

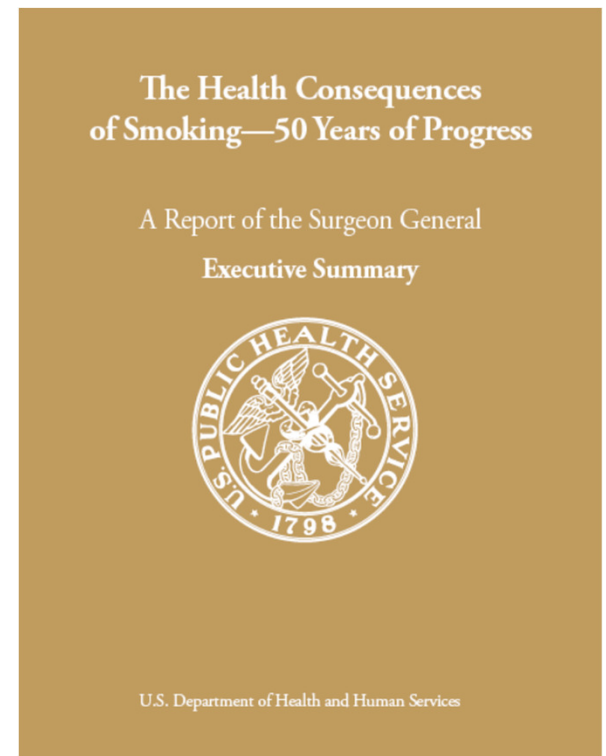
# The Bermuda Triangle of Cannabis, E-Cigarettes, and Other Tobacco Products

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Tobacco Education and Research Oversight Committee

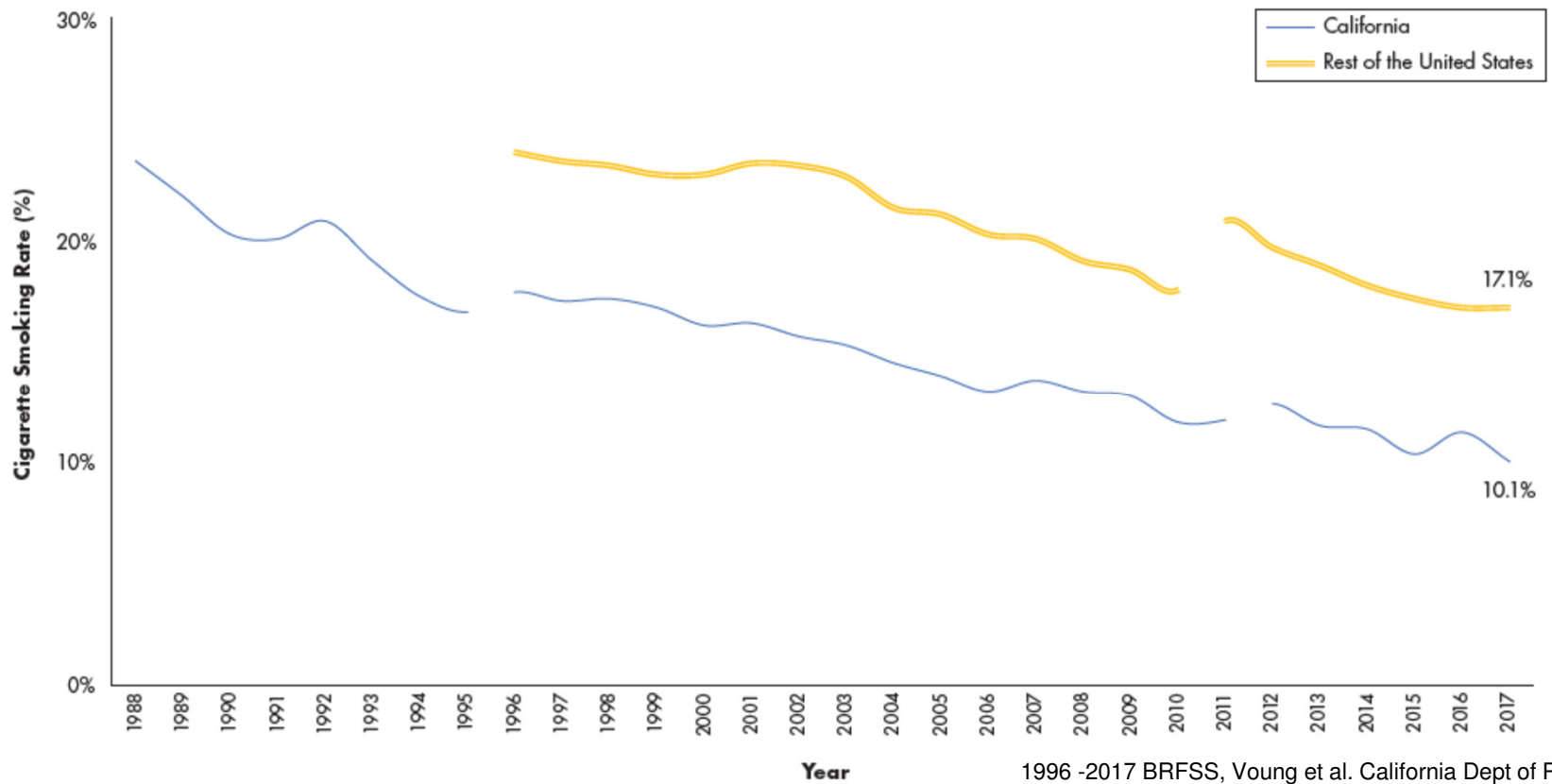
# We used to just be concerned about tobacco

