



Brief report

## Content Analysis of US News Stories About E-Cigarettes in 2015

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### Abstract

**Background:** Coverage of e-cigarettes in the news media may shape public perceptions about them but little is known about such news content. This content analysis characterized discussion of e-cigarettes in leading print and online US news sources in 2015.

**Methods:** We searched Access World News and Factiva databases for e-cigarette-related news articles appearing in the top 30 circulating newspapers, 4 newswires, and 4 online news sources in the United States in 2015 ( $n = 295$ ). Coders identified the presence of various e-cigarette topics (e.g. regulation), and benefit and risk statements.

**Results:** Nearly half of articles (45.1%) focused primarily on e-cigarette policy/regulatory issues, although e-cigarette prevalence (21.0%) and health effects (21.7%) were common main topics. Concerns about youth were frequently mentioned, including the rise in youth e-cigarette use (45.4%), gateway to smoking potential (33.9%) and appeal of flavors (22.4%). Youth e-cigarette prevalence was more frequently mentioned than adult prevalence in articles discussing FDA regulation (61% vs. 13.5%, respectively). News articles more frequently discussed potential e-cigarette risks or concerns (80%) than benefits (45.4%), such as smoking harm-reduction. Quoted physicians, researchers, and government representatives were more likely to refer to e-cigarette risks than benefits.

**Conclusions:** In 2015, rising rates of e-cigarette use among youth and policy strategies to address e-cigarettes dominated US e-cigarette news stories, leading up to their FDA regulation in 2016. Statements about e-cigarettes' potential risks were frequently attributed to trusted sources such as physicians, and outnumbered claims about their harm-reduction benefits. Such coverage may impact e-cigarette risk perceptions, use intentions and policy support.

**Implications:** In the year leading up to the FDA's Deeming Rule, concerns about youth use or potential use were frequently discussed in e-cigarette news. News articles more frequently discussed

potential e-cigarette risks/concerns compared to potential harm-reduction benefits relative to tobacco cigarettes. While such coverage may inform the public about potential e-cigarette risks, they may also contribute to increasing perceptions that e-cigarettes are as harmful as tobacco cigarettes. E-cigarette risk and benefit statements were most frequently made by or attributed to researchers and physicians in articles, which is significant given that they may be particularly trusted sources of e-cigarette risk information.

## Introduction

Electronic cigarettes, or “e-cigarettes,” are battery-powered devices that deliver nicotine, flavorings, and other chemicals to the user as an aerosolized vapor. In recent years, use of e-cigarettes in the United States has risen among both adults<sup>1</sup> and adolescents.<sup>2</sup> Proponents of e-cigarettes argue that they are a form of harm reduction that can help smokers quit cigarettes. Emerging evidence indicates lower levels of toxicants compared to combusted tobacco<sup>3</sup> and some observational and population studies suggest that some individuals have transitioned away from cigarettes with help from e-cigarettes.<sup>4</sup> However, others caution that e-cigarettes may facilitate dual use with cigarettes, appeal to youth, and act as a gateway to cigarette smoking. No consensus yet exists on their overall public health impact.

E-cigarette use and regulation may be influenced by the public's and policymakers' knowledge and perceptions of these products, which may be influenced by various information sources. Although the public reports hearing about e-cigarettes from a variety of sources including friends, family, physicians, and advertisements,<sup>5</sup> news stories are a particularly important source of information. According to the Agenda Setting Theory, the salience and importance of a particular issue is heavily influenced by media coverage of that topic<sup>6</sup> and news stories have historically played an important role in shaping public perceptions about tobacco products and policies.<sup>7–9</sup> News about *e-cigarettes* appears to be reaching the public, with over 60% of US smokers hearing about e-cigarettes in the news.<sup>10</sup> To date, however, only two known studies have examined the content of e-cigarette news stories.<sup>11,12</sup> One analyzed e-cigarette articles in the UK and Scottish press between 2007 and 2012, reporting a substantial increase in coverage over time and a generally positive view of e-cigarettes as a less risky smoking alternative.<sup>11</sup> In the only analysis of US news coverage, Yates et al. documented a strong focus on the need for e-cigarette regulation, and found that in most years (2007 to mid-2014) more articles referenced the potential drawback of e-cigarettes versus their potential benefits.<sup>12</sup> This study was limited however in its use of only one headline search term (“electronic cigarettes”) in identifying sample articles.

