

One of the major conclusions of the 2012 Surgeon General's report was that "Advertising and promotional activities by tobacco companies have been shown to cause the onset and continuation of smoking among adolescents and young adults".¹³ In the absence of regulation, the recent acquisition and creation of e-cigarette brands by tobacco companies has resulted in advertising tactics both in medium and message content which are shockingly similar to the banned cigarette marketing ads of yesteryear.¹⁴ These tactics included the use of celebrity endorsements and cartoon characters. A recent study collected Nielsen data on audience exposure to e-cigarette advertisements on T.V. and found that youth exposure to e-cigarette ads had increased 256% from 2011 to 2013, reaching 24 million youth; likewise, young adult exposure to e-cigarette ads increased by 321% over the same period.¹⁵ E-cigarette companies have been equally effective at marketing to adults, 8 of 10 U.S. adults are aware of e-cigarettes.^{16, 17} Awareness is highest among younger, white (as compared with Hispanic), and more educated current or former smokers.¹⁸ E-cigarette marketing may be specifically targeting some demographic groups including young adults, those with higher incomes and members of the lesbian, gay, and bisexual community.¹⁹

Not only are these ads making the public aware of e-cigarettes, they are also eliciting a desire for current smokers to try them. A recent study among current smokers who were shown an e-cigarette ad found that after viewing the ad the majority of respondents (88%) said that e-cigarettes were 'made for people like them' and two-thirds of the respondents indicated that they would try them in the future.²⁰ Smokers were most receptive to ads which emphasized the differences between e-cigarettes and tobacco cigarettes as well as ads showing a person using an e-cigarette.²¹

In addition to T.V. advertisements, e-cigarette companies have used social media including the internet, YouTube, and Twitter to market e-cigarettes. One study found that during a two month period in 2012, approximately 72,000 tweets were related to e-cigarettes and 90% of these were classified as commercial tweets originating from a small group of highly active accounts which included links to websites that sold e-cigarettes.²² A study which analyzed YouTube videos from 2008-2011 found that 85% of the videos were sponsored by marketers and these videos were seen by approximately 15.5 million people worldwide, of which 1.2 million are estimated to be under 18 years old. It is estimated that 30-50% of all e-cigarettes are sold via the internet and from August 2012 to January 2014 the number of brands increased by 10.5 per month to a total of 460 brands offering 7,700 flavors.²³ These studies have shown that e-cigarette companies have been effective at using both traditional and new social media to market their products much like the marketing tactics of the tobacco companies before regulation was implemented.

Lippi G, Favalaro EJ. E-Cigarettes and Cardiovascular Risk: Beyond Science and Mysticism. *Seminars in Thrombosis & Hemostasis*. 2014; 40:60-65. This literature review accessed the effects of e-cigarette use on the cardiovascular system and concludes that e-cigarettes are safer than traditional tobacco smoke and even other types of smokeless tobacco, adverse effects together with occasional cases of poisoning by device refills have been described.

Czogala, J, Goniewicz ML. Secondhand Exposure to Vapors from Electronic Cigarettes. *Nicotine & Tobacco Research*. 2014; 16(6): 655-662. This study measured selected airborne markers of secondhand exposure: nicotine, aerosol particles (PM_{2.5}), carbon monoxide, and volatile organic compounds in an exposure chamber. E-cigarette aerosol was generated from 3 various brands of e-cigarettes using a smoking machine and controlled exposure conditions. Indoor use of e-cigarettes involuntarily exposes nonusers to nicotine but not to toxic tobacco-specific combustion products.

U.S. Department of Health and Human Services. *Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012.

Campaign for Tobacco-Free Kids. 7 Ways E-Cigarette Companies Are Copying Big Tobacco's Playbook. http://www.tobaccofreekids.org/tobacco_unfiltered/post/2013_10_02_ecigarettes. Accessed 9/18/2014.

