos/MMCs <sup>§</sup>		Premium cigars <sup>¶</sup>	
	%	(95% CI)	%	(95% CI)	%	(95% CI)
<b>Overall</b>	<b>18.4</b>	<b>(16.1–20.9)</b>	<b>61.8</b>	<b>(58.6–64.9)</b>	<b>19.9</b>	<b>(17.4–22.6)</b>
<b>Sex</b>						
Men	14.5	(12.1–17.2)	61.6	(57.9–65.2)	23.9	(21.0–27.2)
Women	35.3	(28.7–42.4)	59.4	(52.0–66.5)	— <sup>††</sup>	
<b>Age group (yrs)</b>						
18–29	12.8	(9.8–16.5)	72.1	(67.2–76.5)	15.1	(11.7–19.2)
30–49	18.5	(14.5–23.4)	57.6	(51.6–63.3)	23.9	(19.1–29.5)
50–64	31.7	(26.2–37.8)	43.5	(37.7–49.4)	24.8	(20.4–29.8)
≥65	24.0	(17.5–32.1)	55.6	(46.8–64.1)	20.4	(14.6–27.7)
<b>Race/Ethnicity</b>						
White, non-Hispanic	20.2	(17.2–23.6)	53.1	(48.9–57.2)	26.7	(23.2–30.5)
Black, non-Hispanic	12.2	(7.5–19.3)	82.6	(74.8–88.3)	5.2	(2.5–10.4)
Other, non-Hispanic	22.5	(16.3–30.2)	68.4	(60.2–75.6)	9.1	(5.8–14.1)
Hispanic	14.7	(8.4–24.4)	65.9	(54.0–76.0)	19.5	(11.5–30.9)
<b>U.S Census region**</b>						
Northeast	13.9	(9.7–19.7)	57.6	(48.2–66.4)	28.5	(20.4–38.3)
Midwest	20.2	(15.5–25.9)	65.2	(58.7–71.2)	14.6	(10.8–19.6)
South	16.3	(13.1–20.2)	64.8	(59.9–69.3)	18.9	(15.5–22.9)
West	23.1	(17.3–30.1)	57.0	(49.7–64.0)	19.9	(15.4–25.2)
<b>Education</b>						
0–12 years (no diploma)	23.6	(16.8–32.0)	73.1	(64.2–80.4)	— <sup>††</sup>	
High school diploma or GED	19.0	(14.9–24.0)	69.8	(63.7–75.3)	11.1	(7.3–16.6)
Some college or associate degree	20.5	(16.5–25.0)	57.1	(51.6–62.4)	22.5	(18.1–27.5)
Undergraduate degree or higher	8.0	(5.3–11.8)	40.3	(34.6–46.3)	51.7	(45.8–57.6)
<b>Annual household income (\$)</b>						
<20,000	34.6	(27.5–42.5)	60.6	(52.5–68.1)	4.8	(2.5–8.9)
20,000–49,999	17.6	(13.7–22.2)	71.5	(66.0–76.5)	10.9	(7.8–15.1)
50,000–99,999	12.1	(8.5–17.1)	60.9	(53.8–67.5)	27.0	(21.3–33.6)
≥100,000	10.1	(6.0–16.6)	49.9	(41.8–58.0)	40.0	(32.4–48.1)
Unspecified	21.0	(15.5–28.0)	58.3	(50.4–65.8)	20.7	(14.8–28.2)
<b>Sexual orientation</b>						
Heterosexual/Straight	17.6	(15.2–20.2)	61.5	(58.0–64.9)	20.9	(18.2–23.9)
Lesbian, gay, bisexual	35.6	(22.5–51.2)	51.9	(36.8–66.6)	12.5	(5.8–25.0)
Unspecified	18.1	(11.6–27.2)	67.0	(56.6–76.0)	14.9	(8.5–24.8)

**Abbreviations:** CI = confidence interval; MMC = mass market cigar; GED = General Education Development certification.

\* To be eligible to be assigned a usual cigar type, respondents had to now smoke cigars “every day,” “some days,” or “rarely”; in addition, adults aged ≥30 years had to report smoking ≥50 cigars in their lifetime, whereas adults aged 18–29 years did not.

