

# Stimulants: An Overview

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The use of affirming language inspires hope and advances recovery.

**LANGUAGE MATTERS.**

**Words have power.**

**PEOPLE FIRST.**

The ATTC Network uses affirming language to promote the promises of recovery by advancing evidence-based and culturally informed practices.



**ATTC**

Addiction Technology Transfer Center Network  
Funded by Substance Abuse and Mental Health Services Administration



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# Disclosures

There are no relevant financial relationships with ACCME-defined commercial interests for anyone who was in control of the content of this activity.



# Acknowledgments

The following slides were drawn from various modules of SAMHSA's Addiction Technology Transfer Network Stimulants 101 Core Curriculum. The entire core curriculum and supplemental modules, including Stimulants and HIV, can be accessed at:

<https://attcnetwork.org/centers/network-coordinating-office/introducing-new-national-core-curriculum-stimulants-and-their>

# Stimulants: What are We Talking About?



# Forms of Cocaine

- Powder cocaine (Hydrochloride salt)
- Smokable cocaine (Crack, rock, freebase)
- Cocaine half-life: ~1-2 hours



SOURCE: NIDA, 2018

# Methamphetamine



## Methamphetamine Powder

*Description: Beige/yellowy/  
off-white powder*

## Base / Paste Methamphetamine

*Description: 'Oily', 'gunky', 'gluggy' gel,  
moist, waxy*

## Crystalline Methamphetamine

*Description: White/clear crystals/rocks;  
'crushed glass' / 'rock salt'*

SOURCE: NIDA, 2019



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# Types of Stimulants: Methamphetamine

## Amphetamine-Type Stimulants (ATS)

- Methamphetamine
  - ▶ Speed, crystal, ice, yaba, shabu, tina
- Amphetamine
- Pharmaceutical products used for ADD and ADHD

Methamphetamine half-life: **8-10 hours**

- 50% of drug is removed from the body within 8 hours

SOURCE: NIDA, 2019



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# Methamphetamine: Patterns of Use

- ▶ Either smoking or injecting causes an immediate, intense “rush” which lasts a few minutes
- ▶ Snorting or oral ingestion produces euphoria—a high, but not an intense rush.
  - ▶ Snorting produces effects within 3 to 5 minutes
  - ▶ Oral ingestion produces effects within 15 to 20 minutes
- ▶ Often abused in “binge & crash” pattern
  - ▶ “Run”: foregoing food and sleep while continuing to take the drug for up to several days

