

LECTURE I

INTRODUCTION: DRUGS AND BEHAVIOR

KEY TERMS – WHAT IS A DRUG?

- **Drug** - Any substance, natural or artificial, other than food*, that by its chemical nature **alters** structure or function in a living organism
 - *Does the World Health Organization agree?
- **Legal drug** - A drug that is lawful to possess
- **Illicit drug** - A drug that is unlawful to possess or use
 - What qualifies...?
- **Psychoactive drug** - chemical substance that changes the function of the nervous system and results in alterations of perception, mood/emotional state, cognition/mental state, and behavior



KEY TERMS - TYPES OF DRUG TAKING BEHAVIOR

- **Drug Use**
- **Drug misuse** - Use of drugs in greater amounts than, or for purposes other than, those prescribed (use of drug in way other than intended)
 - Textbook discusses “**Deviant drug use**” - Drug use that is not common within a social group *and* that is disapproved of by the majority.
- **Drug Abuse, Substance Addiction, Drug Dependence...**
 - Refers to cases in which people have struggled to control substance use and have suffered serious negative consequences from that use.
 - Have all been used interchangeably (*the term “drug abuse” is falling out of favor)
- **Substance Use Disorder** is technical term for diagnosis
 - Drug use that causes problems (physical, psychological, social, legal, etc.) in person’s life
 - Continued use despite these negative consequences

SHIFT TOWARD THE USE OF PERSON-FIRST LANGUAGE

BY NATIONAL
INSTITUTES OF DRUG
ABUSE; NATIONAL
INSTITUTES OF
ALCOHOL ABUSE AND
ALCOHOLISM

Talking About Yourself or Others with Substance Use Disorder

Use...	Instead of...	Because...
<ul style="list-style-type: none">▪ Person with a substance use disorder¹⁰▪ Person with an opioid use disorder (OUD) or person with opioid addiction	<ul style="list-style-type: none">▪ Addict▪ User▪ Substance or drug abuser▪ Junkie	<ul style="list-style-type: none">▪ Using person-first language shows that SUD is an illness.▪ Using these words shows that a person with a SUD “has” a problem/illness, rather than “is” the problem.⁶▪ The terms avoid elicit negative associations, punitive attitudes, and individual blame.⁶
<ul style="list-style-type: none">▪ Person with alcohol use disorder▪ Person who misuses alcohol/engages in unhealthy/hazardous alcohol use	<ul style="list-style-type: none">▪ Alcoholic▪ Drunk	
<ul style="list-style-type: none">▪ Person in recovery or long-term recovery/person who previously used drugs	<ul style="list-style-type: none">▪ Former addict▪ Reformed addict	
<ul style="list-style-type: none">▪ Testing positive (on a drug screen)	<ul style="list-style-type: none">▪ Dirty▪ Failing a drug test	<ul style="list-style-type: none">▪ Use medically accurate terminology the same way it would be used for other medical conditions.⁸▪ These terms may decrease a person’s sense of hope and self-efficacy for change.⁶

Health Professions Education

CME/CE

Centers of Excellence

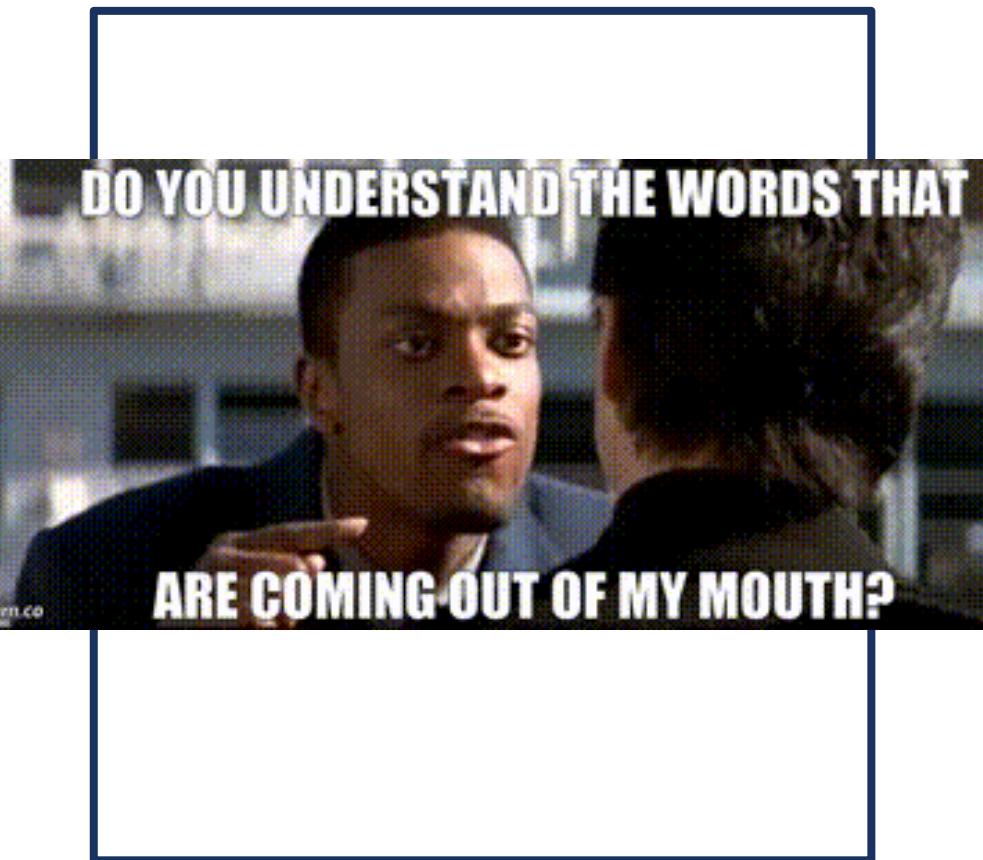
Addiction Medicine Toolkit for Health Care Providers in Training

Words Matter - Terms to Use and Avoid When Talking About Addiction

Stigma Resources

Instead of...	Use...	Because...
▪ Habit	▪ Substance use disorder ▪ Drug addiction	▪ Inaccurately implies that a person is choosing to use substances or can choose to stop. ⁶ ▪ "Habit" may undermine the seriousness of the disease.
▪ Abuse	For illicit drugs: ▪ Use For prescription medications: ▪ Misuse ▪ Used other than prescribed	▪ The term "abuse" was found to have a high association with negative judgments and punishment. ⁹ ▪ Legitimate use of prescription medications is limited to their use as prescribed by the person to whom they are prescribed. Consumption outside these parameters is misuse.
▪ Opioid substitution replacement therapy ▪ Medication-assisted treatment (MAT)	▪ Opioid agonist therapy ▪ Pharmacotherapy ▪ Addiction medication ▪ Medication for a substance use disorder ▪ Medication for opioid use disorder (MOUD)	▪ It is a misconception that medications merely "substitute" one drug or "one addiction" for another. ⁶ ▪ The term MAT implies that medication should have a supplemental or temporary role in treatment. Using "MOUD" aligns with the way other psychiatric medications are understood (e.g., antidepressants, antipsychotics), as critical tools that are central to a patient's treatment plan.
▪ Clean	For toxicology screen results: ▪ Testing negative For non-toxicology purposes: ▪ Being in remission or recovery ▪ Abstinent from drugs ▪ Not drinking or taking drugs ▪ Not currently or actively using drugs	▪ Use clinically accurate, non-stigmatizing terminology the same way it would be used for other medical conditions. ¹⁰ ▪ Set an example with your own language when treating patients who might use stigmatizing slang. ▪ Use of such terms may evoke negative and punitive implicit cognitions. ⁷

USING PRECISE AND PERSON-FIRST LANGUAGE



- Consider the question “Are drugs harmful to college kids?”
 - When a term or phrase is ambiguous, its meaning is left uncertain and open to interpretation, as we saw in our example earlier:
 - What kinds of drug?
 - How much or how often?
 - What type of harm?
 - Define “college kids”.
- Consider instead, “Does consuming two ounces of alcohol a day cause liver damage in college students?”
- Practice identifying this language in your day-to-day life, and catching yourself when discussing in class

Our concern about the use of a drug depends on what is being used, who is using it, how much is being used, and when, where, and why it is being used.



GENERAL PRINCIPLES OF DRUG USE

1) Use is not abuse.

- Most users of any given substance do not use it in ways that can be defined as addiction, or a substance use disorder.

2) Every drug has multiple effects.

- Positive, negative, and in between
- Although a user might seek only one effect, every psychoactive drug acts at multiple sites, both in the brain and on other organs.

3) Amount matters.

- Large doses, frequent doses, or taking a drug by a method that results in a lot of the drug getting to the brain quickly can produce very different effects, and more problems, compared with a single or lower dose.

GENERAL PRINCIPLES OF DRUG USE

4) User's history and expectations powerfully influence drug effects.

- Experienced users react differently than new users and may report more of the positive effects of a drug.

Expectations influence the experience:

- Even first-time users are influenced by peers, family members, especially older siblings (D'Amico & Fromme, 1997), advertising, media (movies, TV, etc).
- Bar Lab Experiment:
<https://www.youtube.com/watch?v=8EWqy6MGpxo>
https://www.youtube.com/watch?v=BR2_YpocWQk

GENERAL PRINCIPLES OF DRUG USE

5) Drugs are not good or bad.

- Any drug that produces effects might produce some benefit when used carefully and has the potential to produce harm when abused.
- Blaming the substance affects our efforts to correct drug-related problems by focusing on eliminating the substance and ignoring all the factors that led to the abuse of the drug in the first place.

HOW DID WE GET HERE?

Drug use is not at all new.

- Drugs have been used throughout history...
 - Enhance spiritual/religious experiences.
 - Significant roles in the economies of societies in the past.
 - Treat illnesses.



HOW DID WE GET HERE?

However...

Many developments in the past century.