<sup>†</sup> Respondent reported their usual cigar had a spongy filter, or was from a manufacturer that primarily or exclusively manufactures little filtered cigars. Respondents who smoked little filtered cigars but usually smoked another type are not included.

<sup>§</sup> Respondent reported their usual cigar did not have a filter and the usual brand was not premium. Respondents who smoked cigarillos/other mass market cigars but usually smoked another type are not included.

<sup>¶</sup> Respondent reported their usual cigar did not have a filter or tip, and the name of the usual brand was identified as being hand-rolled or otherwise described as containing high-grade tobaccos in the filler, binder, or wrapper. Respondents who smoked premium cigars but usually smoked another type are not included.

\*\* *Northeast:* Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. *Midwest:* Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. *South:* Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. *West:* Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

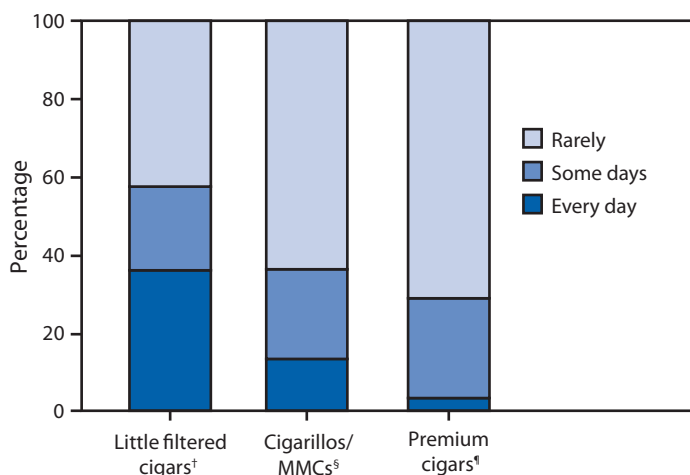
<sup>††</sup> Estimate not presented because relative standard error ≥40%.

use of cigarillos/MMCs and of LFCs, and higher prevalence of usual use of premium cigars. By sexual orientation, prevalence of LFCs as a usual cigar was greater among lesbian, gay, and bisexual adults (35.6%) than among heterosexual/straight adults (17.6%) ( $p < 0.05$ ).

Among cigar smokers who usually smoked premium cigars, 3.3% reported “every day” use, 25.6% reported “some day” use, and 71.2% reported use “rarely” (Figure 1). Among usual smokers of cigarillos/MMCs, 13.3% reported “every day” use, 23.0% reported “some day” use, and 63.8% reported use “rarely.” Among usual smokers of LFCs, 36.0% reported “every day” use, 21.5% reported “some day” use, and 42.5% reported use “rarely.”

Among usual smokers of premium cigars, 35.1% currently smoked cigarettes, 23.0% formerly smoked cigarettes, and 41.9% never smoked cigarettes (Figure 2). Among usual cigarillo/MMC smokers, 58.3% currently smoked cigarettes, 15.3% formerly smoked cigarettes, and 26.4% never smoked cigarettes. Among usual LFC smokers, 75.2% smoked cigarettes, 12.3% formerly smoked cigarettes, and 12.4% never smoked cigarettes.

**FIGURE 1. Percentage of current cigar smokers aged  $\geq 18$  years who smoke cigars every day, some days, or rarely, by type of cigar usually smoked — National Adult Tobacco Survey, United States, 2012–2013**



**Abbreviation:** MMC = mass market cigar.

\* To be eligible to be assigned a usual cigar type, respondents had to currently smoke cigars “every day,” “some days,” or “rarely”; in addition, adults aged  $\geq 30$  years had to report smoking  $\geq 50$  cigars in their lifetime, whereas adults aged 18–29 years did not.

<sup>†</sup> Respondent reported their usual cigar had a spongy filter, or was from a manufacturer that primarily or exclusively manufactures little filtered cigars.

