

6/12/2026

Vaping and Oral Health

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GENERATIONS OF E-CIGARETTES & VAPE PENS



CIG-A-LIKE (2007)

E-Cigarettes came onto the market around 2007. Most looked very similar to a traditional cigarette.

0mg/mL - 6mg/mL



MODS/TANKS (2012)

Large size, modifiable e-cigarettes allow for more aerosol, nicotine, and other chemicals to be breathed into the lungs at a faster rate. E-juice and e-liquid often put in externally.

0mg/mL - 36mg/mL



SINGLE-USE/DISPOSABLE* (2018-NOW)

These e-cigarettes are currently the most popular and range in sizes and color. They typically contain high nicotine content and are highly addictive.

0mg/mL - 50mg/mL



VAPE PENS (2009)

These have batteries that can reach higher temperatures, have refillable e-liquid cartridges, and allow users to regulate the frequency of inhalations.

0mg/mL - 18mg/mL

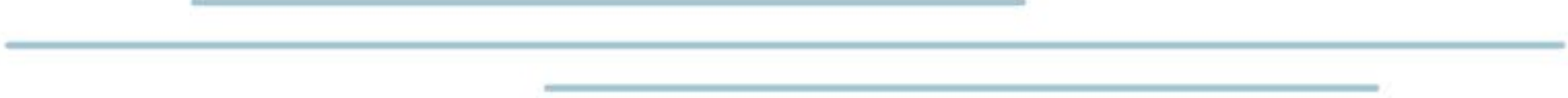


POD-BASED (2015-2017)

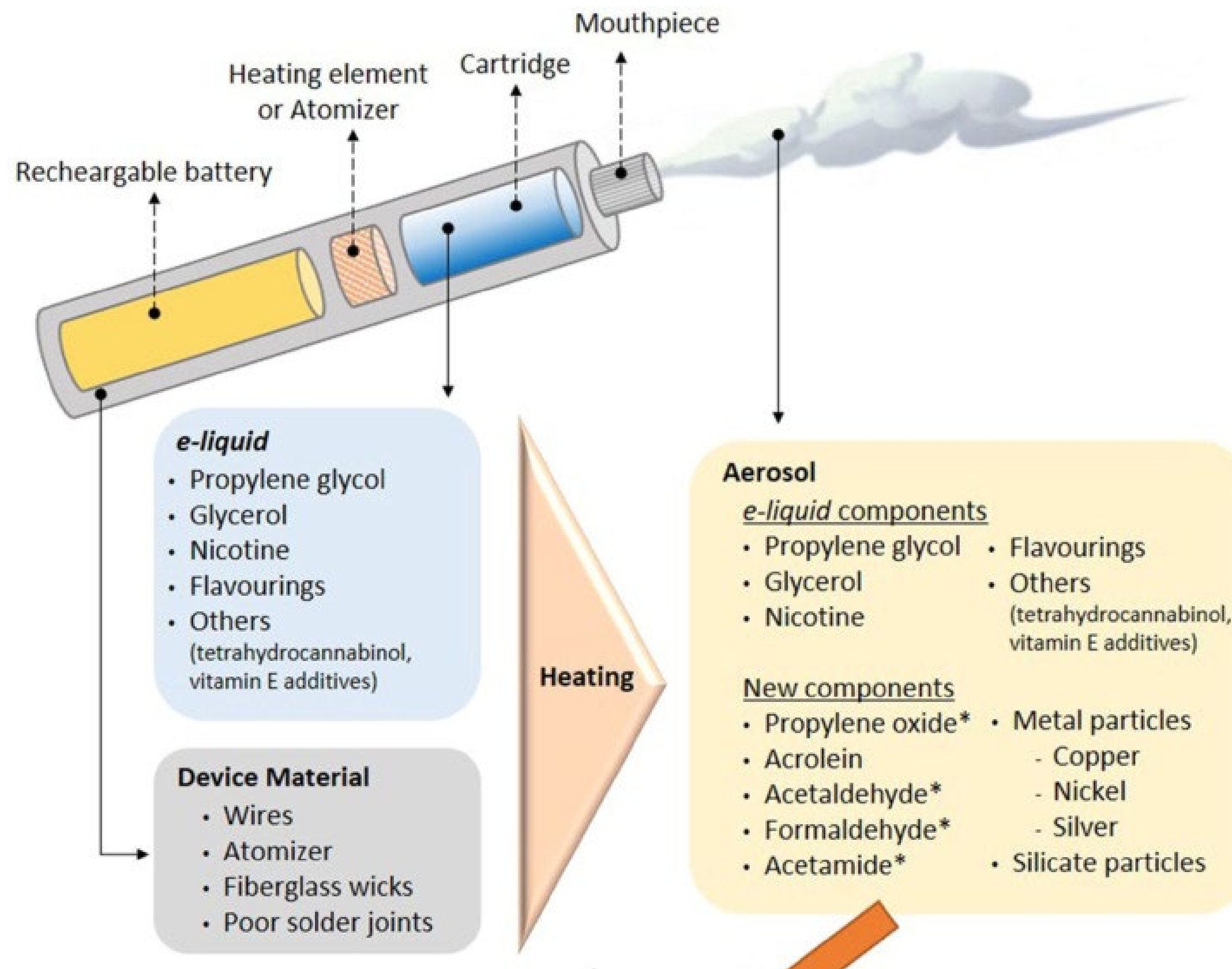
These e-cigarettes are shaped like USBs or different shapes, and contains pods with higher amounts of nicotine than previous generations.

