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# Public support for selected e-cigarette regulations and associations with overall information exposure and contradictory information exposure about e-cigarettes: Findings from a national survey of U.S. adults

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ABSTRACT

*Objective.* We assessed public support for six e-cigarette regulations and examined whether self-reported exposure to e-cigarette information and contradictory e-cigarette information were associated with support.

*Method.* We conducted an online survey among a nationally representative sample of 527 U.S. adults in July 2014. Weighted, fully adjusted multinomial logistic regression models predicted support for banning e-cigarettes in smoke-free areas, prohibiting e-cigarette sales to youth, requiring addiction warnings, banning flavors, requiring labeling nicotine and harmful ingredients, and banning youth-targeted marketing.

*Results.* Between 34% and 72% supported these six policies (disagreed 6–24%; no opinion 18–38%). We found higher support for policies to protect youth (prohibit sales to youth and youth-targeted marketing) and to require labeling e-cigarette constituents (nicotine and harmful ingredients). Banning the use of flavors in e-cigarettes was the least supported. Overall information exposure predicted lower relative risk of support for three policies (prohibit sales to youth, nicotine and harmful ingredient labeling, addiction warnings). In comparison, contradictory information exposure predicted lower relative risk of support for two policies (prohibit sales to youth, nicotine and harmful ingredient labeling).

*Conclusions.* Exposure to overall and conflicting information about e-cigarettes in the public sphere is associated with reduced support for certain proposed e-cigarette policies. These findings are important for policymakers and tobacco control advocates involved in promulgation of e-cigarette policies. The results provide insights on which policies may meet some public resistance and therefore require efforts to first gain public support.



## Introduction

In April 2014, the U.S. Food and Drug Administration (FDA) Center for Tobacco Products issued a proposed deeming rule to extend its regulatory authority over electronic cigarettes (e-cigarettes) and other tobacco products (U.S. Food and Drug Administration, 2014). While federal regulations for e-cigarettes are pending public comment as of August 2015, states and local communities have started introducing laws to regulate e-cigarette use, youth access, and taxation (Gourdet et al., 2014; American Nonsmokers' Rights Foundation, 2015; Marynak et al., 2014; Paradise, 2014). For instance, as of July 2015, three states (New Jersey, Utah, and North Dakota) and 394 local governments have banned indoor use of e-cigarettes in smoke-free areas (American Nonsmokers' Rights Foundation, 2015). Gauging public support for these policies can help policymakers and tobacco control advocates prioritize among different policy options. Surveying public opinion about e-cigarette regulations would also contribute to determining which policies require efforts to obtain broad public support in order to ensure successful implementation and enforcement. For instance, prior research has found that smokers who supported smoking bans within bars and restaurants were more likely to comply with these bans (Borland et al., 2006).

Some studies have reported public opinion about various e-cigarette regulations in recent years (Majeed et al., 2014; Tan et al., 2014; Wackowski and Delnevo, 2015; Martínez-Sánchez et al., 2014). In 2012, 40% of a national sample of U.S. adults in 2012 were uncertain about allowing e-cigarette use in smoke-free areas, while 37% opposed and 23% agreed that e-cigarette use should be allowed (Majeed et al., 2014). In a national survey in 2013, respectively, 46%, 31%, and 26% of U.S. adults felt that vaping indoors in restaurants, indoors in bars/

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casinos/clubs, and at parks should never be allowed (Tan et al., 2014). A national sample of current smokers reported strong support (84–88%) for regulations of e-cigarettes by the FDA for safety and quality, requiring warning labels about potential risks, and imposing a minimum age for sales. In contrast, support was lower (41–56%) for banning e-cigarette indoor use, flavorings, and advertising (Wackowski and Delnevo, 2015).

Research suggests that advertising, entertainment media, and discussion within one's social networks may have an adverse impact on opinions about tobacco control policies (Tan et al., 2014; Blake et al., 2009a, 2009b). However, these studies tended to measure overall exposure to tobacco-related information (i.e., about smoking or about e-cigarettes) in various channels as a predictor of public opinion without taking into account potential effects of exposure to conflicting information surrounding tobacco. Due to product advertising, media coverage, and debate about potential risks and benefits (Schripp et al., 2013; Cahn and Siegel, 2011; Maziak, 2014; Chapman, 2014; Polosa et al., 2013; Ragsdale, 2014; Rooke and Amos, 2013; Tierney, 2011; Richardson et al., 2014; Kim et al., 2014; Pepper et al., 2014a), the public may be encountering conflicting information about the safety of e-cigarettes. In a national survey, for example, U.S. adults reported being exposed to a mix of both positive and negative information about e-cigarettes from sources such as advertising, media (e.g., news), and interpersonal discussions (Tan et al., 2014, 2015). One concern is that conflicting information about e-cigarettes could potentially reduce public support for e-cigarette regulations, similar to backlash resulting from conflicting information observed in other health contexts including nutrition and childhood vaccinations (Nagler, 2014; Caplan, 2011; Kelly et al., 2009; Poland and Spier, 2010).

