

Multnomah County Vital Signs

A data report on emerging public health policy issues

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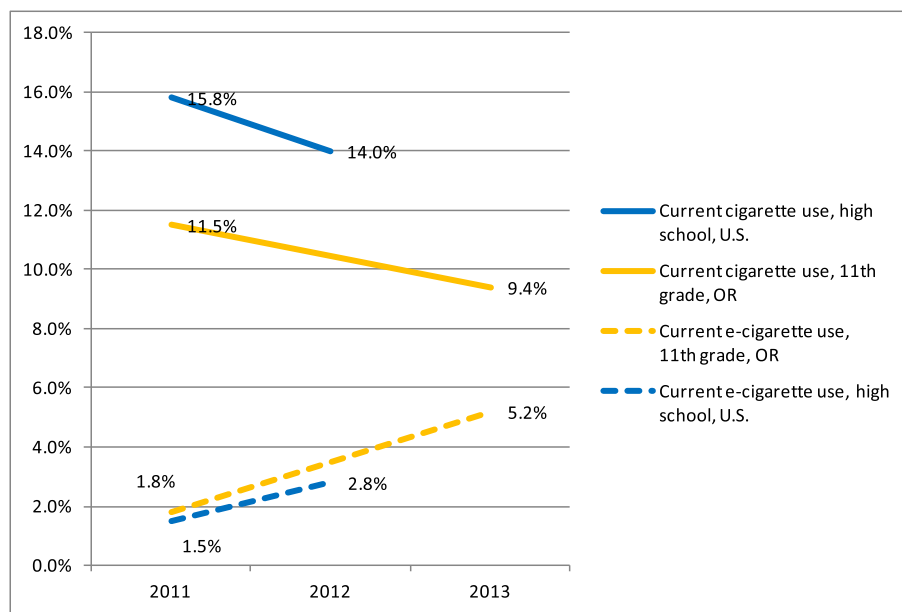
E-cigarettes and the Growing Culture of Vaping: Concern for Multnomah County Youth

Electronic cigarettes, also known as e-cigarettes, e-hookahs, and vape pens, were introduced to the United States market in 2007. The popularity of these electronic devices has soared in recent years, with U.S. e-cigarette sales reaching more than \$1 billion in 2013.¹ E-cigarettes are marketed as an alternative to conventional cigarettes with claims that they produce harmless water vapor, and have no effect on indoor air quality. In reality, little information exists regarding their

safety, and questions remain about the health effects to both to the e-cigarette user and to those around them.

In addition, there is special concern about the use of these products by youth. There are no restrictions in Oregon on sales of e-cigarettes to minors and e-cigarette marketing is heavily targeted to youth.

This report focuses on the many issues surrounding youth use of e-cigarettes in Multnomah County.



Current e-cigarette and cigarette use* among 11th graders (Oregon) and high school students overall (U.S.), 2011-2013**

* Defined as use at least once in the past 30 days; Oregon data from Oregon Healthy Teens; U.S. data from National Youth Tobacco Survey.

**Figure taken from CD Summary, Vol. 62, No. 27, December 31, 2013, Oregon Health Authority.

Youth use of e-cigarettes has increased dramatically

- Current use of e-cigarettes (i.e., in the last month) among Oregon eleventh-graders has almost tripled recently: from 1.8% in 2011 to 5.2% in 2013, even as cigarette smoking appears to decline. This mimics national trends of current e-cigarette use among high school students overall (1.5% in 2011 to 2.8% in 2012).
- Among Multnomah County high school students in 2012:
 - 10.1% have ever used an e-cigarette, similar to high school students nationally (10.0%).
 - 3.9% currently use e-cigarettes, not significantly different than high school students nationally (2.8%).

What are e-cigarettes and how do they work?

E-cigarettes consist of a small battery, an atomizer with a heating element, a cartridge or reservoir for a solution (sometimes called e-liquid) that contains nicotine, flavorings, and a carrier (e.g., propylene glycol). When heated, the device produces an aerosol, referred to as a vapor, rather than smoke. The term “vaping” comes from this vapor. Some brands (e.g., Blu and Vuse) look like and are held like traditional cigarettes. Other brands look very different, sometimes more like a pen. Some e-cigarettes have cartridges that are disposable, and some have refillable cartridges.

The ingredients of cartridges, refill solutions, and aerosol sometimes include harmful or potentially harmful chemicals. The U.S. Food and Drug Administration (FDA) analyzed the ingredients of a sample of cartridges



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from two leading brands of e-cigarettes. One sample was found to contain diethylene glycol, a toxic chemical used in antifreeze. Other samples were found to contain nitrosamines, carcinogenic chemical compounds.² Depending on the heating coils and the engineering of the device, harmful metals such as lead, nickel, and chromium have also been detected.^{3,4}

Are there adverse health effects?