0mg/mL - 50mg/mL

*Disposable vapes contain harmful chemicals and cannot be thrown away normally and should be disposed in proper manner.



E-Cigarette Components



THE DIFFERENCE BETWEEN

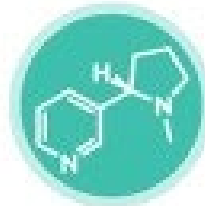
HEATS TOBACCO



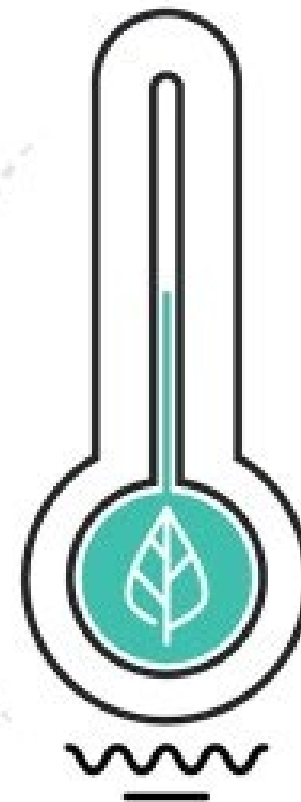
USES REAL
TOBACCO



NICOTINE
NATURALLY
PRESENT IN
TOBACCO



NO ASH,
NO SMOKE



**HEATED
TOBACCO**

VS



E-CIGARETTE



VAPORIZES E-LIQUID



NO TOBACCO



NICOTINE
DERIVED FROM
TOBACCO ADDED
IN E-LIQUID



NO ASH,
NO SMOKE

SMOKE-FREE PRODUCTS ARE NOT RISK-FREE AND ARE ADDICTIVE. THE BEST CHOICE
A SMOKER CAN MAKE IS TO QUIT CIGARETTES AND NICOTINE COMPLETELY.



PHILIP MORRIS
INTERNATIONAL

VAPE AEROSOL TOXINS

Nicotine – a highly addictive substance that negatively affects adolescent brain development

Propylene glycol – a common additive in food; also used to make things like antifreeze, paint solvent, and artificial smoke in fog machines

Carcinogens- chemicals known to cause cancer, including acetaldehyde and formaldehyde

Acrolein – a herbicide primarily used to kill weeds, can cause irreversible lung damage

Diacetyl – a chemical linked to a lung disease called bronchiolitis obliterans aka "popcorn lung"

Diethylene glycol – a toxic chemical used in antifreeze that is linked to lung disease

Heavy metals such as nickel, tin, lead

Cadmium – a toxic metal found in traditional cigarettes that causes breathing problems and disease

Benzene – a volatile organic compound (VOC) found in car exhaust

Ultrafine particles that can be inhaled deep into the lungs

Where Else Can You Find These Chemicals?

