Communication from Public

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HENPAR Questions and Draft Answers:

1. What are the "best practices employed by jurisdictions that have already enacted flavored tobacco restrictions or prohibitions?"

San Francisco: Only one major jurisdiction, the City and County of San Francisco, has enacted a full flavor ban. Since then, they have struggled to enforce it[1]. The ordinance was subject to a multi-million-dollar referendum on both sides of the campaign, and the African-American community in San Francisco largely rejected the ban at the ballot box. After the voters reaffirmed the ban, the City delayed implementation, and flavored tobacco products are still widely available in the City. In areas where the City is now trying to enforce the ban, there are growing anecdotal accounts[2] of people illegally selling the banned products on the street since the products have been pushed out of the licensed and regulated channels. There is no evidence yet of a decrease in youth usage of flavored tobacco products in the City.

More recently, the San Francisco City council introduced and unanimously passed a new law that prohibits the sale of *all* electronic cigarettes both online and in stores - the first of its kind in the U.S..[3] The new ban on vapor products was authored by City Attorney Dennis Herrera and Supervisor Shamann Walton, arguing that the previous ban focused too much on menthol cigarettes, which are not the driving force behind youth tobacco usage. In a public statement, Herrera commented, "The evidence is overwhelming that e-cigarettes, not traditional cigarettes, are what's driving the surge in children using tobacco products. [...] cigarettes are bad, but they're not what's dragging our children into a lifetime of addiction."[4] This ordinance takes a more nuanced and even-handed approach than the original ban in addressing and eventually curtailing the widespread use of flavored e-cigarettes by today's youth, and has served as a template for other cities - such as Richmond and Livermore - to follow suit. JUUL is now hoping to overturn the law with an initiative that has qualified to appear on the ballot later this year in San Francisco's municipal election.

While the passage of this ordinance is a big win for those seeking to reduce teen tobacco use, banning the sale of vapor products will have a huge impact on the economy in and around San Francisco. That's why the authors of the bill - Herrera and Walton - are working to assemble a team to assess and mitigate the negative effects of the ban on local retailers and businesses.

Chicago: In July 2016, the City of Chicago enacted a ban on the sale of all flavored tobacco products at retailers within 500 feet of a school or park. After just a year, the City amended the ban – making it only applicable to stores 500 feet from high schools – due to the negative impact on the business community, the rise of illicit trade, and general inability to adequately enforce the ban.[5]

New York: The City of New York has had a ban on flavored tobacco products, with an exemption for menthol cigarettes and menthol, mint and wintergreen smokeless tobacco products, since 2009. A

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[1] KALW - San Francisco Banned Flavored Tobacco Sales. Now What?

[2] Per Miriam Zouzounis, San Francisco Small Business Commissioner

[3] Office of the City Attorney of San Francisco

[4] San Francisco Chronicle, Letter to the Editor

[5] Chicago Sun-Times – Aldermen Lift Ban on Menthol Cigarette Sales Near Schools

proposal to add menthol cigarettes to the ban has languished this year.[6] Between this ban, the highest tobacco taxes in the nation, and the proximity of lower taxed states and localities nearby, New York City has the highest rate of illegal tobacco sales in the nation. An estimated 80% of all tobacco sales in the City are conducted via illicit trade,[7] according to some estimates. Many community activists and faith-leaders point to the tragic case of Eric Garner, an African American man who was killed by the NYPD while engaged in the sale of loose cigarettes,[8] as the inevitable unintended consequence of such restrictive policies.

Oakland: The City of Oakland, California passed a full flavor ban in 2017, but exempted age restricted stores (Age 21+) from the ban.[9] Despite this exemption, there is strong anecdotal evidence of illicit sales on street corners near traditional convenience stores that are no longer allowed to sell flavored tobacco products.

Sacramento: The City of Sacramento recently passed a full flavor ban[10] but delayed enforcement until after the State Legislature does or does not address the issue at the state level. The City also a scheduled a one year check in after the ban is implemented, to gauge the impact on small businesses and review the ban's measurable impact on youth usage of tobacco products.

Others: In addition to Sacramento, Oakland and San Francisco, about two dozen, smaller jurisdictions in northern California have passed various versions of flavor bans. Some passed full flavor bans, while others exempted traditional adult flavors like menthol, mint & wintergreen, exempted adult-only stores, grandfathered in existing retailers, or only enacted restrictions on retailers located within 500 or 1000 feet of schools and parks and other "youth-sensitive" sites.

Generally, these jurisdictions are too small and too geographically close to other jurisdictions to significantly impact access to the banned products, beyond increasing inconvenience for legal buyers and/or spurring an increase in the illicit trade.

2. What are the "ongoing and proposed state and federal administrative or legislative actions intended to prevent use of flavored tobacco by minors?"

Federal Administrative Action: Since being given the authority to regulate tobacco products during the Obama Administration, the FDA looked extensively at the issue of banning menthol cigarettes and decided against it.[11] Recent FDA actions have been focused on drafting regulations and providing guidance on enforcement action targeting non-traditional vapor flavors and all flavored cigars,[12] citing these tobacco products as the ones driving youth initiation and use.

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[6] Wall Street Journal – New York City Council Weighs Ban on Flavored E-Cigarettes, Menthols
[7] Wall Street Journal – Illegal Cigarettes Are Big Business In New York City
[8] New York Post – Man Dies After Suffering Heart Attack During Arrest
[9] East Bay Times – Oakland Bans Flavored Tobacco Products
[10] Sacramento Bee – Sacramento City Council Bans Sale of Flavored Tobacco Products
[11] New York Times – FDA Plans to Seek a Ban on Menthol Cigarettes
[12] Statement from the Office of the FDA Commissioner

A federal judge has ordered the FDA to require Premarket Tobacco Product Applications (PMTAs) on all deemed products by May 2020, accelerating the current PMTA deadline by 27 months. This ruling also requires that the only deemed products that can be sold after May 2021 are those that have received PMTA authorization.[13] It is too soon to know if the FDA will appeal this decision. Regardless, the FDA has stated they will issue guidance by mid-October that addresses access to flavored electronic cigarettes during the interim period.

Federal Legislative Action: Senator Mitch McConnell has introduced legislation raising the national tobacco purchase age to 21 years old. Senator McConnell has stated that he "hope[s] and expect[s] this legislation to get strong bipartisan support in the Senate" and that it "will be a top priority" for the 116th Congress.[14] As Majority Leader, McConnell will be a particularly influential advocate for the legislation. This bill, introduced by the Senate Majority Leader who is from a tobacco state, could be construed as growing momentum for this policy.[15]

Representatives Pallone and Shalala have introduced legislation that would, among other things, ban all flavored tobacco products, including menthol cigarettes.[16] This legislation is under serious consideration in both the House of Representatives and the United States Senate.

State Legislation: SB 38 would have banned the sale of all flavored tobacco products in the State of California.[17] It was abandoned by its chief backers and legislative author after amendments perceived to be hostile were added in the Senate Appropriations Committee.[18] Among others, the California State Conference of the National Association for the Advancement of Colored People (NAACP) opposed SB 38, citing among other reasons: *"A ban on menthol cigarettes would give police another reason to interact negatively on the retail level or with individual citizens on a low-level, non-violent offense. At a time in which we know that interactions between law enforcement and young men and women of color lead to all-too-often tragic results, we should be looking at a way to lessen any negative encounters in our community with law enforcement."* [19]

AB 739, the companion bill to SB 38, was not heard in the Assembly Governmental Organization Committee prior to the legislative deadline. The Chairman of the Assembly G.O. Committee (which has jurisdiction over tobacco issues), Adam Gray, said he wants to develop a comprehensive solution to address the issue of youth access to vaping products, without restricting adult choice. Additional legislation SB 39,[20] would require any online sales of tobacco products to comply with similar rules to the online sale of alcohol products, namely, that the products will only be delivered to the purchaser's verified address, that the product be shipped in conspicuously labelled packaging, and must be signed

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[13] American Academy of Pediatrics v. Food and Drug Administration, attached
[14] Politico - McConnell: Raising age to buy tobacco to 21 a 'top priority'
[15] Roll Call – McConnell Introduces Bill Making the Legal Smoking Age 21
[16] The Hill – House Dems Unveil Legislation Aimed at Curbing Youth Tobacco Use
[17] Senate Bill 38
[18] San Francisco Chronicle – California lawmakers withdraw bill banning flavored tobacco sales
[19] Copy of NAACP Floor Alert on SB 38 attached
[20] Senate Bill 39

for upon delivery by a person over 21 at the point of delivery.

Citing the need to develop a comprehensive solution to address youth e-cigarette usage, Assemblymember Gray introduced AB 1639, which seeks to reduce youth tobacco use by implementing state regulation of flavored tobacco products. AB 1639 imposes regulations that limit flavored electronic cigarette sales to age-restricted tobacco retailers and online vendors that use an age verification system to ensure customers are over 21 years old. Notably, AB 1639 incorporated the NAACP's critique of SB 38 and exempts electronic cigarettes with tobacco, mint or menthol flavors. The bill would impose additional regulations on the marketing of flavored products and fines for both underage customers and retailers who violate the regulations. On July 10, AB 1639 passed out of the Committee on Governmental Organization with a unanimous 16 to 0 vote and has been referred to the Committee on Health.[21]

It is the opinion of these submitters that managing the regulation of tobacco products sales on a local jurisdiction by local jurisdiction basis is counter-productive, and that the City of Los Angeles should wait to see the results of state and federal action before proceeding.

3. What are the "penalties for retailers who sell tobacco products to minors and additional options for enforcement?"

The penalties in Los Angeles City code for retailers who violate the City's laws related to selling tobacco products to minors/underage consumers are captured in Chapter 11.35 of the City Code, related to Tobacco retailing. These penalties include administrative fines, suspension or revocation of license, and prosecution as a misdemeanor. A copy of Chapter 11.35 of the City Code has been attached with penalty sections highlighted.[22] Below is an excerpt from section C. re: license violations

11.35.100 - Suspension or revocation of license

C. When the director finds a violation as set forth in section 11.35.100(A), the license may be suspended or revoked as follows:

Upon finding by the director of a 1st license violation within any five-year period	*License may be suspended for up to 30 days*
Upon a finding by the director of a 2nd license violation within any five-year period	*License may be suspended for up to 90 days*
Upon a finding by the director of a 3rd license violation in any five-year period	*License may be suspended for up to 120 days*
Upon a finding by the director of a 4th license violation within a five-year period	*License shall be revoked*

[21] Assembly Bill 1639

[22] Copy of Los Angeles City Code Section 11.35 attached, with sections highlighted

The City could, among other options, increase fees for tobacco retail licenses and utilize the funds from these fee revenues to conduct greater enforcement activities.

4. Provide data on the "use of flavored tobacco products and menthol products used by minors and any data indicating such products are a gateway."

Based on the most recent available California Department of Public Health survey on youth usage of tobacco products,[23] it is clear that menthol cigarettes are not driving youth initiation into tobacco products in any meaningful way. The most recent data, from 2018, shows that youth tobacco use among traditional tobacco products – cigarettes, little cigars/ cigarillos, hookah, and smokeless tobacco – has declined from 2015-2016 levels. In fact, cigarette use fell from 4.3% to 2.0%; little cigar/ cigarillo use fell from 4.3% to 2.3%; hookah use fell from 4.8% to 1.7%; and, smokeless tobacco fell from 1.7% to 0.7%. However, electronic smoking device use has increased from 8.6% to 10.9%. Electronic smoking devices now account for 84.3% of tobacco products used by youth.[24] In a 2017 study, non-menthol cigarettes reported higher usage, at 2.4 %, and electronic cigarettes reported usage at 8.6%. A set of infographics and fact sheets on this and other relevant data is attached.[25]

New data from the latest study, expected to be released soon, are anticipated to show that the usage statistics for vapor products among underage users have risen to close to 25%, while it is not anticipated that youth usage of menthol cigarettes has risen appreciably or at all. Former FDA Commissioner Scott Gottlieb identified youth usage of e-cigarettes and vapor products as an epidemic and the primary product driving youth initiation into tobacco and nicotine products.[26] The most recent data, from 2017, shows that just 1.9% of youth report using a menthol cigarette in the last 30 days.

[23] California Department of Public Health – California Student Tobacco Survey

[24] California Department of Public Health - California Tobacco Facts And Figures 2019

[25] Factsheets and Infographics on youth usage of tobacco products attached

[26] Vox – FDA Chief Gottlieb: Juul Drove a Youth Vaping Crisis

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Flavored and Mentholated Tobacco Products: Enticing a New Generation of Users

CMA White Paper

May 2016

California Medical Association

Flavored and Mentholated Tobacco Products: Enticing a New Generation of Users

Executive Summary

May 2016

Smoking has long been known to lead to tobacco-related diseases and harmful health outcomes, including heightened risk of cancer, stroke, and heart disease. Decades of research and public health efforts through prevention programs, education, and regulation have contributed to widespread awareness of these health impacts and the larger societal costs caused by tobacco use. California, in particular, has been a leader in tobacco use reduction and cessation, as evidenced by the 50 percent reduction in adult smoking rates over the past twenty-five year span.

However, introduction of novel tobacco products that are offered in a variety of flavors designed to appeal to children; such as bubblegum, grape, and chocolate; may present new public health threats to adolescents and young adults and threaten the progress achieved in tobacco control. Snuff, hookah, and liquid nicotine solution are just a few of the substances on the market that contain tobacco and tobacco-derived nicotine, but are not subject to the same strict flavor restrictions as traditional cigarettes. Notably, these products are sold in a variety of flavors and bright packaging which, complemented by targeted advertisements, appeal to youth, certain ethnic minorities, and other priority populations.

This white paper was prepared by the California Medical Association (CMA) and reviewed by its Council on Science and Public Health, a panel of physician experts, with input from subject matter researchers. These findings provide insight into the increasing consumption of flavored and mentholated tobacco products, specifically with regards to priority populations, and the resulting health effects. The paper assesses existing data and research regarding tobacco use by priority population and the types of flavored tobacco products on the market.

> *"[Flavored tobacco products] are widely considered to be 'starter' products, establishing smoking habits that can lead to a lifetime of addiction."*
>
> Food and Drug Administration, Flavored Tobacco Product Fact Sheet

Key Points:

- Consumption of flavored tobacco products such as cigars, smokeless tobacco, hookah tobacco, and liquid nicotine solution (used in electronic smoking devices) have increased among youth in recent years, while menthol cigarettes continue to corner a large part of the U.S. cigarette market.
- Flavorings used in tobacco products do not reduce the health impacts and risks associated with tobacco use, and are not safer than non-flavored tobacco products.
- Flavored and mentholated tobacco products are "starter" products that help new users establish daily habits and promote addiction to tobacco products, make it harder to quit, and may result in the concurrent use of multiple tobacco products.
- The tobacco industry has marketed these flavored and mentholated tobacco products to account for user preferences that skew younger, and reinforce sociocultural messages with priority populations.
- Strong evidence supports the finding that youth, certain racial/ethnic groups, and other targeted priority populations (i.e., LGBT and women) are particularly vulnerable to sweet flavors and menthol, and are largely driving this increased uptake and sustained use of flavored tobacco products.

Acknowledgements and Disclaimers

This document was prepared by the California Medical Association and reviewed by its Council on Science and Public Health, a panel of physician experts, with input from subject matter researchers. It was approved by the CMA Board of Trustees on April 21, 2016.

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Introduction

The California Medical Association's (CMA) mission is "to promote the science and art of medicine, the care and well-being of patients, the protection of the public health and the betterment of the medical profession" and the organization has a similar core objective of advancing public health.

CMA has long recognized that tobacco use is a costly habit that often leads to illness and poor health; in 1963, CMA was the first among state medical societies to create policy to inform people about the harmful effects of cigarette smoking. Effective policy solutions that prevent and reduce tobacco use and the negative health impacts of these products should be guided by the current literature and research that indicates these interventions are necessary – namely, that there is a preponderance of evidence that highlights emerging issues and which can be used to help guide tobacco control efforts.

This report presents the evidence and research on the impact of flavored and mentholated tobacco products on public health, particularly among priority populations. Priority populations are groups that have higher rates of tobacco use than the general population, experience greater secondhand smoke exposure at work and at home, are disproportionately targeted by the tobacco industry, and have higher rates of tobacco-related disease compared to the general population.[1]

Specifically, this report addresses:

- The evidence linking flavored and mentholated tobacco products with initiation of and sustained tobacco use by youth and other priority populations, and the resulting negative health effects.

Background

While great strides have been made in reducing tobacco use in California, tobacco use is still the leading preventable cause of premature death and disability in the state and nationally – more than 440,000 people die prematurely from tobacco-related disease.[2] Evidence indicates that lifelong smoking and other tobacco use begins early in life; in California, 63% of smokers start by the age of 18, and 97% start by age 26.[3]

Although the overall prevalence of youth smoking is declining in California, the introduction of novel tobacco products that are offered in a variety of flavors designed to appeal to children, such as bubblegum, grape, and chocolate, may present new public health threats to adolescents and young adults. Other evidence indicates that flavor additives, such as menthol, may impose additional threats, particularly among certain priority population groups that have relatively higher use rates.

The use of flavor and menthol additives in tobacco products has long been a popular industry strategy to mask the natural harshness and taste of tobacco, making initiation easier for younger and beginner smokers.[4] Like all tobacco products, flavored and mentholated tobacco products have serious health risks and are not considered safe by the United States (U.S.) Food and Drug Administration (FDA).[5]

In 2009, the Family Smoking Prevention and Tobacco Control Act (FSPTCA) was signed into federal law, making it illegal to manufacture cigarettes that contained "characterizing flavors" other than that of tobacco. This included flavors like strawberry, grape, orange, clove, chocolate, and cinnamon. The FDA concluded that flavored cigarettes are a gateway for many children and young adults to become regular smokers.[6]

Notably, the federal ban on flavored cigarettes did not apply to mentholated cigarettes or other flavored tobacco products.[7]

Types of Flavored and Mentholated Tobacco Products

There are several types of flavored tobacco products on the market, including cigars, smokeless tobacco, hookah, liquid nicotine solutions (used in electronic smoking devices), and menthol cigarettes. These products come in a variety of candy and fruit flavors such as chocolate, watermelon, grape, cherry, apple, and wintergreen. This section describes each type of tobacco product and consumption patterns, as well as health impacts associated with use of these products.

Cigars

- Cigars are sold in a variety of candy, fruit, and alcohol- like flavors.
- Cigars are the second most common form of tobacco used by youth, and flavored cigars represent more than half of the cigar market.
- Cigar smoke contains many of the same carcinogens as cigarette smoke, and may even be more toxic.
- Cigars pose significant morbidity and mortality risks to users.

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Cigar Products and Market Share

Cigars tend to vary in terms of size and the quantity of tobacco used in their products. There are three types of cigar sizes sold in the United States:

- **Large or Premium Cigars:** Contain between 5 and 20 grams of tobacco, which can equate to a pack of cigarettes.
- **Little Cigars:** Very similar to cigarettes and sold in the same size (e.g., contain 1 gram of tobacco), shape and packaging (20 little cigars in a package).
- **Cigarillos:** Contain about 3 grams of tobacco, usually larger than little cigars and cigarettes.[8]

In 2014, about 13 billion cigars were sold in the United States, including 12.4 billion large cigars and cigarillos and 0.6 billion little cigars.[9] While cigarette consumption has declined from 2000 to 2014, total consumption of cigars increased by 122% over this same period,[10] with flavored cigars representing more than half of the U.S. cigar market.[11] Following the Family Smoking Prevention and Tobacco Control Act of 2009, research indicates that cigar manufacturers and the tobacco industry manipulated flavored cigarettes to become flavored cigars in order to circumvent the ban on flavored cigarettes.[12,13] Cigars are also commonly sold as single products, making them an affordable alternative to cigarettes which are taxed at higher rates.[14]

Swisher International Inc.'s Swisher Sweets and Little products represent the most popular cigar brands on the market. They come in a variety of flavors, including chocolate, strawberry, ice cream, peach, and grape. Black & Mild brand cigars, owned by Altria (parent company of Philip Morris USA), also maintain a significant market share and sell flavors like apple, wine, and cream.[16]

Cigar Use by Certain Groups

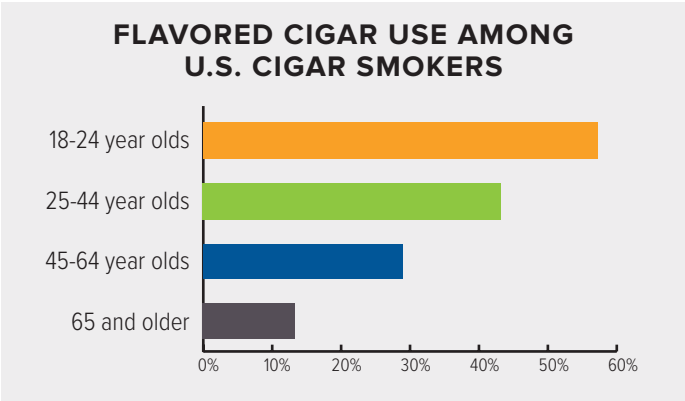
Cigars are the second most common form of tobacco used by high school students.[17] That number increases among first-time tobacco users aged 12 and older, with nearly 2.7 million smoking cigars, in comparison to 2.3 million smoking cigarettes.[18]

A recent study found that more than 87% of adolescents who used cigarillos in the past 30 days used flavored cigarillos.[19] When asked, 73.8% of current youth cigar smokers said they smoked cigars "because they come in flavors I like."[20] More than two fifths of U.S. middle and high school smokers report using flavored little cigars or flavored cigarettes.[21]

In fact, a recent study found that flavored tobacco products, such as sweet-flavored cigars, are being engineered with the same flavor chemicals used in popular candy and drink products like LifeSavers and Jolly Ranchers, providing a "familiar, chemical-specific flavor cue" to the user.[15]

When asked, 73.8% of current youth cigar smokers said they smoked cigars "because they come in flavors I like."