SOURCE: NIDA, 2019

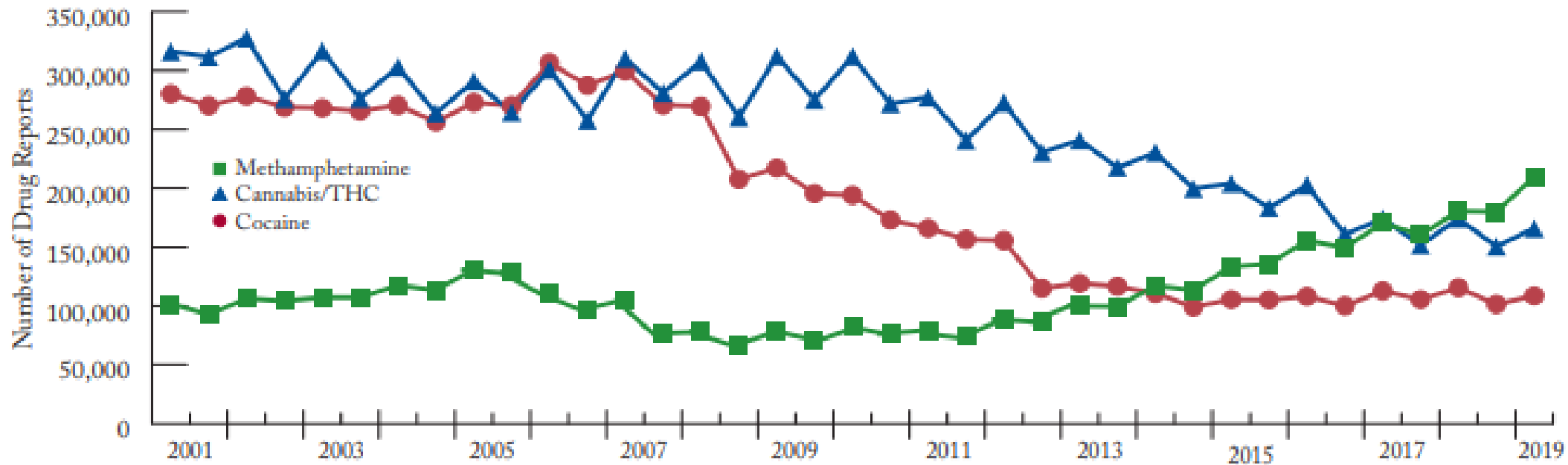


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# Epidemiology

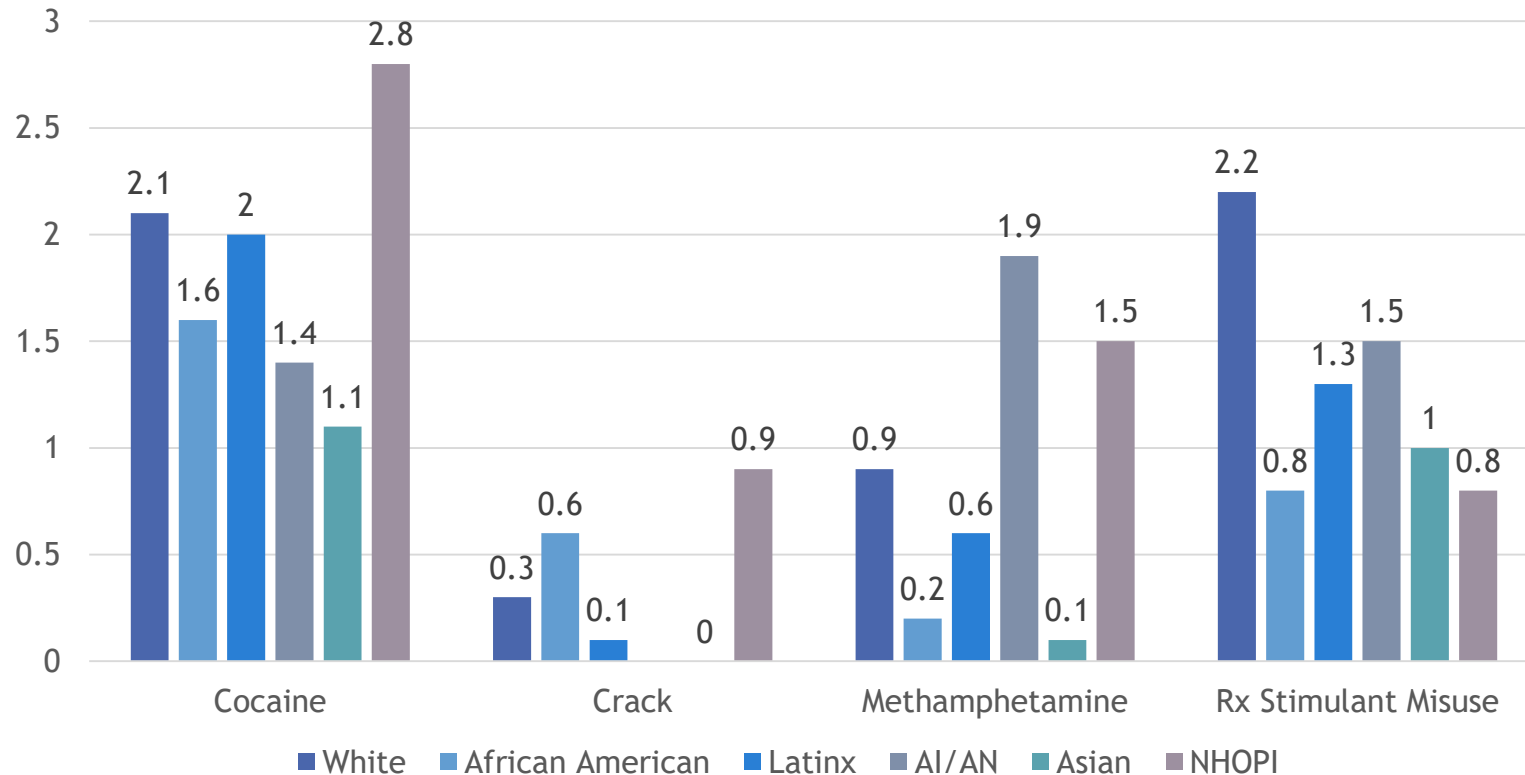


# National Trend Estimates for Stimulants and Cannabis, NFLIS, 2001-2019



SOURCE: U.S. DEA, 2020

