

Reach Lab

Adolescent Cannabis and Tobacco/Vaping: The What, Why, and How to Help

Bonnie Halpern-Felsher, PhD, FSAHM Marron and Mary Elizabeth Kendrick Professor in Pediatrics II

Founder & Executive Director, REACH Lab and Curriculums

Disclosures

- Expert scientist in some e-cigarette litigation
- Expert for some city, state, and federal-level policies



REACH Lab

The REACH Lab





Bonnie Halpern Felsher, PhD Professor/PI

Shivani Galha, PhD Instructor



Devin McCauley, PhD Postdoctoral Scholar



Jessica Liu, PhD Postdoctoral Scholar



Marcia Zorilla, DrPH Director of Positive Youth Development



Divya Ramamurthi SRITA Research Associate



Holly Lung, BS Research Coordinator



Carly Noelani Kajiwara, BA Education Coordinator



David Cash, BA Project Co-Director, **Research & Evaluation**



Scott Gerbert, MBA Director, Outreach and Strategic Partnerships





Juanita Greene, BA Director of Curriculum Development



Lauren Lempert, JD/MPH Director of Policy



Brandon Tran Graphic Designer



Stephanie Logarta, BS Administrative Associate



Clea Sarnquist, DrPH Associate Professor



Mike Baiocchi, PhD Associate Professor. Statistician



Bradley Zicherman, MD Psychiatrist, Co-Founder VISIT



Arash Anoshiravani, MD Adoloscent Medicine Co-Founder VISIT





Anabel Rozo, BA Project Co-Director, **Research & Evaluation**



REACH Youth Action Board (YAB)



Reach Lab













A MISTING

























Ν







- Understand and be able to recognize different substances that youth are using.
- Understand harms associated with different drugs
- Know about and how to use our REACH Lab prevention and intervention curriculums and resources





Reach Lab



Tobacco Products & Use Rates



Lucile Packard Children's Hospital Stanford



Past 30-day Use of Cigarettes vs E-cigarettes; 2011-2023 High School Students



Percentage (%)

NYTS, 2011-2023

Past 30-day Use of Cigarettes vs E-cigarettes; 2011-2023 Middle School Students



NYTS, 2011-2023

Past 30-day Use of Cigarettes vs E-cigarettes; 2000-2022 Stanford High School Students Reach Lab



Frequent E-cigarette Use, 20 out of 30 days Middle School and High School Students, 2019-2023



Percentage (%)



NON-NICOTINE E-CIGARETTE USE RATES

National Convenience Sample

- *TOTAL SAMPLE* (*n*=6,131)
- 25.9% ever-users
- 16.7% past 30-day users
- 12.5% past 7-day users





Original Investigation | Substance Use and Addiction

Use Patterns, Flavors, Brands, and Ingredients of Nonnicotine e-Cigarettes Among Adolescents, Young Adults, and Adults in the United States

Shivani Mathur Gaiha, PhD; Crystal Lin, MSc; Lauren Kass Lempert, JD, MPH; Bonnie Halpern-Felsher, PhD

Oral Nicotine Products

Pouches



Tablets & Lozenges



Toothpicks









Reach Lab



Cannabis Products & Use Rates



Lucile Packard Children's Hospital Stanford

Smoking Cannabis: Joints, Blunts, & Spliffs



Joint: cannabis flowers in a thin paper made for rolling cigarettes

Blunt: cannabis flower in cigar tobacco leaf

Spliff: part tobacco and part cannabis

5-10 seconds to feel the effect

High lasts 30 minutes to several hours

THC concentration depends on cannabis flower used



Reach Lab

Pipes and Bongs



- Pipe: cannabis flower is burned; its smoke is inhaled
- Bong: flower is burned; its smoke is cooled through water then inhaled
- 5-10 seconds to feel the effect
- High lasts 30 minutes to several hours
- THC concentration depends on cannabis flower used



Dabbing



- Concentrated THC wax is heated, the aerosol is then inhaled
- 5-10 seconds to feel the effect
- High lasts 30 minutes to several hours
- ~80% THC concentration
- One of the methods most associated with emergency room visits



Reach Lab

Aerosolizing or "Vaping"



- THC concentrate is aerosolized
- 5-10 seconds to feel the effect
- High lasts 30 minutes to several hours
- THC concentration depends on liquid; often mislabeled