In general, the aerosol from e-cigarettes does contain much lower levels of the harmful ingredients present in conventional cigarettes; however, almost all e-cigarettes contain nicotine. Nicotine is a powerful psychoactive drug that acts in the brain and throughout the body. It rapidly produces physical dependence characterized by withdrawal symptoms. The pharmacologic and behavioral processes related to nicotine addiction are similar to those of drugs such as heroin and cocaine.⁵ Nicotine is also harmful to the developing adolescent brain.⁵

Another danger of e-cigarettes is possible acute nicotine toxicity if the e-liquids are ingested. From

January through July of 2014, the Oregon Poison Center received 54 calls related to human exposure to nicotine from e-cigarettes, compared to fewer than 40 for the prior *three* years combined. A total of 13 calls during the 2014 period came from Multnomah County residents.^{6,7} Adding to the risk of acute nicotine toxicity is the fact that e-liquids meant for refills are not always packaged in safe, childproof containers. In fact, more than one-third of the e-cigarette calls to the Poison Center were made about exposures occurring to children under five years of age.⁶ Nicotine is also easily absorbed through the skin.

In large enough doses, nicotine can cause a variety of adverse health effects such as dizziness, nausea, vomiting, and elevated heart rate.⁸

In addition, there is concern that some flavorings, although safe for use in food, can be toxic when inhaled. At minimum, these flavoring agents can act as respiratory irritants.⁹

There is currently no external regulatory oversight of the ingredients in or the packaging for e-cigarettes. Although the FDA has proposed rules that would cover some aspects of e-cigarette regulation, the rules are still under review. No schedule has been set for adoption.

The nicotine levels in e-liquids and e-cigarette cartridges vary considerably. Some products contain more nicotine and could be more addictive and toxic than others. Studies have shown that the nicotine level listed on the labels of cartridges and e-liquids are often significantly different from measured values.¹⁰

How are they marketed?

E-cigarettes are marketed aggressively as a healthier alternative to conventional smoking, as a way to quit or reduce smoking, and as a way to circumvent clean indoor air policies. For example, a prominent e-cigarette website is named SmokeAnywhere.com and has the tagline “Smoking pleasure for today’s world.”

Most of the adverse health effects in conventional cigarettes come from the by-products of combustion,

not the nicotine itself, thus fueling the idea that vaping products are safe. The American Heart Association (AHA) recognizes the potential for harm reduction in *strongly regulated* e-cigarette products, if they are used as a substitute for – not in addition to – cigarettes. However AHA also expresses concern over the use and marketing of these products to renormalize smoking behavior, sustain dual use, and maintain nicotine addiction or initiate addiction among youth.¹¹

Advertising spending for e-cigarette products grew three-fold during 2011-2012, from \$6.4 million to \$18.3 million. In 2013, for the top six e-cigarette companies, spending on advertising reached \$60 million.¹² E-product marketing includes a clear focus on youth. Youth exposure to TV advertising for e-cigarette products increased more than 250% from 2011 to 2013, with e-cigarette ads reaching more than 24 million youth during this period.¹³

Just as e-products themselves are not regulated, e-cigarette advertising remains unregulated. Manufacturers are at liberty to advertise in all venues. E-cigarette ads can be seen and heard in places where ads for cigarettes have not been allowed for decades,

including youth-centered cable TV, radio, billboards, and of the internet. Some ads feature popular celebrities and e-cigarette company sponsorships of sporting events are growing. There is a strong e-cigarette presence on social media platforms such as Twitter and product samples are given out at youth events.¹⁴

A multitude of e-cigarette flavors exist, with many targeting youth. In early 2014, there were 466 brands and 7,764 unique flavors of e-cigarette products.¹⁵ Some examples of e-cigarette flavors that could particularly appeal to youth are Bubble Gum, Snicker Doodle, Gummi Bear, Skittles, Mountain Dew, and the children's cereal Captain Crunch.

Are they widely available?

E-cigarettes are widely accessible to youth. They are available in both internet and retail settings. Retail

settings include convenience stores that adolescents are particularly likely to frequent. About 70% of youth shop at convenience stores at least once a week.¹⁶ In addition, some e-cigarette devices are less expensive than conventional cigarettes, appealing to price-sensitive youth.¹⁷



Youth are very aware of e-cigarettes and many perceive them as less harmful than regular cigarettes