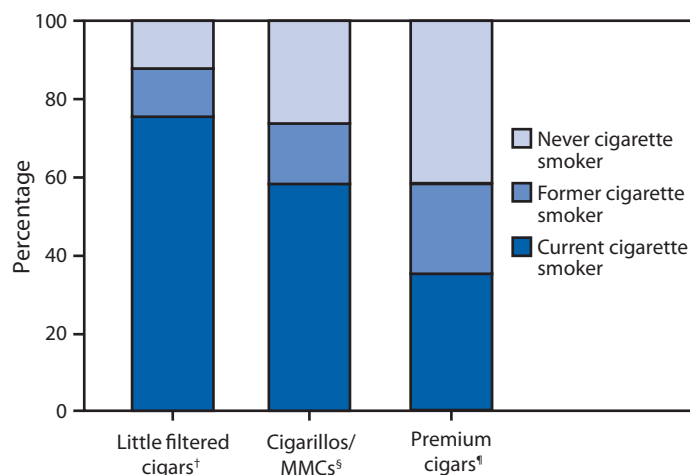
<sup>‡</sup> Respondent reported their usual cigar did not have a filter and the usual brand was not premium.

<sup>¶</sup> Respondent reported their usual cigar did not have a filter or tip and the name of their usual brand was a brand name of a hand-rolled cigar or a cigar described by the manufacturer or merchant as containing high-grade tobaccos in the filler, binder, or wrapper.

## Discussion

On the basis of these results, it is estimated that three in five cigar smokers (an estimated 10.9 million persons) usually smoke cigarillos/MMCs, approximately one in five (an estimated 3.6 million persons) usually smoke premium cigars, and nearly one in five (an estimated 2.9 million persons) usually smoke LFCs. Younger adults were more likely to identify cigarillos/MMCs as their usual cigar (72.1% of cigar smokers). However, among those aged 18–29 years, 15.1% reported that their usual cigar was a premium cigar; 12.7% usually smoked LFCs. Additionally, variations in usual cigar type by sex, age, race/ethnicity, education, income, and sexual orientation suggest that a single, aggregated measure of cigar smoking might mask important differences in tobacco use behaviors. For example, more than eight in 10 cigar smokers who were non-Hispanic black used cigarillos/MMCs. More disaggregated surveillance by cigar type has the potential to better inform public health strategies to reduce the health burden of cigar smoking in the United States. Regular cigar use is estimated to be responsible for approximately 9,000 premature deaths and almost 140,000 years of potential life lost annually, and this might underestimate total

**FIGURE 2. Percentage of current cigar smokers aged  $\geq 18$  years who currently smoke cigarettes, formerly smoked cigarettes, or never smoked cigarettes, by type of cigar usually smoked — National Adult Tobacco Survey, United States, 2012–2013**



**Abbreviation:** MMC = mass market cigar.

\* To be eligible to be assigned a usual cigar type, respondents had to currently smoke cigars “every day,” “some days,” or “rarely”; in addition, adults aged  $\geq 30$  years had to report smoking  $\geq 50$  cigars in their lifetime, whereas adults aged 18–29 years did not.

<sup>†</sup> Respondent reported their usual cigar had a spongy filter, or was from a manufacturer that primarily or exclusively manufactures little filtered cigars.

<sup>‡</sup> Respondent reported their usual cigar did not have a filter and the usual brand was not premium.

<sup>¶</sup> Respondent reported their usual cigar did not have a filter or tip and the name of their usual brand was a brand name of a hand-rolled cigar or a cigar described by the manufacturer or merchant as containing high-grade tobaccos in the filler, binder, or wrapper.



**What is already known on this topic?**

The cigar market includes diverse product types manufactured with a variety of shapes and sizes, filters, tips, flavors, and prices. Although national estimates of cigar consumption have been reported previously, data characterizing who uses different cigar types are limited.

**What is added by this report?**

Among current cigar smokers who provided information that could be used to assign a usual cigar type, 61.8% usually smoke cigarillos/other mass market cigars, 19.9% usually smoke premium cigars, and the remainder, 18.4%, usually smoke little filtered cigars. Variations in usual cigar type were observed by sex, age, race/ethnicity, education, household income, and sexual orientation. Daily cigar smoking was reported by 3.3% of usual premium cigar smokers, 13.3% of usual cigarillo/other mass market cigar smokers, and 36.0% of usual little filtered cigar smokers. Among each group of smokers, nearly 60% or more of current cigar smokers are either current or former cigarette smokers; these persons are more likely to inhale cigar smoke more deeply, putting them at particularly high risk for tobacco-related diseases.