Research indicates that use of flavored cigars decreases with age: an analysis of data from the National Adult Tobacco Survey show that flavored cigar use among cigar smokers was 57.1% for 18-24 year olds, 43.2% for 25-44 year olds, 28.9% for 45-64 year olds, and 13.4% for those 65 and older.[22] In addition, youth, young adults, females, African-Americans, cigarette smokers, and daily cigar smokers are significantly more likely to report smoking a usual cigar brand that is flavored, with preference for a usual brand that produces flavored cigars decreasing significantly with age.[23]



Source: Findings from the 2009–2010 National Adult Tobacco Survey. Nicotine & Tobacco Research. 2013;15:608–14.

Health Impacts of Cigar Use

Cigar smoke contains many of the same carcinogens as cigarette smoke, and may even be more toxic.[24] As a result of the curing and fermentation process involved in producing cigar tobacco, higher concentrations of cancer-causing nitrosamines are present and released upon combustion. Additionally, cigars have more tar for every gram of tobacco smoked in comparison to cigarettes, and higher concentrations of toxins due to less-porous cigar wrappers.[25]

Cigars pose significant morbidity and mortality risks to users. While lung cancer risk is less strongly associated with cigar smoking than with cigarette smoking, the health risks from cigar smoking increase depending upon level of exposure as measured by cigars smoked per day, inhalation level, and past smoking history.[26,27]

Cigar smokers have higher rates of lung cancer, heart disease, and lung disease as compared to nonsmokers.[28] Regular cigar smoking is associated with increased risk for lung, larynx, oral cavity, and esophageal cancer, and has been linked to gum disease and tooth loss.[29,30] Cigar smokers have also tested for higher levels of toxic and carcinogenic substances like cotinine, 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL), which is a tobacco-specific nitrosamine (TSNA) that is a known lung carcinogen, and lead concentrations, as compared to nontobacco users.[31]

Daily cigar use and deep inhalation has also been linked to elevated risk of heart disease and chronic obstructive pulmonary disease.[32] Cigar smokers also increase their mortality risk for an aortic aneurysm.[33] Regular cigar smoking was responsible for approximately 9,000 premature deaths and more than 140,000 years of potential life lost among U.S. adults aged 35 years or older in 2010.[34]

There is a misperception that cigars are not harmful because cigar smoke is not inhaled, however, studies indicate that some cigar smokers do inhale, especially current and former cigarette smokers.[35] Inhalation of cigar smoke into the lungs and bloodstream causes smoke particles to deposit into the lungs, stomach, and digestive tract and increases the risk for cancer.[36-38] Other research indicates that some youth and adult users of little cigars fully inhale the cigar smoke, similar to cigarettes, often indicating that inhaling was necessary to get a "buzz" from little cigars.[39,40] Regardless of the level of inhalation, all cigar smokers expose their lips, tongue, and throat to smoke and cancer-causing chemicals.[41]

Smokeless Tobacco

- Smokeless tobacco is sold in various flavors and forms, with newer products that do not require spitting.
- Moist snuff is the most popular smokeless tobacco product and flavors account for the largest portion of moist snuff sales.
- Smokeless tobacco users tend to be younger and evidence shows the industry has manipulated the nicotine content to attract and retain users.
- Smokeless tobacco contains at least 28 cancer-causing chemicals.

Smokeless Tobacco Products and Market Share

Smokeless tobacco contains nicotine and is addictive.[42] It is not burned, and it may be sucked, chewed, spit, or swallowed. It can come in a variety of flavors such as wintergreen, citrus blend, cinnamon, berry, vanilla, and apple.[43,44]

There are three main types of smokeless tobacco:

- **Chewing tobacco:** includes cured tobacco that comes in various forms such as loose leaf, plug, or twist tobacco, and is available in multiple flavors. Users place chewing tobacco between the cheek and gums.
- **Snuff:** Oral snuff is a finely cut, processed tobacco which the user places between the cheek and gums. Snuff may be moist, dry, or packaged in tea-like pouches or packets (i.e., snus). Dry snuff may be sniffed or inhaled into the nose, while snus is a newer form of snuff that does not require spitting.
- **Dissolvables:** Finely ground tobacco and flavorings, shaped into tablets, strips, or other forms, that the user ingests orally. These products do not require spitting.

In 2011, smokeless tobacco sales totaled approximately 124.6 million pounds in the U.S., increasing from the 122.6 million pounds sold in 2010. Moist snuff is the most popular smokeless tobacco product with over 80% of the market share, followed by loose leaf at over 17% of the market.[45] Three companies account for nearly 90% of U.S. sales of smokeless tobacco—U.S. Smokeless Tobacco Company (owned by Altria, popular premium brands like Skoal and Copenhagen), American Snuff, and Swedish Match.[46]

Between 2005 and 2011, sales of flavored moist snuff across all companies increased by 72%; and in 2011, flavored products accounted for more than half (56.1%) of all moist snuff sales.[47] Internal documents for the U.S. Smokeless Tobacco Company indicate that flavors were intentionally used to "graduate" new users from the "milder-tasting, more flavored" products to those with a "more full-bodied, less flavored … more concentrated tobacco taste."[48]

Smokeless Tobacco Use by Certain Groups

The current demographics of smokeless tobacco users have changed as tobacco manufacturers introduce novel smokeless tobacco products with flavorings and new delivery methods appealing to a broader consumer base.[49] In 1970, men aged 65 and older were about six times more likely to use smokeless tobacco regularly as compared to men aged 18 to 24. By 1991, young men were 50% more likely than the oldest men to be regular users of smokeless tobacco.[50,51]

In a 2013 survey of U.S. high school students, 14.7% of high-school boys and 8.8% of all high-school students reported current use of smokeless tobacco products.[52] Furthermore, each year about 535,000 youth ages 12-17 report using smokeless tobacco for the first time.[53] More broadly, the number of persons aged 12 or older who used smokeless tobacco for the first time within the past year was 1.1 million in 2013.[54] Smokeless tobacco use among females has historically been low. Among males, smokeless use decreased between 1986 and 2000, but has been increasing since 2000.[55]

There is evidence that users who begin with low-nicotine "starter" products are more likely to subsequently "graduate" to products with higher nicotine content,[56] and that use of starter products reinforces use of other tobacco products, including cigarettes.[57,58] Industry marketing practices and introduction of novel products have encouraged cigarette smokers to use smokeless tobacco as an alternative in locations where smoking is not permitted.[59,60] Cigarette smokers may also consider smokeless tobacco to be a cessation or harm reduction strategy to reduce use of combustible tobacco products.[61] Studies have found that smokers who no longer use combustible tobacco may switch to smokeless tobacco as a substitute to smoking or may engage in dual use by using both products concurrently.[62-64] Smokeless tobacco is not a safe alternative to combustible tobacco, and there is no conclusive evidence that shows that switching to smokeless tobacco is an effective long-term smoking cessation strategy.[65,66]

Health Impacts of Smokeless Tobacco Use

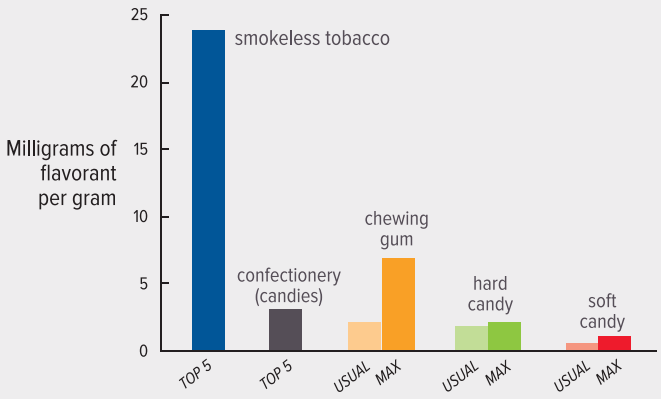
Smokeless tobacco contains at least 28 cancer-causing chemicals[67] and has been shown to cause gum disease, tooth decay and cancers of the oral cavity, esophagus and pancreas.[68-70] The health risks associated with smokeless tobacco use can vary depending upon the product characteristics, manner and frequency of use, as well as interactions with dual use of other tobacco products.[71]

The use of flavorings in some oral smokeless tobacco products presents another level of exposure as the flavorings are ingested along with the tobacco.[72] A measurement of the mint and wintergreen contents found in popular moist snuff products indicated that these products contain far more of these flavorings (i.e., methyl salicylate) than found in hard candies – a typical smokeless tobacco user could ingest up to 12 times the acceptable daily intake level of methyl salicylate as established by a scientific expert committee on food additives.[73] Smokeless tobacco products may also contain additives that have been prohibited for use in food; coumarin, for example, is an additive that has been banned in foods due to its liver toxicity, that is also found in Camel Mellow Orbs, a dissolvable tobacco product.[74]

Smokeless tobacco products differ considerably in their concentrations of nicotine, volatile and nonvolatile nitrosamines including TSNAs, the most abundant strong carcinogens in smokeless tobacco products, as well as toxic metals and other compounds.[75-77] All smokeless tobacco products contain nicotine and almost all contain TSNAs.[78] A comparison of studies found that biomarkers indicating exposure to carcinogens in the urine of users of moist snuff varied by brand used and, for some brands, were higher than levels seen in Marlboro cigarette smokers.[79]

Smokeless tobacco use is strongly associated with the prevalence of oral lesions on the cheeks, gums, and/or tongue, such as leukoplakia.[80,81] Lesions typically occur at the site in the mouth of smokeless tobacco application and indicate a high risk of cancers arising from leukoplakia and

METHYL SALICYLATE IN "WINTERGREEN" TYPES OF SMOKELESS TOBACCO, CANDY, AND GUM



Source: Chen C, et al. (2010)

oral submucous fibrosis.[82,83] Research suggests that more than half of daily smokeless tobacco users had lesions or sores in the mouth,[84] and lesions are more severe in people who begin use at an earlier age, use for more hours per day, use greater dosages, or use on more days per month.[85] Other oral conditions associated with smokeless tobacco use include gingival recession, which can be observed within one year of smokeless tobacco use, dental decay, and caries.[86] A study found chewing tobacco users were four times more likely than non-users to have decayed dental root surfaces.[87]

Other health impacts from smokeless tobacco use include an association with increased risk of fatal ischemic heart disease and stroke.[88-90] Use during pregnancy heightens risk for early delivery and stillbirth, and can affect how a baby's brain develops before birth.[91,92] Research shows that users who engage in dual use of smokeless tobacco and cigarettes may have greater levels of toxicants and may prolong the duration of smoking than those who use only one tobacco product, potentially posing greater health risks.[93,94]

Hookah Tobacco

- Hookah has a wide range of flavors and flavor mixes available for purchase.
- Hookah smoking is a social activity and its popularity has increased among youth and college students.
- Flavored hookah tobacco is the preferred tobacco for use in water pipes.
- Hookah is not safer than cigarettes and has many of the same health risks as cigarette smoke.

Hookah Products and Market Share

Hookah—also called shisha, narghile, and goza—refers to water pipes that are used to smoke tobacco by indirectly heating it with burning embers or charcoal.[95] The tobacco comes in a range of flavors, such as apple, mint, cherry, chocolate, cardamom, watermelon, and cappuccino,[96] and some manufacturers even mix flavors to produce combinations such as strawberry-peach or raspberry-orange.[97] Several Middle Eastern companies manufacture and import the tobacco, including Al Fakher, Al Waha, Nakhla, Romman, and Fumari, and there are also U.S. companies that manufacture and distribute their own brands of tobacco for water pipe smoking.[98]

Hookah Use by Certain Groups

Hookah smoking is often a social activity and two or more people may share the same waterpipe.[99] Hookah use began centuries ago in ancient Persia and India,[100] but hookah cafes have gained popularity nationwide in the U.S.[101] and use by American youth[102,103] and college students is increasing.[104-108] One study found that hookah use in California was much higher among young adults (24.5% among men, 10% among women) than it was among all adults (11.2% among men, 2.8% among women) in the U.S.[109] A 2014 study found that teens that use hookah are two-to-three times more likely to start smoking cigarettes or to become current smokers than teens who have not tried hookah.[110] In addition, an analysis of the 2012–2013 National Adult Tobacco Survey found that among young adults who had never established cigarette smoking, two of five hookah smokers reported being susceptible to smoking cigarettes.[111]

The World Health Organization (WHO) found that the introduction of sweetened flavored water pipe tobacco, called *maassel*, is one of the contributing factors that has caused hookah's explosive growth.[112] Prior to the introduction of *maassel*, most water pipe smokers used some type of raw tobacco that produced a strong, harsh smoke, unlike the smoother, aromatic smoke produced from *maassel*.[113] Research indicates that *maassel* is the preferred tobacco for use in water pipes, especially among young smokers.[114] One study found that 88.7% of 12-17 year olds who had ever smoked hookah used flavored hookah the first time they tried the product, and 89% of current hookah smokers used a flavored product in the last month.[115] Similarly, the 2014 National Youth Tobacco Survey found that 60.6% of middle and high school hookah smokers had used flavored hookah in the past month.[116]

Health Impacts of Hookah Use

Many young adults falsely believe that hookah smoking is safer than cigarette smoking;[117] however, hookah poses many of the same health risks as cigarette smoking. One hookah session delivers approximately 125 times the smoke, 25 times the tar, 2.5 times the nicotine, and 10 times the carbon monoxide as a single cigarette.[118] During an hour-long hookah smoking session the average user will take 200 puffs, while smoking an average cigarette involves only about 20 puffs.[119,120] In fact, smoking hookah for 45 to 60 minutes can be equivalent to smoking 100 or more cigarettes.[121]

The charcoal that is used to heat the tobacco in a hookah can increase health risks for smokers, as the smoke contains toxicants emitted from both the charcoal and the tobacco product, including flavorings.[122] Hookah smoke has high levels of carbon monoxide, metals, and cancer-causing chemicals.[123] As a result, hookah use can cause negative health effects on the respiratory system, cardiovascular system, oral cavity and teeth, and long-term use has been linked to high incidences of chronic obstructive pulmonary disease and periodontal disease.[124,125] Hookah smokers may also be at risk for some of the same diseases as cigarette smokers, including oral cancer, lung cancer, stomach cancer, and esophageal cancer.[126,127]

Liquid Nicotine Solution

- Liquid nicotine solution is a broad term that encompasses "e-juice" or "e-liquid" which is often used in electronic nicotine delivery devices, or electronic cigarettes.
- Liquid nicotine solution is available in a plethora of candy and fruit-flavors, many of which use popular brand names and logos that appeal to youth.
- Youth uptake of electronic cigarettes has vastly increased over the last several years.
- While there is insufficient research on the long-term health effects of liquid nicotine solution, evidence shows that toxic additives are often included in the aerosol spray.

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Liquid Nicotine Products and Market Share

Liquid nicotine solution, also called "e-juice" or "e-liquid," is used in electronic smoking devices such as e-cigrettes and vaporizers. The term "electronic cigarette" or "e-cigarette" is a common term that can refer to a wide variety of products that use liquid nicotine solution, which is a derivative of tobacco. Unlike combustible tobacco products, e-cigarettes are battery-operated devices that heat liquid nicotine solution to form an inhalable aerosol.[128] Some e-cigarettes are reusable and users can replace or refill the liquid nicotine solution, while others are disposable and cannot be refilled.[129] Other more advanced devices, called modulars or "mods," can be assembled with separate component parts and accessories, which permits greater variation in the battery power, style, and size.[130]

Sales of electronic cigarettes and supplies have experienced triple-digit growth over the past five years, climbing to over $3.5 billion with market analyses projecting use of e-cigarettes and vaporizers to overtake combustible cigarettes in ten years.[131] Almost 50% of the electronic cigarette market is owned by the largest tobacco companies, and that market share is expected to reach 80% in 2021.[132] However, sales have decelerated over the past year due to customer dissatisfaction, safety concerns, and increased state regulation.[133]

As a result of this growth, there are now over 460 brands of e-cigarettes and more than 7,700 unique e-cigarette flavors available for purchase online.[134] This includes a wide range of candy and fruit-flavors that are not permitted in cigarettes, many of which use well-known brand name candy and cereal products, such as Wrigley's, Atomic Fireball, Tutti Frutti, and Cap N' Crunch, which are considered to be appealing to children.[135]

Liquid Nicotine Use by Certain Groups

Data trends depict increasing use of e-cigarettes by youth. From 2013 to 2014, a Centers for Disease Control and Prevention (CDC) survey found that youth use of e- cigarettes had tripled and now exceeds youth use of traditional cigarettes. Current e-cigarette use among high school students increased from 4.5% to 13.4%, amounting to 2 million high school students and 450,000 middle school students who currently use e-cigarettes.[136]

A 2015 Monitoring the Future study found that 40% of youth who used e-cigarettes did so because "they tasted good" compared to only 10% who use them to quit smoking traditional cigarettes.[137]

Other studies found similar increases in youth uptake of e-cigarettes,[138-140] and preliminary California specific data indicates e-cigarette youth use to be at much higher rates than traditional cigarettes.[141]

A gateway effect has been observed for youth users: a recent longitudinal study of e-cigarette use found that adolescents who use e-cigarettes are more likely to start smoking cigarettes. Among nonsmoking students who used e-cigarettes, 20% indicated they had smoked their first cigarette a year later. Among nonsmokers who had not used e-cigarettes, only 6% had used cigarettes a year later.[142] Similar findings were published in *The Journal of the American Medical Association* (JAMA) *Pediatrics* that indicates young people who smoke e-cigarettes are more likely to start smoking traditional cigarettes within a year

as compared to their peers who do not use e-cigarettes.[143] Using data from the 2012 National Youth Tobacco Survey, one study confirmed that e-cigarette users who had never smoked cigarettes and who had experimented with smoking had elevated intention to smoke cigarettes compared with their counterparts who had never used e-cigarettes.[144] Additionally, a new analysis of a nationally representative sample of adolescents supports these findings: use of electronic nicotine delivery systems (such as e-cigarettes) was associated with initiation of cigarette smoking in the last year.[145]

Health Impacts of Liquid Nicotine Use

There is insufficient research regarding the long-term health effects of using e-cigarettes.[146] As e-cigarettes have largely been unregulated, they have been heavily marketed as a safer alternative to conventional cigarettes. However, the liquid nicotine solution used in e-cigarettes frequently contains nicotine, as well as propylene glycol, glycerin, flavorings, and other toxic additives.[147] Research has found chemicals and toxins contained in the aerosol; such as nicotine, formaldehyde, lead, nickel, and acetaldehyde, all of which are found on California's Proposition 65 list of chemicals known to cause cancer, birth defects, or other reproductive harm.[148] It is posited that nicotine exposure during periods of developmental vulnerability has multiple adverse health consequences, including impaired fetal brain and lung development, and altered development of cerebral cortex and hippocampus in adolescents.[149]

Furthermore, certain chemicals used to flavor liquid nicotine, like diacetyl, 2,3-pentanedione, and acetoin, are present in many e-liquids at levels which are unsafe for inhalation.[150] While diacetyl has been approved for ingestion in human food, it has not been similarly evaluated and approved for use in tobacco products, which result in exposures other than ingestion (e.g., inhalation).[151] A recent study found diacetyl in 75% of flavored e-cigarette liquids and refill liquids that were tested, and at least one of the three flavoring chemicals (i.e., diacetyl, 2,3-pentanedione, or acetoin) was detected in 92% of the tested e-cigarettes and liquids.[152] Diacetyl, when inhaled, is associated with the development of the severe lung condition called bronchiolitis obliterans, also known as "popcorn lung," which causes an irreversible loss of pulmonary function and damage to cell lining and airways.[153] Still another study has found that users of flavored e-cigarettes are likely inhaling a chemical called benzaldehyde, a widely used flavoring agent found in foods, as well as medicines like cough syrup, that when inhaled can irritate the airways.[154]

In addition, the liquid nicotine solution contains varying concentrations of nicotine, ranging from no nicotine to 100 mg per milliliter (a milliliter is approximately a fifth of a teaspoon). The lethal dose of nicotine is estimated to be 30-60 mg in an adult and 10 mg in a child. The toxicity of a 60 mg dose of liquid nicotine is similar to or even higher than that of cyanide.[155] Accidental exposure to nicotine, particularly by children aged five and younger, has lead to significant increases in calls to poison control centers in California and nationally.[156]

Although there are claims that e-cigarettes are an effective smoking cessation tool, there is not enough evidence to indicate that e-cigarettes will help smokers quit or reduce the number of cigarettes smoked.[157,158] The U.S. Preventive Services Task Force, which makes recommendations about the effectiveness of specific preventive care services after a thorough assessment of the science, recently concluded that "the current evidence is insufficient to recommend electronic nicotine delivery systems for tobacco cessation…"[159] In fact, recent evidence points to potential signs of dual use instead of cessation: instead of using e-cigarettes as a cessation tool, some users are using e-cigarettes in indoor environments where use of traditional cigarettes may be prohibited, but continuing to smoke traditional cigarettes outdoors.[160-163]

Menthol Cigarettes

- Menthol is an anesthetic additive used in cigarettes that imparts a cooling effect and minty taste, and reduces the harsh taste of cigarette smoke.
- Menthol cigarettes represent about one third of the U.S. cigarette market.
- Menthol users tend to be younger, female and members of ethnic minorities, and the FDA has concluded that menthol cigarettes are "starter" products.
- Menthol cigarettes lead to greater addiction and can inhibit cessation.