### *Objectives*

To examine public support for different e-cigarette regulations, we conducted an online survey among a national sample of U.S. adults and measured the level of support for six different e-cigarette policies (ban in smoke-free areas, prohibit sales to youth, require addiction warning, ban use of flavors, require ingredient labeling, and ban youth-targeted advertising). This study further examined whether support for these policies was associated with overall exposure to e-cigarette information from media and interpersonal sources. To evaluate potential effects of conflicting information about e-cigarettes, we also analyzed the association between policy support and exposure to contradictory e-cigarette information from these sources.

## Methods

### *Study sample and data collection*

Study participants were members of KnowledgePanel (maintained by GfK), a nationally representative online research panel. Unlike Internet convenience panels or "opt-in" panels that include only individuals who have Internet access and volunteer themselves to participate in research studies, KnowledgePanel members have been recruited by probability-based sampling of households (random-digit dial (RDD) and more recently address-based sampling (ABS)). Only households sampled through these probability-based methods are eligible to join the panel as part of these national samples; no one can volunteer to be on the panel. Participating households are supplied with hardware and Internet service if needed. Respondents are informed about the privacy terms and confidentiality protections provided consent to receive survey invitations online. For full details of GfK's respondent sampling and recruitment methods, please refer to www.knowledgenetworks.com/knpanel/.

Data for this study were obtained from a longitudinal study focused on health information exposure among U.S. adults aged 18 years and older. The study involved three rounds of online surveys among a cohort of adults. The first two rounds of the survey (January and April 2014) did not include items related to e-cigarette policy support or exposure to information about e-cigarettes. These items were added in the third round of the study (July 2014). Fig. 1 summarizes the flowchart of participants at each round and the final analyzed sample. Overall, 72% (n = 571) of the first round participants completed the third round. Participants were excluded from the analysis if they had never heard about e-cigarettes (n = 44),[1] resulting in a final analyzed sample of 527 respondents (aged 18–87 years). Participation in the survey was voluntary and consent was implied from completion of the survey. No personally identifiable data were collected. Written informed consent was not obtained because this would have been the only identifiable data provided by the participants. The institutional review board of the University of Illinois at Urbana-Champaign approved this study (protocol number 14435).

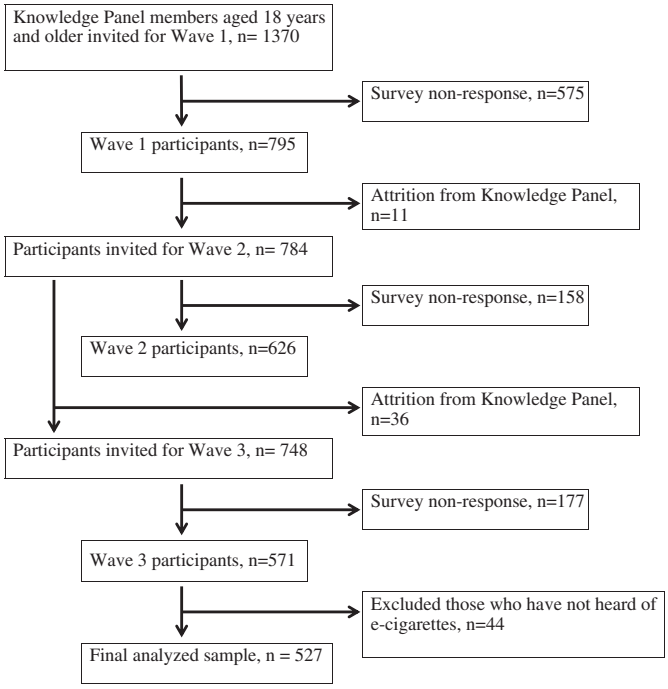


**Fig. 1.** Flowchart of analyzed study sample.

### *Measures*

#### *Outcome variables*

Participants were asked: "There are currently proposals to regulate electronic cigarettes (e-cigarettes) in various ways. How much do you agree or disagree with the following statements?" The six statements were as follows: 1) Vaping or using e-cigarettes should not be allowed in places where smoking cigarettes is not allowed, 2) Youth under 18 years should not be allowed to buy e-cigarettes, 3) E-cigarette packages and advertisements should be required to carry an addiction warning, 4) The use of flavors in e-cigarettes should not be allowed, 5) E-cigarette packages should be required to label the amount of nicotine and other harmful ingredients, and 6) Marketing and advertising e-cigarettes to youth under 18 years should not be allowed. These six policies were based on proposed or implemented state and local regulations (Gourdet et al., 2014; American Nonsmokers' Rights Foundation, 2015; Marynak et al., 2014). Responses options were "strongly agree," "agree," "disagree," "strongly disagree," or "no opinion." These responses were re-categorized into "agree," "disagree," or "no opinion,"

#### *Exposure to e-cigarette information*

Participants were asked, "Thinking about the past 3 months, how often did you see or hear information about electronic cigarettes (e-cigarettes) from each of the following sources?" on a 4-point scale (a lot/ some/ a little/ not at all). The eight sources were adapted from a prior national survey (Pepper et al., 2014b) and included (1) online news (e.g., *New York Times* website, CNN.com), (2) social media (e.g., Facebook, YouTube, Twitter, or blogs), (3) medical or health websites (e.g., WebMD, American Cancer Society website, National Cancer Institute website), (4) television, (5) print newspapers or

[1] Respondents were asked if they have tried or used e-cigarettes. If they answered that they have never heard about e-cigarettes (n = 44), they were excluded from this analysis.