**What are the implications for public health practice?**

Enhanced monitoring of noncigarette product use, including use of different cigar types and concurrent use of multiple tobacco products, can inform efforts to reduce the burden of adverse health effects caused by cigar smoking in the United States.

premature mortality because deaths resulting from less frequent cigar smoking were not estimated (6). These findings underscore the importance of public health interventions to reduce cigar smoking among U.S. adults. Evidence-based tobacco control interventions such as increased taxes, smoke-free policies, and public education campaigns should also address noncigarette tobacco products.

Daily cigar smoking was reported by 3.3% of usual premium cigar smokers, 13.3% of usual cigarillo/MMC smokers, and 36.0% of usual LFC smokers, suggesting that cigar smoking is not exclusively an infrequent or rare behavior. Regardless of cigar type, nearly 60% or more of current cigar smokers are either current or former cigarette smokers. Cigar smokers that are current or former cigarette smokers are more likely to report inhaling cigar smoke, putting them at particularly high risk for tobacco-related diseases (7). Even cigar smokers who report not inhaling show evidence of inhalation (8). Moreover, elevated risks for dying from oral, pharyngeal, laryngeal, and esophageal cancers have been found among those reporting no inhalation (7). The high proportion of current and former cigarette smoking reported by current cigar smokers underscores the importance of continued implementation of proven, population-based interventions to address all forms of tobacco use, especially smoked products such as cigarettes and cigars

that currently account for the greatest public health burden in the United States (1).

The findings in this report are subject to at least six limitations. First, cigar use was self-reported and not biochemically verified; however, self-reported cigarette smoking correlates highly with serum cotinine levels, suggesting good validity of self-reported cigar use (9). Second, more than 47% of current cigar smokers could not be assigned a usual cigar type because of insufficient information about the usual cigar smoked; to generate weighted counts of cigar smokers by cigar type, the distribution of usual type was assumed to be the same for those with and without missing information, after controlling for frequency of use. Third, for each type of cigar, data were gathered only from persons who smoked them as their usual cigar; persons who smoked more than one type of cigar contributed data only for their usual cigar type. Fourth, price or cigar weight could also be used to differentiate cigar types; however, NATS did not collect data for either. Fifth, small sample sizes for certain subgroups resulted in less precise estimates. Finally, the NATS response rate of 44.9% might have resulted in nonresponse bias, even after adjustment for nonresponse. Although they are not limitations, it is important to note two features of the 2012–2013 NATS. First, a response option of “rarely” was provided to characterize cigar smoking frequency after cognitive testing suggested some cigar smokers did not consider “every day,” “some days,” or “not at all” to accurately reflect their use; however, although respondents chose this option to describe their current use of cigars, exactly how respondents interpreted “rarely” is unknown. In addition, the approach used to assign usual cigar type differed from that of another national tobacco survey, which asked cigar smokers to report their usual cigar type as either LFC, cigarillo, or regular/large cigar, thus yielding potentially different distributions of cigar smokers according to usual cigar type (10).

In April 2014, the Food and Drug Administration proposed to extend its jurisdiction over the manufacture, marketing, and sale of tobacco products to cigars.\*\* Full implementation of comprehensive tobacco control programs at CDC-recommended funding levels could reduce all forms of tobacco use, including cigars, and change social norms regarding the acceptability of tobacco use in the United States.†† Additionally, given the diversity of tobacco product use in the United States (4), enhanced surveillance of noncigarette products, including different cigar types and concurrent use of multiple tobacco products, is critical.

\*\* Additional information available at <http://www.fda.gov/aboutfda/reportsmanualsforms/reports/economicanalyses/ucm394922.htm>.

†† Additional information available at [http://www.cdc.gov/tobacco/stateandcommunity/best\\_practices](http://www.cdc.gov/tobacco/stateandcommunity/best_practices).

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<sup>1</sup>Center for Tobacco Products, Food and Drug Administration; <sup>2</sup>Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, CDC; <sup>3</sup>Center for Tobacco Studies, Rutgers School of Public Health (Corresponding author: Catherine Corey, catherine.corey@fda.hhs.gov, 301-796-7396)

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## Notes from the Field

### Outbreak of Pertussis in a School and Religious Community Averse to Health Care and Vaccinations — Columbia County, Florida, 2013

James Matthias, MPH<sup>1</sup>, Cristina Dusek<sup>2</sup>,  
P. Scott Pritchard, MPH<sup>1</sup>, Laura Rutledge<sup>2</sup>, Paula Kinchen<sup>3</sup>,  
Mark Lander, MS<sup>3</sup> (Author affiliations at end of text)

