



## Arguments for amending smoke-free legislation in U.S. states to restrict use of electronic nicotine delivery systems

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### ABSTRACT

The uneven diffusion of local and state laws restricting the use of electronic nicotine delivery systems (ENDS) in the United States may be a function of inconclusive scientific evidence and lack of guidance from the federal government. The objective of this study was to assess whether the rationale for amending clean indoor air acts (CIAAs) is being conflated by issues that are not directly relevant to protecting the health of ENDS non-users. Online sources were used in identifying bills ( $n = 25$ ) that were presented in U.S. state legislatures from January 2009 to December 2015. The bills were categorized into one of three groups: 1) bills amending comprehensive CIAAs ( $n = 11$ ), 2) bills prohibiting use of ENDS in places frequented by youth ( $n = 5$ ), and 3) remaining bills that varied between the two categories ( $n = 9$ ). Arguments presented in committee hearings were coded as scientific, public health, economic, enforcement, freedom, or regulatory. Arguments pertaining to amendment of clean indoor air acts spanned several categories, many of which were not directly relevant to the aims of the legislation. This finding could assist lawmakers and expert witnesses in making arguments that yield greater success in amending legislation. Alternatively, inconclusive scientific data on the hazards of ENDS aerosols might encourage lawmakers to propose legislation that prohibits ENDS use in places frequented by youths.

### 1. Introduction

The publication of two prominent reports in 1986, the U.S. Surgeon General's Report and the National Research Council Report, outlined the link between exposure to secondhand smoke and the development of lung cancer (Eriksen and Cerak, 2008). By 1992, the U.S. Environmental Protection Agency had designated secondhand smoke as a Group A Carcinogen, a decision based in part on the epidemiologic studies showing elevated lung cancer risks in the non-smoking spouses of smokers (Dockery and Trichopoulos, 1997). Local clean indoor air acts (CIAAs) proliferated in the U.S. from the late 1980s through the first decade of the 21st century (Eriksen and Cerak, 2008). In contrast to this sequence of events, legislation restricting the use of electronic nicotine delivery systems (ENDS), or more commonly known as electronic cigarettes, was enacted prior to discovery of long-term health effects from exposure to ENDS secondhand vapor (Kadowaki et al., 2015).

Results from studies comparing the hazardous constituents of secondhand vapor versus secondhand smoke (e.g., heavy metals) have been inconsistent, leading researchers to suggest that scientific data on the safety of ENDS are inconclusive (Pisinger and Dossing, 2014; Callahan-Lyon, 2014). Given the inconclusive scientific data, the

enactment of legislation restricting the use of ENDS suggests that lawmakers are using a precautionary approach in developing policy. In the words of Kadowaki et al. (2015), “policy is outpacing science” regarding ENDS restrictions in public spaces. Proponents of the precautionary approach warn that original CIAAs took too long to be implemented, leaving the public exposed to harmful secondhand smoke for many years. Given epidemiologic evidence of the hazards of cigarette smoking dating back to the 1950s, the proponents argue that it would have been sensible to take precautionary action on limiting secondhand smoke exposure prior to establishment of conclusive scientific evidence. Opponents of the precautionary approach argue that passage of legislation in the absence of scientific evidence is a form of government overreach.

The lack of federal guidance, accompanied by inconclusive scientific data, may have contributed to the uneven diffusion of ENDS clean air policies from local municipalities to U.S. states (Kadowaki et al., 2015). The patchwork is evident from the concentration of policies in municipalities in Massachusetts and Mississippi, for example, and the large gaps in the Great Plains region. One argument for the uneven diffusion is the variability in the way smoking is defined in existing clean indoor air laws (Hardin, 2011). Efforts to amend the laws to include ENDS

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have encountered obstacles in cases where smoking is narrowly defined as inhaling a combustible tobacco product. The inconsistencies in legislating ENDS use are not likely to abate anytime soon as the FDA's final ruling on tobacco products, which took effect on August 8, 2016, addresses youth access issues, but not issues pertaining to places where ENDS can be used.

One trend in legislating ENDS use is the focus on protecting youth from access and exposure to ENDS (Gourdet et al., 2014; Tremblay et al., 2015). Gourdet et al. (2014) reported that as of November 2013, 22 U.S. states had enacted laws prohibiting minors' access to ENDS. Today, federal law prohibits the sales of e-cigarettes and other ENDS products to minors in the 50 U.S. states. Among the twelve U.S. states that applied smoke-free provisions to ENDS by November 2013, (Gourdet et al., 2014) seven prohibited ENDS use in venues frequented by minors and young adults (e.g., schools, childcare centers). Tremblay et al. (2015) had also reported that U.S. state legislation prohibiting minors' use of ENDS in limited venues was enacted more frequently than comprehensive ENDS bans. The authors suggested that the higher frequency of youth-specific ENDS legislation reflects acceptance of restrictions on a targeted group at high risk (i.e. youth), versus the general population that is at a lower risk of the potential harms of ENDS use. The concern for youth has been expressed by U.S. adults who were surveyed about their support for ENDS regulations (Wackowski and Delnevo, 2015; Tan et al., 2015). Wackowski and Delnevo (2015) reported that the majority of adult smokers favored laws prohibiting ENDS sales to minors (87.7%), while the minority favored restrictions on indoor use (41.2%). Support for the latter is increasing over time as a likely function of public health advocacy campaigns, such as the California Department of Health's campaign "Still Blowing Smoke" (<http://stillblowingsmoke.org>). Yet, the increased support does not appear to be translating to comprehensive restrictions on the public use of ENDS at the state level, the reason for which is unclear. The objective of this study was to assess whether the rationale for amending clean indoor air acts in U.S. states is being conflated by issues that are not directly relevant to protecting the health of ENDS non-users. This hypothesis could potentially explain the challenges in amending comprehensive CIAAs.