We aimed to contribute to this new literature with a content analysis of US news articles about e-cigarettes in 2015, the year before FDA asserted its authority over e-cigarettes. Our goals were to describe the frequency of various e-cigarette topics in news articles, the frequency with which e-cigarette benefits and risks were discussed, and the source to which these risks and benefits were attributed.

## Methods

### Data sample

E-cigarette news articles were located using the online news databases *Access World News* and *Factiva*. Searches were limited to articles published in 2015 in the 30 top-circulating newspapers in

the United States (identified using data from *Alliance for Audited Media*), four leading online news sources (i.e., Huffington Post, NBC News, CBS News, ABC News), as identified by the Pew Research Center,<sup>13</sup> and four national wire services (i.e., Associated Press, Reuters, CNN Wire, UPI News Track). Articles were included if they contained at least one of 21 e-cigarette-related search terms in the headline (singular and plural forms of “electronic cigarette(s),” “e-cigarette(s),” “ecigarette(s),” “e-cig(s),” “ecig(s),” “vaping(s),” “vape(s),” “vaporizer(s),” “e-liquid(s),” “e-juice(s),” “electronic nicotine delivery device(s)”). Articles not accessible through the databases were purchased through the publications' archive services. All news, feature, advice, and opinion articles were included in the sample, but obituaries, advertisements, announcements, or event listings were excluded. Duplicate articles (e.g. wire stories published in newspapers) were also excluded and identified by searching wire sources first. Articles that included sections or excerpts from wire stories but had additional added content were coded as unique articles.

### Coding and analysis

The study team developed a coding system based on previous experience with tobacco news content analyses,<sup>14–16</sup> review of previous e-cigarette news studies,<sup>11,12</sup> and an iterative review and pilot coding of a random sample of 50 articles. Using a coding sheet (with 60 unique variables) and guide (with explanatory definitions of each code and examples), each article was coded for the presence of statements related to e-cigarette topics or characteristics (e.g. e-cigarette prevalence, industry activities, product characteristics, health benefits and risks, see [Table 1](#)). The overall main topic of the article (defined as the topic/issue mainly driving the story, typically discussed in the headline and leading paragraphs), was also coded (i.e., e-cigarette prevalence/trends; health effects; policy/regulation; industry activities/retail; cessation; or other). For articles containing e-cigarette health benefit and/or risk statements, the sources to which these were attributed (e.g. physician or researcher, health organization, government representative, industry representative or advocate, civilian) were also coded (see [Table 2](#)). These were defined as direct quotes by these sources or attributions to them (e.g. “According to CDC officials, e-cigarettes are...”). Two research staff members completed article coding between January and June 2016. To assess intercoder reliability, 10% of all articles were randomly sampled and coded by both staff members—reliability was good, with an average Kappa value of 0.89 (range 0.46–1.0).<sup>17</sup> Disagreements between the two coders were resolved through re-review and discussion of the article. Descriptive statistics were used to identify the frequency of various topics and differences in health benefit/risk statements by their source.

## Results

A total of 295 articles were analyzed. Most (62.7%) had a national or general focus, while 37.3% focused on local issues, such as