# Past Year Use (as Percentages) of Stimulants by Racial/Ethnic Group, 2019



SOURCE: SAMHSA, 2020



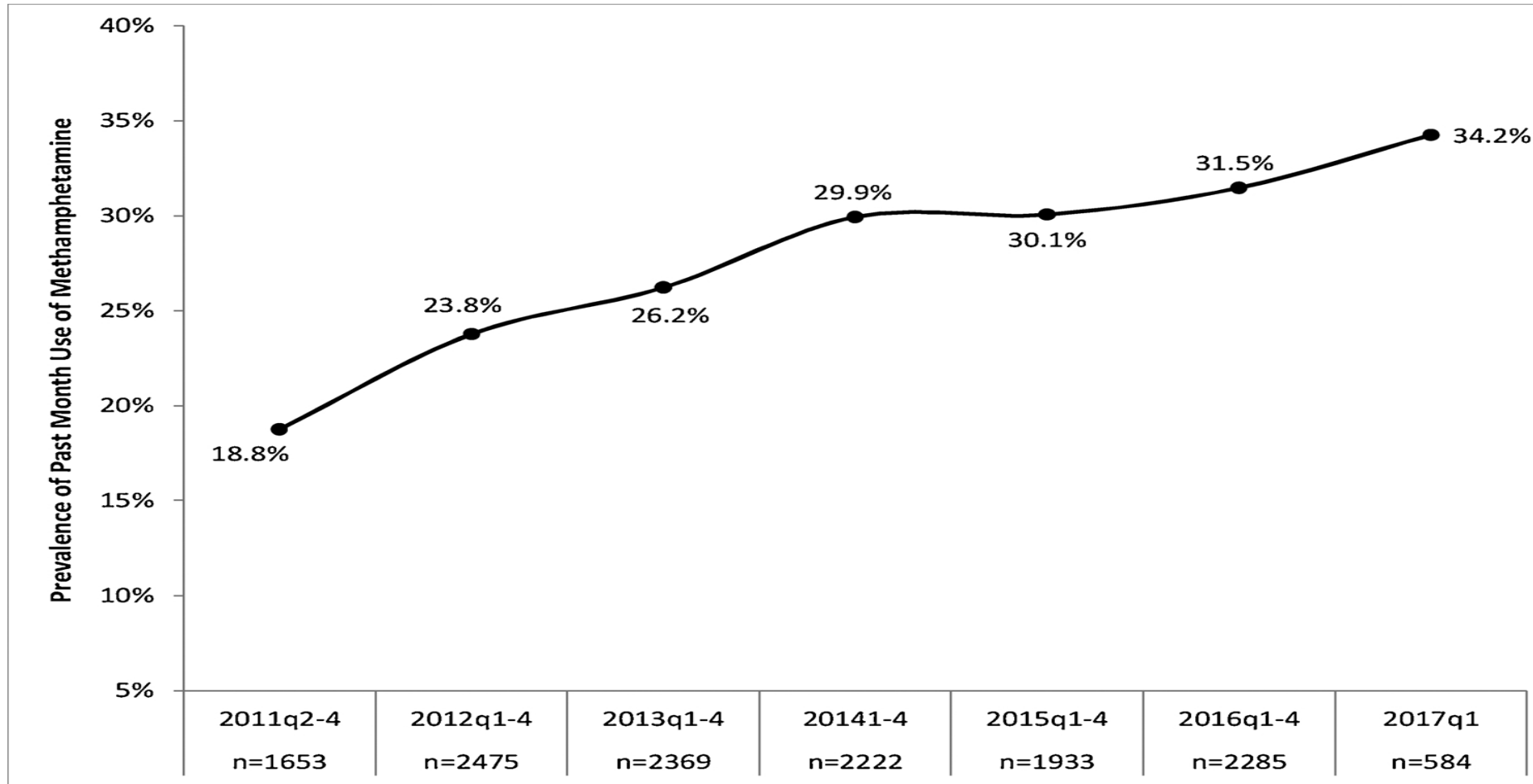
# Methamphetamine and Opioid Co- Ingestion - What are the Issues?

