



# IDENTIFYING SUBSTANCE USE DISORDERS AND VAPING DANGERS

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HOAG ADDICTION TREATMENT CENTERS

FEBRUARY 4, 2020

# Our Culture

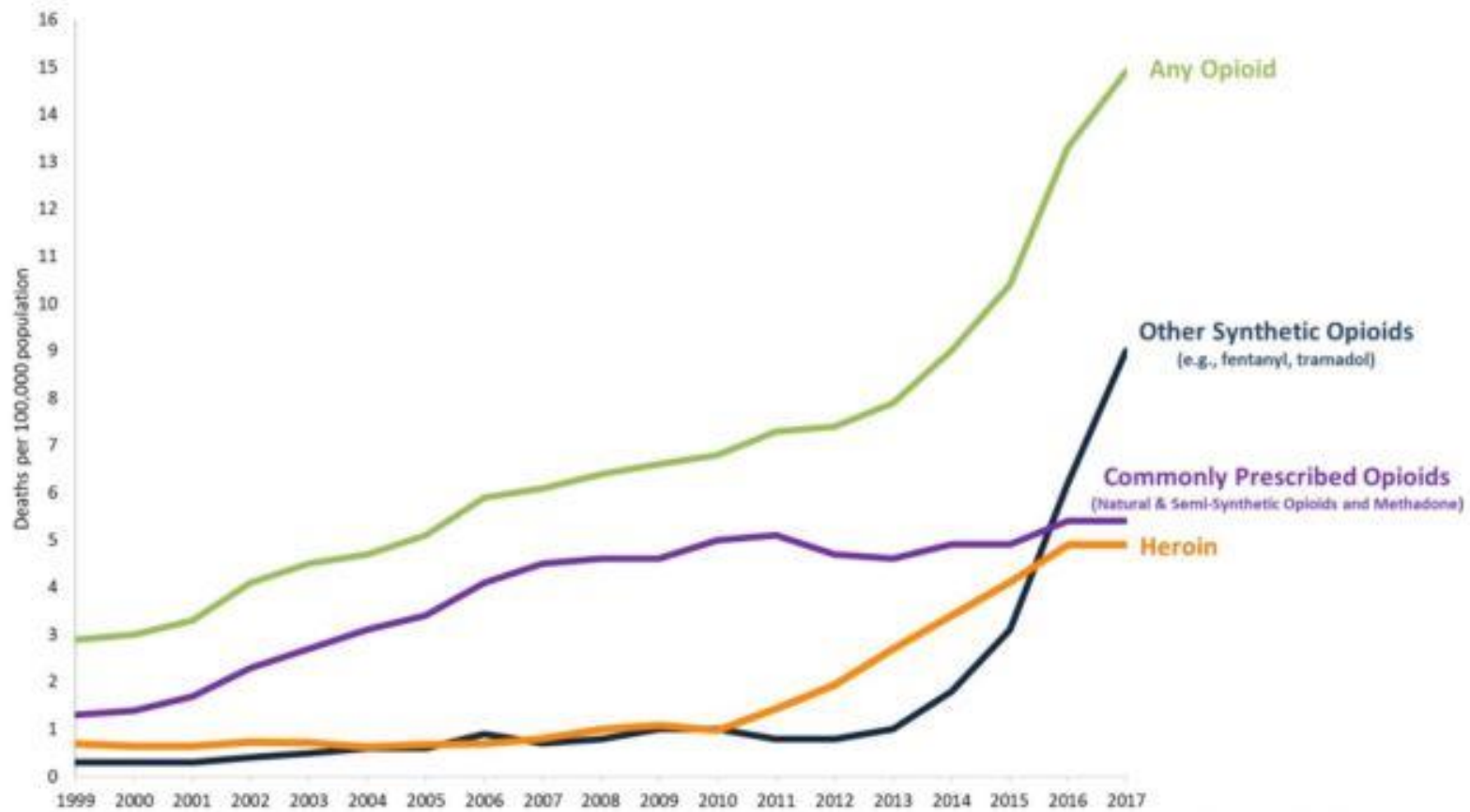


# Epidemiology

- By senior year
  - 70% of high school students will have tried alcohol
  - 50% will have taken an illegal drug
  - 40% will have smoked a cigarette
  - >20% will have used a prescription drug for a nonmedical purpose
- Use before age 18 increases risk of SUD by 6.5x
- Only 10% of adolescents receive treatment



## Overdose Death Rates Involving Opioids, by Type, United States, 2000-2017

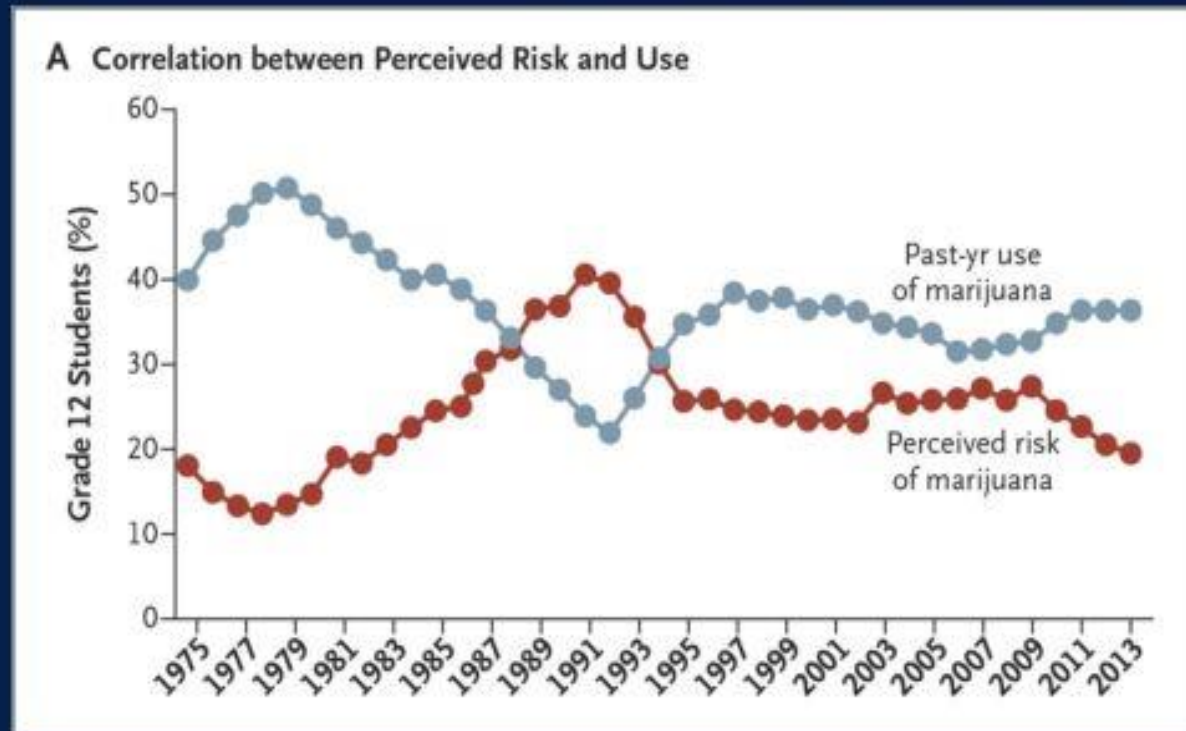


SOURCE: CDC/NCHS, National Vital Statistics System, Mortality. CDC WONDER, Atlanta, GA: US Department of Health and Human Services, CDC; 2018.  
<https://wonder.cdc.gov/>.

