

# **Methamphetamine 2020: New Risks, Current Treatments**

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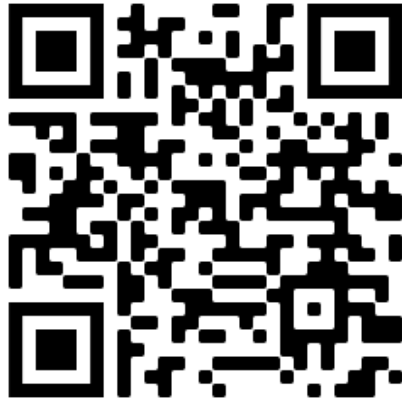
July 8, 2020

No Disclosures

# Evaluation

***Your feedback is important!***

- QR code



- **Url:** <https://ttc-gpra.org/P?s=394237>



# Learning Objectives

- Participants will be able to explain the current epidemiology of cocaine and methamphetamine in the US
- Participants will be able to describe the most common clinical challenges in treatment people with stimulant use disorders.
- Participants will be able to review and discuss the current evidence-based practices for the treatment of individuals with stimulant use disorder.

# Forms of Methamphetamine



## Methamphetamine Powder

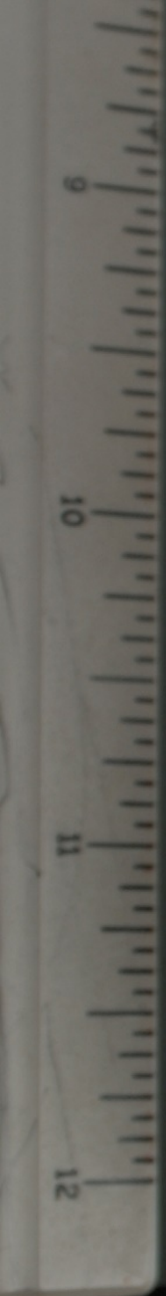
Description: Beige/yellowy/off-white powder



## Crystalline Methamphetamine

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





ST

# Methamphetamine

- In the 1990s and early 2000s, meth made from the decongestants, pseudoephedrine and ephedrine, poured out of domestic labs like those in the early seasons of “Breaking Bad.”
- Narcotics squads partially became hazmat teams.





# Methamphetamine Availability Reduced

In 2005 Congress passed the Combat Methamphetamine Act, which put pseudoephedrine products behind the counter, limited amounts purchased, and tracked purchasers.

Although some meth makers tried “smurfing,” meth cases plummeted.

- With no more meth lab explosions on the nightly news, the public forgot about the drug.
- Mexican drug cartels stepped in improving production with higher potency and lower price (\$2,000 per pound; down from \$8,000)

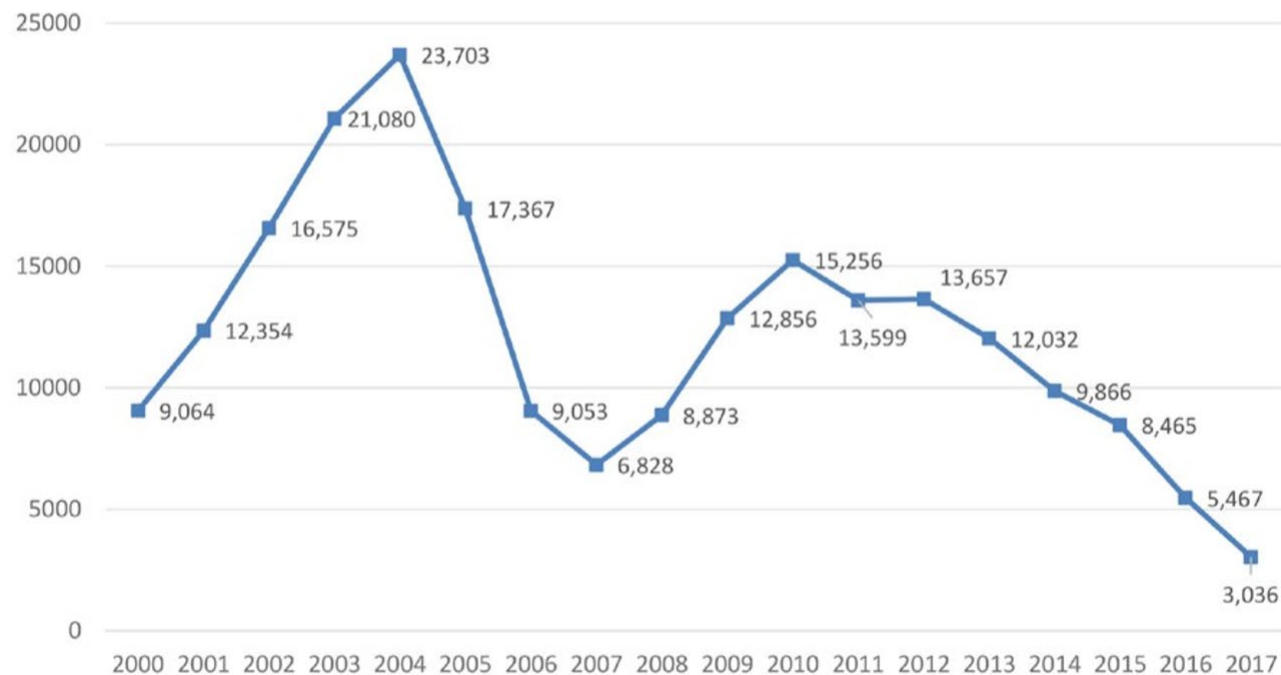


# Methamphetamine Lab Incidents

METHAMPHETAMINE

UNCLASSIFIED

Figure 76. Number of Methamphetamine Laboratory Incidents, 2000 – 2017.



Source: El Paso Intelligence Center National Seizure System as of June 12, 2018

# Methamphetamine Today

- The market is inundated with so much pure, low-cost meth that dealers have more of it than they know what to do with.
- 2018 - United States border agents seizing 10 to 20 times the amounts they did a decade ago.
- California border seizures in **2018 were 48,000 lbs.**
- California border seizures in **2019 were 80,000 lbs.**
- 2014-2018 fentanyl-contaminated meth and cocaine became more prevalent

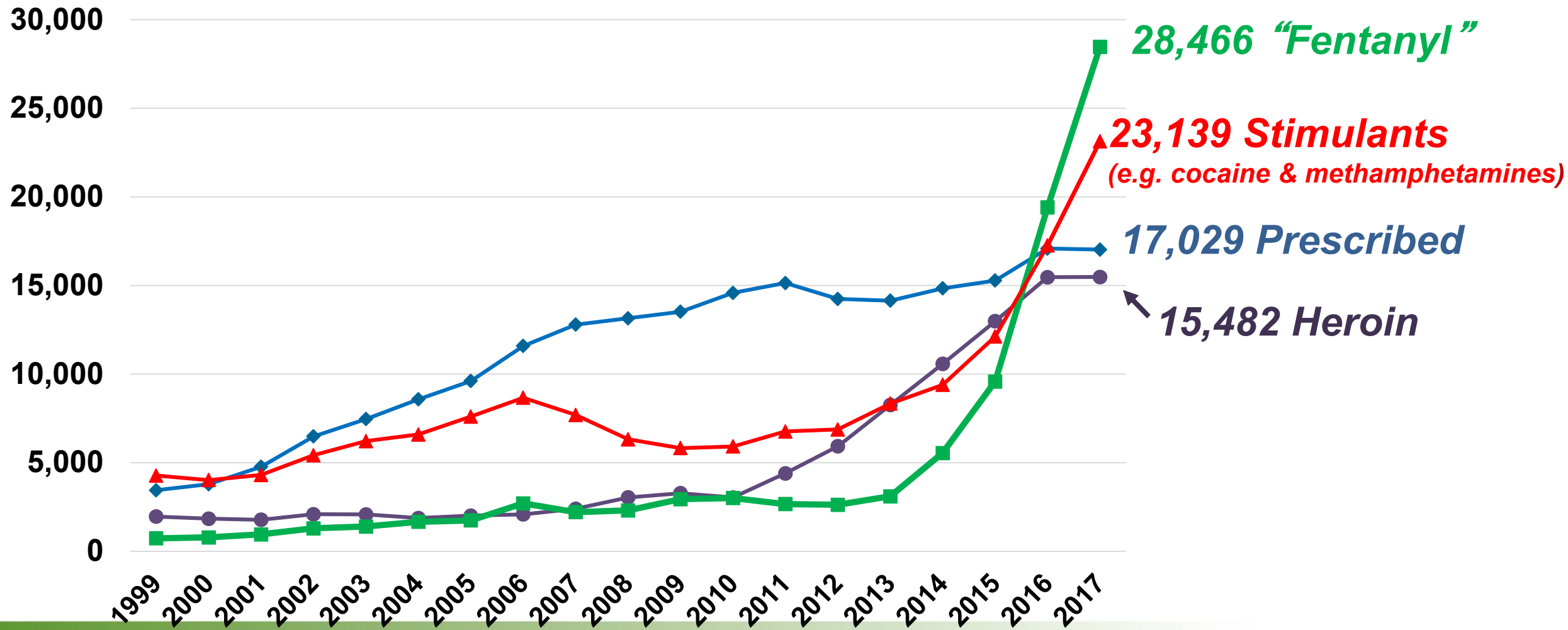
# Potential Lethal Dose Heroin, Fentanyl and Carfentanil



Comparing the size of lethal doses of heroin, fentanyl, and carfentanil. The vials here contain an artificial sweetener for illustration. (New Hampshire State Police Forensic Laboratory)

# Evolution of Drivers of Overdose Deaths:

*Analgesics* ➡ *Heroin* ➡ *Fentanyl* ➡ *Stimulants*



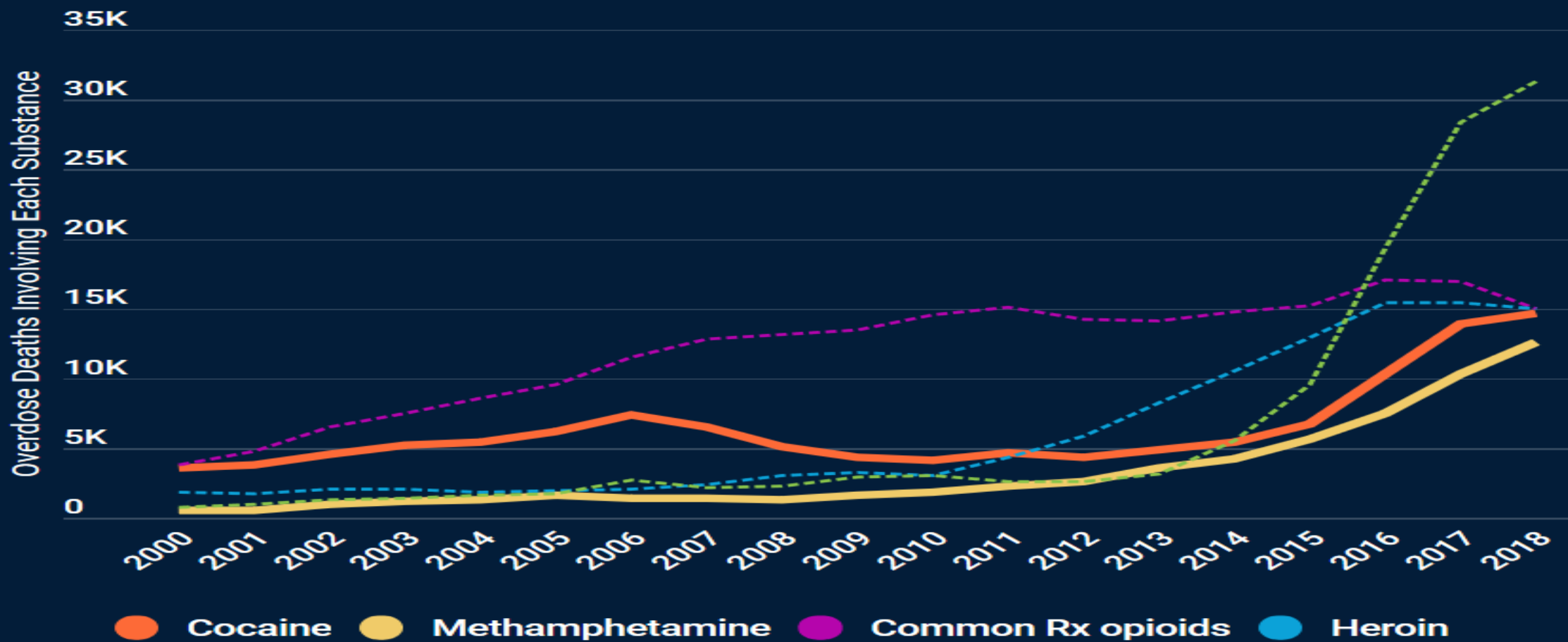
See: Compton WM & Jones CM, *Ann NY Acad Sci*, 2019; Data from CDC WONDER Database





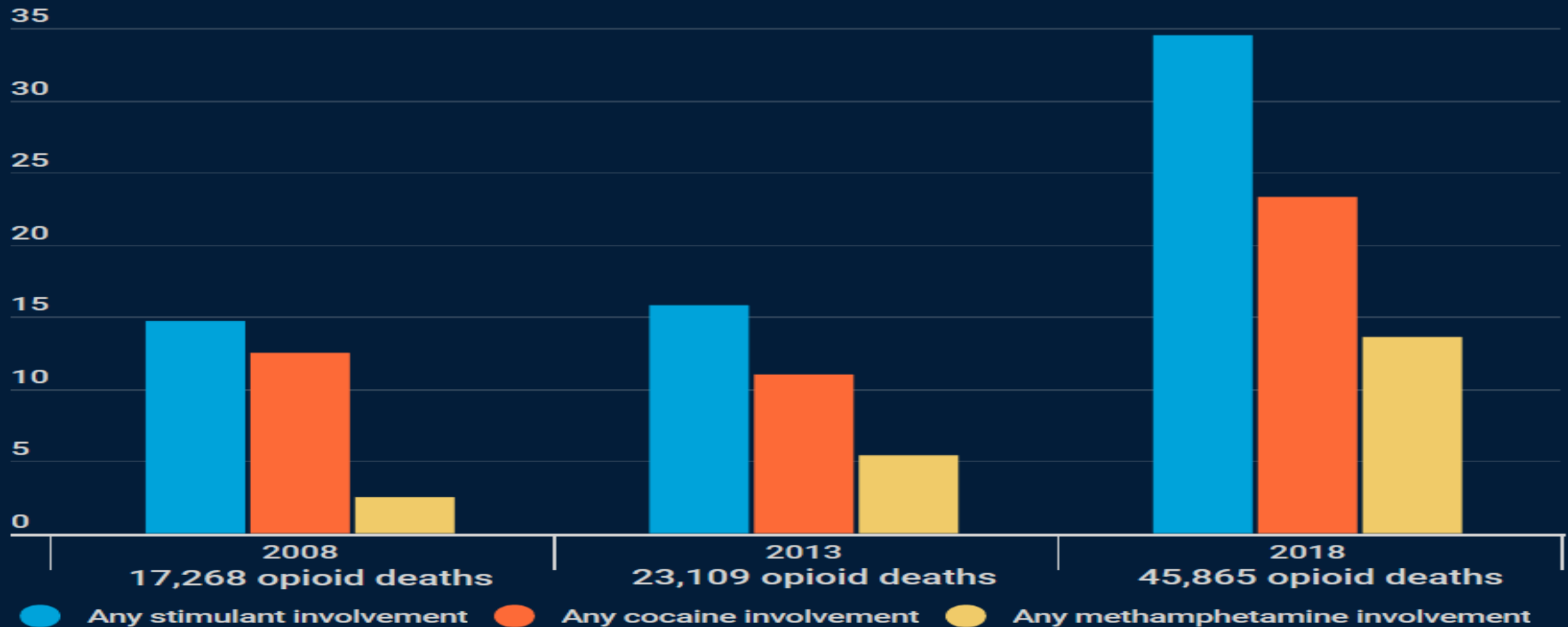
## Beyond Opioids:

# Rapid increase in drug deaths involving stimulants

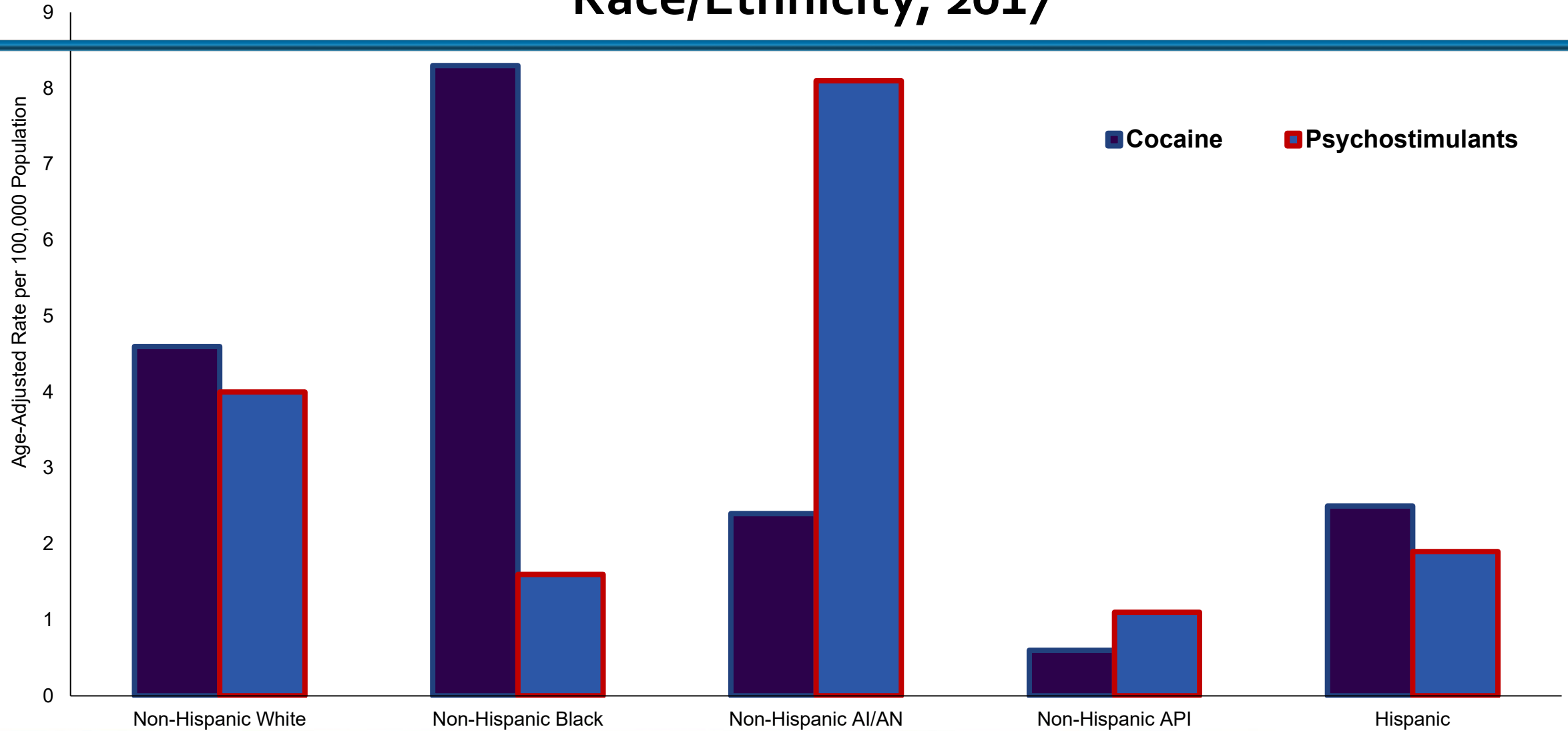




## Of all opioid overdose deaths, a growing proportion also involve stimulants



# Cocaine and Psychostimulant Overdose Deaths by Race/Ethnicity, 2017

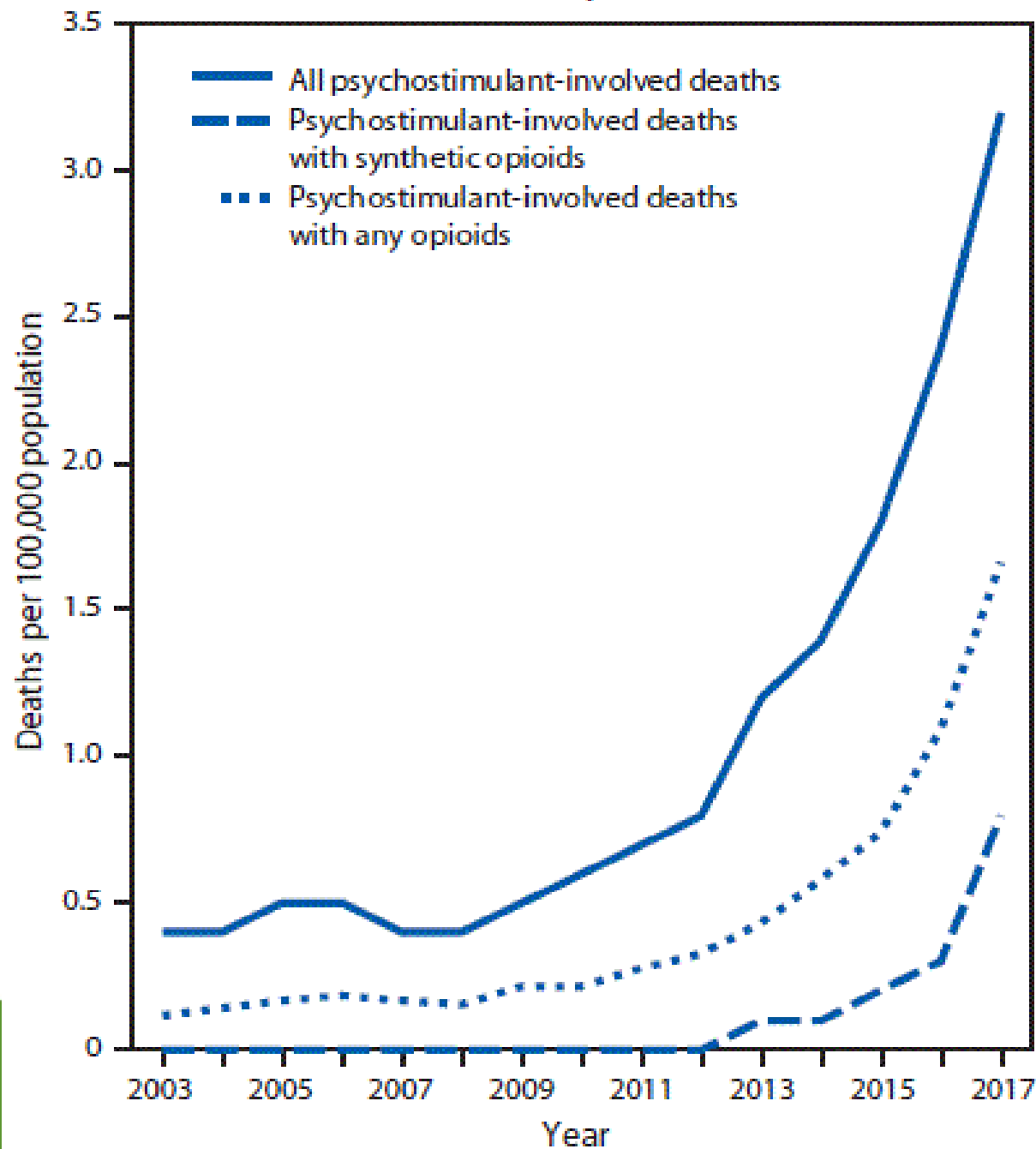


**Kariisa M, et al. *MMWR Morb Mortal Wkly Rep.* 2019;68(17):388-395**

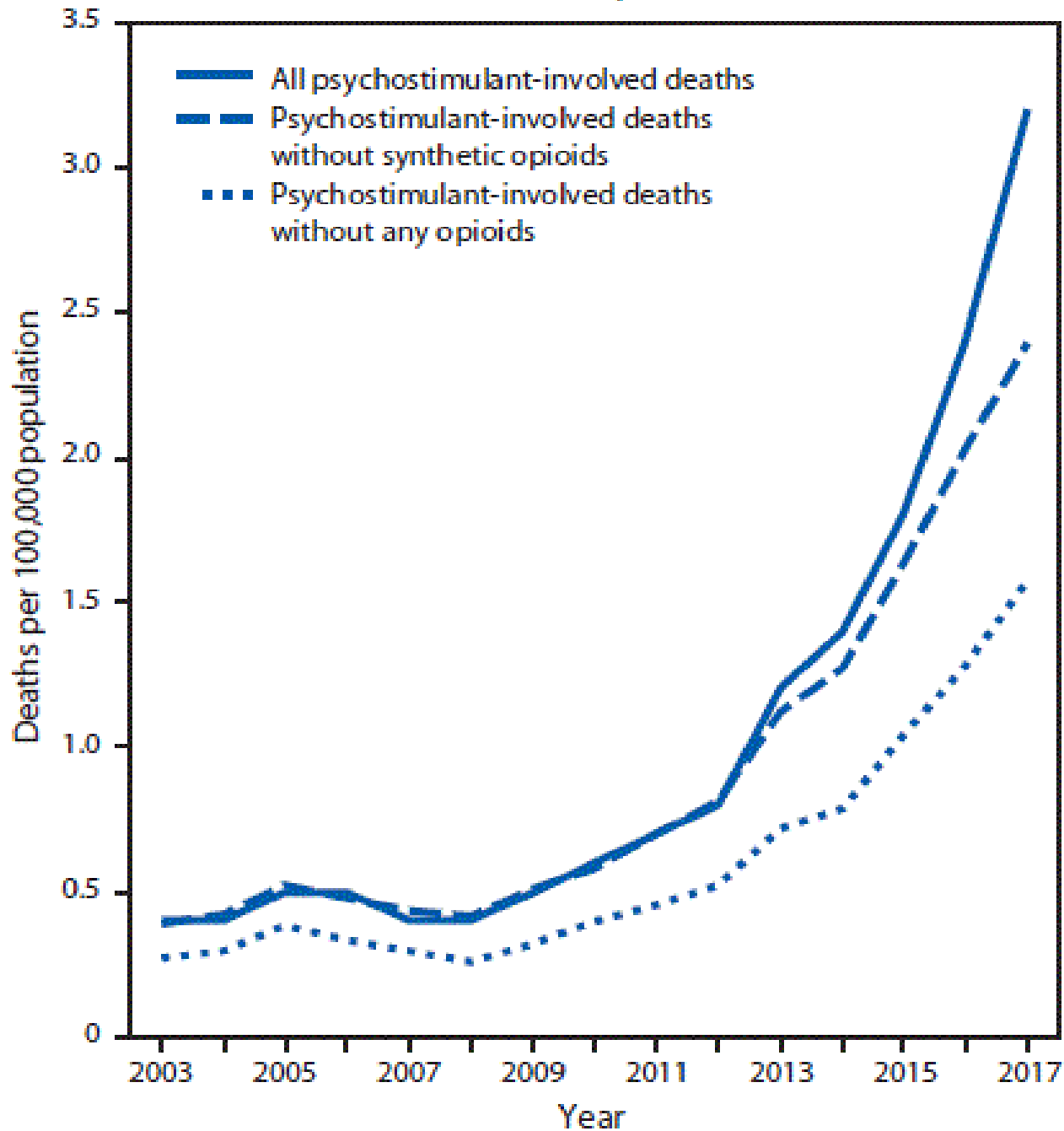




With opioids

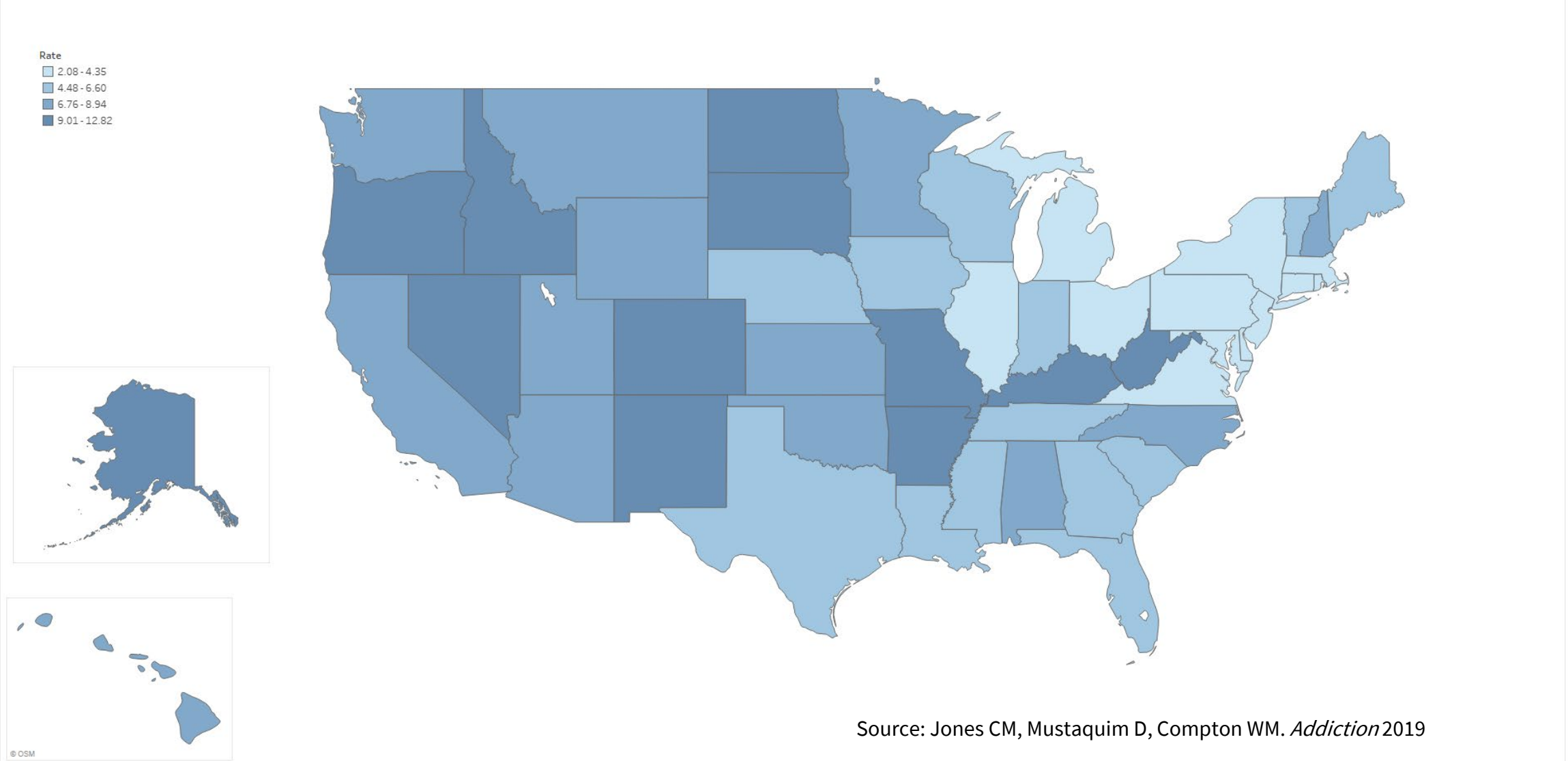


Without opioids

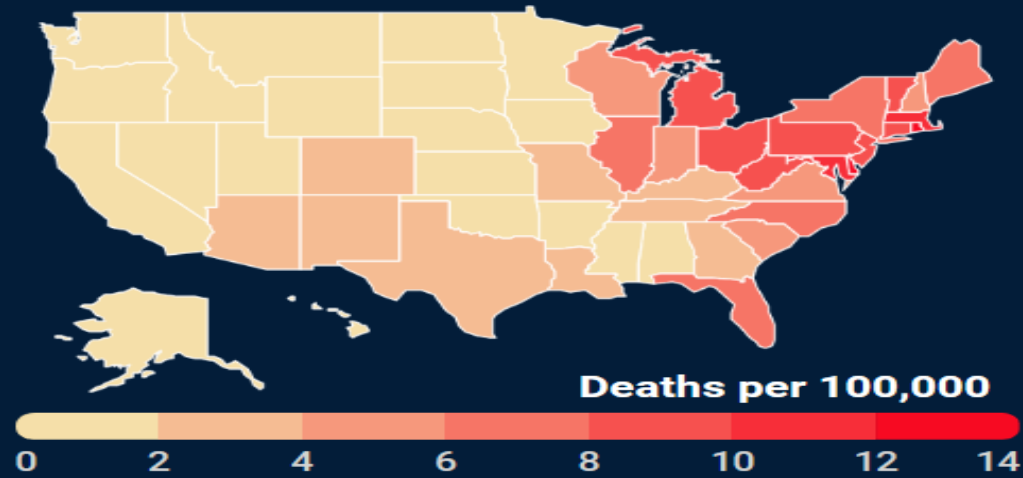


# Methamphetamine: Rates (per 1000 adults) of Past Year Use, By State, 2016-2017 (NSDUH)

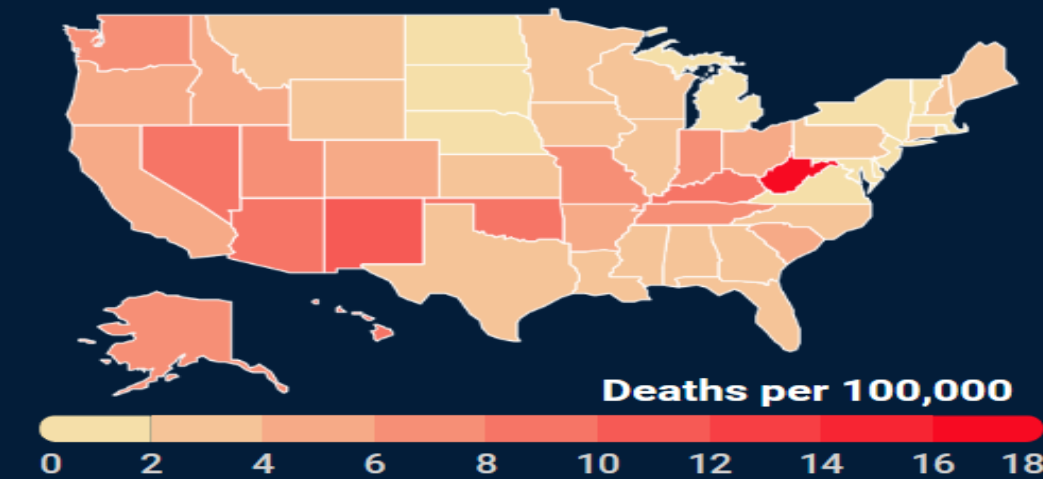
Methamphetamine Use 18 and Older



# Different geographic patterns in death rates by stimulant type



**Cocaine Deaths**

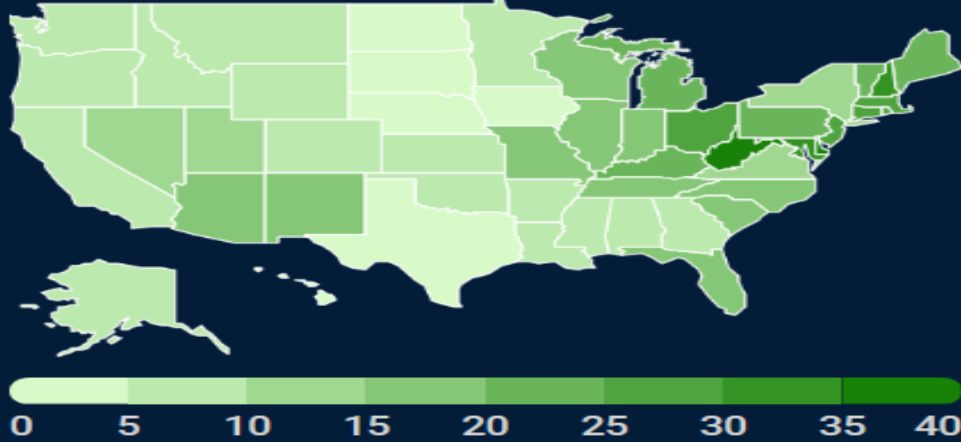


**Methamphetamine Deaths**

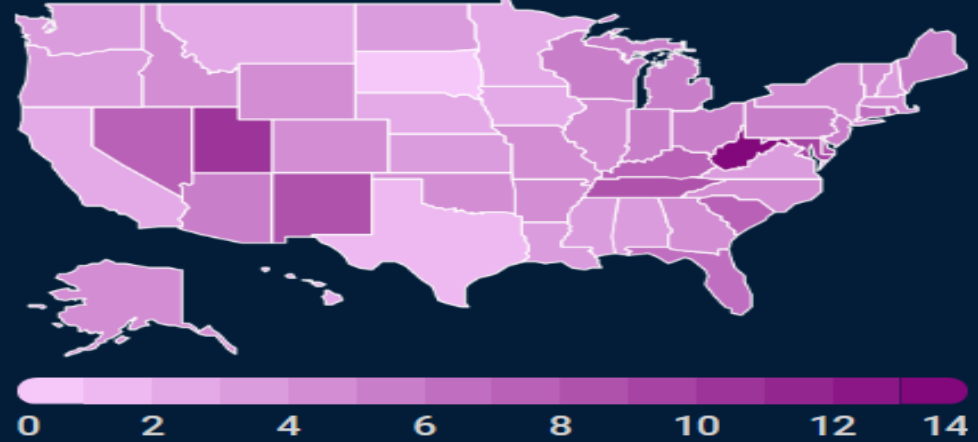
... mutually exclusive; a single death may involve multiple substances.

# Different geographic patterns in death rates by opioid type

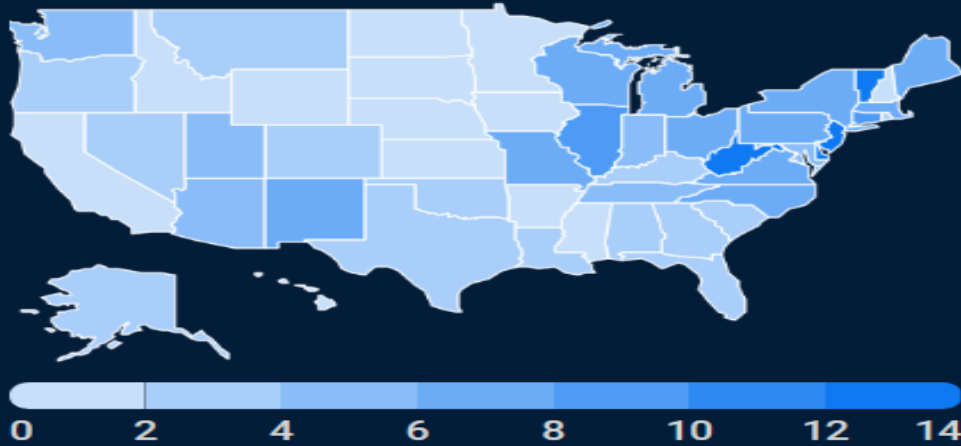
## All Opioid Deaths per 100,000



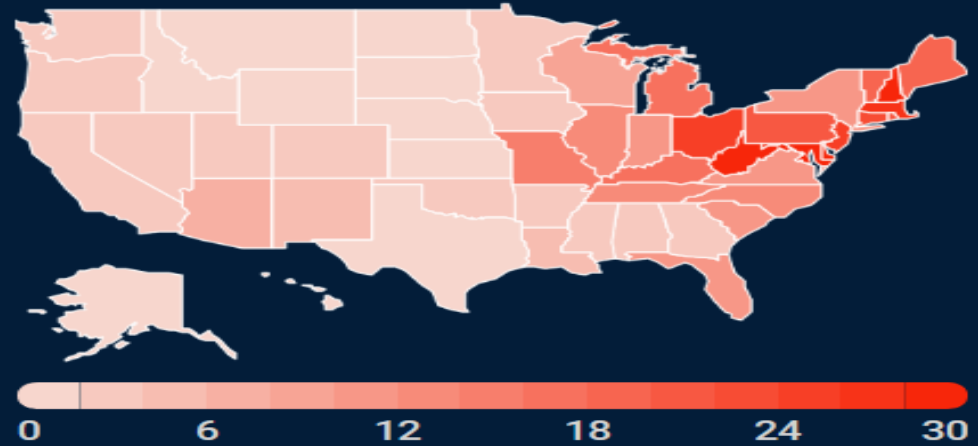
## Common Rx Opioid Deaths per 100,000



## Heroin Deaths per 100,000



## Synthetic Opioid Deaths per 100,000



Categories not mutually exclusive; a single death may involve multiple substances.

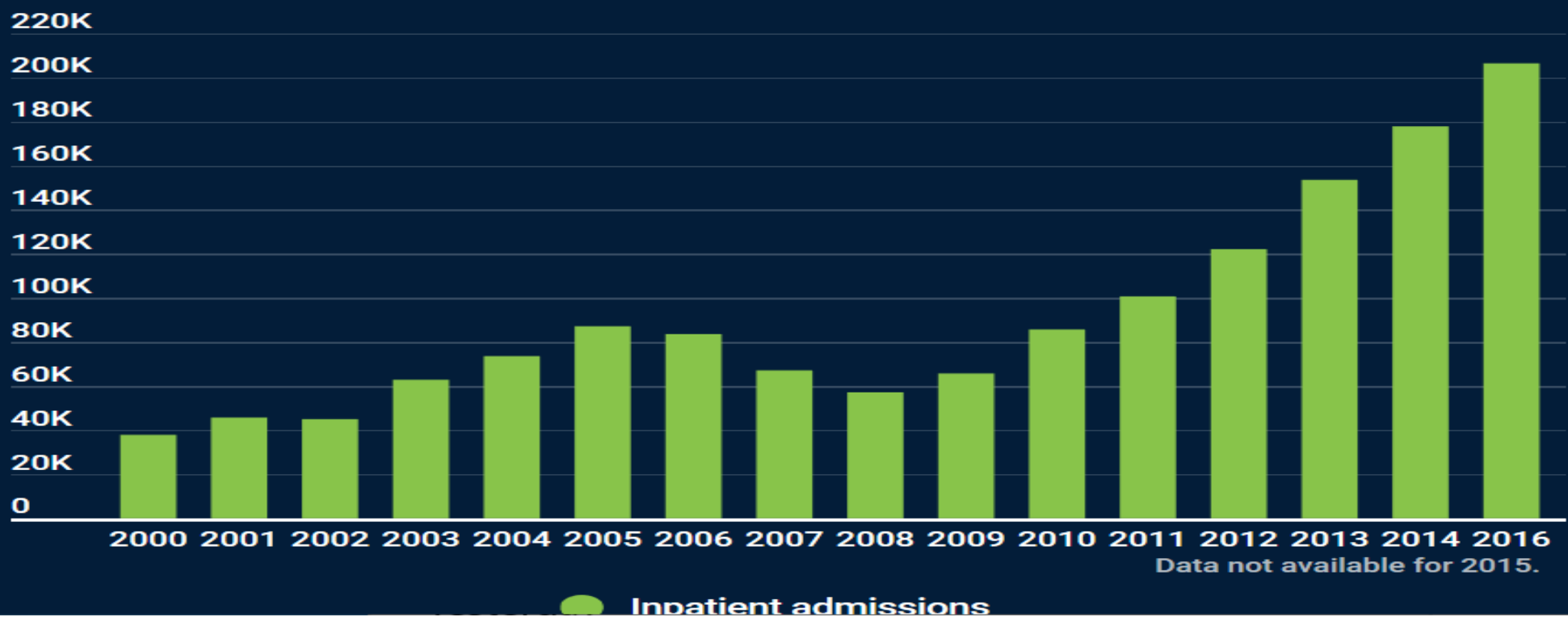


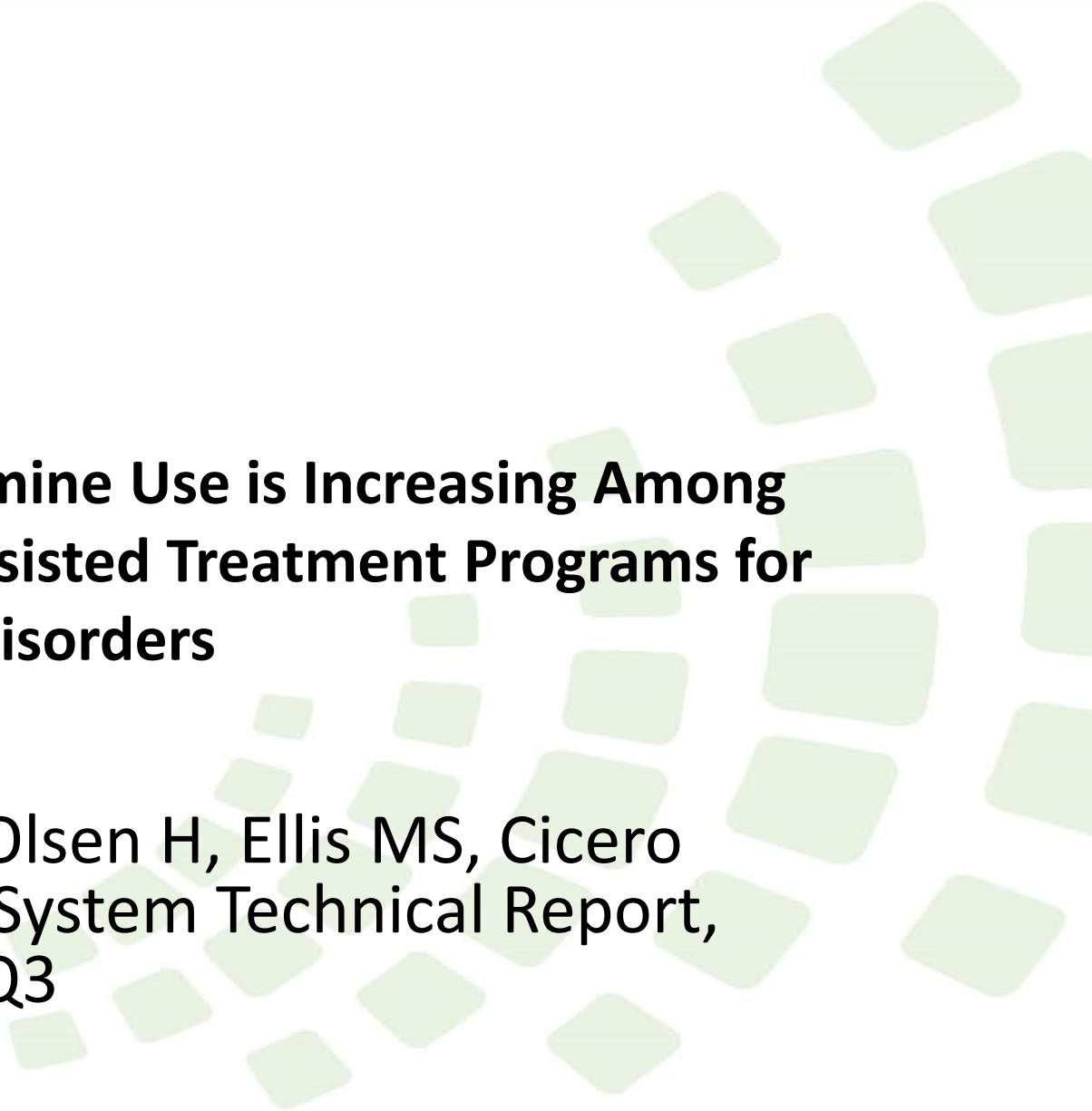


## Methamphetamine is placing a rapidly increasing burden on the hospital system

Inpatient Admissions

Emergency Department Visits