Duke JC, Lee YO, Kim AE, et al. Exposure to electronic cigarette television advertisements among youth and young adults. *Pediatrics*. 2014; 134: e29-e36. E-cigarette companies currently advertise their products to a broad audience that includes 24 million youth. In the absence of evidence-based public health messaging, the current e-cigarette television advertising may be promoting beliefs and behaviors that pose harm to public health. If current trends in e-cigarette TV ads continue, awareness and use of e-cigarettes are likely to increase among youth and young adults.

Emery SL Vera L. Wanna know about vaping? Patterns of message exposure, seeking and sharing information about e-cigarettes across media platforms. *Tobacco Control*. 2014;23:iii17-iii25. This study conducted an online survey of 17,522 US adults in 2013. High levels of awareness about e-cigarettes were indicated (86% aware and 47% heard through media channels). Exposure to e-cigarette related information was associated with tobacco use, age, gender, more education, social media use and time spent online. Gender, high income and using social media were associated with searching for e-cigarette information; lesbian, gay and bisexual and less education were associated with sharing.

Tan AS, Bigman CA. E-Cigarette awareness and perceived harmfulness. *American Journal of Preventive Medicine*. 2014;47(2):141-149. This study was based on 3,630 respondents who completed the Health Information National Trends Survey between October 2012 and January 2013 administered by the National Cancer Institute. Among those who were aware of e-cigarettes, younger, more educated respondents and current smokers (compared with former and non-smokers) were more likely to believe that e-cigarettes were less harmful. Awareness and perceived harm were not associated with smokers' past year quit attempts or intention to quit.

Kim AE, Lee YO. Adult smokers' receptivity to a television advert for electronic nicotine delivery systems. *Tobacco Control*. 2013;0:1-4. A convenience sample of 519 Florida adult smokers were shown an ad for Blu e-cigarettes and subsequently asked questions about the ad. Seeing the ad elicited an urge to smoke (mean 42.1, SD=1.9) and thoughts about smoking cigarettes (75.8%) as well as quitting (74.6%). Prior e-cigarette users were significantly more likely than non-users to report thinking about smoking cigarettes after seeing the ad ($p<0.05$).

Pepper JK, Emery SL. Effects of advertisements on smokers' interest in trying e-cigarettes: the roles of product comparison and visual cues. *Tobacco Control*. 2014;23:iii31-iii36. This study involved 3,253 smokers who had never tried e-cigarettes and were randomly assigned to one of three respondent groups for viewing advertisements: those who saw a person using an e-cigarette; a rechargeable e-cigarette kit; and no e-cigarette. Each ad also had 3 different headlines comparing e-cigarettes to regular cigs: the difference, the similarity, or neither. Ads that emphasized differences between e-cigarettes and regular cigarettes elicited more interest than ads without comparisons ($p<0.01$), primarily due to claims about e-cigarettes' lower cost, greater healthfulness and utility for smoking cessation.

Huang J, Kornfield R. A cross-sectional examination of marketing of electronic cigarettes on Twitter. *Tob Control*. 2014 23: iii26-iii30. During a two month period, 73,672 tweets were collected which were related to e-cigarettes of which 90% were classified as commercial tweets. Commercial tweeting was largely driven by a small group of highly active accounts and 94% included links to websites, many of which sell or promote e-cigarettes.

Zhu S, Sun JY, Bonnevie E, et al. Four hundred and sixty brands of e-cigarettes and counting: implications for product regulation. *Tobacco Control*. 2014;23:iii3-iii9. Comprehensive internet searches of English-language websites from May-August 2012 and December 2013-January 2014 identified brands, models, flavors, nicotine strengths and product claims of e-cigarettes. In the 17 months between the searches, there was a net increase of 10.5 brands and 242 new flavors per month. Older brands were significantly more likely to claim that they were healthier, cheaper, and good substitutes to regular cigarettes. Newer brands emphasized flavors and were less likely to compare themselves to tobacco cigarettes.