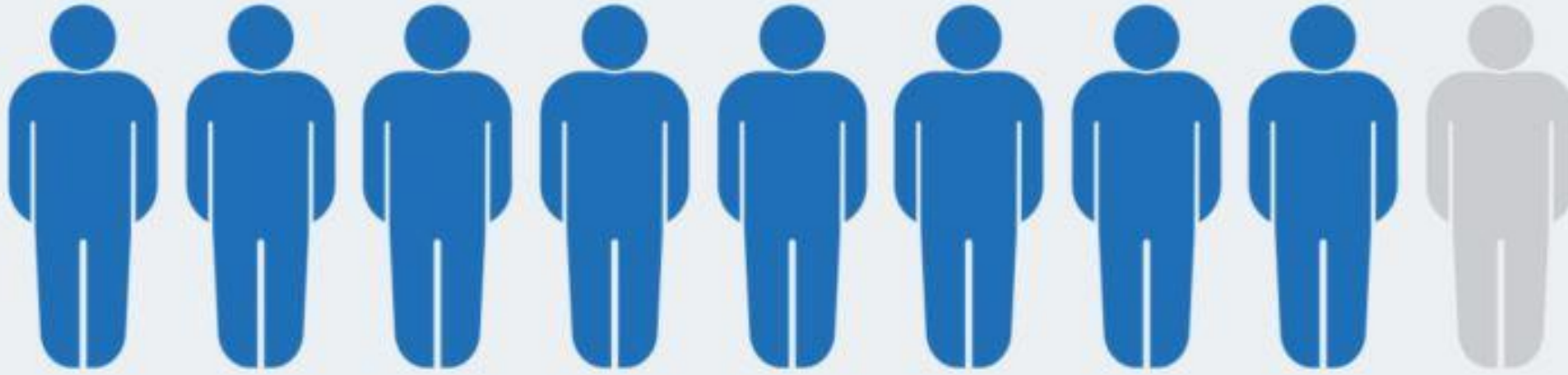
[www.cdc.gov](http://www.cdc.gov)  
Your Source for Credible Health Information

CSAM

# Increased Use and Decreased Perceived Risk



MonitoringTheFuture.org; Volkow, *NEJM*, 2014.



**9 OUT OF 10**

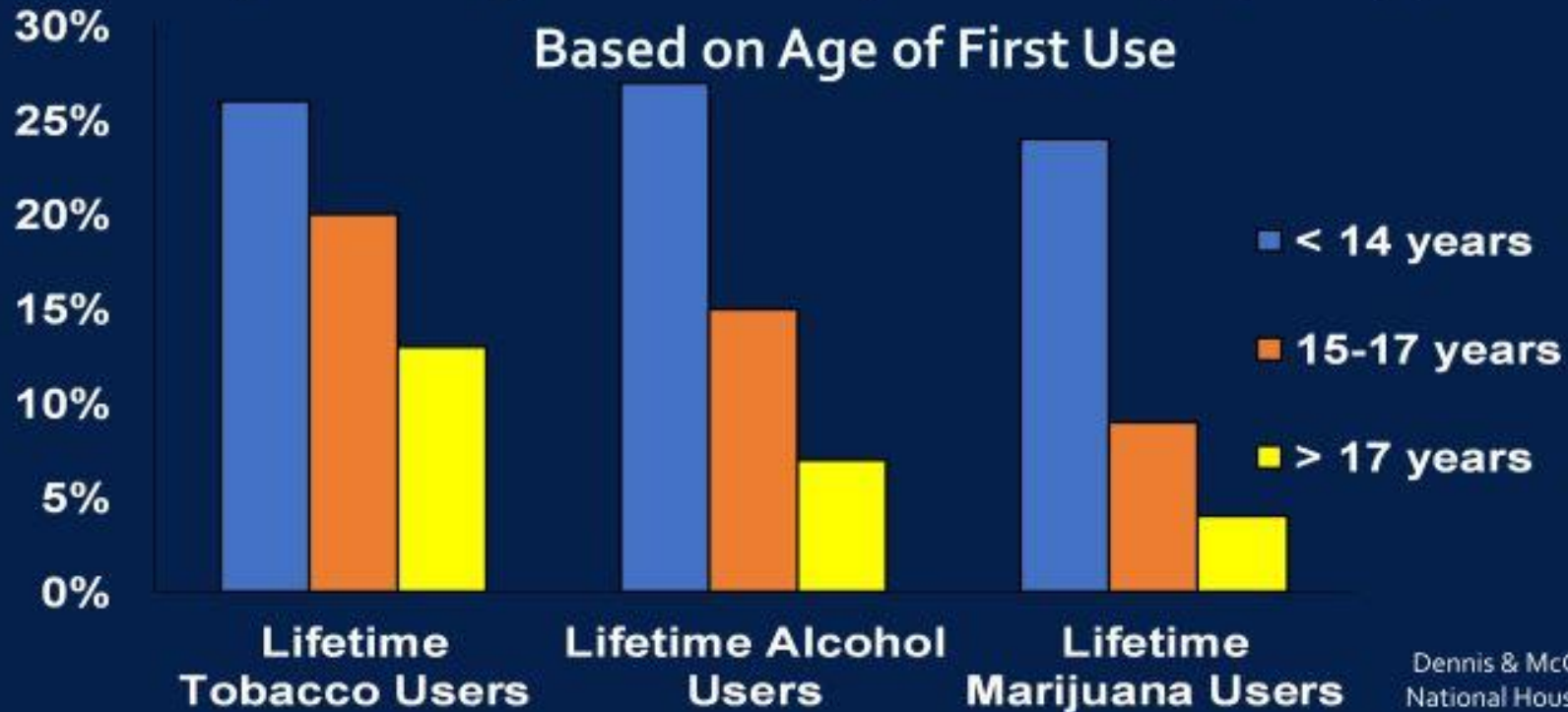
PEOPLE WITH SUBSTANCE PROBLEMS  
STARTED USING BY AGE 18

**CSAM**



## Does Development Matter?

Probability of Having 1 or More Dependence Symptom(s) as an Adult



Dennis & McGeary. Data from 1995 National Household Survey on Drug Abuse

## How Much Is “Too Much”?

### ◆ MEN:

- ◆ 5 or more standard drinks in a sitting.
- ◆ (15 or more per week.)

