

# CNS Stimulants

- Cocaine
- Methamphetamine
- Prescription amphetamines
  - Adderall
  - Vyvanse

# COCAINE





# METHAMPHETAMINE



# PRESCRIPTION AMPHETAMINES



# INCREASE IN ADHD PRESCRIBING

- In 2019, adolescents were 4x more likely to receive an ADHD prescription than in 2004
- Increase among adults have been higher



# PRESCRIPTION AMPHETAMINES



# Stimulants and Depressants

- Increased CNS activity
- Stimulation
- Withdrawal symptoms minor
- OD: Heart attack, stroke, seizures
- Potential for psychiatric impairment high



- Decreased CNS activity
- Sedation
- Withdrawal symptoms a major issue
- OD: Respiratory depression
- Potential for psychiatric impairment low



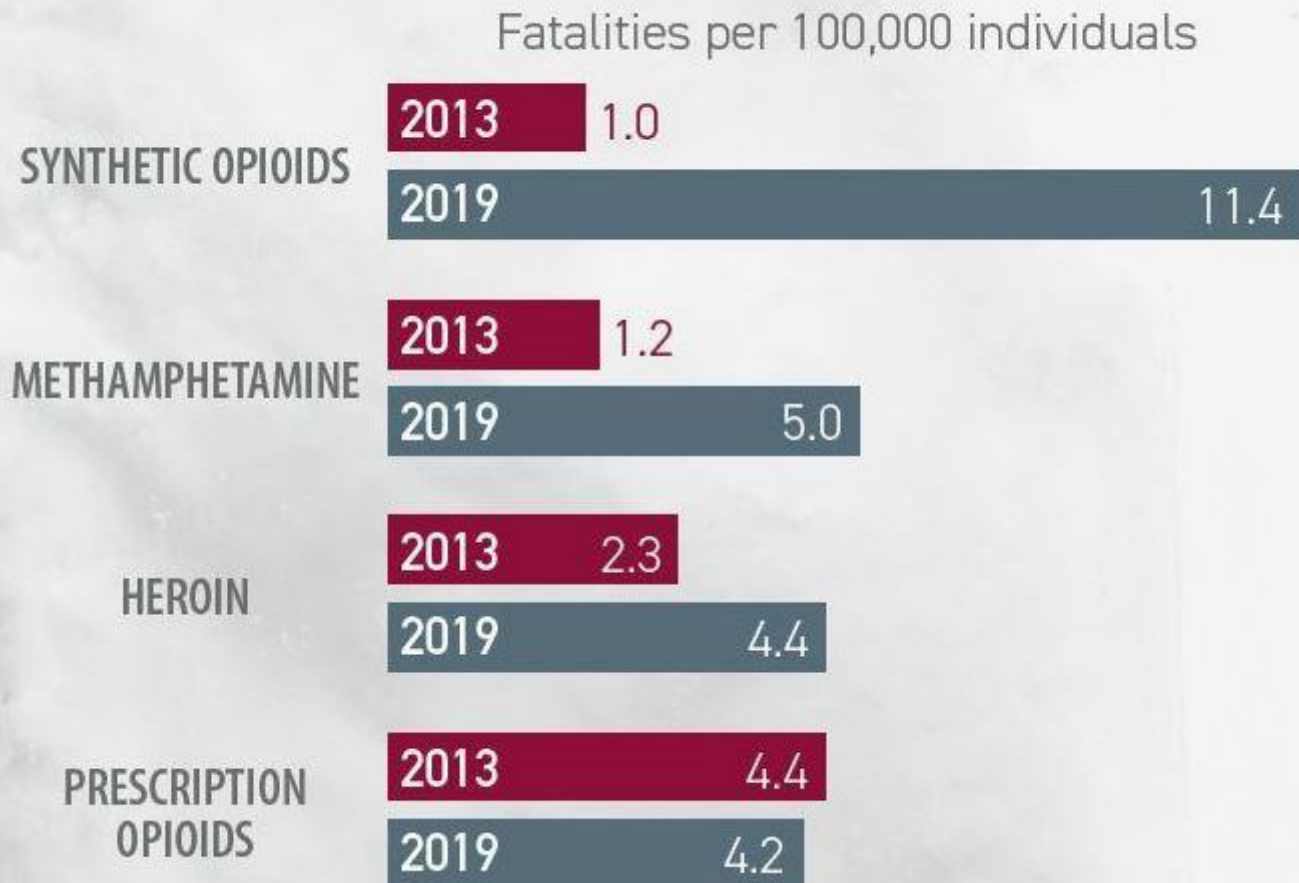
# Hospital Admissions Related to Methamphetamine Use: 2008 Vs. 2017

