An Analysis of U.S. News Media Coverage of E-Cigarettes: Does a Youth Epidemic
Make a Difference?

By
Julia R. Winett

A THESIS

Submitted to

Oregon State University

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In partial fulfillment of the requirements for the degree of

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Presented May 30, 2019
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AN ABSTRACT OF THE THESIS OF

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Rates of electronic cigarettes (or "e-cigarettes") use among youth are so high that the Surgeon General declared them to be of "epidemic proportions" (A Report of the Surgeon General, 2012). If these rates go unchanged, e-cigarettes will likely be responsible for the creation of a new generation of combustible cigarette (or "cigarette") smokers. Among youth, use of e-cigarettes as their first tobacco product was associated with more than four times the probability of ever use of cigarettes and three times the probability of current cigarette use (Berry, et al., 2019). Further, given the addictive nature of tobacco, three of every four teen smokers will still be smoking as adults, even if they intend to quit after just a few years (A Report of the Surgeon General, 2012). Since the introduction of e-cigarettes, there has been a debate within the public health community as to whether e-cigarettes create overall population health benefit by reducing the use of cigarettes and their subsequent health harms, or if they create overall harm by recruiting new (especially young) smokers and exposing them to untested chemicals. This thesis aims to study whether and how the news media landscape has changed as the rates of youth e-cigarette use have increased. The central question will be whether frames (the packaging and delivery of an issue) linked to the harm reduction position have lost ground to the more precautionary position that warns of potential harms from e-cigarettes. Since the news media is important to shaping public discourse and policy debate on any given topic, understanding the evolution of how e-cigarettes have been framed in the media can help shed light on current and potential future directions for public health action.

Key Words: e-cigarette, media, framing, epidemic, youth, public health, FDA, cigarette, vape, JUUL

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<u>Honors Baccalaureate of Science in Public Health</u> project of Julia R. Winett presented on May 30, 2019.

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I understand that my project will become part of the permanent collection of Oregon State University, Honors College. My signature below authorizes release of my project to any reader upon request.

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An Analysis of U.S. News Media Coverage of E-Cigarettes: Does a Youth Epidemic Make

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Tobacco use is the leading cause of preventable death in the United States, accounting for more than 470,000 deaths per year. Data from 2016 show that approximately 37.8 million adults smoke cigarettes and 16 million adults live with a preventable smoking-related chronic disease (Morbidity and Mortality Weekly Report, 2018). Combustible tobacco products (cigarettes) have been one of the primary foci of the public health community for decades. However a new problem, that of a high prevalence of e-cigarette use, has emerged in this past decade.

While e-cigarette companies tout that they market their products as an adult cigarette cessation technique, there has been a stark increase in youth users beginning in 2011 (Jackler, et al., 2019). The public health and policy communities are currently engaging in debate concerning the benefits and risks of selling nicotine vaping devices, otherwise known as "vapes" or "e-cigarettes," as a method of smoking cessation. This debate over the potential role of e-cigarettes reflects a tension between a hands-off approach to government and a harm-reduction model posed by the public health community. It also reflects differing perspectives within the public health community itself, as to how to best reduce existing smoking behavior while also avoiding preventable risk to others.

The goal of this study is to determine how and if the print news media's portrayal of e-cigarettes has changed to favor one public health argument over the other as the number of youth users has risen over time. This is important because understanding the ways in which the media are talking about e-cigarettes could shed light upon how the

debate is shaped, which viewpoints are predominant, and how e-cigarette trends are reflected in them. Discourse in the news, specifically the ways in which an issue is framed (packaged and delivered to the public), surrounding e-cigarettes can contribute to the public's understanding of the topic, which in turn can influence policymakers and their decision-making (Mccombs & Shaw, 1993).