Menthol Cigarette Products and Market Share

Menthol is an anesthetic additive that can be natural or synthetically produced, and is commonly used as a minty flavoring in cigarettes. At low doses, menthol has a cooling, sensory effect that reduces the perceived harshness of tobacco and increases ease of smoking.[164] At high doses, menthol can cause irritation and pain via effects on certain receptors located in the nose, mouth and airways. Menthol is present in most cigarettes in the U.S., both as a characterizing flavor (higher levels) and for other taste reasons (lower levels).[165,166] Menthol is also an active ingredient in many medicinal products, such as cough drops, and it is regulated as a drug by the FDA. The use of menthol in tobacco products is not regulated by the FDA, and it may be found in cigarettes, cigars, smokeless tobacco, and other tobacco products.[167]

Menthol was first used as a cigarette additive in 1925, with sales totaling only 3% of the overall U.S. cigarette market prior to 1956.[168] Once the tobacco industry realized menthol made cigarettes more palatable upon initiation and could be used to retain smokers, marketing strategies were refined to target youth and certain groups (See Priority Populations Section).[169,170]

There are approximately 19 million Americans who smoke menthol cigarettes, including 1.1 million adolescents, and sales of these products comprise between 28% and 34% of the U.S. cigarette market.[171,172] Common menthol cigarette brands include Kool, Newport, and Salem, although the cigarette market is highly consolidated among three companies: Altria (parent company of Phillip Morris, Marlboro products), Reynolds American and Lorillard.[173]

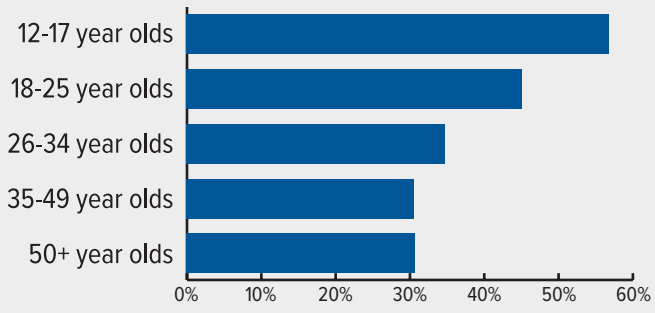
Lorillard's brand of mentholated cigarettes, Newport, has historically outpaced all other menthol brands and reflects its main product line. In 2014, Reynolds acquired Lorillard in a merger allegedly designed to give Reynolds access to the Newport product.[174]

Menthol Cigarettes Use by Certain Groups

Analyses of internal tobacco industry documents reveal that the tobacco industry knowingly manipulated the menthol content in cigarettes to account for sensory preferences among younger and more experienced smokers,[175] understanding that the amount of menthol in a cigarette changes how the cigarette is smoked and how pleasurable it is to the smoker.[176] Menthol enhances the sensory experience or "throat grab" of the smoke, and through desensitization, reduces the irritating effect of nicotine, leading to a positive association by novice smokers.[177,178]

Research indicates that menthol cigarettes are a "starter" product for youth and use of menthol is more likely among those who are recent initiates.[179-183] Using data from the National Surveys on Drug Use and Health, one study found that menthol cigarette use is more common among 12–17 year olds (56.7%) and 18–25 year olds (45.0%) than among 26-34 year olds, 35-49 year olds, and 50+ year olds (range of 30.5% to 34.7%). The study also found that while adolescent and young adult use of non-menthol cigarettes has decreased from 2004-2010, menthol smoking rates have remained constant (adolescents) and increased (young adults) over this same period.[184]

MENTHOL CIGARETTE USE AMONG PAST 30-DAY U.S. SMOKERS BY AGE



Source: Giovino GA, et al. (2015)

Menthol users are associated with being younger, female, and of non-Caucasian race/ethnicity, and use is especially high among minority youth. A review of three national data sets determined that more than 80% of adolescent African American smokers and more than half of adolescent Latino smokers use menthol cigarettes. Menthol cigarettes are also used by more than half of Asian American middle-school smokers.[185] In addition, an analysis on the 2008 and 2009 National Survey on Drug Use and Health found that an elevated prevalence of menthol use was found among persons with severe psychological distress,[186] while another study indicated that menthol is disproportionately used among young adult tobacco users with mental health problems.[187]

Strong evidence also suggests that use of mentholated cigarettes during childhood and early adulthood increases nicotine addiction and dependence,[188-190] with the FDA surmising that youth appeared to be particularly vulnerable to the effects of menthol cigarette smoking.[191] Further, evidence indicates that menthol smokers in general, and African American smokers in particular, are less likely to quit successfully than non-menthol cigarette users.[192-195]

In 2011, after an extensive survey of the literature and research, the FDA released a report concluding that menthol cigarettes are "starter" products and increase smoking initiation among youth and young adults, lead to greater addiction, and can inhibit quitting smoking.[196] The FDA concluded that the removal of menthol cigarettes from the marketplace would greatly benefit public health.

Health Impacts of Menthol Cigarettes

Tobacco industry documents and empirical studies suggest that consumers, particularly younger users, tend to perceive menthol cigarettes as less hazardous than non-menthol cigarettes.[197] However, menthol cigarettes are not safer than non-menthol cigarettes and carry many of the same health risks: smokers are more likely than nonsmokers to develop heart disease, stroke, lung cancer and other respiratory diseases.[198]

Due to the anesthetic effect of mentholated cigarettes, evidence suggests that they may facilitate deeper and more prolonged inhalation of toxic cigarette smoke.[199] Additionally, by reducing airway pain and irritation, continuous menthol smoking can mask the early warning symptoms of smoking-induced respiratory problems.[200] Still other evidence has associated menthol with inhibiting the metabolism of nicotine in the body, and smokers of menthol cigarettes have been found with higher levels of cotinine and carbon monoxide in the bloodstream as compared to non-menthol smokers.[201,202]

Menthol in high concentrations may also inhibit the detoxification of tobacco-specific carcinogens (NNAL), which could increase the risk of cancer,[203] although the FDA in its 2013 report did not find enough evidence to support this claim. Lastly, a study of current smokers using data from the 2001-2008 U.S. National Health and Nutrition Examination Surveys found significantly increased odds of stroke for smokers of mentholated cigarettes compared with non-mentholated cigarette smokers.[204]

Priority Populations

Priority populations are groups that have higher rates of tobacco use than the general population, experience greater secondhand smoke exposure at work and at home, are disproportionately targeted by the tobacco industry, and have higher rates of tobacco-related disease compared to the general population.[205] This section describes the evidence which indicates particular priority populations (i.e., youth, racial/ethnic minorities, and other targeted groups) are more likely to initiate and use flavored and mentholated tobacco products.

Adolescents (12-17) and Young Adults (18-26)

A multitude of research indicates that flavored products appeal to youth and young adults leading to increased use for this population. Despite prevalence rates for cigarette use trending downward for youth, research shows that more youth are using other flavored tobacco products. A national study found that 80.8% of 12-17 year olds who had ever used a tobacco product initiated tobacco use with a flavored product, and that 79.8% of current tobacco users had used a flavored tobacco product in the past month.[206] Additionally, an examination of young adult tobacco users (18-34 year olds) found that 18.5% currently use a flavored tobacco product, with younger age being a predictor of flavored tobacco product use: young adults aged 18-24 year olds had an 89% increased odds of using a flavored tobacco product compared to those aged 25-34 year olds.[207]

Menthol cigarettes carry similar results. Among cigarette smokers, menthol cigarette use was more common among 12-17 year olds (56.7%) and 18-25 year olds (45%) than among 26-34 year olds, 35-49 year olds, and 50+ year olds (range of 30.5% - 34.7%).[208] In fact, adolescents smoke menthol cigarettes at a higher rate than any other age group.[209]

Flavors Make Using Tobacco More Enticing and Harder to Quit

Flavorings and menthol additives mask the naturally harsh taste of tobacco, making it easier for youth to initiate and sustain tobacco use.[210,211] A 2014 review of internal tobacco industry documents indicate that menthol and candy-like flavors in little cigars and cigarillos were used to increase product appeal to beginning smokers by masking the heavy cigar taste, reducing throat irritation, and making the cigar smoke easier to inhale.[212]

The majority of youth ever-users reported that the first product they had used was flavored, including 88.7% of ever hookah users, 81.0% of ever e-cigarette users, 65.4% of ever users of any cigar type, and 50.1% of ever cigarette smokers. Youth consistently reported product flavoring as a reason for use across all product types, including e-cigarettes (81.5%), hookahs (78.9%), cigars (73.8%), smokeless tobacco (69.3%), and snus pouches (67.2%).[213]

Studies indicate that individuals who begin smoking at a younger age are more likely to develop a more severe addiction to nicotine than those who start later.[214] Further, both the FDA and the U.S. Surgeon General have warned that flavored tobacco products help new users establish habits that can lead to long-term addiction.[215,216] A recent study of middle and high school students supports this: among cigar smokers, prevalence of no-intention-to-quit tobacco use was higher among flavored-little-cigar users (59.7%) than nonusers (49.3%).[217] Additionally, youth who initiate smoking with menthol cigarettes are more likely to become regular, addicted smokers and to show higher measures of dependence than youth who initiate with non-menthol cigarettes.[218] Furthermore, a nationally representative sample of U.S. youth tobacco users found that dual use (i.e., use of two tobacco product categories) was the most prevalent pattern (30.5%) detected among these users.[219]

Flavored and Mentholated Tobacco Products are Heavily Marketed with Sweet Flavors, Colorful Packaging, and Brand Recognition

The U.S. Surgeon General concluded that, "... advertising and promotional activities by the tobacco companies cause the onset and continuation of smoking among adolescents and young adults."[220] Tobacco industry documents containing information about tobacco companies' advertising, manufacturing, marketing, and research activities demonstrate a strategic focus on designing brand varieties with particular appeal to youth, such as mentholated, candy-flavored, and fruit-flavored brands.[221]

For example, one internal industry memo described sweetened products as "... for younger people, beginner cigarette smokers, teenagers ... when you feel like a light smoke, want to be reminded of bubblegum."[222]

Several flavored tobacco products share the same names, packaging and logos as popular candy brands like Jolly Rancher, Kool-Aid, and Life Savers.[223] They are also engineered with the same flavoring agents as those used in popular kid-friendly candy and drink products such as Life Savers and Jolly Ranchers, providing a "familiar, chemical-specific flavor cue" to the user.[224] Bright packaging and product placement at the register, near candy, and often at children's eye-level, increases tobacco flavored products' visibility to kids.[225] As stated in an industry publication, "While different cigars target a variety of markets, all flavored tobacco products tend to appeal primarily to younger consumers."[226]

The tobacco industry has aggressively used branding and advertising as a method to exploit particular youth populations and use of mentholated cigarettes. The vast majority of adolescents who smoke before the age of 18 use the three most heavily advertised brands. One of these heavily advertised brands, Newport, is the cigarette brand leader among African-American youth in the United States. Nearly eight out of every ten African American youth smokers smoke Newport cigarettes.[227]

Many Youth Believe Flavored or Mentholated Tobacco Products are Safer than Non-flavored Tobacco Products

Multiple studies of youth perception indicate that many younger users falsely believe that flavored or mentholated tobacco products are safer than non-flavored tobacco products. A recent study found that people younger than 25 years of age were more likely to say that hookahs and e-cigarettes were safer than cigarettes,[228] and that mentholated cigarettes were less hazardous than non-menthol cigarettes.[229] This finding has been supported in other studies that show cigar smokers misperceive cigars as being less addictive, more "natural," and less harmful than cigarettes.[230]

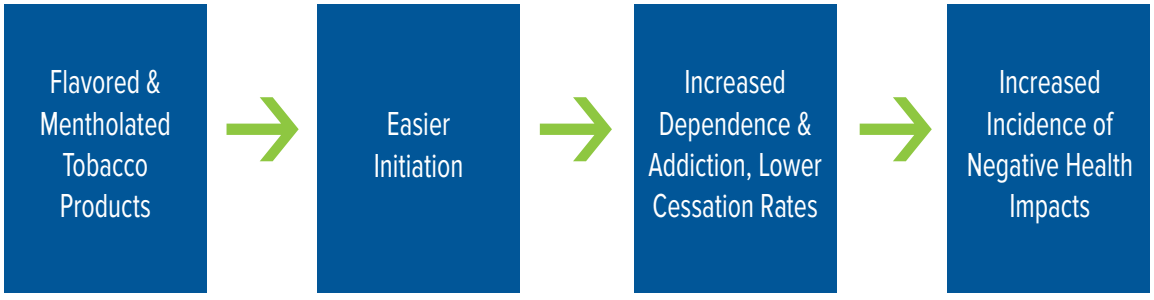
Recent research indicates that some teens may be more likely to use e-cigarettes prior to using combustible tobacco because of beliefs that e-cigarettes are not harmful or addictive, as a result of youth targeted marketing and availability of e-cigarettes in flavors that are attractive to youths.[231] A longitudinal study of e-cigarette use found that adolescents who use e-cigarettes are more likely to start smoking cigarettes, and that risk for use was greater for students who had the impression that e-cigarettes were less dangerous than regular cigarettes.[232]

Racial and Ethnic Minorities

Menthol Cigarette Use is Higher Among African Americans, Especially Minority Youth

Significant disparities exist in the use of menthol flavored tobacco products by certain racial and ethnic minority communities. African American smokers are far more likely to smoke menthol cigarettes than smokers of other racial and ethnic groups, and this trend is pervasive across all categories, regardless of stratification by income, age, gender, region, education, etc. African American youth are especially impacted: more than 80% of all African American adolescents who smoke use menthol cigarettes—the highest usage among all minority groups.[233]

Although African Americans usually smoke fewer cigarettes and start smoking cigarettes at an older age, their smoking-related morbidity and mortality is significantly higher than white smokers.[234,235] This disparity in tobacco-related morbidity and mortality among African Americans may partly result from the greater use of menthol cigarettes among African American smokers.[236] A smoking simulation model predicted that a 10% quit rate among menthol smokers



would save thousands of lives, preventing more than 4,000 smoking-attributable deaths in the first ten years, and over 300,000 lives over the next 40 years. Approximately 100,000 of those lives saved would be African Americans.[237]

In addition, menthol cigarettes are used disproportionately by other minority youth groups. Data from the National Survey on Drug Use and Health (NSDUH) shows that among adolescent smokers aged 12-17 years, 51.5% of Asians, 47.0% of Hispanics, and 41.4% of Native Hawaiians/Pacific Islanders reported smoking a menthol brand in the past 30 days.[238] Further, other research shows that during the last year of high school, one third of Asian American youth are smokers. Of these youth, 60% report that their usual brand of cigarettes is a menthol brand.[239]

Lower Cessation Rates Common Among Minority Menthol Smokers

Research indicates that menthol smoking can lead to lower rates of cessation outcomes, especially for non-white smokers.[240] Generally, quitting menthol cigarettes is particularly difficult because menthol smokers have to overcome the dependency on nicotine as well as positive associations with menthol itself.[241] In addition, one study found that among African Americans and Hispanic/Latino current smokers, those who smoked mentholated cigarettes were more likely to be seriously considering quitting smoking in the next six months and to think that they would quit smoking successfully in the next six months compared to non-menthol smokers. However, the evidence did not support this outcome: African Americans and Hispanics/Latinos who smoked mentholated cigarettes were less likely to quit successfully for at least six months compared to those who smoked non-mentholated cigarettes.[242]

Another study found that despite smoking fewer cigarettes per day, African American and Hispanic/Latino menthol smokers were less likely to successfully quit as compared to non-menthol smokers within the same ethnic/racial group.[243] This suggests that lower rates of cessation among these populations may be linked to higher rates of smoking mentholated cigarettes.

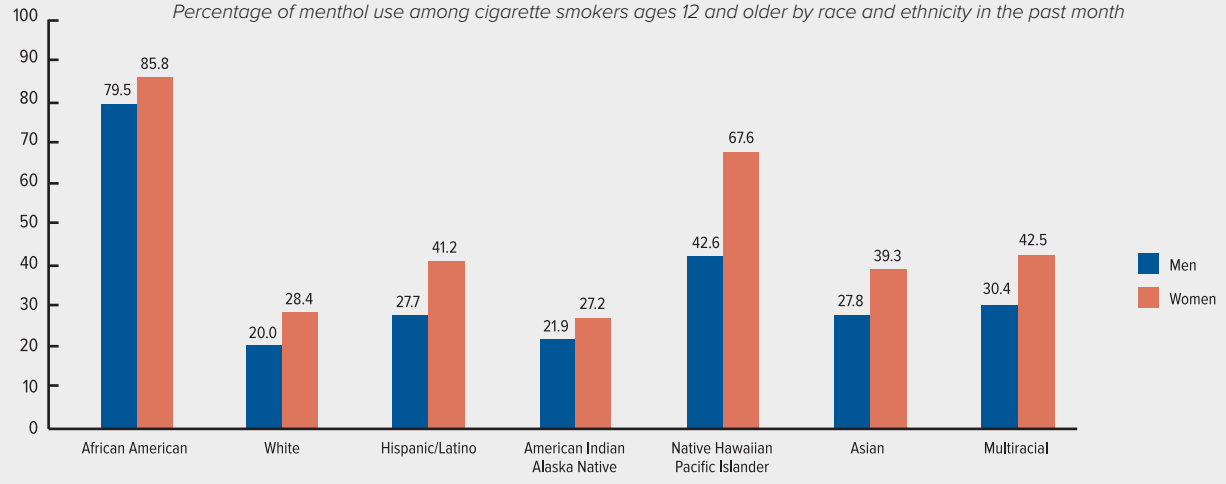
Tobacco Industry Has a Long History of Targeting Racial and Ethnic Minorities

Through strategic marketing and price discounting, the tobacco industry has targeted communities of color with mentholated tobacco products and flavored, cheap little cigars and cigarillos. Price discounting contributes to tobacco-related health disparities because vulnerable populations including youth, racial minorities, and persons with low incomes are more likely to purchase tobacco products through affordable discounts.[244,245]

In particular, the tobacco industry has aggressively targeted African American populations through the use of multiple advertising mediums and branding to convey sociocultural messages around menthol products.[246] Research indicates that African American neighborhoods have a disproportionate number of tobacco retailers,[247] many which employ various point-of-sale strategies, such as price discounting, to encourage initiation and use in these communities.

MENTHOL SMOKING BY RACE/ETHNICITY

Percentage of menthol use among cigarette smokers ages 12 and older by race and ethnicity in the past month



Source: Substance Abuse and Mental Health Administration. The National Survey on Drug Use (NSDUH) and Health Report: Use of Menthol Cigarettes. November2009.