**Figure 1.** Percentage of Treatment Admissions Due to Methamphetamine Use

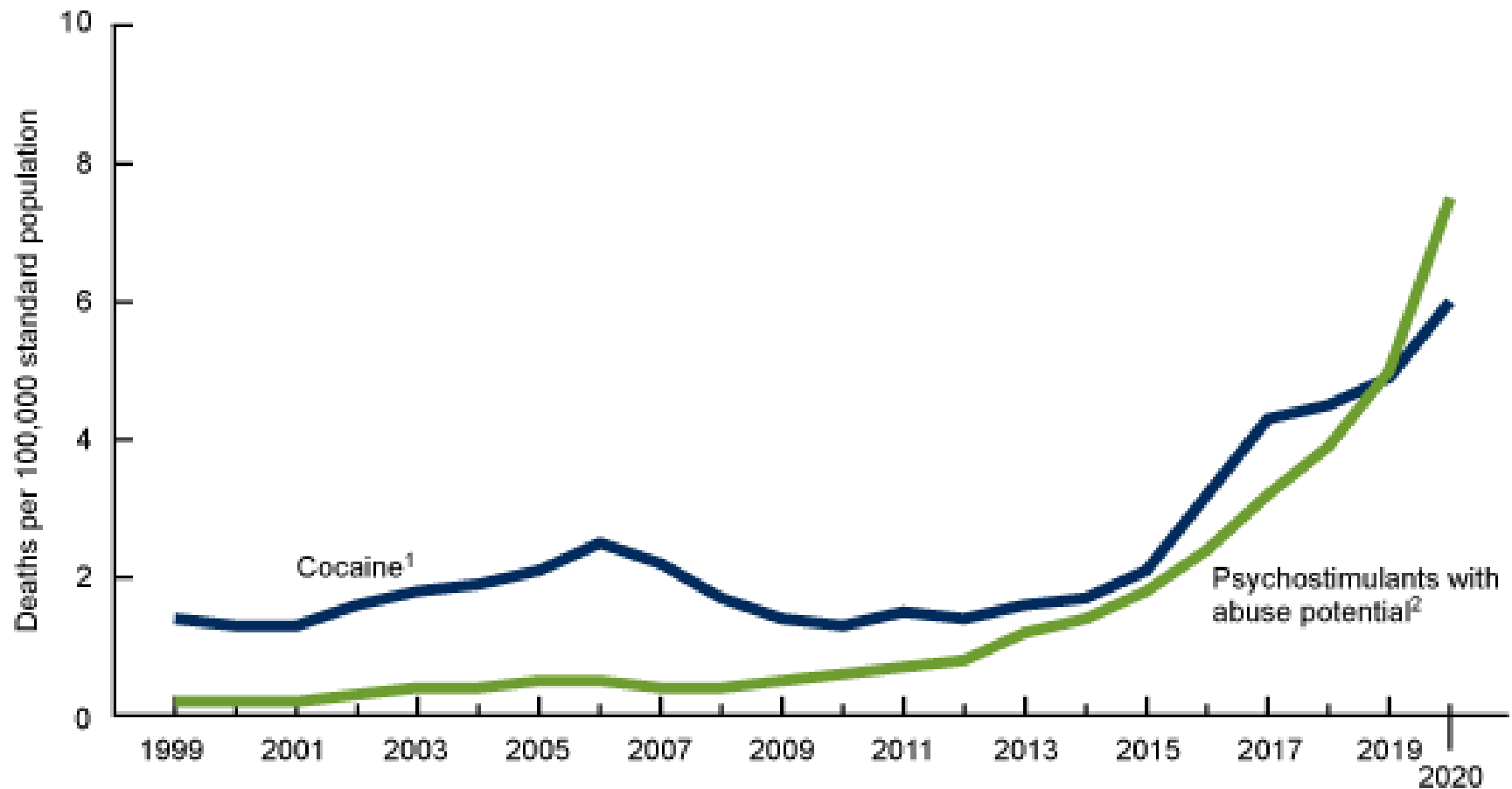




**Figure 2. US Fatalities Associated With Narcotics**



# Overdose rates for stimulant substances: 1999-2020 (CDC)



# KEY DATES IN THE HISTORY OF STIMULANT USE

- 19<sup>TH</sup> century
  - Cocaine extracted from coca (1860)
  - Methamphetamine synthesized (1887)
- 1936: The first reported misuse of amphetamines occurs by student subjects in a research project at University of Minnesota testing effects of the drug.
- Once exposed to the drug, students were seeking and using the drug outside the research study.