LITERATURE REVIEW

E-Cigarettes

Electronic cigarettes (e-cigarettes) are devices that heat a solution comprised of various amounts of propylene glycol, nicotine, and flavoring to be inhaled by the user (Grana, Benowitz, & Glantz, 2015). E-cigarettes were initially introduced to the United States market in 2007 (Payne, Orellana-Barrios, Medrano-Juarez, Buscemi, & Nugent, 2016) after having been invented in China by pharmacist Hon Lik in 2003 (Boseley, 2015). Due to a lack of standardization, manufacturers have created various names for e-cigarettes including "vapes," and often refer to the product by its brand name such as Vuse, blu, JUUL, Logic, Suorin, and MarkTen XL (Alexander et al., 2016). However, in this paper, the term "e-cigarette" is used to refer to all heated nicotine delivery devices.

E-cigarettes are particularly addictive due to the inclusion of nicotine in the inhaled solution. According to the Mayo Clinic, inhaling nicotine releases the chemical into the bloodstream (Nicotine Dependence, 2018). The chemical then travels into the brain, where it connects with a receptor that releases neurotransmitters, such as dopamine, which controls mood and feelings of pleasure (Nicotine Dependence, 2018). These receptors come to expect incoming nicotine, leading to craving (Nicotine

Addiction Explained, n.d.). For any given individual, the addictiveness of nicotine varies and is dependent upon factors such as genetic predisposition, social influence, age, preexisting mental disorders, and previous substance use (Nicotine Dependence, 2018).

Additionally, the nicotine content in e-cigarettes varies and is often inconsistent among the same product, due to a lack of regulation. There is also great variation in the flavors and chemicals mixed into the delivery solution (Grana, Benowitz, & Glantz, 2015), which is important because a user may be aware of what they are putting into their body. These flavors are often designed to mimic sweet flavors such as strawberry, chocolate, cream, and menthol, all of which are banned in cigarettes because they attract youth users (Dutra & Glantz, 2014). Nicotine and flavoring combined increase dependence risk (Payne, Orellana-Barrios, Medrano-Juarez, Buscemi, & Nugent, 2016).

In 2016, the Federal Drug Administration (FDA) approved a rule that deemed tobacco products, including e-cigarettes, to be subject to the Federal Food, Drug, and Cosmetic Act. By including e-cigarettes in the Federal Food, Drug, and Cosmetic Act, the FDA can regulate their manufacturing, packaging, advertising, sale, promotion, labeling, and distribution (FDA Regulations for E-cigarettes and all other Tobacco Products, n.d.). In an effort to curtail the rise of youth users, the FDA issued warning letters and fines to more than 1,300 retailers who sold e-cigarettes (including brands such as Vuse, blu, JUUL, Logic, and MarkTen XL) to minors (Cullen, et al., 2018). Beginning in 2018, e-cigarette companies were also required to display the nicotine addictiveness warning statement on their packaging and advertisements (FDA Regulations for E-cigarettes and all other Tobacco Products, n.d.). Other attempts to regulate e-cigarettes are less extensive. For example, one attempt to regulate stopped short of legislation,

warning e-cigarette makers to change marketing tactics that appealed to youth through

self-regulation (Kaplan & Hoffman, 2018).

Epidemiological Data

Increased rates:

Figure 1. Percentage of middle and high school students who currently use e-cigarettes from National Youth Tobacco Survey data compiled from Morbidity and Mortality Weekly Reports (2011-2018)

| Year	2011	2012	2013	2014	2015	2016	2017	2018
Number of High School Students Using E-Cigarettes	220,000	No data available	No data available	2.01 million	2.39 million	1.68 million	1.730 million	3.05 million
Percentage of High School Students Using E-Cigarettes	1.5%	2.8%	11.9%	13.4%	16.0%	11.3%	11.7%	20.8%
Percent Difference of High School Students Using E-Cigarettes	No data available	86.7% Increase	325% Increase	12.6% Increase	18.9% Increase	29.7% Decrease	2.97% Increase	77.8% Increase
Number of Middle School Students Using E-Cigarettes	No data available	No data available	No data available	450,000	610,000	500,000	390,000	570,000
Percentage of Middle School Students Using E-Cigarettes	0.6%	1.1%	3.0%	3.9%	5.3%	4.3%	3.3%	4.9%
Percent Difference of Middle School Students Using E-Cigarettes	No data available	83.3% Increase	172.7% Increase	30% Increase	35.6% Increase	18% Decrease	23.3% Decrease	48% Increase

E-cigarettes were first introduced to the United States' market in 2007.