One study found that a higher proportion of African American and young adult residents was associated with more exterior little cigar advertising and cheaper prices, with 95% of these stores selling little cigars in fruit, candy, and wine flavors.[248]

Other communities of color have similarly been targeted by industry. A review of tobacco industry documents suggests that RJ Reynolds, one of the leading cigarette manufacturers, developed a sophisticated surveillance system to track the market behavior of Hispanic/Latino smokers and understand their cultural values and attitudes. This information was translated into targeted marketing campaigns for the Winston and Camel brands, and in 2005, RJ Reynolds launched a music-themed marketing campaign to target African American and Hispanic/Latino youths.[249] Empirical research examining menthol and non-menthol advertising also found a higher proportion of menthol advertisements out of all cigarette advertisements in Hispanic/Latino neighborhoods and magazines, than in non-Hispanic white neighborhoods and magazines.[250]

Since the mid-1980s, tobacco companies have targeted Asian Americans and Pacific Islanders in their marketing campaigns. The tobacco industry considered these groups to be a "potential gold mine" because of high rates of smoking in Asia and the Pacific, concentration in certain geographic regions, and the high proportion of Asian retailers.[251] A tobacco industry document review provided further evidence that Asian Americans and Hawaiian/Pacific Islanders were targeted in menthol marketing by cigarette companies.[252]

Lesbian, Gay, Bisexual, and Transgender (LGBT)

Similar to other priority populations, LGBT individuals have been aggressively targeted by tobacco industry through advertising and sponsorships on specific themes that resonate within the community: liberation, individualism, social success, and acceptance.[253] For example, an ad for Camel Snus directed at LGBT audiences to "Take pride in your flavor," and according to initial assessments of prevalence data, this industry messaging may be working.

Overall, LGBT individuals smoke cigarettes at a higher rate than the general population.[254,255] In a national study conducted in 2009-2010, 71% of LGBT young adult smokers (18-25) reported smoking menthol cigarettes.[256] In addition, current menthol cigarette smoking was higher among LGBT adults (9.7%) than heterosexual/straight adults (4.2%), and LGBT women are more likely to smoke menthols cigarettes than straight women (42.9% vs.32.4%).[257]

LGBT individuals are also more likely to smoke flavored cigars (8.2%) than heterosexual/straight individuals (2.7%).[258] Furthermore, 4.5% of LGBT adults use e-cigarettes, compared to 1.9% of heterosexuals.[259] A Missouri study comparing heterosexual general population youth and LGBT youth found that these two groups differed significantly on many tobacco use related factors. General population youth initiated smoking at a younger age, and LGBT youth did not catch up in smoking initiation until age 15 or 16. However, LGBT youth (41.0%) soon surpassed heterosexual general population youth (11.2%) in initiation and proportion of current smokers and were more likely to use cigars/cigarillos and be poly-tobacco users.[260] The latter finding is supported in a representative sample of U.S. high school youth that examined the concurrent use of multiple tobacco products: data indicated the prevalence of poly-tobacco use to be 21.7% among sexual minority youth compared with only 12.1% among heterosexual youth.[261]

Women

Over 18 million adult women and 1.3 million girls in the U.S. currently smoke cigarettes.[262] Although men are more likely to smoke cigarettes than women, that is not the case with menthol cigarettes: women are 1.6 times more likely to smoke menthol cigarettes than men, and this pattern is seen across all racial/ethnic groups, except among American Indians/Alaskan Natives.[263]

Research suggests that among women smokers, menthol cigarette use is associated with higher tobacco dependence. More female menthol smokers, as compared to female non-menthol smokers, reported smoking their cigarette within five minutes of waking up in the morning and fewer quit attempts greater than 90 days.[264,265]

A review of tobacco industry documents show extensive research was conducted on female smoking patterns, needs, and product preferences, including menthol brands. The tobacco industry has targeted some menthol brands to women, using women's social and cosmetic concerns for cleanliness and freshness, and incorporated these themes in menthol cigarette product design and marketing.[266]

Conclusion

California and its tobacco control program have achieved great success in reducing the burden of tobacco use: over a 25 year period, cigarette consumption has decreased in California by 65%,[267] with over 1 million lives saved[268] and $134 billion in averted health care costs.[269] Despite this progress, tobacco use remains the chief risk factor for the leading causes of death in the state,[270] and evidence shows that the tobacco industry continues to engage in efforts that entice a new generation of users. A foundation of this strategy is the use of candy and fruit flavors and cooling additives in tobacco products that are intended to attract and retain users by masking the naturally harsh taste of tobacco. More specifically, the combination of flavorings, the introduction of novel tobacco products, and deployment of predatory marketing has presented new public health threats in the form of increased initiation and sustained use of tobacco, particularly among certain vulnerable groups.

Contrary to popular beliefs, flavorings do not reduce the health impacts and risks associated with tobacco use, and are not safer than non-flavored tobacco products;[271] in fact, the literature suggests that flavored and mentholated tobacco products pose significant public health risks because they make these toxic tobacco substances more appealing and palatable upon use. There is also a growing body of research which shows that these chemical flavorings and additives may present another level of exposure that has not been deemed safe for inhalation.

Furthermore, the literature shows that the tobacco industry has manipulated and marketed these flavor and menthol tobacco products to account for user preferences that skew younger, and reinforce sociocultural messages with priority populations. Research supports the finding that flavors and menthol tobacco products are “starter” products that establish daily habits and increase addiction to tobacco products, make it harder to quit, and increase use of multiple tobacco products concurrently.

Consumption of flavored tobacco products such as cigars, smokeless tobacco, hookah tobacco, and liquid nicotine solutions (used in electronic smoking devices) have increased in recent years, while menthol cigarettes continue to corner a large part of the U.S. cigarette market. Strong evidence supports the finding that youth, certain racial/ethnic groups, and other targeted priority populations (i.e., LGBT and women) are particularly vulnerable to sweet flavors and menthol, and are largely driving this increased uptake and sustained use of flavored tobacco products.

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Communication from Public

Name: American Cancer Society Cancer Action Network
Date Submitted: 08/02/2019 09:30 AM
Council File No: 18-1104
Comments for Public Posting:

July 7, 2019

Hon. David Ryu
Chair, Health, Education, Neighborhoods, Parks, Arts and River
District 4, City of Los Angeles
200 N. Spring Street, Room 425
Los Angeles, CA 90012

Dear Chair Ryu:

As a resident of the City of Los Angeles in District 5 and a volunteer with the American Cancer Society Cancer Action Network, **I fully support motion 18-1104 authored by Councilmember Mitch O'Farrell to restrict the sale of flavored tobacco products including menthol** in the City of Los Angeles.

Tobacco remains the leading cause of preventable death in our country, and sadly, nearly 95% of adult smokers begin smoking before the age of 21 and most begin with a flavored product. Of the 9 million youth currently living in our state, nearly 1.4 million of them will become smokers, and approximately 440,000 of those kids will die prematurely because of tobacco use.

Both opponents of smoking and purveyors of cigarettes have long recognized the significance of adolescence as the period during which smoking behaviors are typically developed. Adolescents are still going through critical periods of brain growth and development, and they are especially vulnerable to the toxic effects of nicotine. A study published in the journal, *Pediatrics*, found that the earlier youth are exposed to nicotine, the less likely they will be able to quit smoking. Tobacco companies have a long history of marketing to vulnerable populations and targeting youth with imagery and by marketing appealing flavors.

The use of e-cigarettes by teens has sky-rocketed in recent years. A 2018 study by the Food and Drug Administration (FDA) and the Centers for Disease Control and Prevention (CDC) found that e-cigarette use increased 78% among high school students in just the past year alone. Similarly, while adult cigar use has declined, cigar use by young men and teenage boys has continued to increase. It is not coincidental that these are the same products that are available in a wide array of kid-friendly flavors, packaged in bright colors, and sold with product names designed to be alluring to young people.

Targeted marketing to communities of color, low income communities and LGBTQ communities adds to the health disparities in populations already impacted by social inequities. In African-American communities, the tobacco industry has aggressively marketed menthol flavored tobacco products to youth. Approximately 85% of African-American smokers smoke menthol cigarettes, and consequently, African-American men have the highest death rates from lung cancer, when compared to other demographic groups. The anesthetizing effect of menthol masks the harshness of tobacco, making menthol cigarettes more appealing to beginning smokers, and menthol smokers demonstrate greater dependence, and are less likely to quit.

Again, I fully support Councilmember Mitch O'Farrell's motion to restrict the sale of flavored tobacco products (including menthol) in the City of Los Angeles.

Sincerely,

Tasha Jaramillo
1823 Holmby Ave. #102
Los Angeles, CA 90025

Communication from Public

Name: Bonnie Halpern-Felsher
Date Submitted: 08/02/2019 11:33 AM
Council File No: 18-1104
Comments for Public Posting: Dear all, I am submitting these documents, including some research and a public statement, in support of policies that eliminate ALL tobacco flavors, including mint and menthol. There is an abundance of evidence showing that youth not only use fruit and sweet flavors, but mint/menthol as well. We must take action NOW, as each day I am seeing more and more youth initiative and become addicted to tobacco (and in particular, e-cigarettes/juul). Please let me know if you need further information in support of such policies. Best, Bonnie Bonnie Halpern-Felsher, PhD, FSAHM Professor of Pediatrics Professor (By courtesy), Health Research & Policy Director of Fellows' Scholarship, Department of Pediatrics Director of Research, Division of Adolescent Medicine Associate Director, Adolescent Medicine Fellowship Program Co-leader, Scholarly Concentrations, Pediatrics Residency Program Founder and Executive Director, Tobacco Prevention Toolkit and the Marijuana Awareness and Prevention Toolkit. Division of Adolescent Medicine Department of Pediatrics Stanford University 770 Welch Road, Suite 100 Palo Alto, CA 94304 bonnie.halpernfelsher@stanford.edu 650-724-1981 (W) 650-736-7706 (F)

Flavors Clearly Attract Youth

Bonnie Halpern-Felsher, PhD
Professor of Peditarics

Stanford University, Department of Pediatrics, Division of Adolescent Medicine

The number of youth using e-cigarettes and other new vaping products (herein: e-cigarettes) has reversed progress in reducing youth nicotine addiction, and continues to grow. Over the past year, high school students' use of e-cigarettes including pod-based products has increased by 78%, with 1 in 5 high school students reporting current use. Middle school students' use increased by 48%, with 1 in 20 middle school students reporting recent use.[1,2]

FDA's public statements about the growing epidemic of youth e-cigarette use suggest the agency recognizes the enormity of the problem. For example, speaking of the proposed new steps to reduce youth vaping by preventing their access to flavored tobacco products, FDA Commissioner Scott Gottlieb, MD, said:

> "Today, I'm pursuing actions aimed at addressing the disturbing trend of youth nicotine use and continuing to advance the historic declines we've achieved in recent years in the rates of combustible cigarette use among kids."
>
> "[A]ny policy accommodation to advance the innovations that could present an alternative to smoking – particularly as it relates to e-cigarettes – cannot, and will not, come at the expense of addicting a generation of children to nicotine through these same delivery vehicles. This simply will not happen. I will take whatever steps I must to prevent this." [3]

All flavors, including mint and menthol, in all tobacco products, not just e-cigarettes, should be prohibited

In order to attract young and new users, the tobacco industry adds characterizing flavors like mint, menthol, fruit, and candy to tobacco, often using the same flavorants that are in fruit-

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[3] November 15, 2018;https://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm625884.htm

flavored candy, and sometimes at higher doses.[4][5] These flavors appeal to new users by masking the harsh taste of tobacco, and in the case of e-cigarettes, resulting in a more pleasant smell than that found with tobacco alone.

Flavor or "taste" is one of the most common persuasive marketing techniques used to promote food (mostly candy and snacks) to children on TV.[6] Exposure to ads for flavored products is positively associated with youth consumption,[7] and most money spent by youth is on food or beverages, particularly sweets.[8] Research on e-cigarettes is consistent with these findings, concluding: flavors play an important role for online e-cigarette marketing and boosts user interaction and positive emotion;[9] flavored (vs. unflavored) e-cigarette ads elicit greater appeal and interest in buying and trying e-cigarettes; and the appeal of ads marketing flavors is linked to rapid and persistent adoption of e-cigarettes among youth.[10]

Youth are Attracted to Flavored Tobacco Products

The vast majority of youth in the US who try tobacco initiate with flavored tobacco products, including 81% of e-cigarette ever users, 65% of cigar ever users, and 50% of cigarette ever smokers.[11][12] Adolescents are more likely to report interest in trying an e-cigarette from a friend if it is menthol-, candy-, or fruit-flavored than if unflavored.[13] Flavor preferences are associated with higher e-cigarette use among adolescents.[14] Most adolescent current tobacco users cite flavors as a reason for use (including 81% for past 30-day e-cigarette users; 74% for past 30-day cigar users).[10] Three quarters of adolescent and young adult flavored tobacco product users reported they would quit if flavors were unavailable.[15]

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Youth and young adult tobacco users are more likely than older adult tobacco users to use flavored products, including menthol cigarettes,[16] flavored smokeless tobacco,[17] and flavored cigars.[18] Young smokers (12-17 years of age) are three times as likely to smoke menthol cigarettes than smokers 35 years and older.[19] Research among approximately 4000 school-going youth shows that for 98% of them, first e-cigarettes used were flavored to taste like something other than tobacco, compared to 44.1% of older adults nationwide. Fruit and candy flavors predominated for all groups; and, for youth, flavors were an especially salient reason to use e-cigarettes.[20] Finally, a recent study showed that only 1.5% of adolescent and young adult e-cigarette users used tobacco flavored-Juuls and .9% used tobacco-flavored other e-cigarette products. Instead, the majority used fruit or dessert flavors (33% for Juul users and 64% for other e-cigarette users) and 27% of Juul users and 12% of other e-cigarette users used mint or menthol flavors.[21]

Youth Believe Ads for Flavored E-cigarettes Target Them

Using flavors in e-cigarettes is a key marketing strategy to reach and recruit youth. In 2014, over 7,700 flavors for e-cigarettes were available, with greater than 240 new flavors being added per month.[22] What is most important is that youth believe flavored e-cigarette ads target them.

In a study[23] of California youth and young adults (mean age 17.5, SD = 1.7), participants were asked to indicate whether eight different ads for flavored e-cigarette products (Figure 2), randomly displayed, target someone younger than them, their age, someone a little older, or someone much older like their parents. Participants felt the ads were for someone just a little older than them (age 18 – 26; not for someone much older). More than half of participants felt

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adults: What if flavors didn't exist? *Tob Regul Sci*. 2017;3(2):168-173.

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ads for *cherry*, *vanilla cupcake*, *caramel,* and *smoothie* flavors were for someone their age. Ads were also seen as targeting an audience younger than them. These findings suggest that while the tobacco industry argues that flavored tobacco products, including sweet and fruit flavored products, are not meant to attract youth, youth see them as aimed at them. ***These and similar findings indicate that we must immediately remove all flavored tobacco products from the market all tobacco.***[24]

Figure 2. Flavored e-cigarette ads shown to adolescents and young adults to elicit perceptions of the age of audience being targeted for each ad.

There is no scientific basis to keep mint and menthol flavored e-cigarettes and e-liquids on the market.

To successfully tackle youth e-cigarette use, we must ensure that all flavored tobacco products are prohibited. We need immediate action to ban all flavors in all products as part of our overall effort to protect youth.

Despite historic tobacco industry claims that menthol simply adds flavor, tobacco industry documents have revealed that the industry manipulates menthol levels to control a cigarette's intensity to cater to new and long-term smokers.[25]

Menthol and other characterizing flavors appeal to new users by masking the harsh taste of tobacco, and bright packaging associates flavored tobacco products with candy and other flavors.[26,27] Additionally, tobacco products with a characterizing flavor including fruit-flavored e-cigarettes[28] and menthol cigarettes[14] are perceived to be less harmful than unflavored or

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tobacco-flavored products. In addition, there is some evidence that menthol cigarettes are harder to quit.[29,30]

Mint and menthol target vulnerable youth. In the general population, differences in menthol use exist across race, gender, age, and sexual orientation. Rates of use of menthol flavored tobacco products are often higher in marginalized populations. African American smokers consistently have the highest menthol use rate.[31] Menthol use is also higher among female smokers;[27] Lesbian, Gay, and Bisexual smokers[32] (although see Rath et al 2013[33]); people with severe psychological distress; people with fewer years of education and lower income; and those who are unmarried or uninsured.[34]

The tobacco industry cultivated menthol use among African Americans by manipulating social factors of the civil rights era,[35] advertising menthol brand cigarettes, little cigars, and cigarillos in African American media and retail settings in African American neighborhoods,[36,37] and donating to African American leadership organizations.[38] The strategy has been so successful that even by 6th grade, African American youth were three times more likely to recognize menthol brands than their peers.[39]

Taken together, these data clearly show that youth <u>do</u> use mint and menthol flavors, that such flavorants are purposely added to attract both users and non-users, and that mint and menthol

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[30] Trinidad DR, Pérez-Stable EJ, Messer K, White MM, Pierce JP. Menthol cigarettes and smoking cessation among racial/ethnic groups in the United States. Addiction. 2010;105(SUPPL.1):84-94. doi:10.1111/j.1360-0443.2010.03187.x.

[31] Villanti AC, Mowery PD, Delnevo CD, Niaura RS, Abrams DB, Giovino GA. Changes in the prevalence and correlates of menthol cigarette use in the USA, 2004–2014. *Tob Control*. 2016:1-7. doi:10.1136/tobaccocontrol-2016-053329.

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attract youth. As such, a ban on flavored e-cigarette products must include mint and menthol.

Summary

The evidence is clear. Youth are using e-cigarettes, including pod-based products, in record numbers. The increase in use of e-cigarettes is undermining and repealing the great progress that has been made by tobacco control efforts over the past two decades. Such increases in e-cigarette use come at a time when youth have negative views of cigarettes, compared to even 10 years ago.[40]

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Communication from Public

Name: The California Association for Responsible Retail
Date Submitted: 08/02/2019 12:11 PM
Council File No: 18-1104
Comments for Public Posting:

August 2, 2019

Office of Mike Feuer
Los Angeles City Attorney
James K. Hahn City Hall East Suite 800
Los Angeles, CA 90012

Hon. Herb Wesson, President
Los Angeles City Council
200 North Spring Street, Room 430
Los Angeles, CA 90012

RE: Public Comment -- Council file number 18-1104 (Flavored Tobacco Products / Youth Tobacco Use / Sale Restriction / Proposed Strategy)
VIA: Public Comment Form Portal: https://cityclerk.lacity.org/publiccomment/

Dear City Attorney Feuer:

The California Association for Responsible Retail (CARR), a united coalition made up of small business owners of specialty shops who specialize in the sale of tobacco related products, appreciates the opportunity to comment on the Office of the Los Angeles City Attorneys' proposed changes to ordinances that strictly regulate the sale of flavored tobacco.

CARR does not represent big tobacco or the large manufacturers of e-cigarette products. Our small, local and family-operated businesses are scattered throughout Los Angeles. We agree with stricter regulation on the sale of flavored tobacco, and are eager and willing to work with your office in finding realistic and viable solutions to ensure that vape and other tobacco related products stay out of the hands of children, and are only sold at specialty shops like ours. We firmly believe that vape products should not be sold online, in convenience stores or directly by the manufactures. We want to do our part and serve as the regulators of vape related products, by doing what it takes to ensure that the sale of flavored tobacco is controlled.

However, we are concerned that a full-on ban of the sale of e-cigarettes in Los Angeles would cause detriment to our members by forcing our businesses to shut down, greatly affecting the economic wellbeing of our family's livelihood. A ban of this kind would also affect the economy of our City as a whole.

Additionally, according to data from the Centers for Disease Control & Prevention, vapor products are now one of the most commonly used aids to quit smoking in the United States. While we share the widely reported concerns about the rise of use in e-cigarettes among adolescents, we urge the City Attorney to take careful calibrated and proportionate action, because e-cigarettes serve as an alternative to smoking cigarettes.

In our efforts to be good stewards of public health and keep e-cigarettes away from minors, we support enforcing California's vaping age to 21 and by restricting the sale of vape products to brick and mortar locations like our specialty shops. This type of regulation would strengthen accountability in the sale of

tobacco products without taking away e-cigarettes as an alternative to smoking, from those who have dedicated themselves to quitting the deadly habit.

Given the potentially serious impact on public health and the large number of Angelenos and businesses affected, we hope you will agree to meet some of our association's board to discuss the likely adverse consequences for public health, the economy and the development of an illegal black market, while also discussing the fundamentals of the appropriate alternatives to cigarettes.

We look forward to being a part of this process and welcome the opportunity to provide your office with any input, information, and to voice our issues, concerns and ideas as small business owners, constituents and residents of this City.