Reach Lab

• Not harmless

Edibles



Ę

- Cannabis infused foods and drinks
- 20 min 2 hours to feel the effects
- High typically lasts for hours
- THC concentration varies greatly and is difficult to measure accurately
 - Very easy to over consume



THC concentrations over time



REACH Lab

Percentage of THC and CBD in Cannabis Samples Seized by the DEA, 1995-2021



SOURCE: U Miss, Potency Monitoring Project

U Miss, Potency Monitoring Project

Marijuana Use 2018-2023 Monitoring the Future



REACH Lab

Past-Year Marijuana Use 2018-2023 Monitoring the Future



MTF, 2018-2023

Marijuana Use 2018-2023 Monitoring the Future



REACH Lab

Daily Marijuana Use 2018-2023 Monitoring the Future



MTF, 2018-2023

Marijuana Use 2018-2023 Monitoring the Future

=



REACH Lab

Past-Year Vape Marijuana Use 2018-2023 Monitoring the Future



MTF, 2018-2023

Rates of Co-Use of Cannabis and Tobacco



What is Co-Use?



- Use of cannabis and tobacco at the same time
- Use of cannabis and tobacco within a short period of time (chasing)
- Ever or past 30-day use of both types of products





Rates of Co-Use

- Past 30-day co-use of tobacco and cannabis is highly prevalent
- 5-30% of adolescents and young adults (AYAs) in the United States engage in co-use
- Some studies suggest co-use is more prevalent than sole-use of either tobacco or cannabis





Reach Lab



What's in E-cigarettes?



Lucile Packard Children's Hospital Stanford

Which Chemicals Are Found in E-Cig/Pod-Based Aerosol?



Reach Lab

- Propylene glycol
- Glycerin
- Flavorings (many)
- Nicotine
- NNN
- NNK
- NAB
- NAT
- Ethylbenzene
- Benzene
- Xylene
- Toluene
- Acetaldehyde
- Formaldehyde
- Naphthalene
- Styrene
- Benzo(b)fluoranthene

- Chlorobenzene
- Crotonaldehyde
- Propionaldehyde
- Benzaldehyde
- Valeric acid
- Hexanal
- Fluorine
- Anthracene
- Pyrene
- Acenaphthylene
- Acenapthene
- Fluoranthene
- Benz(a)anthracene
- Chrysene
- Retene
- Benzo(a)pyrene
- Indeno(1,2,3-cd)pyrene

- Benzo(ghi)perylene
- Acetone
- Acrolein
- Silver
- Nickel
- Tin
- Sodium
- Strontium
- Barium
- Aluminum
- Chromium
- Boron
- Copper
- Selenium
- Arsenic
- Nitrosamines
- Polycyclic aromatic hydrocarbons

- Cadmium
- Silicon
- Lithium
- Lead
- Magnesium
- Manganese
- Potassium
- Titanium
- Zinc
- Zirconium
- Calcium
- Iron
- Sulfur
- Vanadium
- Cobalt
- Rubidium







REACH Lab

1 Pack of Cigarettes = ~22mg of Nicotine



AMOUNT OF NICOTINE IN





CIGS IN AN E-CIG





AMOUNT OF NICOTINE IN





1 Flum Float = ~400mg of Nicotine



AMOUNT OF NICOTINE IN





PREVENTION TOOLKIT

= ~650mg of Nicotine





Newer e-cigarette products contain salt-based nicotine.



Reach Lab



Health Effects



Lucile Packard Children's Hospital Stanford

The Body on Cannabis/Tobacco

stan.md/capt

Altered brain development, anxiety, paranoia, slowed reactions, poor memory

Lung inflammation, cell damage, chronic cough, slowed breathing, respiratory infections

Increased appetite, hausea, vomiting

Increased heart rate by 20-50 beats per minute

Poor muscle coordination, imbalance, falling

> Slide Created in Collaboration with:






Addiction



Lucile Packard Children's Hospital Stanford

Addiction





% of Past 30-Day Users Reporting HONC Scores of None, 1+, and 9/9



*average = 3 endorsed items for e-cig only users

Crystal Lin¹, Shivani Mathur Gaiha² and Bonnie Halpern-Felsher^{2,*}

Adult Users

Figure 4. Use of e-Cigarettes Within 5 Minutes of Waking



Glantz et al., JAMA Network Open, 2022

Cannabis & The Brain





- Addiction!
- Impaired learning, memory, attention, impulse control, decision-making
- Lower academic performance
- Loss of IQ Points with repeated use
- Sleep issues
- The higher the dose and more regular the use, the greater the impairment
- Brain impairment in youth does not resolve with abstinence

Youth Want to Quit



Studies show:

- Among high school past 30-day e-cigarette users, 40.5% attempted to quit in the past 12 months
- Almost 2/3 of adolescents who used any tobacco product reported seriously thinking about quitting
- Among adolescent e-cigarette users
 - 55% reported general intentions to quit
 - 15% reported intentions to quit within 30 days
 - ~33% had a past-year quit attempt
- Don't use effective means of cessation









Lungs



Lucile Packard Children's Hospital Stanford

Tobacco and the Lungs

Ę



Weaker Immune Response to Infection

Pulmonary Effects



- Inhaled flavorings associated with (animal and human models):
 - -Respiratory illness/bronchitis
 - -Life-threatening respiratory failure
- Largely due to diacetyl, a buttery flavoring agent used in microwaveable popcorn
 - -Generally Recognized as Safe (GRAS) for oral but not inhalation









Secondhand and Thirdhand Aerosol/Smoke



Lucile Packard Children's Hospital Stanford

Secondhand Aerosol

tobaccopreventiontoolkit.stanford.edu



Nicotine

Heavy Metals

Ultrafine Particles

VOCs

Cancerous Chemicals

Stanford MEDICINE

Thirdhand Smoke

tobaccopreventiontoolkit.stanford.edu



Smoke/Aerosol



Secondhand tobacco smoke / aerosol easily goes from apartment to apartment and location to location

Walls
Vents
Windows
Pipes
Hallways
Stairways

But Also In and On...

















Why Youth Use



Lucile Packard Children's Hospital Stanford

Why Youth Use E-cigarettes



- Flavors
- Easy to hide
- Marketing
- Access
- Misperceptions
- Stress





Why Youth Use E-cigarettes



- Flavors
- Easy to hide
- Marketing
- Access
- Misperceptions
- Stress









- Flavors mask the harsh taste and smell of the tobacco
- Flavors mask the risks of the tobacco product
- Youth are more likely to report interest in trying tobacco if flavored
- Youth report they would quit if flavors weren't available
- Ads and packaging of flavored tobacco products are appealing to youth
- Youth are looking for flavors, in any product, and will switch products to get flavors.







Targeting Youth















Why Youth Use E-cigarettes



- Flavors
- Easy to hide
- Marketing
- Access
- Misperceptions
- Stress























Why Youth Use E-cigarettes



- Flavors
- Easy to hide
- Marketing
- Access
- Misperceptions
- Stress























E-cigarette brands copy from popular culture in their marketing and advertising as well as in their design. These cute looking devices are often advertised by manufacturers and e-cigarette vendors as discreet products that can be used stealthily.



Minions Disposable





https://happyvape.en.made-in-china.com/product/KFLTpXDOQbVZ/China-Minions-Mesh-X-Rechargeable-Disposable-Vapes.html



| Q | HOME / STARTER KITS / DISPOSABLE VAPES / BBK GLOOMY BEAR 8000 PUFF BBK Gloomy Bear Disposable Vapes 8000 Puffs – Mineral Water \$15.99 | | |
|------|---|---------------|---|
| | FLAVOR | Mineral Water | ~ |
| | - 1 + | ADD TO CART | |
| | SKU: BBK-010-1 | | |
| | | | |

Boba vapes

Ē







V-Play: The First VAPENTERTAINMENT System



Description for the Vape device boasts 20,000 puffs, and 1.77 inch screen on which you can play games.

Games available on the device include F-22, Pac Maze, & Tetra Stack. The product is available in a number of sweet flavors and the device offers a **"beast mode"** that delivers a more intense flavor and more vapor.

Why Youth Use E-cigarettes



- Flavors
- Easy to hide
- Marketing

Access

- Misperceptions
- Stress









What is the legal age to purchase tobacco and cannabis?