According to data recorded by the National Youth Tobacco Survey (NYTS), by 2014

e-cigarettes became the most frequently used tobacco product among youth (Cullen,

et.al, 2018). In 2018, the rates of youth use reached and surpassed 20% (see Figure

1). The NYTS is a voluntary cross-sectional, school-based survey of youth in middle

and high schools and is conducted in all 50 states and the District of Columbia.

Below is a graph provided by the CDC visually identifying the increase of youth e-

cigarette use (See Figure 2).

Figure 2: Percentage of middle and high school students who currently use e-cigarettes and any tobacco product- National Youth Tobacco Survey, United States, 2011-2018 (Cullen et al., 2018).
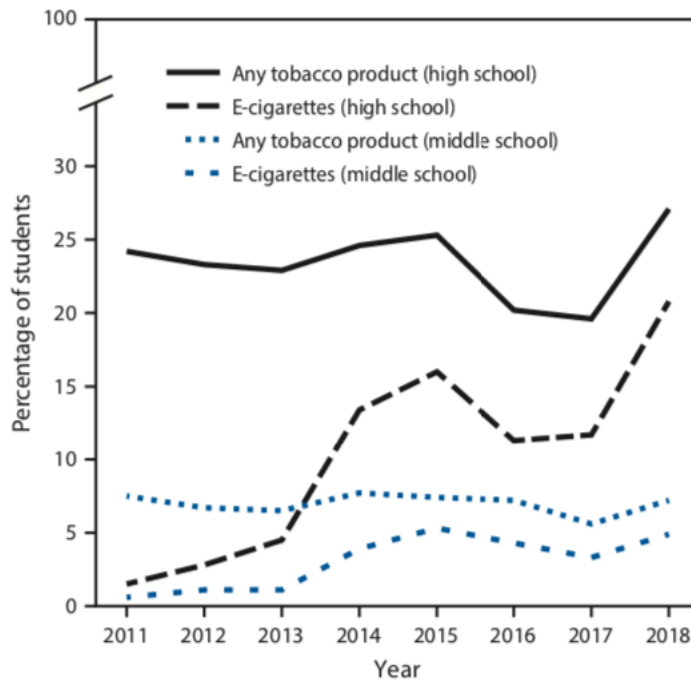
Why are youth rates increasing?

Although e-cigarette companies market their products as adult cessation devices,

rates of e-cigarette use are higher among youth than adults (Dutra & Glantz, 2014). The

increase of youth users from 2017-2018 is likely caused by the creation of the "JUUL"

vaping device. Shaped like a USB drive and sold at a relatively cheap price at $49.99 for

a device and a pack of nicotine solution "pods," (JUUL Starter Kit, n.d.) these products

currently account 75% of the e-cigarette market (Truth Initiative, 2019). A survey

conducted in 2018 found that youth ages 15-17 were 16 times more likely to use JUUL than adults ages 25-34 (Vallone, et al., 2018). The products' presence on the internet and marketing on platforms such as Instagram and Twitter (Dutra & Glantz, 2014) could make them more accessible and visible to young audiences. Their high nicotine content and sweet flavors are likely to keep youth hooked (Cullen, et al., 2018.). Predominantly sweet flavors are represented in JUUL's advertising with slogans such as *"Have a sweet tooth, try bruule."* and *"Save room for JUUL"* (Jackler, et al., 2019) which allude to dessert.

Why are these rates significant?

These rates are significant because rather than discouraging cigarette use, research suggests that e-cigarettes can encourage conventional cigarette use among youth. More than one puff on an e-cigarette has been associated with higher odds of ever using a combustible cigarette, and current e-cigarette use is associated with continued cigarette use (Glantz & Bareham, 2018). The same NYTS survey reveals that in 2018, 14.8% of high school students who used e-cigarettes and 14.4% of middle school students who used e-cigarettes users also used combustible cigarettes (Gentzke et al., 2019). In response to this trend, Robert Redfield, the current director of the Centers for Disease Control and Prevention (CDC) stated, "The skyrocketing growth of young people's e-cigarette use over the past year threatens to erase progress made in reducing youth tobacco use. It's putting a new generation at risk for nicotine addiction" (Progress Erased, n.d.).