Thank you,

Elia Baida
Board Member – Director of Communications
The California Association for Responsible Retail
310 East 3rd St.
Los Angeles, CA 90013

Communication from Public

Name: Amerian Cancer Society Cancer Action Network
Date Submitted: 08/02/2019 01:18 PM
Council File No: 18-1104
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Youth say ads for flavored e-liquids are for them

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ABSTRACT

Introduction: E-cigarettes are the most popular tobacco product among adolescents and young adults ("AYA") and are available in many flavors. The e-cigarette industry argues that flavors are not meant to appeal to youth, yet no study has asked youth what age group they think ads for flavored e-liquids are targeting. We asked AYA which age group they thought ads for flavored e-liquids targeted.

Methods: In 2016 as part of a larger survey, a random sample of 255 youth from across California (62.4% female, mean age = 17.5, SD = 1.7) viewed eight ads, presented in randomized order, for fruit-, dessert-, alcohol-, and coffee-flavored e-liquids and indicated the age group they thought the ads targeted: younger, same age, a little older, or much older than them. Population means and 95% confidence intervals were estimated using bootstrapping (100,000 replicate samples).

Results: Most participants (93.7%) indicated the cupcake man flavor ad targeted an audience of people younger than they. Over half felt ads for smoothy (68.2%), cherry (63.9%), vanilla cupcake (58%), and caramel cappuccino (50.4%) targeted their age and for no flavor ad did most feel the primary target age group was much older.

Conclusions: Youth believe ads for flavored e-liquids target individuals about their age, not older adults. Findings support the need to regulate flavored e-liquids and associated ads to reduce youth appeal, which ultimately could reduce youth use of e-cigarettes.

1. Introduction

E-cigarettes are the most commonly used tobacco product among adolescents and young adults (NIDA, 2017). E-cigarettes aerosolize glycerin-based liquids, commonly referred to as "e-liquids," which are available in myriad flavors including fruity, sweet, and alcohol (Brown, Luo, Isabelle, & Pankow, 2014). The e-cigarette industry maintains flavored e-liquids are intended for adult smokers using e-cigarettes to quit smoking cigarettes, and supports this claim with industry-sponsored research (Shiffman, Sembower, Pillitteri, Gerlach, & Gitchell, 2015). However, evidence shows that colorful ads depicting e-liquid flavors like those displayed on e-cigarette retail websites are attractive to youth (Grana & Ling, 2014; Lewis & Wackowski, 2006).

Flavor or "taste" is one of the most common persuasive marketing techniques used to promote food (mostly candy and snacks) to children on TV (Jenkin, Madhvani, Signal, & Bowers, 2014). Exposure to these ads is positively associated with youth consumption (Cairns, Angus, Hastings, & Caraher, 2013); and most money spent by youth is on food or beverages, particularly sweets (Kraak, Gootman, & McGinnis, 2006). Not surprisingly, similar research conducted on e-cigarettes comports with these findings, concluding: flavors play an important role for online e-cigarette marketing and boosts user interaction and positive emotion (Liang, Zheng, Zeng, & Zhou, 2015), ads for flavored (vs. unflavored) e-cigarettes elicit greater appeal and interest in buying and trying e-cigarettes (Vasiljevic, Petrescu, & Marteau, 2016), the appeal of ads for flavors is linked to rapid and persistent adoption of e-cigarettes among youth (Zhu, Sun, Bonnevie, et al., 2014), and 84% of US youth who use e-cigarettes stated they would not use e-cigarettes without flavors (Ambrose et al., 2015).

Despite research implicating flavors and the marketing of flavors in youth interest in and use of e-cigarettes (Farrelly, Duke, Crankshaw, et al., 2015; Harrell, Loukas, Jackson, Marti, & Perry, 2017; Jackler & Ramamurthi, 2016; Klein et al., 2016), no study has asked youth what age group they think ads for flavored e-liquids are targeting. In this

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study, we examined adolescents' and young adults' ("AYA") opinions of which age group(s) ads were targeting, and if target age group differed by flavor group (e.g., sweet, fruit, alcohol, coffee). We hypothesized that AYA would perceive ads, especially those depicting fruit and dessert flavors, to be targeting those around their age group, rather than older adults. Understanding whether and which flavors youth perceive as meant for their age group(s) will inform FDA regulation of e-liquid flavors and associated advertisements.

2. Material and methods

Participants (n = 255; mean age = 17.5, SD = 1.7 [range 14–21, Median age = 18; with only four participants (1.6%) aged 14 and 1 (0.4%) aged 21]; 62.4% female; 25.6% ever-used e-cigarettes; 24.2% white, 27.4% Asian/Pacific Islander, 36.1% Latino, and 12.3% other) were from an ongoing prospective cohort study designed to assess tobacco-related perceptions, exposure to marketing, and use (detailed methods have been published elsewhere (Roditis, Delucchi, Cash, & Halpern-Felsher, 2016; Gorukanti, Delucchi, Ling, Fisher-Travis, & Halpern-Felsher, 2016). Data for this study were collected from June through September 2016 from a random sample of Wave 3 participants (n = 255). There were no differences between the overall sample for Wave 3 (N = 528) and the analytic sample for this study in sex, age, e-cigarette ever-use status or race/ethnicity (all p's > 0.20).

Eight flavors were included: "appletini," "beer," "caramel cappuccino," "kona coffee," "the cupcake man," "vanilla cupcake," "cherry," and "smoothy." Images were randomly chosen from the Stanford Research into the Impact of Tobacco Advertising database (SRITA) and retail websites of e-liquid brands. The SRITA database is an online repository of advertisements that is continuously updated. The images were chosen such that each of the four flavor categories ("alcohol," "coffee," "dessert," and "fruit") had one image that exemplified a traditional advertisement while the other image was of a bottle containing flavored e-liquid. The advertisements selected for the study were current at the time of the study. Included flavor profiles were chosen in part because Reddit conversations at that point in time showed us that fruit and dessert flavors were very popular. Because there were many brands that offered alcohol flavored products, we wanted to add alcohol to see if it was attractive to youth; this was unknown at the time. The selected ads were representative of flavor profiles commonly marketed by popular e-liquid and e-cigarette manufacturers. (See Appendix for ad images, including links to the ads, used in the study). The order in which ads were displayed was randomized. After viewing each ad, and without knowing what ads would come next, participants were asked to select which age group(s) they felt the advertisement targeted (younger than me; my age; a little older [18–24]; much older [parents' age]). Our university's institutional review board approved all study procedures.

We first calculated frequencies and proportions of target-age groups for each ad. A priori, it was decided not to stratify these analyses by e-cigarette use status due to small sample size (n = 65 had ever used) nor by age group (adolescent = 14–17 and young adult = 18+) as 72% of ever-users were ages 18 and over. To inform future research in this area, we conducted secondary analyses which used regressions adjusted for use status and age; these secondary analyses showed no differences in the outcomes of interest by use status or age. Only combined results are reported.

Next, to estimate population means and 95% confidence intervals, we performed a stratified bootstrap analysis with 100,000 replicate samples. The bootstrap is a non-parametric method employed to account for person-to-person variability (Erceg-Hurn and Mirosevich, 2008). This analysis was stratified by prior e-cigarette use, and participants were sampled/resampled with equal probability within: (i) never used and (ii) some use as reported in Wave 3.

3. Results

Participants predominately identified ads as targeting individuals just a little older than themselves or their own age. Nearly all participants (93.7%) indicated the cupcake man flavor ad targeted people younger than themselves. More than half of participants felt ads for smoothy (68.2%), cherry (63.9%), vanilla cupcake (58%), and caramel cappuccino (50.4%) targeted people their age (See Supplemental Fig. 1 for details). For none of the flavor ads did a majority of participants believe the target age group was much older (See Fig. 1, which illustrates the proportion of responses attributed to each age group for each flavor).

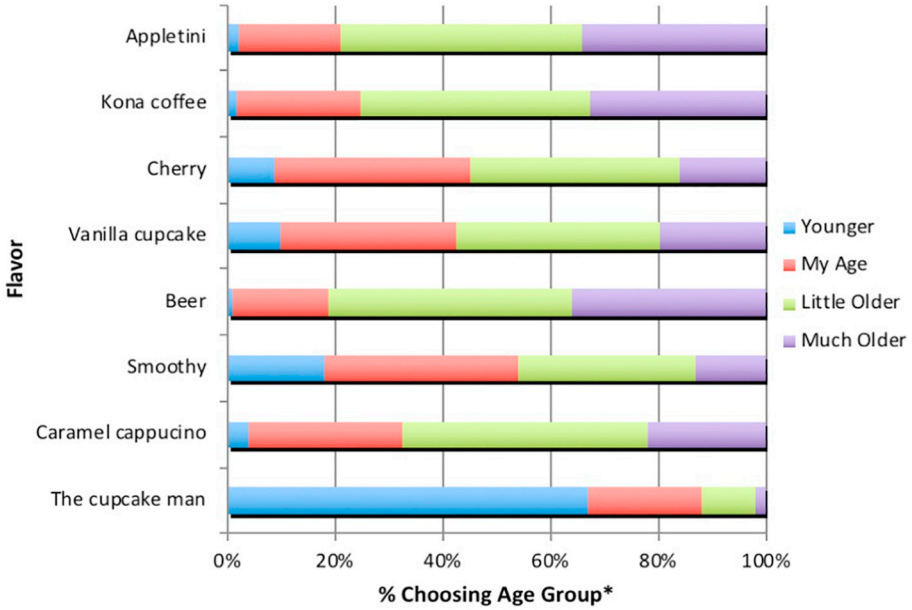

Fig. 1. Target age groups as proportion of total number of responses for each flavor among California adolescents and young adults in 2016 (n = 255; mean age = 17.5).

*Proportions reported in Fig. 1 were calculated using the total number of responses choosing each age group (within each flavor) as the numerator and the total number of responses received for that flavor as the denominator. This was done to account for the fact that participants could choose from 0 to 4 age groups for each flavor, resulting in a diversity of denominators.

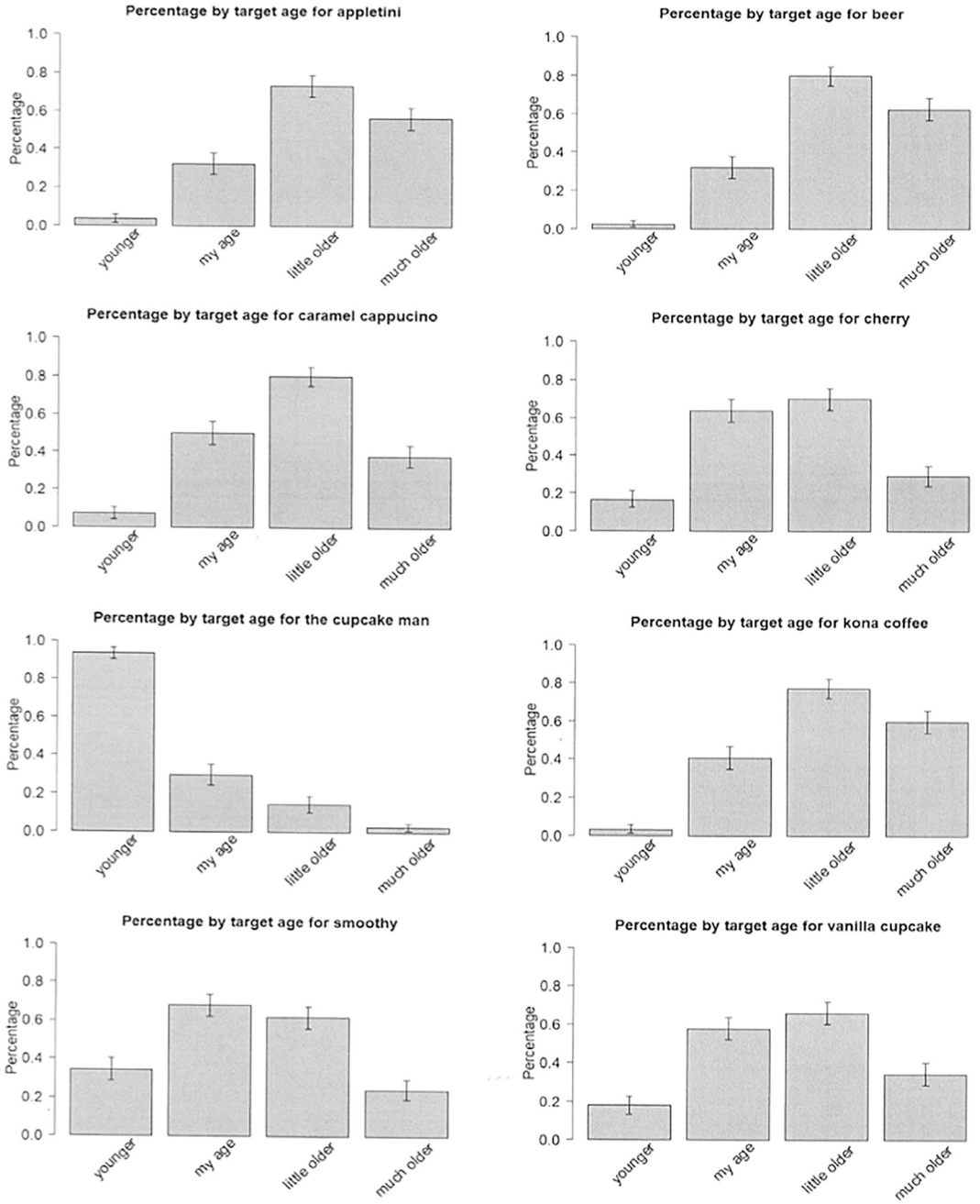

Fig. 2. Estimates of population means and 95% confidence intervals from stratified bootstrapping of 100,000 replicate samples among California adolescents (N = 255; mean age 17.5) surveyed in 2016.
Each category has the potential to have a height of 1 (i.e., probability 1), if all respondents selected a particular age-category as appropriate to the given flavor. Respondents were able to choose all age-categories they believed applied to each flavor, thus sum of all age-categories within a given flavor add to > 1. The confidence interval for each age-category represents the sampling variability, showing bootstrap upper and lower bounds.

Bootstrap estimates of the confidence intervals for estimates of population means and 95% confidence intervals, generated by stratified sampling on individuals and prior use of e-cigarettes, are summarized in Fig. 2 (see Supplemental Table 1 for point estimates and upper- and lower- bounds for 95% CI). In sum, mean point estimates for cupcake man are wildly out of line with those for the remaining flavor ads, reflecting the belief among participants that the cupcake man ad targets a younger audience extraordinarily more than any other flavor. Also, there is a slight shifting toward a younger audience being the target for the remaining sweet flavors (i.e., cherry, smoothy, and vanilla cupcake), though nothing so dramatic as for the cupcake man. In other words, "sweets for children."

4. Discussion

Our findings contradict industry-sponsored claims that marketing of flavored e-liquids is not meant for and does not target youth. Instead these results show that AYA perceive flavored e-liquid ads to be targeting people their age (of 17.5 on average) or those a little older (18–24), and in fact at times to be targeting an audience even younger

than themselves. It is particularly problematic for the industry-sponsored claims that participants perceived dramatic differences in target-audience age by flavor (Feirman, Lock, Cohen, Holtgrave, & Li, 2016). For example, the cupcake man flavor ad was the most likely to be perceived as targeting younger people; contrastingly, appletini, kona coffee, and beer ads were most likely to be perceived as targeting those much older, although even for these ads, a greater proportion indicated the target age group was someone a little older. The dramatic shifts in the distribution of the histograms by flavor could be explained, at least in part, by an underlying connection between flavors and target audience-age groups in the minds of AYA. Also, the order the flavor ads were displayed was randomized and participants were shown flavors one by one (versus being shown all of the flavors at once). Perhaps AYA would not think about age if unprompted, but it is clear they perceive a difference in target-age by flavor if prompted.

Further, while a content analysis of tobacco-industry ads found intense visual images were important for ad saliency among adolescents (Davis, Gilpin, Loken, Viswanath, & Wakefield, 2008), participants here did not appear to differentially identify target age groups based on how the ad looked. Rather, participants overwhelmingly indicated that all flavors were for people about their age. These findings comport with evidence that tobacco advertising targeting young adults (age 18–24) appeals simultaneously to adolescents since many smokers started as a way to propel themselves into maturity (i.e., smoking serves as a tool for attempts to look older) (Bidstrup, Frederiksen, Siersma, et al., 2009; Barton, Chassin, Presson, & Sherman, 1982; Gerrard, Gibbons, Stock, Lune, & Cleveland, 2005; Halpern-Felsher, Biehl, Kropp, & Rubinstein, 2004; Kremers, Vries, Mudde, & Candel, 2004) and a review showing differences in flavor preferences by age group, with youth preferring sweet and fruit flavors and being more open to unique and exotic flavors, compared to adults (Feirman et al., 2016; Klein et al., 2008).

This is the first research showing AYA's opinions about the age groups being targeted by ads for flavored e-liquids. These findings should be interpreted within the limits of the data and may not be generalizable to youth outside of California or the U.S. Response options included “my age” and “a little older [18-24];” some participants were $\geq$18 years old, so there could have been some overlap. Still, participants were allowed to choose between and among discriminant categories for “target age group,” which helps reduce overlap within the measure and serves to bolster robustness of results (Conway & Lance, 2010). Another limitation is our lack of a tobacco-flavored ad; such an ad would further allow us to determine whether all flavors or just non-tobacco flavors most appeal to youth. Also, we did not stratify frequencies and proportions by use status or age and while our data revealed no differences, these variables have been shown to be important determinants of perceptions and use of tobacco products among AYA and should be included in future research. In our bootstrap analysis, we did stratify by e-cigarette ever-use and these results support results from the unstratified analyses.

Our findings are not surprising when one considers the established appeal of flavors to youth in both food and tobacco industry research, which shows AYA are more likely to purchase and use flavored products (Jackler & Ramamurthi, 2016; Jawad, Nakkash, Hawkins, & Akl, 2015; Liang et al., 2015; Vasiljevic et al., 2016). Highlighting flavors in ads for food is known to be one of the most persuasive tactics to influence AYA food consumption behaviors, and it is likely similar in ads for other flavored products (Cairns et al., 2013; Jenkin et al., 2014; Kraak et al., 2006). These findings raise concerns that unregulated advertising of flavored e-liquids will contribute to continued appeal and uptake of e-cigarettes among youth; ultimately increasing associated short- and long-term deleterious health effects.

5. Conclusions

Our findings support FDA regulation of flavored e-liquids, including limiting or banning advertising for flavored tobacco products, given that marketing of flavored e-liquids is a potent strategy used by e-cigarette manufacturers (Clark, Jones, Williams, et al., 2016). Reducing youth exposure to flavored e-liquid ads could have a positive impact on public health by reducing appeal and uptake of e-cigarettes among youth (Aldrich et al., 2015). Lastly, FDA could develop public health and education campaigns to communicate information about harms associated with using flavored e-liquids and e-cigarette use in general.

Supplementary data to this article can be found online at https://doi.org/10.1016/j.addbeh.2018.08.029.

Human subjects approval statement

Our university's institutional review board approved all study procedures.

Conflict of interest disclosure statement

All authors are aware of no potential real or perceived conflicts of interest.

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Contributors

KM wrote the first draft and conducted analysis. MB Conducted analysis and contributed to writing. DR conceived of the study design and contributed to the writing. SM contributed to the writing and research. BHF conceived of the study design and contributed to the writing. All authors have contriubed to and approved the final manuscript.

Appendix A. Ads and links to ads for flavored e-liquids used in 2016 survey of California high school students (N = 255; mean age = 17.5) to discern perceived target age group for each flavor

http://tobacco.stanford.edu/tobacco_web/images/ecig_ads/d_flavor/cupcakes/large/cupcake_34.jpg

https://i.pinimg.com/originals/6f/95/86/6f95867ea6d44ab968ce4804a641b32a.jpg

http://tobacco.stanford.edu/tobacco_web/images/ecig_ads/d_flavor/11 Alcoholic Beverages/large/bev_1.jpg

https://jawikw.com/menu/drinks/milkshake-smoothy/smoothy-man-strawberry-banana.html

http://www.monstervape.com/

https://cdn.shopify.com/s/files/1/1133/8204/products/0mg-cherry_large.jpg?v=1468340138

htttobacco.stanford.edu/tobacco_web/images/ecig_ads/d_flavor/10%20Coffee%20p://&%20Tea/large/coffee_47.jpg

https://www.vapedudes.com/shop/e-juice/appletini

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Adolescent health brief

Popular Flavors Used in Alternative Tobacco Products Among Young Adults

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A B S T R A C T

Purpose: The aim of the article was to examine flavors of alternative tobacco products most commonly used by young adults (YAs).
Methods: California YA (N = 365; mean age = 20.0 years) were surveyed in 2018 about the first and usual flavors of alternative tobacco products used. Flavor categories were fruit, candy, menthol, mint, coffee, spice, alcohol, wintergreen, and tobacco.
Results: Fruit and mint were the most common flavors used (pod-based e-cigarettes: 35.4% and 29.3%; other e-cigarettes: 52.7% and 23.1%; hookah: 45.4% and 18.5%; cigars/cigarillos: 22.4% and 6.9%, respectively). For other e-cigarettes and hookah, candy was also popular (20.5% and 14.8%, respectively). For pod-based and other e-cigarettes, menthol was widely used (13.4% and 17.0%, respectively). Approximately half of the ever-flavor users reported they "usually" used the same flavors across products (menthol users: 52.2%; fruit users: 51.7%; mint users: 44.0%; and candy users: 43.8%).
Conclusions: YA are clearly using flavors, specifically fruit, mint, candy, and menthol, in their tobacco products.