- Leading preventable cause of death in U.S.
  - 480,320 die each year
  - 37,000 in CA each year
- Substantial costs
  - \$175.9 billion in annual smoking-attributable health costs
- 15.5% of U.S. adults are current smokers
  - 37.8 million adults



CDC, MMWR, 2018; SGR 2014

# Cigarettes: Nearing the Endgame?



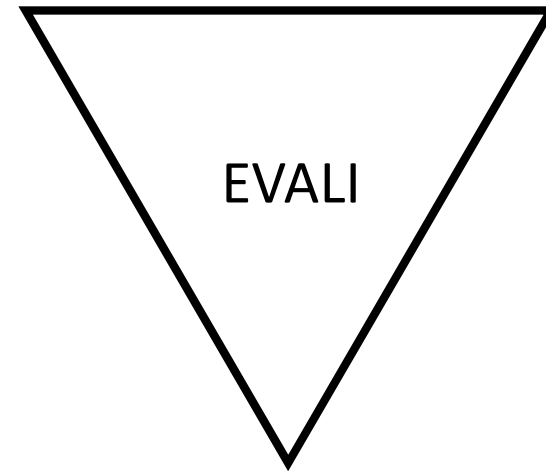
1996 -2017 BRFSS, Young et al. California Dept of Public Health, 2019