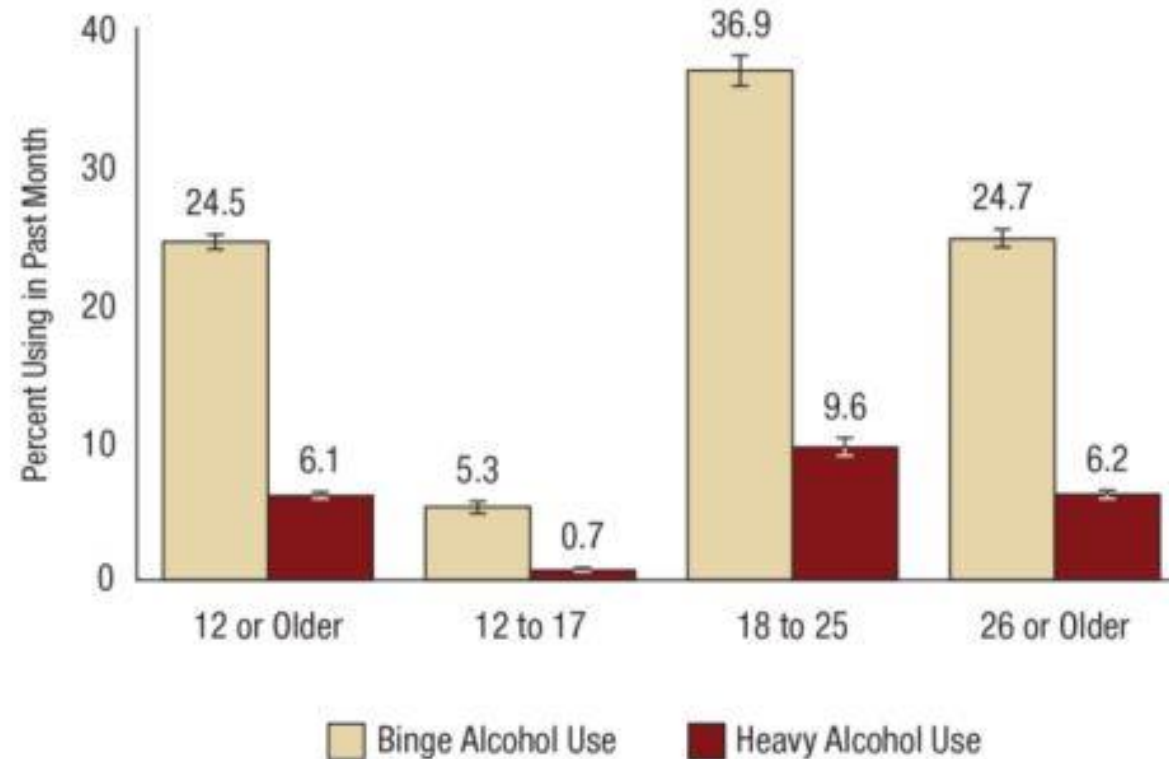
### ◆ WOMEN:

- ◆ 4 or more standard drinks in a sitting.
- ◆ (8 or more per week.)



## Past Month Binge and Heavy Alcohol Use among People Aged 12 or Older, by Age Group: Percentages, 2017

NSDUH 2017



Note: Since 2015, the threshold for determining binge alcohol use for males is consuming five or more drinks on an occasion and for females is consuming four or more drinks on an occasion.

CSAM

# Cannabis and Cognitive Impairment

**CAUTION**  
**MEMORY LOSS**  
**AHEAD**

- ◆ IQ measured age 13, 38; N=1037
- ◆ MJ use measured age 18, 21, 26, 32, 38
- ◆ IQ decline associated with regular use and dependence, dose response related to persistence

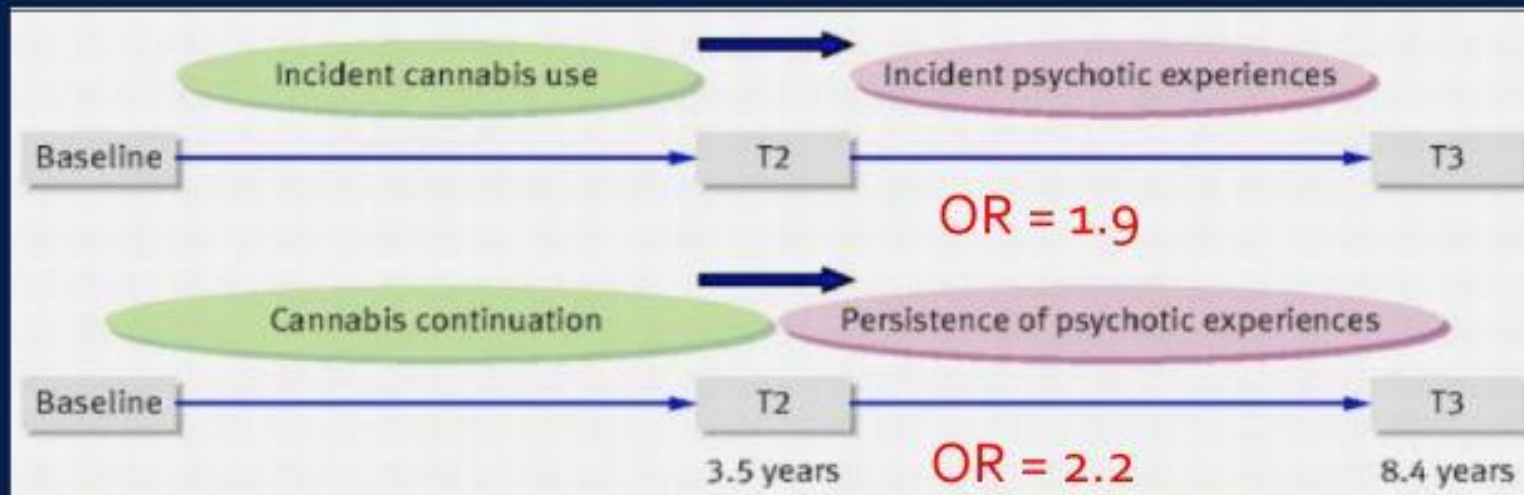
	None	Some use	1 wave	2 waves	3+ waves
Regular use	+1	-1	-3	-2	-5
Dependence	+1	-1	-2	-3	-6

- ◆ No difference with controls for education, recent use, other substances, schizophrenia
- ◆ Adolescent onset worse, -8 points for 3+waves

