

A Ban on Menthol Cigarettes: Impact on Public Opinion and Smokers' Intention to Quit

Jennifer L. Pearson, PhD, MPH, David B. Abrams, PhD, Raymond S. Niaura, PhD, Amanda Richardson, PhD, and Donna M. Vallone, PhD, MPH

In 2009, the passage of the Family Smoking Prevention and Tobacco Control Act gave the US Food and Drug Administration (FDA) the authority to regulate tobacco products in the United States.¹ Three months after passage of the law, the FDA banned cigarette flavorings such as clove and chocolate as a measure to reduce smoking initiation. The law excluded menthol from this ban, but mandated that the FDA's new Center for Tobacco Products consider a menthol ban as one of its first actions. Convened in 2010, the Center's Tobacco Products Scientific Advisory Committee was tasked with assessing the scientific evidence regarding the public health impact of menthol in cigarettes. The committee's report to the FDA in March 2011 stated, "removal of menthol cigarettes from the marketplace would benefit public health in the United States."^{2(p208)}

Even before the 2009 cigarette-flavoring ban, menthol was the most popular characterizing flavor in the United States.³ Although most cigarettes contain some menthol, about one third of all adult smokers smoke cigarettes with menthol as their characterizing flavor.^{3,4} Smoking prevalence has decreased since the mid-20th century, but the proportion of menthol smokers has increased in recent years,⁴ with menthol smoking higher among youths, women, African Americans, and those making less than \$50 000 a year.³ Proposed reasons for this increased market share include menthol's role in facilitating initiation and decreasing cessation, as well as cigarette companies' targeted marketing of African Americans.⁵⁻⁸

Research by Winickoff et al. showed that public support for a ban is high when menthol cigarettes are framed as a type of flavored cigarette.⁹ Our study adds to existing research assessing public support for a menthol ban, with special attention to the role of smoking status, gender, race/ethnicity, and education. We also report here the first peer-reviewed data on menthol smokers' predicted behavioral

Objectives. We assessed support for a ban by the Food and Drug Administration on menthol in cigarettes and behavioral intentions among menthol smokers in the event of such a ban.

Methods. We surveyed 2649 never, former, and current smokers and used ordinal logistic regression to calculate weighted point estimates and predictors of support for a menthol ban among the adult population and menthol smokers only. For menthol smokers, we also calculated weighted point estimates and predictors of behavioral intentions.

Results. Overall, 28.2% of adults opposed, 20.0% supported, and 51.9% lacked a strong opinion about a menthol ban. Support was highest among Hispanics (36.4%), African Americans (29.0%), never smokers (26.8%), and respondents with less than a high school education (28.8%). Nearly 40% of menthol smokers said they would quit if menthol cigarettes were no longer available, 12.5% would switch to a nonmenthol brand, and 25.2% would both switch and try to quit.

Conclusions. Support for a menthol ban is strongest among populations with the highest prevalence of menthol cigarette use. A menthol ban might motivate many menthol smokers to quit. (*Am J Public Health.* 2012;102:e107–e114. doi:10.2105/AJPH.2012.300804)

responses in the event of a menthol ban.^{10,11} Information about consumer sentiment and predicted behavioral reaction to a menthol ban could inform the FDA's decision-making and help the agency plan what type of mass media educational campaign and smoking cessation resources are needed to maximize the public health benefit of a menthol ban.

METHODS

We obtained data from a June 2010 cross-sectional survey drawn from Knowledge Networks' KnowledgePanel, a nationally representative online cohort of adults aged 18 years and older that covers populations both with and without access to the Internet in the United States. Participants may not opt in to KnowledgePanel. The survey uses an address-based sampling stratified design to recruit members, although some members who were recruited during earlier efforts with random-digit-dialing sampling remain. Members without access to the Internet are given a computer with Internet access to facilitate data collection. All new members complete a profile survey that collects

demographic information used for determining eligibility for studies and statistical weighting.

We randomly sampled members from the KnowledgePanel cohort, with oversampling for African Americans and Hispanics. Overall, we contacted 10 537 members for participation, of whom 6792 (64.5%) completed the screening and confirmed smoking status. We accepted all current smokers and randomly invited 20% of the former and never smokers to participate, yielding a final sample of 2649 never, former, and current smokers.

Measures

Smoking status was self-reported, with never smokers classified as having smoked no more than 99 cigarettes in their lives, former smokers having smoked 100 cigarettes or more in their lives but currently smoking "not at all," and current smokers having smoked in excess of 100 cigarettes in their lifetimes and currently smoking "every day" or "some days." Menthol smoking status was also self-reported, assessed with the item, "Were the cigarettes you smoked most often during the last 30 days menthol?" Smokers who responded positively to this

question were then asked, “If the government were to ban the use of menthol in cigarettes, how might this affect your smoking? Would you switch to a non-menthol brand or would you try to quit smoking?” Response choices were “switch to a non-menthol brand,” “try to stop smoking,” “both switch to a non-menthol brand and try to quit smoking,” and “don’t know.” To assess opinions on FDA regulation of menthol in cigarettes, all participants were asked to choose “strongly agree,” “agree,” “neither agree nor disagree,” “disagree,” “strongly disagree,” or “don’t know” in response to the following statement: “Menthol flavoring in cigarettes should be banned.”