- Marketing of legal pharmaceuticals.
 - Vaccines, antibiotics, birth control medicines, and mental health treatments were introduced.
- Government efforts to limit access to certain kinds of drugs
 - “war on drugs” (we will go into more depth on this in our history/policy lecture)

EXTENT OF DRUG USE

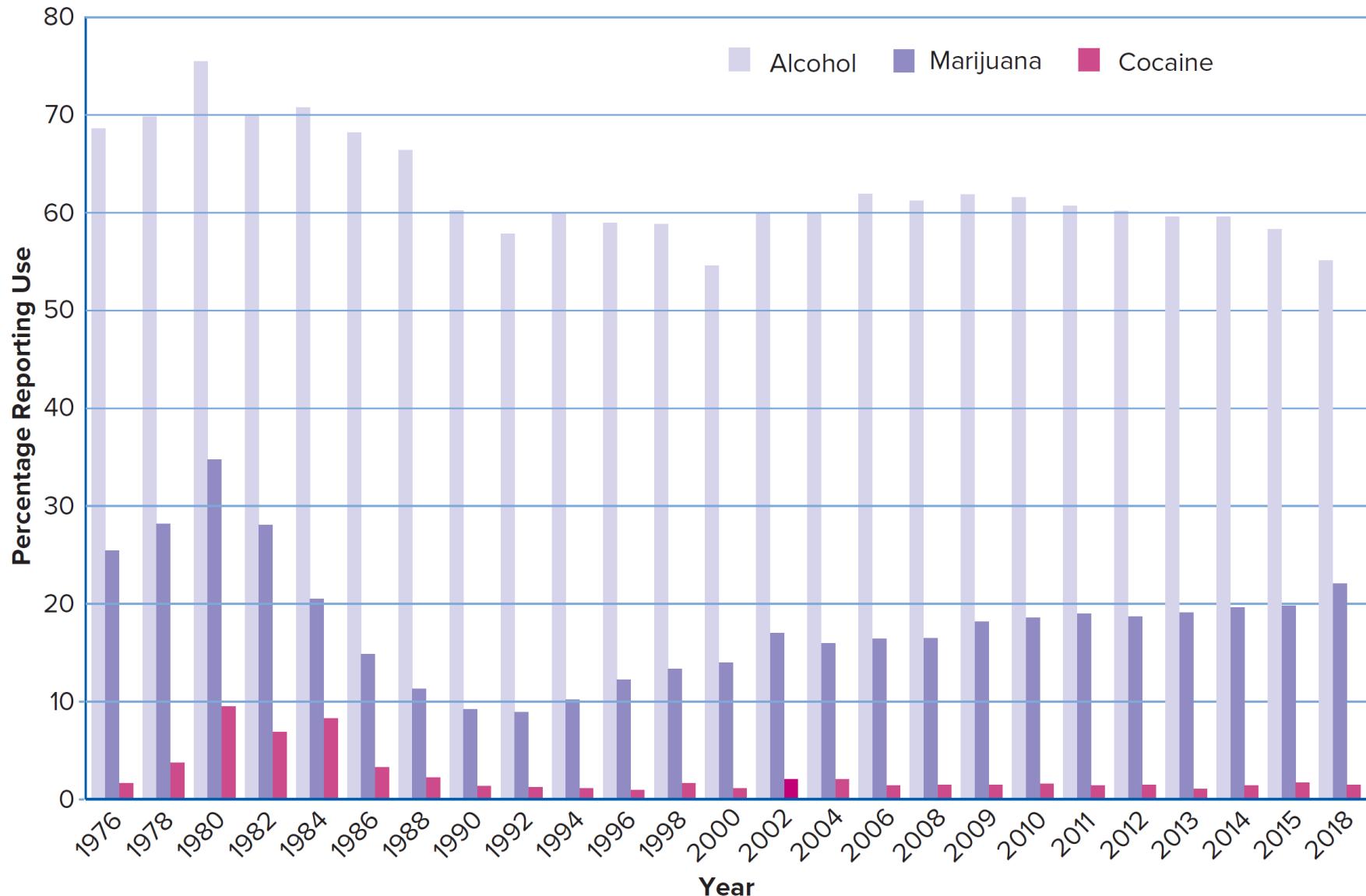
Think back to our exercise at the beginning of the class...

“Yes or No: Rates of drug use have continuously gone up over time.”

in some cases, we don’t know what we don’t know...

- It is not easy to get accurate and complete information on:
 - How much of an illicit drug is imported and sold.
 - Number of users for illegal drugs such as cocaine
 - True usage of legal drugs such as alcohol, tobacco, and prescription drugs.

TRENDS IN REPORTED DRUG USE WITHIN THE PAST 30 DAYS FOR YOUNG ADULTS AGES 18 TO 25



POPULATIONS OF USERS

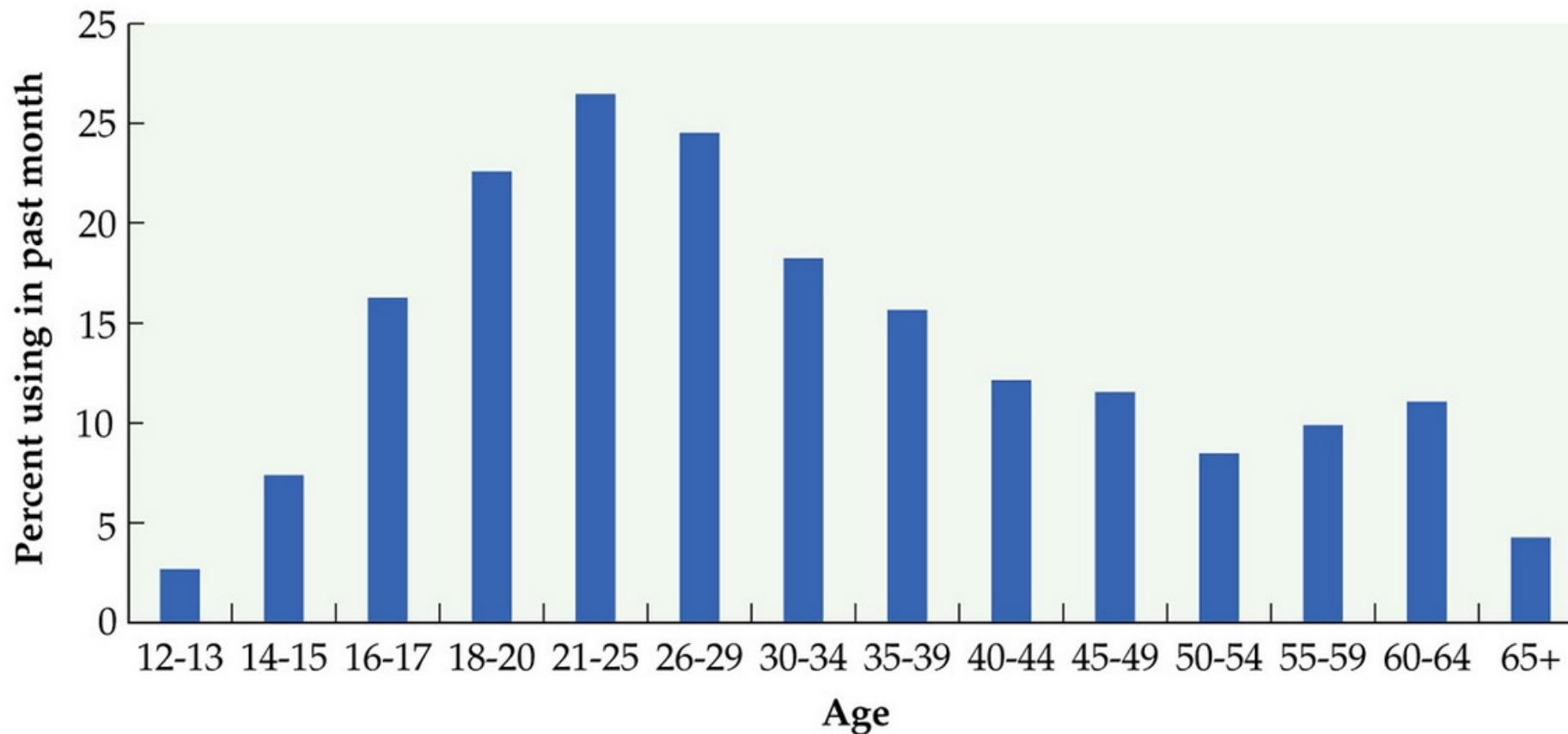
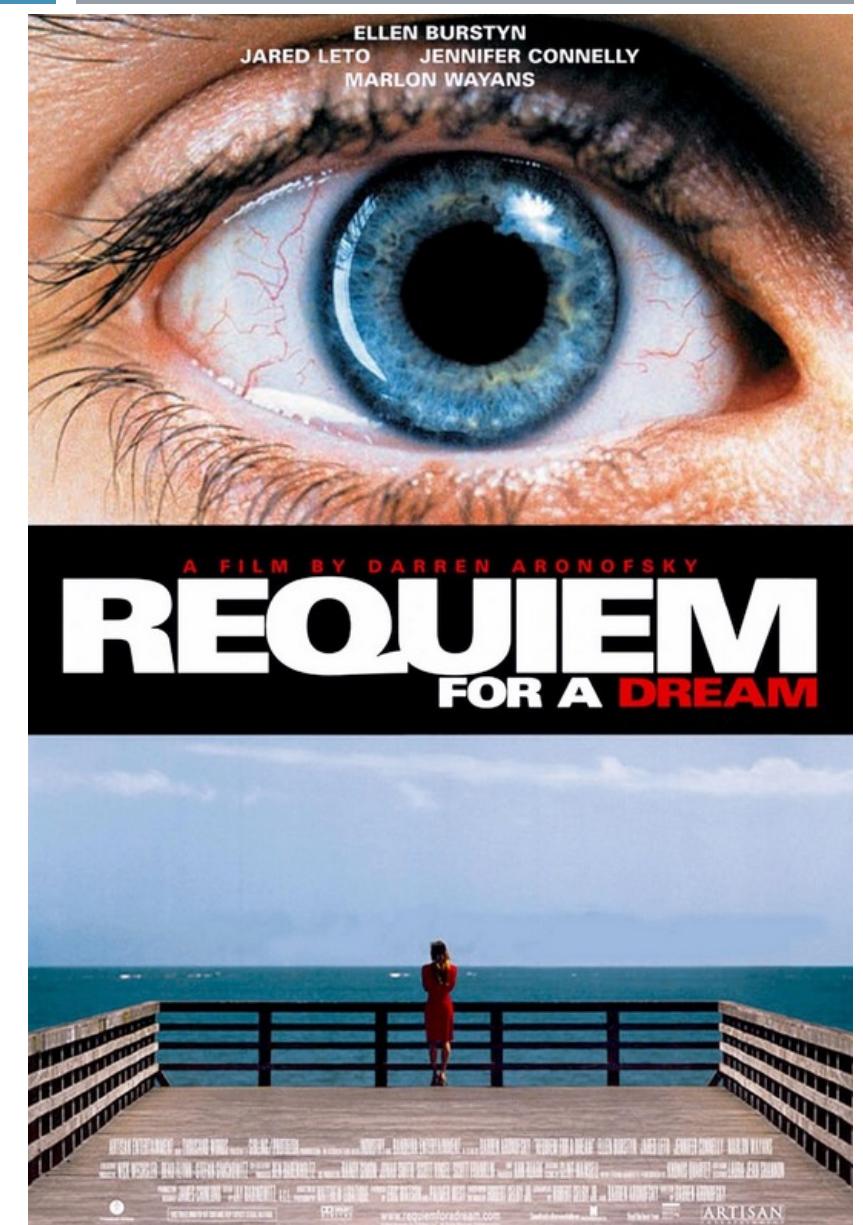


