Smokers' attitudes and support for e-cigarette policies and regulation in the USA

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ABSTRACT

Background In April 2014, the Food and Drug Administration (FDA) proposed a rule to extend its tobacco regulatory authority to e-cigarettes, which have been unregulated and growing in use since their 2006–2007 US introduction. The FDA will issue a final rule based on comments and data received from researchers, tobacco companies and the public. We aimed to present data about current smokers' awareness of and attitudes towards potential e-cigarette regulation and various policies in the USA.

Methods We conducted a cross-sectional online e-cigarette focused survey of 519 adult current smokers in April 2014, before the FDA's proposed rule was announced. Participants were recruited from a private research panel (GFK's Knowledge Networks) designed to be representative of the US population.

Results The majority of respondents (62.5%) did not know that e-cigarettes are unregulated by the FDA but agreed that e-cigarettes should be regulated by the FDA for safety and quality (83.5%), carry warning labels about their potential risks (86.6%) and have the same legal age of sale as other tobacco (87.7%). Support was similarly high among current e-cigarette users. Support was substantial though lower overall for policies to restrict e-cigarette indoor use (41.2%), flavouring (44.3%) and advertising (55.5%), and was negatively associated with current e-cigarette use.

Conclusions Support for many e-cigarette regulatory policies is strong among smokers, including for policies that the FDA has recently proposed and potential future regulations. States considering indoor e-cigarette restrictions should know that a substantial number of current smokers support such regulations.

INTRODUCTION

Electronic cigarettes (or 'e-cigarettes') constitute a growing multibillion dollar market[1] and have the potential to positively impact public health if smokers use them to quit tobacco cigarettes,[2 3] but may also have negative population-level consequences if, for example, they serve as a gateway back into smoking for former smokers or into smoking *initiation* for youth.[4]

Although previous research has tracked e-cigarette awareness, trial and use,[5–10] data about e-cigarette policy perceptions has been lacking. Such data could inform and support local and federal regulatory efforts. On 25 April 2014, the Food and Drug Administration (FDA) proposed to extend its tobacco regulatory authority to e-cigarettes, which would require e-cigarette companies to register their products with the FDA, apply to market new products and use a nicotine addiction warning label.[11] It would also ban free samples, create a minimum age of sale, and act as a stepping stone to other potential regulations (eg, on advertising, flavours) through future rulemaking. FDA will issue a final rule based on comments and data from researchers, tobacco companies and the public.[11] We aimed to contribute to the literature by presenting data about current smokers' awareness of and attitudes towards potential e-cigarette policies in the USA. Smokers' are a relevant stakeholder group given that they are the primary target audience of e-cigarettes and have historically been mobilised by tobacco companies and smokers' rights groups to oppose tobacco control efforts.[12–14]

METHODS

We conducted an online survey of adult current smokers (ie, have ever smoked 100 cigarettes and now smoke 'some days' or 'everyday') from GFK's Knowledge Networks nationally representative research panel. GFK sampled 1042 participants and 609 (58.4%) completed the smoker eligibility questions. Of these 609 individuals, 519 qualified for and completed the survey. We compared weighted demographics of our sample (gender, race, age, education, census region) with current smokers from the 2013 National Health Interview Survey and judged that there were no concerning discrepancies. Data was collected between 1 and 14 April 2014, before the FDA's proposed rule announcement.

Current e-cigarette users were defined as smokers who had used e-cigarettes in the past 30 days and former e-cigarette users/triers as those who had ever tried e-cigarettes but not used them in the past 30 days. All respondents were asked if they had ever heard of e-cigarettes prior to the survey and how harmful they believed e-cigarettes are compared to regular cigarettes. Additionally, participants were asked to what extent they agreed or disagreed (as 4-point Likert scale questions) with the following statements: 'e-cigarette advertising should be banned in places where cigarette advertising is banned (eg, television and radio)'; 'e-cigarettes should carry warning labels about their potential risks, like other tobacco products do'; and 'e-cigarettes should be regulated by the FDA for safety and quality standards'. Respondents were also asked about the sale of fruit or candy flavoured e-cigarettes and the use of e-cigarettes indoors in places where smoking is banned (ie, should/should not be allowed) and whether there should be a legal age to purchase e-cigarettes. Finally, respondents were asked if they knew before the survey that e-cigarettes were not yet regulated by the FDA. Descriptive statistics and Wald χ^2 tests were conducted using Sudaan (V.11), applying a poststratification weight to adjust for non-coverage and non-response.