- ▶ A **synergistic effect occurs** when using meth and an opioid together (i.e., the result of using both is greater than either alone)
- ▶ The stimulant effect counterbalances the depressant effect, thus **increasing overdose risk** (respiratory depression AND cardiac arrest)
- ▶ The **most potent effect** seems to be in the **first 90 minutes** of co-ingestion

SOURCES: Ellis et al., 2018; Tian et al., 2017;  
Meacham et al., 2016; Trujillo et al., 2011



# Past Month Use of Methamphetamine among People Seeking Treatment for an Opioid Use Disorder



SOURCE: Ellis et al., 2018

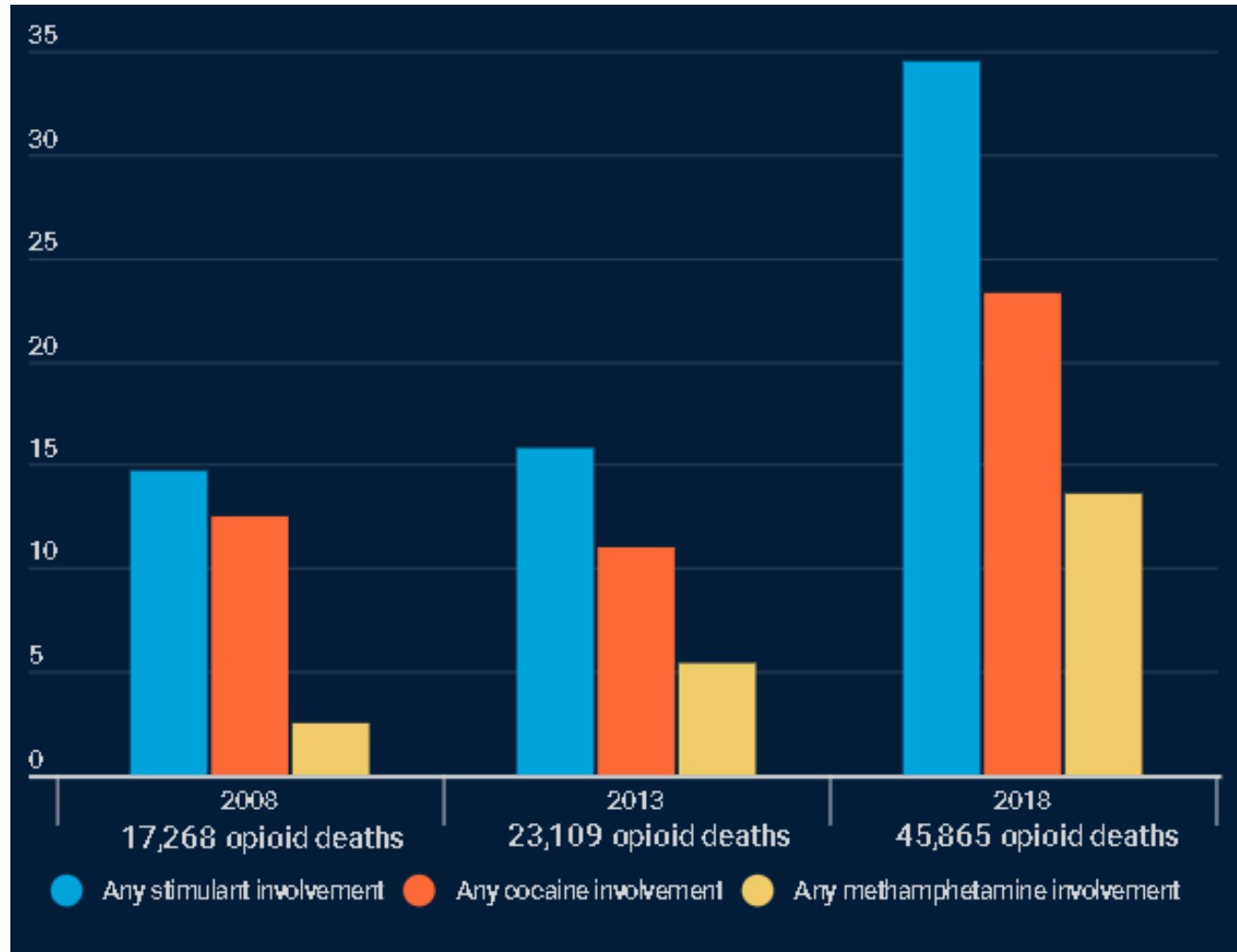
# What are Some Treatment Implications for Methamphetamine and Opioid Co-Ingestion?

