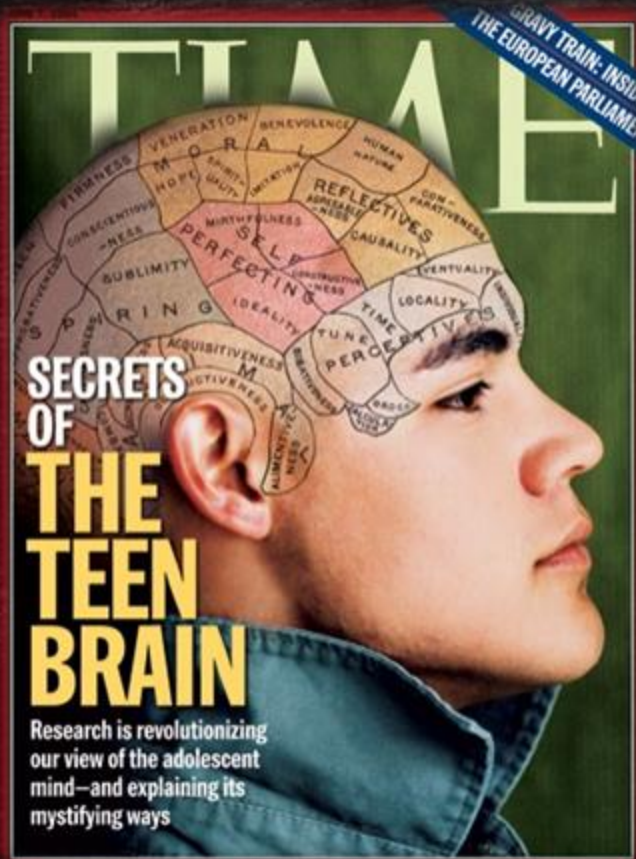


# Parties, Pills & Pot; Rite of Passage or Russian Roulette?

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Amy LaHood MD MPH FAAFP  
November 4, 2016

# Adolescent Brain (<24 years old)

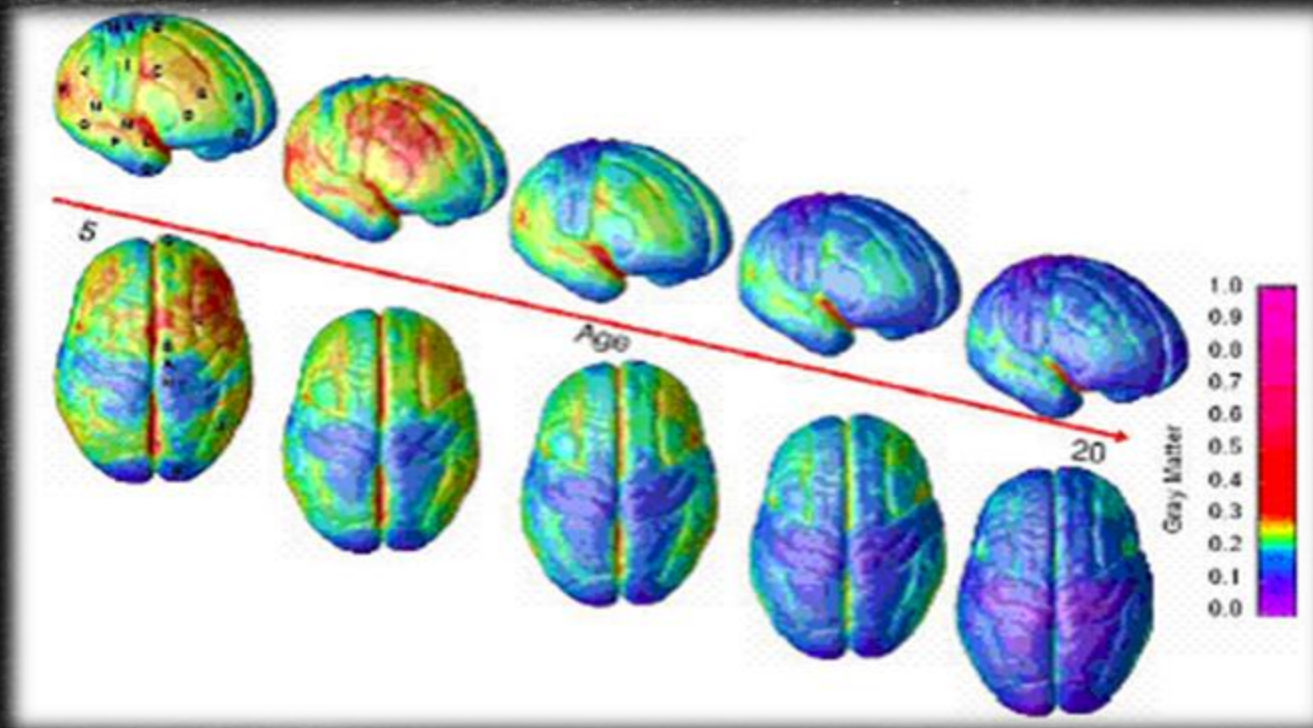


- Has traditionally been viewed with adult brain prism
- Societal norms based on incorrect assumption of brain development
- Die is not cast at puberty
- Immeasurable neuroplasticity ; extraordinary ability to learn new things
- Life Experiences during adolescence often significant primer future
- Harness a skill or talent

# Brain (<24 yo)

## Immature Frontal Lobe & Executive Function

Executive function includes impulse control, problem solving, and inhibition, working memory and recognition of long term consequences.



# Teen Brain (<24 years old)

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- Primed to take risks
- Seek experimentation
- Immature decision making, judgment, impulse control
- Emotion & memory are not yet fully developed in adolescence
- **Addictive substance use physically alter brain structure and function faster and more intensely than in adults**
  - Interfering with brain development
  - Further impairing judgment
  - Significantly increase the risk of addiction

# Risk of Addiction

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- **90%** adults with substance abuse (nicotine/ alcohol /drugs) **began** smoking, drinking or using drugs < 18yo
- If use of substance <18yo
  - **25%** become addicted
- If use of substance >21
  - **4%** become addicted
- Children <15yo who use any addictive substance are 6.5X more likely to develop a substance use disorder as those who delay use until age 21 or older (**28.1 percent vs. 4.3 percent**).

Source:

"Adolescent Substance Abuse: America's #1 Public Health Problem," National Center on Addiction and Substance Abuse at Columbia University, June 2011, p. 2.

# Why do adolescents use drugs or alcohol?

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If using/abusing...

- To fit in
- To escape or relax
- To feel grown up
- To relieve boredom
- **To feel good** /excitement
- To rebel
- To experiment (curiosity)
- Peer Pressure
- To stay awake

If dependent on them...

- Craving ... a strong need or urge ingest substance
- Loss of control ... not being able to stop or cut down
- Feeling bad physically and emotionally when not using

# Brain Physiology 101

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When your brain releases  
one of these chemicals,  
you feel good.