Meier et al. PNAS. 2011

# Cannabis and Psychosis Prospective Exposure Cohort Study

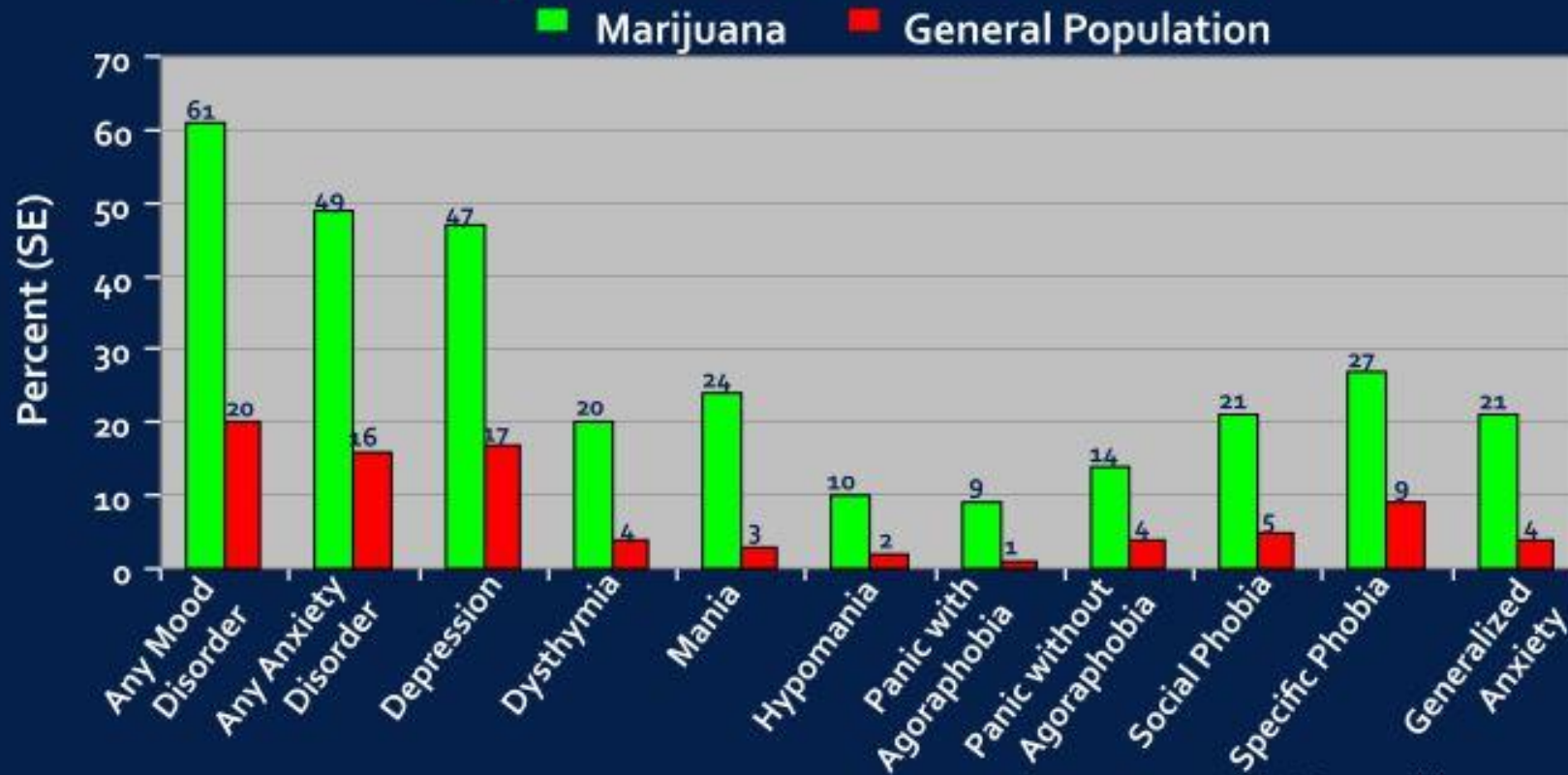
- ◆ 10 yr. prospective cohort of 1923 German youth (14-24 at baseline)
- ◆ Examination of change over 3 time points



Kuepper et al British Med J. 2011



# Psychiatric Co-Morbidity



NESARC, 2005; slide courtesy of Dr. Frances Levin.

# Potency = Strength

- ◆ Morphine = 1
  - ◆ Heroin = 2X
  - ◆ Fentanyl = 100X
  - ◆ Carfentanil = 10,000X
- 
- ◆ Fentanyl synthesized primarily in China and transported to USA.
  - ◆ Not from Pharmaceutical Fentanyl

# Lethal Dose

Morphine = 1X  
Fentanyl = 100X  
Carfentanil = 10,000X



Lethal doses of heroin compared to "synthetic" opioids.  
*New Hampshire State Police Forensic Lab*

DEA Schedule:

I

II

II

Legal Implications



## Screening: CRAFFT

- ◆ Qualitative approach
- ◆ It asks:
  - ◆ Have you ever ridden in a CAR driven by someone (including yourself) who was "high" or had been using alcohol or drugs
  - ◆ Do you ever use to RELAX, feel better about yourself or fit in
  - ◆ Do you ever use while you are by yourself, ALONE?
  - ◆ Do you ever FORGET things you did while using?
  - ◆ Do your FAMILY or FRRIENDS ever tell you that you should cut down?
  - ◆ Have you ever gotten into TROUBLE while you were using?

**Score of  $\geq 2$  indicates high risk**

[http://www.ceasar-boston.org/CRAFFT/pdf/CRAFFT\\_English.pdf](http://www.ceasar-boston.org/CRAFFT/pdf/CRAFFT_English.pdf)



## E-Cigarettes

- ◆ Battery-operated device
- ◆ Heats liquid containing nicotine
- ◆ Creates vapor that is inhaled
- ◆ Entered US market in 2006