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Table 1 Current smokers' regulation awareness and support of e-cigarette policies by user status and demographics (n=519)

	Unaware e-cigarettes unregulated		Support legal age of sale*		Support e-cigarette warning labels		Agree FDA should regulate e-cigarettes		Support consistent ad policies		Support banning flavoured e-cigarettes		Support indoor e-cigarette ban	
	Per cent	(95% CI)	Per cent	(95% CI)	Per cent	(95% CI)	Per cent	(95% CI)	Per cent	(95% CI)	Per cent	(95% CI)	Per cent	(95% CI)
Gender														
Male	60.8	(53.5 to 67.6)	84.6	(78.5 to 89.2)	86.8	(80.4 to 91.3)	82.6	(76.2 to 87.6)	57.1	(49.8 to 64.1)	44.8	(37.7 to 52.0)	43.7	(36.8 to 50.9)
Female	64.2	(56.0 to 71.7)	90.9	(85.1 to 94.6)	86.4	(79.3 to 91.4)	84.3	(77.0 to 89.6)	53.8	(45.5 to 61.9)	43.9	(35.9 to 52.2)	38.6	(30.9 to 46.9)
p Value†	0.53		0.21		0.93		0.69		0.55		0.87		0.35	
Age														
18–29	69.2	(54.0 to 81.2)	88.1	(75.4 to 94.7)	85.5	(70.4 to 93.6)	82.9	(66.9 to 92.0)	49.1	(35.1 to 63.3)	41.0	(27.8 to 55.7)	36.3	(23.7 to 51.1)
30–44	55.1	(44.5 to 65.2)	87.4	(78.8 to 92.9)	83.9	(73.3 to 90.9)	82.5	(72.9 to 89.1)	52.6	(42.0 to 62.9)	36.7	(27.5 to 46.9)	40.7	(31.1 to 51.0)
45–59	70.5	(62.5 to 77.5)	86.1	(79.1 to 91.1)	89.9	(83.8 to 93.9)	85.2	(78.2 to 90.3)	59.2	(50.7 to 67.1)	44.0	(35.8 to 52.6)	41.6	(33.5 to 50.2)
60+	51.9	(41.8 to 61.9)	90.7	(84.0 to 94.8)	86.2	(78.7 to 91.3)	82.6	(74.9 to 88.3)	61.5	(51.2 to 70.8)	62.2	(51.8 to 71.6)	47.9	(37.7 to 58.2)
p Value†	0.01		0.04		0.60		0.93		0.42		0.01		0.60	
Education														
High school or less	71.6	(64.6 to 77.6)	87.4	(82.1 to 91.4)	86.6	(81.0 to 90.8)	82.6	(76.2 to 87.5)	57.1	(49.8 to 64.1)	48.6	(41.3 to 56.0)	43.5	(36.4 to 50.8)
At least some college	49.1	(41.1 to 57.3)	88.2	(81.4 to 92.7)	86.6	(78.2 to 92.1)	84.8	(77.3 to 90.1)	53.0	(44.7 to 61.2)	38.0	(30.7 to 46.0)	38.0	(30.6 to 46.0)
p Value†	<0.01		0.90		0.99		0.61		0.47		0.06		0.31	
Race/ethnicity														
White	60.2	(54.0 to 66.1)	87.6	(82.6 to 91.4)	86.1	(80.7 to 90.1)	79.5	(73.5 to 84.4)	52.9	(46.6 to 59.1)	42.2	(36.2 to 48.5)	35.6	(29.9 to 41.8)
Black	79.1	(64.7 to 88.7)	89.8	(79.0 to 95.3)	93.6	(83.1 to 97.8)	96.3	(85.4 to 99.1)	59.8	(43.9 to 73.8)	63.6	(47.7 to 77.1)	56.9	(41.1 to 71.4)
Hispanic	57.9	(37.7 to 75.8)	85.1	(68.0 to 93.9)	80.0	(56.7 to 92.4)	86.8	(65.2 to 95.8)	66.3	(45.3 to 82.3)	36.3	(20.3 to 56.1)	56.4	(35.7 to 75.1)
Other	58.4	(39.2 to 75.4)	89.2	(72.8 to 96.3)	88.8	(74.4 to 95.6)	90.0	(76.0 to 96.2)	53.5	(35.3 to 70.8)	40.4	(24.5 to 58.7)	42.1	(25.7 to 60.4)
p Value†	0.08		0.87		0.28		<0.01		0.56		0.09		0.04	
Census region														
Northeast	56.4	(43.6 to 68.4)	88.0	(75.0 to 94.7)	89.4	(78.7 to 95.1)	86.0	(74.1 to 92.9)	58.6	(46.1 to 70.1)	47.2	(35.0 to 59.8)	41.2	(29.4 to 54.2)
Midwest	66.8	(55.9 to 76.2)	85.1	(74.6 to 91.8)	83.3	(71.9 to 90.7)	75.0	(62.7 to 84.3)	48.1	(37.3 to 59.1)	39.4	(29.3 to 50.4)	27.0	(18.9 to 37.1)
South	62.7	(53.9 to 70.8)	89.0	(83.1 to 93.0)	87.6	(79.4 to 92.8)	87.1	(79.9 to 91.9)	54.2	(45.5 to 62.7)	47.0	(38.5 to 55.7)	46.5	(38.1 to 55.0)
West	62.2	(49.0 to 73.8)	88.2	(78.7 to 93.8)	86.0	(76.4 to 92.1)	84.1	(74.4 to 90.6)	64.5	(51.6 to 75.6)	42.0	(29.4 to 55.6)	49.2	(36.4 to 62.2)
p Value†	0.68		0.08		0.79		0.32		0.28		0.68		0.01	
E-cigarette experience														
Never user	68.4	(60.3 to 75.5)	84.5	(77.2 to 89.7)	85.6	(77.3 to 91.1)	83.4	(75.3 to 89.2)	63.8	(55.2 to 71.6)	55.9	(47.4 to 64.1)	57.3	(48.8 to 65.5)
Former user	62.4	(53.3 to 70.6)	88.6	(81.4 to 93.2)	92.0	(86.1 to 95.6)	85.7	(78.6 to 90.7)	53.2	(44.4 to 61.8)	40.6	(32.3 to 49.5)	34.9	(27.0 to 43.8)
Current user	45.8	(33.7 to 58.4)	91.8	(84.4 to 95.9)	77.5	(65.0 to 86.5)	77.9	(65.3 to 86.9)	38.5	(27.1 to 51.2)	24.9	(15.5 to 37.4)	15.1	(8.1 to 26.4)
p Value†	0.02		0.36		0.03		0.47		0.01		<0.01		<0.01	
E-cigarette risk belief														
Less harmful than cigarettes	58.1	(50.8 to 65.1)	91.4	(86.6 to 94.6)	85.4	(79.1 to 90.0)	82.7	(76.3 to 87.7)	42.2	(35.3 to 49.4)	32.3	(30.6 to 44.5)	29.9	(23.7 to 37.0)
As or more harmful than cigarettes	67.6	(59.3 to 75.0)	82.7	(75.0 to 88.4)	89.4	(81.9 to 94.0)	85.5	(77.8 to 90.8)	75.7	(67.5 to 83.3)	54.0	(45.4 to 62.3)	57.4	(48.9 to 65.5)
p Value†	0.08		0.03		0.32		0.53		<0.01		<0.01		<0.01	
Total	62.5	(57.0 to 67.6)	87.7	(83.7 to 90.9)	86.6	(82.1 to 90.1)	83.5	(78.8 to 87.3)	55.5	(49.9 to 60.9)	44.3	(39.0 to 79.8)	41.2	(36.0 to 46.7)