Richardson A, Pearson J. Prevalence, harm perceptions, and reasons for using noncombustible tobacco products among current and former smokers. *American Journal of Public Health*. 2014; 104(8): 1437-1444. This study addressed awareness of, prevalence of, purchase of, harm perceptions of, and reasons for using noncombustible tobacco products among 1,487 current and former smokers. Noncombustible tobacco use was associated with being male, non-Hispanic white, younger, and more nicotine dependent. Only snus was associated with a higher likelihood of making a quit attempt.

Lee S, Grana RA. Electronic cigarette use among Korean adolescents: A cross-sectional study of market penetration, dual use, and relationship to quit attempts and former smoking. *Journal of Adolescent Health*. 2014;54:684-690. This study analyzed a 2011 web-based survey of 75,643 South Korean youth aged 13-18. Among current cigarette smokers, those who smoked more frequently were more likely to be current e-cigarette users. The odds of being an e-cigarette user were 1.58 times (95% confidence interval, 1.39-1.79) higher among students who had made an attempt to quit than for those who had not. It was rare for students no longer using cigarettes to be among current e-cigarette users (odds ratio, .10 CI: .09-.12).

Bunnell RE, Agaku IT, Arrazola RA, et al. Intentions to smoke cigarettes among never-smoking U.S. middle and high school electronic cigarette users, National Youth Tobacco Survey, 2011-2013. *Nicotine Tob Res*. 2014 doi: 10.1093/ntr/ntu166 first published online: August 20, 2014.

Dutra LM, Glantz SA. Electronic Cigarettes and Conventional Cigarette Use Among US Adolescents: A Cross-sectional Study. *JAMA Pediatrics*. 2014; 168(7):610-617. This is a cross sectional study of US middle and high school students who completed the 2011 and 2012 National Youth Tobacco Survey (n=17,353 in 2011 and 22,529 in 2012). Use of e-cigarettes was associated with higher odds of ever or current cigarette smoking, higher odds of established smoking, higher odds of planning to quit smoking among current smokers, and, among experimenters, lower odds of abstinence from conventional cigarettes.

Ambrose BK, Rostron BL, Johnson SE, et al. Perceptions of the Relative Harm of Cigarettes and E-cigarettes Among U.S. Youth. *American Journal of Preventive Medicine*. 2014; 47(2S1):S53-S60. This study used data from the 2012 National Youth Tobacco Survey (N=24,658) to identify patterns of cigarette harm perceptions among youth. Multinomial logistic regression was conducted to identify associations between demographic and tobacco use characteristics and cigarette harm perceptions patterns. Logistic regression was conducted to examine the relationship between cigarette harm perceptions and the perception of e-cigarettes as less harmful than cigarettes for current, ever, and never cigarette smokers. Regardless of cigarette smoking status, ever users of e-cigarettes and those with "dose-dependent" cigarette harm perceptions consistently were more likely to perceive e-cigarettes as less harmful than conventional cigarettes.

Centers for Disease Control and Prevention (CDC). Fast Facts.

http://www.cdc.gov/tobacco/data_statistics/fact_sheets/fast_facts/. Accessed 9/18/2014.

Etter J, Bullen C. A longitudinal study of electronic cigarette users. *Addictive Behaviors*. 2014; 39(2): 497-494. This was a longitudinal internet survey from 2011-2013 which assessed use of e-cigarettes and tobacco among the same cohort at baseline, after one month (n=477), and one year (n=367). Most participants were former smokers (72%) and 76% were using e-cigarettes daily. Almost all the daily vapers at baseline were still vaping daily after one month (98%) and one year (89%). Among former smokers who were vaping daily at baseline, 6% had relapsed to smoking after one month and also 6% after one year. Among dual users, 22% had stopped smoking after one month and 46% after one year. In dual users who were still smoking at follow-up, cigarette consumption decreased by 5.3 cig/day after one month, but remained unchanged between baseline and the year follow-up.