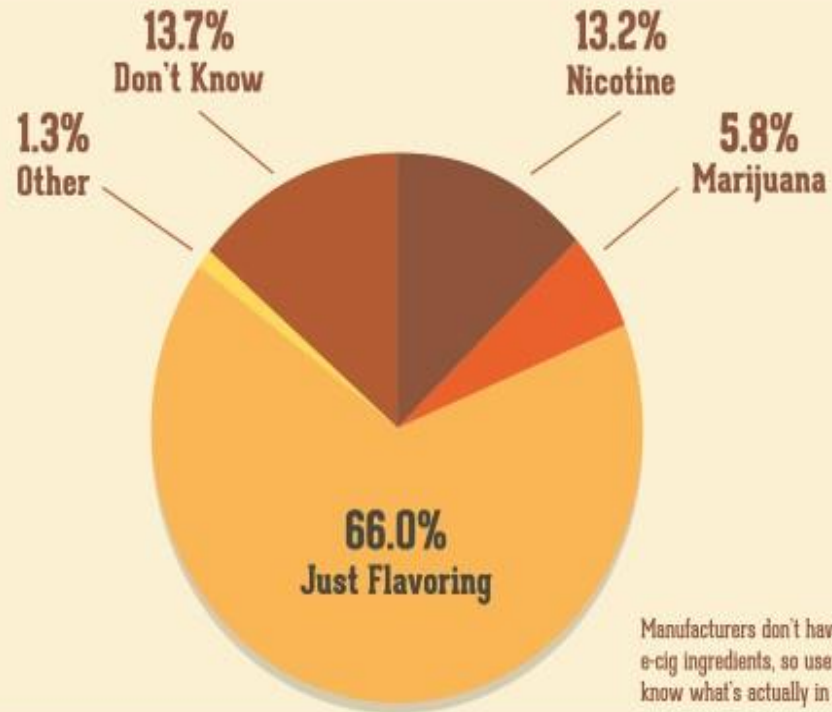
## E-Cigarettes Contents

- ◆ The **nicotine** content varies and usually ranges from 0 to 36 mg/mL
- ◆ Propylene glycol/glycerol are used as humectants
- ◆ Flavoring: > 7000 flavors are available
- ◆ Other compounds include metals such as tin, lead, nickel, chromium, manganese, and arsenic, tobacco-specific nitrosamines, carbonyl compounds, volatile organic compounds, and phenolic compounds





# WHAT DO TEENS SAY IS IN THEIR E-CIG?<sup>3</sup>



National Institute  
on Drug Abuse

[WWW.DRUGABUSE.GOV](http://WWW.DRUGABUSE.GOV)

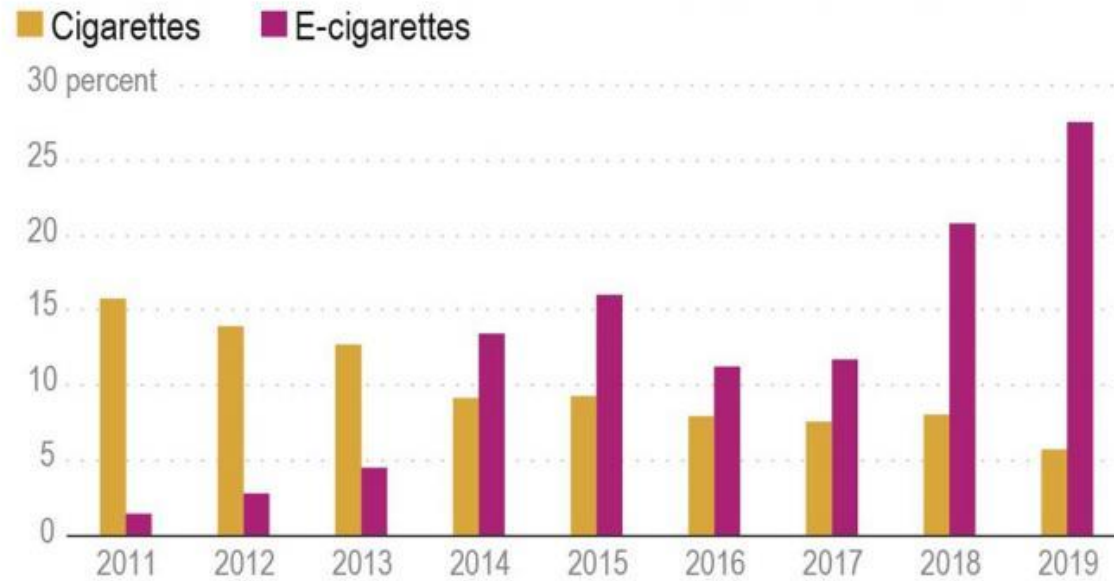
# VAPING HOODIE

- IN YET ANOTHER TWIST FOR WORRIED PARENTS:  
MEET THE VAPING HOODIE.  
THIS HIGH SCHOOL FASHION MAINSTAY DEFINED BY A HOOD  
WITH DRAWSTRINGS IS NOW AVAILABLE AS A VAPING DEVICE  
READY TO DELIVER A PUFF OF NICOTINE (OR MARIJUANA)  
ANYWHERE, ANYTIME. INCLUDING IN THE CLASSROOM.



# NATIONAL DATA ON GROWTH OF E-CIGARETTE USE

## Teen e-cigarette use increases



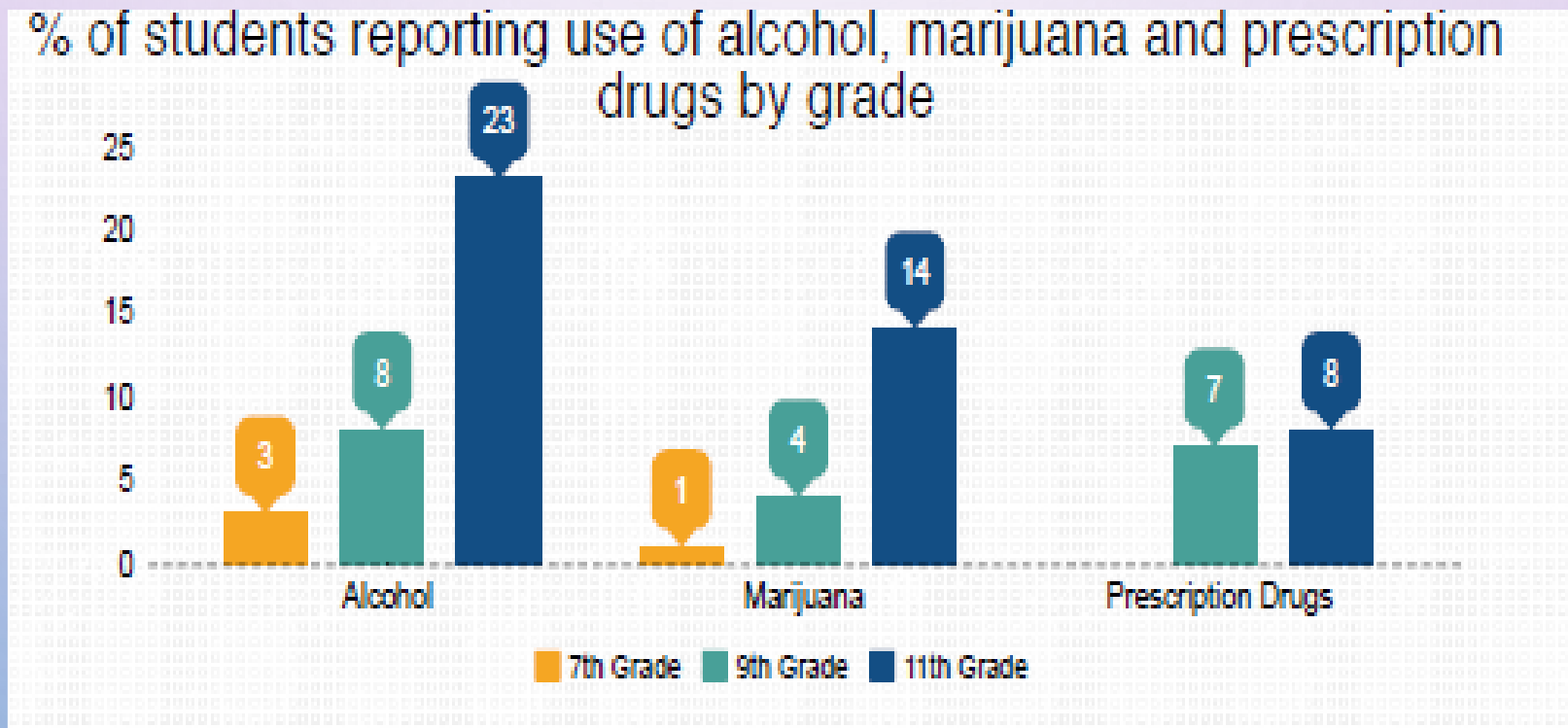
Note: Data from the 2019 National Youth Tobacco Survey conducted of students in grades 6 through 12. Responses are from within 30 days preceding the administration of the survey.