Dopamine



Serotonin



Oxytocin

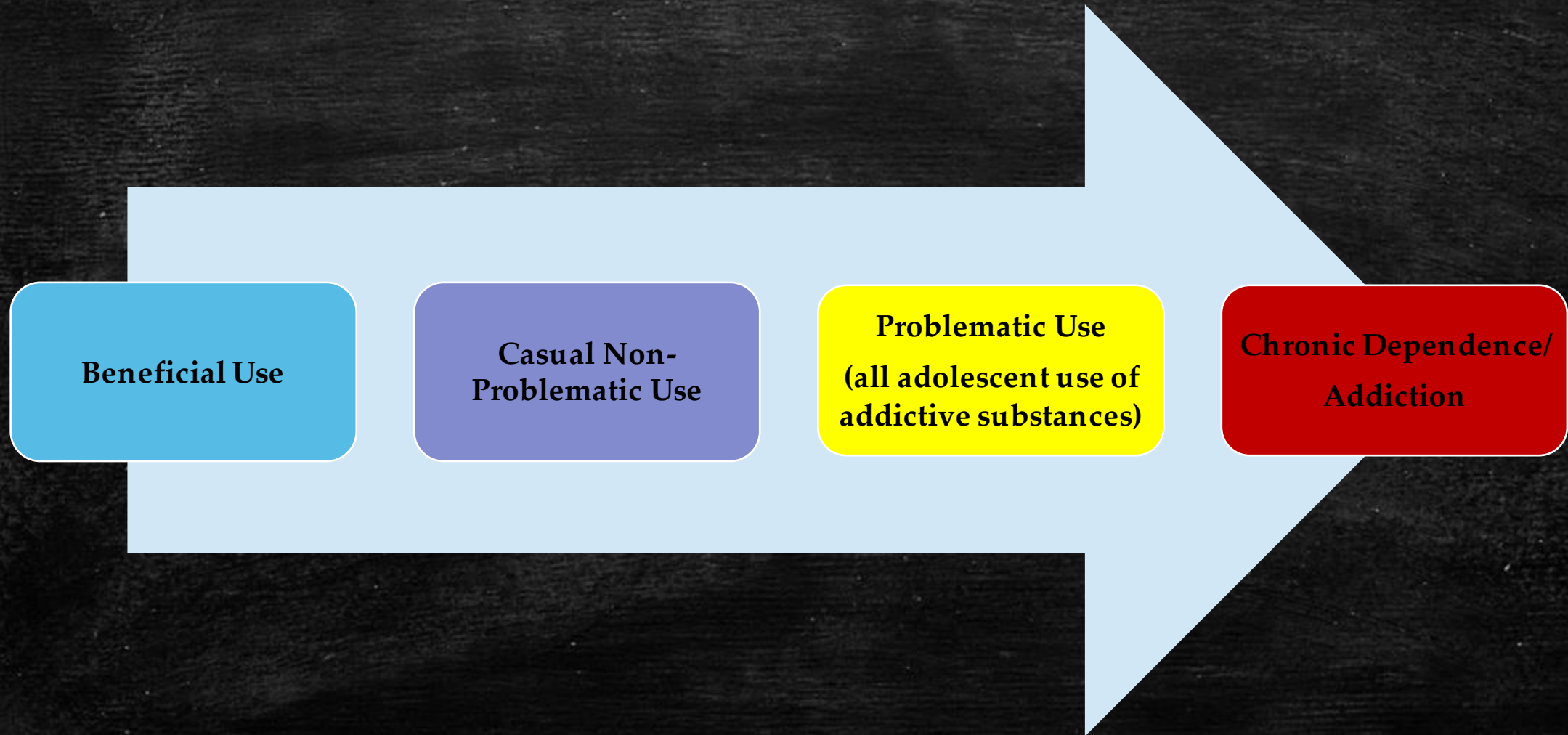


Endorphin



# Spectrum of Substance Use

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# Consequences of Adolescent Substance Use

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- Injuries
- Unintended pregnancies/STI's/Sexual assault
- Asthma
- Depression, anxiety, psychosis
- Impaired brain function
- Reduced academic performance
- Reduced educational achievement
- Criminal involvement
- Death



## DRUG ADDICTION

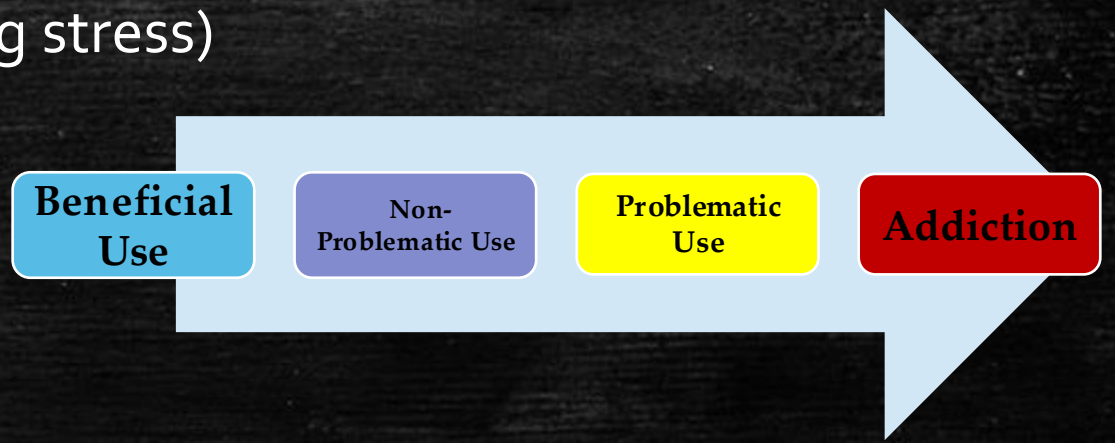
Addiction is a condition characterized by repeated, compulsive seeking and use of drugs, alcohol or similar substances despite adverse social, mental and physical consequences.



# Risk of Addiction Depends on . . . .

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- Genetic inheritance (40-60%)
- Biological responses to the reward (Cannot control this)
- Past adverse experiences (neglect or abuse)
- Temperament
- Social influences
- Underlying mental health (including stress)
- Maturity of the brain



# Treatment of Addiction

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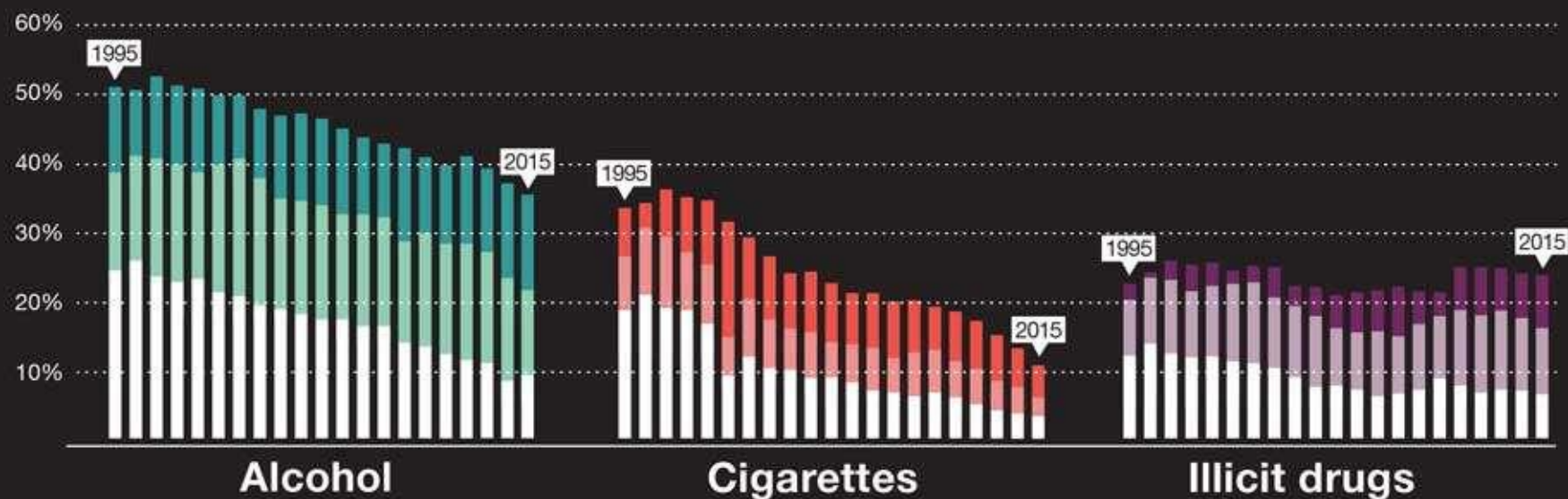
- Lifelong Recovery
- Cost prohibitive
- Difficult to access
- Relapse is the norm
- Life is never the same