IMPLICATIONS AND CONTRIBUTION

The Food and Drug Administration, several states, and cities are proposing bills to eliminate the sale of all flavored tobacco products. More research is needed to inform these bills. This study shows the most common flavors (i.e., fruit, mint, candy, and menthol) used across e-cigarettes, hookah, and cigars/cigarillos among young adults.

The tobacco industry uses flavors in alternative tobacco products (e.g., e-cigarettes, hookah, cigars/cigarillos) to attract young and new users, with more than 7,700 flavors available in e-cigarettes alone [1,2]. Adolescents and young adults (YA) have stronger preferences for flavored tobacco compared with older adults [3], with 70%–80% of young tobacco users using flavors [3].

The U.S. Food and Drug Administration and state and local agencies are seeking evidence to inform tobacco flavor regulation [4]. However, research has predominately focused on flavors more generally or on nonmenthol flavorings, rather than examining specific flavors [3,5]. In addition, few have studied flavors used with hookah and cigars/cigarillos [3,5]. To inform regulatory actions, we examined the array of flavors used by YA (aged 18–26 years) in pod-based e-cigarettes, other e-cigarettes, hookah, and cigars/cigarillos.

Methods

Design and participants

An online survey administered by Qualtrics (Provo, UT) was completed by 365 racially/ethnically diverse California YA (mean age = 20.0; 64.9% female; 83.6% currently in college; Supplemental Table) participating in Wave 7 of a longitudinal study of tobacco use and perceptions. More details on the original sample were

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Table 1
Flavors usually used by tobacco products among 365 California young adults in 2018[a]

	Pod-based e-cigarettes, n (%)	Other e-cigarettes, n (%)	Hookah, n (%)	Cigars/cigarillos, n (%)
Ever users	82 (22.5)	112 (30.7)	108 (29.6)	58 (15.9)
Current users	41 (11.2)	28 (7.7)	0 (.0)	11 (3.0)
Used flavor at the first time use of the product	59 (72.0)	95 (84.8)	86 (79.6)	19 (32.8)
First flavor used				
Fruit	21 (25.6)	42 (37.5)	42 (38.9)	9 (15.5)
Mint	23 (28.1)	7 (6.3)	8 (7.4)	2 (3.5)
Candy	6 (7.3)	18 (16.1)	3 (2.8)	2 (3.5)
Menthol	2 (2.4)	5 (4.5)	1 (.9)	0 (.0)
Tobacco flavored	0 (.0)	0 (.0)	0 (.0)	1 (1.7)
Wintergreen	1 (1.2)	1 (.9)	2 (1.9)	0 (.0)
Coffee	0 (.0)	1 (.9)	0 (.0)	0 (.0)
Spice	0 (.0)	0 (.0)	0 (.0)	0 (.0)
Alcohol	1 (1.2)	0 (.0)	1 (.9)	0 (.0)
Other	2 (2.4)	3 (2.7)	3 (2.8)	0 (.0)
Unknown/unsure	23 (28.1)	18 (16.1)	26 (24.1)	5 (8.5)
Unflavored	3 (3.7)	0 (.0)	0 (.0)	0 (.0)
Flavor usually used				
Fruit	29 (35.4)	59 (52.7)	49 (45.4)	13 (22.4)
Mint	24 (29.3)	26 (23.1)	20 (18.5)	4 (6.9)
Candy	7 (8.5)	23 (20.5)	16 (14.8)	2 (3.5)
Menthol	11 (13.4)	19 (17.0)	4 (3.7)	2 (3.5)
Tobacco flavored	NA	2 (1.8)	NA	NA
Wintergreen	4 (4.9)	5 (4.5)	8 (7.4)	1 (1.7)
Coffee	2 (2.4)	1 (.9)	1 (.9)	1 (1.7)
Spice	0 (.0)	1 (.9)	1 (.9)	3 (5.2)
Alcohol	1 (1.2)	1 (.9)	3 (2.8)	0 (0.0)
Other	7 (8.5)	8 (7.1)	6 (5.6)	2 (3.5)
Unknown/unsure	26 (31.7)	27 (24.1)	37 (34.3)	33 (56.9)
Unflavored	3 (3.7)	4 (3.6)	5 (4.6)	7 (12.1)

NA = not available.
[a] Mean (standard deviation) age = 20.0 (1.5) y.

described elsewhere [2]. The survey was completed from August to October 2018. Consent forms were obtained from participants. The study was approved by Stanford University's Institutional Review Board.

Measures

Respondents answered questions about ever and past 30-day use of pod-based e-cigarettes, other e-cigarettes, hookah, and cigars/cigarillos. For each product ever used, participants indicated whether the first product they used was flavored. If yes, they were asked which flavor (fruit, candy, menthol, mint, tobacco, coffee, alcohol, spice, wintergreen, unflavored, other, and unsure/unknown) was first used and usually used for each tobacco product.

Analysis

Unweighted frequencies and proportions were calculated for each flavor and tobacco product. Number of products (from 0 to 4) usually used for each flavor by participant was computed. Analyses were conducted using STATA 15 (StataCorp. 2017. Stata Statistical Software: Release 15, StataCorp LLC, College Station, TX).

Results

Most ever-tobacco users reported using flavors the first time they tried a tobacco product (pod-based e-cigarettes: 72.0%; other e-cigarettes: 84.8%; hookah: 79.6%; cigars/cigarillos: 32.8%). The most common first flavors were fruit, mint, and

Table 2
Usual flavor used in multiple tobacco products among 365 California young adults in 2018[a]

Flavor	Ever-flavor users, n (%)	In a single product, n (%)	In multiple products, n (%)
Fruit	89 (100.0)	43 (48.3)	46 (51.7)
Mint	50 (100.0)	28 (56.0)	22 (44.0)
Candy	32 (100.0)	18 (56.2)	14 (43.8)
Menthol	23 (100.0)	11 (47.8)	12 (52.2)
Wintergreen	13 (100.0)	9 (69.2)	4 (30.8)
Coffee	3 (100.0)	2 (66.7)	1 (33.3)
Spice	5 (100.0)	5 (100.0)	0 (.0)
Alcohol	3 (100.0)	2 (66.7)	1 (33.3)

[a] Mean (standard deviation) age = 20.0 (1.5) y.

candy. Fruit and mint were the most common flavors usually used (pod-based e-cigarettes: 35.4%, 29.3%; other e-cigarettes: 52.7%, 23.1%; hookah: 45.4%, 18.5%; cigars/cigarillos: 22.4%, 6.9%, respectively). Other popular flavors were menthol for pod-based e-cigarettes (13.4%) and other e-cigarettes (17.0%), candy for other e-cigarettes (20.5%) and hookah (14.8%), and spice for cigars/cigarillos (5.2%). Notably, 24.1%–56.9% of participants were unaware of which flavors they used, and virtually none of the participants used tobacco-flavored products (Table 1). Approximately half of the ever-flavor users reported usually using the same flavors across products: menthol (52.2%), fruit (51.7%), candy (43.8%), and mint (44.0%) (Table 2).

Discussion

This study extends the literature by examining a wide range of flavors used across alternative tobacco products among YA, with separate categories for mint and menthol and for pod-based e-cigarettes and other e-cigarettes. We found both sweet (fruit and candy) and nonsweet (menthol and mint) flavors were most commonly used, and tobacco flavored products were not used among YA. Furthermore, half of the flavor users reported usually using the same flavors across multiple products, and many were unsure of flavors used.

We confirmed widespread appeal of flavored alternative tobacco products among YA, showing fruit, candy, mint, and menthol were particularly appealing regardless of products [3,5]. Industry-targeted marketing [2], coupled with flavor preferences inherent among YA [6], contribute to the popularity of sweet-flavored tobacco. We found YA preferred sweet flavors for both experimentation and usual use.

In our sample, substantial proportions of YA lacked awareness of the flavors used and marked “unknown/unsure” on the survey. It could be that names of flavors (e.g., unicorn, sugar booger) are so nuanced that YA do not know which flavor category to answer. Another explanation may be that YA are sharing e-cigarettes and are unaware of what they are using. More research on measuring flavored tobacco use is warranted.

Currently, several states and cities are considering eliminating the sale of flavored tobacco; however, several bills have exemptions for mint/menthol, arguing that these flavors are not for youth [4,7]. The Tobacco Control Act did not consider menthol as a “flavor” [4], possibly impacting efforts to ban menthol. Our finding that mint and menthol are among the most commonly used flavors suggests appeal to YA similarly as do other characterizing flavors, and similarly as has been found for adolescents [6,8]. Moreover, mint and menthol may increase tobacco use disparities since tobacco companies have used these flavors to target vulnerable populations (e.g., youth, females, and African Americans) [9]. Emerging evidence suggests that flavors might further contribute to polytobacco use and subsequent nicotine addiction [3]. Although our study was not powered to examine this hypothesis, most ever-users did report using the same flavors across products. In addition, there is inconsistent and inadequate evidence suggesting flavors help adult smokers quit [3]. Collectively, the evidence points to needed regulation of all flavored tobacco products, including mint and menthol.

Because our original sample was a school-based convenience sample, the findings may not be representative of the California YA population. In addition, two thirds of our sample were female; however, we did not find gender differences on flavor use in subgroup analysis (data not shown). Also, the findings may not generalize to other states that have higher smoking rates and fewer tobacco control policies than California (e.g., high taxes, older minimum age of tobacco purchase). In addition, self-reported data and a large proportion of “unknown” responses may threaten the validity of our results.

Our findings provide the most updated data on flavor preferences across alternative tobacco products, suggesting that all flavors, including mint and menthol, should be eliminated from all tobacco products. By eliminating the sale of all flavored tobacco, these products will be less appealing to youth and YA, and they will be more likely to quit using tobacco [10]. As such, their tobacco use and associated negative health effects are likely to decrease. As the U.S., several states, and cities are proposing a comprehensive ban on all flavored tobacco products, this study makes a timely contribution by providing the rationale for this important regulation.

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Supplementary Data

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Original Investigation | Substance Use and Addiction

Adolescents' and Young Adults' Use and Perceptions of Pod-Based Electronic Cigarettes

Karma McKelvey, PhD; Mike Baiocchi, PhD; Bonnie Halpern-Felsher, PhD

Abstract

IMPORTANCE Electronic cigarettes (e-cigarettes) are the most commonly used tobacco product among adolescents and young adults, and the new pod-based e-cigarette devices may put adolescents and young adults at increased risk for polytobacco use and nicotine dependence.

OBJECTIVE To build an evidence base for perceptions of risk from and use of pod-based e-cigarettes among adolescents and young adults.

DESIGN, SETTING, AND PARTICIPANTS In a survey study, a cross-sectional analysis was performed of data collected from April 6 to June 20, 2018, from 445 California adolescents and young adults as part of an ongoing prospective cohort study designed to measure the use and perceptions of tobacco products.

EXPOSURES Use of pod-based e-cigarettes, e-cigarettes, and cigarettes.

MAIN OUTCOMES AND MEASURES Ever use, past 7-day use, and past 30-day use and co-use of pod-based e-cigarettes, e-cigarettes, and cigarettes; use of flavors and nicotine in pod-based e-cigarettes and e-cigarettes; and associated perceptions of risks, benefits, and nicotine dependence.

RESULTS Among 445 adolescents and young adults (280 females, 140 males, 6 transgender individuals, and 19 missing data; mean [SD] age, 19.3 [1.7] years) who completed wave 6 of the ongoing prospective cohort study, ever use information was provided by 437 respondents, of which 68 (15.6%) reported use of pod-based e-cigarettes, 133 (30.4%) reported use of e-cigarettes, and 106 (24.3%) reported use of cigarettes. The mean (SD) number of days that pod-based e-cigarettes were used in the past 7 days was 1.5 (2.4) and in the past 30 days was 6.7 (10.0). The mean (SD) number of days that other e-cigarettes were used in the past 7 days was 0.8 (1.8) and in the past 30 days was 3.2 (7.4). The mean (SD) number of days that cigarettes were used in the past 7 days was 0.7 (1.8) and in the past 30 days was 3.0 (7.6). Among ever users of pod-based e-cigarettes, 18 (26.5%) reported their first e-liquid was flavored menthol or mint and 19 (27.9%) reported fruit (vs 13 [9.8%] and 50 [37.6%] for other e-cigarettes). The mean perceived chance of experiencing social risks and short-term and long-term health risks from the use of either pod-based e-cigarettes or other e-cigarettes was 40% and did not differ statistically by e-cigarette type. Among 34 adolescents and young adults reporting any loss of autonomy from nicotine, there was no difference in mean (SD) Hooked On Nicotine Checklist scores between those using pod-based e-cigarettes (2.59 [3.14]) and other e-cigarettes (2.32 [2.55]).

CONCLUSIONS AND RELEVANCE Use by adolescents and young adults of newer types of e-cigarettes such as pod-based systems is increasing rapidly, and adolescents and young adults

(continued)

Key Points

Question How and why are California adolescents and young adults using new pod-based electronic cigarettes (e-cigarettes)?

Findings This survey study of 445 adolescents and young adults revealed similar chances (40%) of experiencing negative health and social consequences from using pod-based and/or other types of e-cigarettes. Among 34 adolescents and young adults reporting any loss of autonomy from nicotine, there was no difference in mean Hooked On Nicotine Checklist scores between those using pod-based and other e-cigarettes.

Meaning Increasing use of pod-based e-cigarettes among otherwise nicotine-naive adolescents and young adults could be associated with the absence of clear, consistent public health warnings and messaging targeting relevant aspects common to all types of e-cigarettes.

+ Invited Commentary

+ Supplemental content

Author affiliations and article information are listed at the end of this article.

Abstract (continued)

report corresponding misperceptions and lack of knowledge about these products. Rapid innovation by e-cigarette manufacturers suggests that public health and prevention efforts appear to be needed to include messages targeting components common to all current and emerging e-cigarette products to increase knowledge and decrease misperceptions, with the goal to try to ultimately reduce e-cigarette use among adolescents and young adults.

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Introduction

Electronic cigarettes (e-cigarettes) are the most commonly used tobacco product among adolescents and young adults.[1] Liquids aerosolized by e-cigarettes (e-liquids) typically contain flavorings, moisture-retaining substances (ie, propylene glycol or glycerol), and nicotine.[2] Around the world, there is seemingly ceaseless demand by adolescents and young adults for novel and improved "high-tech" products, understood among this group to impart status.[3,4] E-cigarettes are such devices for the adolescents and young adults who use them,[5,6] with device modification adding to their appeal.[7,8] The availability of e-liquids in a multitude of flavors[9] and favorable perceptions of harm associated with e-cigarettes,[3,4] including e-cigarettes being considered the least harmful of all tobacco products,[9-11] have also contributed to the rapid global adoption of e-cigarettes by adolescents and young adults. Although evidence of the health risks of e-cigarettes is nascent,[12] ample evidence exists that exposure to nicotine by adolescents and young adults is associated with myriad health risks,[1,12-16] and the use of e-cigarettes increases the odds of initiation of smoking traditional tobacco cigarettes.[17-19] Exemplifying concern with youth uptake and use of e-cigarettes in general and pod-based e-cigarettes in particular, the US Food and Drug Administration released a statement in April 2018 on new enforcement actions and a Youth Tobacco Prevention Plan to stop youth use of, and access to, JUUL (brand name for a pod-based e-cigarette) and other e-cigarettes.[20]

In contrast to the comparatively stagnant market for traditional cigarettes, the e-cigarette market allows for rapid product innovation by manufacturers. Accordingly, in June 2015 a new pod-based style of e-cigarette (the JUUL) became available. Although pod-based e-cigarettes aerosolize flavored e-liquids like other brands of e-cigarettes,[21,22] there are important differences between the types of e-cigarettes. JUUL e-cigarettes, conceived in an innovative design school program and marketed heavily as an alternative to cigarettes, were, until recently, available in only 1 nicotine concentration: 59 mg/mL. According to the company's website: "Each JUULpod is designed to contain approximately 0.7 mL with 5% nicotine by weight at time of manufacture which is approximately equivalent to 1 pack of cigarettes or 200 puffs."[23] Also, unlike other types of e-cigarettes that require users to add e-liquid, purchased separately, to the reservoir of the device, pod-based e-cigarettes use USB-shaped prefilled pods. Furthermore, the sleek, small, and "high-tech" look of pod-based e-cigarettes makes it easy to hide the e-cigarettes in one's hand and may not appear at first glance, or to those unfamiliar with the design, to even be an e-cigarette.[24] Sales of JUULs have increased quickly, and their market share was listed at 68% of the US e-cigarette market as of July 2, 2018, a 783% increase from the year prior ending June 16, 2018.[25]

Given the novelty, popularity, and potential for harm of pod-based e-cigarettes, data describing how adolescents and young adults use and perceive pod-based devices are both timely and important. Thus far, 1 scientific study has reported data on the use and perceptions of JUULs among US adolescents and young adults aged 15 to 24 years.[26] That study's data, collected November 2017, showed that 25% of the sample recognized the JUUL brand, of whom only 25% knew all JUULs contained nicotine. Furthermore, 10% reported ever use of JUULs and 8% reported past 30-day use. Levels of recognition and use of JUULs were higher among those aged 18 to 24 years compared with those aged 15 to 17 years.[26] Further illustrating the popularity of pod-based e-cigarettes among adolescents and young adults, a study published in April 2018 reported on JUUL-related messages

online, including on Reddit (a popular discussion forum).[24] Authors found, among other things, a "subreddit" (focused discussion group within Reddit) called "UnderageJuul," which existed from July 2017 until it was banned in January 2018, at which point there were nearly 1000 members. Reported exchanges between members of the UnderageJuul subreddit included identification of retailers not requiring age verification, users of legal age offering to order the product for those who were underage (for a small fee), and sharing strategies about how not to get caught using pod-based e-cigarettes in places where e-cigarette use is banned.[24] Despite limited empirical data,[27] numerous articles in the popular press have highlighted the marketing[28] and popularity of pod-based e-cigarettes.[28-31]

More scientific data are needed to explicate the effect of this new form of e-cigarettes on the attitudes, initiation, and use of tobacco products among adolescents and young adults. We examine the use of pod-based e-cigarettes and compare it with the use of other e-cigarettes and conventional cigarettes among California adolescents and young adults. We also examine how these pod-based e-cigarettes and other e-cigarettes are used, including flavor choices, perceptions of associated risks and benefits, and symptoms of nicotine dependence. These findings contribute to the basis for future studies to determine how innovation in e-cigarettes affects patterns of tobacco use and may diminish the efficacy of public health tobacco prevention campaigns, which could translate to higher risk for adolescents and young adults using tobacco products. The findings will also inform regulation, marketing, and prevention messaging for e-cigarettes, including the newer pod-based systems.

Methods

Participants

The data in this study are derived from wave 6 of an ongoing prospective cohort study of adolescents and young adults recruited from 10 racially/ethnically and socioeconomically diverse high schools across California. From July 13, 2014, through October 11, 2015, all 9th- and 12th-grade students in these schools were invited to enroll and complete the wave 1 survey; of 1299 students who returned consent and assent forms, 772 (59.4%) completed wave 1. The wave 6 sample (n = 445; mean [SD] age, 19.3 [1.7] years; 280 females, 140 males, 6 transgender individuals, and 19 missing data) had more females and a higher percentage of Asian students than the schools from which we recruited. Still, participant demographics reflected the demographics of their respective schools. The 5 largest racial/ethnic backgrounds were white (163 [36.6%]), Asian or Pacific Islander (122 [27.4%]), and Hispanic (166 [37.3%]), with 128 (28.8%) nonwhite Hispanic individuals and 38 (8.5%) white Hispanic individuals (**Table 1**). The survey and research protocol were approved by the Stanford University Institutional Review Board. Consent forms, assent forms, and project information sheets were given to students to take home and review with their parents or guardians. Prospective participants provided signed parental informed consent and assent forms; students 18 years or older provided their own written informed consent. This study followed the American Association for Public Opinion Research (AAPOR) reporting guideline.