Graphic: Dien Magno; Source: U.S. Food and Drug Administration

AP



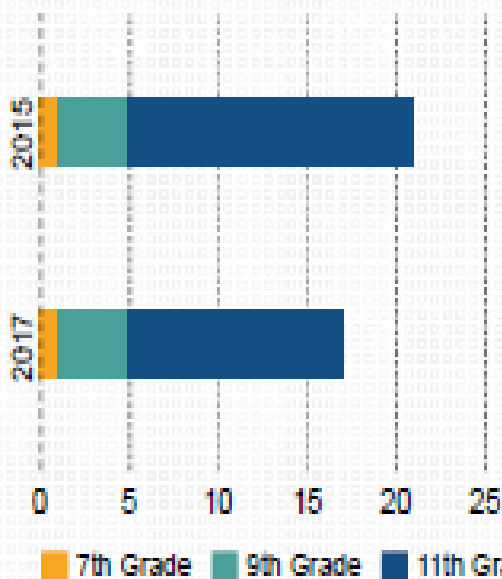
# 2017-2018 CALIFORNIA HEALTHY KIDS SURVEY IRVINE UNIFIED SCHOOL DISTRICT



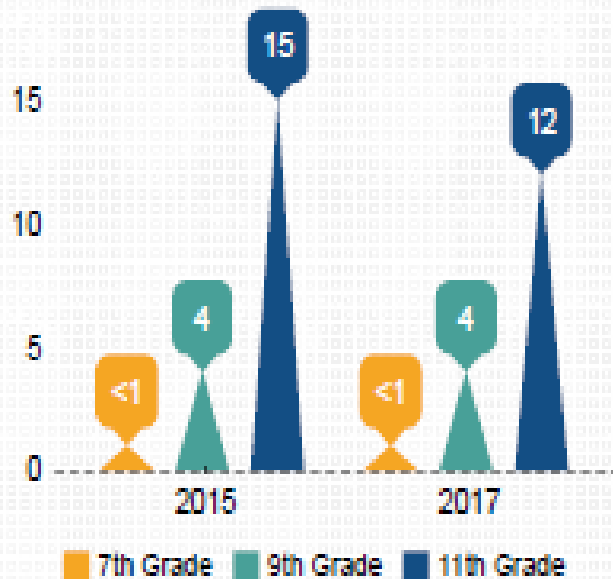
# 2017-2018 CALIFORNIA HEALTHY KIDS SURVEY

## IRVINE UNIFIED SCHOOL DISTRICT

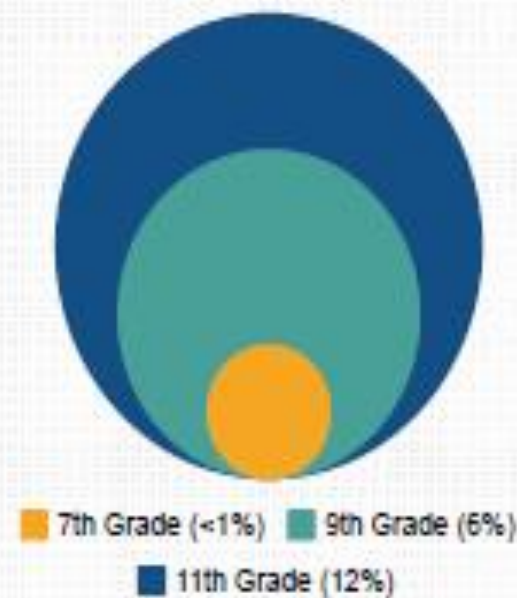
% of students who have been very drunk or sick after drinking



% of students who have been high from using drugs



Current use of:  
Cigarettes, e-cigarettes, smokeless tobacco



# 2017-2018 CALIFORNIA HEALTHY KIDS SURVEY

## CURRENT E-CIGARETTE USE

### 9<sup>TH</sup> GRADE

- IRVINE USD 4%
- NEWPORT MESA USD 11%
- CAPISTRANO USD 10%
- TUSTIN USD 10%

### 11<sup>TH</sup> GRADE

- IRVINE USD 9%
- NEWPORT MESA USD 19%
- CAPISTRANO USD 19%
- TUSTIN USD 11%



# CDC UPDATES GUIDANCE ON VAPING LINKED ILLNESS, COINS TERM EVALI

- THE CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC) RELEASED UPDATED INTERIM CLINICAL GUIDANCE FOR HEALTHCARE PROVIDERS REGARDING LUNG INJURY ASSOCIATED WITH E-CIGARETTE, OR VAPING, PRODUCT USE. THE AGENCY HAS COINED THE TERM "EVALI" FOR E-CIGARETTE, OR VAPING, PRODUCT USE ASSOCIATED LUNG INJURY ILLNESSES.



# USING SOCIAL MEDIA TO UNCOVER A BLACK MARKET 'BRAND' LINKED TO VAPING ILLNESS

ON SEPTEMBER 27, 2019 FEDERAL HEALTH OFFICIALS announced that they had tracked a number of bootleg THC cartridges to the vaping-related lung illnesses that have afflicted more than 1,000 people across the country. The most common cartridge cited by officials is a brand known as Dank Vapes.