Propylene glycol → Antifreeze



Acetone → Nail Polish Remover



Ethylbenzene → Paints, Pesticides



Formaldehyde → Embalming



Nicotine → Cigarettes



Rubidium → Fireworks

Common Side Effects of Vaping Include:

- Coughing
- Dry/sore mouth and throat
- Mouth and throat irritation
- Weakened taste
- Burning or scratchy feeling in mouth, lips and throat

E-Liquid Contents



E-Cigarette/Vape Pen Liquid Ingredients

Propylene Glycol
Vegetable Glycerin
Nicotine
Flavoring Chemicals

CIGS IN AN E-CIG

1 Pack of Cigarettes
= ~22mg of Nicotine



AMOUNT OF NICOTINE IN

~20
CIGARETTES



1 JUUL Pod
= ~41.3mg of Nicotine



AMOUNT OF NICOTINE IN

~37
CIGARETTES



1 Vuse Pod
= ~90mg of Nicotine



AMOUNT OF NICOTINE IN

~82
CIGARETTES



1 Elf Bar
= ~650mg of Nicotine



AMOUNT OF NICOTINE IN

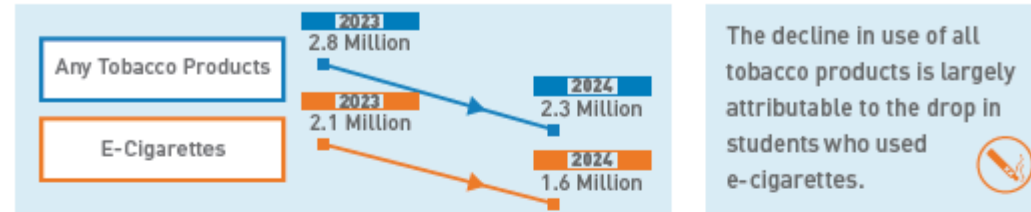
~590
CIGARETTES



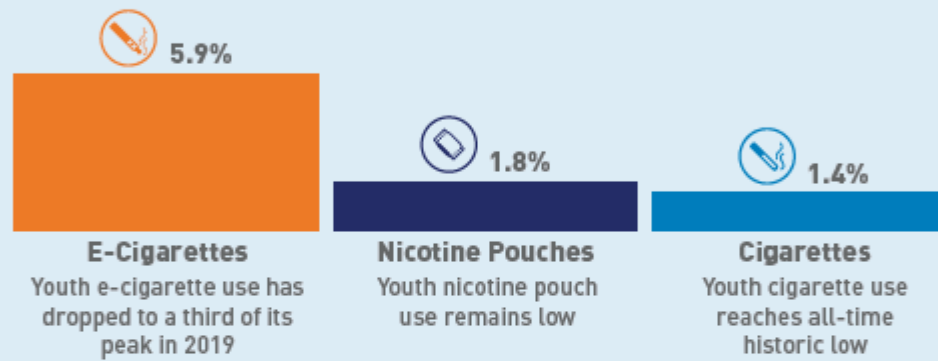
NYTS
2024

Youth Tobacco Product Use Drops to Lowest Level in Past 25 Years

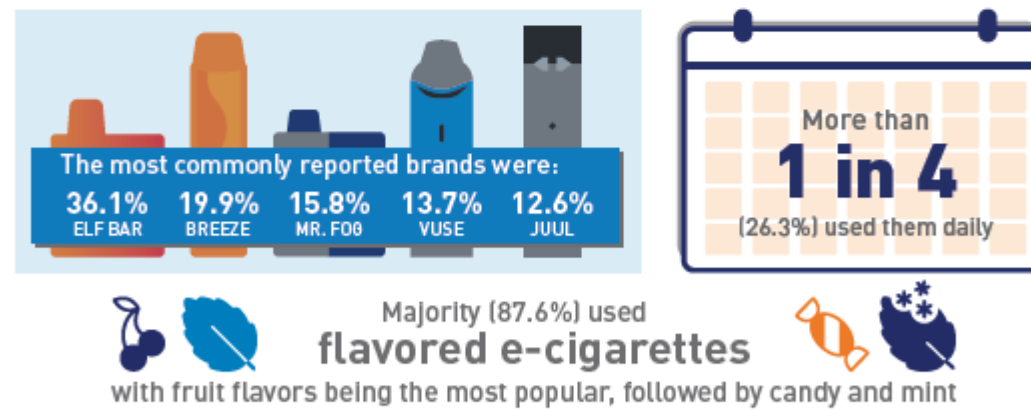
Half a Million Fewer Students Used Tobacco Products in 2024



Most commonly used products among middle and high school students:



Among those who reported current e-cigarette use:



Youth use of tobacco products in any form - including e-cigarettes - is unsafe. Keeping tobacco products out of the hands of youth remains a top priority for the FDA.