*Same age as other tobacco products.
†Wald F χ^2.
FDA, Food and Drug Administration.

RESULTS

The study sample (n=519) was approximately equally distributed by gender (51% male, 49% female), about one-third were young adults (ages 18–34, 31.5%), two-thirds (66.1%) were white (14.7% black, 12.7% Hispanic, 6.4% other), 40.1% had at least some college education, and 54% were currently employed. Regarding smoking characteristics, 80.3% were daily smokers, 57.5% were lighter smokers (ie, half a pack or less per day) and 52% had been smoking for at least 20 years. Approximately 39% of participants had tried to quit smoking at least once in the past year and 44.3% had plans to quit smoking within the next 30 days or 6 months. In terms of e-cigarette experience, the sample consisted of current (18.9%), former (37.8%) and never (43.3%) e-cigarette users/triers. The majority (59.9%) believed e-cigarettes are less harmful than tobacco cigarettes, while 40.1% indicated they were as or more harmful.

Although the vast majority of respondents were aware of e-cigarettes (90.7%), 62.5% did not know, prior to taking the survey, that e-cigarettes are unregulated. Lack of awareness was higher among never (68.4%) and former (62.3%) versus current e-cigarette users (45.8%; p=0.02). Awareness was also significantly associated with education and age (see table 1). The vast majority of respondents (including current e-cigarette users) agreed that e-cigarettes should be regulated by the FDA for safety and quality (83.5%, all respondents, 77.9% current e-cigarette users), should carry warning labels about their potential risks (86.6%, all respondents, 77.5% current e-cigarette users), and should have the same legal age of sale as other tobacco products (87.7%, all respondents, 91.8% current e-cigarette users).