Brown J, Beard E. Real-world effectiveness of e-cigarettes when used to aid smoking cessation: a cross-sectional population study. *Addiction*. 2014;109(9): 1531-40. This study was a large cross-sectional survey of a representative sample of the English population. It included 5,863 adults who had smoked within the past 12 months and made at least one quit attempt during that period with either an e-cigarette only (n=464), NRT only (n=1,922) or no aid (n=3,477). Abstinence was self-reported among the participants. The adjusted odds of non-smoking in users of e-cigarettes were 1.63 (95% CI 1.17-2.27) times higher compared with users of NRT and 1.61 (95% CI 1.19-2.18) times higher compared with those using no aid.

Dawkins L, Turner J. Vaping profiles and preferences: an online survey of electronic cigarette users. *Addiction*. 2013;108: 1115-1125. This study consisted of 1,347 online participants of whom 74% reported not smoking for at least a few weeks since using the e-cigarette and 70% reported reduced urge to smoke. Mean duration of use was 10 months. E-cigarettes were considered to be satisfying to use; elicit few side effects; be healthier than smoking; improve cough/breathing; and be associated with low levels of craving. Among ex-smokers, "time to first vape" was significantly longer than "time to first cigarette" suggesting a lower level of dependence to e-cigarettes.

Pokhrel P, Fagan P. Smokers who try e-cigarettes to quit smoking: findings from a multiethnic study in Hawaii. *American Journal of Public Health*. 2013;103(9): e57-e62. This was a cross-sectional study of 1,567 adult daily smokers in Hawaii who were surveyed from 2010-2012. 13% of respondents reported having ever used e-cigarettes to quit smoking and those who had used them reported higher motivation to quit, higher quitting self-efficacy, and longer recent quit duration than did other smokers.

Vickerman KA, Carpenter KM. Use of electronic cigarettes among state tobacco cessation quitline callers. *Nicotine & Tobacco Research*, 2013;15(10): 1787-1791. This study collected data from 2,758 callers to 6 state tobacco quitlines 7 months after they received intervention from the quitline program. 30.9% of respondents reported ever using or trying e-cigarettes; most (61.7%) used them for less than a month. Reasons for use were to help quit tobacco (51.3%) or to replace other tobacco (15.2%). The respondent quit rates after 30 days were 31.3% for non-e-cigarette users, 21.7% for a month or longer e-cigarette users and 16.6% for less than a month e-cigarette users, these percents were all significantly different.

Bullen C, Howe C, Laugesen M, et al. Electronic cigarettes for smoking cessation: a randomised controlled trial. *Lancet*. 2013; 382: 1629-37. 657 Adult smokers who wanted to quit were randomized into three groups: nicotine e-cigarettes, patches, and placebo e-cigarettes. At 6 months verified abstinence was 7.3% for nicotine e-cigarettes, 5.8% for patches and 4.1% for placebo e-cigarettes. Statistical differences couldn't be calculated due to small numbers. There was no correlation between adverse effects and study products.

Caponnetto P, Campagna D, Cibella F, et al. Efficiency and safety of an eElectronic cigAreTte (ECLAT) as tobacco cigarettes substitute: A prospective 12-month randomized control design study. *PLoS ONE*. 2013;8(6): e66317. This study was a 12-month randomized, controlled trial that evaluated smoking reduction/abstinence in 300 smokers not intending to quit using two different strengths of a popular e-cigarette model and a non-nicotine e-cigarette. Declines in cig/day use and exhaled carbon monoxide levels were observed at each study visit in all three study groups ($p < 0.001$ vs. baseline) with no consistent differences among study groups.

Kandra KL, Ranney LM. Physicians' attitudes and use of e-cigarettes as cessation devices, North Carolina, 2013. *PLoS ONE*. 2014;9(7):e103462. This study surveyed 787 North Carolina physicians via an email survey. A total of 413 respondents opened the email and 128 responded to the survey. Physicians were more likely to recommend e-cigarettes when their patients asked about them or when the physician believed e-cigarettes were safer than smoking tobacco cigarettes.

American Association of Public Health Physicians. Principles to Guide AAPHP Tobacco Policy. <http://www.aaphp.org/tobacco>. Accessed September 18, 2014.