# VITAMIN E OIL STRONGLY LINKED TO EVALI

- **AS OF JANUARY 21, 2020**, A TOTAL OF 2,711 HOSPITALIZED EVALI CASES OR DEATHS HAVE BEEN REPORTED TO CDC FROM ALL 50 STATES, THE DISTRICT OF COLUMBIA, AND TWO U.S. TERRITORIES (PUERTO RICO AND U.S. VIRGIN ISLANDS).
  - SIXTY DEATHS HAVE BEEN CONFIRMED IN 27 STATES AND THE DISTRICT OF COLUMBIA (**AS OF JANUARY 21, 2020**).
- U.S. HEALTH OFFICIALS FINALLY HAVE A POTENTIAL BREAKTHROUGH IN THE VAPING ILLNESS OUTBREAK NARROWING IN ON VITAMIN E ACETATE AS A “POTENTIAL TOXIN OF CONCERN.”
- THE COMPOUND, USED IN SUPPLEMENTS, COSMETICS AND SOME VAPING PRODUCTS WAS DETECTED IN ALL 29 LUNG TISSUE SAMPLES FROM PATIENTS HEALTH OFFICIALS TESTED.



# E-CIGARETTE BATTERY EXPLOSIONS

- ONE STUDY PUBLISHED IN 2018 ESTIMATED THAT MORE THAN 2,000 E-CIGARETTE EXPLOSION AND BURN INJURIES SENT USERS TO US HOSPITAL EMERGENCY DEPARTMENTS FROM 2015 TO 2017.
- IN FEBRUARY 2019, A TEXAS MAN DIED AFTER HIS E-CIGARETTE EXPLODED AND SHRAPNEL TORE THROUGH HIS CAROTID ARTERY.

# NIH NOVEMBER 2019

- MANY CHEMICALS THAT CAUSE CANCER ARE IN THE VAPOR. THEY INCLUDES FORMALDEHYDE, HEAVY METALS, AND PARTICLES THAT CAN GET STUCK IN THE DEEPEST PARTS OF YOUR LUNGS.
- MICE EXPOSED TO E-CIGARETTE VAPOR CONTAINING NICOTINE HAD AN INCREASED RISK OF DEVELOPING LUNG CANCER AND PRE-CANCEROUS CHANGES IN THE BLADDER.
- WHILE THESE RESULTS CAN'T PREDICT HOW E-CIGARETTE VAPOR MIGHT AFFECT PEOPLE, THEY HIGHLIGHT THE NEED FOR MORE STUDIES INTO THE POTENTIAL TOXICITY OF E-CIGARETTES.
- AS SUCH, THERE IS NOW EVIDENCE THAT SUGGESTS VAPING MAY INCREASE YOUR OVERALL RISK FOR CANCER. THIS IS DIFFERENT THAN DIRECTLY CAUSING CANCER.

# NICOTINE CONCENTRATION IN CIGARETTES

- THE AVERAGE **CIGARETTE** CONTAINS ABOUT 10 TO 12 MG OF **NICOTINE**. YOU DON'T INHALE EVERY MILLIGRAM OF **NICOTINE** AS IT BURNS. YOU'LL PROBABLY INHALE ABOUT 1.1 TO 1.8 MG OF **NICOTINE** BY THE END OF EACH **CIGARETTE**. THIS MEANS THAT FOR A **PACK** OF 20 **CIGARETTES**, YOU'LL LIKELY INHALE BETWEEN 22 TO 36 MG OF **NICOTINE**





# NICOTINE CONCENTRATION IN OTHER FORMS OF USE

<b>Product</b>	<b>Amount of nicotine (average)</b>
Cigar	13.3–15.4 mg ( <a href="#">large cigars</a> ) <a href="#">Trusted Source</a>
E-cigarette	<a href="#">0.5–15.4 mg (15 puffs)</a>
Pipe (tobacco)	<a href="#">30.08–50.89 mg</a> <a href="#">Trusted Source</a>
Chewing tobacco	144 mg ( <a href="#">whole can</a> )
Hookah	1.04 mg ( <a href="#">per puff</a> ) <a href="#">Trusted Source</a>

NIH Slide: Nicotine levels in e-cigarettes can vary greatly from one brand to the next.

# E-CIGARETTES APPEALING TO YOUTH

- REGULAR NICOTINE IN A CIGARETTE COMES IN THE FORM OF FREE BASE WHICH IS IRRITATING TO THE BACK OF YOUR THROAT. SO, YOU CAN ONLY TAKE IN A LIMITED AMOUNT.
- WHAT JUUL DID IS BASICALLY USE A NICOTINE SALT IN A FORM OF BENZOIC ACID WHICH REDUCED THE PH TO SOMETHING MORE NEUTRAL — MUCH MORE TOLERABLE TO SOMEONE WHO'S NEVER BEEN A SMOKER. THEY FOUND A WAY TO MAKE THE NICOTINE MUCH MORE PALATABLE AND, AS A RESULT, INCREASED THE NICOTINE CONCENTRATION.



# INCREASING NICOTINE CONCENTRATION INCREASES PHYSIOLOGIC DEPENDENCE

- HIGHER NICOTINE E-CIGARETTES HAVE DRIVEN THE SURGE IN E-CIGARETTE SALES IN RECENT YEARS, WITH THOSE CONTAINING AT LEAST 4% NICOTINE COMPRISING NEARLY THREE-QUARTERS OF THE E-CIGARETTE MARKET IN 2018. UNLIKE IN EUROPE, WHERE E-CIGARETTE NICOTINE CONCENTRATIONS CANNOT EXCEED 2%, THERE ARE NO NICOTINE CONCENTRATION RESTRICTIONS IN THE UNITED STATES.
- FOR EXAMPLE, THE MAKER OF JUUL CLAIMS THE PRODUCT HAS A NICOTINE CONTENT LIKE TRADITIONAL CIGARETTES, BUT IT DELIVERS THE NICOTINE UP TO 2.7 TIMES FASTER THAN OTHER E-CIGARETTES.



# FLAVORED E-CIGARETTES STILL READILY AVAILABLE

- A 2018 TRUTH INITIATIVE STUDY PUBLISHED IN TOBACCO CONTROL FOUND THAT AMONG CURRENT YOUTH AND YOUNG ADULT USERS, THE MAJORITY — 63% — DID NOT KNOW THAT THE PRODUCT ALWAYS CONTAINS NICOTINE. ANECDOTALLY, YOUTH ARE REPORTING SIGNS OF SEVERE DEPENDENCE, SUCH AS INABILITY TO CONCENTRATE IN CLASS, USING AN E-CIGARETTE UPON WAKING, AND USING E-CIGARETTES AT NIGHT AFTER WAKING WITH A CRAVING.
  - THE FDA HAS ALSO REPORTED THAT, AMONG CURRENT YOUTH USERS OF E-CIGARETTES, 97% USED A FLAVORED E-CIGARETTE IN THE PAST MONTH.
  - AS MUCH AS 98.7% OF FLAVORED E-CIGARETTE PRODUCTS SOLD IN CONVENIENCE, DOLLAR, DRUG AND GROCERY STORES CONTAIN NICOTINE.
  - YOU CAN BUY EXTRA-STRENGTH CARTRIDGES, WHICH HAVE A HIGHER CONCENTRATION OF NICOTINE, OR YOU CAN INCREASE THE E-CIGARETTE'S VOLTAGE TO GET A GREATER HIT OF THE SUBSTANCE.