**40-60%**  
**Relapse**



# LAST TWO DECADES OF ALCOHOL, CIGARETTE, AND ILLICIT DRUG USE\*


\*Past-month use



2015

 35.3% OF 12TH GRADERS  
 21.5% OF 10TH GRADERS  
 9.7% OF 8TH GRADERS

 11.4% OF 12TH GRADERS  
 6.3% OF 10TH GRADERS  
 3.6% OF 8TH GRADERS

 23.6% OF 12TH GRADERS  
 16.5% OF 10TH GRADERS  
 8.1% OF 8TH GRADERS



National Institute  
on Drug Abuse

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

# Monitoring the Future 2015

## College Students- Past Year Use

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- Alcohol- **79%**
- Alcohol with caffeine- **34%**
- Marijuana- **38%**
- Tobacco using Hookah- **23%**
- Cigars- **20%**
- Cigarette use- **20%**
- Illicit (not marijuana) **20%**
- Adderall **10.7%**
- Cocaine **4%**
- Narcotics- **3%**
- Heroin **0.1%**

# Monitoring the Future 2015

## College Students

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- Daily Marijuana use- 4.6%
- Daily Cigarette use- 4%
- Daily Alcohol use- 3%
- Alcohol Binge in past 2 weeks- 31%

# Binge Drinking (>5 drinks)

- **46%** Indiana College Students past month
- **25%** college students academic consequences
- **1,825** college students die accidents/yr
- **696,000** college students assaulted/yr
- **98,000** sexually assaulted or raped/ yr
- Costs US **\$191 Billion**
  - Lost productivity, accidents, health care



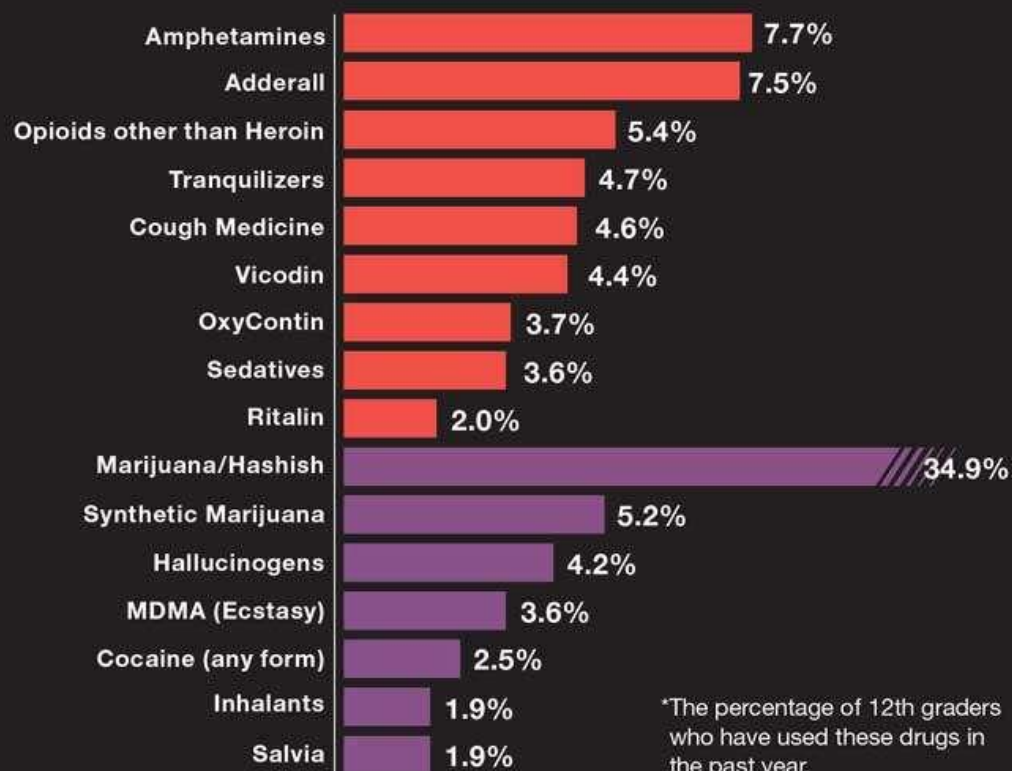
THE CONSUMPTION AND CONSEQUENCES OF ALCOHOL, TOBACCO, AND DRUGS IN INDIANA: A STATE EPIDEMIOLOGICAL PROFILE 2015.

<https://www.healthpolicy.iupui.edu/PubsPDFs/2015%20State%20Epidemiological%20Profile.pdf>

Sacks JJ, Gonzales KR, Bouchery EE, Tomedi LE, Brewer RD. 2010 National and State Costs of Excessive Alcohol Consumption. *Am J Prev Med* 2015; 49(5):e73–e79.

Hingson, R.W.; Zha, W.; and Weitzman, E.R. Magnitude of and trends in alcohol-related mortality and morbidity among U.S. college students ages 18–24, 1998–2005. *Journal of Studies on Alcohol and Drugs* (Suppl. 16):12–20, 2009. PMID: 19538908 <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2701090/> 4 Hingson R, Heeren T, Winter M. et al. Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18–24: changes from 1998 to 2001. *Annual Review of Public Health* 26: 259–279, 2005. PMID: 15760289 <http://www.ncbi.nlm.nih.gov/pubmed/15760289> 5

## PRESCRIPTION/OVER-THE-COUNTER VS. ILLICIT DRUGS\*



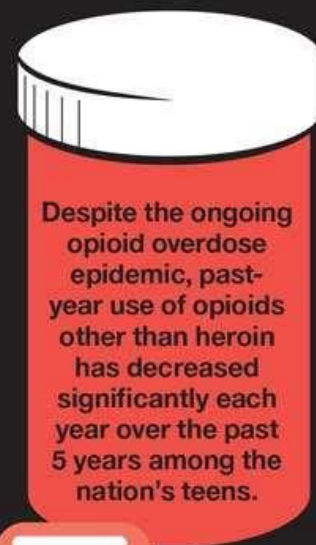
\*The percentage of 12th graders who have used these drugs in the past year.



PRESCRIPTION/OTC



ILLICIT DRUGS



Despite the ongoing opioid overdose epidemic, past-year use of opioids other than heroin has decreased significantly each year over the past 5 years among the nation's teens.



Heroin use has also decreased over the past 5 years and is at the lowest rate since the MTF survey began.



National Institute  
on Drug Abuse

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

# Marijuana Use is Common

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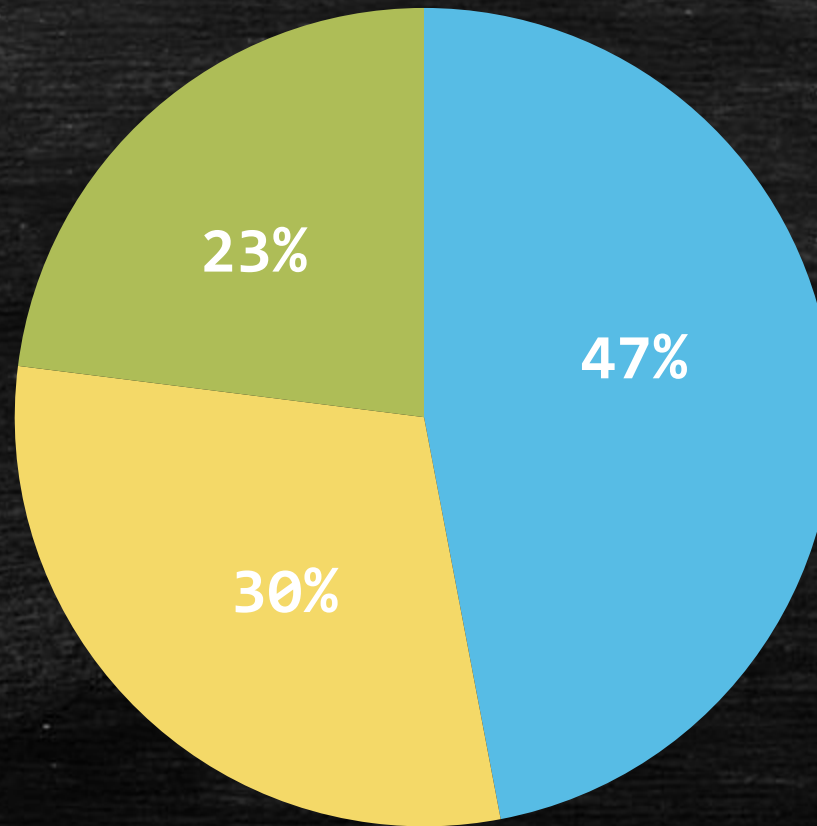
- Marijuana is the most commonly used illicit drug in the U.S.
- **7%** of all >12yo use Marijuana
- **19%** of all 18-25yo use Marijuana
- **48%** of adults in the US report having used marijuana at some time in their life