Pop Quiz



What is the legal age to purchase tobacco?

21!!!







Stanford Children's Health

ealth | Lucile Packard Children's Hospital Stanford









Why Youth Use E-cigarettes



- Flavors
- Easy to hide
- Marketing
- Access
- Misperceptions
- Stress







Contents lists available at ScienceDirect

Preventive Medicine



journal homepage: www.elsevier.com/locate/ypmed

Adolescents perceive e-cigarettes to be less risky and less addictive compared to all other tobacco products.

and Benefits Differ Across Tobacco Products

CrossMark

Maria Roditis, Ph.D.^a, Kevin Delucchi, Ph.D.^b, David Cash^a, and Bonnie Halpern-Felsher, Ph.D.^{a,*}

^a Division of Adolescent Medicine, School of Medicine, Stanford University, Palo Alto, California ^b Department of Psychiatry, University of California San Francisco, San Francisco, California

Article history: Received August 31, 2015; Accepted January 27, 2016 *Keywords:* Tobacco use; Risk perceptions; Decision making

Why Youth Use E-cigarettes



- Flavors
- Easy to hide
- Marketing
- Access
- Misperceptions
- Stress





Mental Health Issues



- Youth are incredibly stressed
- Especially during the pandemic
- More than 44% of students reported feeling sad or hopeless about themselves in 2021, which is a substantial increase compared to 34% in 2019 (YRBS)
- 25% of high school students expressing suicide ideation (YRBS)
- Youth are more likely to use substance when feeling stressed, depressed, and anxious
 - $-\text{Co-use} \rightarrow \text{our study}$





Reach Lab



Healthy Options for Coping with Stress





Meditate



Watch a Movie



Paint



Drug Use, Stigma, and Mental Health



Reach Lab



Summary: Perfect Storm to Addict Youth



- Stealth/youth-focused products
- Very high nicotine/THC levels
- Nicotine: Salt-based \rightarrow less throat hit, easier to use
- Misperceptions of nicotine/THC and harms
- Flavors
- Packaging, ads
- Cheap!
- HARMFUL







Reach Lab



What Can We Do?



Lucile Packard Children's Hospital Stanford

Honest Drug Education



- Based in science
- Based on how adolescent learn and make decisions
- Keep teens safe!











- Normalize drug education communication not normalize drug use!
- Conversation, not a confrontation! Not a lecture!





Starting the Conversation



- Goal: Have a conversation, not a lecture
 - -Find the "right time"
 - -Be patient and listen
- Avoid "we need to talk" or "you don't use, right!?!?"
- Use the right words
- Realize that you might not learn immediately whether teen is using; might need more than one conversation





Stanford MEDICINE

REACH Lab



Research and Education to Empower Adolescents and Young Adults to Choose Health



REACH Lab



Research

Our research is driven to improve adolescent and young adult (AYA) health by:

- · Conducting interdisciplinary, high-impact research focused on health-related decision-making
- Translating evidence into effective programs that reduce and prevent AYA risk behavior
- · Informing and supporting policies that improve AYA health
- · Training the next generation of leaders in AYA health and risk prevention

Current research projects/evaluations:

Understanding the Potential Impact of FDA Authorization and Marketing on Adolescents Young Adults', and Adults' Perceptions, Intentions, and Actual Use of Tobacco (funded by the NIH)



Research Publications Preventions and Interventions Advocacy In the News YAB Corner Parent Corner

Resources

Our Team

Marketing and Promotion

Lab Fun

Cost Calculators

cannabis in a year? *

around how much you spend each time.

Cost of Vaping Calculator

— fx

Use the tabs to switch from vaping/e-cigarettes and cannabis.

Cannabis Cost

Calculator

Tips for Quitting Nicotine

Information and Resources to Help Adolescents and Young Adults Quit All forms of Nicotine

-

Have you ever wondered how much you spend on e-cigarettes/vaping or

Use the cost calculator below to get an estimate of how much you spend based on how frequently you purchase, and

Cost of Cannabis Calculator

Quitting Tips for Nicotine & Cannabis



Take back control. Quitting nicotine or cannabis is no easy feat. Below are some tips and tricks that you can utilize to help with quitting either nicotine or cannabis. You got this!



Think about your reasons for quitting, which can be very within 1-3 weeks. motivating.