We incorporated several additional independent variables in our analysis, including perceived health status, political ideology, and measures of quit attempts, intention to quit, and nicotine dependence. To estimate perceived health status, respondents were asked, “In general, how would you say your health is . . .” Respondents could choose “excellent,” “very good,” “good,” “fair,” “poor,” or “don’t know.” This single-item measure of perceived health status has been frequently employed in public health research because of its capacity to predict morbidity and mortality.^{12–14} Adapted from an item used by the Pew Research Center for the People and the Press, our single-item measure of political ideology was an 11-point scale, with 0 being “very liberal” and 10 “very conservative.”^{15,16} Research shows that those identifying as conservative are less supportive of government regulation of business than are those identifying as liberal¹⁶; thus, we expected support for banning menthol to fall along ideological lines. The survey also collected information on demographic and smoking-related items, including quit attempts in the past 3 months, intention to quit, and time to first cigarette after waking, a common brief measure of nicotine dependence.¹⁷

Data Analysis

We conducted a weighted analysis with Stata 12¹⁸ to obtain demographic and point estimates for opinions about a ban on menthol cigarettes. We analyzed both the total sample and the menthol smokers only with design-based population weights that adjusted for the probability of selection into the sample: noncoverage and nonresponse caused by

recruitment methods, clustering caused by stratification, and oversampling of African American and Hispanic census blocks. We calculated poststratification weights to reflect the 2010 US population demographic characteristics, census region, urban or rural residence, and Internet access according to the April 2010 wave of the Current Population Survey.¹⁹ We included demographic variables in all multivariable analyses irrespective of statistical significance in univariate analyses. We included all other variables in multivariable analyses if they were significant at the $P < .2$ level and were theoretically justified. We built models with likelihood ratio tests and fit statistics compared without weights, later adding weights during the interpretation phase. Items included in this analysis were missing at a rate of less than 2%. This low level of missing data may be attributable to the construction of the Knowledge Networks survey, which does not allow the respondents to proceed to the next question without answering the current item.

We collapsed dependent variable responses for menthol ban support from a 5-point Likert scale into “approve,” “neither approve nor disapprove,” and “disapprove,” with the “don’t know” responses folded into “neither agree nor disagree.” A comparison of an analysis that dropped those who responded “don’t know” with another that combined those who responded “don’t know” and “neither agree nor disagree” did not qualitatively alter our conclusions; thus, we combined the unordered “don’t know” and the “neither agree nor disagree” categories and employed an ordinal logistic regression. For ordinal logistic regressions, a 1-unit increase in the independent variable corresponded to an increase in the log odds of being at a higher level of support for a menthol ban, when all the other variables in the model were held constant. We used logistic regression to investigate the predictors of behavioral intentions if menthol were banned, with the behavioral intention of interest coded as 1 and all other behaviors coded as zero.

RESULTS

Table 1 presents the unweighted and weighted demographic characteristics by total population and menthol smokers only.

Unweighted proportions are presented with the April 2010 Current Population Survey estimates to establish national representativeness of the sample and to highlight where poststratification weighting was necessary.¹⁹

Characteristics of the menthol smoker sample (Table 1) were consistent with estimates and findings from other national data sets.^{3,20} Thirty-seven percent of smokers preferred menthol cigarettes. Although the majority of menthol smokers were White (43.9%), a greater proportion of African American smokers smoked menthol cigarettes (82.8% vs 17.2%; $P < .01$). Menthol smokers were more likely than nonmenthol smokers to intend to quit (39.8% vs 29.6%; $P < .01$), to have made a quit attempt in the past 3 months (39.8% vs 27.0%; $P < .001$), and to believe that menthol cigarettes were less harmful than regular cigarette brands (6.1% vs 1.7%; $P < .01$).

Support for a Menthol Ban

More than 28% of American adults disapproved and 20% approved of a menthol ban. Another 51.9% (38.9% neither agreed nor disagreed and 13.0% didn’t know) did not have a strong opinion for or against a menthol ban. Menthol smokers were more likely than otherwise similar nonmenthol smokers to disagree with a menthol ban (50.5% vs 31.2%; $P < .001$). Nearly 38% of menthol smokers did not have a strong opinion for or against a menthol ban (29.9% neither agreed nor disagreed and 6.8% didn’t know; Table 1). African American menthol smokers were more ambivalent, with 50.7% (37.7% neither agreed nor disagreed and 13.0% didn’t know) without a strong opinion for or against a ban. Overall, support was highest among Hispanics (36.4%), African Americans (29.0%), never smokers (26.8%), and respondents with less than a high school education (28.8%; Table 2).