## 2. Methods

### 2.1. Selection of ENDS legislation

The terms 'electronic cigarette', 'e-cigarette', 'vapor product', 'alternative nicotine inhalant', and 'electronic nicotine delivery systems' (Lempert et al., 2014) were used in searching ENDS bills proposed between January 2009 and December 2015. The searches were conducted via the 50 state legislative websites, LegiScan, and archives of bill alerts from the Consumer Advocates for Smoke-Free Alternatives Association (CASAA), an advocacy group tasked with alerting ENDS users of restrictions on taxes, clean indoor air acts, and other legislation. We identified 67 bills whose objective was to restrict ENDS use in public spaces; among them, only 25 had records of legislative hearings and floor debates that were publicly available. Bills proposing a tax or age restriction on the purchase of ENDS were excluded from our analysis. Each bill was coded for the state in which the bill was proposed, year, bill number, status in the legislative process (pass/fail), category of the bill, and location targeted for restriction. The bills were then categorized into one of three groups: 1) amendment to a comprehensive clean indoor air act, which prohibited use of ENDS in workplaces, bars, and restaurants; 2) bills prohibiting use of ENDS in places frequented by youth, which included schools, playgrounds, other facilities used by minors, and motor vehicles (when a minor is present); and 3) remaining bills that did not fit into either of the two categories. An example of the latter is AK SB1 which prohibits smoking in specified places such as public transportation. The legislation is not comprehensive and does not target venues frequented by youths, thus, qualifying as the third

**Table 1**  
Occurrence of arguments supporting and opposing U.S. state legislation (2009–2015) aimed at restricting use of ENDS.

Argument <sup>a</sup>	Amend CIAA <sup>b</sup> (n = 11 bills)		Youth exposure <sup>c</sup> (n = 5 bills)		All other bills <sup>d</sup> (n = 9 bills)	
	Support	Oppose	Support	Oppose	Support	Oppose
Public health						
Gateway to smoking	16	8	4	0	8	1
Smoking renormalization	19	6	1	0	6	3
Harm reduction	6	59	0	2	2	26
ENDS > NRT <sup>e</sup>	12	77	3	3	6	27
Youth marketing/access	32	21	12	0	28	7
Vapor constituents						
Nicotine	34	11	3	2	13	6
Propylene glycol/glycerol	2	14	0	0	5	1
Other constituents	38	56	5	0	18	14
Adverse health events						
Pulmonary effects	6	2	0	0	9	1
Cardiovascular effects	3	1	0	0	3	0
Other health effects	17	16	4	0	9	8

<sup>a</sup> Argument is counted only once for a given individual.

<sup>b</sup> Clean indoor air act.

<sup>c</sup> Bills aimed at prohibiting ENDS in places frequented by youths (e.g., educational facilities).

<sup>d</sup> Bills aimed at prohibiting ENDS in other venues (e.g., public transportation).

<sup>e</sup> Nicotine replacement therapy.

type of bill restricting ENDS use. The terms comprehensive (category 1) and non-comprehensive (categories 2, 3) legislation were used throughout the remainder of the manuscript. The term amendment to a CIAA refers to inclusion of ENDS as part of an existing clean indoor air act. Audio and video testimonies presented in the hearings were transcribed into text and independently coded by three students, resulting in a total of 38 transcripts (~902 pages). Discrepancies in coding were resolved upon a group discussion and subsequent vote.

### 2.2. Classifying arguments according to bill objective

Arguments from the transcripts were first grouped into one of the following six categories: science, public health, economics, enforcement, freedom, regulation. Subcategories for scientific and public health arguments are listed in Table 1. The six categories were derived from a literature review of hearings on clean indoor air legislation (Apollonio and Bero, 2009) and an initial reading of the transcribed testimony. If an individual at a committee hearing made the same argument repeatedly, then the argument was counted only one time. If the individual made multiple but separate arguments, then each argument was counted one time.

The arguments were first coded as being supportive or unsupportive of the legislation, and then coded in terms of the relevance of the bill's population-level effect (viewed from a public health perspective). Relevant arguments in support of amending CIAAs pertained to potential population-level harms of using ENDS in public spaces, which included hazards of being exposed to secondhand vapor; (Bauld et al., 2017) the re-normalization of smoking in society; (Fairchild et al., 2014) the challenges of enforcing existing CIAAs due to the inability to distinguish ENDS from conventional cigarettes; and the gateway from ENDS use to cigarette smoking. Any one of the four arguments was considered relevant to amendment of the legislation irrespective of whether the scientific data was conclusive or inconclusive. For example, some studies found high levels of tobacco-specific nitrosamines

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