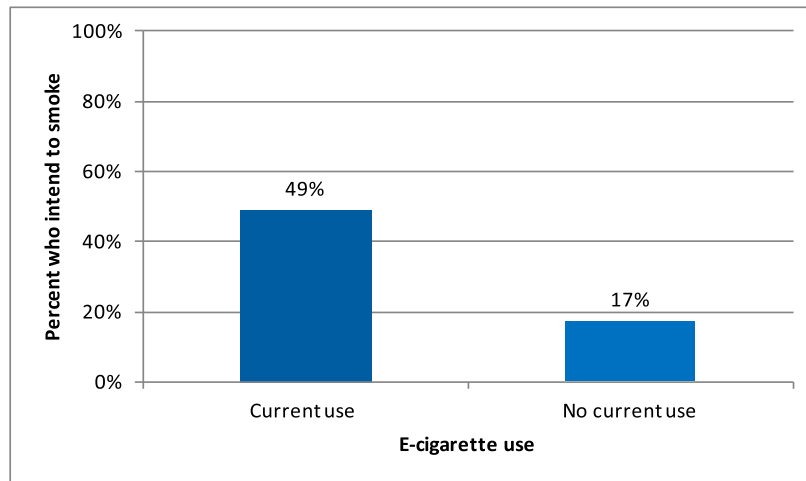
The effects of industry marketing efforts are reflected in a high level of youth awareness of the products and a perception that they are less harmful than traditional cigarettes.

- Nationally, in 2012, 41% of middle school students and 58% of high school students said

that they had heard of e-cigarettes such as Ruyan or NJOY.¹⁸

- In Multnomah County, more than half (55.1%) of the high school students perceived e-cigarettes as less harmful than regular cigarettes (CPPW YRBS 2012).

Percent of eighth- and eleventh-grade non-smokers who intend to smoke*, by current e-cigarette use, Multnomah County, Oregon Healthy Teens, 2013



* Defined by the following questions: "If one of your best friends were to offer you a cigarette, would you smoke it?" and "Do you think you will smoke a cigarette in the next year?" Those who answered "definitely not" to both questions were classified as not intending to smoke (i.e., "nonsusceptible"); those who gave any other response ("probably not", "probably would", or "definitely would") were classified as having the intention to smoke (i.e., "susceptible").

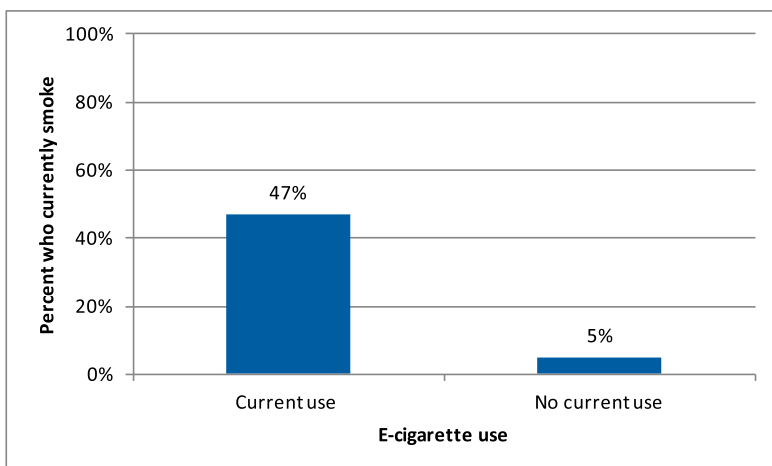
E-cigarette use may lead to regular cigarette use

Indirect evidence both locally and nationally suggests that e-cigarette use may lead to use of regular cigarettes:

- In Multnomah County in 2013, among eighth- and eleventh-graders who do not currently smoke: those who currently use e-cigarettes are nearly three times as likely to intend to smoke regular cigarettes (49%) than those who do not use e-cigarettes (17%) ($p < .01$).

- Similar patterns are seen nationally among middle and high school students who do not currently smoke: those students who had ever used e-cigarettes were twice as likely to intend to smoke (44%) than students who had never used e-cigarettes (22%) (2011-2013).¹⁹

Prevalence of current smoking by current use of e-cigarettes,* High School, Multnomah County, Youth Risk Behavior Survey, 2012



Many youth who currently use e-cigarettes also use regular cigarettes

- In Multnomah County, current smoking is much more common among high school students who currently use e-cigarettes (47%) than among high school students who do not currently use e-cigarettes (5%) (2012).

* Defined as using at least once in the past 30 days.

Could e-cigarette use begin to make smoking more socially acceptable?

The tobacco control movement has been working arduously to transform the image of smoking from a glamorous activity to a health-endangering addiction. It has been generally successful. Eleventh-grade smoking prevalence decreased sharply in Oregon between 1996

and 2013: from nearly 28% to less than 10%²⁰, but e-cigarette use could reverse this trend. One of the major ways this smoking denormalization has been achieved is

through clean indoor air laws—smoking is now rarely seen in public places. With vaping becoming a common sight, the strong message being sent to youth is that “lighting up” is socially acceptable again.