Prevalence, unadjusted odds ratios, and adjusted odds ratios (AORs) for support of a ban of menthol in cigarettes within the total population and by menthol smoking status are presented in Table 2. In adjusted analysis, support for a menthol ban was significantly higher among never smokers, women, racial/ethnic minorities, and those with less than a high school education. The AORs of supporting a menthol ban were about twice as high

TABLE 1—Unweighted and Weighted Demographic Characteristics in a Sample of US Adults and Menthol Cigarette Smokers: KnowledgePanel, 2010

Characteristic	Total Population (n = 2649)			Menthol Smokers (n = 465)		
	No.	Unweighted, ^a % (CPS %) or Mean (95% CI)	Weighted, % (95% CI) or Mean (95% CI)	No.	Unweighted, % or Mean	Weighted, % (95% CI) or Mean (95% CI)
Menthol ban						
Agree	493	18.9 (NA)	20.0 (18.0, 22.3)	50	27.0	12.8 (9.0, 18.0)
Neither agree nor disagree	1013	38.9 (NA)	38.9 (36.3, 41.4)	12	11.0	29.9 (24.1, 26.5)
Disagree	758	29.1 (NA)	28.2 (25.9, 30.5)	254	55.6	50.5 (44.1, 56.8)
Don't know	343	13.2 (NA)	13.0 (11.4, 14.8)	29	6.4	6.8 (4.3, 10.7)
Gender						
Male	1323	49.9 (48.3)	48.3 (45.8, 50.9)	202	43.4	46.0 (39.7, 52.3)
Female	1326	50.1 (51.7)	51.7 (49.1, 54.3)	263	56.6	54.0 (47.5, 60.3)
Race/ethnicity						
White, non-Hispanic	1902	71.8 (69.0)	67.6 (64.9, 70.1)	246	52.9	43.9 (38.0, 50.0)
African American, non-Hispanic	298	11.3 (11.1)	11.8 (10.1, 13.8)	126	27.1	30.2 (24.4, 36.6)
Hispanic	288	10.9 (13.4)	14.5 (12.4, 16.8)	59	12.7	18.6 (13.4, 25.3)
Other	161	6.1 (5.4)	6.2 (5.0, 7.7)	34	7.3	7.3 (4.6, 11.5)
Age, y						
18–29	403	15.2 (22.0)	19.6 (17.6, 21.9)	87	18.7	21.5 (16.8, 27.2)
30–44	568	23.7 (26.2)	23.1 (20.9, 25.4)	91	19.6	23.5 (18.4, 29.6)
45–59	949	33.6 (27.8)	33.6 (31.3, 26.1)	217	46.7	40.7 (34.7, 47.0)
≥ 60	729	27.5 (24.0)	23.7 (21.6, 25.9)	70	15.1	14.3 (10.3, 19.6)
Education						
College	661	25.0 (27.2)	21.2 (19.3, 23.2)	60	12.9	9.9 (7.2, 13.4)
Some college	789	29.8 (27.8)	28.8 (26.5, 31.1)	170	36.6	31.3 (26.1, 36.9)
High school diploma/GED	861	32.5 (31.0)	33.0 (30.6, 35.5)	165	35.5	32.4 (26.8, 38.5)
< high school	338	12.8 (24.0)	17.1 (14.9, 19.4)	70	15.1	26.5 (20.5, 33.5)
Smoking status						
Never	680	25.7 (52.7)	52.5 (49.5, 55.4)	...	...	...
Former	661	25.0 (25.5)	25.4 (23.0, 27.9)	...	...	...
Current, nonmenthol	843	64.5 (NA)	62.7 (59.0, 66.3)	...	...	...
Current, menthol	465	35.6 (NA)	37.3 (33.7, 41.0)	...	...	...
Current, total	1308	49.4 (21.8)	22.2 (20.4, 24.0)	...	...	...
Political views	2629	6.5 (6.4, 6.6)	6.6 (6.4, 6.7)	465	6.3 (6.1, 6.5)	6.1 (5.9, 6.4)
Health status						
Good	1967	74.9 (NA)	72.3 (69.8, 74.7)	299	64.6	61.0 (54.5, 67.2)
Fair	540	20.6 (NA)	22.4 (20.2, 24.7)	135	29.2	30.3 (24.7, 36.6)
Poor	121	4.6 (NA)	5.3 (4.2, 6.8)	29	27.1	8.7 (5.4, 13.8)

Note. CI = confidence interval; CPS = Current Population Survey; GED = general equivalency diploma, NA = not available in the Current Population Survey. Ellipses indicate data not applicable.
^aUnweighted proportions are presented with the April 2010 CPS estimates to establish national representativeness of the sample and to show where poststratification weighting was necessary.

among African Americans and Hispanics as Whites. In addition, the AORs of support among respondents with less than a high school education were 1.7 times as high as the AORs among otherwise similar respondents with a college degree (Table 2).