# Bermuda Triangle



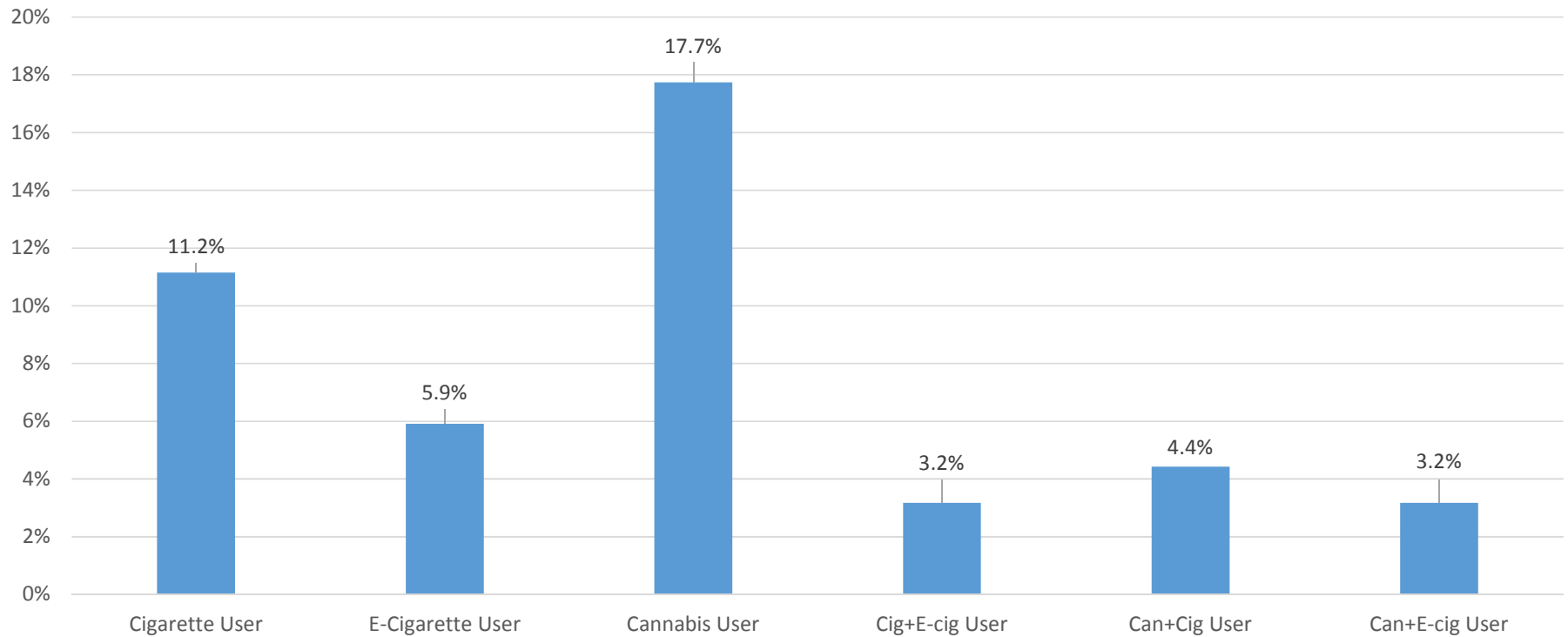
Cannabis

E-cigarettes

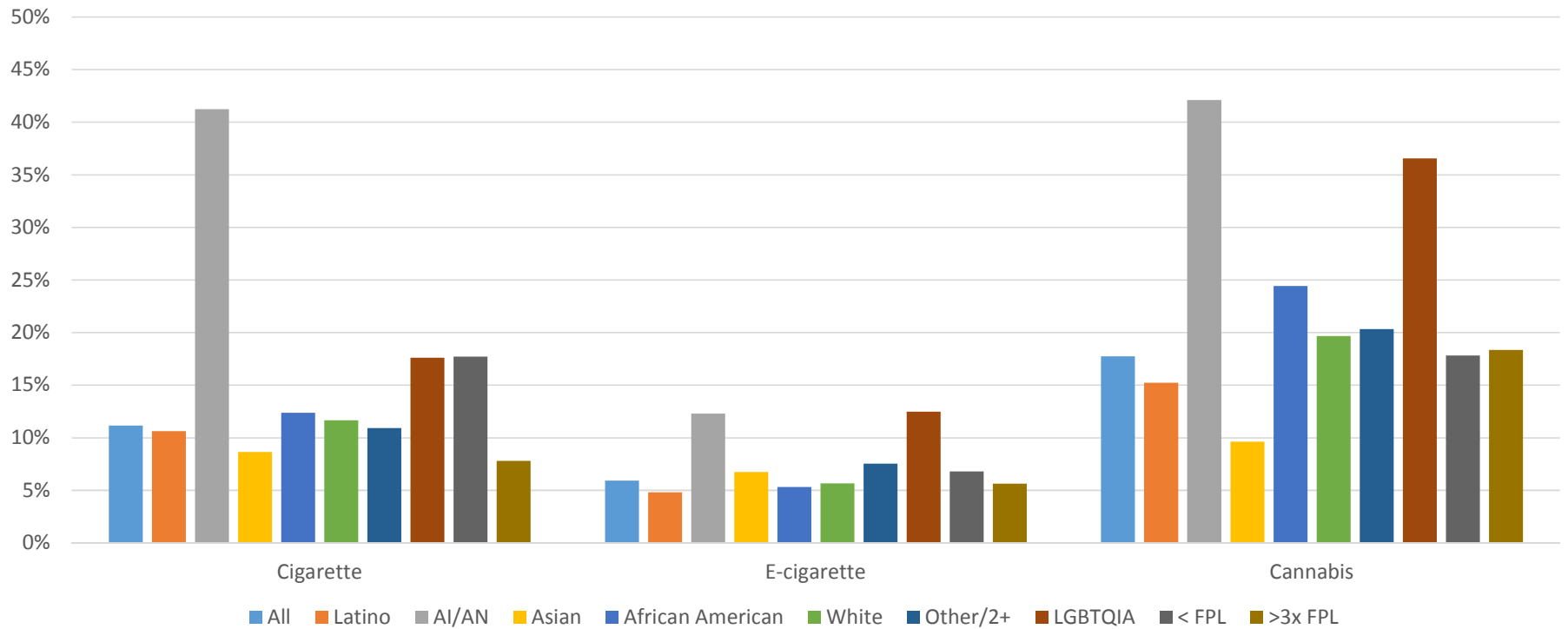


Tobacco: Cigarettes  
and Other Tobacco Products

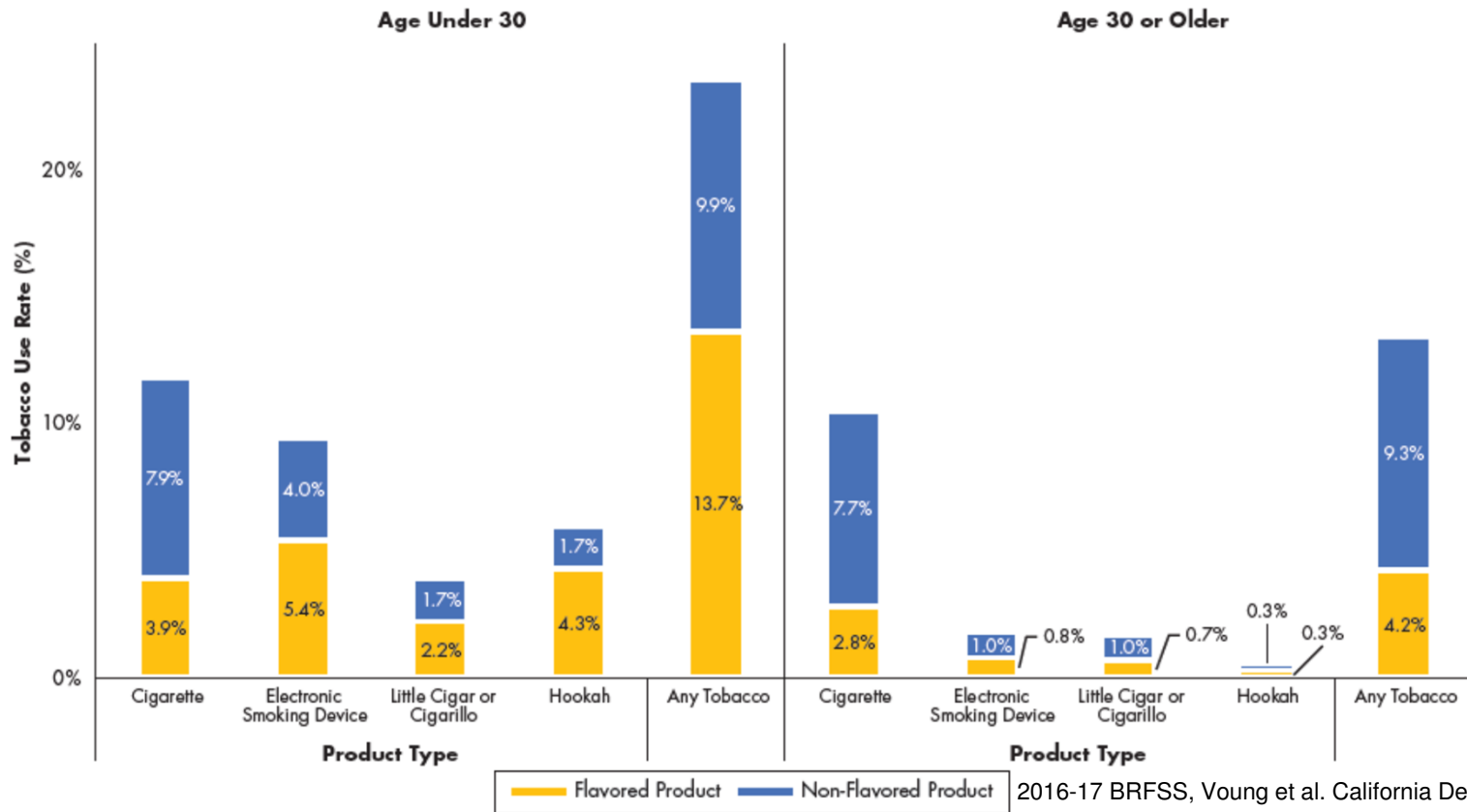
# California adults: Who uses?