FIGURE 1.4. Illicit drug use in the United States over the past month, by age. Illicit drug use is highest in those age 18–29. Source: SAMHSA. (2020). *Results from the*

POPULATIONS OF USERS

- There is a wide range of rates and amounts of use among people who use a particular substance.
 - This is true of all psychoactive drugs.
- This range of users has important implications for:
 - Prevention & Treatment efforts.
 - Law enforcement.
 - The nature of “dependence”.



PATTERNS/TRENDS IN DRUG USE (VIA SURVEYS)

Monitoring the Future study (MTF) :

- Gathers data from students.
- Conducted annually since 1975.
- Types of data collected:
 - Prevalence of drug use.
 - Perceived risk and availability of various drugs.

National Survey on Drug Use and Health (NSDUH) :

- Gathers data from people ages 12+ in households across the United States.
- Conducted annually since 1971.
- Face-to-face, computer-assisted interviews.
- Types of data collected:
 - Prevalence of drug use.
 - Frequency of drug use.

Both shows changes in the trends over time in the rates of drug use.



(Part B of Forms 2-6, Base Year and Follow up)

EXTENT OF DRUG USE

- Much of our information from survey questionnaires.
- Easiest way to get a lot of information with minimum effort... but many drawbacks.
 - 1) selection bias
 - 2) validity of self-reported drug use

PART B

The following questions are about cigarette smoking.

1. Have you ever smoked cigarettes?

- Never—GO TO QUESTION 3
 Once or twice
 Occasionally but not regularly
 Regularly in the past
 Regularly now

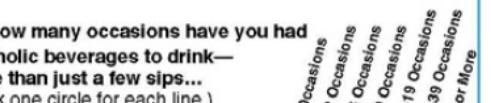
2. How frequently have you smoked cigarettes during the past 30 days?

- Not at all
 Less than one cigarette per day
 One to five cigarettes per day
 About one-half pack per day
 About one pack per day
 About one and one-half packs per day
 Two packs or more per day

3. Next we want to ask you about drinking alcoholic beverages, including beer, wine, liquor, and any other beverage that contains alcohol.

Have you ever had any alcoholic beverage to drink—more than just a few sips?

- No—GO TO TOP OF NEXT COLUMN
 Yes

4. On how many occasions have you had alcoholic beverages to drink—more than just a few sips...
(Mark one circle for each line.)

a. ...in your lifetime?

b. ...during the last 12 months?

c. ...during the last 30 days?

5. On the occasions that you drink alcoholic beverages, how often do you drink enough to feel pretty high?

- On none of the occasions
 On few of the occasions
 On about half of the occasions
 On most of the occasions
 On nearly all of the occasions

The next major section of this questionnaire deals with various other drugs. There is a lot of talk these days about this subject, but very little accurate information. Therefore, we still have a lot to learn about the actual experiences and attitudes of people your age.

We hope that you can answer all questions; but if you find one which you feel you cannot answer honestly, we would prefer that you leave it blank.

Remember that your answers will be kept strictly confidential; they are never connected with your name or your class.

7. On how many occasions (if any) have you used marijuana (weed, pot) or hashish (hash, hash oil)...
(Mark one circle for each line.)

a. ...in your lifetime?

b. ...during the last 12 months?

c. ...during the last 30 days?

8. On how many occasions (if any) have you used LSD ("acid")...
(Mark one circle for each line.)

a. ...in your lifetime?

b. ...during the last 12 months?

c. ...during the last 30 days?

9. On how many occasions (if any) have you used hallucinogens other than LSD (like mescaline, peyote, "shrooms" or psilocybin, PCP)...
(Mark one circle for each line.)

a. ...in your lifetime?

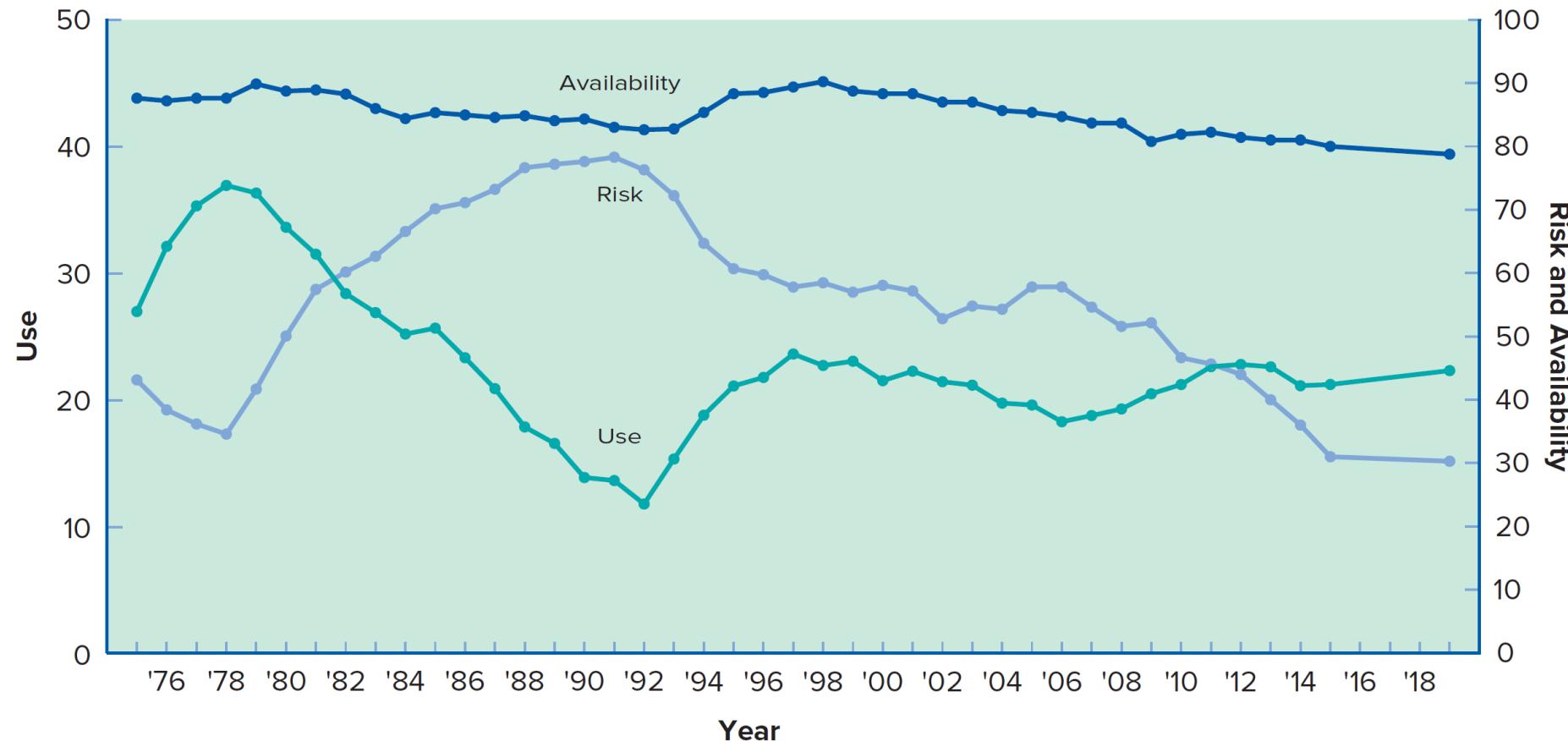
b. ...during the last 12 months?

c. ...during the last 30 days?

10. On how many occasions (if any) have you used cocaine (sometimes called "coke", "crack", "rock")...
(Mark one circle for each line.)