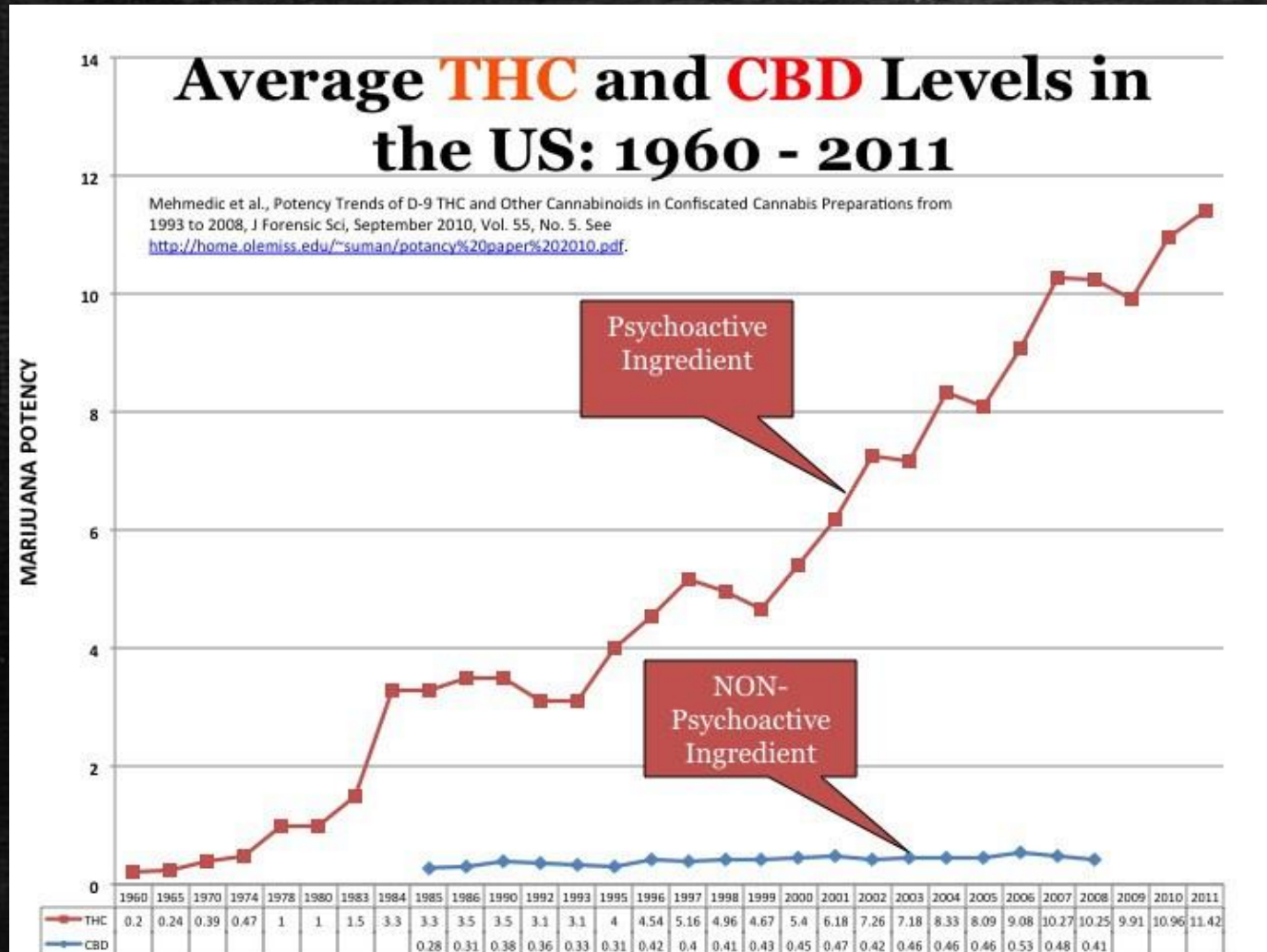
# Why Do People Use Marijuana?

Among people who used marijuana in the past year:

■ For Fun ■ For Medical Reasons ■ For Fun and for Medical Reasons



# *“It’s not your dad’s ‘pot’ anymore”*



- Marijuana growers have worked to make the drug as potent as possible.
- 1960s-70s THC concentrations were 1-2%. Today, they are as high as 20%

# Marijuana Short Term Effects

## Potential Upside

- Reduce anxiety
- Promote Euphoria
- Promote Relaxation



## Potential Downside



- Impaired memory
- Impaired learning attention
- Impaired reaction time/coordination(drugged driving)
- Increase risk Paranoia/Psychosis
- Impair decision making
- Acute intoxication (rare)

# Teen Marijuana Use & Long-Term Associations

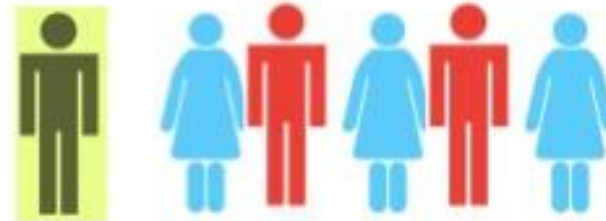
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- Persistent and heavy use among adolescents reduces IQ by 8 points
- Increased risk of mental illness (??cause or effect)
  - Schizophrenia (6 fold)
  - Psychosis
  - Depression/Anxiety
  - Amotivational syndrome



# 1 in 6 teens become addicted

1 in 10 adults and **1 in 6 adolescents** who try marijuana will become addicted to it.



- The adolescent brain is especially susceptible to marijuana use.
- When kids use, they have a greater chance of addiction since their brains are being primed.

# What is “Spice” “K2”? (Synthetic Marijuana)



- Spice or K2 is a mixture of herbs or spices sprayed with synthetic chemicals
- **Smoked to get high**
- **Spice is NOT Marijuana, it is a dangerous Hallucinogenic Drug!**
- Intentionally Mislabeled as “herbal incense”, and “potpourri”
- Marked “Not For Human Consumption”



# Spice (synthetic marijuana)

## Effects on Mind & Body

- Increased BP / Increased heart rate
- Blood shot eyes
- Insomnia
- Tingling, numbness, Tremors
- Vomiting
- Seizures
- Cardiac Arrest
- Agitation
- Anxiety / panic attacks
- Depression
- Paranoia / Psychosis
- Hallucinations
  - Visual or Auditory
- Suicidal Thoughts?

