Brief Report

Flavored Cigar Smoking Among U.S. Adults: Findings From the 2009–2010 National Adult Tobacco Survey

Brian A. King, Ph.D., M.P.H.,[1,2] *Shanta R. Dube, Ph.D., M.P.H.,*[1] *& Michael A. Tynan, B.A.*[1]

[1] *Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA*

[2] *Epidemic Intelligence Service, Division of Applied Sciences, Scientific Education and Professional Development Program Office, Centers for Disease Control and Prevention, Atlanta, GA*

Corresponding Author: Brian A. King, Ph.D., M.P.H., *Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 4770 Buford Highway, MS K-50, Atlanta, GA 30341, USA. Telephone: 770-488-5107; Fax: 770-488-5848; E-mail: baking@cdc.gov*

Received May 1, 2012; accepted June 24, 2012

Abstract

Introduction: Under its authority to regulate tobacco products, the U.S. Food and Drug Administration prohibited certain characterizing flavors in cigarettes in September 2009; however, flavored cigars are still permitted to be manufactured, distributed, and sold. This study assessed the prevalence and correlates of flavored cigar smoking among U.S. adults.

Methods: Data were obtained from the 2009–2010 National Adult Tobacco Survey, a national landline and cell phone survey of adults aged ≥18 years old residing in the 50 U.S. states and the District of Columbia. National and state estimates of flavored cigar use were calculated overall and among current cigar smokers; national estimates were calculated by sex, age, race/ethnicity, educational attainment, annual household income, U.S. Census Region, and sexual orientation.

Results: The national prevalence of flavored cigar smoking was 2.8% (95% confidence interval [*CI*] = 2.6%–3.1%; state range: 0.6%–5.7%) and was greater among those who were male, younger in age, non-Hispanic Other race, less educated, less wealthy, and lesbian, gay, bisexual, or transgendered (LGBT). Nationally, the prevalence of flavored cigar use among cigar smokers was 42.9% (95% *CI* = 40.1%–45.7%; state range: 11.1%–71.6%) and was greater among those who were female, younger in age, Hispanic, non-Hispanic Other race, less educated, less wealthy, and LGBT.

Conclusions: More than two fifths of current cigar smokers report using flavored cigars. Disparities in flavored cigar use also exist across states and subpopulations. Efforts to curb flavored cigar smoking have the potential to reduce the prevalence of overall cigar smoking among U.S. adults, particularly among subpopulations with the greatest burden.

Introduction

Cigars contain the same toxic and carcinogenic compounds found in cigarettes and are not a safe alternative to cigarettes (National Cancer Institute [NCI], 1998). Regular cigar smoking is associated with an increased risk for cancers of the lung, larynx, oral cavity, and esophagus (NCI, 1998). Moreover, regular cigar smokers who inhale, particularly those who smoke several cigars per day, are also at an increased risk of developing coronary heart disease and chronic obstructive pulmonary disease (NCI, 1998).

The prevalence of cigarette smoking has decreased substantially in the U.S. in recent decades (Centers for Disease Control and Prevention [CDC], 2007a, 2011b). However, cigar consumption increased nearly 50% between 1993 and 1997, reversing a decline that had persisted since advertisements for little cigars were prohibited from television and radio in 1973 (NCI, 1998). This increase has been attributed to a corresponding surge in promotional activities, which enhanced the visibility of cigar consumption and normalized cigar use (NCI, 1998). In 2010, an estimated 13.2 million people in the U.S., or 5.2% of those ≥12 years old, were current cigar smokers (Substance Abuse and Mental Health Services Administration [SAMHSA], 2011).

In 2009, the Family Smoking Prevention and Tobacco Control Act was enacted, which gave the U.S. Food and Drug Administration (FDA, 2009) the authority to regulate tobacco products, including the ability to propose certain requirements and restrictions on manufacturing, marketing, and distribution (U.S. Government Printing Office [GPO], 2009). On September 22, 2009, the FDA prohibited certain characterizing flavors in cigarettes, excluding menthol (FDA, 2009). However, other flavored tobacco products, such as flavored cigars, cigarillos, and little cigars, can still be legally manufactured, distributed,

doi:10.1093/ntr/nts178

and sold in the U.S. Flavors can mask the natural harshness and taste of tobacco, making these products easier to use and increasing their appeal among youth (Carpenter, Wayne, Pauly, Koh, & Connolly, 2005; Klein et al., 2008; Manning, Kelly, & Comello, 2009).