MONITORING THE FUTURE STUDY

MARIJUANA:TRENDS IN PERCEIVED AVAILABILITY, RISK OF REGULAR USE, AND PREVALENCE OF USE IN THE PAST 30 DAYS FOR 12TH-GRADERS



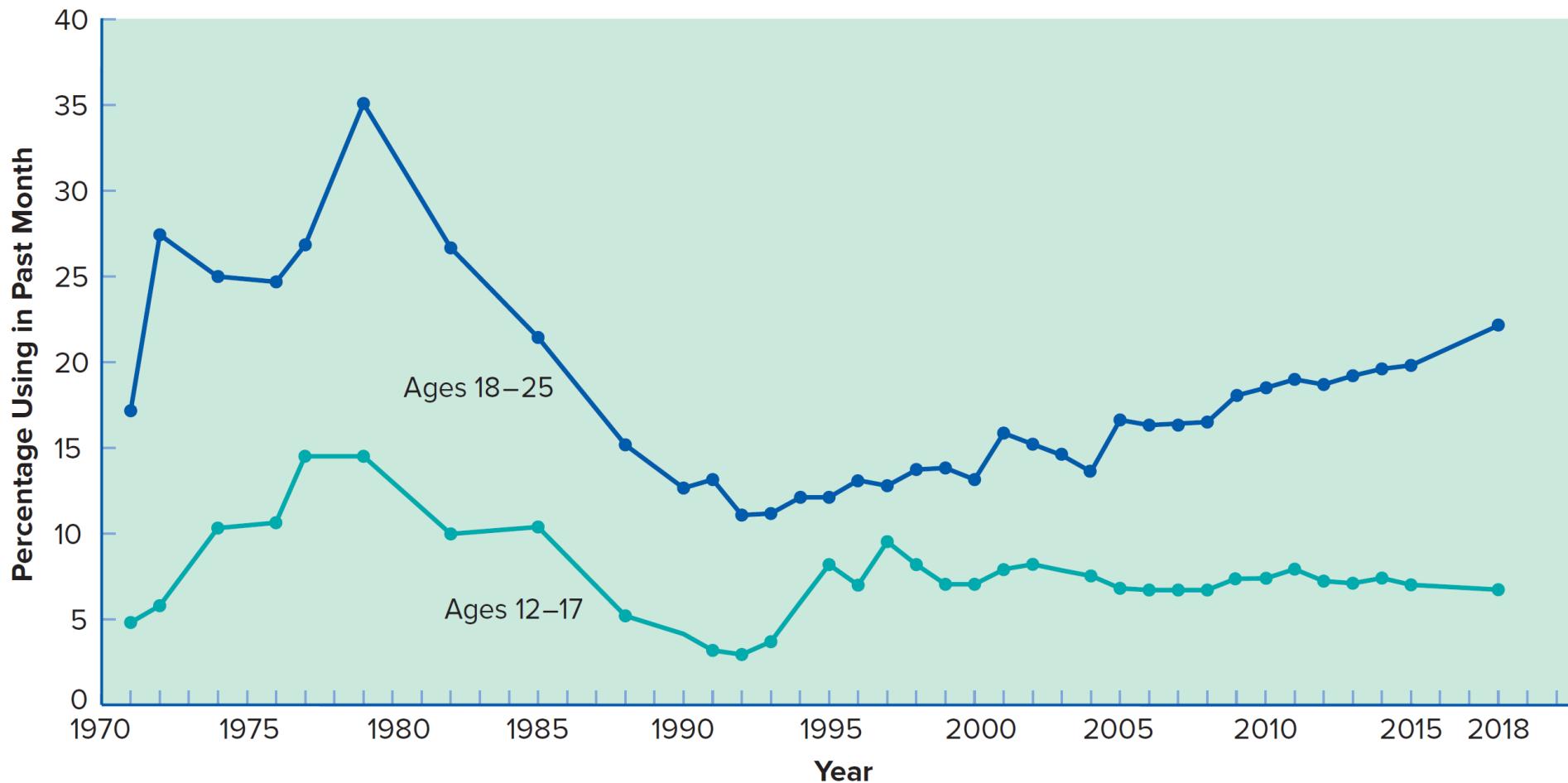
Use: % using once or more in past 30 days

Risk: % saying great risk of harm in regular use

Availability: % saying fairly easy or very easy to get

NATIONAL SURVEY ON DRUG USE AND HEALTH

TRENDS IN MARIJUANA USE AMONG PERSONS AGES 12 TO 25, BY AGE GROUP

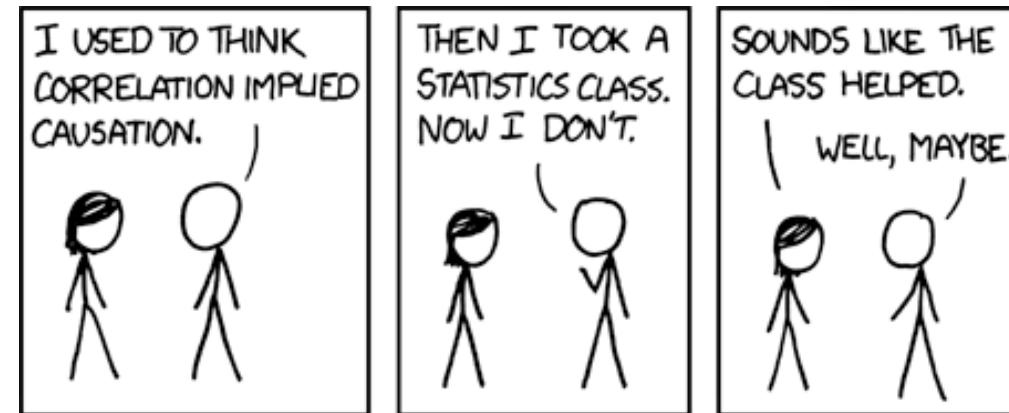


NATIONAL SURVEYS

- Data from Monitoring the Future study (MTF), National Survey on Drug Use and Health (NSDUH), and other large-scale studies can be examined together.
 - Ongoing epidemiological and etiological research and reporting project.
 - NSDUH is the **primary source** of national and state-level data concerning alcohol, tobacco, and drug use.
- Patterns found in both surveys are similar.
 - Indicates that these trends are real and probably reflect broad changes in the American society over time.

CORRELATES OF DRUG USE

- **Correlate** - A variable that is statistically related to some other variable
 - Reminder: This does not necessarily mean it **causes** that other variable



- Much of the research on correlates of drug use has used marijuana smoking as an indicator partly because:
 - Adolescent marijuana use has been a matter of some concern for some time.
 - Enough people have tried it so that meaningful correlations can be done.

RISK VS. PROTECTIVE FACTORS

- **Risk factors** vs. **protective factors** - Risk factors are correlated with higher rates/increased drug use, and protective factors are correlated with lower rates/decreased drug use.
 - Gender
 - Race and ethnicity
 - Level of education
 - Genetics
 - Personality variables - Play a small role in whether someone decides to try alcohol or marijuana but a larger role in whether that use develops into a serious problem.
 - “Impulsive” individuals might use drugs at a higher rate.

FACTORS ASSOCIATED WITH ADOLESCENT MARIJUANA USE

Risk Factors (in order of importance):	Protective Factors (in order of importance):
Having friends who use marijuana or other substances	Perceiving that there are strong sanctions against substance use at school
Engaging in frequent fighting, stealing, or other antisocial activities	Having parents as a source of social support
Perceiving that substance use is prevalent at your school	Being committed to school
Knowing adults who use marijuana or other substances	Believing that religion is important and frequently attending religious services
Having a positive attitude toward marijuana use	Participating in two or more extracurricular activities

ANTECEDENTS OF DRUG USE

- **Antecedent** - A variable that occurs before an event such as the initiation of drug use.
 - Not necessarily the cause of drug use.
- Examples include...
 - Aggressiveness.
 - Conduct problems.
 - Poor academic performance.
 - Attachment to a drug-using peer group.
 - Parent and community norms that support drug use.



RISK VS. PROTECTIVE FACTORS

- The terms “risk factor” and “protective factor” sound like they connote **causality**.
 - But for almost all these factors we cannot say they cause or prevent drug use...we can only say they are correlates of drug use.
 - Being in fights at school is a risk factor for marijuana use...
does fighting cause marijuana use?

What are the three possible causal relationships when two variables are correlated?