What has already been done in Oregon?

Oregon is one of nine states (as of October 2014) without regulations banning the sale of e-cigarettes to minors.²¹ On the local level, however, there have been some related policy changes:

- Governor John Kitzhaber signed the Tobacco-Free Campus Executive Order prohibiting the use of tobacco products, including e-cigarettes, in state agency buildings and on state agency grounds. (2012)²²
- Multnomah County’s tobacco-free campus policy includes a prohibition on use of electronic cigarettes. (2012)²³
- Corvallis banned the sale of e-cigarettes to minors, and devices cannot be used indoors or within ten feet of doorways. (2013)²⁴
- Oregon State University campus remains smoke-free, including a ban on e-cigarettes. (2013)²⁴
- Benton County (unincorporated) banned the sale of e-cigarettes to minors, and e-devices cannot be used indoors or within ten feet of doorways. (2014)²⁴
- TriMet includes electronic cigarettes in their tobacco free policy. (2011)²⁵
- University of Oregon included e-cigarettes as part of their tobacco-free campus policy. (2012)²²
- Hillsboro City Council banned e-cigarettes in public parks. (2014)²⁴
- Southern Oregon University banned e-cigarettes on campus. (2014)²⁴
- City of Banks prohibits sale of electronic cigarettes to minors and possession by minors. (2014)²³
- City of North Plains prohibits sale of electronic cigarettes to minors and possession by minors. (2014)²³
- Oregon School Boards Association provides optional language to be added to the Oregon Tobacco-Free K-12 School Policy OAR 581-021-0110 that broadens the definition of tobacco products to include e-cigarettes and allows prescription of smoking cessation products. (2011)²⁶
- Hood River County (2014) and Curry County (2014) school boards’ tobacco-free K-12 policies specifically include e-cigarettes.^{23,24}
- Riverdale School District (K-12) includes e-cigarettes in their tobacco free policy. (2011)²⁷
- Starbucks includes e-cigarettes as part of their tobacco-free worksite policy. (2013)²²

What other e-cigarette policies can be implemented to protect the public's health?

There are numerous policies that could be implemented to limit the potential negative health consequences of e-cigarettes. Building on best practices for tobacco control,²⁸ the American Heart Association recommends policymakers do the following:¹¹

- Include e-cigarettes in clean indoor air regulation.
- Include e-cigarettes in laws prohibiting sales of tobacco to minors, and in enforcement of those laws.
- Include e-cigarettes in laws that restrict marketing and advertising.
- Tax e-cigarettes at a rate high enough to discourage youth use, while retaining or increasing differentials with combustible products by increasing taxes on combustibles. Revenue generated from the tax should support tobacco cessation and prevention.
- Support effective FDA regulation that addresses marketing, youth access, labeling, quality control over manufacturing, free sampling, and standards for contaminants.
 - Regulations should allow for quality-controlled products for adults who want to transition from conventional cigarettes to e-cigarettes to quit or reduce smoking.
 - Bottles containing nicotine should have proper warning labels and childproof packaging.
 - Relevant government agency should monitor whether these devices are used for delivery of other drugs or medications.
 - Companies should not be allowed to claim that e-cigarettes are a cessation aid unless they are approved by the FDA for that purpose.
- Incorporate screening for e-cigarette use into tobacco-screening questions at clinical visits and worksite-community health screenings, and educate clinicians about e-cigarettes.
- Improve and increase surveillance on e-cigarette use and establish a research agenda to clarify the public health impact.
- Include e-cigarettes in the definition of tobacco products (or tobacco-derived products) and smoking, not by creating a separate definition for e-cigarettes because a separate definition can create a risk of e-cigarettes being exempted from other tobacco control laws. E-cigarettes could still be treated differently within taxation legislation and regulation.

In addition to the American Heart Association recommendations, local strategies should also:

- Ensure that school tobacco policies explicitly include e-cigarettes.
- Include education and awareness campaigns directed to parents and youth about the potential harms of e-cigarettes.
- Include electronic cigarettes in tobacco retail licensing laws so that retailers of these products must be licensed and inspected.
- Prohibit sales of e-cigarettes at retailers located within 500 feet of schools.

Data sources

CPPWYRBS 2012: The CPPWYRBS was a Youth Risk Behavior Survey done as part of the CDC-funded project *Communities Putting Prevention to Work* (CPPW) and was conducted in seven school districts in Multnomah County during 2012.

Oregon Healthy Teens (OHT): The Oregon Healthy Teens survey was conducted among eleventh-graders in Oregon by the Oregon Public Health Division. Oregon estimates include all eleventh-graders that participated. Multnomah County estimates include only eleventh-graders attending Multnomah County schools.

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