Although recent data on the prevalence and sale of cigars in the United States have been published (Maxwell, 2010; SAMHSA, 2011), the current prevalence of flavored cigar smoking and the characteristics of users are uncertain. To address this research need, we analyzed data from the 2009–2010 National Adult Tobacco Survey (NATS) to determine national and state-specific estimates of the prevalence and sociodemographic correlates of flavored cigar smoking among U.S. adults ≥18 years old.

Methods

Sample

The 2009–2010 NATS was a stratified, national telephone survey of non-institutionalized adults aged ≥18 years residing in the 50 U.S. states and the District of Columbia (CDC, 2011a). The sample was designed to yield data representative at both national and state levels. Each state was divided into separate strata by telephone type. For the landline component, each state was allocated an equal target sample size (n = 1,863). For the cell phone component, each state was allocated a sample size in proportion to its population (range: n = 255–24,100). Four states independently added to their samples (Louisiana, New Jersey, North Dakota, and Oklahoma).

Respondent selection varied by phone type. For landline numbers, one adult was randomly selected from each eligible household. For cell phone numbers, adults were selected if a cell phone was the only method they could be reached by telephone at home. In total, 118,581 interviews were completed (n = 110,634 landline; n = 7,947 cell phone) between October 2009 and February 2010. The National Council of American Survey and Research Organizations (CASRO, 1997) response rate was 37.6% (landline: 40.4%; cell phone: 24.9%); the national cooperation rate was 62.3% (landline: 61.9%; cell phone: 68.7%). State-specific CASRO response rates ranged from 28.2% in New Jersey to 49.3% in Vermont (median: 37.9%); cooperation rates ranged from 52.9% in Louisiana to 72.4% in Vermont (median: 62.9%).

Measures

Flavored Cigar Smoking

Three questions were used to define current use of cigars and flavored cigars: (a) "Have you ever tried smoking cigars, cigarillos, or very small cigars that look like cigarettes in your entire life, even one or two puffs?" (b) "During the past 30 days, on how many days did you smoke cigars, cigarillos, or very small cigars that look like cigarettes?" (c) "Were any of the cigars, cigarillos, or very small cigars that look like cigarettes that you smoked in the past 30 days flavored to taste like candy, fruit, chocolate, or other sweets?" Current cigar smokers were defined as respondents who reported trying cigars, cigarillos, or very small cigars in their lifetime and reported using these products on at least 1 day within the past 30 days. Flavored cigar smokers were defined as respondents who reported trying cigars, cigarillos, or very small cigars in their lifetime, reported using these products on at least 1 day within the past 30 days, and also reported that the products they used in the past 30 days were flavored.

Respondent Characteristics

Assessed respondent characteristics included: sex (male or female), age in years (18–24, 25–44, 45–64, or ≥65), race/ethnicity (non-Hispanic White, non-Hispanic Black, non-Hispanic Asian, non-Hispanic Other, or Hispanic), education (0–12 years [no diploma], Graduate Equivalency Degree [GED], high school graduate, some college [no degree], associate degree, undergraduate degree, or graduate degree), annual household income (<$20,000, $20,000–$49,999, $50,000–$99,999, ≥$100,000, or unspecified), sexual orientation (heterosexual/straight, lesbian/gay/bisexual/transgender [LGBT], or unspecified), and U.S. Census region (Northeast, Midwest, South, or West). For race/ethnicity, "non-Hispanic Other" included respondents who were American Indian or Alaska Native, Native Hawaiian or Pacific Islander, multiracial, or some other race.

Analysis

Data were analyzed using SAS-Callable SUDAAN, version 10.0.0 (SAS Institute Inc., Research Triangle Park, NC) and weighted to adjust for the differential probability of selection and response. Final weights were also adjusted for undercoverage by sex, age, race/ethnicity, marital status, educational attainment, and telephone type. For states with a small number of cell phone respondents, the use of both landline and cell phone data resulted in a large unequal weighting effect. Therefore, national and state estimates were calculated using separate weights. For the national weight, both cell phone and landline respondents were included. For the state weight, cell phone respondents were only included for states with a cell phone sample of ≥200 (n = 12: California, Florida, Georgia, Illinois, Louisiana, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, and Texas).

National estimates were calculated overall and by respondent characteristics. Due to limited sample size, only overall estimates were calculated at the state level. Differences between estimates were considered statistically significant if 95% confidence intervals did not overlap. Estimates with a relative standard error of ≥40% are not reported.