Design and Setting

Participants received a unique log-in identification to complete an online survey, administered by Qualtrics. In recognition of the entry of JUUL e-cigarettes (and, recently, more brands of pod-based e-cigarettes) into the market and their rapidly increasing market share, we added questions using the term "JUUL," defined in our survey as follows: "A JUUL is an electronic vaping device that uses nicotine salts (crystals) to deliver a nicotine aerosol…" to our wave 6 survey, with many questions mirrored from other published measures and findings concerning e-cigarettes and other tobacco products.[9,10] Data for wave 6 were collected from April 6 to June 20, 2018. Additional details regarding the study design, data collection, and sampling are published elsewhere.[9,32] Participants received a $35 gift card for completing wave 6.

Main Outcomes

Measures are briefly summarized below. Survey questions and response choices reported on in this study are provided verbatim in the eAppendix in the Supplement.

Tobacco Products

Prior to answering questions about tobacco products, participants viewed pictures and descriptions of cigarettes, e-cigarettes, and JUULs to ensure that participants focused on the same products. This is standard practice for surveys about e-cigarettes.[33,34] To separate JUULs from other e-cigarettes, questions about e-cigarettes were identified using the language: "e-cigarettes/vapes (not including JUULs)."

Recognition

The survey asked participants, "Before today have you ever heard of a JUUL?" The response choices were yes or no. Participants were then asked about use, nicotine dependence, flavors of e-liquid,

Table 1. Comparison of Participant Demographics Between Wave 1 (2014-2015) and Wave 6 (2018)[a]

Covariate	Participants, No. (%)		χ^2 for Difference	*P* Value
	Wave 1 (n = 772)	Wave 6 (n = 445)		
Sex				
Female	483 (62.6)	280 (62.9)	12	.21
Male	277 (35.9)	140 (31.5)		
Transgender	1 (0.1)	6 (1.3)		
Missing	11 (1.4)	19 (3.4)		
Grade at study start				
Freshman	311 (40.3)	181 (40.7)	15	.24
Sophomore	2 (0.3)	2 (0.4)		
Junior	10 (1.3)	6 (1.3)		
Senior	439 (56.9)	251 (56.4)		
Missing	10 (1.3)	5 (1.1)		
Race				
American Indian or Alaskan Native	18 (2.3)	8 (1.8)	48	.24
Asian	150 (19.4)	113 (25.4)		
Native Hawaiian or Pacific Islander	23 (3.0)	9 (2.0)		
Black or African American	27 (3.5)	9 (2.0)		
White	271 (35.1)	163 (36.6)		
More than 1 race	191 (24.7)	99 (22.2)		
Not sure	32 (4.1)	19 (4.3)		
Race missing	60 (7.8)	25 (5.6)		
Ethnicity				
Hispanic or Latino	316 (40.9)	166 (37.3)	12	.21
Not Hispanic or Latino	411 (53.2)	261 (58.7)		
Not sure	21 (2.7)	13 (2.9)		
Ethnicity missing	24 (3.1)	5 (1.1)		
Born in the United States				
Yes	669 (86.7)	386 (86.7)	6	.20
No	90 (11.7)	53 (11.9)		
Missing	13 (1.7)	6 (1.3)		
English primary language at home				
Yes	536 (69.4)	315 (70.8)	6	.20
No	224 (29.0)	125 (28.1)		
Missing	12 (1.6)	5 (1.1)		

[a] Analyses for this study were constrained to wave 6 data.

social norms, acceptability, perceived prevalence of use, and perceptions of risks and benefits separately for pod-based e-cigarettes, other e-cigarettes, and cigarettes.

Use

Participants were asked about ever use and number of days used in the past 7 days and past 30 days. Ever users of any type of e-cigarette were asked about the first type of e-cigarette they used.

Nicotine Dependence

The Hooked on Nicotine Checklist (HONC), a validated measure of the severity of reduced autonomy from nicotine, was used (HONC scores range from 0 to 10).[35] Endorsement of any symptom indicates loss of full autonomy, and increasing scores indicate more severe loss of autonomy, presumed to signify greater nicotine dependence.

Flavors

Participants were asked if their first e-liquid was flavored; if the response was yes, they were asked what the first flavor was that they used. Response choices for JUUL e-cigarettes reflected available JUULpod flavors at the time of survey administration: not sure/don't remember, mango, cool mint, Virginia tobacco, fruit medley, crème brûlée, cool cucumber, classic tobacco, cool menthol, and other (participants could fill in the flavor). For comparability and ease of interpretation, flavors were categorized into the following: tobacco, menthol and mint, fruit, dessert and sweets, alcohol, spice, candy, coffee and tea, beverage, unflavored, and don't know and other, as delineated by Yingst et al.[36]

Social Norms, Acceptability, and Perceived Prevalence

Participants were asked how many of their 5 closest friends and how many of 100 adolescents and young adults their age have tried e-cigarettes or cigarettes, used e-cigarettes or cigarettes in the past 30 days, and use e-cigarettes or cigarettes regularly? They were then asked to indicate their agreement with statements that their friends think it is okay to try e-cigarettes or cigarettes, use e-cigarettes or cigarettes once in a while, or use e-cigarettes or cigarettes regularly.

Perceptions of Risks and Benefits

Queries regarding risks and benefits of e-cigarettes or cigarettes presented a scenario describing a specific context to consider. After the scenario, participants were asked the perceived chance (0%-100%) of experiencing specific health and social risks and benefits (eTable 1 in the Supplement).

Study Size and Potential Bias

There has been dropout across the waves of the study, and the original sampling frame was all students in the 9th and 12th grades from the 10 participating high schools. Rather than make population-level estimates beyond these schools, the overarching cohort study was designed to examine changes in use and perceptions of tobacco products over time. The current analysis is constrained to wave 6, the only survey with items pertaining to pod-based e-cigarettes. In accordance with the AAPOR reporting guideline for survey studies,[37] the participation rate for wave 6 was 43.0% (540 students who initiated the survey of 1257 viable e-mail invitations containing survey links). Data for this study included only participants who completed the wave 6 survey (445 [82.4%]). Although there were differences in proportions for race/ethnicity between waves 6 and 1, no adjustments for dropouts are reported, as previous work with this cohort has revealed no association between race/ethnicity and our outcomes of interest.[9,10,32]

Statistical Analysis

Descriptive summaries include counts, means, and percentages. Standard deviations were created using bootstrap estimates, which accounted for school clustering; no weighting scheme was deployed.

Because of the well-established difference in adolescent perceptions between cigarettes and e-cigarettes, cigarettes were included only in summaries of use.[10,38] Wilcoxon signed rank tests were performed to assess within-subject use patterns in the past 7 days and the past 30 days for pod-based and other e-cigarettes.

Exploratory analyses of HONC scores were performed. Ever users of any e-cigarettes were classified as either reporting signs of diminished autonomy (HONC score 1) or full autonomy (HONC score 0). A McNemar test was then performed comparing full autonomy with loss of autonomy. Next, to summarize the association between autonomy from nicotine and participants' age and sex, for both products, the binary outcome (diminished autonomy or full autonomy) was regressed on age (continuous) and sex (categorical). The Wilcoxon rank sum test was used to compare mean HONC scores by product. Among only those who reported diminished autonomy, mean HONC scores were compared by product using a paired *t* test. All *P* values were from 2-sided tests and results were deemed statistically significant at $P < .05$.

Results

Recognition and Use

A total of 229 of 445 students (51.5%) in our sample had heard of JUUL e-cigarettes, which did not significantly vary by sex. Ever use information was provided by 437 respondents, of which 68 (15.6%) reported use of pod-based e-cigarettes, 133 (30.4%) reported use of other e-cigarettes, and 106 (24.3%) reported use of cigarettes. The proportions of students reporting past 7-day use and past 30-day use of pod-based e-cigarettes, e-cigarettes, and cigarettes, together with frequencies of use among ever users, are shown in **Table 2**. Wilcoxon signed rank tests for differences detected differences between pod-based e-cigarettes and cigarettes for both past 7-day use (Wilcoxon statistic, 127; $P = .02$) and past 30-day day use (Wilcoxon statistic, 161.5; $P = .04$); differences between pod-based e-cigarettes (Wilcoxon statistic, 238; $P = .21$) and other e-cigarettes (Wilcoxon statistic, 143; $P = .41$) were not significant. The mean (SD) number of days that other e-cigarettes were used in the past 7 days was 0.8 (1.8) and in the past 30 days was 3.2 (7.4). The mean (SD) number of days that cigarettes were used in the past 7 days was 0.7 (1.8) and in the past 30 days was 3.0 (7.6). Among ever users of pod-based e-cigarettes, 18 (26.5%) reported their first e-liquid was flavored menthol or mint and 19 (27.9%) reported fruit (vs 13 [9.8%] and 50 [37.6%] for other e-cigarettes).

For users of pod-based e-cigarettes, co-use of other e-cigarettes and cigarettes was high, with only 4 of 163 students (2.5%) reporting exclusive use of pod-based e-cigarettes (vs 33 of 163 [20.2%] for exclusive use of other e-cigarettes and 24 of 163 [14.7%] for cigarettes) (**Table 3**); 41 of 163 participants (25.2%) reported use of all 3 products. Most often, pod-based e-cigarette users' first-used form of e-cigarette was a "vape pen" (14 of 61 [23.0%]), followed by "mods" (8 of 61 [13.1%]) and "large size 'tank' device" (8 of 61 [13.1%]), with 6 of 61 participants (9.8%) reporting pod-based e-cigarettes as their first form of e-cigarette. Of the 132 users of other e-cigarettes, 39 (29.5%)

Table 2. Use of Pod-Based e-Cigarettes, Other e-Cigarettes, and Cigarettes Among 437 California Adolescents and Young Adults in 2018[a]

Product	Ever Use, No. (%)	Any Past 30-d Use, No./Total No. (%)	Past 30-d Use, Mean (SD), d	Any Past 7-d Use, No./Total No. (%)	Past 7-d Use, Mean (SD), d
Pod-based e-cigarettes	68 (15.6)	40/68 (58.8)	6.7 (10.0)	25/68 (36.8)	1.5 (2.4)
Other e-cigarettes	133 (30.4)	40/133 (30.1)	3.2 (7.4)	26/133 (19.5)	0.8 (1.8)
Cigarettes	106 (24.3)	30/106 (28.3)	3.0 (7.6)	17/106 (16.0)	0.7 (1.8)

[a] Mean (SD) age, 19.3 (1.7) years.

indicated that a "vape pen" was their first form of e-cigarette, followed by "disposable/single use e-cigarettes" (18 [13.6%]), with 6 participants (4.5%) reporting JUUL as their first form of e-cigarette (these are the same 6 respondents cited in the use summary for pod-based e-cigarettes).

Nicotine Dependence

Models used to summarize associations between the loss of autonomy from nicotine and the variables of sex and age showed very little association with sex (all estimates were close to null) (eTable 2 in the Supplement shows regression results). A McNemar test considering any loss of autonomy vs some loss of autonomy revealed no significant within-participant differences between ever users of pod-based e-cigarettes vs ever users of other e-cigarettes (McNemar $\chi^2_1 = 1.07$; $P = .30$). A Wilcoxon signed rank test of the distributions of HONC scores among ever users similarly showed no statistically significant difference ($V = 123$; $P = .29$). Among participants who reported any loss of autonomy (n = 34), there was no difference in mean (SD) HONC scores between pod-based e-cigarettes (2.59 [3.14]) and other e-cigarettes (2.32 [2.55]; $t_{33} = 0.48$; $P = .63$).

Use of Flavors

Among ever users of pod-based e-cigarettes, 48 of 65 (73.8%) indicated that their first pod was flavored, and 17 of 65 (26.2%) indicated that theirs was not flavored. Of 65 ever users of pod-based e-cigarettes, the largest proportion (22 [34.9%]) reported that they were not sure or did not remember their first flavor, 18 (28.6%) reported cool mint or menthol as the first flavor, 19 (30.2%) reported fruit, 3 (4.8%) reported desserts or sweets, and 1 (1.6%) reported classic tobacco (**Table 4**). Among users of pod-based e-cigarettes, menthol or mint (18 [28.6%]) and fruit (19 [30.2%]) flavor categories were the most-reported first flavors; 50 of 107 (46.7%) users of other e-cigarettes reported fruit as their first flavor. No participant indicated using a flavor from the categories of alcohol, nuts or spices, candy, beverage, or unflavored (Table 4).

Social Norms (Use by Friends and Perceived Prevalence and Acceptability)

Participants reported that, of their 5 closest friends, on average, just over 2 had tried pod-based e-cigarettes, 3 had used pod-based e-cigarettes in the past 30 days, and 2 regularly use pod-based e-cigarettes. These numbers are virtually identical to those for use of other e-cigarettes (**Table 5**). Participants believed that, among 100 adolescents and young adults their age, 38.4 had tried pod-based e-cigarettes, and 30.6 had used pod-based e-cigarettes in the past 30 days or used regularly; numbers were slightly higher for other e-cigarettes (Table 5). Of 336 respondents, a total of 70 participants (20.8%) strongly agreed that it is okay to try pod-based e-cigarettes and 94 (28.0%) strongly disagreed, 76 (22.6%) strongly agreed it is okay to use pod-based e-cigarettes once in a while and 104 (31.0%) strongly disagreed, and 19 (5.7%) strongly agreed it is okay to use pod-based e-cigarettes regularly and 128 (38.1%) strongly disagreed. Proportions were similar for other e-cigarettes (eTable 3 in the Supplement).

Table 3. Frequency and Proportion of Participants Reporting Ever Use of Pod-Based e-Cigarettes, e-Cigarettes, and/or Cigarettes Among 445 California Adolescents and Young Adults in 2018[a]

Tobacco Product	Participants, No. (%) (n = 163)
Pod-based e-cigarettes only	4 (2.5)
e-Cigarettes only	33 (20.2)
Cigarettes only	24 (14.7)
Pod-based e-cigarettes and e-cigarettes only	21 (12.9)
Pod-based e-cigarettes and cigarettes only	2 (1.2)
e-Cigarettes and cigarettes only	38 (23.3)
Pod-based e-cigarettes, e-cigarettes, and cigarettes	41 (25.2)

Abbreviation: e-cigarette, electronic cigarette.

[a] Mean (SD) age, 19.3 (1.7) years.

Perceptions of Risks and Benefits

On average, participants perceived a 40% chance of experiencing social risks and short-term and long-term health risks from using pod-based e-cigarettes. Other than the lower perceived mean (SD) chance of experiencing "other tobacco-related disease" using pod-based e-cigarettes (44.0 [34.2]) vs e-cigarettes (48.7 [33.5]; t_{888} = 2.07; P = .04), the perceived chance of experiencing each risk and benefit was comparable for both types of e-cigarettes, although greater variability was observed for non-pod-based e-cigarettes for the item "better concentration" (eTable 1 in the Supplement).

Discussion

The 3 most concerning insights from the data presented here are the high prevalence of co-use and polyuse of pod-based e-cigarettes with other e-cigarettes and traditional cigarettes and the higher proportion of participants who reported past 30-day use together with the much higher frequency of use reported for pod-based e-cigarettes vs other e-cigarettes. These findings point to the potential for greatly increased harm for adolescents and young adults associated with the use of pod-based e-cigarettes, as their still-forming brains are particularly vulnerable to the effects of nicotine, with increased earlier exposure to nicotine being associated in a dose-response manner with deleterious health effects.[39]

Our findings of high proportions of students reporting past 30-day use and higher frequency of use for pod-based e-cigarettes align with those of Willett et al.[26] Emergent evidence of larger proportions of adolescents and young adults reporting past 30-day use of pod-based e-cigarettes suggests a different pattern of uptake among this demographic when one considers the national use pattern of other and earlier styles of e-cigarettes, wherein smaller proportions of users reported past

Table 4. First Flavors Used by Participants Reporting Use of Pod-Based e-Cigarettes and Other e-Cigarettes Among 445 California Adolescents and Young Adults in 2018[a]

	Participants, No./Total No. (%)	
First Flavor Used	Pod-Based e-Cigarettes	Other e-Cigarettes
First product flavored (yes)	48/65 (73.8)	108/133 (81.2)
First flavor used		
Tobacco	1/63 (1.6)	1/107 (0.9)
Menthol or mint	18/63 (28.6)	13/107 (12.1)
Fruit	19/63 (30.2)	50/107 (46.7)
Dessert or sweets[b]	3/63 (4.8)	19/107 (17.8)
Coffee or tea	0	1/107 (0.9)
Don't know or other	22/63 (34.9)	23/107 (21.5)

Abbreviation: e-cigarette, electronic cigarette.

[a] Mean (SD) age, 19.3 (1.7) years.

[b] Our survey response category "candy or dessert flavors (eg, caramel, vanilla, chocolate, ice cream, mud pie)" precluded us from differentiating between "candy" and "dessert."

Table 5. Comparison of Use of Pod-Based e-Cigarettes and Other e-Cigarettes Among 445 California Adolescents and Young Adults in 2018[a]

Product	Tried	Friends Who Used in Past 30 d	Use Regularly
Among 5 closest friends, mean (SD), No.			
Pod-based e-cigarettes	2.4 (1.1)	3.0 (1.5)	2.0 (0.9)
Other e-cigarettes	2.5 (1.1)	3.1 (1.5)	2.1 (1.0)
Among 100 people their age, mean (SD), No.			
Pod-based e-cigarettes	38.4 (28.0)	30.6 (26.0)	29.8 (25.8)
Other e-cigarettes	45.5 (24.7)	38.2 (24.7)	36.0 (24.6)

Abbreviation: e-cigarette, electronic cigarette.

[a] Mean (SD) age, 19.3 (1.7) years.

30-day use.[40] The high use frequency, prevalent co-use and polyuse of other e-cigarettes and/or traditional cigarettes, and larger proportion of current users of pod-based e-cigarettes could suggest a risk profile dissimilar to that for other e-cigarettes. Furthermore, Willett and colleagues[26] found that just 37% of current users of pod-based e-cigarettes knew that the product always contains nicotine. This finding shows how changing the form of delivery (eg, pod-based devices vs traditional cigarettes or other e-cigarettes) can confuse user perceptions (eg, nicotine content). Given its addictive nature, nicotine is a stable and worthwhile target for public health prevention messaging.

Although this descriptive study was not prospectively powered for testing group differences, point estimates suggest that adolescents and young adults perceive pod-based e-cigarettes to be less harmful than other e-cigarettes overall, a finding important to clinicians and public health professionals who have occasion to talk with and educate adolescents and young adults. For example, among those reporting any loss of autonomy from nicotine, slightly more severe loss of autonomy was reported by users of pod-based e-cigarettes. In other words, pod-based e-cigarettes are perceived as posing less harm or addictive potential while more nicotine dependence is being reported. This finding exemplifies the disconnect between the harm adolescents and young adults perceive and the harm they report experiencing (here, nicotine dependence), illustrating their apparent inability to connect the idea of addiction to the experience of it.[41]

Moreover, among adolescents and young adults who use them, pod-based e-cigarettes are synonymous with the brand-name JUUL and use is termed "juuling," whereas "vaping" has typically been used by youths to refer to using all other types of e-cigarettes. This use of language raises concern that adolescents and young adults who use pod-based e-cigarettes could be missed in surveys asking only about "vaping."[26,27,31] Although, as with cigarettes and non-pod-based e-cigarettes, mint and menthol and fruit flavors (known to be popular with youths) were the most often-reported flavors first tried,[8,21,42-46] we also found that many adolescents and young adults were either unaware of the fact that their e-liquid pod was flavored (all pod-based e-cigarette pods are flavored) or were unaware of the flavor that they used. Confusion about flavors could reflect the fact that adolescents typically share their e-cigarettes, regardless of style.[47]

Limitations

This study has some limitations. The survey draws from schools in California; as diffusion of newer pod-based e-cigarettes likely differs across states, generalization of use patterns is not warranted. Survey questions about pod-based e-cigarettes were not designed to address all the differences in participant understanding of the devices or the JUUL brand; however, questions concerning other e-cigarettes were identified with the phrase "e-cigarettes/vapes (not including JUUL)." We suspect that some differences in perception were obscured by the close proximity in which questions about pod-based e-cigarettes and other e-cigarettes were presented in the survey, although questions were randomly ordered, reducing order bias. Questions differentiated between JUUL and all other e-cigarettes; since other brands of pod-based e-cigarettes are available, it is possible that some respondents reported use of pod-based e-cigarettes that were not the JUUL brand in the category of "e-cigarette/vapes (not JUUL)." Given the primacy of the JUUL brand, it is unlikely that this issue would alter interpretation of the results.