Framing

　　Framing is the cognitive process conducted in our own minds by which "pieces of information are selected and organized to produce stories that make sense for their writers and audiences" (Ryan, 1991). While frames are not deliberately constructed, people use frames to package and contextualize an issue to better understand it using information they already have in their mind (Ryan, 1991). This process is more than simply interpreting the world around us, but is also a process by which one determines what is important. Communication scholar Frank Gilliam, noted that frames are the "labels the mind uses to find what it knows. Frames… signal what to pay attention to— and what not to, they allow us to fill in or infer missing information, and they set up a pattern of reasoning that influences decision outcomes. Framing, therefore, is a translation process between incoming information and the pictures in our heads" (Gillam, 2003). Thus, framing is an implicit method of packaging an issue to better understand it and its relation to the rest of the world.

　　As it relates to the news media, reporter and political commentator Walter Lippman described "framing" in 1922 as the "pictures in our heads" that come from news coverage. He noted that through news frames, people are able to understand and piece events in the news into the larger picture (Lippman, 1965). While certain aspects of an issue may be highlighted in one frame, they might be lacking in another, depending upon how a journalist portrays an issue. Examining the range of frames and emphasis across frames may help us understand how the public perceives an issue.

Nevertheless, the press "may not be successful much of the time in telling people what to think but it is stunningly successful in telling its readers what to think about" (Cohen quoted in McCombs & Shaw, 1993). Thus, the media informs the public what to think about, then helping to guide discourse and the public agenda-- a "list of events that are viewed at a point in time as ranked in a hierarchy of importance" (Rogers & Dearing, 1988). The public agenda, in turn, influences the policy agenda. Research indicates that the ways in which an issue is framed on an agenda can influence behavior (Mccombs & Shaw, 1993). For example, according to social scientist William A. Gamson, the way in which an issue is framed "May have an impact on the 'mobilization for collective action aimed at social change'" (Gamson, 1985 quoted in Scheufele, 2000), which could further influence policymakers.

How Do News Media Inform E-Cigarette Debate

To better understand why rates of e-cigarette use have increased so drastically over the past decade, studying the news media can help provide context-- Lori Dorfman, Director of Berkeley Media Studies Group noted that "the news media largely determine what issues we collectively think about, how we think about them, and what kinds of alternatives are considered viable; the news media set the agenda and terms of debate for policy makers and the public" (Dorfman & Krasnow, 2014). Increased coverage of an issue brings it into the public sphere—community members are more likely to know about an issue if it is covered in the media. Policy makers also focus on more visible issues, thus, the media influence the policy they ultimately create by publishing certain issues and not others.

Further, media coverage can influence individual behavior. A study of youth and young adult exposure to news media coverage of e-cigarettes in the United States, Canada, and England revealed that youth who were exposed to predominantly negative coverage of e-cigarettes were more likely to believe that e-cigarettes were harmful, whereas youth who were exposed to predominantly positive coverage were more susceptible to trying e-cigarettes. Thus, in this study, news coverage likely played a part in the ways in which youth understood and perceived e-cigarettes, influencing their behavior in turn (Wackowski, Sontag, & Hammond, 2019).

A study of twelve UK and Scottish newspapers between 2007 and 2012 revealed that the quantity of newspaper coverage of e-cigarettes increased significantly, and that the themes and frames within that coverage informed the public about how e-cigarettes should be used (Hajek, et al., 2019). The themes found within this news coverage, which were predominantly positive, pose difficulties for tobacco control due to their ability to promote e-cigarettes as effective cessation devices and as being socially normative (Rooke & Amos, 2013).