**The Prevalence of Methamphetamine Use is Increasing Among  
Individuals Entering Medication-Assisted Treatment Programs for  
Opioid Use Disorders**

Severtson SG, Kreider SED, Olsen H, Ellis MS, Cicero  
TJ, Dart RC (2019). RADARS<sup>®</sup> System Technical Report,  
2019-Q3

## The Prevalence of Methamphetamine Use is Increasing Among Individuals Entering Medication-Assisted Treatment Programs for Opioid Use Disorders

- Data from the RADARS<sup>®</sup> System Opioid Treatment Program were used to assess the change in the prevalence of past month methamphetamine use among individuals entering medication-assisted treatment programs for opioid use disorders. Data from 39,312 valid surveys given to individuals entering treatment facilities from January 2012 through December 2018 were assessed.

## The Prevalence of Methamphetamine Use is Increasing Among Individuals Entering Medication-Assisted Treatment Programs for Opioid Use Disorders

- The number of respondents reporting past month use of methamphetamine increased from 402 (7.8%) in 2012 to 1,166 (21.3%) in 2018. Areas with the greatest increases in the number of cases appeared to be in the West (California, Montana, Nevada), the Midwest (Indiana) and South (Oklahoma) .
- The Census Region with the highest prevalence of past month methamphetamine use in 2018 was the West region (46.0%) followed by the South (16.8%), the Midwest (12.4%), and the Northeast (5.4%)

**Association between methamphetamine use  
and retention among patients  
with opioid use disorders treated with  
buprenorphine**

Journal of Substance Abuse Treatment

109 (2020) 80–85

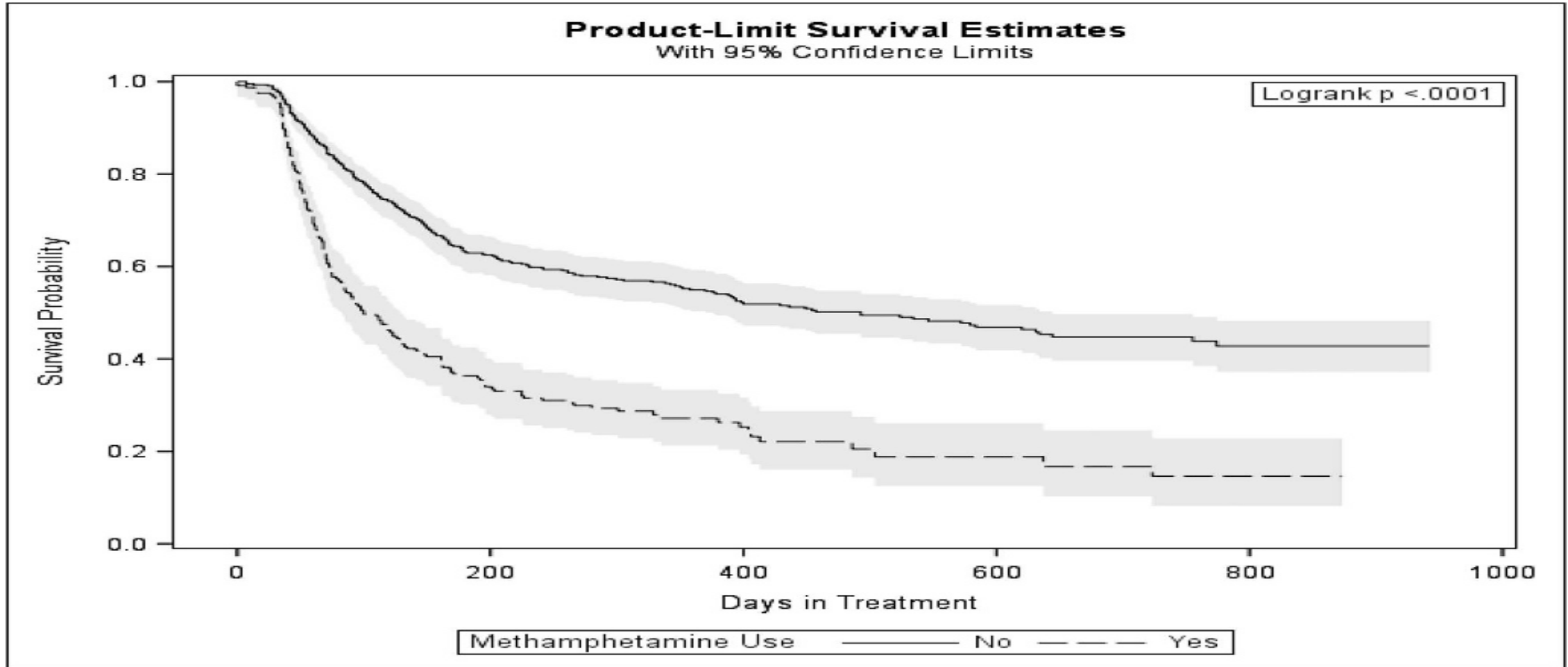
Judith I. Tsui, et al.