# Prescription Drug Misuse

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- USA <5% of world population
- consumes >80% global opioid



Source: NSDUH 2009

# Commonly Abused Prescription Drugs



**vicodin<sup>®</sup>**  
(hydrocodone bitartrate and acetaminophen tablets, USP)

5 mg/500 mg



Rx only

**AMBIEN<sup>®</sup>**  
(ZOLPIDEM TARTRATE)<sup>Ⓒ</sup>



# Most common misused prescription drugs

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- Pain Medications- Opioids or Narcotic
  - Euphoria, Ease stress, help students relax



- Sedatives
  - relax, sleep or treat anxiety



- Stimulants – Adderall, Ritalin, Vyvance
  - study or stay awake

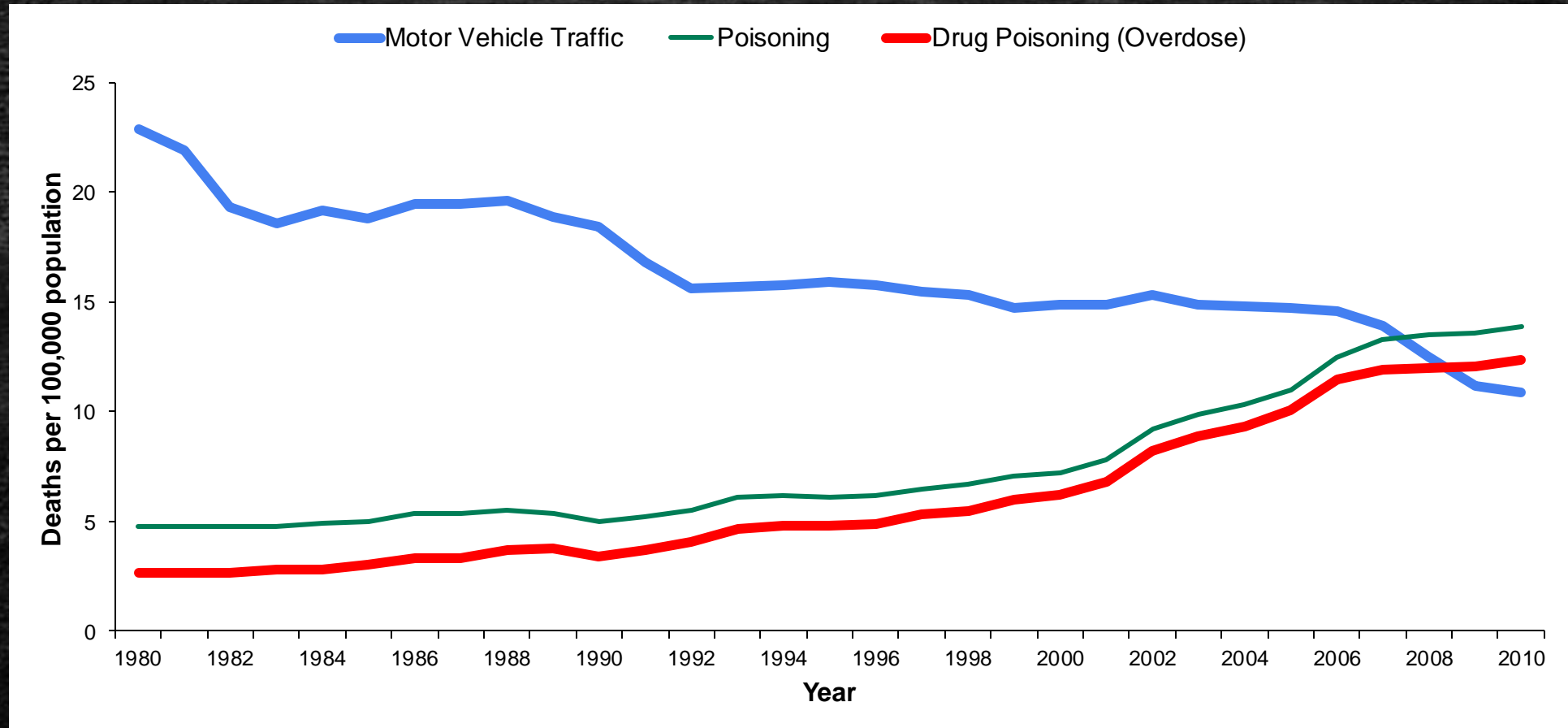


Every 19 minutes an American Dies of  
a Prescription Drug Overdose

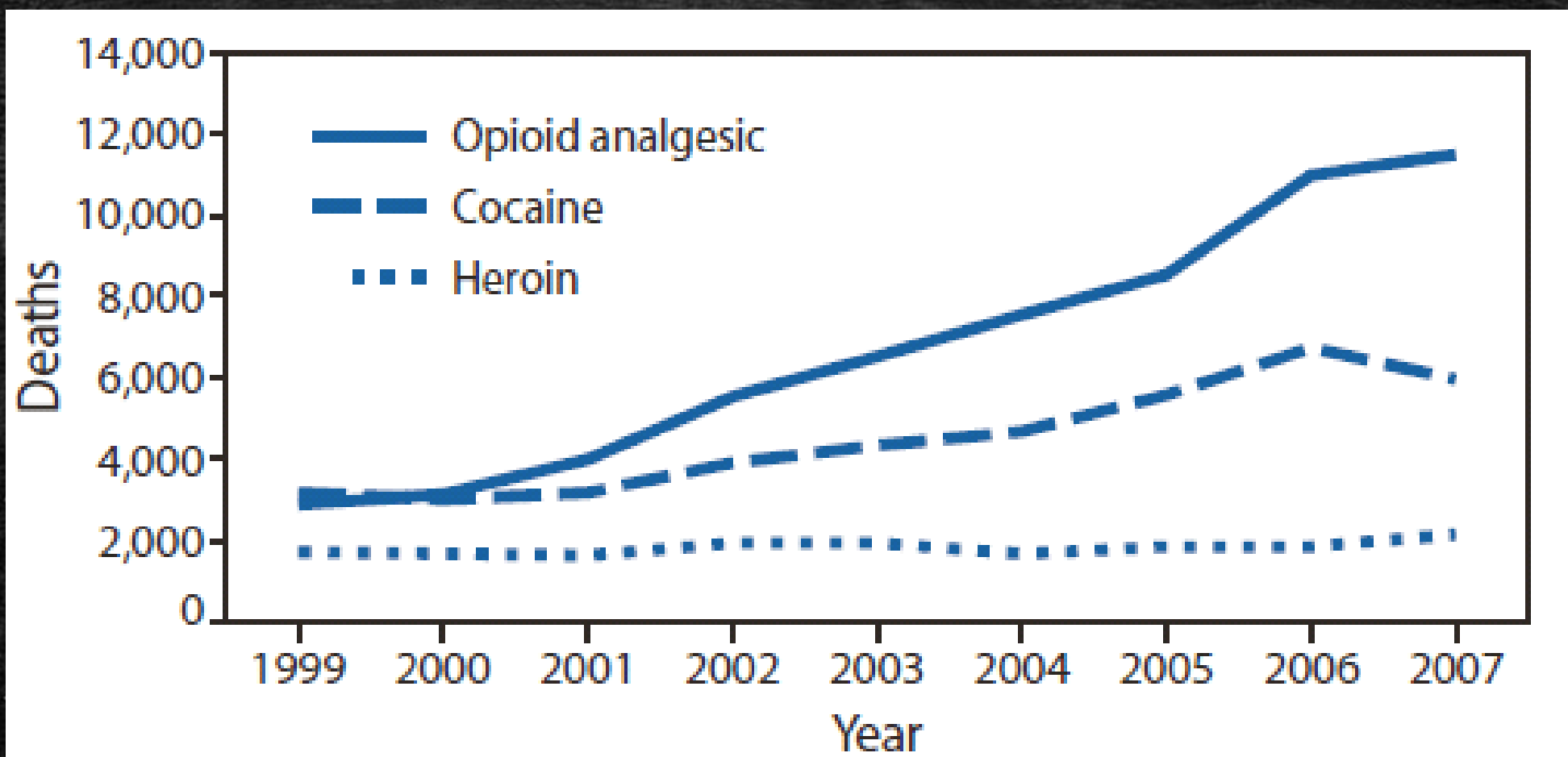
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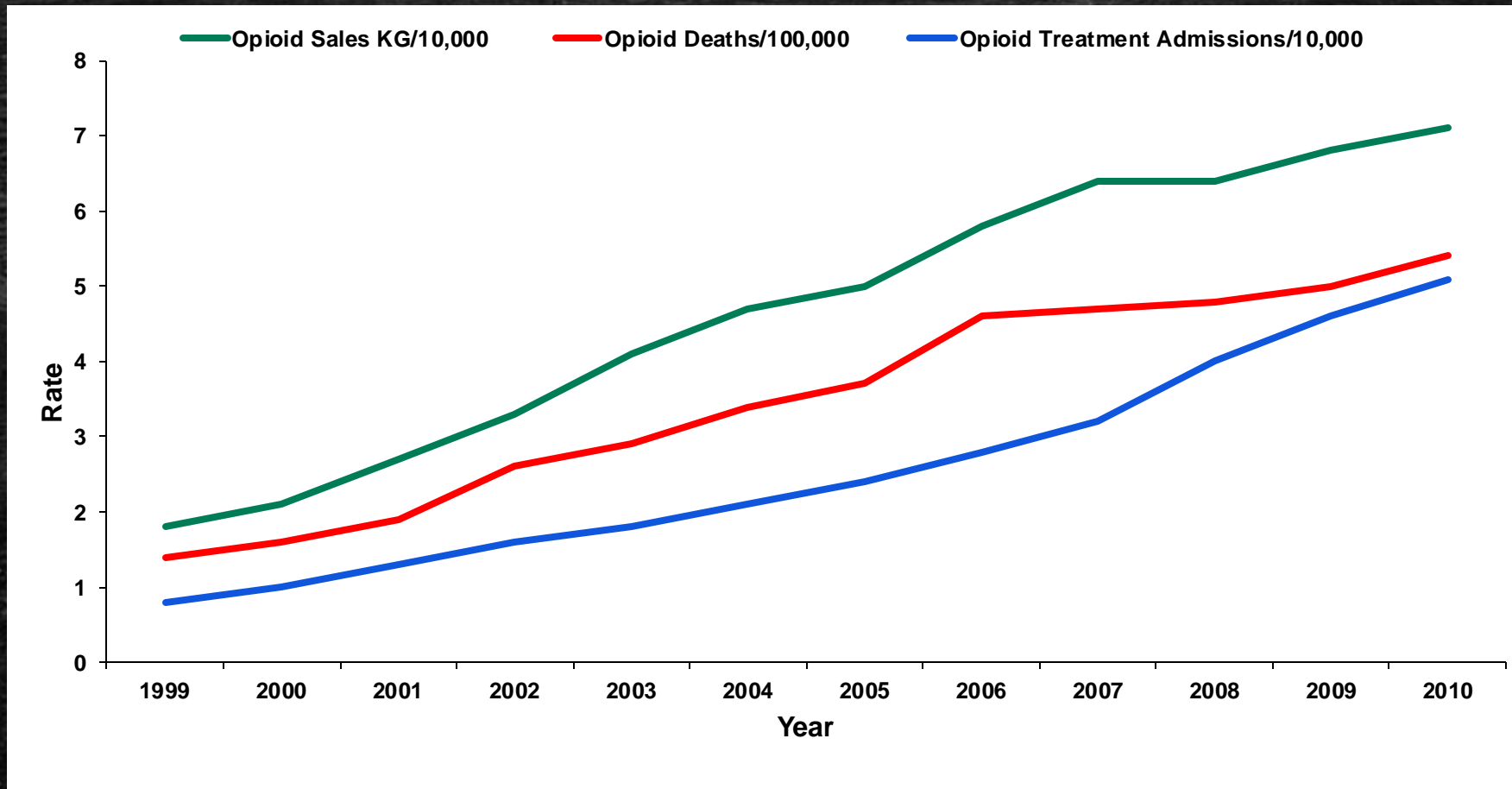
# US Death Rate Car Accident vs Overdose