Results

Flavored Cigar Smoking Among All Respondents

The overall prevalence of flavored cigar smokers was 2.8% (Table 1). Prevalence was higher among males (4.1%) than females (1.7%). Prevalence decreased with increasing age and was highest among persons aged 18–24 years (9.1%). By race/ethnicity, prevalence ranged from 0.8% among non-Hispanic Asians to 7.5% among non-Hispanic Other races. Prevalence generally decreased with increasing education and was greatest among those with a GED (10.5%). By annual household income, prevalence ranged from 1.7% among those with $50,000–$99,999 to 5.3% among those with <$20,000. By sexual orientation, prevalence was higher among LGBT (8.2%)

Table 1. Current Use of Cigars and Flavored Cigars Among U.S. Adults Aged ≥18 Years, by Selected Characteristics, 2009–2010

	Among all respondents (N = 118,215)				Among current cigar smokers (N = 4,326)	
	Cigar smokers[a]		Flavored cigar smokers[b]		Flavored cigar smokers[b]	
Characteristics	%	95% *CI*	%	95% *CI*	%	95% *CI*
Sex						
Male	10.4	9.7–11.0	4.1	3.6–4.5	39.2	35.9–42.6
Female	3.1	2.8–3.4	1.7	1.4–1.9	60.8	57.4–64.1
Age (years)						
18–24	15.9	14.4–17.7	9.1	7.8–10.5	57.1	51.4–62.5
25–44	7.2	6.6–7.9	3.1	2.7–3.6	43.2	38.7–47.8
45–64	4.9	4.5–5.4	1.4	1.2–1.7	28.9	25.1–33.2
≥65	1.8	1.6–2.1	0.2	0.1–0.3	13.4	9.3–18.9
Race/Ethnicity						
White, non-Hispanic	6.1	5.7–6.4	2.3	2.1–2.5	37.9	34.9–40.9
Black, non-Hispanic	9.2	8.1–10.5	3.6	2.9–4.4	39.4	32.9–46.3
Asian, non-Hispanic	1.8	1.1–2.8	0.8	0.4–1.8	48.0	26.5–70.3
Other, non-Hispanic	12.0	9.7–14.8	7.5	5.5–10.1	62.4	51.8–71.9
Hispanic	6.8	5.5–8.4	4.2	3.2–5.5	61.7	51.2–71.2
Education						
0–8 years (no diploma)	6.2	4.2–9.0	2.5	1.4–4.6	40.9	24.0–60.3
9–12 years (no diploma)	10.0	8.5–11.7	5.3	4.2–6.6	52.8	44.5–60.9
GED	16.2	13.2–19.8	10.5	7.9–13.9	65.3	54.5–74.7
High school graduate	7.9	7.2–8.7	3.4	2.9–4.0	43.6	38.7–48.7
Some college (no degree)	6.1	5.4–6.8	2.7	2.2–3.2	43.9	37.9–50.2
Associate degree	5.5	4.9–6.3	2.3	1.9–2.9	41.7	35.2–48.5
Undergraduate degree	4.0	3.6–4.5	0.8	0.6–1.1	20.1	15.5–25.8
Graduate degree	3.3	2.8–3.8	0.5	0.4–0.8	16.4	11.5–22.7
Annual household income						
<$20,000	10.3	9.1–11.8	5.3	4.4–6.5	51.7	44.8–58.5
$20,000–$49,999	6.9	6.3–7.5	3.3	2.8–3.8	47.8	43.1–52.5
$50,000–$99,999	5.5	5.0–6.1	1.7	1.4–2.1	31.6	26.8–36.9
≥$100,000	6.0	5.2–6.8	1.8	1.3–2.5	29.7	22.6–38.0
Unspecified	5.0	4.2–6.0	2.8	2.2–3.6	56.9	47.2–66.0
Sexual orientation						
Heterosexual/Straight	6.5	6.2–6.9	2.7	2.5–3.0	41.8	38.9–44.7
LGBT	12.2	9.3–15.9	8.2	5.6–11.9	67.0	54.6–77.3
Unspecified	3.9	2.9–5.2	1.4	0.9–2.2	36.7	24.4–51.0
U.S. region						
Northeast	5.0	4.5–5.6	1.7	1.3–2.1	33.5	27.8–39.7
Midwest	6.7	6.0–7.4	3.1	2.6–3.6	46.2	40.9–51.5
South	7.6	7.0–8.2	3.2	2.8–3.6	42.1	37.9–46.5
West	6.4	5.6–7.3	3.0	2.4–3.7	47.0	40.1–54.1
Total	6.6	6.3–7.0	2.8	2.6–3.1	42.9	40.1–45.7

Note. All estimates were calculated among both landline and cell phone respondents. *CI* = confidence interval; GED = graduate equivalency degree; LGBT = lesbian, gay, bisexual, or transgender.