Note: Current use: use on 21 day during the last 30 days. All numbers presented here are estimates.
Source: Jamal A, Park-Lee E, Bindsey J, et al. Tobacco Product Use Among Middle and High School Students — National Youth Tobacco Survey, United States, 2024. MMWR Morb Mortal Wkly Rep 2024;73:117–124.
Park-Lee E, Jamal A, Cowan H, et al. Notes from the Field: E-Cigarette and Nicotine Pouch Use Among Middle and High School Students — United States, 2024. MMWR Morb Mortal Wkly Rep 2024;73:774–778.

CENTER FOR TOBACCO PRODUCTS

CTP-109





Medical News in Brief

November 22, 2023

E-Cigarette Use Down in Children and Teens

Emily Harris

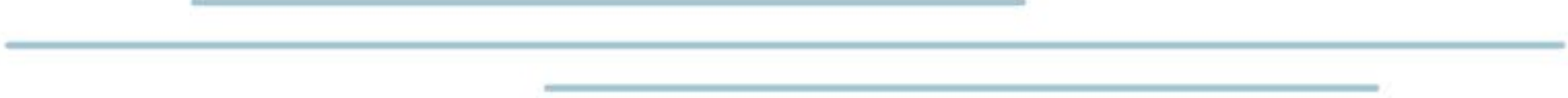
Article Information

JAMA. 2023;330(22):2145. doi:10.1001/jama.2023.22932

More than half a million fewer US middle and high school students used tobacco products this year compared with last year. This finding came from estimates based on answers from 22 000 respondents to the 2023 National Youth Tobacco Survey. E-cigarettes were the most common product among students who reported any tobacco use, with about one-quarter vaping e-cigarettes daily.

The majority—almost 90%—of students who reported using e-cigarettes used flavored products, especially fruit and candy flavors. In addition, 60% said that they used disposable e-cigarettes, which are inexpensive and contain a large amount of nicotine.

The report, which was coproduced by the US Centers for Disease Control and Prevention and the US Food and Drug Administration (FDA), follows the FDA’s fall announcement that the agency will seek civil money penalties from retailers who sell unauthorized e-cigarette products. “We will not stand by as bad actors place profit over the health of our nation’s youth,” Brian King, PhD, MPH, the director of the FDA’s Center for Tobacco Products, said in a statement.



Effects of Vaping On Oral Health

- **DRY MOUTH** - Caused by Propylene Glycol which steals moisture from its surrounding

Dry Mouth

Gum Irritation and Inflammation

- **GUM IRRITATION AND INFLAMMATION** - Caused by Nicotine and flavorings which cause oxidative stress and inflammatory cytokine release at PDL level. Also the e-liquid by-products, such as the “-aldehydes” cause tissue irritation and inflammation

Altered Oral Microbiome

- **ALTERED ORAL MICROBIOME** - Due to overgrowth of pathogens due to lessened immune response, potentially leading to earlier periodontal disease onset/progression

Cellular Damage

- **CELLULAR DAMAGE** - Partly due to the restriction of blood vessels caused by Nicotine, as well as, DNA damage and the cell's response to toxic aerosol chemicals

Nicotine Impact

- **NICOTINE IMPACT** - Restricts blood vessels and blood flow leading to gum tissue death and recession

Increased Risk of Cavities

- **INCREASED RISK OF CAVITIES** - Due to consolidation of dry mouth and chemical exposure, as well as the lack of saliva

Oral Lesions

- **ORAL LESIONS** - Can be caused by both chemical and physical burns and are manifestations of the cellular chemical damage

Enamel Erosion

- **ENAMEL EROSION** - Stems from the breakdown of Propylene Glycol into acids damaging the enamel



VAPES AND CIGARETTES

Different products. Same dangers.



GET THE FACTS



Some vape pods have as much nicotine as **20 cigarettes**.



It's not water vapor—
aerosol from vaping has **cancer-causing chemicals**.



Nicotine can **harm your brain**, including your **memory** and **ability to learn**.



If you vape, you are **4 times more likely** to smoke cigarettes.

mass.gov/vaping

@GetTheVapeFacts

Massachusetts
Department
of Public Health



TC0801 06/2019



ORAL HEALTH RISKS OF VAPING

what is VAPING?