- ▶ Make sure you have sufficient **naloxone kits** available for overdoses
  - ▶ Because of the interaction effect, it may require more than one dose to counteract the effects of meth and heroin
- ▶ Combine **medication-assisted treatment for heroin with contingency management for meth**
  - ▶ It may be better to use buprenorphine rather than methadone, since methadone and meth would still have a potent interaction (for people who relapse on meth during treatment)
- ▶ Exercise may help to **reduce methamphetamine use and reduce depression and anxiety symptoms**





# A Growing Percentage of Opioid-Related Deaths also Involve Stimulants

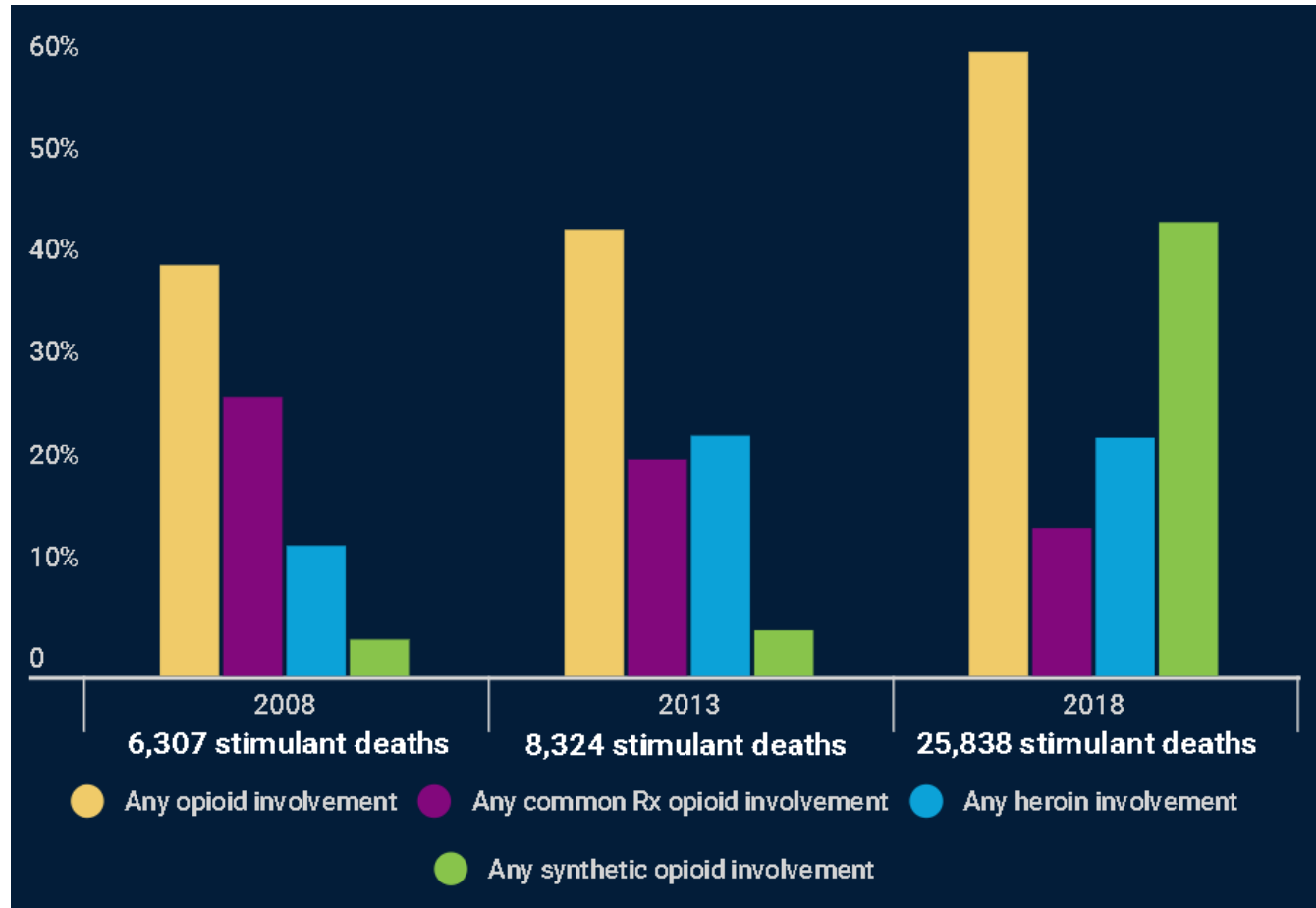


SOURCE: NIHCM Foundation, 2020



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# Increases Seen in Stimulant-Related Deaths that also Involve Opioids



SOURCE: NIHCM Foundation, 2020

# Cocaine vs. Methamphetamine

## Methamphetamine

- ▶ Stimulant
- ▶ Man-made
- ▶ Smoking produces a long-lasting high
- ▶ 50% of drug is removed from body in 12 hours
- ▶ Increases dopamine release and blocks dopamine re-uptake
- ▶ Limited medical use

## Cocaine

- ▶ Stimulant and local anesthetic
- ▶ Plant-derived
- ▶ Smoking produces a brief high
- ▶ 50% of drug is removed from body in 1 hour
- ▶ Blocks dopamine re-uptake
- ▶ Limited use as a local anesthetic (surgical)

SOURCE: NIDA, 2019



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# Summary

- ▶ Psychostimulant use is increasing in the US