Possibilities if A is correlated with B

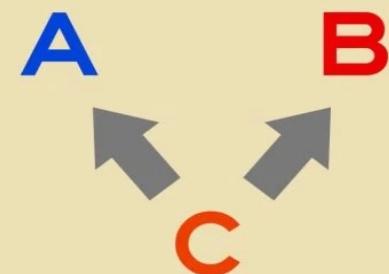
A caused B



B caused A

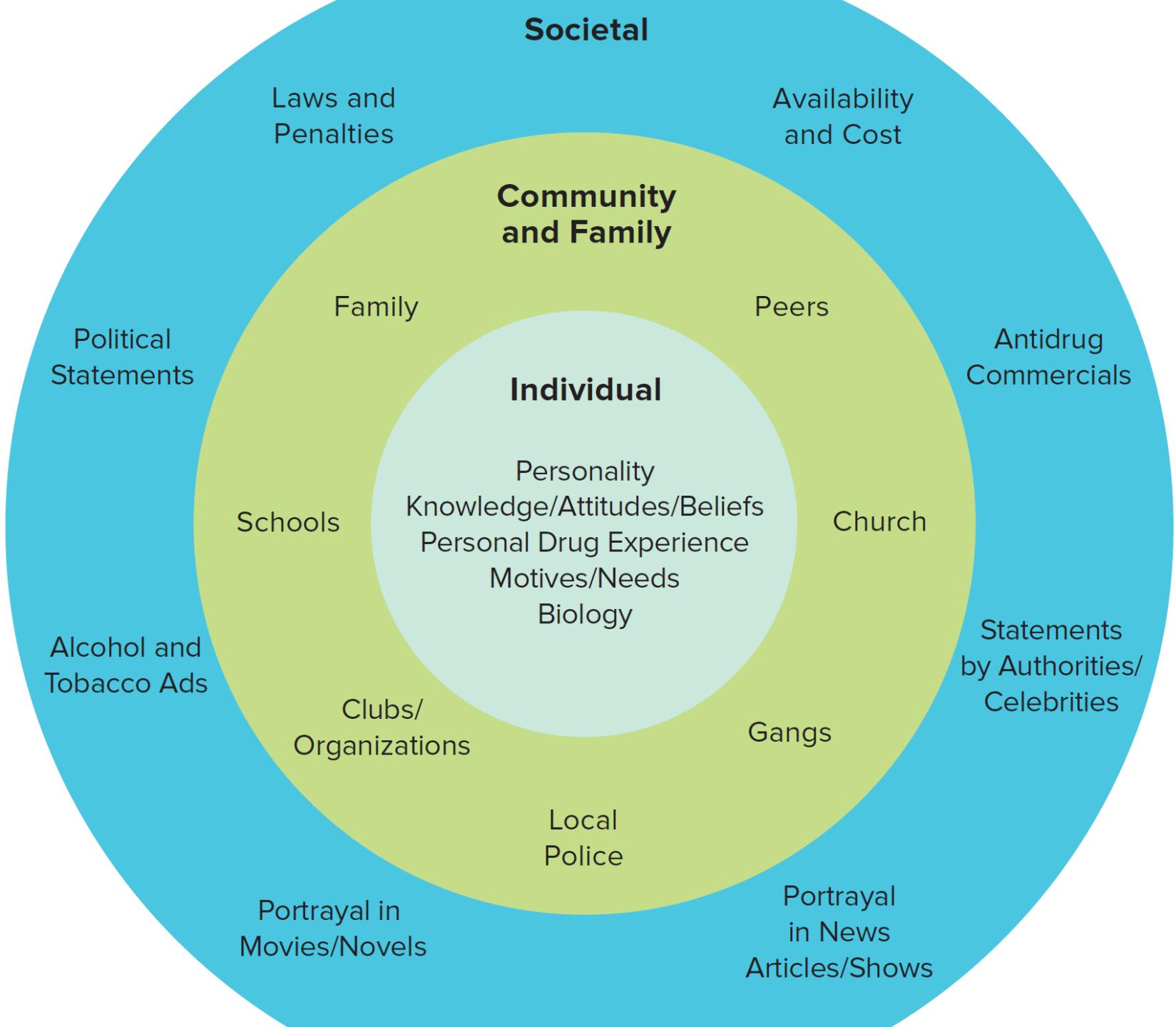


A and B were caused
by something else



- Three possible causal relations that can explain correlation.
 - 1) Fighting causes marijuana use.
 - 2) Marijuana use causes fighting.
 - 3) A third variable causes both fighting and marijuana use.
 - What other ‘3rd’ variables might there be?

INFLUENCES ON DRUG USE



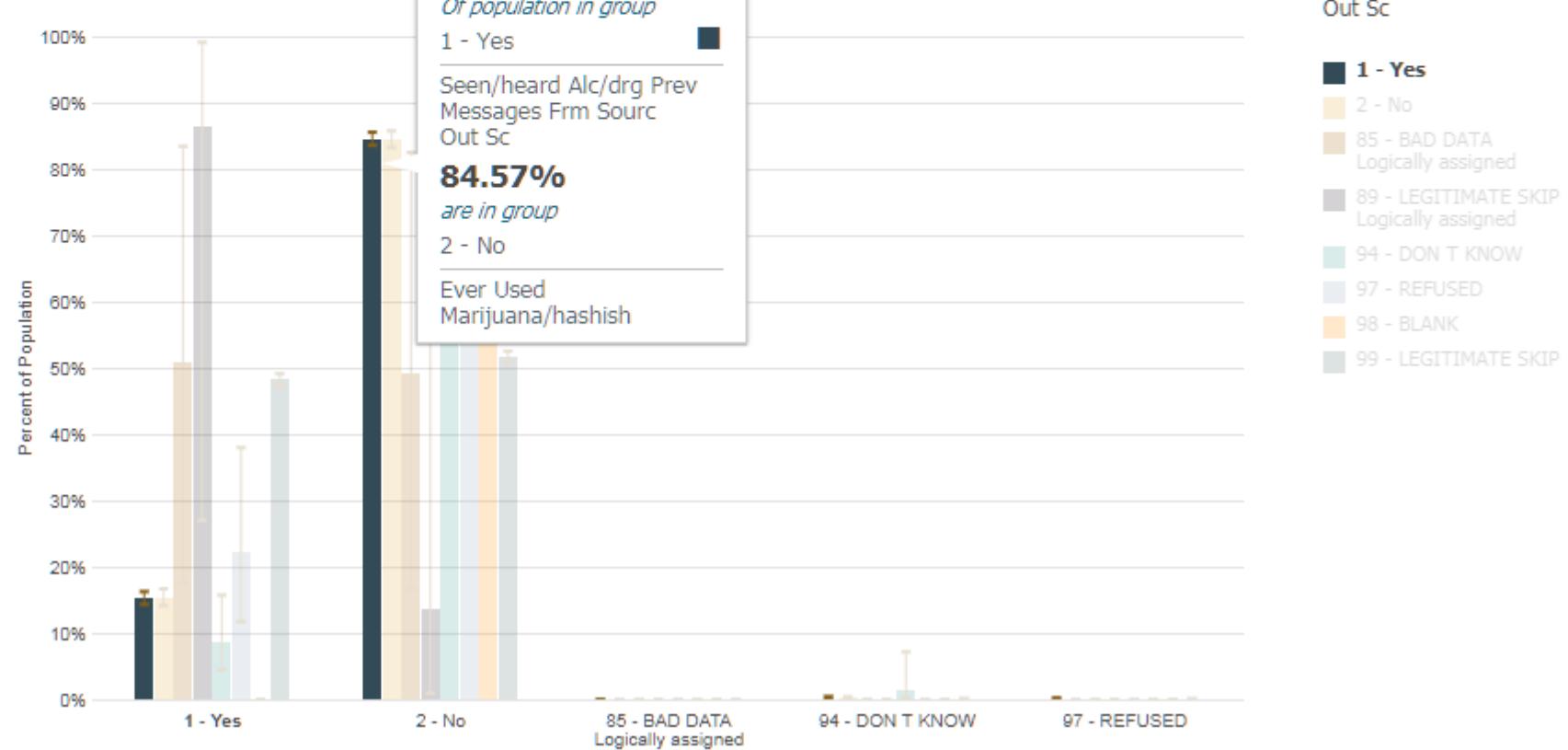
DRUG PUBLIC SERVICE ANNOUNCEMENTS

- Are drug PSAs (public service announcements) a protective factor against drug use?
 - <https://www.youtube.com/watch?v=GOnENVylxPl>
 - <https://www.youtube.com/watch?v=iE7ukc7MV-k>

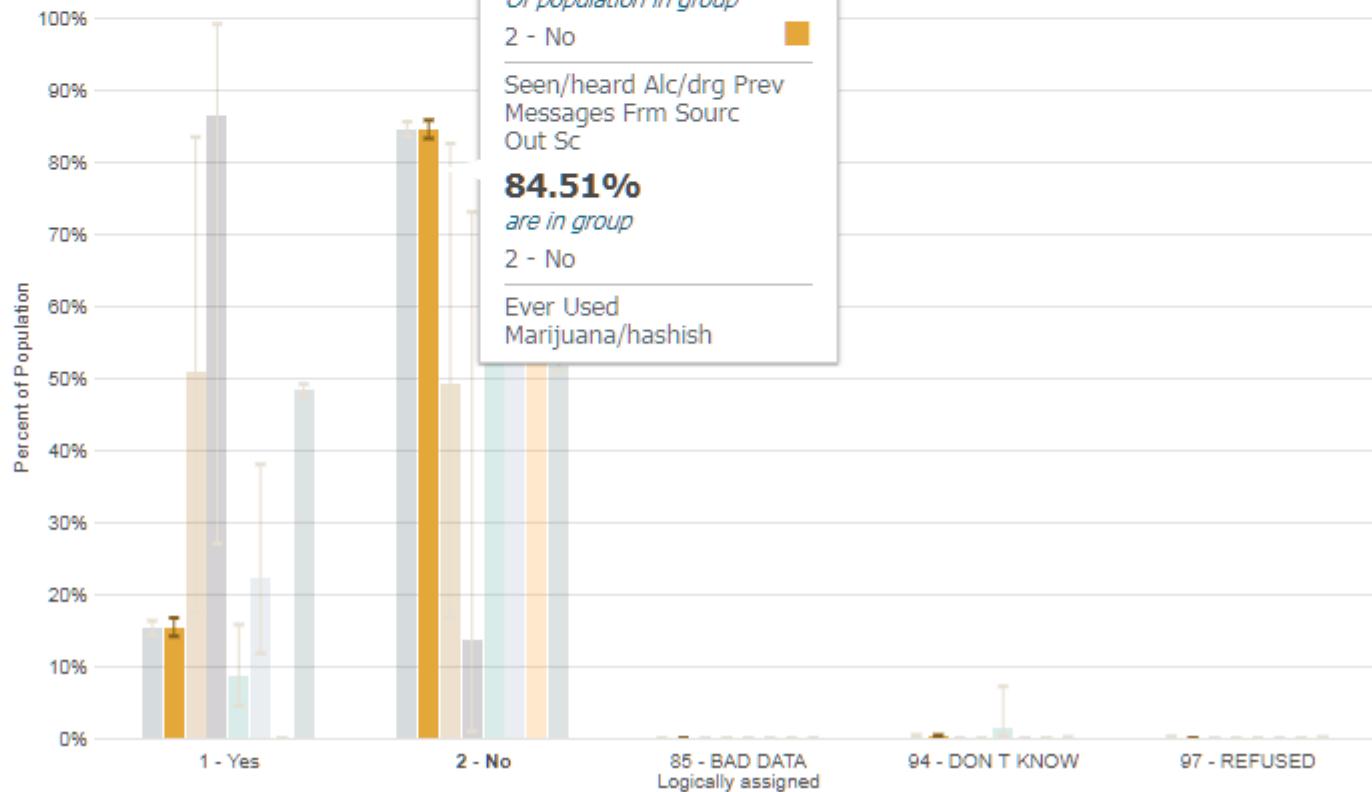


National Survey on Drug Use and Health, 2018

Ever Used Marijuana/hashish (Mjever) Seen/heard Alc/drg Prev Messages Frm Sourc Out Sc (Yepvnty)