Support for FDA regulation was significantly associated with race (p=0.005), with support highest among blacks (96.3%), and support for warning labels was significantly associated with e-cigarette experience (p=0.03), with support highest among former e-cigarette users/triers (92%; see table 1).

Support was lower for policies to restrict e-cigarette indoor use (41.2%), flavouring (44.3%) and advertising (55.5%; see table 1). Support for these three policies varied significantly by e-cigarette experience (p≤0.01) and risk perception beliefs (p<0.01), and was consistently least prevalent among those who believed them to be less harmful than tobacco cigarettes, and was least prevalent among current e-cigarette users versus former and never users/triers.

DISCUSSION

To the best of our knowledge, this is the first study about smokers' attitudes on a range of e-cigarette policy issues in the USA. We found that support for many policies that would more strictly regulate e-cigarettes is strong among smokers, including ones that the FDA has recently proposed (eg, age-of-sale restrictions) and potential future FDA policies (eg, restrictions on e-cigarette advertising and flavouring).

We also found that most smokers were unaware that e-cigarettes are unregulated by the FDA. This is consistent with previous research finding smokers incorrectly believing that various unregulated tobacco products are evaluated for safety by the government, an issue that might impart some false sense of security.[15 16] However, we also found that when prompted the vast majority of smokers believed that they *should* be regulated by the FDA for safety and quality, a finding which directly supports the FDA's proposed rule to do so. Although support was high among all groups, it was notably highest (96.3%) among black smokers. A recent study similarly found that support for banning menthol cigarettes, another timely policy issue, was highest among blacks even though they are the group most likely to use such products.[17]

Not surprisingly, support for some policies, such as banning e-cigarette use in indoor public places, was substantially lower among current e-cigarette users versus non-users. However, previous studies on indoor *cigarette* smoking have found that support for such laws increased among smokers after implementation.[18 19] As such, support for e-cigarette policies may also increase among e-cigarette users with time. Otherwise, while regulation of tobacco indoor air laws does not fall under the FDA's jurisdiction, states or municipalities still considering policies about indoor e-cigarette use should know that even a substantial number of current smokers support such regulations. Although 27 states had local laws regulating e-cigarette use in public places as of 1 October 2014, only three had *statewide* laws explicitly restricting e-cigarette use in existing 100% smoke-free venues.[20]

We also found that support for some policies was lower among those who believed e-cigarettes are safer than regular cigarettes. This is reminiscent of research finding lower support for clean indoor air laws among those less likely to believe secondhand smoke is harmful.[21] Although our results were consistent with several studies in finding that a majority of smokers believe that e-cigarettes are less harmful than tobacco cigarettes,[5 6 22 23] we found that almost 90% of smokers nevertheless agreed that e-cigarettes should carry warning labels about their potential risks like other tobacco products do. The FDA's proposed rule would require e-cigarettes to carry a warning that they contain the addictive chemical of nicotine,[11] an important first step in formally warning the public about their potential risks, although some have called for additional and stronger warnings.[24] Future research should explore messages most effective for these new products.

Finally, our research may represent a conservative measure of support for e-cigarette policies since our sample was limited to current smokers. Given previous research on other tobacco policies, it would be reasonable to assume that support for e-cigarette restrictions might be even higher among non-smokers.[17 25–27] Additionally, the views of e-cigarette users in our sample, who all still smoked tobacco cigarettes, may be different than those of e-cigarette users who have completely quit smoking. Our study was limited in having a relatively small sample size, and future research should measure policy attitudes with larger samples, explore additional policy issues such as e-cigarette

What this paper adds

- Previous research has tracked growth in e-cigarette awareness, trial and use, but data about e-cigarette policy perceptions has been lacking.
- This study provides the first data about current smokers' awareness of and attitudes towards potential e-cigarette Food and Drug Administration (FDA) regulation and a variety of e-cigarette policies in the USA.
- This study shows that support for many e-cigarette policies is strong among smokers, including for policies that the FDA has recently proposed and potential policies the FDA may be able to propose in the future.
- Although support for bans on indoor e-cigarette use among e-cigarette users was low (15.1%), support among never users was substantial (57.3%)—states and municipalities should continue to pursue such legislation.

taxation and internet sales, further examine how policy perceptions correlate with e-cigarette knowledge and beliefs, and explore the public's opinions about how changes to e-cigarette policies might change their e-cigarette attitudes and behaviours.

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Competing interests None.

Ethics approval The Institutional Review Board for the Rutgers Biomedical and Health Sciences School approved this study under exempt review.

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