On August 30, 2013, the Florida Department of Health in Columbia County was notified of a *Bordetella pertussis* laboratory-positive unimmunized child attending a local charter school (316 students from pre-K through 8th grade) in a large religious community averse to health care and vaccinations. Kindergarten immunization records showed that only five (15%) of 34 students were fully immunized with pertussis-antigen-containing vaccines. In seventh grade, only one (5%) of 22 students was fully immunized with pertussis-antigen-containing vaccines. Of the children who were not fully immunized in these two grades, 84% had religious exemptions (1).

Interviews confirmed that a sibling of the patient had symptoms consistent with pertussis. By September 3, two additional children from the same school were confirmed by polymerase chain reaction to have pertussis. On September 12, the Florida Department of Health in Columbia County declared a communicable disease emergency; children with cough illness were excluded from school, and reentry required an evaluation by a health care provider. After this declaration, 38 additional students were excluded. Prophylaxis or treatment with antibiotics following current guidelines were provided to patients and household contacts (2). The local health department offered to provide these services free of charge to persons without health care coverage. Pertussis vaccine administered at the health department was available; however, fewer than five persons from the community used this opportunity for vaccination.

An investigation was conducted to determine disease incidence within the community and measures to control the spread of the disease. Medical record review and household interviews were conducted for children excluded or absent from the charter school because of cough illness. Cases were classified as confirmed or probable using the Council of State and Territorial Epidemiologists case definitions (3). Additionally, a suspected case was defined as either 1) a cough illness that lasted 7–13 days but did not meet either the confirmed or probable case definition, or 2) an illness in a person who received treatment for pertussis without additional clinical details. Case onset dates, vaccination status, demographics, and school attack rates were evaluated.

A total of 109 cases were identified in the community, of which eight were classified as confirmed (five by laboratory confirmation), 61 were probable, and 40 were suspected. Of 316 students and 16 teachers, 94 (30%) students and one teacher had illnesses that met one of the three case definitions. Fourteen cases, including three in infants, were in household contacts of ill charter school students. None were hospitalized. Only one confirmed or probable case was reported in a person who reported having received any vaccination against pertussis. Nearly 90% of persons with illnesses meeting one of the case definitions were evaluated and prescribed antibiotics consistent with current guidelines by a single pediatrician in the course of his normal practice; laboratory testing was performed in only nine of 109 cases (2). Attack rates were highest among the youngest students (57.1% among pre-kindergarten students) and decreased with increasing age (to 14.3% among 8th-grade students).

In vaccine-averse communities, controlling vaccine-preventable disease outbreaks is challenging, particularly when susceptible community members have prolonged contact in multiple settings. Local public health agencies need to identify and collaborate with institutions and health care resources to reduce morbidity from vaccine-preventable diseases in communities where a substantial number of persons do not have immunity. Physicians should pursue laboratory testing for pertussis in patients with symptoms consistent with the disease. However, physicians also need to understand the importance of reporting presumptive pertussis cases, even without laboratory confirmation, to public health departments.

<sup>1</sup>Bureau of Epidemiology, Florida Department of Health; <sup>2</sup>Bureau of Communicable Diseases, Florida Department of Health; <sup>3</sup>Florida Department of Health in Columbia County (Corresponding author: James Matthias, james.matthias@flhealth.gov, 850-245-4444 x2367)

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## Announcement

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### Surgeon General's Call to Action to Prevent Skin Cancer

On July 29, the Office of the Surgeon General released its Call to Action to Prevent Skin Cancer (<http://www.surgeon-general.gov/library/calls/prevent-skin-cancer/index.html>). Skin cancer is the most frequently diagnosed cancer in the United States, with nearly 5 million persons treated each year, at an estimated cost of \$8.1 billion dollars (1–4). Melanoma is responsible for most skin cancer–related deaths, causing approximately 9,000 deaths annually (5).

Most cases of skin cancer are preventable, yet skin cancer rates have continued to increase in the United States during the past 35 years (6). Despite efforts to increase use of sun protection, approximately one third of U.S. residents reported being sunburned in the past year (7). In addition, indoor tanning greatly increases the risk for developing skin cancer, yet one out of every three non-Hispanic white women aged 16–25 years engages in indoor tanning each year (8).