# Association between methamphetamine use and retention among patients with opioid use disorders treated with buprenorphine

- The study utilized data on adult patients receiving buprenorphine from Washington State Medication Assisted Treatment-Prescription Drug and Opioid Addiction program clinics between November 1, 2015 and April 31, 2018 (N=799) Past 30-day substance use data were collected at baseline and 6-months, as well as date of program discharge.
- 30% (n=237) individuals reported meth use at admission. Baseline methamphetamine use was associated with more than twice the relative hazards for discharge in adjusted models (aHR=2.39; 95% CI: 1.94–2.93).



# Association between methamphetamine use and retention among patients with opioid use disorders treated with buprenorphine



# Covid-19 and Drug Supply

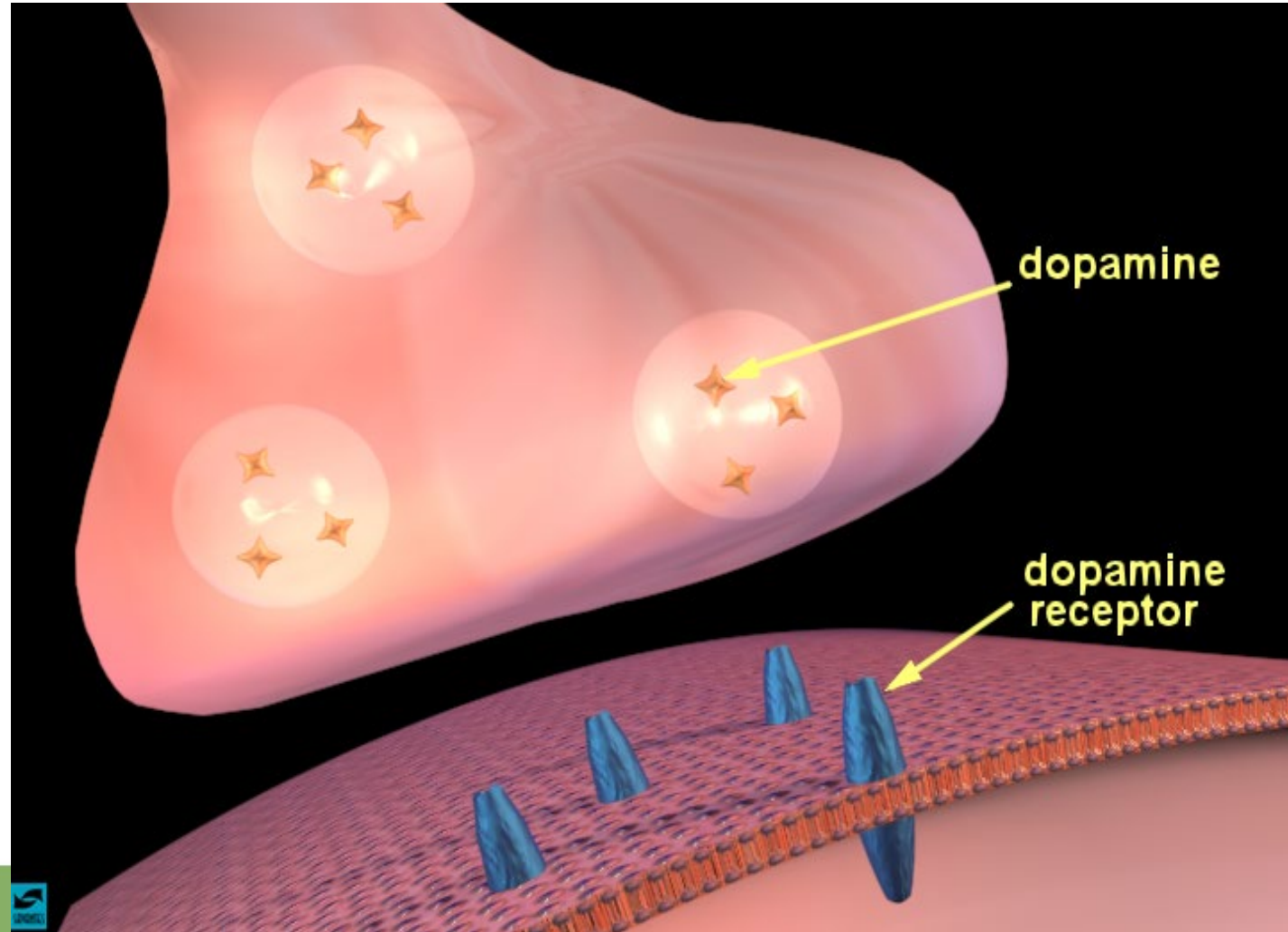
# Cartels are scrambling': Virus snarls global drug trade

MUSTIAN and BLEIBERG AP News April 19, 2020

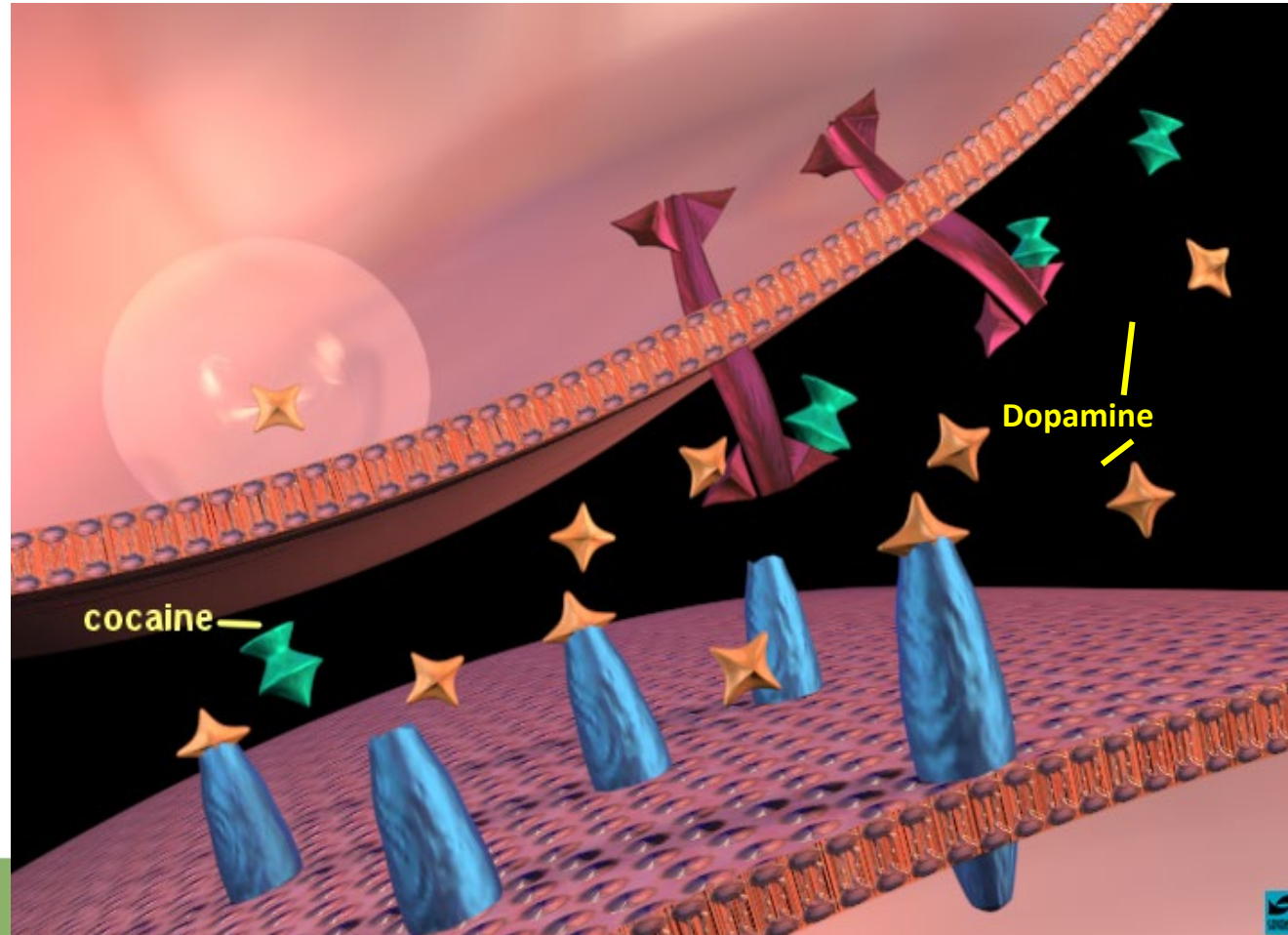
- Cartels are increasingly shifting to synthetic opioids such as fentanyl, which can be cooked 24/7 throughout the year, are up to 50 times more powerful than heroin and produce a greater profit margin.
- Though some clandestine labs that make fentanyl from scratch have popped up sporadically in Mexico, cartels are still very much reliant upon Chinese companies to get the precursor drugs.
- Huge amounts of these mail-order components can be traced to a single, state-subsidized company in Wuhan that shut down after the outbreak earlier this year, said Louise Shelley, director of the Terrorism, Transnational Crime and Corruption Center at George Mason University, which monitors Chinese websites selling fentanyl.

# Impacts of Methamphetamine Use

# Dopamine Release Causes Pleasure

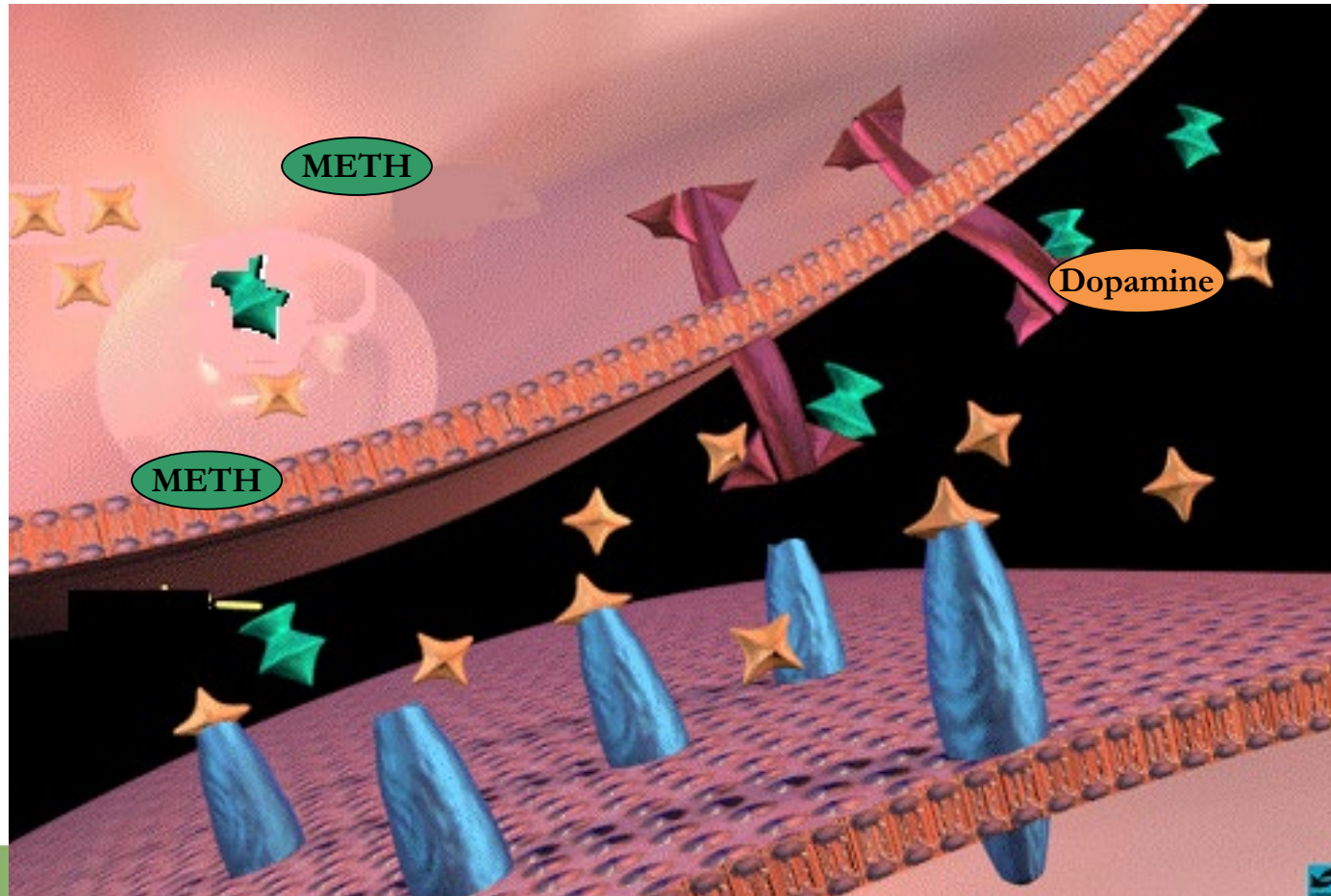


# Cocaine Blocks the Uptake of Dopamine

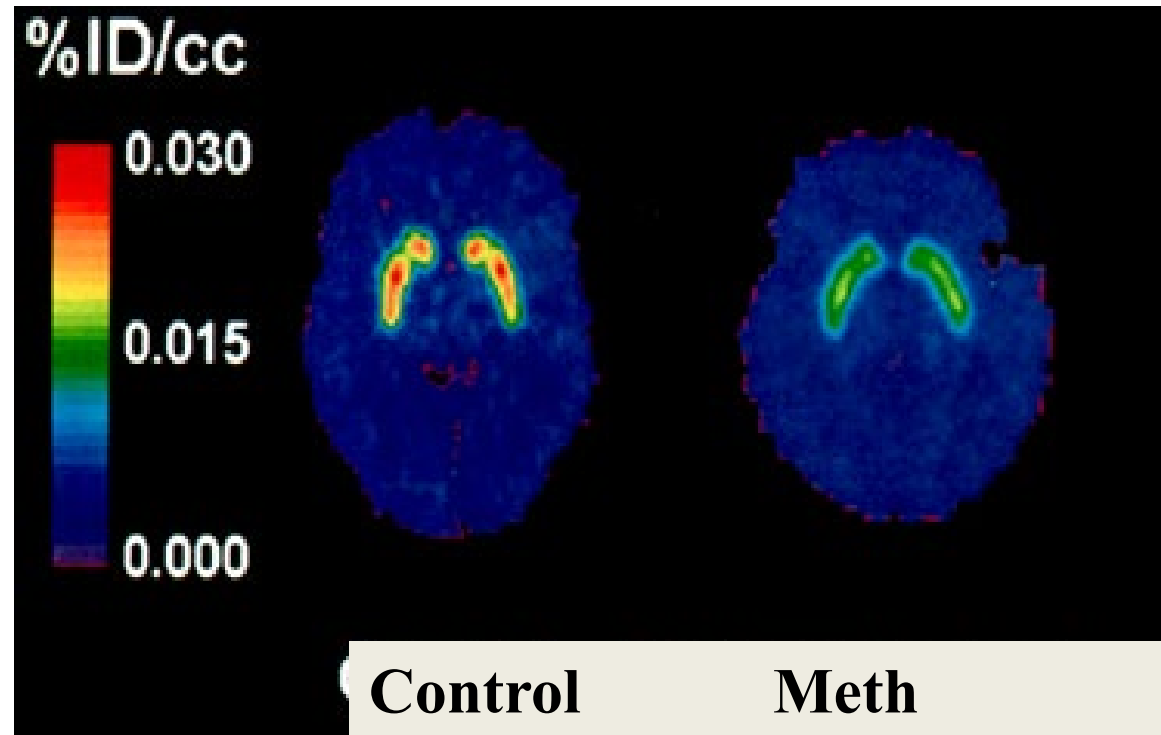




# Methamphetamine releases dopamine into the synapse and enters the presynaptic terminal

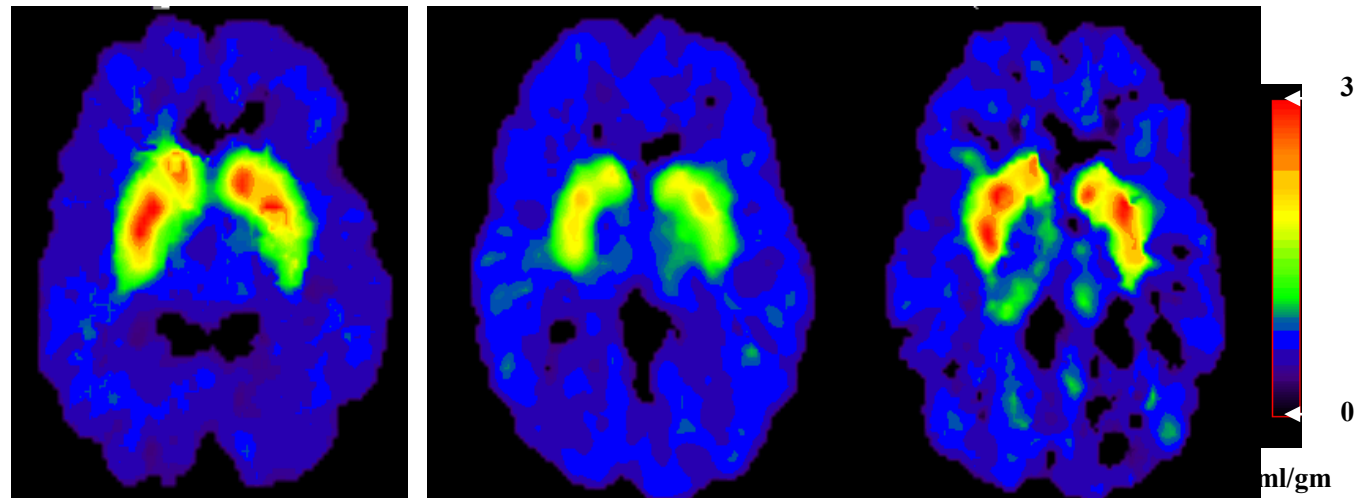


Decreased dopamine transporter binding in METH users resembles that in Parkinson's Disease patients



Source: McCann U.D., et al., *Journal of Neuroscience*, 18, pp. 8417-8422, October 15, 1998.