[a]Reported ever using "cigars, cigarillos, or very small cigars that look like cigarettes" in their lifetime, and at the time of survey, reported using "cigars, cigarillos, or very small cigars that look like cigarettes" on at least 1 day within the past 30 days.

[b]Reported ever using "cigars, cigarillos, or very small cigars that look like cigarettes" in their lifetime, and at the time of survey, reported using "cigars, cigarillos, or very small cigars that look like cigarettes" on at least 1 day within the past 30 days that were "flavored to taste like candy, fruit, chocolate, or other sweets."

than heterosexual/straight respondents (2.7%). By region, prevalence was lowest in the Northeast (1.7%). By state, prevalence ranged from 0.6% in New Hampshire to 5.7% in Mississippi (Table 2).

Flavored Cigar Smoking Among Cigar Smokers

Among all cigar smokers (6.6%), a total of 42.9% reported smoking flavored cigars (Table 1). Flavored cigar smoking among all cigar

Table 2. Current Use of Cigars and Flavored Cigars Among U.S. Adults Aged ≥18 Years, by State, 2009–2010

	Among all respondents				Among current cigar smokers	
	Cigar smokers[a]		Flavored cigar smokers[b]		Flavored cigar smokers[b]	
State	%	95% *CI*	%	95% *CI*	%	95% *CI*
Northeast						
Connecticut	6.0	4.2–8.6	2.5	1.2–4.9	40.7	23.4–60.7
Maine	6.4	4.6–8.9	2.4	1.2–4.5	37.1	21.4–56.0
Massachusetts	7.3	4.8–10.9	2.8	1.3–5.8	38.7	19.8–61.7
New Hampshire	5.7	4.2–7.7	0.6	0.3–1.3	11.1	5.1–22.4
New Jersey[c]	4.7	3.9–5.6	1.1	0.8–1.6	23.7	16.9–32.2
New York[c]	4.3	3.3–5.6	1.5	0.9–2.5	35.4	23.0–50.0
Pennsylvania[c]	4.7	3.7–6.0	1.6	1.0–2.5	33.5	22.8–46.3
Rhode Island	8.3	5.9–11.4	3.5	2.0–6.3	42.9	26.7–60.8
Vermont	4.6	3.2–6.6	2.4	1.4–4.0	51.4	33.1–69.2
Midwest						
Illinois[c]	6.5	5.0–8.4	3.6	2.4–5.3	55.3	42.2–67.6
Indiana	8.1	6.1–10.7	3.5	2.2–5.7	44.0	29.8–59.2
Iowa	3.0	2.0–4.3	1.1	0.5–2.3	37.7	20.7–58.5
Kansas	5.2	3.5–7.7	2.5	1.3–4.8	48.3	28.7–68.4
Michigan	7.8	5.8–10.5	4.1	2.6–6.6	54.7	38.8–69.6
Minnesota	3.5	2.1–5.9	2.1	0.9–4.7	59.0	35.1–79.3
Missouri	8.4	5.8–12.1	3.4	2.0–5.6	40.1	23.6–59.1
Nebraska	6.0	4.2–8.5	3.5	2.1–5.9	59.0	41.4–74.5
North Dakota	4.7	3.1–7.1	3.3	1.8–5.8	71.6	55.6–83.6
Ohio[c]	6.2	4.9–7.9	2.7	1.8–3.9	42.8	31.1–55.4
South Dakota	4.2	2.7–6.5	1.8	0.9–3.5	42.8	23.1–65.0
Wisconsin	4.2	2.9–6.0	2.1	1.1–3.8	49.7	31.7–67.7
South						
Alabama	6.5	4.8–8.8	2.3	1.3–4.0	35.0	21.3–51.8
Arkansas	6.7	5.1–8.6	3.0	1.9–4.6	44.8	31.7–58.6
Delaware	6.0	4.2–8.4	3.4	2.0–5.6	57.0	39.9–72.6
District of Columbia	6.5	3.3–12.6	[d]		48.8	18.3–80.3
Florida[c]	7.8	6.2–9.8	3.3	2.2–5.0	43.5	31.8–56.1
Georgia[c]	6.2	4.9–7.9	2.4	1.7–3.6	39.1	28.0–51.6
Kentucky	9.9	7.3–13.2	4.7	2.8–7.9	48.6	32.9–64.6
Louisiana[c]	9.0	7.5–10.6	4.2	3.2–5.6	47.6	38.3–57.0
Maryland	5.0	3.4–7.4	2.2	1.2–4.2	44.8	26.3–64.9
Mississippi	11.9	8.7–16.2	5.7	3.5–9.1	47.6	31.2–64.5
North Carolina[c]	7.9	6.1–10.2	3.5	2.3–5.4	44.5	31.5–58.2
Oklahoma[c]	7.9	6.8–9.3	3.2	2.4–4.1	40.0	32.0–48.5
South Carolina	4.9	3.8–6.4	2.0	1.3–3.1	40.9	28.1–55.0
Tennessee	6.5	4.6–9.2	2.8	1.7–4.5	43.6	27.1–61.7
Texas[c]	8.9	7.3–10.9	3.8	2.7–5.3	42.6	32.4–53.4
Virginia	6.8	5.1–9.1	2.5	1.5–4.3	37.0	23.3–53.1
West Virginia	5.9	4.1–8.3	3.0	1.9–4.9	52.6	34.3–70.2
West						
Alaska	6.0	4.2–8.5	2.0	1.1–3.4	33.4	19.2–51.3
Arizona	3.4	2.2–5.4	1.2	0.6–2.4	34.9	17.6–57.4
California[c]	6.3	5.0–7.8	2.8	2.0–4.0	44.9	33.7–56.7
Colorado	6.3	3.5–10.9	[d]		68.9	44.2–86.2
Hawaii	4.3	2.8–6.5	1.3	0.6–2.7	30.5	14.8–52.6
Idaho	4.8	3.0–7.5	2.6	1.3–5.1	55.9	32.7–76.8
Montana	6.5	4.2–10.1	[d]		[d]	
Nevada	6.0	4.1–8.7	3.0	1.5–5.8	49.7	30.8–68.7
New Mexico	5.7	3.7–8.6	3.9	2.2–6.8	69.0	49.4–83.5
Oregon	2.9	1.8–4.8	[d]		[d]	