# Dormance, Emergence & Hibernation

A drug can lie dormant within a culture for generations before it breaks into the open as a favored intoxicant

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# KEY DATES IN THE HISTORY OF STIMULANT USE

- 1938: The first published report of the possible addiction to amphetamine appears.
- 1938: Amphetamine psychosis is first reported in the medical literature.
- 1940s: Amphetamines are distributed to Allied, Axis and Japanese soldiers
- 1960s: “Diet pills” become popular and are widely prescribed
- 1970s: Cocaine becomes popular among middle class
- 1990s: “Methamphetamine epidemic”



# KEY DATES IN THE HISTORY OF STIMULANT USE

- 2000s: Most methamphetamine manufactured in Mexican “super labs”
- 2000s: Much fentanyl cut with cocaine or methamphetamine
- 2000s: Increase in use of amphetamines to treat ADHD

# AMPHETAMINES VS COCAINE

- **ORIGIN**
- **METHOD OF USE**
- **ONSET OF ACTION**
- **DURATION OF ACTION**
- **NEUROTOXICITY**
- **LOCAL ANESTHESIA**
- **CHARACTERISTICS OF USERS**

# Amphetamines: Methods of Administration

- Oral (ingestion)
- Insufflation (“snorting”)
- Inhalation
- Injection



# AMPHETAMINES: ONSET OF ACTION

- 30-60 minutes when ingested
- 5-10 minutes when snorted
- 10-15 seconds when injected
- 5-10 seconds when smoked

## DURATION OF ACTION

- 4-12 hours, depending on dose, method of administration and form

# Cocaine: Method of Administration

- Intranasal
- Injection
- Smoking

# COCAINE: ONSET OF ACTION

- 5-10 minutes when snorted
- 10-15 seconds when injected
- 5-10 seconds when smoked

## DURATION OF ACTION

- 10-60 minutes depending on dose, method of administration and form



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# SIGNS OF STIMULANT USE

- Desired effects
  - Euphoria
  - Enhanced concentration
  - Reversal/prevention of fatigue
  - Reduction in appetite

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# SIGNS OF STIMULANT USE

- Side Effects:
  - Insomnia/lack of sleep
  - Increased breathing and pulse rate
  - Sweating
  - Rapid/pressured speech
  - Hyperactivity
  - Dry mouth

# SIGNS OF STIMULANT USE

- Side Effects:
  - Tremor (shaking hands)
  - Dilated pupils
  - Bruxism (teeth-grinding)
  - Depression (“the crash”-occurs when drug wears off)

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# THE CRASH: NO PARACHUTE

- Severe depression
- Anhedonia
- Sadness
- Boredom
- Despair
- Anguish
- Anxiety
- Panic
- Suicidal ideation



# RESPONSES TO THE CRASH

- Pray for sleep
- Wait it out
- Continued use of drug (the “run” continues)
- Self-medication with alcohol, marijuana, opiates or benzodiazepines

# SIGNS OF STIMULANT USE

- Side Effects: Stimulant Psychosis
  - Irritability, suspiciousness, paranoia
  - Visual and auditory hallucinations
  - Formication (“coke bugs”)



# STIMULANT PSYCHOSIS:

- Onset of stimulant psychosis can be from 2-48 hours after the initial dose.



# STIMULANT PSYCHOSIS:

- Onset appears as a result of acute intoxication.
- While psychosis may appear during the withdrawal period, it is not a true withdrawal sign.
- Generally associated with chronic, high dosage use.
- More likely to occur in IV users and smokers.

# STIMULANT PSYCHOSIS: SYMPTOMS

- Suspiciousness
- Irritability
- Delusions of persecution and/or grandeur
- Ideas of reference
- Visual, auditory and/or tactile hallucinations (latter = formication)
- Hyperactivity



# STIMULANT PSYCHOSIS: SYMPTOMS

- Agitation
- Aggressiveness.
- Depression, sometimes severe, may also be present.
- Closely resembles paranoid schizophrenia.

# STIMULANT PSYCHOSIS: SYMPTOMS

- Differential diagnosis may be based on presence or lack of physical signs such as pupillary dilation, increased blood pressure, pulse, and rapid breathing rate, as well as sudden onset and remission

# STIMULANT PSYCHOSIS

- Once an individual has suffered a CNS stimulant psychosis, s/he is more likely to experience the same outcome in the future.



# PERSISTENT STIMULANT PSYCHOSIS

- Psychotic symptoms generally disappear as abstinence continues, and rarely persist beyond 24 hours after the cessation of drug use.
- If psychotic signs persist beyond 24-48 hours, additional psychiatric consultation is advised.