# Partial Recovery of Brain from Methamphetamine After Abstinence



Source: Volkow, ND et al., *Journal of Neuroscience* 21, 9414-9418, 2001.

Dopamine improvements after 1 year

UCLA

# Medical Issues Related to Methamphetamine Use

Neurobiology, Clinical Presentation, and Treatment of Methamphetamine Use Disorder

Paulus and Stewart, JAMA Psychiatry, 2020

- Neurotoxicity, cognitive effects
- Cardiovascular and cerebrovascular symptoms
- Need for pharmacologic interventions

# Neurotoxicity

- Excessive dopamine results in damaged cell structures
- Cell death
- Activation of dopamine D3 receptors resulting in hyperthermia
- Disruption of the blood-brain barrier
- Overall the altered brain state is consistent with degenerative central nervous system diseases.

# Cognition

- Soon after cessation of methamphetamine use:
  - Poor performance on motor and processing tasks
  - Poor performance on verbal fluency and attention
- Even after prolonged abstinence:
  - Poor learning efficiency and comprehension
  - Poor visual-spatial processing
  - Slow processing and psychomotor speed



# Cognition

- It is estimated the more than 2/3 of those with methamphetamine use disorder show cognitive impairment.
- Impairment is associated with older age, longer duration of use, and greater frequency of use.
- May limit ability to follow through with treatment, comprehend advice and direction in treatment, and generally achieve good treatment outcomes.

# Cognitive Deficits in Methamphetamine Addiction

Fitzpatrick et al., 2020

- Compared 108 methamphetamine treatment seekers and 50 matched controls.
- Methamphetamine use was associated with impulsive decision making and disinhibition.
- Greater disinhibition associated with longer durations of methamphetamine use.
- These findings are consistent with prior findings.
- Authors suggest that treatments should “focus initially on behaviour and contingency management strategies...so as to build their capacity in inhibiting drug-related impulsive behaviours.”

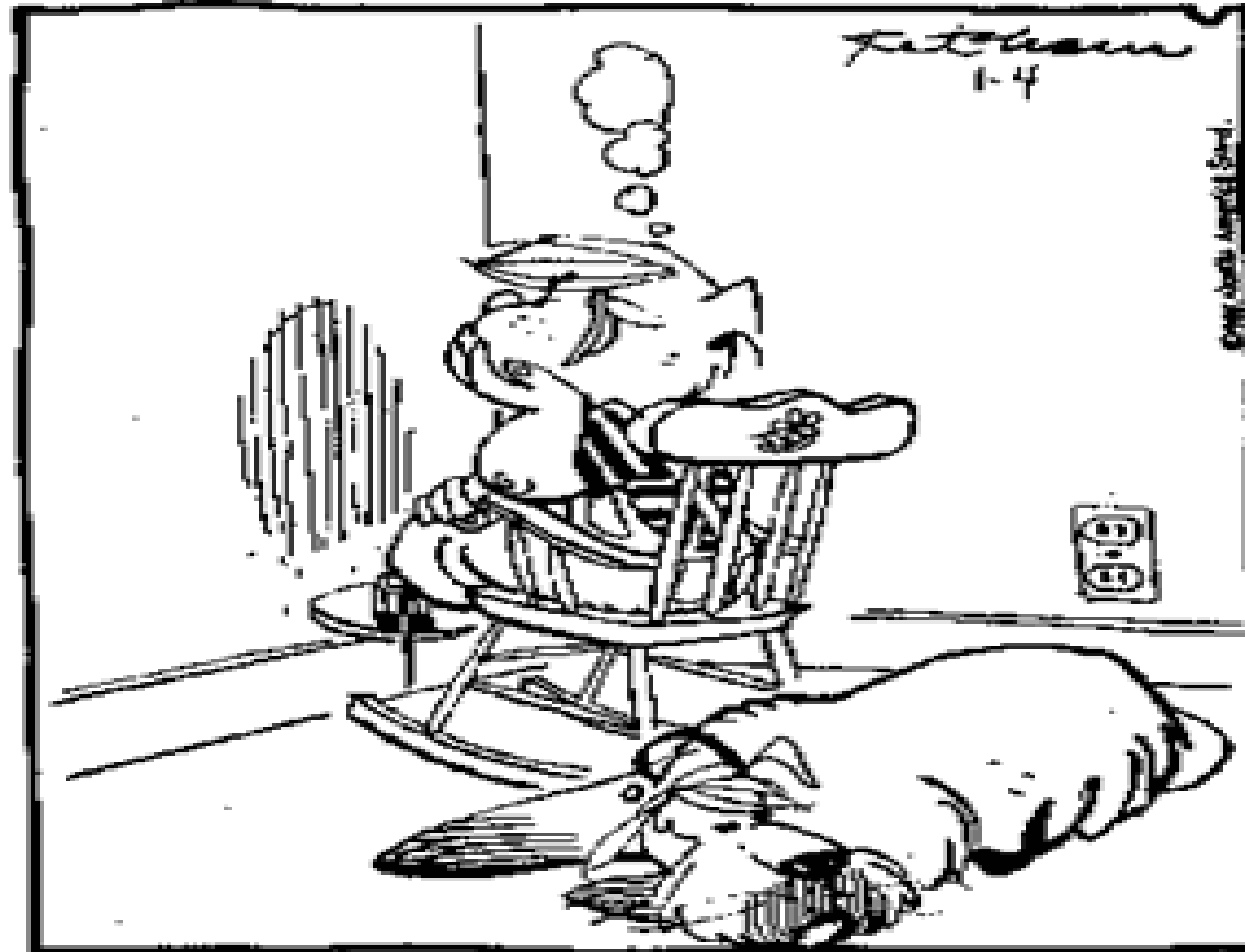
# Methamphetamine and Violence

Foulds et al., 2020

- Review of 28 studies.
- 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.

# Disinhibition

## DENNIS THE MENACE



**"BY THE TIME I THINK ABOUT WHAT I'M  
GONNA DO... I ALREADY DID IT!"**

# Cerebrovascular and Cardiovascular Disease

- Leading causes of death with methamphetamine use disorder
- Strokes are increasing most often with young men
- Strokes are primarily hemorrhagic
  
- Associated with methamphetamine use:
  - Pulmonary hypertension
  - Cardiac arrhythmia
  - Cardiomyopathy

# Stroke and Methamphetamine use in Young Adults: a Review

Lappin et al., 2017

- 77 articles reviewed reporting stroke in young adult (<45) methamphetamine users.
- 81 hemorrhagic, 17 ischemic strokes reported.
- Hemorrhagic associated with oral or injection route of administration.
- Ischemic associated with inhalation.
- Following hemorrhagic stroke, 1/3 died.
- Following ischemic stroke, 1/5 died.



# Stroke and Methamphetamine use in Young Adults: a Review

Lappin et al., 2017

- Treatment providers should be aware of the heightened risk of stroke in young methamphetamine users.
- Be aware of early signs and symptoms:
  - Numbness
  - Headache
  - Speech and language difficulty
  - Vision problems
  - Dizziness

Smid, M., Metz and Gorden (2019) Stimulant Use in  
Pregnancy – an under-recognized epidemic among  
pregnant women Clin Obstet Gynecol . 2019 March ;  
62(1): 168–184

# Stimulant Use in Pregnancy

Smid et al., 2019

- Women are disproportionately vulnerable to stimulant use and abuse.
- Vulnerability is related to hormones and reinforcement of gender constructs.
- Women progress faster from first exposure to addiction.
- Prenatal stimulant use is more common than opioid use.

# Stimulant Use in Pregnancy

Smid et al., 2019

- Meta-analysis of 31 studies found cocaine use during pregnancy increased risk of pre-term delivery, low birth weight, small for gestational age, earlier gestational age at delivery, and reduced birth weight (Gouin, 2011).
- Meta-analysis of 8 studies found methamphetamine use during pregnancy was associated with earlier gestational age at delivery, lower birth weight, and smaller head circumference (Kalaitzopoulos, 2018).
- Infants with prenatal exposure to methamphetamine exhibit jitteriness, drowsiness, and respiratory distress suggesting withdrawal.
- Cocaine and methamphetamine are excreted in breastmilk and contraindicate breastfeeding.

# Stimulant Use in Pregnancy

Smid et al., 2019

- Long-term follow-up of 204 methamphetamine exposed maternal-child pairs and 208 unexposed (Derauf et al., 2007).
- At one month 33% methamphetamine-exposed mothers did not have custody compared to 2% of unexposed.
- At age 3 years heavy prenatal methamphetamine use ( $\geq 3$  days per week) was associated with anxiety/depression and attention problems.
- At age 7.5 years methamphetamine exposed children had poorer cognitive function.

# Symptoms Preceding Death from Toxic Methamphetamine Effects

- Collapse
- Breathing difficulty
- Hyperthermia
  
- Methamphetamine users presenting with acute intoxication may be at risk for fatality with symptoms:
  - Labored breathing,
  - Angina, palpitations
  - Cough
  - Coughing up blood
- Should be closely monitored

# “Double-Jeopardy: Methamphetamine use and HIV as Risk Factors for COVID-19” Carrico et al., 2020

- Damage to the immune system by HIV plus immune system damage from methamphetamine increases risk for COVID-19
- Methamphetamine use is associated with sexual risk behavior among MSM. Suggests poor adherence to social distancing guidelines
- Men who seek out partners for substance use and sex could cause COVID-19 clusters (has happened in Miami).
- COVID-19 related stress and psychiatric disorders leads to increased substance use and poorer SA treatment outcomes.
- Authors suggest more use of telehealth approaches.



# Collision of the COVID-19 and the Addiction Epidemics

Volkow, 2020

- Chinese Center for Disease Control report fatality rate of 6.3% for people with chronic respiratory diseases compared to 2.3% overall.
- People who smoke, vape, use opioids or have an SUD are vulnerable.
- Opioid use causes hypoxemia.
- Methamphetamine use causes pulmonary damage.
- Social distancing increases risk of overdose with fewer people available to administer naloxone.
- Limited access to support for those in recovery.
- **Isolation, stress, anxiety, and depression can lead to more substance use and more fatal overdoses.**

# Clinical Challenges

# Clinical Challenges with Stimulant Dependent Individuals

- Overdose death
- Limited understanding of stimulant addiction
- Ambivalence about need to stop use
- Impulsivity/Poor judgement
- Cognitive impairment and poor memory
- Anhedonia
- Hypersexuality
- Violence and psychosis
- Powerful Pavlovian trigger-craving response
- Very poor retention in outpatient treatment
- Elevated rates of psychiatric co-morbidity

# Special Treatment Consideration Should Be Made for the Following Groups

- Injection users
- Users who take stimulants daily or in very high doses.
- Women (high rates of physical/sexual abuse)
- Homeless, chronically mentally ill and/or individuals with high levels of psychiatric symptoms at admission.
- Men who have sex with men (MSM)
- Users under the age of 21.
- Individuals in medication treatment for OUD

# **Craving for stimulants is a central and very powerful component of stimulant dependence**

A Key Premise: Classical conditioning and craving

- The brain and addiction
- Craving is automatic and creates a powerful push to use
- For many, the craving seems overpowering and uncontrollable.
- The craving is triggered by external (people, places, things, times of day) and internal (emotional states) stimuli.
- Managing exposure to triggers and responses to triggers is important

# Pavlovian Conditioning



# Conditioning and the Brain: Message to Patients

- Methamphetamine dependence results in powerful conditioned cravings
- Will power, good intentions are not enough
- Behavior needs to change
- Insight will not affect cravings



# Insight is not enough...



*"And then it bit me: I'm salivating over a goddam bell."*

# Clinical Interventions

# Clinical Management of Stimulant Users: *Acute Psychosis*

- Symptoms of acute psychosis: Auditory hallucinations, and visual (flashing lights, peripheral artifacts), olfactory, and tactile sensations. Powerful paranoia and persecutory delusions are extremely common, ideas of reference, stereotypy and compulsive acts, blunt affect, poverty of speech, delirium, and violence.
- Stimulant-induced psychosis is generally transient and may require use of either a benzodiazepine or an antipsychotic, both of which should be discontinued when acute symptoms have resolved.

# Clinical Management of Stimulant Users

## *Intoxication*

- Symptoms include: Euphoria, hyperexcitability, hypersexuality, increased locomotor activity, agitation, and psychotic symptoms, including paranoia and hallucinations. Objective findings of hypertension, tachycardia, and arrhythmias that present on EKGs of users reflect sympathetic overdrive.
- Acute agitation from MA intoxication is most often the condition that leads users to seek medical attention, and “talking down” the patient in a calm environment is the first course of action. Benzodiazepines may be effective in acute management of agitation and distress and may reduce seizure potential in patients

# Clinical Management of Stimulant Users: *Withdrawal*

- Stimulant withdrawal symptoms consist of severe fatigue, cognitive impairment, feelings of depression and anxiety, anergia, confusion, and paranoia. For the majority of patients experiencing acute withdrawal/early-phase abstinence, most symptoms resolve within 2 to 10 days.
- Rest, exercise, and a healthy diet may be the best management approach for most people in withdrawal. Those with heightened agitation and sleep disturbance may respond to benzodiazepines, but acute depression and anhedonia associated with early abstinence generally resolve without intervention

# Harm Reduction Strategies for Stimulant Users

- Information about medical and psychiatric effects of meth
- Overdose Education (fentanyl)
- Syringe Exchanges
- Naloxone (for opioid overdose)
- Quiet rooms and washup/shower rooms
- Condoms/safe sex education
- Topical antibiotic creams and ointments for injection sites
- Water (dehydration)
- Tooth paste/tooth brush

# Naloxone for MA Users?

- With increasing rates of fentanyl mixed into samples of methamphetamine (and cocaine), these stimulant users are at much higher risk for overdose death due to their lack of tolerance for opioids.
- Stimulant users should be educated about the dangers of fentanyl and offered naloxone (Narcan) in case of opioid overdose.
- Note, fentanyl has greater affinity for the opioid receptor than naloxone= more difficult to reverse overdose.