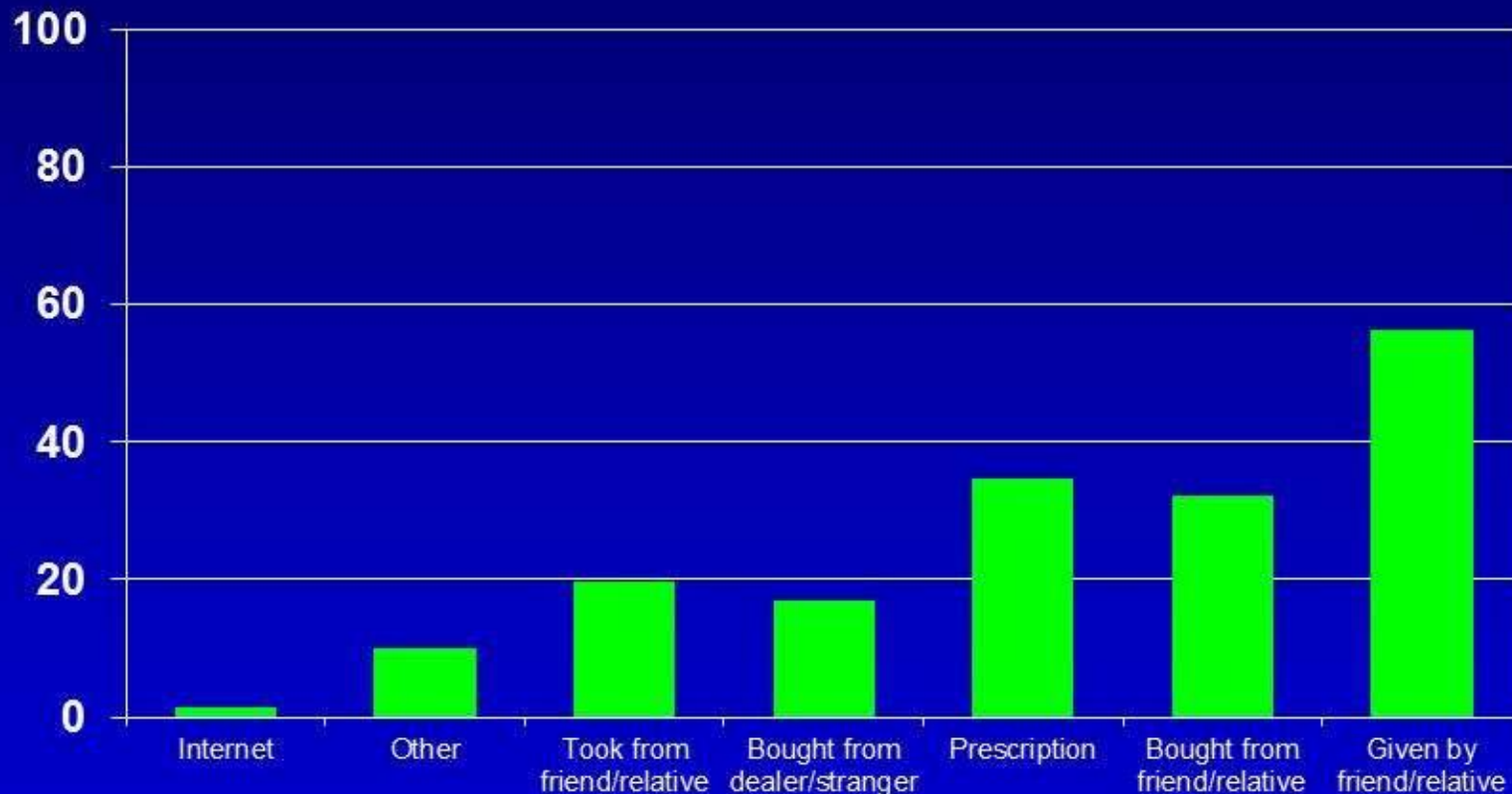
# Overdose death rates by drugs



# Rates of Opioid Overdose Deaths, Sales, and Treatment Admissions, United States, 1999–2010



# Source of Prescription Narcotics Among Those Who Used in the Past Year, 12th Grade\*



**\*Categories not mutually exclusive**

SOURCE: University of Michigan, 2015 Monitoring the Future Study

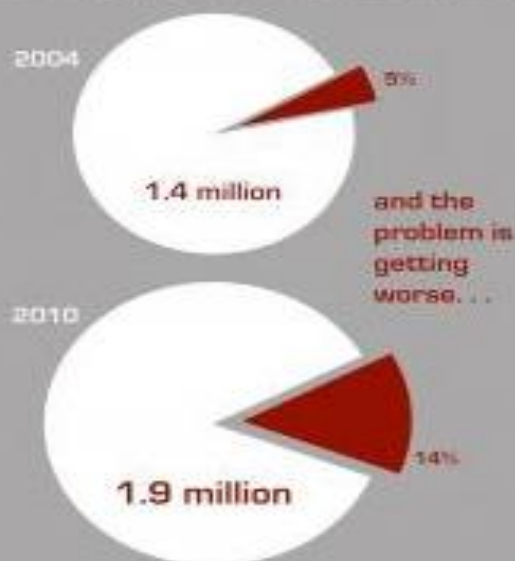
## ABUSE OF PRESCRIPTION PAIN MEDICATIONS RISKS HEROIN USE

In 2010 almost 1 in 20 adolescents and adults – 12 million people – used prescription pain medication when it was not prescribed for them or only for the feeling it caused<sup>1</sup>. While many believe these drugs are not dangerous because they can be prescribed by a doctor, abuse often leads to dependence. And eventually, for some, pain medication abuse leads to heroin.



PEOPLE WHO TAKE NON MEDICAL  
PRESCRIPTION PAIN RELIEVERS WILL TRY  
HEROIN WITHIN 10 YEARS<sup>2</sup>

Number of People Who Abused or were  
Dependent on Pain Medications and  
Percentage of Them that Use Heroin<sup>3</sup>



Heroin users are **3X** as likely  
to be dependent

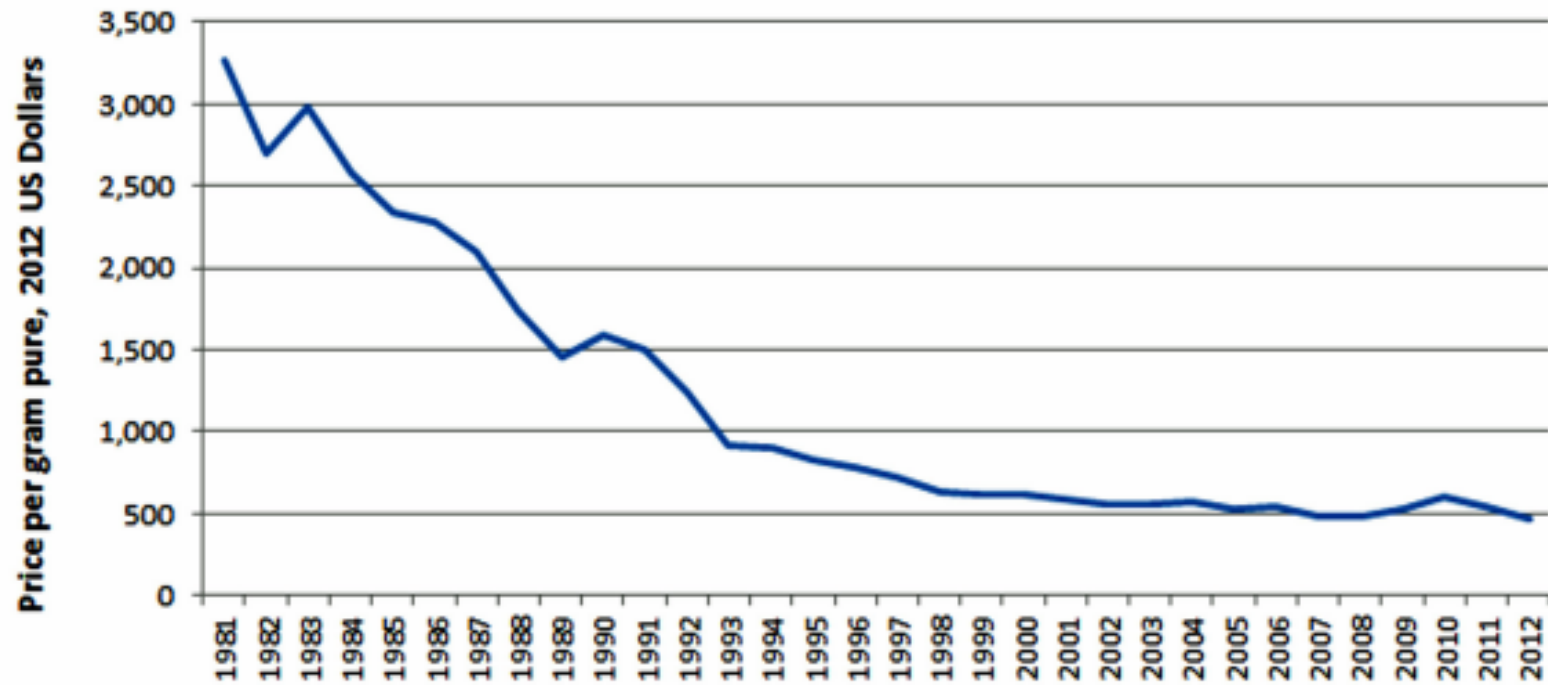
14% of non medical prescription  
pain reliever users are dependent  
54% of heroin users are dependent<sup>4</sup>

### Heroin Emergency Room Admissions Are Increasing<sup>5</sup>



# US Heroin prices

(U) Chart 6. Retail-level Average Price Per Gram Pure, for Heroin in the United States, 1981 to 2012