Ever Used Marijuana/hashish (Mjever) Seen/heard Alc/drg Prev Messages Frm Sourc Out Sc (Yepvntyr)



Seen/heard Alc/drg Prev
Messages Frm Sourc
Out Sc

- 1 - Yes
- 2 - No
- 85 - BAD DATA Logically assigned
- 89 - LEGITIMATE SKIP Logically assigned
- 94 - DON T KNOW
- 97 - REFUSED
- 98 - BLANK
- 99 - LEGITIMATE SKIP

EXTENT OF DRUG USE

- Be careful of media reports!
 - Anecdotes vs. Empirical Data
- Can you overdose on fentanyl just by touching it or being near it?
 - https://www.youtube.com/watch?v=2TkBKCEecuQ&ab_channel=ABC10News
 - https://www.youtube.com/watch?v=iPD8v5fewo0&ab_channel=ABC10News

<https://www.cambridge.org/core/journals/prehospital-and-disaster-medicine/article/accidental-occupational-exposure-to-a-large-volume-of-liquid-fentanyl-on-a-compromised-skin-barrier-with-no-resultant-effect/ID102C667E98D303AA494FD7136DAEAE>



[Prehospital and
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Abstract

References

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Accidental Occupational Exposure to a Large Volume of Liquid Fentanyl on a Compromised Skin Barrier with No Resultant Effect

Published online by Cambridge University Press: 20 June 2022

Ryan Feldman and Benjamin W. Weston

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Abstract

The high prevalence of fentanyl in the illicit drug supply has generated concern among first responders regarding occupational exposure. Social media sharing of unconfirmed first responder overdoses after brief exposure to fentanyl may be contributing to an inappropriate risk perception of brief dermal fentanyl exposure. This case details a dermal exposure to a large dose of analytically confirmed pharmaceutical fentanyl (fentanyl citrate, 10 microgram fentanyl base per ml), over a large skin surface area. Additionally, the exposure occurred at a site with some skin barrier compromise, a factor that can increase fentanyl absorption. The patient underwent appropriate decontamination and underwent a brief medical assessment with no clinical effects of opioid exposure observed. This information is of value to first responders and other health care workers who are at risk of occupational fentanyl exposure. Findings are consistent with in vitro and ex vivo data supporting low risk of rapid absorption after brief dermal fentanyl exposure.

Keywords

dermal absorption

fentanyl

occupational exposure

opioid

KEY TERMS - DRUG-RELATED TOXICITY

- **Toxic** - poisonous, deadly, or dangerous.
 - potentially different connotations for the word 'toxic': Physiological vs. behavioral.
 - **Specific toxicities** - not due to the action of the drug itself, such as blood-bourne diseases and the life-threatening liver infections, hepatitis B and hepatitis C, for those who inject drugs.
- **Acute** versus **chronic** toxicity.
 - **Acute – effects after a single administration**
 - Prescription painkiller overdose can slow the respiration rate to dangerously low levels.
 - Behavioural impairment due to drug intoxication.
 - **Chronic – effects due to long-term exposure of the drug**
 - High blood pressure.
 - Neurological damage.
 - Liver damage.

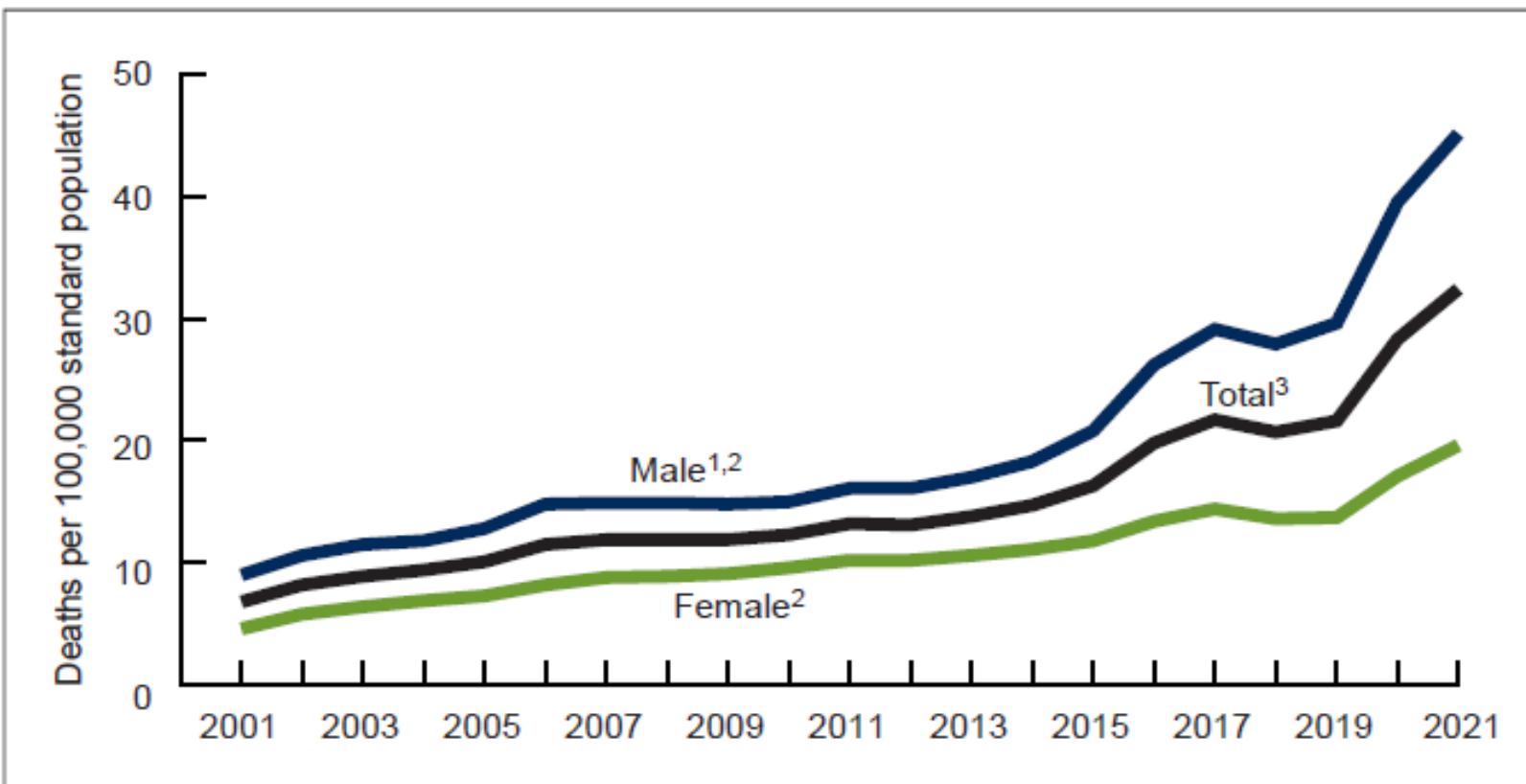


TRENDS IN TOXICITY?

- CDC tracks **overdose** deaths
 - Based on (1) causes of death (2) cited on death certificates
 - Not the best stats/data...textbook explains why (overcounting)
 - Not included are deaths from things like AIDS, hepatitis B, etc., or deaths from chronic toxic drug effects.
 - So total deaths related to drug use are likely higher than overdose deaths

Overdose death rates for all drugs combined

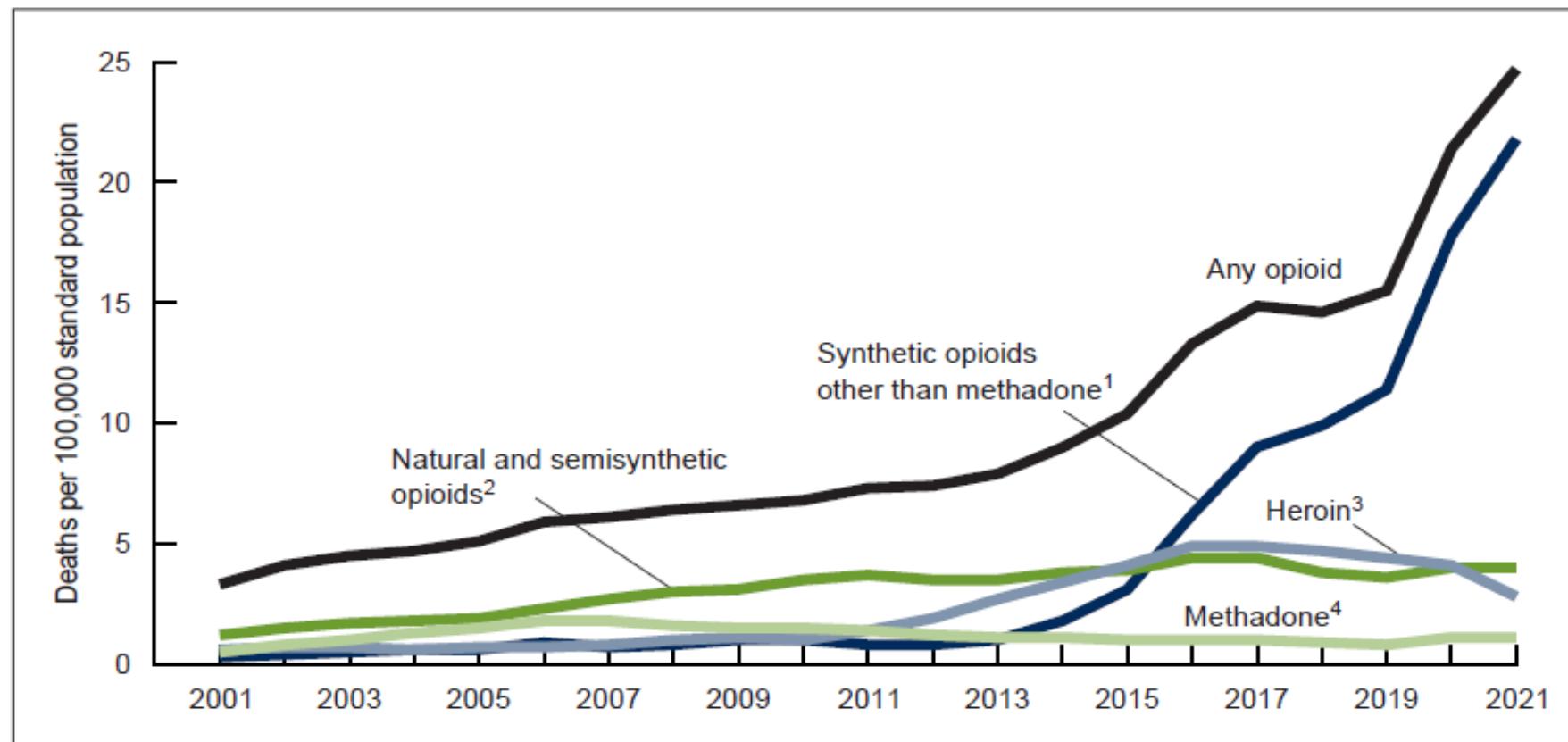
Figure 1. Age-adjusted rate of drug overdose deaths, by sex: United States, 2001–2021