# LOOPHOLE IN LAWS ALLOW DISPOSABLE CARTRIDGES TO CONTAIN MINT AND FRUIT FLAVORS

- THE FOOD AND DRUG ADMINISTRATION IS BANNING MOST FLAVORED E-CIGARETTES, BUT THAT ISN'T KEEPING BANANA ICE, SOUR GUMMY OR COOL MINT OUT OF THE HANDS OF HIGH SCHOOL STUDENTS.
- WHEN LAWS WERE PASSED TO PROHIBIT FRUIT, MINT AND DESSERT FLAVORS IN REFILLABLE CARTRIDGE-BASED E-CIGARETTES, THERE WAS AN EXCEPTION.
- A FOOTNOTE ON PAGE 9 OF THE NEW POLICY PERMITS ALL FLAVORS TO CONTINUE TO BE SOLD IN DEVICES THAT CANNOT BE REFILLED AND ARE DESIGNED TO BE DISPOSED OF AFTER THE FLAVORED NICOTINE HAS RUN DRY.

# TEENAGERS HAVE CAUGHT ON FAST.

- “WE’RE STILL BACK ON JUUL,” MS. RODGERS CONTINUED, DESCRIBING SCHOOL ADMINISTRATORS’ APPROACH TO POLICING TEEN VAPING. BUT, SHE SAID, THE STUDENTS TELL HER, ““JUUL’S SO YESTERDAY, WE’VE MOVED ON.””
- THE HOLES IN THE GOVERNMENT’S FLAVOR BAN HAVE MERELY OPENED THE DOOR TO AN ARRAY OF COMPETING BRANDS THAT PRODUCE DISPOSABLES, LIKE PUFF BARS, BLU, POSH AND STIG. THE PRE-CHARGED, PRE-FILLED DEVICES ARE MADE BY DOMESTIC COMPANIES AND IMPORTED FROM CHINA. SOME HAVE A HIGHER NICOTINE LEVEL THAN JUUL.



# PUSH TO BAN ALL FLAVORED NICOTINE VAPING PRODUCTS IN OREGON MOVES TO LEGISLATURE

## FEBRUARY 2, 2020

- A HIGH SCHOOL JUNIOR IN NEWPORT BEACH, CALIF. SWITCHED TO PUFF BAR, WHICH SHE BUYS FROM OTHER STUDENTS. COSTING BETWEEN \$7 AND \$10 PER DISPOSABLE E-CIGARETTE, PUFF BAR IS CHEAPER THAN JUUL.
- “FOR ME IT WASN’T ABOUT IT BEING EASIER TO GET, IT WAS MORE COST-EFFECTIVE. I’D HAVE TO SAVE UP \$30 TO BUY A PACK OF JUUL PODS,” SHE SAID.
- “PUFF CAME OUT AS THE NEW POPULAR THING THAT EVERY SINGLE KID WAS DOING AND I HOPPED ON THAT FAD,” SHE EXPLAINED. “THEY HAVE FLAVORS LIKE THE JUUL FLAVORS. IT’S BASICALLY LIKE SMOKING A JUUL.”
- A HIGH SCHOOL SENIOR FROM COSTA MESA, CALIF. HAS ALSO SWITCHED TO PUFF BAR.
- “THEY HAVE THE BEST FLAVORING,” HE SAID. “THEY HAVE THE MOST NICOTINE CONTENT.”
- HE SAID THAT HE BELIEVES TEENAGERS WOULD STOP VAPING IF THE FLAVORS WERE NOT AVAILABLE.
- “IF PEOPLE JUST SOLD STRAIGHT TOBACCO FLAVOR VAPES, PEOPLE WOULD WANT TO WEAN THEMSELVES OFF,” HE SAID. “IT’S NOT AS ENJOYABLE.”

NY Times article, January 31, 2020

# WHERE TO START WITH OUR YOUTH

- EDUCATION AND TALKING TO YOUTHS ABOUT DANGERS VAPING
- ASSESSING USE AND ADDICTION WITH SURVEYS
- PROVIDING ACCURATE INFORMATION ABOUT RISKS
- UNDERSTANDING WHY YOUTH VAPE AND SUGGEST ALTERNATIVES
- SEEKING TREATMENT FOR NICOTINE DEPENDENCE EARLY
- MEDICATIONS OR NICOTINE REPLACEMENT THERAPY, ALONG WITH COUNSELING, COULD HELP ADDICTED YOUNG USERS TO QUIT VAPING
- ADVISE AGAINST ALL VAPING.





# FOR MORE INFORMATION ON VAPING

- TO RAISE AWARENESS ABOUT THE DANGERS OF E-CIGARETTE USE AND VAPING, THE FIRST PHASE OF A NEW ADVERTISING CAMPAIGN TARGETING YOUNG ADULTS AND PARENTS CALLED OUTBREAK IS AIRING ON TV, RADIO AND ONLINE. THE CAMPAIGN ADDRESSES THE OUTBREAK OF VAPING ASSOCIATED LUNG ILLNESSES AND THE GROWING TEEN VAPING EPIDEMIC. FOR MORE INFORMATION ABOUT THE DANGERS OF E-CIGARETTES AND VAPING DEVICES, SYMPTOMS OF THE VAPING-ASSOCIATED LUNG ILLNESS AND WHERE TO FIND HELP, YOUNG ADULTS SHOULD VISIT VAPEOUTBREAK, AND PARENTS SHOULD VISIT FLAVORSHOOKKIDS.



# TAKEAWAYS

- MOST SUBSTANCE USE STARTS IN ADOLESCENCE
- THE YOUNGER A PERSON STARTS THE MORE LIKELY A SUBSTANCE USE DISORDER WILL DEVELOP AND THE MORE LIKELY IT WILL LEAD TO MEDICAL AND/OR PSYCHIATRIC DISORDERS
- MARKETING EFFORTS TO MAKE SUBSTANCES ATTRACTIVE TO ADOLESCENTS IS PERVASIVE
- BRAINS CONTINUE DEVELOPING UNTIL WE ARE AT LEAST 25 YEARS OLD AND DRUGS AND ALCOHOL ADVERSELY AFFECT DEVELOPING BRAINS
- START BY TALKING TO YOUR KIDS
- TREATMENT IS AVAILABLE BUT MOST DON'T TAKE ADVANTAGE OF RESOURCES



The background features a vertical gradient from light purple at the top to light blue at the bottom. Numerous realistic water droplets of various sizes are scattered across the surface, with some showing highlights and shadows. A large, faint watermark of a smiley face is centered in the background.

**THANK YOU!**