Two Sides of the Public Health Debate

A review of the public health literature related to e-cigarettes reveals two primary contrasting views, sometimes referred to as the "harm minimization" position and the "precautionary principle" position (Green, Fielding, & Brownson, 2018). The "harm minimization" argument promotes the idea that e-cigarettes could prove to be an important cigarette cessation tool for adult smokers, because they would transition from using combustible cigarettes to a product that could likely contain fewer chemicals and

carcinogens. In this view, e-cigarettes must remain accessible to provide adults with the best chance of quitting combustible cigarettes. The other view, the "precautionary principle" promotes the idea that there are not enough studies about e-cigarettes to make any concrete conclusions about their safety or efficacy, that it is plausible that e-cigarettes could be harmful based upon existing knowledge, and thus people should exercise precaution. Some proponents of this view express skepticism of e-cigarettes as a safer alternative to cigarettes based upon the tobacco industry's history of taking advantage of vulnerable populations to make a profit.

Those on the side of the precautionary principle generally argue that e-cigarettes pose a great threat to youth, in particular. Stanford found targeting to youth in JUUL Labs' advertising from 2013 to 2018 (Jackler et al., 2019). JUUL Labs now represents 75% of the e-cigarette market share in the United States (Truth Initiative, 2019). Other studies found that youth use of e-cigarettes increased in this same time period (Sales of JUUL e-cigarettes, 2018). Thus, JUUL Labs may be setting these trends and should be watched closely by policymakers. A recent *BMJ* report concluded that 12th graders who vape are more than four times more probable to then pick up a cigarette (Miech, Patrick, Omalley, & Johnston, 2017). Therefore, those on the side of the precautionary principle may argue that new nicotine addictions via e-cigarettes could lead to a greater number of preventable tobacco-related deaths and diseases later. Dr. Mark L. Rubinstein, a professor of pediatrics at the University of California, San Francisco stated that "we're going to be hooking a new generation of kids on nicotine, with potentially unknown risks" but added the additional concern that the devices may be risky in their own right: "with cigarettes, we've been studying them for many years, we have a pretty good idea of what the risks

are. We just don't know what the risks of inhaling all these flavorings and dyes are, and what we do know is already pretty scary" (Zernike, 2018). While e-cigarettes contain far fewer dangerous chemicals than those in cigarettes (cigarettes contain approximately 7,000 chemicals, 70 of which are known to be carcinogenic) their long-term health effects are still unknown (Truth Initiative, 2018). Several studies have found that e-cigarettes create and reinforce nicotine addiction, are damaging to the developing brain, and increase blood pressure and heart rate (Ross, 2016). This influx of new youth users due to the accessibility of e-cigarettes and marketing targeted toward youth poses health issues for future generations (Jackler, et. al., 2019).

Those arguing for harm-minimization contend that while e-cigarettes are not necessarily safe, they are less harmful than cigarettes. Further, they argue that regulating e-cigarettes could decrease access for adult smokers who would benefit from the product: cessation, which is also very important," notes Dr. Benowitz, chief of clinical pharmacology at the University of California, San Francisco (quoted in Hoffman, 2019). A recent study published in the *New England Journal of Medicine* concluded that e-cigarettes in addition to behavioral support are more than twice as effective in helping users quit tobacco use than any other cessation method (Hajek, et al., 2019). While 18% of smokers who used e-cigarettes quit, only 9.9% of those who used nicotine replacement therapy did (Hajek, et al., 2019). Thus the argument goes, e-cigarettes may be a central tool in helping current adult smokers quit. If proponents of harm-minimization are correct, e-cigarettes could drastically improve public health because of their widespread appeal and risk-reduction due to a decrease in the prevalence of cigarette smoking.

The harm-minimization argument has, perhaps unsurprisingly, been adopted by major tobacco companies such as Philip Morris. In 2018, Altria Group, Inc., former parent company for Philip Morris International and the maker of Marlboro cigarettes, announced a $12.8 billion investment to acquire 35% equity of JUUL Labs (Altria Makes $12.8 Billion, 2018). In taking on the mantle of the harm-minimization argument, Dr. Moira Gilchrist, a scientist with Philip Morris International, stated that, "the focus should be on what is the right thing to do for the 40 million men and women in the United States who would otherwise continue to smoke cigarettes." (quoted in Kaplan & Hoffman, 2018).