# Treatment for Individuals with Stimulant Dependence

# Systematic Reviews and Meta-analyses

RESEARCH ARTICLE

# Comparative efficacy and acceptability of psychosocial interventions for individuals with cocaine and amphetamine addiction: A systematic review and network meta-analysis

Franco De Crescenzo <sup>1,2,3</sup>, Marco Ciabattini <sup>4</sup>, Gian Loreto D'Alò <sup>4</sup>, Riccardo De Giorgi <sup>1,2</sup>, Cinzia Del Giovane<sup>5</sup>, Carolina Cassar<sup>6</sup>, Luigi Janiri<sup>3</sup>, Nicolas Clark <sup>7</sup>, Michael Joshua Ostacher <sup>8,9</sup>, Andrea Cipriani <sup>1,2\*</sup>

**1** Department of Psychiatry, University of Oxford, Oxford, United Kingdom, **2** Oxford Health NHS Foundation Trust, Warneford Hospital, Oxford, United Kingdom, **3** Institute of Psychiatry and Clinical Psychology, Catholic University of the Sacred Heart, Rome, Italy, **4** School of Hygiene and Preventive Medicine, University of Rome Tor Vergata, Rome, Italy, **5** Institute of Primary Health Care (BIHAM), University of Bern, Bern, Switzerland, **6** Department of Dynamic and Clinical Psychology, Sapienza University of Rome, Rome, Italy, **7** Mental Health and Substance Abuse, World Health Organization, Geneva, Switzerland, **8** Department of Psychiatry and Behavioral Sciences, Stanford University School of Medicine, Stanford, California, United States of America, **9** Department of Psychiatry, VA Palo Alto Health Care System, Palo Alto, California, United States of America



# Meta-Analysis Findings

Network meta-analysis was used to analyze 50 clinical studies (6,943 participants) on 12 different psychosocial interventions for cocaine and/or amphetamine addiction.

**The combination of contingency management and community reinforcement approach, was the most efficacious and most acceptable treatment both in the short and long term.**

# Psychosocial Interventions for Cocaine and Psychostimulant Amphetamines Related Disorders.

*Werner Paulo Knapp, Bernardo Soares, Michael Farrell, Maurício Silva deLima. (2009)*

## ***The Cochrane Collaboration.***

Twenty-seven randomized controlled studies (3663 participants) fulfilled inclusion criteria and had data that could be used for at least one of the main comparisons.

- **The comparisons between different type of behavioral interventions showed results in favor of treatments with some form of contingency management in respect to both reducing dropouts and lowering cocaine use.**

# Responding to global stimulant use: Challenges and opportunities

Lancet (Farrell et al, 2019)

Psychosocial interventions other than contingency management have weak and non-specific effects on stimulant problems and there are no effective pharmacotherapies. Substantial research investment is needed to develop more effective, innovative, and impactful prevention and treatment.

# Non-pharmacological interventions for methamphetamine use disorder: a systematic review Drug and Alcohol Dependence, AshaRani, PV, et al. 2020

- 44 Studies reviewed.
- Conclusions: While Contingency Management (CM) interventions showed the strongest evidence favouring the outcomes assessed, tailored CBT alone or with CM was also effective in the target population.



# Current status of Treatment Approaches for Methamphetamine Use Disorder

- Contingency management unanimously (5 systematic reviews and meta-analyses) found to have best evidence of effectiveness.
- Other approaches with lesser but clear evidence of support: Cognitive Behavioral Therapy (CBT) and Community Reinforcement Approach (CRA)
- Approach with evidence for treatment of a broad variety of SUD: Motivational Interviewing (MI).
- Approach with recent studies showing benefit to methamphetamine users: Physical Exercise (PE). (eg. Rawson et al, 2015)

# Implementation

*The American Journal on Addictions*, 23: 205–210, 2014  
Copyright © American Academy of Addiction Psychiatry  
ISSN: 1055-0496 print / 1521-0391 online  
DOI: 10.1111/j.1521-0391.2014.12092.x

## **Nationwide Dissemination of Contingency Management: The Veterans Administration Initiative**

**Nancy M. Petry, PhD,<sup>1</sup> Dominick DePhilippis, PhD,<sup>2</sup> Carla J. Rash, PhD,<sup>1</sup>  
Michelle Drapkin, PhD,<sup>2</sup> James R. McKay, PhD<sup>2</sup>**

<sup>1</sup>University of Connecticut School of Medicine, Farmington, Connecticut

<sup>2</sup>Dept of Veterans Affairs and University of Pennsylvania, Philadelphia, Pennsylvania

# Treatments for Stimulant Use Disorders (SUDs) with Empirical Support

- Contingency Management/Incentives (CM/I)
- Community Reinforcement Approach (CRA)
- Cognitive-Behavioral Therapy (CBT)
- Other approaches with supportive evidence
  - Physical Exercise
  - Motivational Interviewing

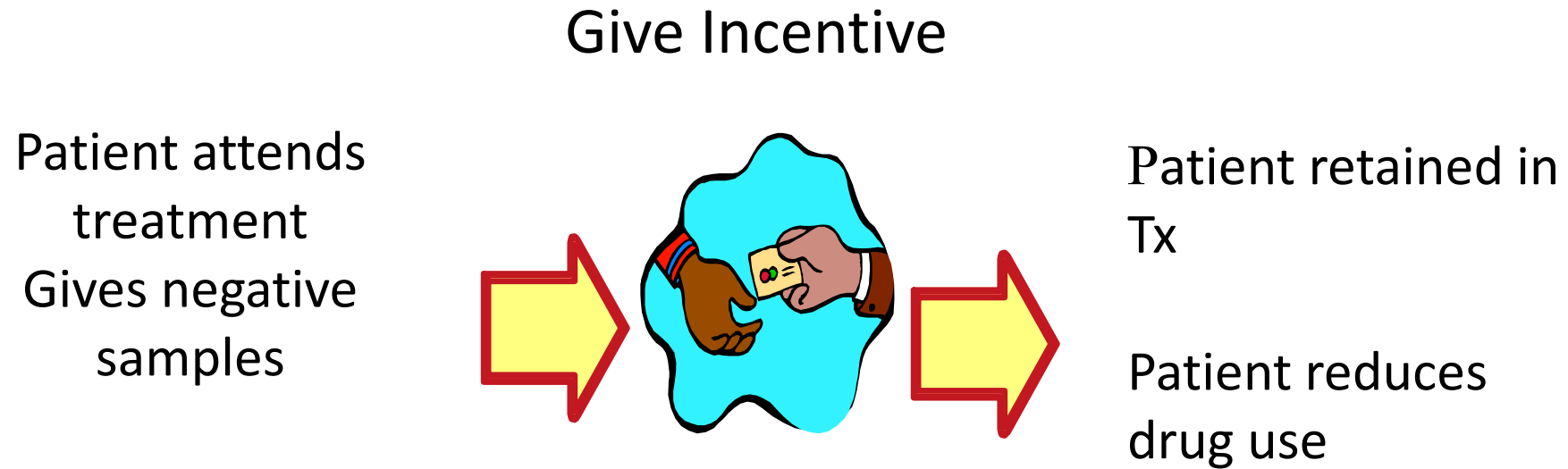
# Contingency Management

(Also known as Motivational Incentives)

# Contingency Management

A technique employing the systematic delivery of positive reinforcement for desired behaviors. In the treatment of methamphetamine dependence, vouchers or prizes can be “earned” for submission of methamphetamine-free urine samples.

# How Incentives Work



# Basic Behavioral Principles

1. Frequently monitor target behavior
2. Provide incentive when target behavior occurs
3. Withhold incentive when target behavior does not occur

# Cognitive Behavioral Therapy and Contingency Management for Stimulant Dependence.

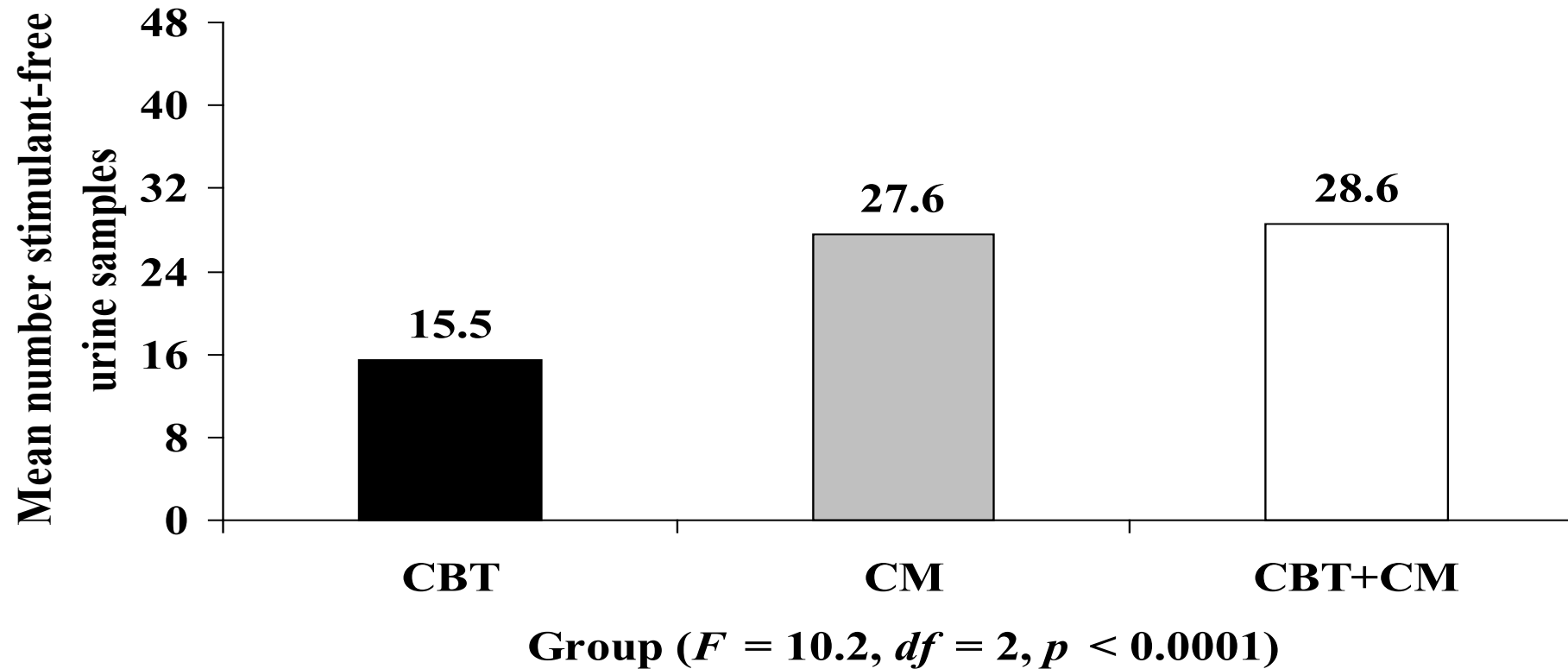
*Rawson, R., McCann, M., et al., Addiction, 2004,101, 267-274.*

- **DESIGN:** Randomized clinical trial
- **PARTICIPANTS:** Stimulant-dependent individuals ( $n = 171$ )
- **INTERVENTION:** CM, CBT, or combined CM and CBT, 16-week treatment conditions. CM condition participants received vouchers for stimulant-free urine samples. CBT condition participants attended three 90-minute group sessions each week.
- **RESULTS:** CM produced evidence of efficacy during treatment. The response of cocaine and methamphetamine users was comparable.
- **CONCLUSIONS:** This study suggests that **CM is an efficacious treatment for reducing stimulant use** and is superior during treatment to a CBT approach. CM is useful in engaging substance abusers, retaining them in treatment, and helping them achieve abstinence from stimulant use.



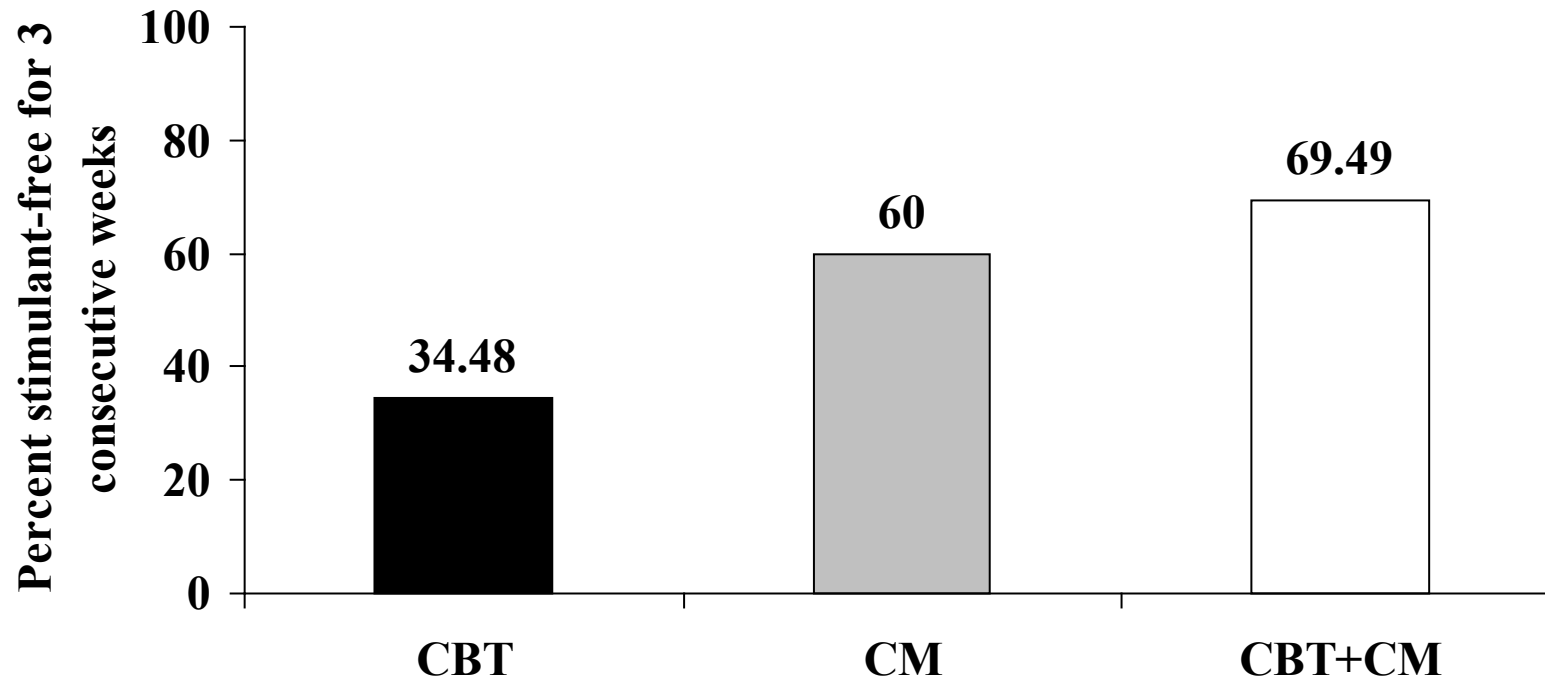
# Stimulant-free UAs

Rawson et al 2004



# % Who Achieve 3 Consecutive Weeks of Stimulant-free UAs

Rawson et al 2004

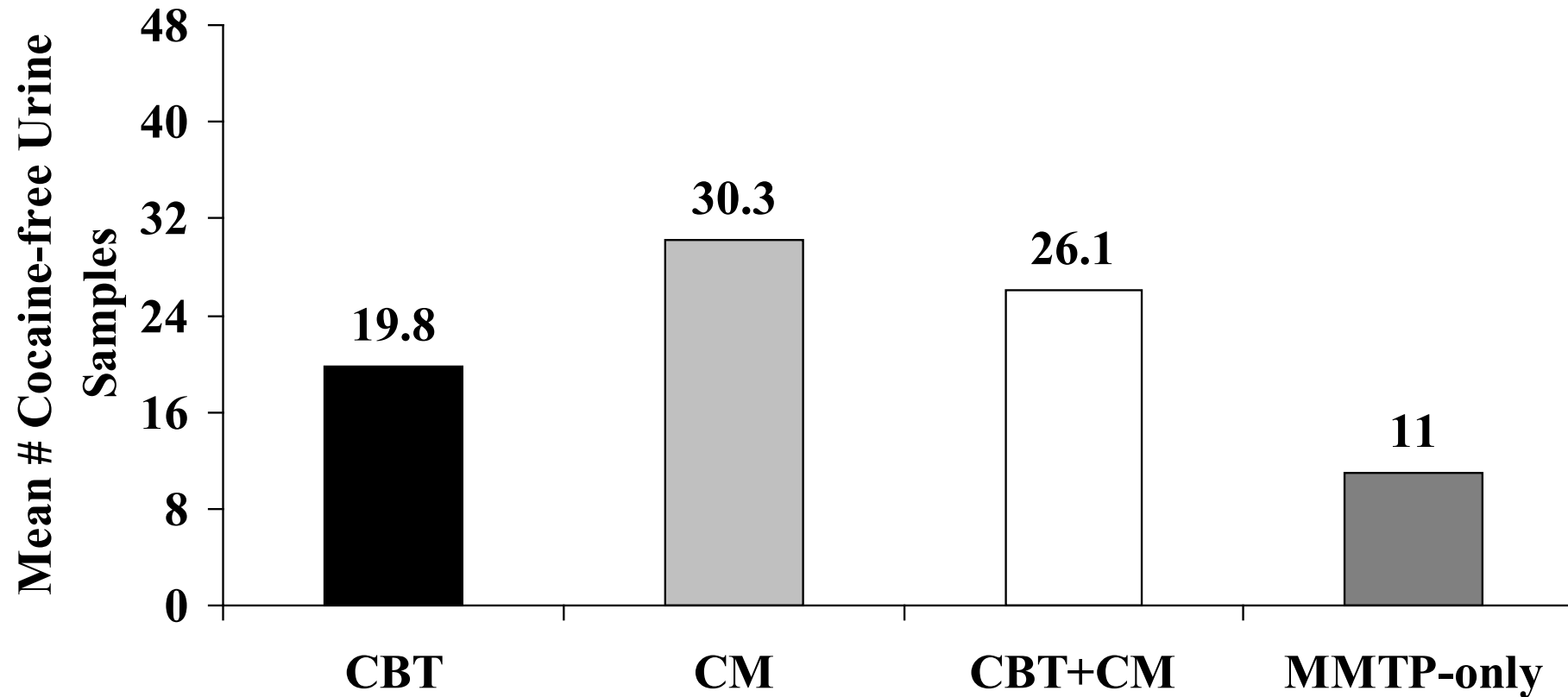


Group ( $X^2 = 15.46$ ,  $df = 2$ ,  $p = 0.0004$ )

# A Comparison of Contingency Management and Cognitive-Behavioral Approaches During Methadone Maintenance Treatment for Cocaine Dependence. *R. Rawson, et al. Archives of General Psychiatry 2002;59:817-824*

- **DESIGN:** Randomized clinical trial.
- **PARTICIPANTS:** Patients with cocaine dependence receiving methadone maintenance treatment (n=120).
- **INTERVENTIONS:** CM, CBT, combined CM and CBT or methadone treatment as usual. 16 weeks, 3 clinic visits per week.
- **RESULTS:** Participants assigned to the 2 groups featuring CM had significantly superior in treatment urinalysis results, urinalysis results from participants in the CBT group were not significantly different than those from the MMTP-only group.
- **CONCLUSIONS:** Study findings during treatment provide solid evidence of efficacy for CM (with and without CBT). There was no evidence of a combined effect.