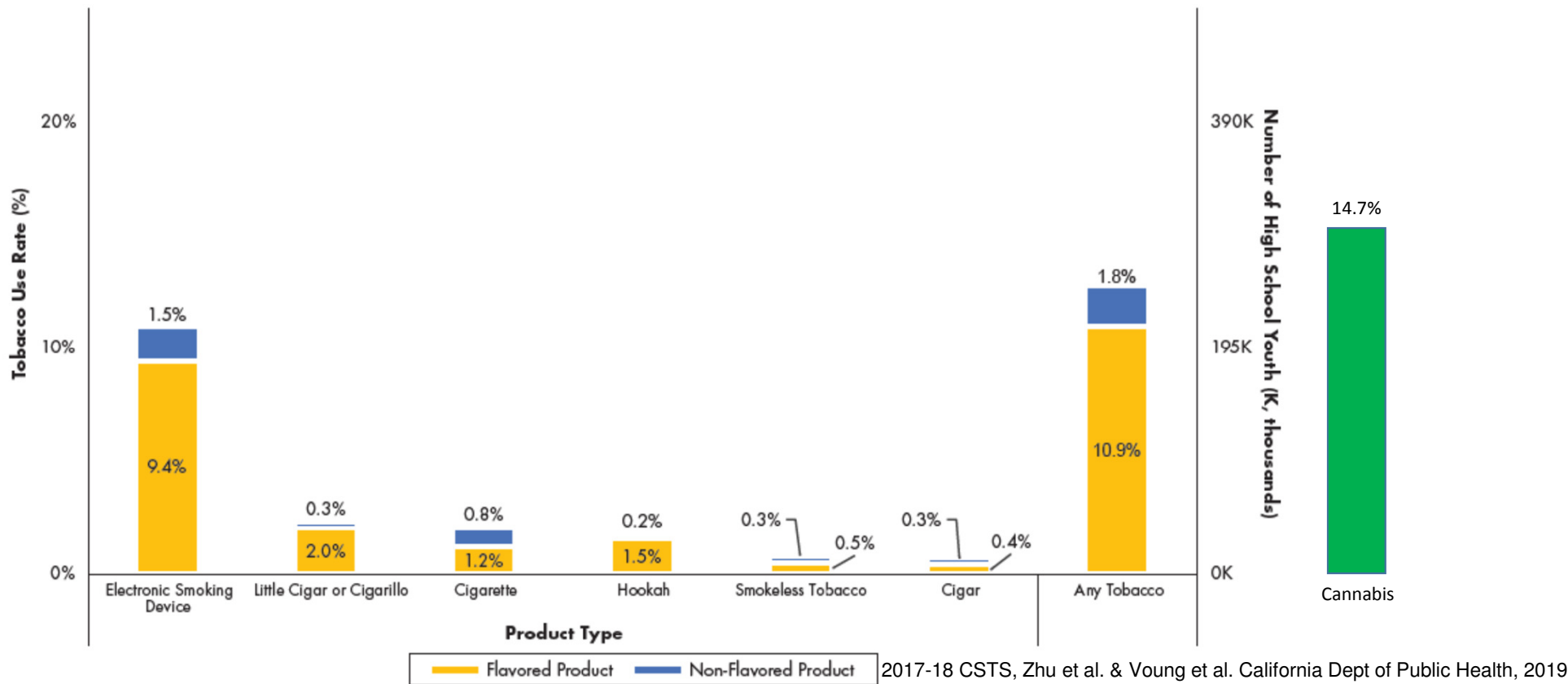
# California adults: Who uses by Subgroups