- ▶ Rates of use vary by racial/ethnic group and by location across the US
- ▶ Purity and potency have both increased because of the way that it is made.
- ▶ Stimulant related deaths are increasing with rates varying significantly across the country
- ▶ Co-ingestion of stimulants with opioids is also increasing



# Acute and Chronic Effects of Stimulants



# Acute Effects of Stimulants

## Physical

### Increases

- ▶ Heart rate
- ▶ Blood pressure
- ▶ Pupil size
- ▶ Respiration
- ▶ Sensory acuity
- ▶ Energy

### Decreases

- ▶ Appetite
- ▶ Sleep
- ▶ Reaction Time

## Psychological

### Increases

- ▶ Confidence
- ▶ Alertness
- ▶ Mood/Euphoria
- ▶ Sex drive
- ▶ Energy
- ▶ Talkativeness

### Decreases

- ▶ Boredom
- ▶ Loneliness
- ▶ Timidity

# Chronic Psychological Effects of Stimulants

- Confusion
- Poor concentration
- Hallucinations
- Fatigue
- Memory loss
- Insomnia
- Irritability
- Paranoia
- Panic reactions
- Depression
- Anger
- Psychosis
- Disinhibition and impulsivity

# Chronic Physical Effects of Stimulant Use

- ▶ **Respiratory** (pulmonary hypertension, difficulty breathing, pleuritic chest pain, decreased capacity)
- ▶ **Neurological** (stroke, seizure, hemorrhage, cerebral vasculitis)
- ▶ **Renal failure** (resulting from rhabdomyolysis)
- ▶ **Hepatic failure** (resulting from rhabdomyolysis)
- ▶ **Cardiac** (tachycardia, arrhythmia, reduced heart rate variability, myocardial infarction, heart failure)
- ▶ **Dental and skin issues**