Context: Covid-19
death rate was
about 100 per
100,000 per year in
U.S. in 2020 and
2021 (averaged)

Overdose death rates for all opioids

Figure 4. Age-adjusted rate of drug overdose deaths involving opioids, by type of opioid: United States, 2001–2021



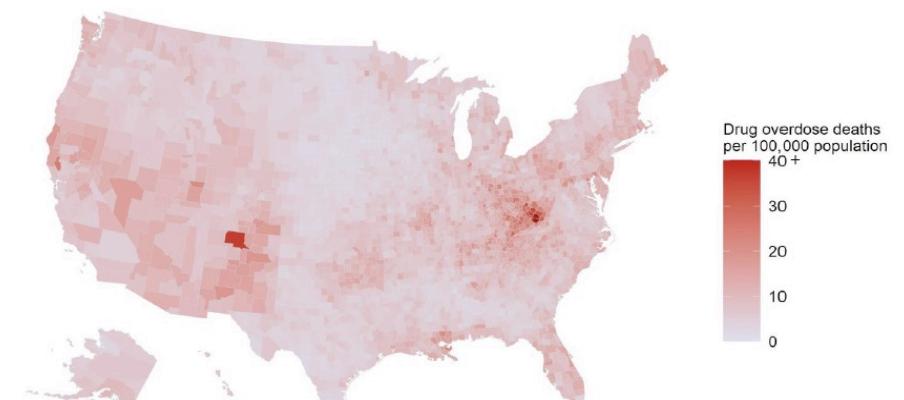
Discussion:

- What information do these graphs display well? What information does it obscure?

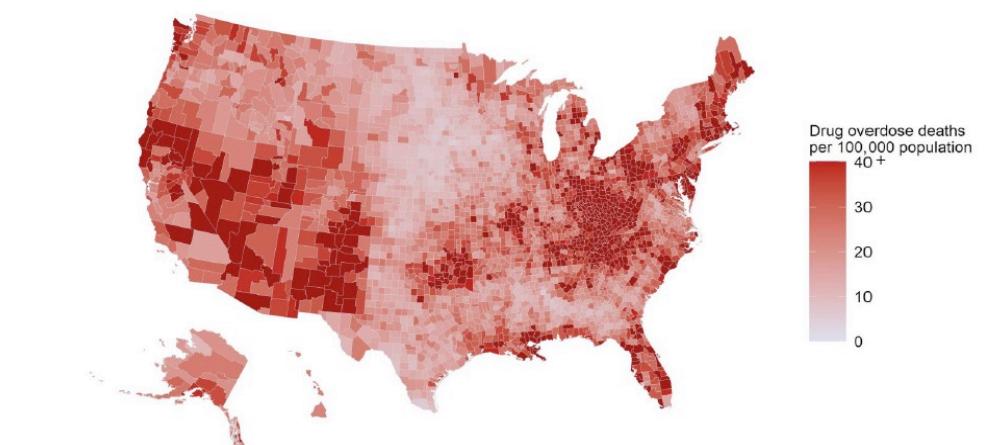
THE CAVEATS OF SUMMARY STATISTICS

- Those were national overdose death stats
- When you look locally, you may see a very different picture...

2003



2021





HOW CAN WE UNDERSTAND AND DETERMINE CAUSALITY?

SCIENTIFIC RESEARCH TO UNDERSTAND DRUGS AND BEHAVIOR

- Unlike biases, cultural norms and expectations toward drugs, scientific research and studies can maintain **objectivity** when asking and assessing tough questions.
- The aim is to report evidence that is based on empirical data, in contrast to anecdotal evidence, which is typically based on one person's casual observation or perception.

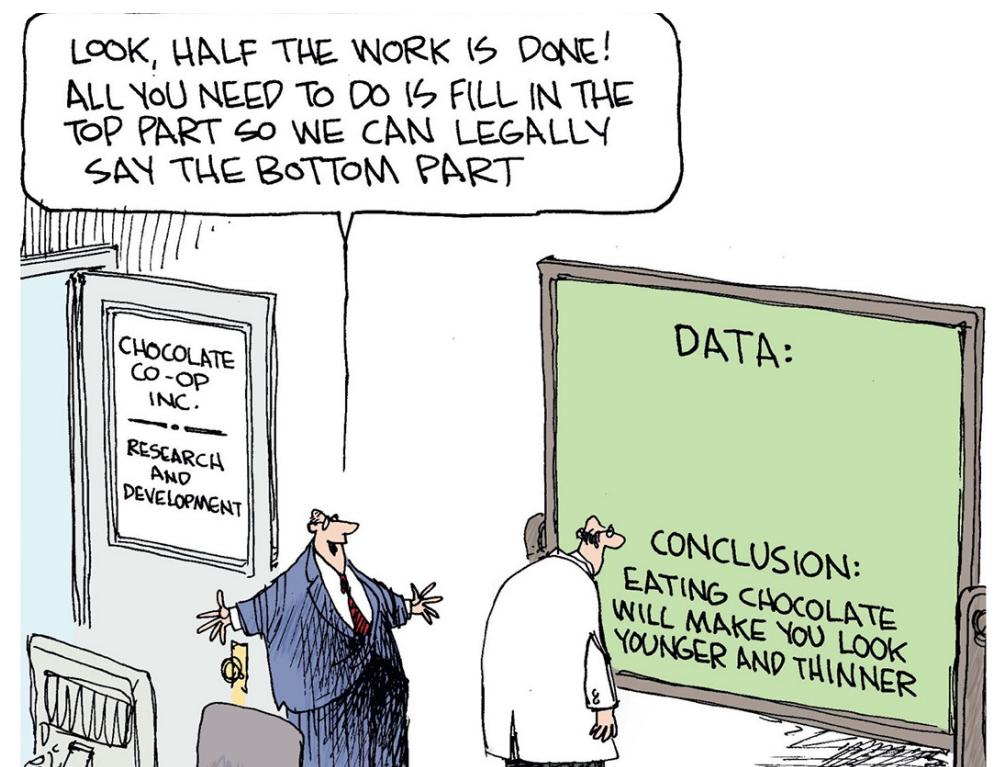


*"We still don't understand how this happened.
You were with the placebo control group."*

CONDUCTING SAFE, ETHICAL, AND UNBIASED STUDIES

KEY TERMS:

- **Confirmation Bias** – the tendency to search for, favor, and remember information that confirms one's previous beliefs
- **Informed Consent** – a process by which a participant confirm their willingness to participate after being told what to expect in study related procedures (risks, benefits, etc)
- **Peer-Review Process** – the process by which scholarly work is subjected to the scrutiny of other experts in the field – independent reviewers can assess the value of the work and check inconsistencies



CONSIDER THE STUDY POPULATION...

Type of Sample	Description	Advantages	Disadvantages
Simple random sample	Each member of the population has an equal chance of being selected.	For very large samples, this gives the best chance of an unbiased/representative sample.	For large populations, this is time-consuming. It is hard to truly get a random sample, because participants with computers or landline phones may be more likely to be selected.
Stratified random sample	The population is divided into subcategories such as age, gender, and race, and members are selected in the proportion that they occur in the population.	Representative sample. Can be generalized to the general population.	Time-consuming. Subcategories have to be identified and their proportions calculated.
Purposive samples	Investigator purposely chooses participants based on certain characteristics.	Economical and less time-consuming. Can focus on subjects with relevant characteristics.	Selection bias can threaten external and internal validity.
Self-selection/volunteer	People self-select to participate—those who respond to an ad or show up for a study.	Convenient, quick, and economical.	Nonrepresentative. Volunteer bias can threaten external validity and internal validity, because differences in participants may underlie results.
Convenience sample	Sample those who are available at the time.	Convenient, quick, and economical.	Nonrepresentative. Volunteer bias and selection bias can threaten external validity and internal validity.

LET'S DISCUSS MARIJUANA AND FIGHTING AGAIN...