Conclusions

Although pod-based e-cigarettes are the focus of this study, a broader concern is the emerging dynamic between novel tobacco products such as e-cigarettes and public health prevention efforts. For example, consider how, for years, traditional cigarettes had a clear, unified form for their delivery system and public health messaging was able to target and affect all brands of cigarettes simultaneously. In contrast, e-cigarettes take many forms, with variations seen in devices, flavors, e-liquids, power or voltage, and nicotine content. Hence, amid rapid innovations in e-cigarettes (eg, newer pod-based styles) and in the absence of clear, consistent public health prevention messaging

that targets relevant aspects common to all forms of e-cigarettes, further misperception of health risks, including nicotine addiction, could result. Public health prevention efforts are challenged to develop multifaceted and adaptive messaging that is necessary to reduce uptake and consumption of pod-based e-cigarettes and other emergent products among adolescents and young adults who otherwise would likely remain nicotine naive.

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SUPPLEMENT.

eTable 1. Perceived Chance of Experiencing Social and Short- and Long-term Health Risks and Benefits Among 445 California Adolescents and Young Adults in 2018: Comparison Between Use of JUUL and Other Styles of e-Cigarettes

eTable 2. Results From Logistic Regression Models Summarizing the Relationship Between Participants' Age and Gender With Autonomy Over Nicotine (Loss of Autonomy/No Loss of Autonomy): Three Models Comparing Between Use of JUUL/Pod-based and Other Styles of e-Cigarettes, Among California Adolescents and Young Adults in 2018 Who Indicated Some Use of the Given Product Type

eTable 3. Comparison of Perceived Acceptability of Different Use Frequencies Between JUUL and Other Styles of e-Cigarettes Among 445 California Adolescents and Young Adults in 2018

eAppendix. Survey Questions

Communication from Public

Name: Stanford University
Date Submitted: 08/02/2019 01:40 PM
Council File No: 18-1104
Comments for Public Posting:

Flavors Clearly Attract Youth

Bonnie Halpern-Felsher, PhD
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The number of youth using e-cigarettes and other new vaping products (herein: e-cigarettes) has reversed progress in reducing youth nicotine addiction, and continues to grow. Over the past year, high school students' use of e-cigarettes including pod-based products has increased by 78%, with 1 in 5 high school students reporting current use. Middle school students' use increased by 48%, with 1 in 20 middle school students reporting recent use.[1,2]

FDA's public statements about the growing epidemic of youth e-cigarette use suggest the agency recognizes the enormity of the problem. For example, speaking of the proposed new steps to reduce youth vaping by preventing their access to flavored tobacco products, FDA Commissioner Scott Gottlieb, MD, said:

> "Today, I'm pursuing actions aimed at addressing the disturbing trend of youth nicotine use and continuing to advance the historic declines we've achieved in recent years in the rates of combustible cigarette use among kids."
>
> "[A]ny policy accommodation to advance the innovations that could present an alternative to smoking – particularly as it relates to e-cigarettes – cannot, and will not, come at the expense of addicting a generation of children to nicotine through these same delivery vehicles. This simply will not happen. I will take whatever steps I must to prevent this." [3]

All flavors, including mint and menthol, in all tobacco products, not just e-cigarettes, should be prohibited

In order to attract young and new users, the tobacco industry adds characterizing flavors like mint, menthol, fruit, and candy to tobacco, often using the same flavorants that are in fruit-

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[3]November 15, 2018;https://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm625884.htm

flavored candy, and sometimes at higher doses.[4][5] These flavors appeal to new users by masking the harsh taste of tobacco, and in the case of e-cigarettes, resulting in a more pleasant smell than that found with tobacco alone.

Flavor or "taste" is one of the most common persuasive marketing techniques used to promote food (mostly candy and snacks) to children on TV.[6] Exposure to ads for flavored products is positively associated with youth consumption,[7] and most money spent by youth is on food or beverages, particularly sweets.[8] Research on e-cigarettes is consistent with these findings, concluding: flavors play an important role for online e-cigarette marketing and boosts user interaction and positive emotion;[9] flavored (vs. unflavored) e-cigarette ads elicit greater appeal and interest in buying and trying e-cigarettes; and the appeal of ads marketing flavors is linked to rapid and persistent adoption of e-cigarettes among youth.[10]

Youth are Attracted to Flavored Tobacco Products

The vast majority of youth in the US who try tobacco initiate with flavored tobacco products, including 81% of e-cigarette ever users, 65% of cigar ever users, and 50% of cigarette ever smokers.[11][12] Adolescents are more likely to report interest in trying an e-cigarette from a friend if it is menthol-, candy-, or fruit-flavored than if unflavored.[13] Flavor preferences are associated with higher e-cigarette use among adolescents.[14] Most adolescent current tobacco users cite flavors as a reason for use (including 81% for past 30-day e-cigarette users; 74% for past 30-day cigar users).[10] Three quarters of adolescent and young adult flavored tobacco product users reported they would quit if flavors were unavailable.[15]

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Youth and young adult tobacco users are more likely than older adult tobacco users to use flavored products, including menthol cigarettes,[16] flavored smokeless tobacco,[17] and flavored cigars.[18] Young smokers (12-17 years of age) are three times as likely to smoke menthol cigarettes than smokers 35 years and older.[19] Research among approximately 4000 school-going youth shows that for 98% of them, first e-cigarettes used were flavored to taste like something other than tobacco, compared to 44.1% of older adults nationwide. Fruit and candy flavors predominated for all groups; and, for youth, flavors were an especially salient reason to use e-cigarettes.[20] Finally, a recent study showed that only 1.5% of adolescent and young adult e-cigarette users used tobacco flavored-Juuls and .9% used tobacco-flavored other e-cigarette products. Instead, the majority used fruit or dessert flavors (33% for Juul users and 64% for other e-cigarette users) and 27% of Juul users and 12% of other e-cigarette users used mint or menthol flavors.[21]

Youth Believe Ads for Flavored E-cigarettes Target Them

Using flavors in e-cigarettes is a key marketing strategy to reach and recruit youth. In 2014, over 7,700 flavors for e-cigarettes were available, with greater than 240 new flavors being added per month.[22] What is most important is that youth believe flavored e-cigarette ads target them.

In a study[23] of California youth and young adults (mean age 17.5, SD = 1.7), participants were asked to indicate whether eight different ads for flavored e-cigarette products (Figure 2), randomly displayed, target someone younger than them, their age, someone a little older, or someone much older like their parents. Participants felt the ads were for someone just a little older than them (age 18 – 26; not for someone much older). More than half of participants felt

adults: What if flavors didn't exist? *Tob Regul Sci*. 2017;3(2):168-173.

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ads for *cherry*, *vanilla cupcake*, *caramel*, and *smoothie* flavors were for someone their age. Ads were also seen as targeting an audience younger than them. These findings suggest that while the tobacco industry argues that flavored tobacco products, including sweet and fruit flavored products, are not meant to attract youth, youth see them as aimed at them. ***These and similar findings indicate that we must immediately remove all flavored tobacco products from the market all tobacco.***[24]

Figure 2. Flavored e-cigarette ads shown to adolescents and young adults to elicit perceptions of the age of audience being targeted for each ad.

There is no scientific basis to keep mint and menthol flavored e-cigarettes and e-liquids on the market.

To successfully tackle youth e-cigarette use, we must ensure that all flavored tobacco products are prohibited. We need immediate action to ban all flavors in all products as part of our overall effort to protect youth.

Despite historic tobacco industry claims that menthol simply adds flavor, tobacco industry documents have revealed that the industry manipulates menthol levels to control a cigarette's intensity to cater to new and long-term smokers.[25]

Menthol and other characterizing flavors appeal to new users by masking the harsh taste of tobacco, and bright packaging associates flavored tobacco products with candy and other flavors.[26,27] Additionally, tobacco products with a characterizing flavor including fruit-flavored e-cigarettes[28] and menthol cigarettes[14] are perceived to be less harmful than unflavored or

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tobacco-flavored products. In addition, there is some evidence that menthol cigarettes are harder to quit.[29,30]

Mint and menthol target vulnerable youth. In the general population, differences in menthol use exist across race, gender, age, and sexual orientation. Rates of use of menthol flavored tobacco products are often higher in marginalized populations. African American smokers consistently have the highest menthol use rate.[31] Menthol use is also higher among female smokers;[27] Lesbian, Gay, and Bisexual smokers[32] (although see Rath et al 2013[33]); people with severe psychological distress; people with fewer years of education and lower income; and those who are unmarried or uninsured.[34]

The tobacco industry cultivated menthol use among African Americans by manipulating social factors of the civil rights era,[35] advertising menthol brand cigarettes, little cigars, and cigarillos in African American media and retail settings in African American neighborhoods,[36,37] and donating to African American leadership organizations.[38] The strategy has been so successful that even by 6th grade, African American youth were three times more likely to recognize menthol brands than their peers.[39]

Taken together, these data clearly show that youth <u>do</u> use mint and menthol flavors, that such flavorants are purposely added to attract both users and non-users, and that mint and menthol

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attract youth. As such, a ban on flavored e-cigarette products must include mint and menthol.

Summary

The evidence is clear. Youth are using e-cigarettes, including pod-based products, in record numbers. The increase in use of e-cigarettes is undermining and repealing the great progress that has been made by tobacco control efforts over the past two decades. Such increases in e-cigarette use come at a time when youth have negative views of cigarettes, compared to even 10 years ago.[40]

[40] McKelvey, K., & Halpern-Felsher, B. Adolescent cigarette smoking perceptions and behavior: Tobacco control gains and gaps amidst the rapidly expanding tobacco products market from 2001-2015. J of Adol Health, 60 (2017) 226e228

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eTable 1. Perceived Chance of Experiencing Social and Short- and Long-term Health Risks and Benefits Among 445 California Adolescents and Young Adults in 2018: Comparison Between Use of JUUL and Other Styles of e-Cigarettes
eTable 2. Results From Logistic Regression Models Summarizing the Relationship Between Participants' Age and Gender With Autonomy Over Nicotine (Loss of Autonomy/No Loss of Autonomy): Three Models Comparing Between Use of JUUL/Pod-based and Other Styles of e-Cigarettes, Among California Adolescents and Young Adults in 2018 Who Indicated Some Use of the Given Product Type
eTable 3. Comparison of Perceived Acceptability of Different Use Frequencies Between JUUL and Other Styles of e-Cigarettes Among 445 California Adolescents and Young Adults in 2018
eAppendix. Survey Questions

This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Perceived Chance of Experiencing Social and Short- and Long-term Health Risks and Benefits Among 445 California Adolescents and Young Adults* in 2018: Comparison Between Use of JUUL and Other Styles of e-Cigarettes

JUST BEGAN USING					
	JUUL		**Other types**		**x^2 for dif.**
	Mean	SD	Mean	SD	*p*-value
Social risks					
Friends will be upset	49.8	41.1	51.5	40.8	0.55
Get into trouble	52.7	40.9	52.8	41.0	0.98
Look cool	16.2	27.4	14.9	26.4	0.51
Short term health risks					
Bad cough	50.9	32.9	53.0	32.5	0.34
Trouble catching breath	50.6	33.6	54.3	32.2	0.11
Feel high or buzzed	49.9	36.9	48.8	43.2	0.69
Long term health risks					
COPD	21.3	27.5	22.1	27.5	0.66
Become addicted	60.8	33.9	62.7	32.0	0.41
Benefits					
Less stressed	26.9	29.5	27.4	29.6	0.80
Better concentration	10.0	20.6	11.8	45.7	0.47
Less anxious	26.2	29.3	26.9	29.2	0.76
Less depressed	19.9	26.4	21.0	27.0	0.57
CONTINUE TO USE FOR THE REST OF YOUR LIFE					
	JUUL		**Other types**		**x^2 for dif.**
	Mean	SD	Mean	SD	*p*-value
Health risks					
Oral cancer	45.4	32.0	47.1	31.6	0.43
Heart attack	41.8	32.5	42.6	32.0	0.72
Lung cancer	47.1	33.4	49.5	32.2	0.31
Other tobacco related disease	44.0	34.2	48.7	33.5	0.05
Other tobacco related death	42.2	34.2	45.6	33.7	0.16
Wrinkles	51.4	36.7	53.7	35.9	0.37
Benefits					
Less anxious	21.0	28.3	20.3	28.0	0.74
Less depressed	48.3	31.9	49.0	30.8	0.74

*mean age 19.3, SD=1.68

eTable 2. Results From Logistic Regression Models Summarizing the Relationship Between Participants' Age and Gender With Autonomy Over Nicotine (Loss of Autonomy/No Loss of Autonomy): Three Models Comparing Between Use of JUUL/Pod-based and Other Styles of e-Cigarettes, Among California Adolescents and Young Adults* in 2018** Who Indicated Some Use of the Given Product Type

	JUUL (N=67)		E-CIG (N = 130)		EITHER (N=136)	
	Coef †	**p-value**	**Coef †**	**p-value**	**Coef †**	**p-value**
Age	0.01	0.98	-0.10	0.64	-0.03	0.86
Male	0.22	0.87	-0.23	0.79	-0.45	0.59
Trans-gender	-1.45	1.00	-14.1	0.99	-14.24	0.99

* mean age 19.3, SD=1.68

**For both pod-based and other e-cigarettes the binary outcome (diminished autonomy/full autonomy) was regressed on age (continuous) and gender (categorical).

†Coefficients are reported on logit scale.

eTable 3. Comparison of Perceived Acceptability of Different Use Frequencies Between JUUL and Other Styles of e-Cigarettes Among 445 California Adolescents and Young Adults* in 2018

FRIENDS THINK IT IS OK TO:	STRONGLY AGREE		AGREE		DISAGREE		STRONGLY DISAGREE	
	JUUL	Other types	JUUL	Other types	JUUL	Other types	JUUL	Other types
TRY	84 19.4%	86 20.0%	137 31.7%	162 37.6%	92 21.3%	71 16.5%	119 27.5%	112 26.0%
USE ONCE IN A WHILE	100 23.4%	99 23.1%	64 15.0%	62 14.5%	134 31.3%	150 35.0%	130 30.4%	118 27.5%
USE REGULARLY	26 6.0%	32 7.4%	99 23.0%	114 26.4%	147 34.2%	131 30.3%	158 36.7%	155 35.9%

*mean age 19.3, SD=1.68

eAppendix. Survey Questions
Complete list of survey questions, including response choices, by content area, for measures reported on in this study.

Recognition

Participants were asked: “Before today have you ever heard of a JUUL?” [Response choices: yes or no]

Use

Ever use

Participants were asked: During your entire life, about how many times have you EVER [used a JUUL, used an e-cigarette, smoked a cigarette] even just a puff... [Response choices: Never; 1-2 times; 3-10 times; 11-19 times; 20-30 times; 31-99 times; 100 or more times]

Participants who indicated ever using any type of e-cigarette were asked:

First use

When you used an electronic cigarette/e-cig/vape pen/vapor pens for the first time, which of the following did you use? [Response choices: Disposable/single use E-Cigarettes, Rechargeable cigarette-shaped, Larger than a cigarette, Large size "tank" device, Hookah pens, Vape pens, Mods, JUULs, Other/Don't know]

Did the first e-cigarette/vape you used contain NICOTINE? [Response choices: yes, no, unsure]

Was the FIRST [e-cigarette/vape, JUUL] you used flavored? [Response choices: yes, no]

Current use

During the LAST 30 DAYS, ON ABOUT HOW MANY DAYS did you smoke/use… [an e-cigarette, JUUL, a cigarette] (Put a 0 if you did not use the product in the last 30 days). [Response: number of days 0 to 30]

In the LAST 7 DAYS, ON ABOUT HOW MANY DAYS did you smoke/use... [an e-cigarette, JUUL, a cigarette] (Put a 0 if you did not use the product in the last 7 days) [Response: number of days 0 to 7].

Flavors

Participants who indicated ever-use of JUUL-style e-cigarette were asked: What flavor was the first JUUL you used? [Response choices for JUUL: Not sure/Don't remember, Mango, Cool Mint, Virginia Tobacco, Fruit Medley, Creme Brulee, Cool Cucumber, Classic Tobacco, Cool Menthol, Other (fill in)]

Participants who indicated ever-use of other e-cigarettes/vapes were asked: What flavor was the FIRST e-cigarette/vape you used? [Response choices for other e-cigarettes: Not sure/Don't remember, Tobacco flavored, Mint, Wintergreen, Menthol, Fruit (e.g., cherry, blueberry, strawberry, watermelon, coconut), Coffee (coffee or any related flavor – e.g., espresso, latte, cappuccino, etc.), Candy or dessert flavors (e.g., caramel, vanilla, chocolate, ice cream, mud pie), Spice (e.g., clove, cinnamon, nutmeg), Alcohol or cocktail (e.g., wine, bourbon, rum, brandy, tequila, whiskey, beer, mai-tai, daiquiri), Other (fill in)]

Perceptions

Social norms of JUUL and e-cigarettes:

Out of 5 of your CLOSEST FRIENDS, how many have EVER TRIED [an e-cigarette, JUUL]? [Response: between 0 and 5]

OUT OF 5 OF your CLOSEST FRIENDS, how many have USED [an e-cigarette, JUUL]? [Response: between 0 and 5]

IN THE PAST 30 DAYS? OUT OF 5 OF your CLOSEST FRIENDS, how many have USED [an e-cigarette, JUUL] REGULARLY? [Response: between 0 and 5]

Social acceptability of JUUL and e-cigarettes:

FRIENDS think it is ok (socially acceptable) for me to TRY just once [an e-cigarette, JUUL]? [Response choices: strongly disagree, disagree, agree, strongly agree]

FRIENDS think it is ok (socially acceptable) for me to USE ONCE IN A WHILE [an e-cigarette, JUUL]. [Response choices: strongly disagree, disagree, agree, strongly agree]

FRIENDS think it is ok (socially acceptable) for me to USE REGULARLY [an e-cigarette, JUUL]. [Response choices: strongly disagree, disagree, agree, strongly agree]

Perceived Prevalence

Out of 100 TEENS/YOUNG ADULTS YOUR AGE, how many do you think HAVE TRIED… [an e-cigarette, JUUL] [Response: number out of 100]

Out of 100 TEENS/YOUNG ADULTS YOUR AGE, how many do you think HAVE USED IN THE PAST 30 DAYS… [an e-cigarette, JUUL] [Response: number out of 100]

Out of 100 TEENS/YOUNG ADULTS YOUR AGE, how many do you think USE [an e-cigarette, JUUL] REGULARLY? [Response: number out of 100]

Short term risks or benefits

Participants first read the following scenario: Whether or not you have used any of these products, imagine that you JUST BEGAN USING [an e-cigarette, JUUL]. You use it about 2 to 3 times a day, every day. Sometimes you use it alone and sometimes you use it with friends. If you use the product 2 to 3 times each day, what is the chance that ...[Response: 0-100%]:

- You'll get a bad cough,
- You'll have trouble catching your breath,
- You'll have better concentration,
- Your friends will be upset with you,
- You'll feel less stressed,
- You'll get into trouble,
- You'll look cool,
- You'll become addicted to the product,
- You'll feel high or buzzed,
- You'll get lung disease (COPD),
- You'll feel less anxious,
- You'll feel less depressed.

Perceived long term risks

Participants first read the following scenario: Imagine now that you CONTINUE TO USE [an e-cigarette, JUUL] 2 to 3 times a day, every day FOR THE REST OF YOUR LIFE. What is the chance that… [Response: 0 to 100%]

- You'll get oral (mouth) cancer,
- You'll have a heart attack,
- You'll get lung cancer,
- You'll get another tobacco-related disease,
- You'll get wrinkles on your face,
- You'll die from a tobacco-related disease,
- You'll feel less anxious,
- You'll feel less depressed.

Addiction or Nicotine Dependence

Participants were asked the following 10 questions, which constitute the Hooked On Nicotine Checklist. [Response choices for all: yes, no]

Have you ever TRIED TO QUIT E-cigarettes/vapes (not including JUULs) or JUULs below but couldn't?

Do you use E-cigarettes/vapes (not including JUULs) or JUULs now because it is really hard to quit?

Have you ever FELT LIKE YOU WERE ADDICTED to using E-cigarettes/vapes (not including JUULs) or JUULs?

Have you ever felt like you REALLY NEEDED E-cigarettes/vapes (not including JUULs) or JUULs?

Do you ever have STRONG CRAVINGS for E-cigarettes/vapes (not including JUULs) or JUULs?

Is it hard to keep from using E-cigarettes/vapes (not including JUULs) or JUULs where you are not supposed to (like in school)?

If you have tried to stop using e-cigarettes/vapes (not including JUULs) or JUULs or if you have not used these product(s) for a while:

Did you find it hard to concentrate because you could not use E-cigarettes/vapes (not including JUULs) or JUULs?

Did you feel more irritable because you could not use E-cigarettes/vapes (not including JUULs) or JUULs?

Did you feel a strong need or urge to use any of E-cigarettes/vapes (not including JUULs) or JUULs?

Did you feel nervous, restless, or anxious because you couldn’t use E-cigarettes/vapes (not including JUULs) or JUULs?