Among menthol smokers, both African Americans and Hispanics were more supportive

of a menthol ban than were Whites in univariate analysis; this relationship endured in multivariable analysis, with the AOR of support 2.1 times as high among African Americans and 4.1 times as high among Hispanics as among Whites. The increased AORs of support of a menthol ban among women and those with less than a high school education in the total

population were not evident in the menthol smoker-only sample.

Political ideology was a significant predictor of support for a ban among menthol smokers, with the AOR of support for a ban increasing by 15% for every 1-unit shift from the liberal to the conservative side of the scale. In addition, the AOR of support among menthol smokers who

TABLE 2—Point Estimates, Unadjusted Odds Ratios, and Adjusted Odds Ratios of Support for a Menthol Ban Among US Adults and Menthol Cigarette Smokers: KnowledgePanel, 2010

Variable	Total population (n = 2649)			Menthol smokers only (n = 465)		
	Support, Weighted % (95% CI) or Mean (95% CI)	OR (95% CI)	AOR (95% CI)	Support, Weighted % (95% CI) or Mean (95% CI)	OR (95% CI)	AOR (95% CI)
Gender						
Male (Ref)	20.6 (17.5, 24.5)	1.00	1.00	13.6 (8.2, 21.8)	1.00	1.00
Female	25.7 (21.8, 30.1)	1.38** (1.09, 1.75)	1.32* (1.04, 1.68)	12.1 (7.3, 19.5)	0.83 (0.51, 1.36)	0.80 (0.47, 1.38)
Race/ethnicity						
White, non-Hispanic (Ref)	20.3 (17.6, 23.3)	1.00	1.00	7.8 (4.7, 12.6)	1.00	1.00
African American, non-Hispanic	29.0 (19.9, 40.1)	1.80** (1.24, 2.60)	1.95** (1.34, 2.85)	12.2 (6.0, 23.1)	2.96** (1.72, 5.13)	2.10* (1.17, 3.78)
Hispanic	36.4 (27.1, 46.9)	1.85** (1.17, 2.94)	2.11** (1.33, 3.34)	18.1 (7.6, 37.2)	3.85** (1.93, 7.70)	4.10** (1.78, 9.45)
Other	18.8 (10.4, 31.8)	1.18 (0.77, 1.82)	1.18 (0.75, 1.86)	31.9 (13.8, 57.9)	3.68* (1.00, 13.58)	4.47* (1.08, 18.52)
Age, y	45.8 (43.3, 48.2)	1.00 (0.99, 1.01)	1.01 (1.00, 1.01)	42.5 (38.1, 46.9)	1.00 (0.98, 1.02)	1.01 (0.99, 1.03)
Education						
College (Ref)	21.6 (16.9, 27.1)	1.00	1.00	11.3 (4.1, 27.6)	1.00	1.00
Some college	20.2 (16.1, 25.0)	1.00 (0.74, 1.35)	1.17 (0.85, 1.61)	15.0 (9.1, 23.8)	1.56 (0.72, 3.36)	1.90 (0.76, 4.75)
High school diploma/GED	25.2 (20.4, 30.8)	1.23 (0.90, 1.69)	1.32 (0.94, 1.85)	5.6 (2.4, 12.6)	0.95 (0.44, 2.08)	1.27 (0.52, 3.10)
< high school	28.8 (20.5, 38.8)	1.35 (0.88, 2.09)	1.72* (1.12, 2.63)	19.4 (9.8, 34.7)	1.96 (0.80, 4.84)	1.48 (0.55, 3.99)
Political ideology ^a	6.5 (6.2, 6.9)	0.97 (0.92, 1.03)	0.96 (0.91, 1.01)	6.6 (5.6, 7.5)	1.14* (1.01, 1.29)	1.15* (1.01, 1.31)
Health status						
Good (Ref)	24.6 (21.4, 28.1)	1.00	1.00	10.3 (6.4, 16.1)	1.00	1.00
Fair	18.7 (14.0, 24.6)	0.83 (0.64, 1.07)	0.83 (0.63, 1.10)	15.3 (8.3, 26.4)	1.22 (0.70, 2.13)	...
Poor	18.1 (10.7, 29.0)	0.88 (0.60, 1.29)	1.03 (0.67, 1.56)	22.9 (7.2, 53.1)	1.63 (0.53, 5.02)	...
Smoking status						
Never	26.8 (22.5, 31.7)	4.53** (3.20, 6.41)	6.40** (4.47, 9.15)	...	...	...
Former	23.0 (18.7, 27.8)	3.44** (2.41, 4.91)	4.71** (3.20, 6.92)	...	...	...
Current, nonmenthol	16.2 (12.9, 20.1)	2.09** (1.49, 2.92)	2.65** (1.84, 3.80)	...	...	...
Current, menthol (Ref)	12.8 (8.9, 18.0)	1.00	1.00	...	...	...
Current, total	14.9 (12.3, 17.9)	...	...	...	...	...
Intention to quit						
Not interested (Ref)	...	...	...	6.4 (2.4, 16.0)	1.00	1.00
Next 6 mo	...	...	...	10.0 (5.6, 17.0)	2.16* (1.16, 4.02)	1.94 (0.98, 3.86)
Next 30 d	...	...	...	27.7 (16.7, 42.4)	5.28** (2.38, 11.70)	4.67** (1.90, 11.51)
Quit attempts in past 3 mo						
None (Ref)	...	...	...	11.0 (6.7, 17.5)	1.00	1.00
≥ 1	...	...	...	15.5 (34.6, 54.4)	1.54 (0.94, 2.55)	0.99 (0.54, 1.81)
Time to first cigarette of day, min						
≤ 5	...	...	...	12.7 (5.5, 26.8)	0.73 (0.37, 1.44)	...
≥ 6 (Ref)	...	...	...	12.9 (8.7, 18.8)	1.00	1.00
Menthol harm perception^b						
Less	...	...	...	18.1 (6.6, 40.9)	0.46 (0.13, 1.62)	...
Same (Ref)	...	...	...	9.3 (3.9, 20.6)	1.00	...
More	...	...	...	20.2 (12.1, 31.9)	1.81 (0.97, 3.39)	...