**Table 1.** Percentage of news articles referring to various e-cigarette related themes and topics (*n* = 295)

	News/ Feature % ( <i>n</i> = 237)	Opinion % ( <i>n</i> = 55)	All articles % ( <i>n</i> = 295)	Articles mentioning FDA regulation ( <i>n</i> = 113)
<b>Main Topic</b>				
E-cig policy/regulation	45.1%	47.3%	45.1%	45.1%
Health effects	20.3%	23.6%	21.7%	19.5%
Prevalence/trends	21.9%	18.2%	21.0%	25.7%
Industry activities	7.6%	3.6%	6.8%	7.1%
Cessation	4.6%	5.5%	4.7%	2.7%
Other	0.4%	1.8%	0.7%	0
<b>Prevalence of e-cigarette use</b>				
Youth	46.8%	41.8%	45.4%	61.1%
Adults/general	12.2%	3.6%	10.5%	13.3%
<b>Policy and Regulation</b>				
FDA regulation	38.4%	40.0%	38.3%	100%
Age-of-sale restrictions	40.9%	16.3%	35.9%	46.9%
Smoke-free air laws/bans on e-cig use	29.9%	20.0%	28.1%	23.0%
E-cig taxation	13.5%	16.4%	13.9%	13.3%
Marketing/advertising restrictions	13.9%	12.7%	13.6%	23.9%
Child-resistant packaging	12.2%	12.7%	12.5%	15.9%
E-cig warning labels	8.9%	9.0%	8.8%	20.4%
E-cig flavor bans	6.7%	7.3%	6.8%	15.0%
E-cig ingredient listing	8.4%	5.4%	7.8%	15.0%
<b>Industry activities</b>				
Vape shops	20.2%	0.02	16.6%	18.6%
Big Tobacco's involvement in e-cig industry	11.8%	0.7%	10.8%	13.3%
E-cig sales trends	9.7%	9.0%	9.5%	13.3%
E-cig advertising strategies	6.3%	9.0%	6.8%	13.3%
<b>Product characteristics</b>				
Sold in different flavors	35.4%	29.0%	34.2%	46.9%
E-cig nicotine content	22.4%	12.7%	20.7%	24.8%
E-cigs modified for drug use	7.2%	5.4%	6.8%	2.7%
<b>Research</b>				
Describes results of research study	18.6%	5.5%	15.9%	18.6%
Mentions need for more research	12.6%	9.1%	11.9%	14.2%
Includes personal testimony/story about e-cigs	6.7%	7.2%	6.8%	7.1%
<b>Health-related Benefits</b>				
Less risky/harmful than cigarettes	33.3	40.0	34.2%	46.0
Effective smoking cessation tool	25.7	23.6	25.1%	29.2
No secondhand smoke	1.2	5.5	2.4%	2.7
<b>Other Potential Benefits</b>				
Cheaper than smoking	2.9%	1.8	2.7%	3.5
Could eliminate tobacco use	0.8%	7.2%	2.0%	1.8
Can use where can't smoke	1.3%	0	1.0%	0.9
Not smoking gateway	2.5%	7.2%	3.4%	6.2
<b>Health-related Risks</b>				
Nicotine is addictive/harmful	26.6%	7.2	27.5%	32.7
Harmful toxins, chemicals, effects	27.4	21.8	26.8%	30.1
Health effects unknown	21.1	7.3%	19.3%	23.0
Does not work for cessation	5.1%	7.2%	5.4%	3.5
Prevents quitting/promotes dual use	3.8%	0	3.1%	2.7
<b>Other E-cigarette Concerns</b>				
Gateway to tobacco	32.5%	41.8	33.9%	46.9%
Flavors appeal to youth	21.9	25.5	22.4%	31.9%
Quality Concerns/Unknown ingredients	1.7	7.2	2.7%	5.3%
Renormalizes smoking	8.4%	5.4%	7.8%	8.0%
Explosions	8.9	1.8	7.8%	5.3%

state-specific policies or prevalence rates. The majority (80.3%) were news or feature stories and nearly 20% were opinion pieces. More opinion articles had a negative/anti-e-cigarette slant (49.1%) than a pro-e-cigarette (32.7%) or neutral (18.2%) slant. There was no

significant association between article type (news/feature or opinion) and main topic. The results below focus on all articles combined (*n* = 295). Almost half of all stories (45.1%) were primarily about e-cigarette policy/regulation, although prevalence/trends (21.0%) and

**Table 2.** Prevalence of statements about potential e-cigarette health-related benefits and risks, by source attributions