METHODOLOGY

Data

In this exploratory study, I wanted to examine whether or not the news media's discussion of e- cigarettes changed over time. Specifically, I wanted to see how the two public health arguments are represented in each time period, and whether or not the debate is even or is leaning toward one argument or another. To evaluate the frames present in public debate over e-cigarettes, I examined newspaper coverage of this issue from around the United States. To sample articles, I used NexisUni (a database comprised of news, business, and legal sources) which returned results from both local and regional papers. I supplemented this search with articles sampled from five large circulation national newspapers that were not included in the NexisUni database. These were: *USA Today* (national perspective), *The Wall Street Journal* (business perspective), *The New York Times* (East coast coverage), *Los Angeles Times* (West coast coverage), and *Washington Post* (federal policy issues).

My article search focused on the search terms "e-cigarette," "vape," "electronic nicotine delivery system," "ENDS," and "JUUL" in their headline or introduction, drawn from similar studies conducted by Rooke & Amos and Lazard, et al. My search was conducted for two time periods: I chose the first, from April 11, 2010 to April 11, 2011 because it marks the beginning of the increase of youth e-cigarette use according to National Youth Tobacco Survey (NYTS) data. I chose the second period, from April 11, 2018 to April 11, 2019, because of its recency and because NYTS data indicates that youth use of e-cigarettes reached and surpassed 20% prevalence during this time. Of the articles collected in the initial search, I randomly sampled 30 articles—20 from the local and regional dataset from NexisUni, and 10 from the national dataset to have equal representation in the data set from small, medium, and large circulation papers. Each article had to fulfill certain criteria; at least one key term had to be mentioned in the title or introduction ("lede") paragraph, no more than 10% of the data set could be from a single source, and no repeating or duplicate articles.

I briefly reviewed all selected articles, which included news, opinion, and editorials, across both datasets (see Figure 4) to identify frames used and define each frame, the issues discussed in the article, and key words that emerged.

In the second step, I conducted an in-depth review of articles for each time period (see figures 3 and 4) and linked identified frames with one of the key public health arguments, core positions, quotes, and statistics used to bolster each frame. I conducted this review following the framework laid out by Charlotte Ryan (1991) and process described by Winett (1997). I recorded each article's predominant frame, as well as any mention of a frame. Any discussion or inclusion of a frame constitutes one "mention."

Each mention is only recorded once per article, indicating whether or not it appeared in the article at all. The count of "1" indicates that a frame appeared in the article. The frame that appears in an article with the greatest frequency is categorized as being the article's "predominant" frame.

FINDINGS

My initial search yielded 104 articles for the first time period, April 11, 2010-April 11, 2011, and 1,756 articles for the second, April 11, 2018-April 11, 2019. From this initial search, I sampled 30 print news publications for each time period which yielded the below story type distributions (see Figure 3).

Figure 3: Story Type Distributions for Sampled Print News Publications for Time 1 (April 11, 2010- April 11, 201)1 and Time 2 (April 11, 2018-April 11, 2019)
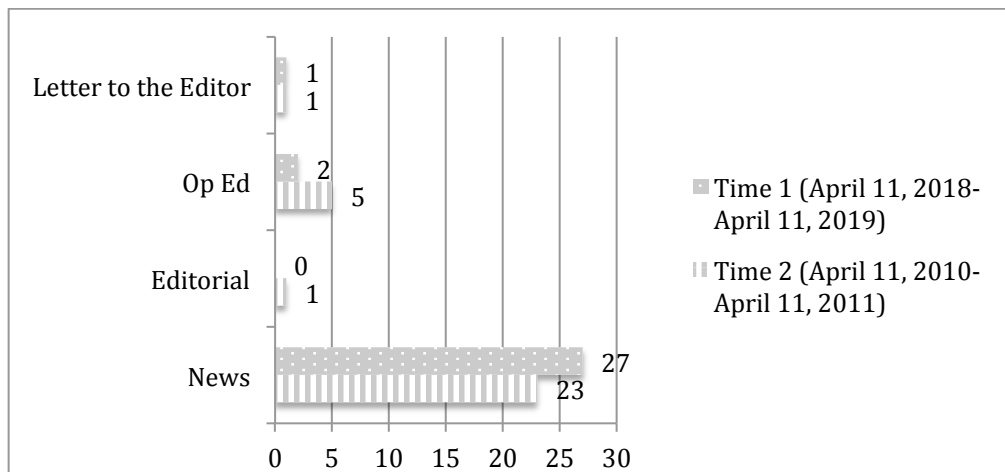
Frame Analysis