Note. AOR = adjusted odds ratio; CI = confidence interval; GED = general equivalency diploma; OR = odds ratio. Ellipses indicate data not applicable. Data were collected in June 2010. Values were obtained from an ordered logistic regression, with the dependent variable coded as 0 (“disagree”), 1 (“neither agree nor disagree”), or 2 (“agree”). The ORs were obtained from simple ordered logistic regressions. All covariates listed were included in the adjusted analyses. The ORs can be interpreted as the change in odds when moving from a lower to a higher response category. Age is presented as weighted mean; all other variables are presented as weighted point estimates.

^aOn a scale of 0–10, 0 = very liberal; 10 = very conservative.

^bCompared with regular cigarettes.

P* ≤ .05; *P* < .01.

were planning to quit in the next 30 days was 4.7 times as high as for their counterparts who were not interested in quitting. In fact, support among menthol smokers who planned to quit in the next 30 days was similar to the overall population's support, with 27.7% approving, 25.0% neither agreeing nor disagreeing, 31.6% disagreeing, and 15.7% without an opinion on a menthol ban.

Menthol Smokers' Behavioral Intentions

Table 3 presents weighted proportions, unadjusted odds ratios, and AORs for menthol smokers' behavioral intentions if menthol were banned. The greatest proportion (38.9%) of menthol smokers said that they would quit if menthol cigarettes were no longer available; 44.5% of African American menthol smokers gave this response. Of menthol smokers who would rather quit than switch to a nonmenthol brand in the event of a menthol ban, nearly 80% (44.2% disagreed and 35.4% neither agreed nor disagreed) did not support a ban. Menthol smokers with at least 1 recent quit attempt had twice the AOR as otherwise similar smokers who had not recently tried to quit of reporting they would rather quit than switch to a nonmenthol brand.

Nearly 13% of menthol smokers would switch to a nonmenthol cigarette if menthol were banned. None of the demographic characteristics assessed predicted membership in this group, although we observed an inverse relationship with age that was marginally statistically significant in multivariable analysis. The AOR that these smokers were nicotine dependent was 5.6 times as high as the AOR among other menthol smokers; members of this group was also significantly less likely to be interested in quitting in the next 6 months than were other menthol smokers. In addition, about 25% of menthol smokers said they would both switch to regular cigarettes and try to quit in the case of a menthol ban. In adjusted analysis, the significant predictor of membership in this group was intention to quit in the next 6 months.

DISCUSSION

In this nationally representative sample, 28.2% of American adults opposed removing menthol cigarettes from the market, 51.9% did

not have a strong opinion for or against a ban, and 20% favored a ban. As expected, menthol smokers were the most likely to oppose a menthol ban (50.5%); however, 36.7% were ambivalent. Among African American menthol smokers, the group with the greatest concentration of menthol smokers²¹ and longest history of targeted marketing of mentholated cigarettes,⁵ 50.7% did not have a strong opinion about a menthol ban. Overall, it is noteworthy that we did not find strong majority opposition to a menthol ban, even among menthol smokers.

The large percentage of undecided respondents may never have considered a menthol ban and were thus unable to render an opinion on such a regulation. Although a potential menthol ban had received some media attention at the time of data collection, most coverage was in small-market newspapers and blogs.²²⁻²⁵ It is not known which way these undecided respondents would move if a ban were adopted. With a public education campaign highlighting the conclusions put forward in the Tobacco Products Scientific Advisory Committee's report to the FDA, this currently undecided group might be persuaded to support a menthol ban.² On the other hand, this large group of undecideds could also be influenced by tobacco industry campaigns advocating against a ban and for "freedom of choice for grown folks," as Lorillard stated on a now-defunct Web page featuring a prominent photo of an African American woman.²⁶