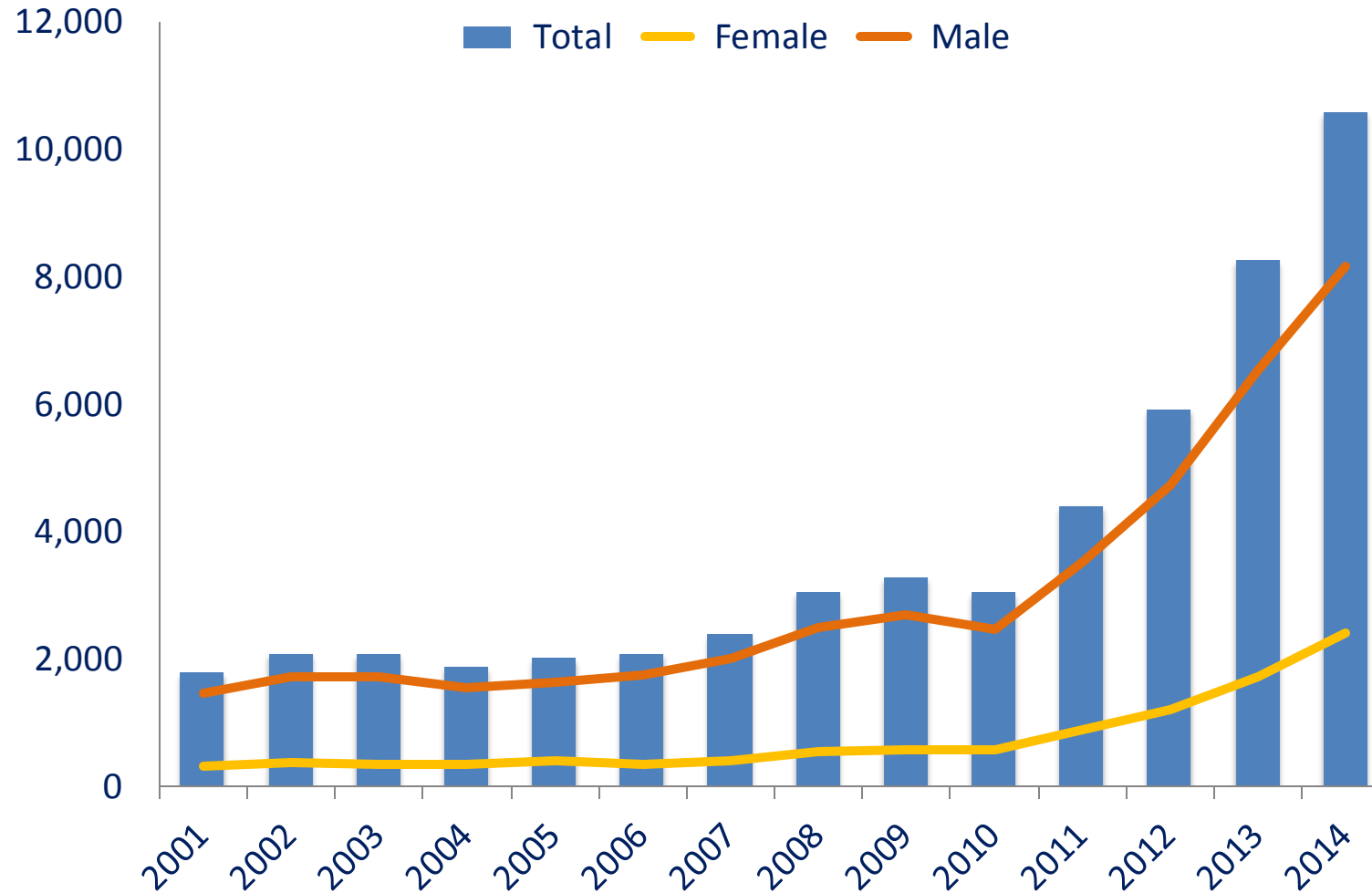


Source: Institute for Defense Analyses and ONDCP



# National Overdose Deaths

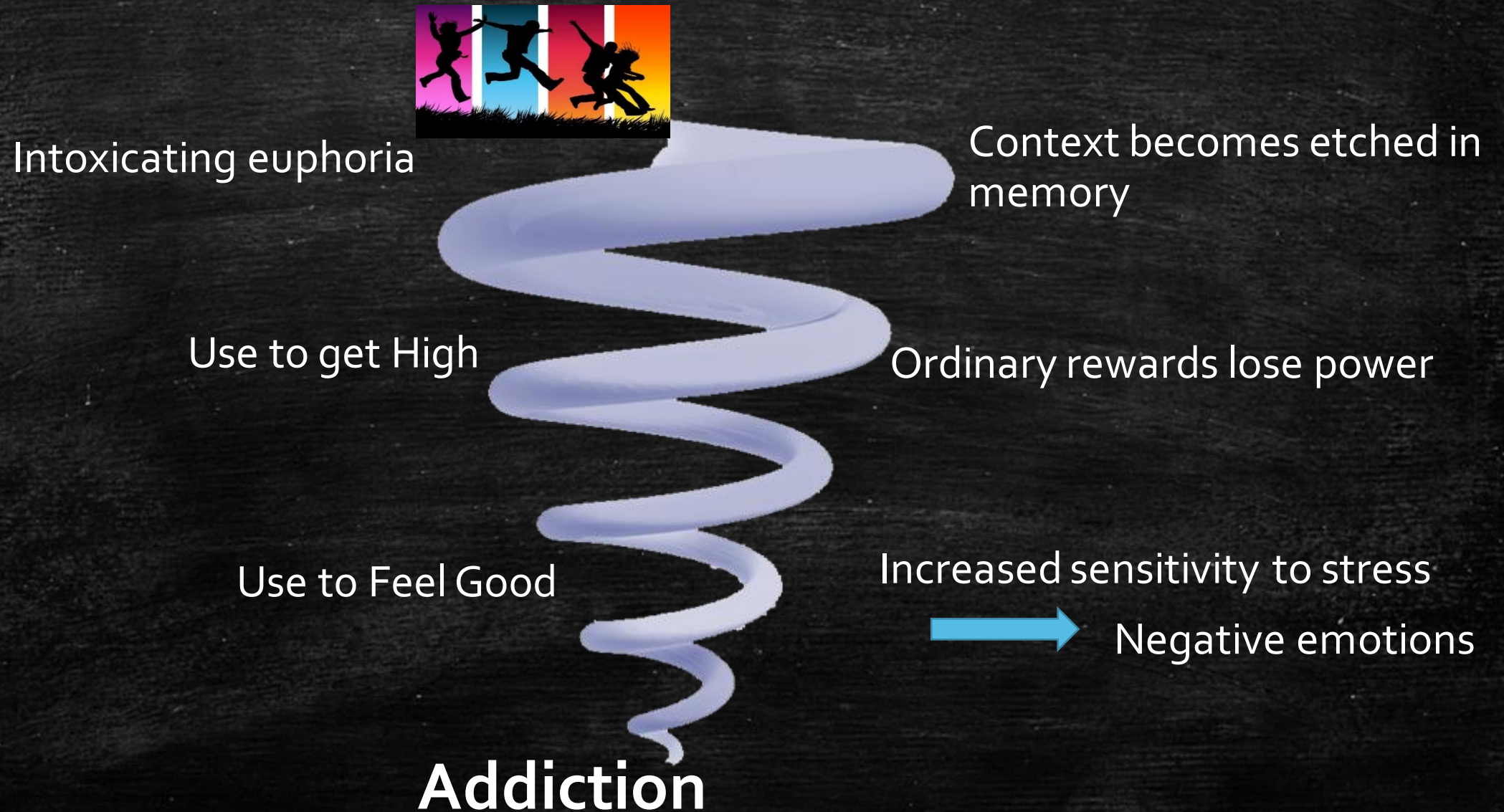
## Number of Deaths from Heroin



Source: National Center for Health Statistics, CDC Wonder

# Heroin's downward spiral

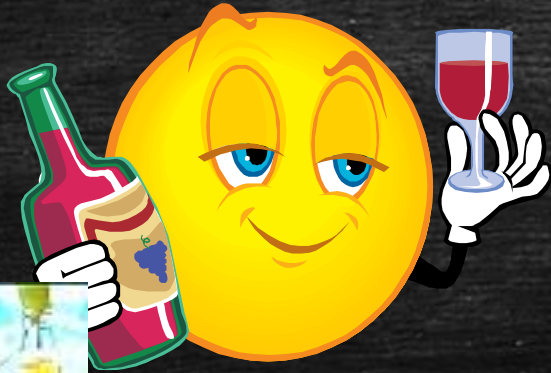
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Who are these people?



# Mia Culpa- We Send Mixed Message



# Russian Roulette or Right of Passage?

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If you could substantially improve the chances that students would avoid accidents, Injuries (including car accidents, rape and STI's), a range of medical and mental health problems, unintended pregnancies, criminal involvement and even death, AND that they would do better academically and professionally, would you do it?

What Can Be done?

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**DELAY ONSET and MINIMIZE  
EXPOSURE TO SUBSTANCE USE**

be it tobacco, alcohol, or drugs

# Russian Roulette

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**Even Once - Doing Meth,  
Bath Salts, Synthetic  
Marijuana, Prescription  
Narcotics, Heroin or Cocaine  
Will harm an adolescent &  
could kill them**



# How can Universities minimize substance use?

- Commit to long term change in the campus culture
- Become Tobacco, Drug and Alcohol Free Campus
- Ban alcohol advertising during any Collegiate events
- Require student education about drug & alcohol abuse
- Foster a culture that supports non-drug/non-alcohol events
- Support a Collegiate Recovery Network
- Incorporate Life Skills into campus experience  
to learn coping/problem solving skills
- Encourage student involvement in Spiritual Practices/ Activities/Communities
- Create environment where students can access evaluation/treatment of stress, anxiety, depression or any mood issues
- **Limit Campus Access to addictive substances**



# Indiana Lifeline Law

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INDIANA LIFELINE LAW

**MAKE THE CALL**  
**SAVE A LIFE**



**NALOXONE**

**SAVES LIVES  
AND SHOULD BE  
AS READILY  
AVAILABLE AS  
EPI-PEN**

*Diary Of An Addict* 

Thank you