SOURCE: NIDA, 2019



# Methamphetamine Use and Violence

- ▶ Compared to no use, amphetamines use was associated with a 2-fold increase in the odds of hostility or violence
- ▶ Frequent use increases the risk of violent behavior
- ▶ Other risk factors included: psychotic symptoms, alcohol or other drug use, psychosocial problems, and impulsivity
- ▶ People who use methamphetamine are also more likely to be victims of abuse or violent acts
- ▶ Women who used methamphetamine are significantly more likely to experience partner abuse/violence



SOURCES: Foulds et al., 2020;  
Cohen et al., 2003

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# Treatments for Stimulant Use Disorders

# Are there Medications for the Treatment of Stimulant Use Disorder?

- ▶ The short answer is **NO**
- ▶ A few medicines have had positive results in clinical trials, most notably off-label use of bupropion or mirtazapine
- ▶ To date, these medicines have not demonstrated reproducible results
- ▶ Much more research is needed to determine the overall efficacy of these medicines

SOURCE: Skolnick, 2015

# What Do the Results from the Latest Methamphetamine Medication Trial Tell Us?

- ▶ Multi-site, double-blind, two-stage, placebo controlled trial to evaluate the efficacy and safety of extended-release injectable naltrexone plus oral extended-release bupropion
- ▶ 403 participants enrolled in stage 1; 225 participants enrolled in stage 2
  - ▶ Stage 1: 18 of 109 participants (16.5%) in the naltrexone-bupropion group and 10 of 294 (3.4%) in the placebo group had a response
  - ▶ Stage 2: 13 of 114 (11.4%) in naltrexone-bupropion group and 2 of 111 (1.8%) in the placebo group had a response

# Behavioral Treatments

- ▶ Contingency Management
- ▶ Community Reinforcement Approach
- ▶ Cognitive Behavioral Therapy/Relapse Prevention
- ▶ Motivational Interviewing
- ▶ Matrix Model
- ▶ Exercise
- ▶ Mindfulness

# Recommendations for Outpatient Stimulant Use Disorder Treatment (1)

- ▶ Durations over 90 days (with continuing care for another 9 months).
- ▶ Techniques and clinic practices that improve treatment retention are critical.
- ▶ Treatment should include 3-5 clinic visits per week for at least 90 days.

SOURCES: UNODC, 2019;  
Rawson et al., 2020; CSAT, 1999



# Recommendations for Outpatient Stimulant Use Disorder Treatment (2)

- ▶ Employ evidence-based practices [i.e., Contingency Management (CM), Community Reinforcement Approach (CRA), Cognitive Behavioral Therapy (CBT), Motivational Interviewing (MI), Matrix Model]
- ▶ Family involvement and 12-step programs appear to improve outcome
- ▶ Urine testing (at least weekly is recommended)

SOURCES: UNODC, 2019;  
Rawson, et al., 2020; CSAT, 1999



# Concluding Thoughts

- ▶ The availability and use of cocaine and methamphetamine is widespread across the U.S. and beyond
- ▶ Central nervous system stimulants affect multiple organ systems, including the brain, heart, lungs, kidneys, liver, and skin
- ▶ A variety of behavioral interventions have been shown to be effective
- ▶ No FDA-approved medications exist (yet)
- ▶ Recovery is possible





# Resources for Continued Learning

- ▶ ATTC Network's Focus on Stimulant Misuse Web Page:  
<https://attcnetwork.org/centers/global-attc/focus-stimulant-misuse>
- ▶ Evidence-Based Resource Guide Series: Treatment of Stimulant Use Disorders: <https://store.samhsa.gov/product/Treatment-of-Stimulant-Use-Disorder/PEP20-06-01-001>
- ▶ Northwest ATTC's Contingency Management for Healthcare Settings Self-Paced Online Course:  
<https://healthknowledge.org/course/search.php?search=Contingency+Management>



# Thanks for Participating!

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