In an analysis of data from the 2009 wave of the Social Climate of Tobacco Control Survey, Winickoff et al. found that more than half (56.1%) of Americans and between 68% and 78% of African Americans supported banning menthol cigarettes.⁹ Our data indicated lower levels of support, but both studies found that women, racial/ethnic minorities, and those with less than a high school education were more likely to support a menthol ban.⁹ Possible reasons for different point estimates between these 2 studies are their dissimilar item wording and response categories. In the Social Climate of Tobacco Control Survey, "Menthol cigarettes should be prohibited just like other flavored cigarettes," was preceded by another item: "Cigarettes with added flavorings like cherry, chocolate, lime, and mint should be prohibited." This question order may have framed menthol as another variety of flavored

cigarettes. By contrast, our survey had a randomly rotated set of tobacco regulation items that did not ask about other cigarette flavorings. In addition, participants in the Social Climate of Tobacco Control Survey were not given the response option "neither agree nor disagree" and were forced to choose between "agree" and "disagree."

Sampling bias could also be a source of difference between the 2 studies, because the respondents from whom Winickoff et al. received data were contacted via random-digit dialing and ours were collected by address-based sampling. As exclusive cell phone use has become more common, address-based sampling has become the gold standard in survey research.²⁷ In light of these studies' significant methodological differences, it is perhaps most useful to think of their different point estimates as a range, with our results representing a low-end estimate and the Social Climate of Tobacco Control Survey as a high-end estimate of support for a menthol ban. Overall, both data sources revealed that at least 50% of Americans and more than 62% of African Americans do not oppose a ban on menthol cigarettes.

A substantial percentage of menthol smokers (38.9%) stated they would quit if menthol cigarettes were no longer available. This is remarkably similar to unpublished estimates presented at the January 2011 Tobacco Products Scientific Advisory Committee meeting from the 2010 Tobacco Use Supplement to the Current Population Survey, which found that 39% of menthol smokers say they would quit and not use any other tobacco product if menthol were banned.¹¹ Similarly, more than 40% of African Americans and women in both samples said they would quit if menthol were banned. Our data also showed that 16% to 18% of menthol smokers who said they would quit if menthol were banned were not otherwise interested in quitting smoking. This is consistent with research showing that menthol smokers are brand loyal and do not find regular cigarettes an adequate substitute for menthol cigarettes.^{10,28} If a significant fraction of those who predict they would quit actually do quit, then a menthol ban could have a large public health impact. A recent simulation model by Levy et al. demonstrated that a 10% to 30% change in menthol smoking initiation

TABLE 3—Weighted Proportions, Unadjusted Odds Ratios and Adjusted Odds Ratios for Menthol Smokers' Intentions in the Event of a Ban on Menthol Cigarettes: KnowledgePanel, United States, 2010