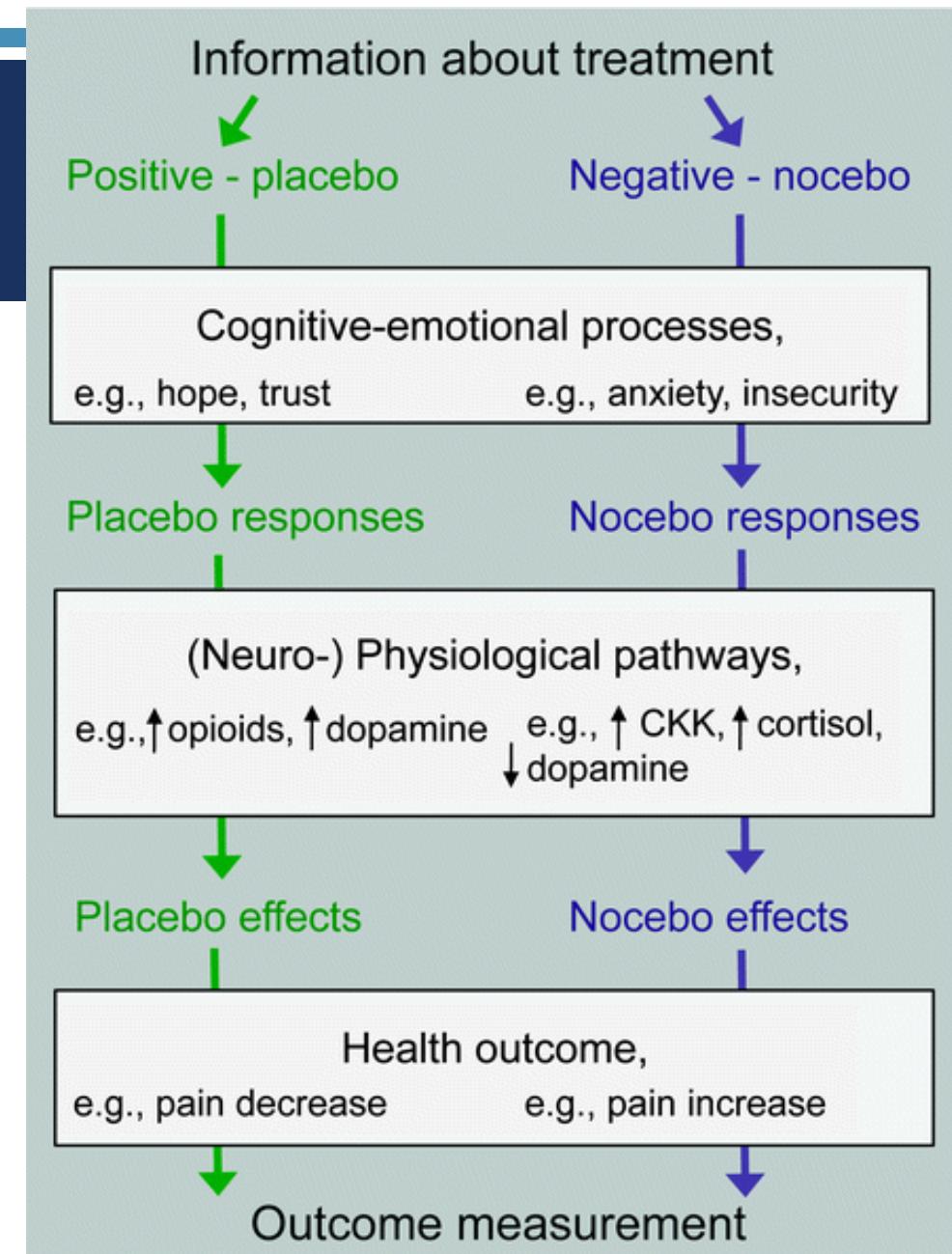
Need an experiment to determine causality.

- From our previous example, suppose we wanted to test possibility #2, marijuana use causes fighting.
 - What are the independent and dependent variables?
- What experiment would test this? What type of population would you select?
 - Is such an experiment feasible?

KEY TERMS - RESEARCH ON DRUGS

Good scientific research uses “controls” to account for factors where bias and experience may play a role

- **Placebo** – an inert substance that provokes perceived benefits
- **Nocebo** – an inert substance causes perceived harm
- **Internal Validity** – the degree to which a research design enables confidence of a causal relationship between the independent variable and the changes in behavior
- **External Validity** – measure of how well the findings of the experiment apply to other settings (real world)



RESEARCH ON DRUGS

- Always consider the quality and vetting of information:

How do we “find” or “do” **good** scientific research?

- 1) Does the study ask **specific** research questions? (precise language reminder!)
- 2) Have they carefully considered the study population?
- 3) Have they chosen an appropriate method of investigation?
- 4) Have they carefully controlled for outside variables to the greatest extent possible?
- 5) Avoid stigmatizing questions* and confirmation bias?

STIGMA AND SCIENTIFIC RESEARCH

- Social stigma is the disapproval of, or discrimination against, an individual or group based on perceived characteristics that serve to distinguish them from other members of a society.
 - Stigma is a well-documented barrier to health seeking behavior, engagement in care, and adherence to treatment.
- Although most research is intended to reduce stigma, stigmatizing research can exist, as well as research not meant to be stigmatizing being used as such.



National Institute on Alcohol
Abuse and Alcoholism

WHAT ARE THE COMPONENTS OF STIGMATIZING RESEARCH

Stigma may be understood as convergence of the following components:

- 1) The identification and labeling of human differences.
- 2) The linking of labeled persons by dominant cultural belief to undesirable characteristics and formation of negative stereotypes.
- 3) Separation of people into categories of “us” and “them” by applying said stereotypes.
- 4) The experience of loss of status and discrimination by labeled persons, the ultimate output of the stigma process.
- 5) The exercise of social, economic, political, or other power that reinforces the above processes, translating them into significant consequences for labeled individuals.

BROADER CONSEQUENCES OF STIGMA...

- Only 6.5% of people with a SUD receive treatment.

Figure 43. Received Any Substance Use Treatment in the Past Year: Among People Aged 12 or Older Who Had a Substance Use Disorder in the Past Year; 2020

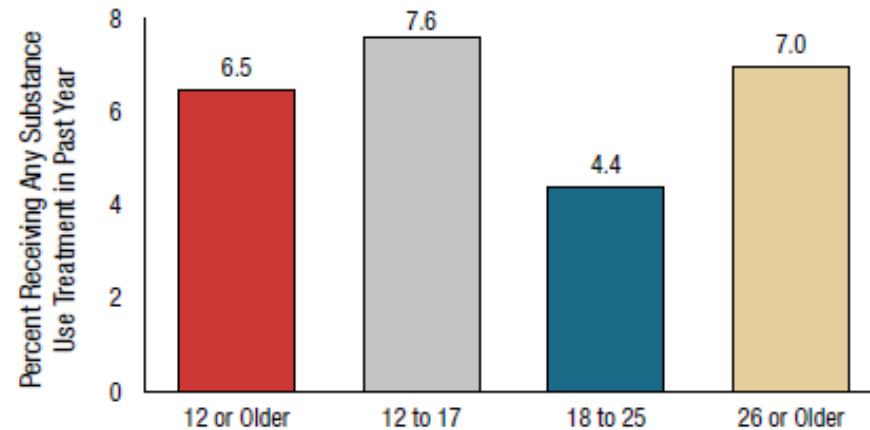
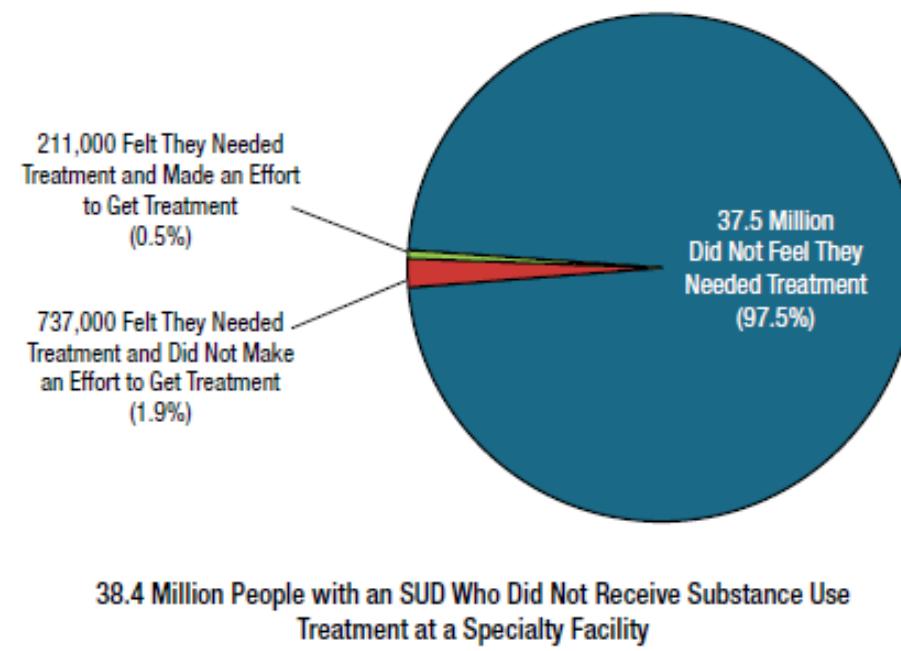


Figure 45. Perceived Need for Substance Use Treatment: Among People Aged 12 or Older with a Past Year Substance Use Disorder (SUD) Who Did Not Receive Substance Use Treatment at a Specialty Facility in the Past Year; 2020



Note: People who had an SUD were classified as needing substance use treatment.

Note: The percentages do not add to 100 percent due to rounding.

SUMMARY

KEEP IN MIND, THIS WAS JUST AN OVERVIEW,
ONLY THE TIP OF THE ICEBERG....

*Practice being wary when you see bold headline claims...
a single sentence is rarely enough to capture the big
picture and nuances of the scientific research.*

Good research on drugs, particularly drugs of abuse, is challenging, complex, and very nuanced!