Table 2. Continued

	Among all respondents				Among current cigar smokers	
	Cigar smokers[a]		Flavored cigar smokers[b]		Flavored cigar smokers[b]	
State	%	95% *CI*	%	95% *CI*	%	95% *CI*
Utah	1.8	1.0–3.1	0.9	0.4–1.7	48.2	23.2–74.0
Washington	6.4	4.2–9.7	1.8	1.0–3.3	28.3	14.7–47.4
Wyoming	5.7	4.0–7.9	2.5	1.4–4.6	44.3	27.7–62.4

Note. *CI* = confidence interval.
[a]Reported ever using "cigars, cigarillos, or very small cigars that look like cigarettes" in their lifetime, and at the time of survey, reported using "cigars, cigarillos, or very small cigars that look like cigarettes" on at least 1 day within the past 30 days.
[b]Reported ever using "cigars, cigarillos, or very small cigars that look like cigarettes" in their lifetime, and at the time of survey, reported using "cigars, cigarillos, or very small cigars that look like cigarettes" on at least 1 day within the past 30 days that were "flavored to taste like candy, fruit, chocolate, or other sweets."
[c]Estimate calculated among both landline and cell phone respondents. All other state estimates were calculated among landline respondents only.
[d]Data not shown because relative standard error ≥40%.

smokers was higher among females (60.8%) than males (39.2%) and decreased with increasing age and income. By race/ethnicity, prevalence ranged from 37.9% among non-Hispanic Whites to 62.4% among non-Hispanic persons of other races. Prevalence generally decreased with increasing education and was greatest among those with a GED (65.3%). By sexual orientation, prevalence was higher among LGBT (67.0%) than among heterosexual/straight respondents (41.8%). By region, prevalence was lowest in the Northeast (33.5%). By state, prevalence ranged from 11.1% in New Hampshire to 71.6% in North Dakota (Table 2).