Variable	Try to Quit (n = 196)		Switch to Nonmenthol Brand and Try to Quit (n = 115)		Switch to Nonmenthol Brand (n = 55)	
	Weighted % (95% CI) or Mean (95% CI)	OR (95% CI)	Weighted % (95% CI) or Mean (95% CI)	AOR (95% CI)	Weighted % (95% CI) or Mean (95% CI)	AOR (95% CI)
Overall	38.9 (33.0, 45.2)		25.2 (20.0, 31.3)		12.5 (8.7, 17.7)	
Gender						
Male (Ref)	33.1 (24.8, 42.6)	1.00	26.6 (18.5, 36.7)	1.00	16.3 (10.0, 25.5)	1.00
Female	44.0 (36.1, 52.1)	1.59 ^b (0.94, 2.68)	24.0 (17.9, 31.5)	0.87 (0.48, 1.59)	9.3 (5.5, 15.4)	0.63 (0.25, 1.61)
Race/ethnicity						
White, non-Hispanic (Ref)	36.5 (29.7, 43.9)	1.00	23.2 (17.2, 29.2)	1.00	13.4 (9.1, 19.4)	1.00
African American, non-Hispanic	44.5 (32.6, 57.0)	1.39 (0.77, 2.52)	23.6 (14.7, 35.6)	1.02 (0.52, 2.01)	7.3 (2.7, 18.6)	0.51 (0.16, 1.61)
Hispanic	37.5 (22.4, 55.6)	1.04 (0.47, 2.32)	35.6 (19.9, 55.1)	1.83 (0.77, 4.36)	15.5 (5.9, 34.9)	1.18 (0.37, 3.79)
Other	34.4 (16.4, 58.4)	0.91 (0.32, 2.57)	17.8 (7.1, 38.2)	0.72 (0.24, 2.16)	21.1 (6.8, 49.5)	1.72 (0.43, 6.82)
Age, y	45.1 (41.9, 48.2)	1.01 (0.99, 1.03)	43.9 (40.6, 47.3)	1.00 (0.98, 1.02)	37.7 (31.9, 43.5)	0.97* (0.94, 0.99)
Education						
College (Ref)	44.5 (29.7, 60.3)	1.00	15.3 (7.3, 29.4)	1.00	12.2 (5.7, 24.4)	1.00
Some college	36.4 (27.7, 45.9)	0.71 (0.34, 1.52)	29.1 (21.6, 37.8)	2.26 ^b (0.90, 5.71)	12.2 (7.2, 19.8)	0.99 (0.36, 2.75)
High school diploma/GED	37.6 (28.2, 48.1)	0.75 (0.35, 1.63)	20.3 (13.4, 29.6)	1.41 (0.53, 3.74)	14.5 (7.9, 25.0)	1.21 (0.41, 3.58)
< high school	41.6 (27.8, 56.8)	0.89 (0.36, 2.16)	30.4 (17.6, 47.1)	2.41 ^b (0.80, 7.25)	10.8 (3.9, 26.2)	0.86 (0.22, 3.40)
Health status						
Good (Ref)	39.2 (32.1, 46.9)	1.00	20.8 (15.6, 27.3)	1.00	13.8 (9.0, 20.7)	1.00
Fair	39.2 (28.6, 51.0)	1.00 (0.56, 1.77)	35.3 (24.3, 48.1)	2.07* (1.09, 3.92)	11.8 (5.6, 22.9)	0.83 (0.32, 2.12)
Poor	33.5 (14.0, 60.9)	0.78 (0.24, 2.52)	22.2 (7.4, 50.5)	1.08 (0.29, 4.08)	6.7 (1.6, 24.1)	0.44 (0.09, 2.14)
Intention to quit						
Not interested (Ref)	16.2 (11.3, 22.7)	1.00	18.6 (9.9, 32.1)	1.00	27.9 (18.3, 40.2)	1.00
Next 6 mo	55.3 (45.7, 64.6)	2.94* (1.64, 5.28)	59.9 (46.2, 72.1)	2.39* (1.06, 5.40)	5.9 (2.6, 12.9)	0.16* (0.06, 0.45)
Next 30 d	28.5 (20.4, 38.2)	3.84* (1.87, 7.88)	21.6 (12.3, 35.0)	1.77 (0.66, 4.77)	6.7 (3.0, 14.3)	0.19* (0.07, 0.51)
Quit attempts in past 3 mo						
None (Ref)	33.0 (26.0, 40.8)	1.00	24.2 (18.6, 33.2)	1.00	16.2 (10.8, 23.5)	1.00
≥ 1	46.4 (36.6, 56.6)	1.76* (1.04, 2.99)	25.6 (17.7, 35.5)	1.02 (0.55, 1.88)	7.5 (3.4, 15.8)	0.42 (0.12, 0.31)
Time to first cigarette of day, min						
≤ 5	21.2 (11.6, 35.4)	0.36* (0.17, 0.78)	24.1 (18.6, 30.6)	1.38 (0.64, 2.97)	10.8 (6.9, 16.4)	2.10 (0.86, 5.16)
≥ 6 (Ref)	42.9 (36.2, 49.9)	1.00	30.5 (16.1, 46.6)	1.00	20.2 (10.7, 35.0)	1.00
Menthol harm perception ^c						
Less	3.7 (1.7, 7.8)	0.56 (0.19, 1.63)	4.4 (1.1, 15.5)	0.61 (0.13, 2.89)	11.6 (4.3, 27.9)	1.91 (0.50, 7.21)
Same (Ref)	50.0 (37.9, 62.0)	1.00	56.6 (40.7, 71.2)	1.00	Ref	1.00
More	46.2 (34.3, 58.8)	1.55 (0.78, 3.06)	39.1 (24.9, 55.4)	0.95 (0.44, 2.07)	25.9 (13.3, 44.4)	0.52 (0.19, 1.40)

Continued

TABLE 3—Continued

Menthol cigarettes should be banned	14.7 (9.0, 23.2)	0.94 (0.38, 2.35)	0.65 (0.20, 2.08)	16.8 (8.4, 30.9)	2.00 ^b (0.69, 5.73)	...	8.4 (3.4, 19.2)	0.86 (0.20, 3.65)	1.11 (0.21, 5.68)
Agree	35.4 (26.0, 46.2)	1.00	1.00	23.6 (14.3, 36.2)	1.00	...	22.5 (8.5, 47.6)	1.00	1.00
Neither agree nor disagree (Ref)	44.2 (35.1, 53.7)	0.60 ^b (0.32, 1.11)	0.59 (0.27, 1.31)	53.4 (40.5, 65.6)	1.46 (0.71, 3.01)	...	62.8 (42.0, 80.0)	1.77 (0.53, 5.92)	1.90 (0.56, 6.50)

Note. AOR = adjusted odds ratio; CI = confidence interval; GED = general equivalency diploma; OR = odds ratio. Ellipses indicate variables not included in analysis. Values were obtained from logistic regressions of the outcome of interest versus all other outcomes. Age is presented as weighted mean; all other variables are presented as weighted point estimates.

^aTheoretically justified for meta-analysis at $P < .1$.

^bTheoretically justified for meta-analysis at $P < .2$.

^cCompared with regular cigarettes.