	Physician or researcher	Health organization	Government representative	Industry or advocates	Civilian
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
<b>Benefits</b>	<b>52 (31.5)</b>	<b>5 (23.8)</b>	<b>15 (15.8)</b>	<b>67 (95.7)</b>	<b>39 (81.3)</b>
Less risky/harmful than smoking	31 (18.8)	3 (14.3)	8 (8.4)	35 (50.0)	19 (39.6)
Effective smoking cessation tool	21 (12.7)	2 (9.5)	6 (6.3)	28 (40.0)	19 (39.6)
No secondhand smoke	0 (0.0)	0 (0.0)	1 (1.1)	4 (5.7)	1 (2.1)
<b>Risks</b>	<b>113 (68.5)</b>	<b>16 (76.2)</b>	<b>80 (84.2)</b>	<b>3 (4.3)</b>	<b>9 (18.8)</b>
Harmful toxins, chemicals, effects	46 (27.9)	6 (28.6)	22 (23.2)	0 (0.0)	1 (2.1)
Nicotine is addictive/harmful	28 (17.0)	4 (19.0)	36 (37.9)	2 (2.9)	4 (8.3)
Health effects unknown	26 (15.8)	4 (19.0)	12 (12.6)	1 (1.4)	4 (8.3)
Does not work for cessation	9 (5.5)	2 (9.5)	5 (5.3)	0 (0.0)	0 (0.0)
Prevents quitting/promotes dual use	4 (2.4)	0 (0.0)	5 (5.3)	0 (0.0)	0 (0.0)
<b>Total benefit/risk statements</b>	<b>165 (100.0)</b>	<b>21 (100.0)</b>	<b>95 (100.0)</b>	<b>70 (100.0)</b>	<b>48 (100.0)</b>

health effects (21.7%) were other common main topic areas, with fewer focusing on industry activities (6.8%), or cessation (4.7%). The number of unique e-cigarette news articles declined over 2015 (with 100, 68, 71, and 56 articles in each quarter, respectively). While policy/regulation was the main article topic across periods, it was tied with prevalence/trends in the second quarter (April–June), coinciding with release of the CDC's report about the tripling of youth e-cigarette use in April 2015 (see Supplementary Figure).<sup>18</sup>

Presence of various e-cigarette themes and topics were also documented, regardless of whether they were the *main* focus of the article (see Table 1). Nearly half (45.4%) of all articles discussed the prevalence of youth e-cigarette use, with most of these ( $n = 134$ ) referring to use as rising (79.1%). Over a third of articles (38.3%) mentioned FDA regulation, typically with discussion about the need for FDA regulation or the proposed deeming regulations. Other policy strategies frequently mentioned were age-of-sale restrictions (35.9%) and smoke-free air laws (28.1%). Less than 10% of articles mentioned e-cigarette warning labels and ingredient listings. Mention of the above policy issues was more prevalent in articles about FDA regulation, except for smoke/vape-free air laws (Table 1). Articles citing FDA regulation more frequently referred to youth (61.1%) rather than adult e-cigarette prevalence (13.5%). E-cigarette flavors were discussed in over one-third of all articles and almost half of articles referencing FDA regulation.

Roughly 16% of articles referred to an e-cigarette study. Industry activities, such as popularity of vape shops (16.6%), Big Tobacco's involvement in the e-cigarette market (10.8%), sales trends (9.5%), and e-cigarette advertising strategies not allowed by tobacco companies (6.8%) were also mentioned in e-cigarette news articles.

News articles also included references to potential health benefits and risks of e-cigarettes (Table 1). Approximately 34% mentioned that e-cigarettes may be less risky/harmful than smoking and 25% mentioned that they could be an effective smoking cessation tool. Fewer mentioned other potential benefits such as their lower cost relative to cigarettes (2.7%), their potential to eliminate tobacco use (2.7%) or that they did not act as a smoking gateway (3.4%). In terms of health risks, about 27% mentioned that e-cigarettes contain nicotine/are potentially addictive and 27% referred to e-cigarettes as having potentially harmful toxins or adverse health effects. About 19% referred to the risks/health effects as being unknown. Other concerns included that e-cigarettes may be a gateway to tobacco use among youth or non-users (33.9%) and the appeal of e-cigarette

flavors to youth (22.4%); these issues were more prevalent in articles mentioning FDA regulation (Table 1). Almost 8% of articles referred to e-cigarette related explosions. Overall, 80% of articles discussed at least one potential e-cigarette risk or concern while 45.4% stated at least one potential e-cigarette benefit (e.g. cost-savings) (data not in table). While most (86%) articles that mentioned a potential benefit also mentioned a potential risk/concern, only 49% of articles that mentioned a risk/concern also mentioned a potential benefit. Overall, only 39% of articles referred to at least one of these risks/concerns and potential e-cigarette benefits in the same article.