# California adults: Who uses: Flavors

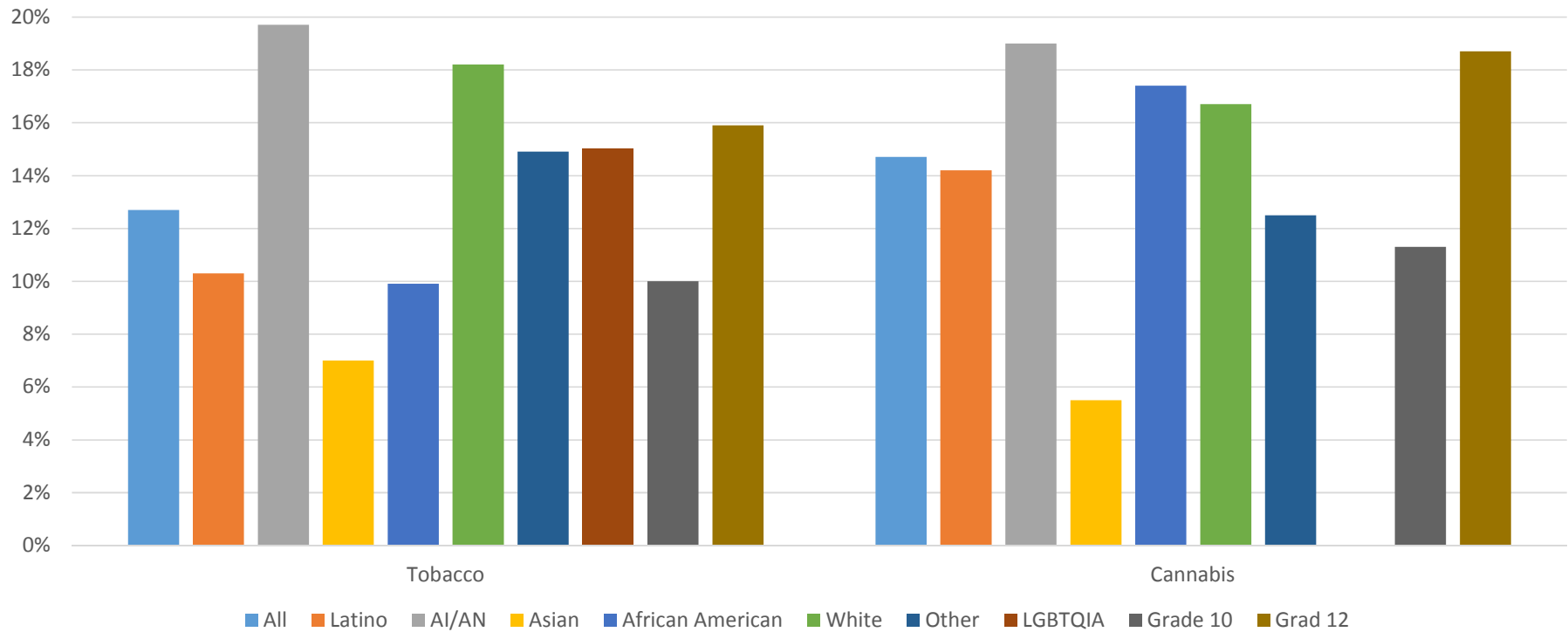


# California youth: Who uses





# California youth: Who uses by Subgroups



2017-18 CSTS, Zhu et al., 2019

# Surgeon General: e-cigarette youth epidemic

- E-cigarette use among U.S. middle and high school students increased 900% during 2011-2015, before declining for the first time during 2015-2017.
- Current e-cigarette use increased 78% among high school students during the past year, from 11.7% in 2017 to 20.8% in 2018.
- In 2018, more than 3.6 million U.S. youth, including 1 in 5 high school students and 1 in 20 middle school students, currently use e-cigarettes.



“I am officially declaring e-cigarette use among youth an epidemic in the United States”  
Surgeon General Jerome Adams December 2018

# E-cigarettes: how did this happen?

- Modern e-cigarettes era began in 2003
  - Developed first in China
  - Introduced in US in 2006
- Recognized in US as needing product regulation, but delayed
  - Family Smoking Prevention and Tobacco Control Act (2009)
  - US FDA classified e-cigarette as “tobacco product” April 2011
  - FDA regulations finalized 2016 but immediately sued by tobacco industry
  - Delays in FDA product review for e-cigarettes to August 2022
  - September 2019: Trump administration announces plans to require product review for e-cigarettes May 2020

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## Product

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### Disposable e-cigarette



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### Rechargeable e-cigarette



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### Pen-style, medium-sized rechargeable e-cigarette



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### Tank-style, large-sized rechargeable e-cigarette



# E-cigarettes: public health split

- Ongoing debate whether these could be used for cessation or harm reduction products
  - Recommended by UK NHS
  - USPSTF does not recommend for cessation
- 2019 RCT at UK free smoking cessation clinics
  - 886 patients randomized to e-cigarette or NRT
  - 1 year abstinence rate from smoking
    - E-cigarette: 18.0%, NRT: 9.9%
  - Of those who quit in each arm, 80% still using e-cigarettes, 4% still using NRT
  - 1 year abstinence rate from nicotine
    - E-cigarette: 3.7%, NRT: 9.0%

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

## A Randomized Trial of E-Cigarettes versus Nicotine-Replacement Therapy




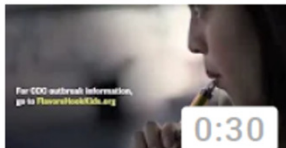
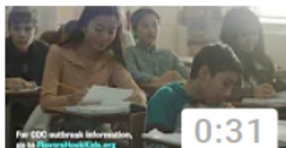
Peter Hajek, Ph.D., Anna Phillips-Waller, B.Sc., Dunja Przulj, Ph.D., Francesca Pesola, Ph.D., Katie Myers Smith, D.Psych., Natalie Bisal, M.Sc., Jinshuo Li, M.Phil., Steve Parrott, M.Sc., Peter Sasieni, Ph.D., Lynne Dawkins, Ph.D., Louise Ross, Maciej Goniewicz, Ph.D., Pharm.D., Qi Wu, M.Sc., and Hayden J. McRobbie, Ph.D.