# Stimulant-Free UAs Rawson et al, 2002



Group ( $F = 6.8, df = 3, P < 0.0001$ )

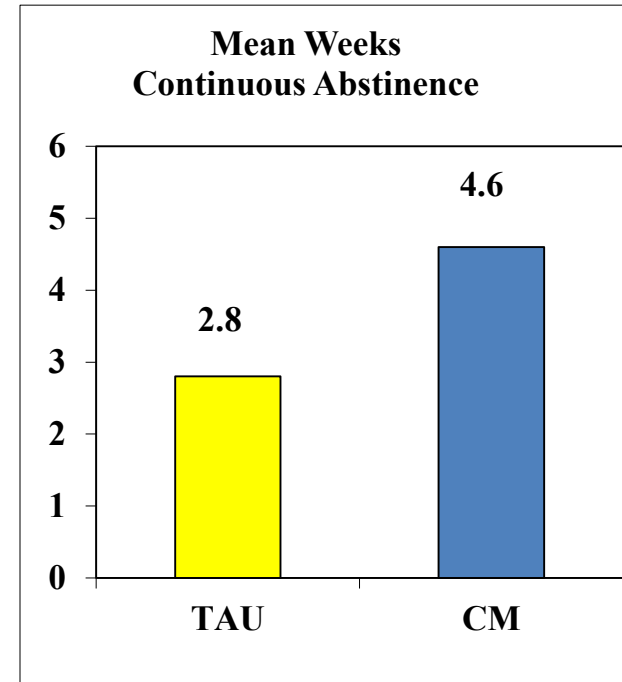
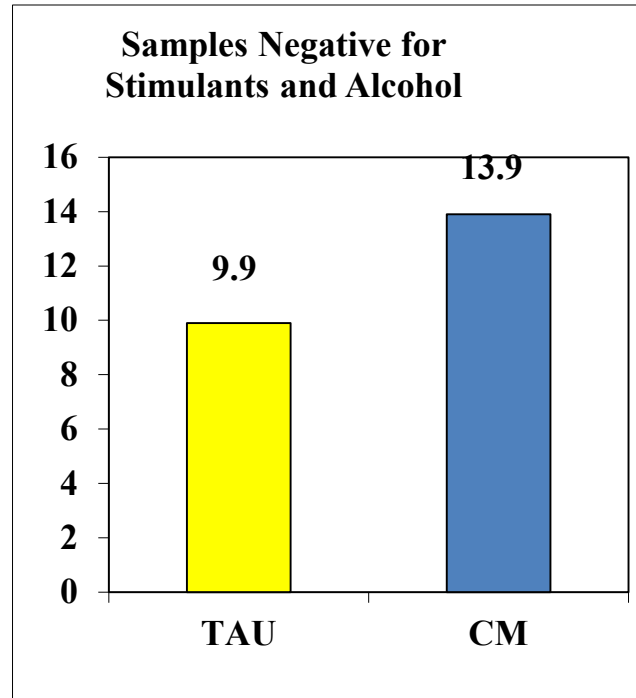
# Contingency Management for the Treatment of Methamphetamine Dependence.

*Roll, John, et al. American Journal of Psychiatry. 163: 1993-1999, 2006.*

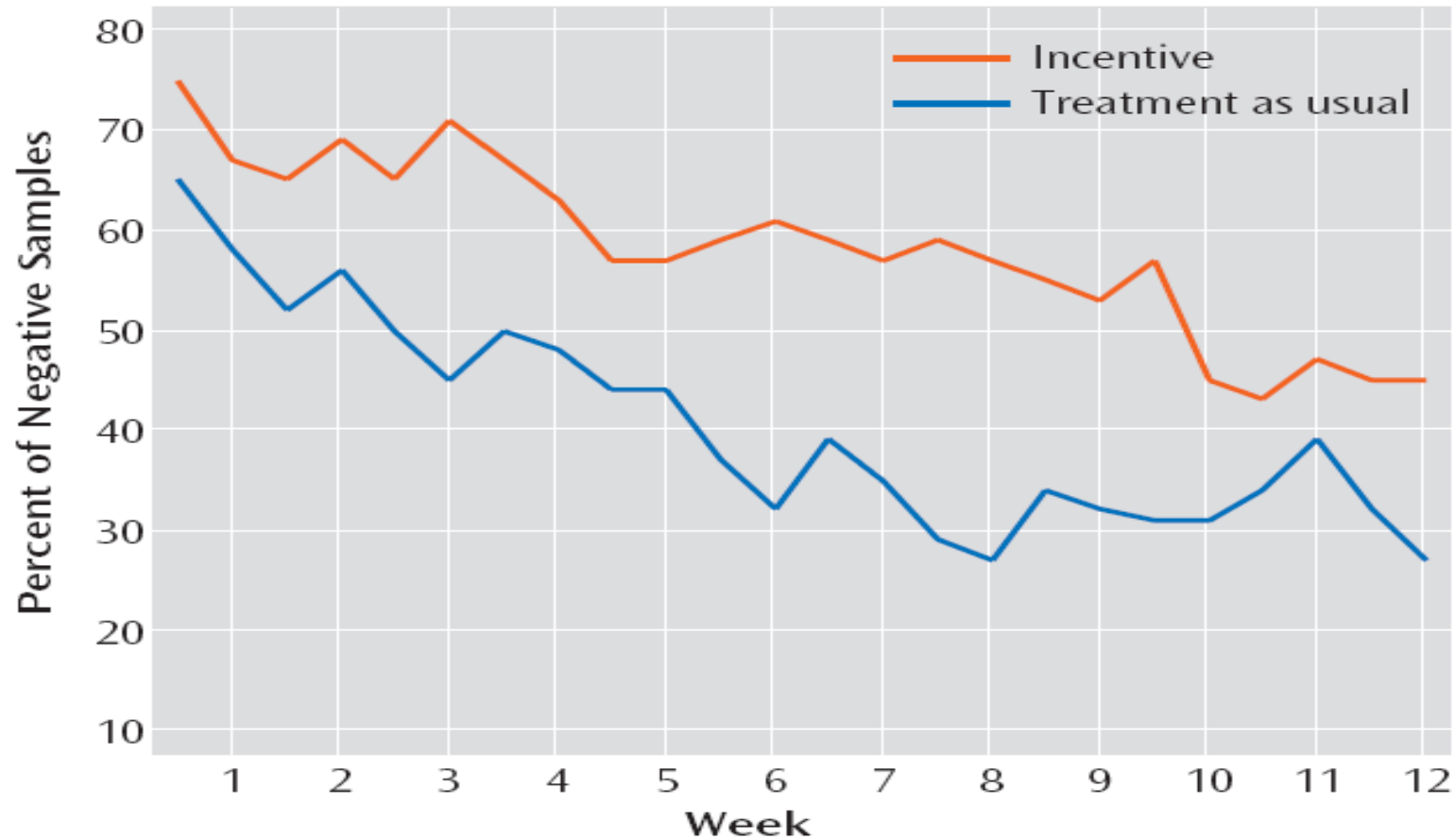
- **METHOD:** The authors report data on 113 participants who were diagnosed with methamphetamine abuse or dependence. They were randomly assigned to receive 12 weeks of either treatment as usual (Matrix) or treatment as usual plus contingency management.. The reinforcers for drug-negative samples were plastic chips, some of which could be exchanged for prizes.
- **RESULTS:** The participants in both groups remained in treatment for equivalent times, but those receiving contingency management in addition to usual treatment submitted significantly more negative samples, and they were abstinent for a longer period of time (5 versus 3 weeks).

# CM with Methamphetamine Users

Roll et al, 2006



# Retention Rate: Roll et al 2006



# CM in Practice: Challenges

- Must be simple
  - Easy to track target behaviors
  - Little burden on the counselor or administrative staff (can't reward patients and punish staff)



# CM in Practice: More Challenges

- Addressing staff resistance
  - Patients should not have to be “paid” or “bribed”; recovery is the reward
  - Motivation needs to come from within
- Reframe CM as an engagement and retention technique along with traditional interventions and approaches
- Treatment = information, *persuasion*, and medication

# **Do Methamphetamine Users Respond Differently to Treatment than Cocaine Users?**

# Comparison of Meth and Cocaine Users

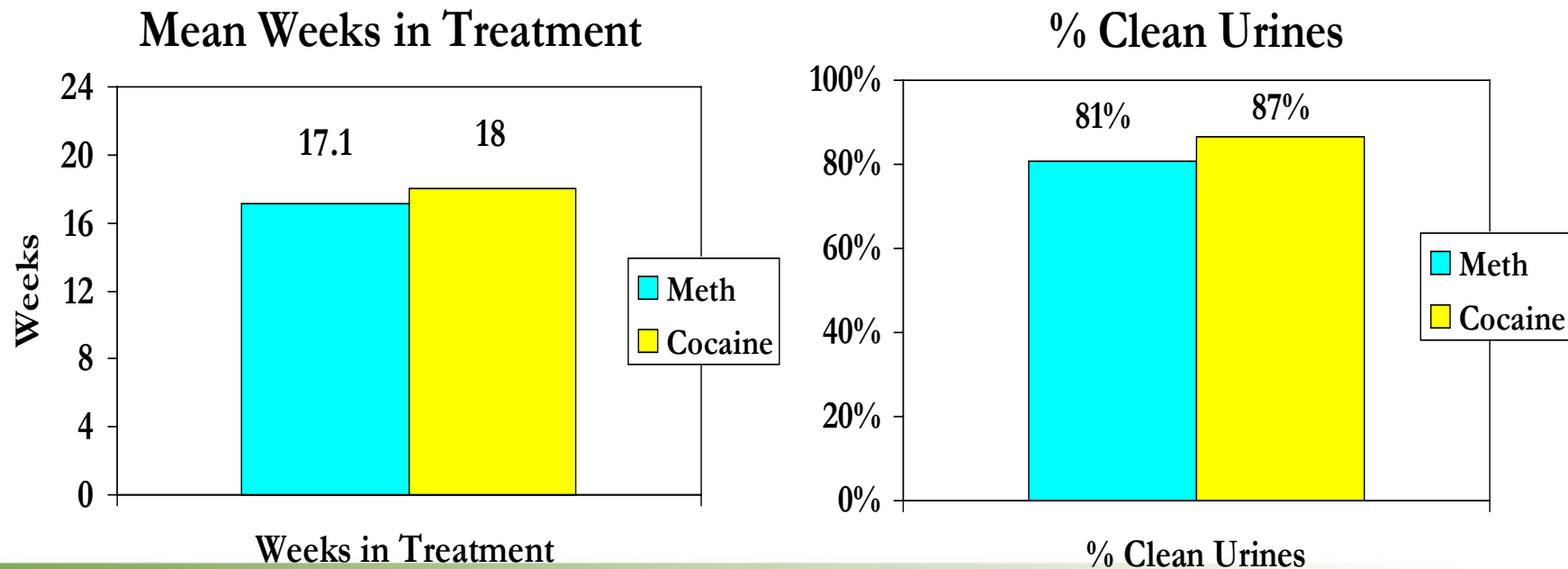
Rawson et al., 2000, Journal of Psychoactive Drugs

- 500 methamphetamine users
- 224 cocaine users
- Matrix San Bernardino County
- Identical program and staff

# Comparison of Meth and Cocaine Users

Rawson et al., 2000, Journal of Psychoactive Drugs

- **Identical treatment outcomes**



# Contingency Management Apps

- **reSET** is a 90-day Prescription Digital Therapeutic (PDT) for Substance Use Disorder (SUD) intended to provide cognitive behavioral therapy (CBT), as an adjunct to a contingency management system, for patients 18 years of age and older who are currently enrolled in outpatient treatment. FDA approved. <https://peartherapeutics.com/products/reset-reset-o/>
- **DynamiCare** Health is a platform for families and individuals that reinforces a person's recovery from addiction and rewards healthy behavior. DynamiCare's easy-to-use technology includes random breath and saliva tests submitted through the app, verified treatment attendance check-ins, a supportive Recovery Coach, rewards for healthy progress, and a dashboard for supporters.
- [www.dynamicarehealth.com](http://www.dynamicarehealth.com).

# Contingency Management Apps

**DynamiCare Health** is a platform for families and individuals that reinforces a person's recovery from addiction and rewards healthy behavior.

- Random breath and saliva tests verified by selfie video.
- GPS verified treatment attendance.
- A supportive Recovery Coach.
- Monetary rewards on a smart debit card for treatment achievements.
- [www.dynamicarehealth.com](http://www.dynamicarehealth.com).

# Community Reinforcement Approach (CRA)

# Community Reinforcement Approach

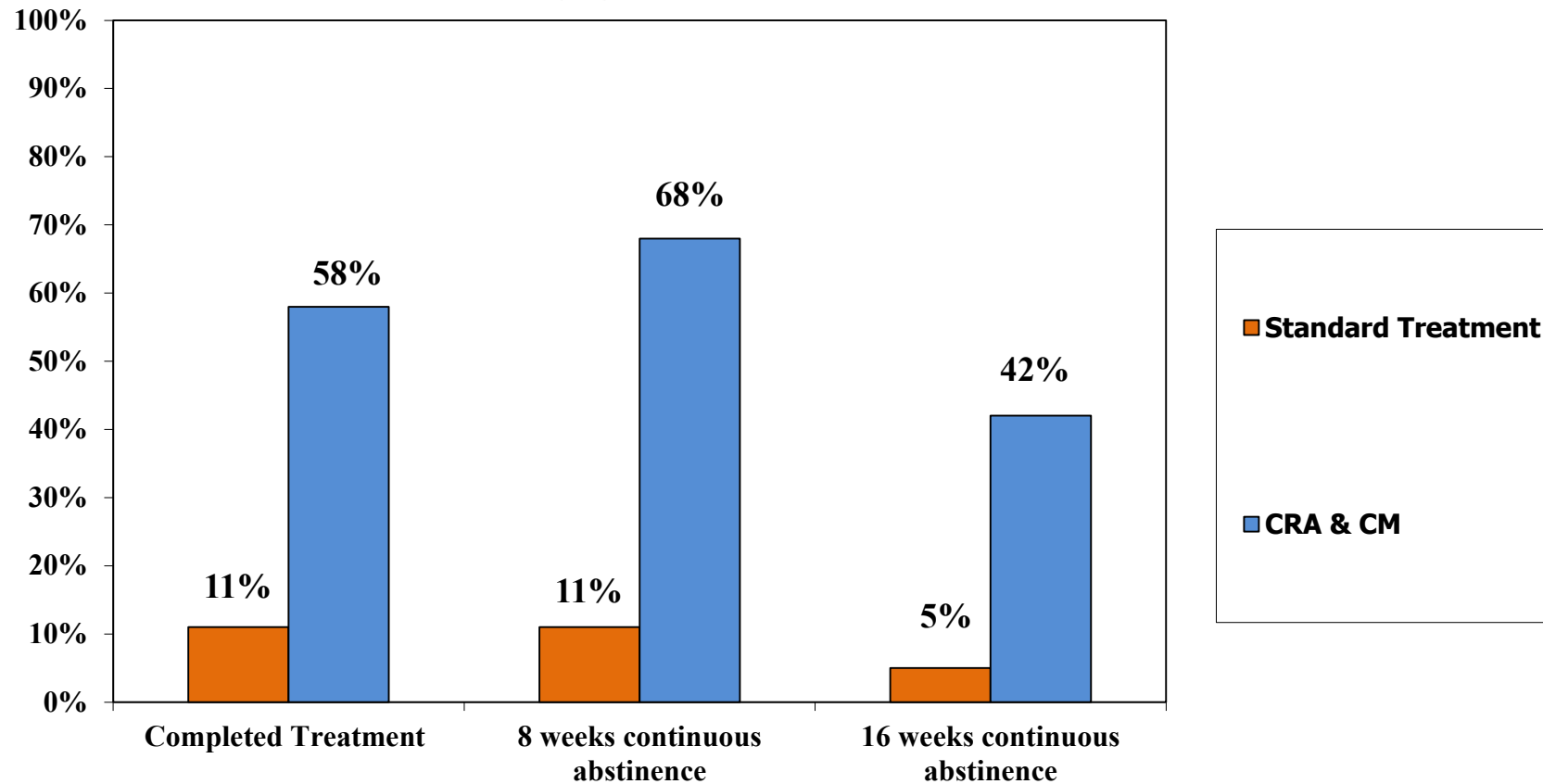
- Community Reinforcement Approach (CRA) is a combination of behavioral strategies that address the role of environmental contingencies in encouraging or discouraging drug use, and attempts to rearrange these contingencies so that a non-drug using lifestyle is more rewarding than a using one.