* $P < .05$.

and cessation between 2010 and 2050 could save 323 000 to 633 000 lives, almost one third of them African Americans.⁸

Limitations

The most important limitation in our study was sample size. Although African Americans and Hispanics were oversampled, the sample included slightly fewer than 300 individuals in each of these groups. This yielded unstable estimates and AORs with wide confidence intervals in subgroup analyses, especially among African American menthol smokers. This instability made comparison of trends in support between the total and menthol smoker-only populations challenging. Still, our results echo patterns from Winickoff et al. that show disproportionate support in the total population for a menthol ban among racial/ethnic minorities and those with less than a high school education, despite differences in item wording, order, and response options.⁹

As an online survey, our Knowledge Networks sample may not have been representative of people of low socioeconomic status, with low reading levels, or without permanent homes, populations that have significant overlap with people who smoke menthol cigarettes.³ To address these potential problems, Knowledge Networks uses address-based sampling to increase its coverage of cell phone-only and minority households and provides free Internet access and computers to households lacking them. A recent comparison of recruited and invited respondents that used data linked to addresses did not reveal any significant sources of nonresponse bias by gender, age, race, educational attainment, home ownership, household income, number of adults in the household, or region in the Knowledge Networks panel.²⁹

Social desirability bias could also have played a role in respondents' answers. Respondents may have felt that it was correct to report favorable opinions of government regulation of menthol because of the stigma associated with tobacco use. This bias may have played a role in the large proportion of menthol smokers who said they would rather quit than switch to a nonmenthol brand. However, research shows that stigma associated with smoking is most likely to be felt by Whites and by those with higher levels of

education.³⁰ Our findings showed an inverse relationship between education and support for government regulation and greater support for regulation among racial/ethnic minorities, so social desirability bias may have led to an overestimation of overall support for regulation, but may also have weakened the relationship between racial/ethnic status, education, and support for regulation in multivariable regression. Research also shows that surveys administered over the Web are the least likely mode to elicit socially desirable answers from respondents³¹; thus, the potential for social desirability bias may have been further minimized in our research.

Measuring political ideology with a single item may be another shortcoming. Although most scholars agree that "the belief systems of political elites in the United States today are captured with a single dimension of ideology,"^{32(p680)} political scientists continue to debate whether the ideology of the American public can be similarly captured.^{33,34} Thus, this 1-item indicator may not have captured the full spectrum of American political ideology.³² Another limitation was the lack of a response choice about obtaining menthol cigarettes illegally or about smokers adding menthol flavoring to their own regular cigarettes. Future surveys should include this response choice. Furthermore, it remains unclear whether and to what extent behavioral intention predicts actual behavior. However, if even 10% of the menthol smokers who reported they would quit rather than switch to a nonmenthol brand succeed, this could translate to hundreds of thousands of lives and millions of dollars saved from tobacco-related disease and death in the next 50 years.⁸

Conclusions

In our survey of American adults, 28.2% opposed, nearly 52% expressed no strong opinion, and 20% supported a ban on menthol cigarettes. Higher levels of support among women, racial/ethnic minorities, and those with less than a high school education suggested that the populations most likely to use menthol cigarettes were also most supportive of an FDA ban. A significant percentage of current menthol cigarette smokers said they would quit or try to quit rather than switch to nonmenthol brands. These public reactions to

a potential FDA ban on menthol cigarettes provide a strong counterargument to the tobacco industry perspective that a ban infringes on freedom of choice, patronizes adults, and will lead to a large black market.

The large group of respondents without an opinion for or against a menthol ban also indicates the need for a strong and timely education campaign by the FDA to ensure that those who are undecided are not fed misinformation by the tobacco industry that would undermine this opportunity for regulation to save thousands of lives and millions of dollars. Public health policy is a scientific, legal, socio-cultural, and political endeavor,^{7,35} and it is thus imperative that scientists continue to assess public receptiveness toward potential FDA regulatory actions that will reduce tobacco-related morbidity and mortality and protect public health. ■

About the Authors

Jennifer L. Pearson, David B. Abrams, and Raymond S. Niaura are with the Schroeder Institute for Tobacco Research and Policy Studies, and Amanda Richardson and Donna M. Vallone are with the Department of Research and Evaluation, American Legacy Foundation, Washington, DC. David B. Abrams, Raymond S. Niaura, Amanda Richardson, and Donna M. Vallone are also with the Department of Health, Behavior, and Society, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD.

Correspondence should be sent to Jennifer Pearson, PhD MPH, The Schroeder Institute for Tobacco Research and Policy Studies at Legacy, 1724 Massachusetts Ave NW, Washington, DC 20036 (e-mail: jpearson@legacyforhealth.org). Reprints can be ordered at <http://www.ajph.org> by clicking the "Reprints" link.

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Contributors

J. L. Pearson was primarily responsible for data analysis and wrote the first complete draft of the article. D. B. Abrams and D. M. Vallone made significant contributions to the refinement of the Introduction and Discussion sections. R. S. Niaura and A. Richardson made significant contributions to the data analysis approach and refinement of the Methods and Results sections. All authors helped create the survey items.

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Human Participant Protection

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