Prepare your environment by throwing away your tobacco and cannabis products, lighters, and Plan your guit date related supplies.



Consider different ways of quitting other than "cold turkey" such as behavioral and medical support (e.g., NRTs and behavioral therapy).



Identify strategies to deal with your triggers.

Explore healthy activities.

You are not alone.





Practice stress-reducing techniques.

You got this!















are common and porary. Plan for how o cope with them.

thdrawal symptoms





ore information, infographics, d quitting resources, visit:





It might take a few tries.



THE MORE YOU KNOW

What are oral nicotine pouches?

Pouches are a form of nicotine delivery that are growing in populartiy. The product is derived from tobacco and contains nicotine.

The pouch is placed between the upper lip (or "upper decky") or lower lip (or "lower decky") and gum.



In 2023, the NYTS¹ showed a slight uptick to 1.5% of middle and high school students reporting having ever used nicotine pouches.

Two studies recently published by the Stanford REACH Lab with data collected in 2021 among a convenience sample of adolescents, young adults, and adults, showed that 1) ZYN is the most used and concerning oral nicotine pouch², and 2) among those 13-20 years old3:







er. B. Populatity of Zyn and other nicotine pourt

me products among adolescents, young adults, and filoxions, 2022 May 90 107832 (9485) 36731224 or 102 10 16 27

OUR CONCERNS ABOUT ZYN

What is ZYN?

ZYN is the name of a popular brand of oral nicotine. ZYN are small pillow-like pouches that contain pre-portioned amounts of white nicotine powder.

ZYN comes in many flavors, including menthol, spearmint, cool mint, peppermint, wintergreen, citrus, coffee, unflavored, and cinnamon.

- ZYN comes in 3 milligram and 6 milligram nicotine pouches
- Each tin of ZYN contains 15-20 nicotine pouches
- Adolescents use multiple pouches throughout the day, and often place more than one in their mouth at once

LOOK OUT FOR

ZYN ON SOCIAL MEDIA & VOCABULARY

Terms such as "Zynning," "Zynnies," "Zynbabwe," along with "Zynfluencers," who are helping to promote ZYN use.

DISCREET PACKAGING

....

The container is similar to mints and icebreakers and are small enough to fit inside a pocket.

CONCERNING QUALITIES

Nicotine is a highly addictive chemical that are in ZYN pouches, ZYN pouches come in 3 milligram and 6 millgram pouches.



Learn more by visiting tinyurl.com/stanfordtpt





THE MORE YOU KNOW OUR CONCERNS ABOUT ZYN

WHAT IS ZYN?

ZYN is the name of a popular brand of oral nicotine. ZYN are small pillow-like pouches that contain pre-portioned amounts of white nicotine powder.

ZYN comes in many flavors including menthol, citrus, coffee and many more, in small discrete packaging.

Social media and marketing has popularized ZYN with terms

such as: "Zynning," "Zynnies," "Zynbabawe," along with "Zynfluencers," who are helping to promote ZYN use.



Comes in 3mg and 6mg nicotine pouches

 Pouch is placed between the upper lip ("upper attack decky") or lower lip ("lower decky") and gum



One 6mg pouch equates to about 9 cigarettes

Each tin cotains about 15-20 nicotine pouches

HOW NICOTINE POUCHES AFFECT YOU















NICOTINE ADDICTION

SORE GUMS & MOUTH

MENTAL HEALTH

ABDOMINAL NAUSEA CRAMPS



Learn more by visiting tinyurl.com/stanfordtpt Stanford | REACH Lab







Use our safetyfirst

st curriculum to talk with your students

Recognize a Fentanyl Overdose

Knowing the signs of opioid overdose is crucial in saving a life.

Signs Include:

• Slow, shallow, and erratic breathing

*

NARCAN

NASAL

UNITAREAS' 1

- Unconscious and unresponsive
- Slow or no pulse
- Pale and clammy

Click <u>here</u> to mail order Narcan or learn more

Respond to the Emergency

Here are the steps to follow:

- Have Narcan ready to use
- Hold the device with your thumb on the bottom plunger and two fingers on the nozzle
- Insert the tip into either
 nostril
- Firmly press the plunger to release the dose
- Dial 911
 - Repeat with additional Narcan

*Narcan does not cause harm if there is no overdose





REACH Lab





Stanford REACH Lab offers free curriculums and resources to supplement prevention, education, harm-reduction, interventions and cessation on: vaping/e-cigarettes, cannabis, drugs and other substances. Scan the QR code below to learn more!