Across Time 1 and Time 2, I identified eight unique frames (see Figures 3 and 4), reflecting the debate between harm-minimization and the precautionary principle. Of these frames, five support the precautionary principle argument, while three support the harm-minimization argument. The frames supporting the precautionary principle are: *Risk to Youth Users, Unknown Health Effects, Lack of Regulation, Regulatory Ambiguity,* and *Health Risks to All Users* (see Figure 4). The three frames supporting the harm-minimization argument are: *Potential Cessation Tool, Risk-Reduction,* and *Against Government Regulation* (see Figure 5).

Figure 4: Precautionary Principle Frames Identified Thematically in E-Cigarette Print News Coverage from April 11, 2010 to April 11, 2011, and April 11, 2018 to April 11, 2019

Frame	Definition	Includes Discussion Of…	Key Words
Risk to youth users	E-cigarettes are marketed as adult cessation devices and shouldn't be used by youth. Using e-cigarettes will lead to health issues among youth users later.	Youth epidemic, high prevalence, increasing rates, dual users, chemicals, effects of nicotine on the developing brain, addiction	Epidemic, addiction, difficulty quitting, using cigarettes and e-cigarettes, JUUL, access
Unknown Health Effects	The long-term health effects of e-cigarettes are still unknown.	Potentially harmful, proceed with caution, need regulation, further studies needed	Risk, unknown, short-term, long-term, chemicals, nicotine, high levels
Lack of Regulation	There should be greater regulation of e-cigarettes.	FDA jurisdiction, proposed or existing policy, legislation,	Law, state, federal, local, government, regulation, bill,

		legislators or policymakers, initiatives	lawmakers, ban, legal, lack, need
Regulatory Ambiguity	Regulatory agencies are unsure how to classify e-cigarettes and under what jurisdiction they fall. This regulation should be clarified.	FDA jurisdiction, ambiguous, need for regulatory clarity	Law, state, federal, local, government, regulation, bill, lawmakers, ban, legal, lack, need, ambiguous
Health Risks for All Users	E-cigarettes will cause health issues for all users.	Chemicals, effects of nicotine on the brain, addiction, cardiovascular health, unknown long-term health effects	Risk, short-term, long-term, chemicals, nicotine, high levels

Of the eight identified frames, three frames support the harm-minimization

argument. These frames are: *Potential Cessation Tool, Risk-Reduction,* and *Against*

Government Regulation (see Figure 5).

Figure 5: Harm-Minimization Frames Identified Thematically in E-Cigarette Print News

Coverage from April 11, 2010 to April 11, 2011, and April 11, 2018 to April 11, 2019

Frame	Definition	Includes Discussion Of…	Key Words
Potential Cessation Tool	E-cigarettes are potentially effective at helping current smokers quit cigarettes.	Adult smokers, trying other methods, cost savings, personal quitting stories, disdain of addiction, nothing else works	Quit, nicotine delivery device, easier, switch, safe, effective
Risk-Reduction	E-cigarettes may not be healthy, but they are better than cigarettes.	E-cigarettes are better than cigarettes, regulatory and health communities are overreacting, fewer chemicals	Better, healthier, no more dangerous than, lower risk

		than cigarettes because no burning of tobacco	
Against Government Regulation	The government has no role regulating e-cigarettes. Using e-cigarettes is the user's prerogative.	First amendment liberties, autonomy, government overreach	Bureaucracy, power, money, overregulation, freedom, personal liberties

In the sample of 30 print news articles for Time 1, I found seven of the eight

identified frames, excluding *Risk to All Users* (see Figure 6). The most common frame

during Time 1 was *Potential Cessation Tool*, a harm-minimization frame, which

appeared in 16 of the 69 (23.2%) frame mentions and was the predominant frame in 10

out of the 30 (33.3%) articles. After *Potential Cessation Tool, Lack of Regulation*, a

precautionary principle frame, appeared in 12 of the 69 frame mentions (17.4%) and 7 of

the 30 predominant frames (23.3%).