Discussion

Data from the 2009–2010 NATS reveal that more than two fifths (42.9%) of U.S. adult current cigar smokers are using flavored cigars and that disparities in flavored cigar smoking exist across states and subpopulations. Accordingly, efforts to curb flavored cigar smoking have the potential to reduce cigar smoking among U.S. adults (NCI, 2011), particularly among subpopulations with the greatest overall prevalence of use, including persons who are male, younger in age, non-Hispanic Other races, less educated, less wealthy, and LGBT.

This study reveals that flavored cigar smoking comprises a substantial proportion of all cigar use among U.S. adults. This finding is consistent with recent increased trends in flavored tobacco use consumption (Federal Trade Commission [FTC], 1999; Maxwell, 2008). Although the FDA prohibited non-menthol flavorings in cigarettes in September 2009 (FDA, 2009), other flavored products, including cigars, remain available and have increased in popularity in recent years. During 1997–2007, little cigar sales increased 240% (Maxwell, 2008), with flavored brands comprising nearly four fifths of the market share (FTC, 1999).

Disparities observed across subpopulations in this study are consistent with other national surveys of flavored cigar smoking and any cigar smoking among U.S. adults (Regan, Dube, & Arrazola, 2012; SAMHSA, 2011). The causes for these disparities are complex and multifactorial. For example, variations by sex and race/ethnicity could be related to cultural factors or exposure to promotional activities (NCI, 1998), while the higher prevalence observed among LGBT respondents may be due to stresses of social stigma, peer pressure, or targeting by the tobacco industry (Ryan, Wortley, Easton, Pederson, & Greenwood, 2001). Variations by education level are likely related to differences in receptivity toward tobacco-related health messages and understanding of the health hazards of cigar use. Although cigars are not safe alternatives to cigarettes (NCI, 1998), studies suggest that many individuals are poorly informed about the risks of cigar smoking (Baker, Dye, Denniston, & Ainsworth, 2001; Nyman, Taylor, & Biener, 2002). It is possible that variations by income level are due to differences in access to cessation support (Siahpush, McNeill, Borland, & Fong, 2006; U.S. Public Health Service [PHS], 2008), or to the availability of cigars as a lower priced alternative to cigarettes (Campaign for Tobacco-Free Kids [CTFK], 2011; NCI, 1998). Variations were also observed by age, with younger adults showing the greatest prevalence. This finding is consistent with research suggesting that the tobacco industry has selectively marketed flavored tobacco products to young adults (Lewis & Wackowski, 2006; U.S. Department of Health and Human Services [DHHS], 2012).

Strengths of the study include a large and representative sample, the inclusion of cell phone respondents, and the ability to assess disparities across multiple subpopulations. However, at least five study limitations should be noted. First, tobacco use was self-reported and not validated by biochemical tests. Second, cell phone respondents were excluded from state-specific analyses for states with fewer than 200 cell phone respondents, which limits generalizability of the results to this subpopulation (Blumberg & Luke, 2010). Nonetheless, cell phone respondents were included in national estimates and state-specific estimates for the 12 states with sufficient sample size. Third, small sample sizes for some states resulted in estimates that could not be presented because they would have been imprecise. Fourth, the questionnaire did not distinguish between use of little cigars and traditional cigars. Little cigars are comparable to cigarettes with regard to shape, size, filters, and packaging, and the tobacco industry has marketed little cigars as

a lower cost alternative to cigarettes (Delnevo & Hrywna, 2007). Finally, the overall response rate was 37.6%, while state-specific rates were 28.2%–49.3%. These rates were comparable to those of other national and state surveys of adult tobacco use (CDC, 2011b). Nonetheless, lower response rates can increase the potential for bias (Delnevo & Bauer, 2009).

To our knowledge, this study is the first to assess the prevalence and correlates of flavored cigar use at both the national and state levels. In addition to clarifying the scope of flavored cigar smoking among U.S. adults, the findings also underscore the need for full implementation of evidence-based prevention strategies to reduce all forms of combustible tobacco use, particularly among subpopulations with the highest prevalence. Proven population-based prevention strategies—such as tobacco price increases, media campaigns, and smoke-free policies—in concert with full access to clinical cessation interventions, will decrease tobacco use and reduce the health burden and economic impact of tobacco-related diseases in the United States (CDC, 2007b).

Funding

There were no sources of funding, direct or indirect, for the reported research.

Declaration of Interests

The authors have no competing interests to report.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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