The inhalation of vapor from a battery-operated device (such as an electronic cigarette). The vapor is created when the liquid or solid that may contain nicotine, flavorings, and other chemicals is heated.¹



**69% OF PEOPLE
VAPING ARE MALE**

66% are between
18-34 years of age

**MORE THAN 2 MILLION STUDENTS FROM GRADES 6-12
CURRENTLY USE E-CIGARETTES**

11.3%
of high school students

2.8%
of middle school students

USE E-CIGARETTES
nearly 85% use flavored
e-cigarettes





NEARLY 50%

of people using e-cigarettes have had gum disease or oral infections.

Nicotine, whether smoked or vaped, restricts blood flow to gums, which contributes to periodontal disease.



Exposure to e-cigarette aerosol can cause an increase of bacteria in the mouth. An increase in bacteria can lead to tooth decay, cavities, and gum diseases. Vaping can also cause dry mouth and inflamed gums.

The ADA states that “e-cigarettes [impact] on human health goes beyond respiratory and cardiac systems and may have significant implications on oral health.”



SOURCES

<https://nida.nih.gov/publications/drugfacts/vaping-devices-electronic-cigarettes>

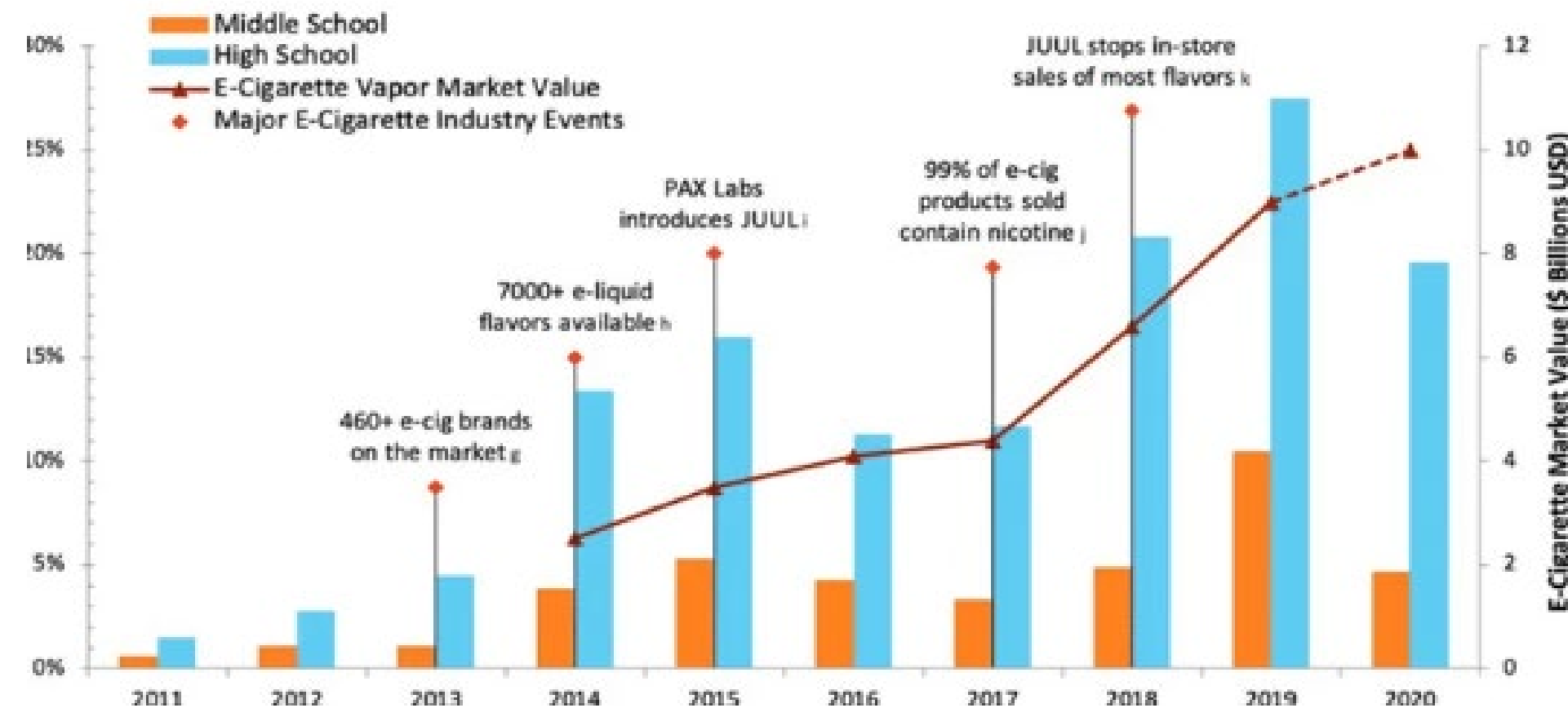
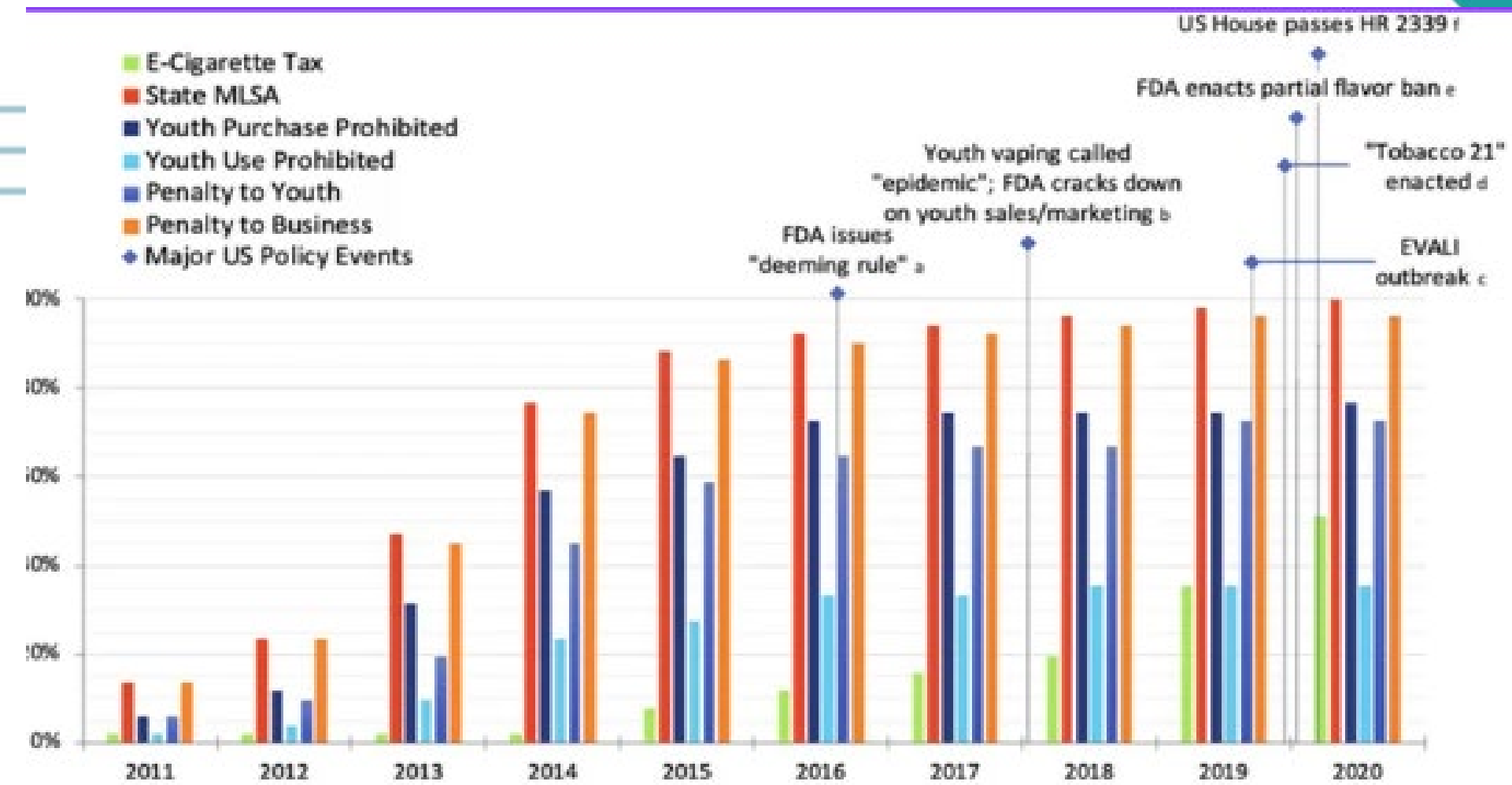
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<https://www.dentistrytoday.com/e-cigarette-usage-may-complicate-oral-surgery/>







THANK YOU

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WELL-AHEAD Dental Echo Facilitator