ABSTRACT

Hayek et al, NEJM, 2019

# E-cigarette: California leading the way

- 2015: state health officer's report
  - Highlighted rapid rise, poisonings, and emerging health risks
- 2015: first media campaign highlighting health risks
  - stillblowingsmoke.org
- 2016: defined e-cigarettes and vaping products as tobacco products
  - Special legislative session
  - Proposition 56 subjected e-cigarettes to same excise tax as regular cigarettes
- 2019: "Outbreak" media campaign
  - part of governor's response to EVALI

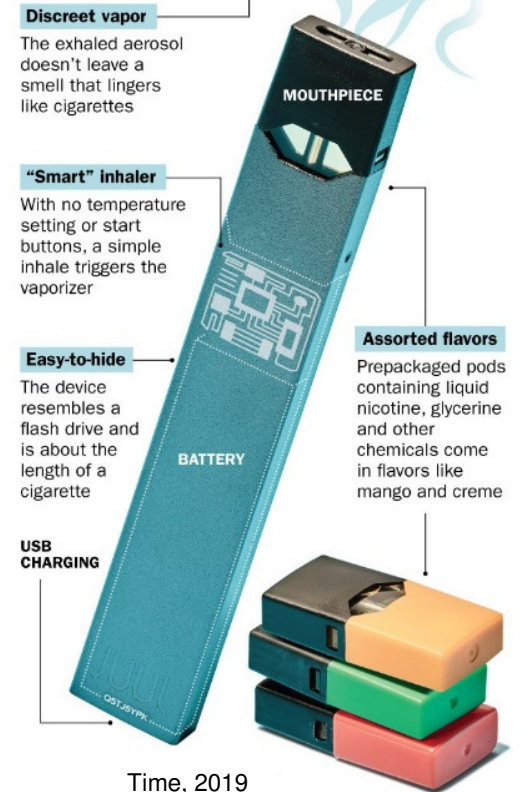
- 1  "Hit" :30 TV  
TobaccoFreeCA
  - 2  "Misconceptions" :30 Radio  
TobaccoFreeCA
  - 3  "It Goes Fast" :30 TV  
TobaccoFreeCA
  - 4  "Young Lives At Risk" :30 Radio  
TobaccoFreeCA
- ▶  "Hidden Harms" :30 Radio  
TobaccoFreeCA

# JUUL

- Introduced 2015, dominates e-cigarette market
  - Appeal of USB lookalike device, easy to hide
- Nicotine salt concentrated formulation
  - One pod = 20 cigarettes
- Multiplicity of Pods
  - Multiple flavors: Mango, fruit, mint are top flavors
  - Non JUUL pods, including THC-filled pods
- December 2018: Altria (US spinoff of Phillip Morris) purchased 35% stake in company

## UNDER THE RADAR

The sleek Juul device has captured about half of the e-cig market. But the features that make it so attractive to the general public also make it easy for teens to conceal



# Cannabis & Tobacco: Regulation Intertwined

- Food, Drug, and Cosmetic Act of 1938
  - Tobacco exempted, cannabis classified as dangerous product
- Medical Marijuana: California first state to pass in 1996
- Proposition 64: Adult Use of Marijuana Act
  - Cannabis use prohibited where tobacco use is already prohibited