Farsalinos KE, Polosa R. Safety evaluation and risk assessment of electronic cigarettes as tobacco cigarette substitutes: a systematic review. *Therapeutic Advances in Drug Safety*. 2014; 5(2): 67-86. This study was a literature review of 114 studies on the chemical analyses of e-cigarettes.

Nitzkin JL. The case in favor of e-cigarettes for tobacco harm reduction. *Int. J. Environ. Res. Public Health*. 2014;11: 6459-6471. This paper makes the case for tobacco harm reduction

(THR) with e-cigarettes as a prominent THR modality being the only feasible policy option with the potential to substantially reduce tobacco-attributable illness and death in the US over the next twenty years, and do so without adversely effecting initiation or quit rates.

Cahn Z, Siegel M. Electronic cigarettes as a harm reduction strategy for tobacco control: A step forward or a repeat of past mistakes?. *Journal of Public Health Policy*. 2011;32(1):16-31. This study reviewed the existing evidence on the safety and efficacy of e-cigarettes and how these products relate to the tobacco harm reduction debate. E-cigarettes show tremendous promise in the fight against tobacco-related morbidity and mortality.

Polosa R, Morjaria J, Caponnetto P, et al. Effect of smoking abstinence and reduction in asthmatic smokers switching to electronic cigarettes: Evidence for harm reversal. *Int. J. Environ. Res. Public Health*. 2014;11:4965-4977. This study reports on subjective and objective asthma parameters in asthmatic smokers who quit or reduced their tobacco consumption by switching to e-cigarettes. There were significant improvements in asthma control and airway hyper-responsiveness. Positive outcomes were noted in single and dual users.

¹ WHO

² See: http://www.tobaccofreekids.org/press_releases/post/2012_03_05_report last accessed 10/14/2014

³ The American Heart Association – Bhatnagar A, Whitsel L, Ribisl K, et al. Electronic cigarettes: A policy statement from the American Heart Association. *Circulation* 2014. Available online at: <http://circ.ahajournals.org/content/130/16/1418.full>

American Heart Association Policy statement, see: <http://circ.ahajournals.org/content/130/16/1418.full> last accessed 10/14/2014

⁴ Grana

⁵ Cheng

⁶ Goniewicz

⁷ Cheng

⁸ WHO

⁹ CDC, http://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhand_smoke/general_facts/index.htm

¹⁰ Schober

¹¹ Lippi

¹² Czogala

¹³ U.S. Department of Health and Human Services. Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012.

¹⁴ See: http://www.tobaccofreekids.org/tobacco_unfiltered/post/2013_10_02_ecigarettes last accessed 9/18/2014

¹⁵ Duke

¹⁶ Emery

¹⁷ Tan

¹⁸ Tan

¹⁹ Emery

²⁰ Kim

²¹ Pepper

²² Huang

²³ Zhu

²⁴ Richardson

²⁵ Lee

²⁶ Bunnell

²⁷ Dutra

²⁸ Ambrose

²⁹ WHO

³⁰ CDC (http://www.cdc.gov/tobacco/data_statistics/fact_sheets/fast_facts/) last accessed 9/18/2014.

³¹ Grana

³² Etter J and Bullen C

³³ Brown 2014

³⁴ Dawkins

³⁵ Pokhrel

³⁶ Vickerman

³⁷ Bullen C

³⁸ Caponnetto 2013

³⁹ Kandra 2014

⁴⁰ Grana

⁴¹ American Association of Public Health Physicians, "Principles to Guide AAPHP Tobacco Policy", <http://www.aaphp.org/tobacco> last accessed 9/18/2014.

⁴² WHO

⁴³ Farsalinos and Polosa

⁴⁴ Nitzkin

⁴⁵ Cahn and Siegel

⁴⁶ Polosa

⁴⁷ The American Heart Association – Bhatnagar A, Whitsel L, Ribisl K, et al. Electronic cigarettes: A policy statement from the American Heart Association. Circulation 2014. Available online at: <http://circ.ahajournals.org/content/130/16/1418.full>