REACH Lab

Stanford |

PREVENTION, EDUCATION & AWARENESS CURRICULUMS



You & Me, Together Vape-Free Elementary, Middle & High School Curriculum



FREE

RESOURCES!

Elementary, Middle & High School Curriculum

HARM-REDUCTION & INTERVENTIONS





DATA DASHBOARD FOR EDUCATORS & ADMINISTRATORS

We have developed and launched a data dashboard for educators, where you can see, in real time, anonymous student survey responses related to the curriculum and interventions you are implementing.

GET STARTED

or visit tinyurl.com/reachlabdatadashboard



Connect with us and learn more by scanning the QR Code:





REACH Lab

Theory + Research + Partnerships + Evidence-informed and evidence-based + Ability to revise/update quickly + Fact-checked

= Curriculums





Stanford REACH Lab offers free curriculums and resources to supplement prevention, education, harm-reduction, interventions and cessation on: vaping/e-cigarettes, cannabis, drugs and other

PREVENTION, EDUCATION & AWARENESS CURRICULUMS



Connect with us and learn more by scanning the QR Code:



Stanford REACH Lab offers free curriculums and resources to supplement prevention, education, harm-reduction, interventions and cessation on: vaping/e-cigarettes, cannabis, drugs and other substances. Scan the QR code below to learn more!

PREVENTION, EDUCATION & AWARENESS CURRICULUMS



Stanford

REACH Lab



Brain development and addiction
Other health effects (heart, lungs, etc)
Environmental and community effects

Marketing
Stress and Coping

Connect with us and learn more by scanning the QR Code:



CANNABIS



Stanford REACH Lab offers free curriculums and resources to supplement prevention, education, harm-reduction, interventions and cessation on: vaping/e-cigarettes, cannabis, drugs and other substances. Scan the QR code below to learn more!

PREVENTION, EDUCATION & AWARENESS CURRICULUMS





Elementary – 2 lessons
Middle and High School – 6 lessons
Hawaii-specific version available
Spanish available
LGBTQ+ specific version coming
Native American version coming

Stanford

REACH Lab

Elementary – 2 lessons
Middle and High School – 5 lessons
Spanish too







Fentanyl & Opioid Awareness & Overdose Prevention

This lesson and resources are dedicated to providing information on the dangers of illegal fentanyl, impact on teens and young adults, harm-reduction strategies to avoid overdose, and educational resources available to educators, students, parents and more.

Why is this important?

"Every week in 2022, the equivalent of a high school classrom's worth of students — an average of 22 adolescents — died of drug overdoses in the United States, according to data..." (The Overdose Crisis among U.S. Adolescents, Friedman, PhD, Hadland, M.D., M.P.H 2023.) Read More



Stanford MEDICINE

REACH Lab

Stanford REACH Lab offers **free** curriculums and resources to supplement prevention, education, harm-reduction, interventions and cessation on: vaping/e-cigarettes, cannabis, drugs and other substances. Scan the QR code below to learn more!

PREVENTION, EDUCATION & AWARENESS CURRICULUMS





Evaluations – Evidence-based

Reach Lab

- •Used in all states and many countries
- •Our team has reached well almost **3 million youth**, conducted hundreds of **trainings**, and trained over **20,000** educators, that we know of!
- Increases knowledge and refusal skills
- Reduces positive attitudes
- Reduces intentions







WE INVITE YOU TO OUR:

5th Annual Teaching Cannabis Awareness & Prevention Virtual Conference:

A Focus on the Triangulum of Cannabis, Tobacco/Nicotine, and Vaping

APRIL 17TH & 18TH, 2024 8:00 A.M. - 2:00 P.M. (PST)

PRICING: -

Registration Fee: **\$150** Early Bird Pricing: **\$125** To Obtain CME Credit: **+\$25**



Register today! Scan the QR or visit: tinyurl.com/cannabisreg2024

Social Media









Thank you! Any Questions ?



REACH Lab





Bonnie.halpernfelsher@Stanford.edu