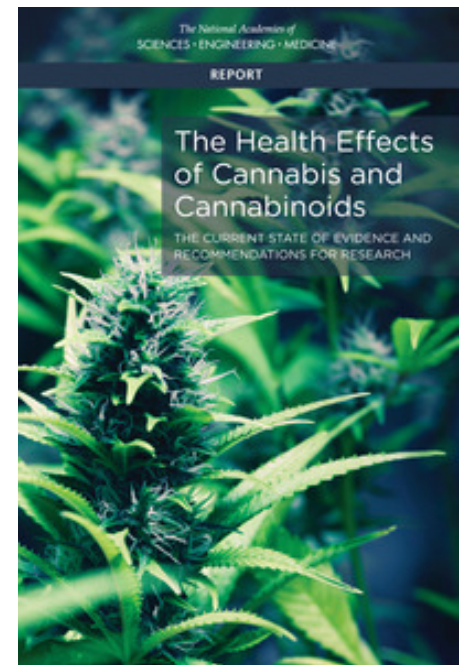






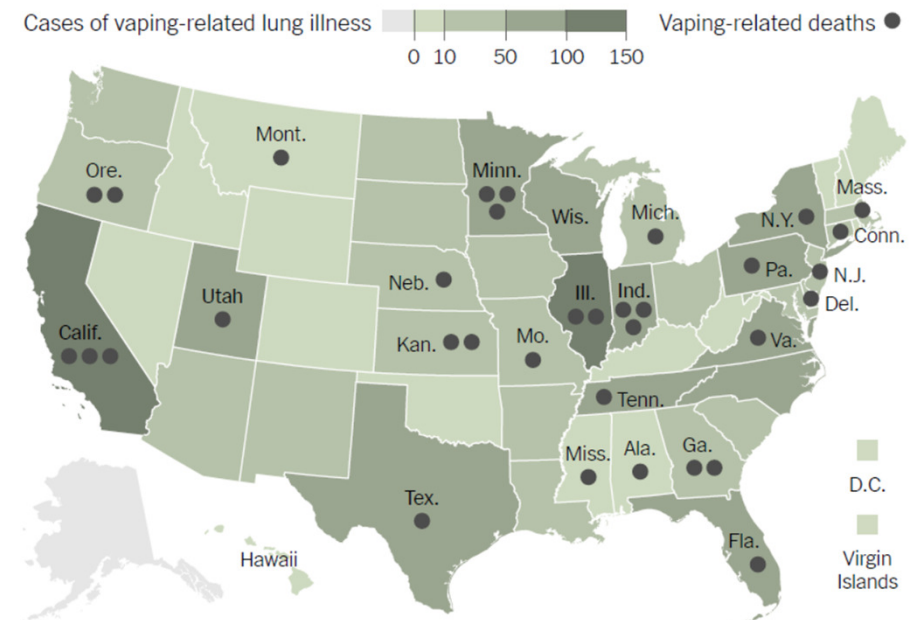
# Cannabis: proliferation of types of use but lack of evidence on health effects

- This is not the “joint” from the 1960s
  - Higher potency strains
  - Isolated THC and CBD products
  - Latching onto e-cigarette/vaping technology
- Data on health harms lacking
  - Federally funded studies require DEA registration, use of cannabis from one source in Mississippi
  - 2017 NAM report “conclusive or substantial evidence”
    - Health benefits: chronic pain, chemo nausea/vomiting, MS spasticity
    - Health harms: respiratory symptoms, bronchitis, motor vehicle accidents, low birth weight, schizophrenia, being male and smoking cigarettes increase risk of progression to problem use



# E-Cigarette and/or Vaping Product Associated Lung Injury (EVALI)

- A perfect storm
  - First reported by CDC in August
  - 1604 cases and 34 deaths through October 22
  - Median age 23, deaths among older individual (median age 45)
  - 2% of all EVALI patients were aged 65–75 years, 24% of deaths
  - 78% white, 16% Latino, 6% others
- 86% associated with THC use
  - 11% nicotine only
  - 52% dual THC/nicotine use
  - Based on 867 cases (54%) only

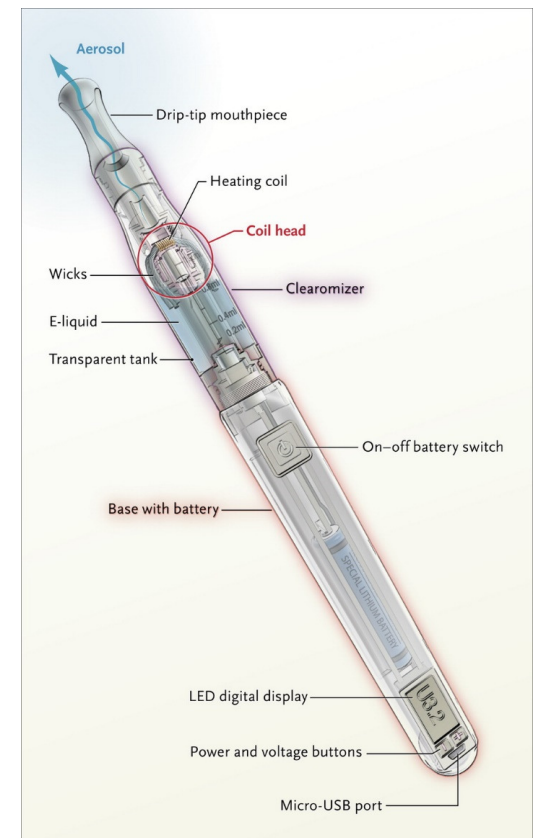


By The New York Times | Source: Centers for Disease Control and Prevention and state agencies

Moritz et al, [MMWR](#) 2019

# E-Cigarette and/or Vaping Product Associated Lung Injury (EVALI): what is the cause?

- no single compound or ingredient has emerged as the cause of EVALI
  - Not just THC: some cases are nicotine only, some with no THC/nicotine, but based on self report
  - Not much residue to test in used devices
- Multiple problems?
  - Different patterns of injury – chemical burn vs. lipoid pneumonia
  - Additive? Vitamin E associated with some but not all cases
  - Product? Multiple products used