# Components of CRA

- CRA Components include:
  - behavioral skills training
  - social and recreational counseling
  - marital therapy
  - motivational enhancement
  - job counseling
  - relapse prevention
- For application to the treatment of cocaine dependence, a voucher based reinforcement program is added.

# CRA and Contingency Management: Higgins et al., 1993



National Institute on Drug Abuse

# THE THERAPY MANUALS FOR DRUG ADDICTION

*Manual 2*

## A Community Reinforcement Plus Vouchers Approach: Treating Cocaine Addiction

U.S. Department of Health and Human Services  
National Institutes of Health

# Cognitive Behavioral Therapy (CBT)

# **Cognitive Behavioral Therapy (CBT)**

# Cognitive Behavioral Therapy (CBT)

- CBT is a form of “talk therapy” that is used to teach, encourage, and support individuals about how to reduce / stop their harmful drug use.
- CBT provides skills that are valuable in assisting people in gaining initial abstinence from drugs (or in reducing their drug use).
- CBT also provides skills to help people sustain abstinence (relapse prevention)

# CBT

## Key Concepts

- Encourage and reinforce behavior change
- Recognize and avoid high risk settings
- Use behavioral planning (scheduling)
- Develop positive coping skills
- Understand and dealing with craving
- Prevent the abstinence violation effect

# CBT

- Present focused and on behavior, not feelings
- Early recovery is like walking in a minefield
- **Look where you are stepping, not how you got there.**
- Treatment focus: defining the areas of risk and strategizing
- Tight structure (detailed schedule) and tethering to treatment (frequent appointments and contacts with calls and texts)



# Behavioral CBT Concepts

In the early stages of CBT treatment, strategies emphasize behavior change, and include:

- Setting a schedule to promote engagement in behaviors that are inconsistent with substance use
- Recognizing and avoiding “high risk” situations
- Facilitating positive coping skills

# The 5 Ws

- The time periods when the client uses drugs
- The places where the client uses and buys drugs
- The external cues and internal emotional states that can trigger drug craving (why)
- The people with whom the client uses drugs or the people from whom she or he buys drugs
- The effects the client receives from the drugs – the psychological and physical benefits (what happened)

# Coping With Cravings

## Coping with Craving:

Engage in non-drug-related activity

Mindfulness meditation

Yoga or Tai Chi

Talk about craving

“Surf” the craving

Thought stopping

Self-talk

Contact a drug-free friend or counsellor

Meditate or Pray

# Research on CBT for StUD

- Carroll, K. M., Rounsaville, B. J., Gordon, L. T., Nich, C., Jatlow, P. M., Bisighini, R. M., et al. (1994). Psychotherapy and pharmacotherapy for ambulatory cocaine abusers. *Archives of General Psychiatry*, 51, 177-197.
- Carroll, K. M., Rounsaville, B. J., Nich, C., Gordon, L. T., Wirtz, P. W., & Gawin, F. H. (1994). One year follow-up of psychotherapy and pharmacotherapy for cocaine dependence: Delayed emergence of psychotherapy effects. *Archives of General Psychiatry*, 51, 989-997.
- Carroll, K.M., Ball, S.A., Martino, S., Nich, C., Babuscio, T. A. & Rounsaville, B.J. (2009). Enduring effects of a computer-assisted training program for cognitive behavioral therapy: A six-month follow-up of CBT4CBT. *Drug and Alcohol Dependence*, 100, 178-181. PMID: PMC2742309
- **CBT for CBT Website: <http://www.cbt4cbt.com/>**

# Motivational interviewing (MI) and methamphetamine users

- **Role of MI**
  - Establish treatment site as a supportive, nonjudgmental environment
  - Promote a positive collaborative relationship between counselor and patient
  - Promote engagement in treatment
  - Reduce resistance to making change
  - Assisting patient who is experiencing paranoia and psychotic symptoms
  - Helping patient recognize negative consequences associated with meth use

# MI Skills needed to be effective with meth users

- **Important micro-skills of MI in working with meth users**
  - **Reflective Listening,**
  - **Affirmations,**
  - **Open-ended questions and**
  - **Summarizing.**
  - **Change talk**
  - **Sustaining talk**
  - **Avoid confrontation**

# **Exercise as a Treatment Intervention for Methamphetamine Dependence**

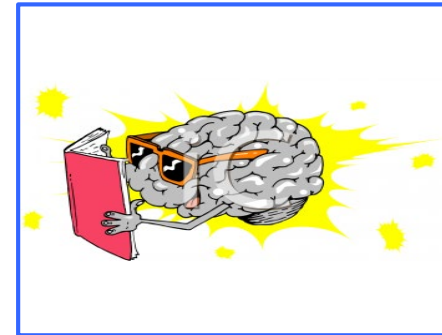
# Impact of Exercise on Methamphetamine Use Outcomes post Residential Care N=135

**Exercise Group:**  
1h, 3 days/wk



N=69

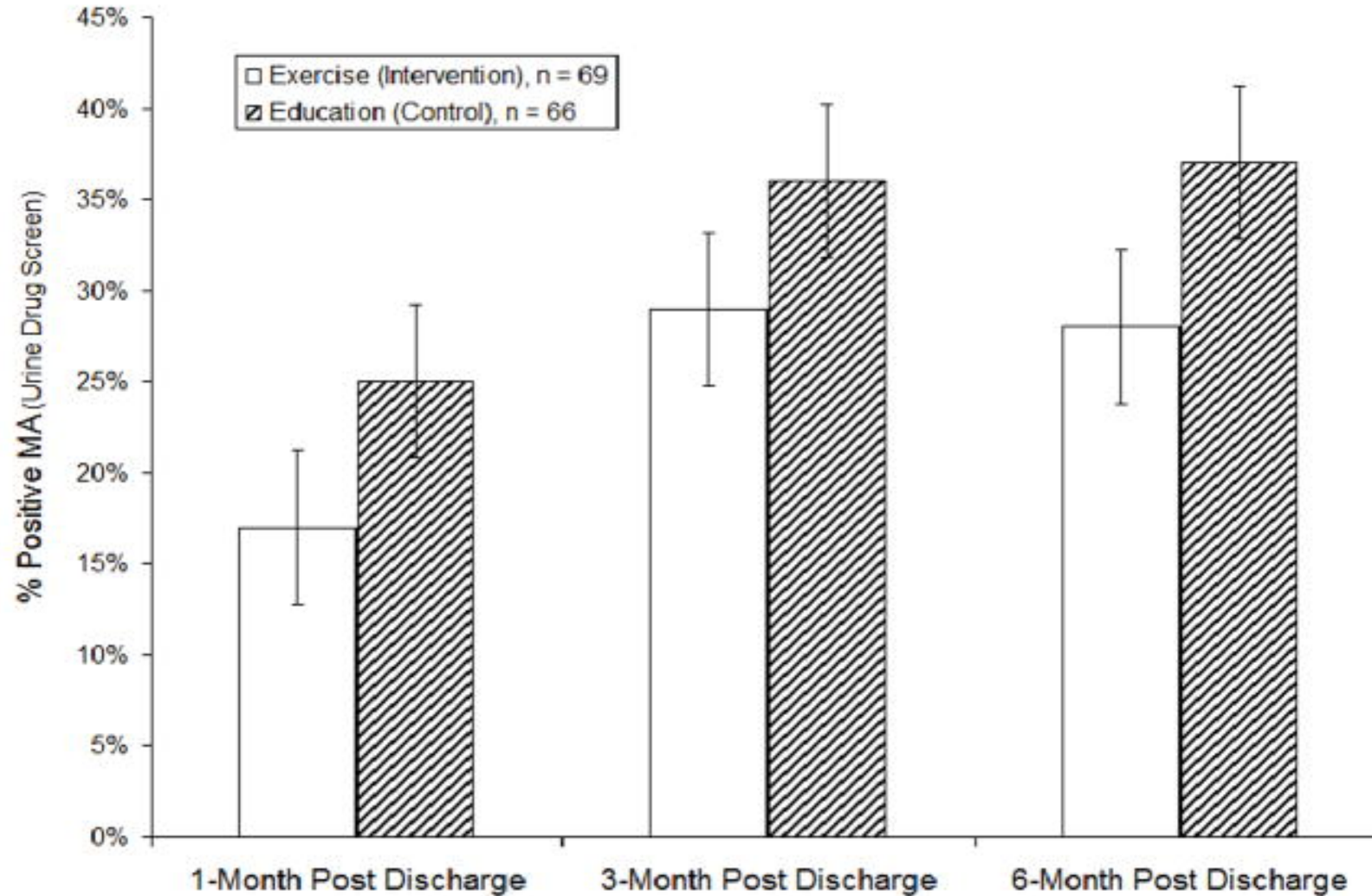
**Health Education Group:**  
1h, 3 days/wk



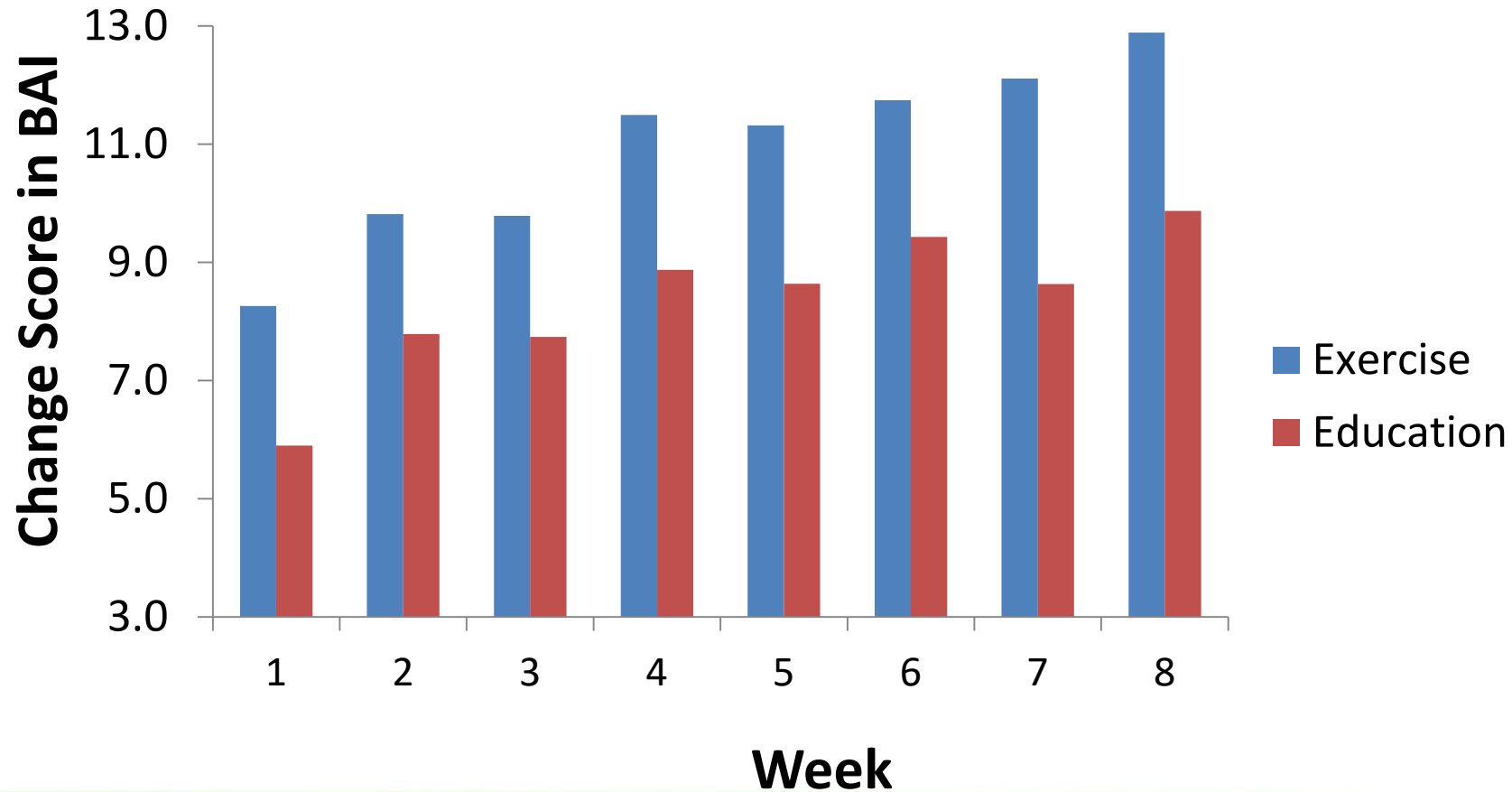
N=66



# Methamphetamine Use at Follow-up



# Change Scores in Anxiety (BAI)



# Medications

# Medications for Methamphetamine Use Disorder

- Medications with positive studies and under consideration

bupropion

mirtazapine \*\*\*\*\*

naltrexone

methylphenidate

d-amphetamine

topiramate

# Medication

- Many clinical trials
- No medication has been FDA-approved for stimulants
- Most promising are bupropion (Wellbutryn) and mirtazapine (Remeron)
- Challenges of medication compliance and recruiting participants

TRUST: Treatment of Uusers of Stimulants:  
TRUST

An Integrated Behavioral Model

# TRUST: The Components

TRUST is an integrated, evidence-based, multi-component program for the treatment of individuals with stimulant use disorders. The contents of this program will include strategies including:

1. motivational incentives (based on contingency management research),
2. elements of cognitive behavioral therapy
3. elements of community reinforcement approach,
4. motivational interviewing skills,
5. physical exercise
6. Self-help (12-Step; Moderation management) program participation encouraged.

In addition, an appendix will include a set of other EBPs to augment the core program at the discretion of each organization.

# TRUST: The Priorities

- 1. Establish a positive, compassionate, respectful, non-judgemental relationship with individuals who use stimulants to promote their engagement and retention in treatment. Individuals in treatment die from overdose and other causes at lower rates than those who are not in treatment
- 2. Provide incentives to promote participation (retention) in treatment. Retention is the single most important measure of treatment benefit. All treatment benefits (eg reduced drug use and criminal involvement, improved employment and other measures of functioning) are directly associated with treatment retention
- 3. Provide respectful evidence-based guidance/information/support to stimulant-using individuals that can help them make changes in their lives that will promote a reduction/discontinuation of methamphetamine/cocaine use.



# TRUST: The Components (#1)

- Orientation and engagement session. An individual session with new patients that allows a counselor to listen to new patients and learn about their situation and provide them with an overview of their treatment.
- Use of motivational interviewing as a manner of interacting with patients and as a set of techniques to promote a positive relationship with patients
- \$5 incentives (gift cards) for attendance at all individual and group session, presented with enthusiasm and praise.
- Four (4) Drug Cessation Group (DCG) sessions (one per week). Providing information, support and encouragement to help people reduce/stop their use of stimulants. Use of MI, CBT and CRA techniques.

# TRUST: The Components (#2)

- A weekly Recovery Skills Group (RSG) session for 12 weeks, that provides information/support/encouragement (CBT and CRA) to promote a recovery from stimulant use and improved functioning.
- A weekly individual coaching session (ICS) for 12 weeks that allows for individualization of treatment, together with promotion on new behaviors including physical exercise as steps in recovery.
- A weekly Continuing Care group beyond the 12 week program that participants are encouraged to participate in for an extended period (at least 12 months) as part of a support system to prevent relapse and promote long term recovery.

# TRUST Training Program

- Four, 3.5 hour Zoom training sessions scheduled in June-July
- Bi-monthly Mentoring Zoom sessions beginning two weeks after the last training session at a time to be determined (Aug –Nov). Followed by a monthly mentoring call Dec 2020-June 2021.
- A minimal amount of data on number of patients, retention in treatment and UA data (If possible) collected and submitted weekly

# Evaluation

***Your feedback is important!***

- QR code



- **Url:** <https://ttc-gpra.org/P?s=394237>