Table 2 presents the prevalence with which the various e-cigarette health benefit and health risk statements were attributed to different sources. Physicians and academic researchers were the most commonly cited sources in the articles. Of the 165 health-related statements attributed to these individuals, 68.5% highlighted risks associated with e-cigarette use, most frequently about their toxins, chemicals and potential negative health effects. Representatives from the government (e.g. FDA, politicians) often expressed similar cautions, although more frequently about the potential for nicotine addiction/harm. Conversely, e-cigarette industry sources, advocates, and civilians largely touted the benefits of e-cigarettes, including that they may be less harmful/risky than cigarettes.

## Discussion

In the year leading up to the FDA's assertion of regulatory authority over e-cigarettes, FDA regulation continued to be a dominant topic in e-cigarette news. Such coverage often included statements about the importance of and need for FDA e-cigarette regulation and, along with similar coverage in preceding years<sup>12</sup> may have played a role in its eventual passage. Most articles that discussed FDA regulation also referenced youth e-cigarette use, and other concerns related to e-cigarettes and youth (such as their flavoring and cigarette gateway potential). This is consistent with previous tobacco news studies finding youth-related concerns to be a prominent frame and a potentially powerful media advocacy tool,<sup>8</sup> and is also consistent with much of the intent of the FDA's final e-cigarette deeming rule (i.e., to protect youth).

We also built on previous research about US e-cigarette news, which has focused on the topics covered,<sup>12</sup> by describing specific e-cigarette risks and benefits discussed in news articles and the sources of these risk/benefit statements. We found that e-cigarette

risk and benefit statements were most frequently attributed to researchers and physicians in news articles, who may be particularly trusted sources of e-cigarette risk information.<sup>10</sup> Researchers and physicians were also more likely to acknowledge both risks and benefits and provide balanced perspective relative to vape industry sources and civilians, who largely emphasized only potential e-cigarette benefits. However, the fact that some of the same benefits described by industry sources were also described by researchers and physicians likely add to their salience and is consistent with previous research on smokeless tobacco news coverage.<sup>15</sup>

Overall, news articles more frequently discussed potential e-cigarette risks/concerns versus benefits. This is not surprising given that discussion about e-cigarette regulation and policy, a major driver of coverage, is inherently tied to the issue of their potential risks (hence the need for regulation), as is the issue of youth e-cigarette use, which does not come with any clear benefits. The number of research studies focusing on the risks of e-cigarettes versus their harm-reduction benefits may also be higher, thus contributing to the more frequent coverage of e-cigarette risks.

As the news framing of e-cigarettes as something potentially dangerous and in need of regulation (to protect youth and in general) may have played a role in support for policy actions, it may have also contributed to changes in their harm perceptions. Data from this study, along with similar findings from Yates et al.,<sup>12</sup> may support recent speculation that negative coverage of e-cigarettes have contributed to increasing perceptions about their harm over the last several years.<sup>19,20</sup> While the news media is an important vehicle for informing the public about the potential risks of these new products, it has also been argued that news stories that focus only on risks without contextualizing their risks relative to cigarettes or discussing their harm-reduction benefits may contribute to misperceptions about the risks of these products.<sup>19</sup>

Study strengths include use of numerous e-cigarette search terms and leading online news and wire sources to increase study generalizability. However, limitations include analysis of only one year of data. Future research should continue to track e-cigarette news coverage over time given changes in societal perceptions of e-cigarettes, their use, and regulation. Coverage in other news media channels, including television and social media, should also be studied.

E-cigarettes are a new and newsworthy topic with coverage dedicated to their use, policies, potential risks, and, to a lesser extent, their potential benefits. Continued research is warranted given the potential impact of such coverage on product perceptions, use and policy-making.

## Supplementary Material

Supplementary data are available at *Nicotine and Tobacco Research* online.

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## Declaration of Interests

None declared.

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