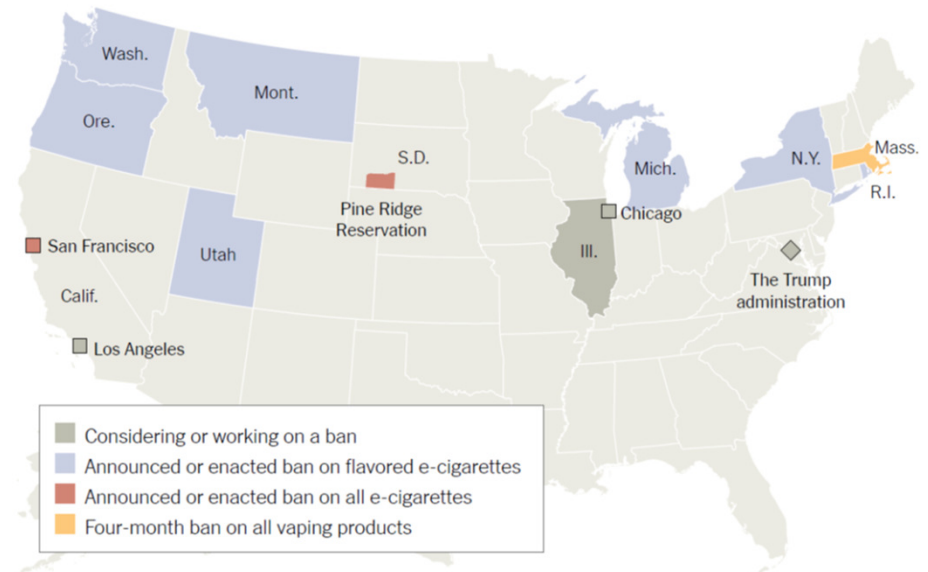
Moritz et al, MMWR 2019; Dinakar & O'Connor, N Engl J Med 2016

# Policy Response

- San Francisco board of supervisors voted to ban all e-cigarette sales until FDA review before EVALI
  - Referendum (Prop C) to repeal funded by JUUL, opposition now dropped
  - Similar proposal by Los Angeles city councilmember Paul Koretz
- Flavored e-cigarettes a focus due to youth use of flavors
  - All flavored tobacco product sales banned by Los Angeles board of supervisors, city council considering

## Recent Vaping Regulations

Several states have announced e-cigarette bans in response to recent vaping illnesses and deaths. [More maps and charts.](#)



By The New York Times

# Future Product Regulation: Flavors & Devices

- Flavors are additives: no product testing on any of these regarding inhalation
  - Similar issue with propellants (propylene glycol or glycerin) regarding testing
  - Focus on exemptions for mint and menthol due to similar exclusion for cigarette flavors
  - Mint/menthol used by African American and LGBTQ tobacco users
- Device regulation: no standardization of how devices are constructed
  - Acrolein “popcorn lung” due to heating propellants at high temperature



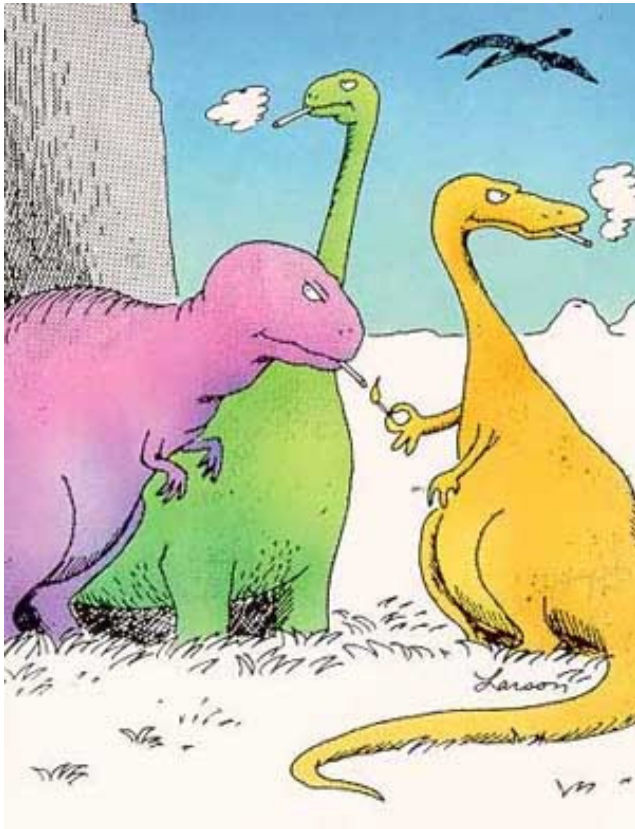
Lauren Justice for NYT; Carlo Allegri/Reuters

# Other Tobacco Products

- Snus
  - Snuff
  - First FDA authorized modified risk tobacco product (10/22/19)
- IQOS and VUSE
  - Heat-not-burn products
  - FDA applications for modified risk tobacco product under review



# The future....

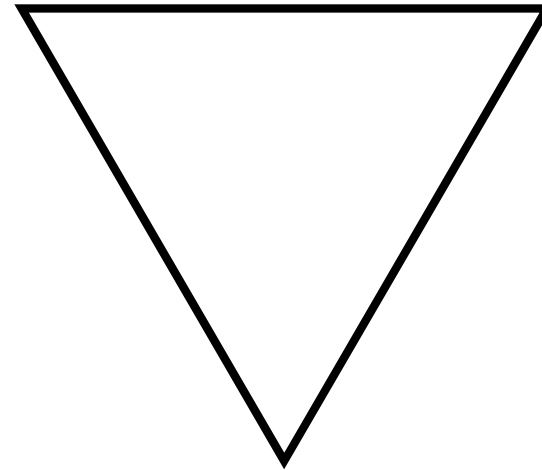


The real reason dinosaurs became extinct....

© Gary Larson

Cannabis

E-cigarettes



Tobacco: Cigarettes  
and Other Tobacco Products