The purpose of the Surgeon General's Call to Action is to increase awareness of skin cancer as a national public health priority, as well as to engage stakeholders across the nation, including policy makers; members of the business, health care, and education sectors; community, nonprofit, and faith-based organizations; and individuals and families, all with concrete strategies to reduce the risk for skin cancer.

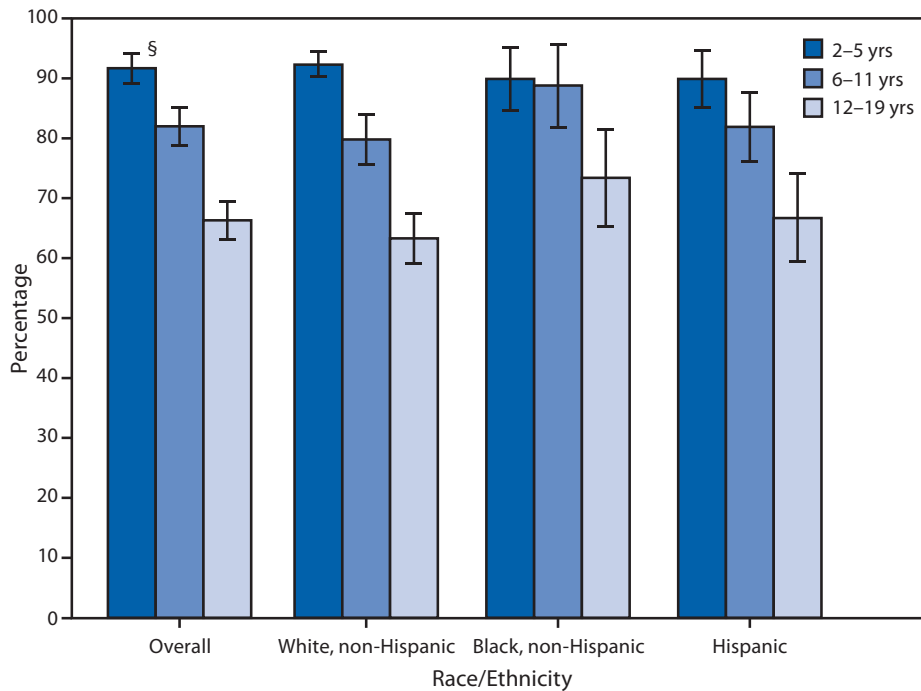
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## QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

## Percentage of Youths Who Consumed Fruit\* on a Given Day,<sup>†</sup> by Age Group and Race/Ethnicity — National Health and Nutrition Examination Survey, United States, 2009–2010



\* The definition of fruit comes from the U.S. Department of Agriculture's Food Patterns Equivalents Database and includes both fruit and fruit juices.

<sup>†</sup> The National Health and Nutrition Examination Survey collects dietary intake information using 24-hour dietary recall interviews.

<sup>§</sup> 95% confidence interval.

During 2009–2010, among youths overall aged 2–19 years, 91.7% of those aged 2–5 years, 82.0% of those aged 6–11 years, and 66.3% of those aged 12–19 years were reported as consuming fruit on a given day. Among non-Hispanic white, non-Hispanic black, and Hispanic youths, the percentage who consumed fruit among those aged 2–5 years was significantly greater than the percentage among those aged 12–19 years. Among those aged 2–5 years, the percentage who consumed fruit was 92.3% for non-Hispanic white youths, 89.9% for non-Hispanic black youths, and 89.9% for Hispanic youths; in contrast, among those aged 12–19 years, the percentage was 63.3% for non-Hispanic whites, 73.4% for non-Hispanic blacks, and 66.7% for Hispanics.

**Source:** Nielsen SJ, Rossen LM, Harris DM, Ogden CL. Fruit and vegetable consumption of US youth, 2009–2010. NCHS data brief no. 156. Hyattsville, MD: US Department of Health and Human Services, CDC; 2014. Available at <http://www.cdc.gov/nchs/data/databriefs/db156.htm>.

**Reported by:** Samara Joy Nielsen, PhD, [snielsen@cdc.gov](mailto:snielsen@cdc.gov), 301-458-4193; Steven M. Frenk, PhD.





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