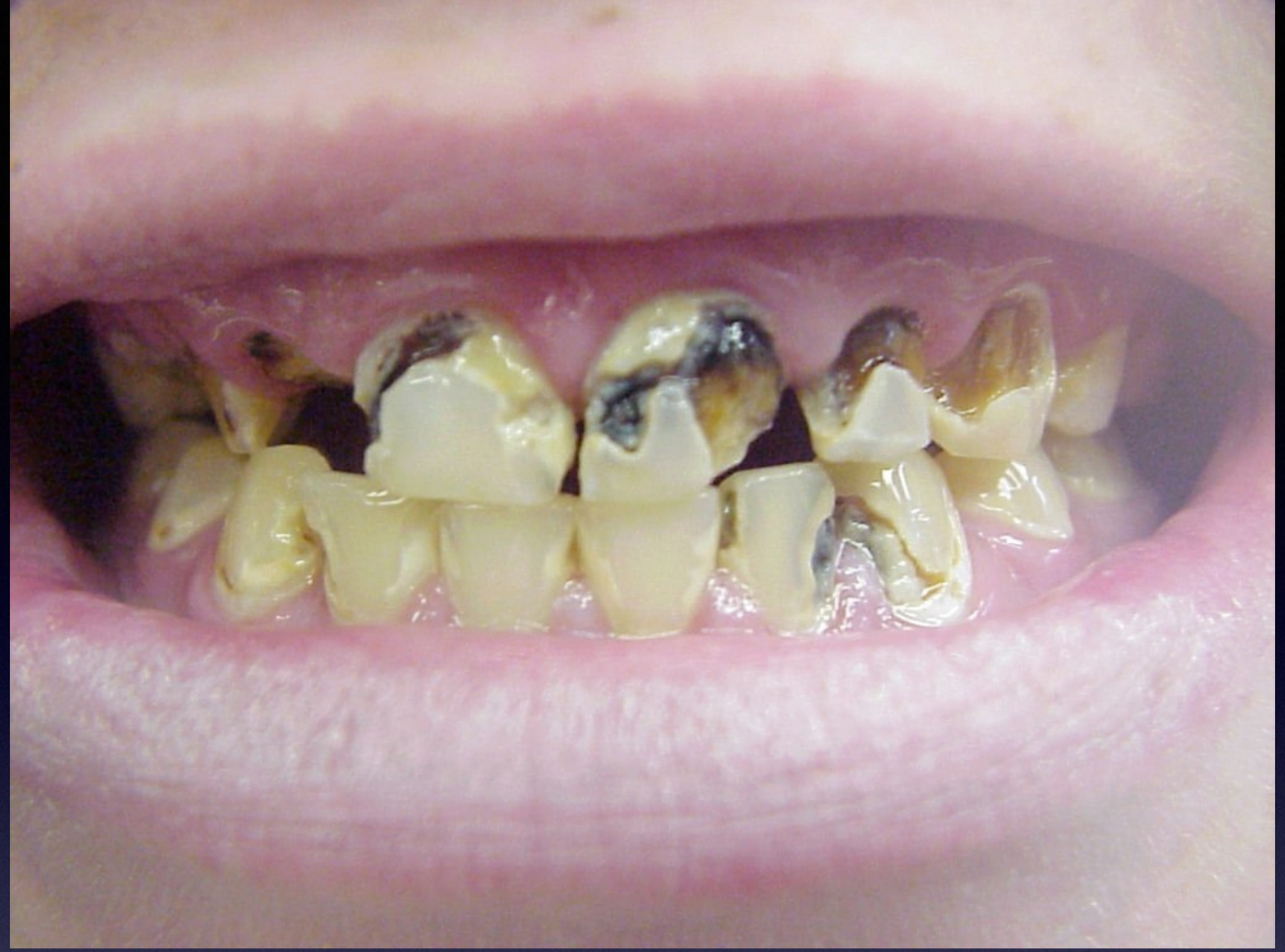


Methamphetamine Use Disorder: Here's how to treat it

Daniel Duhigg, D.O., M.B.A.
Medical Director, Duke City Recovery Toolbox

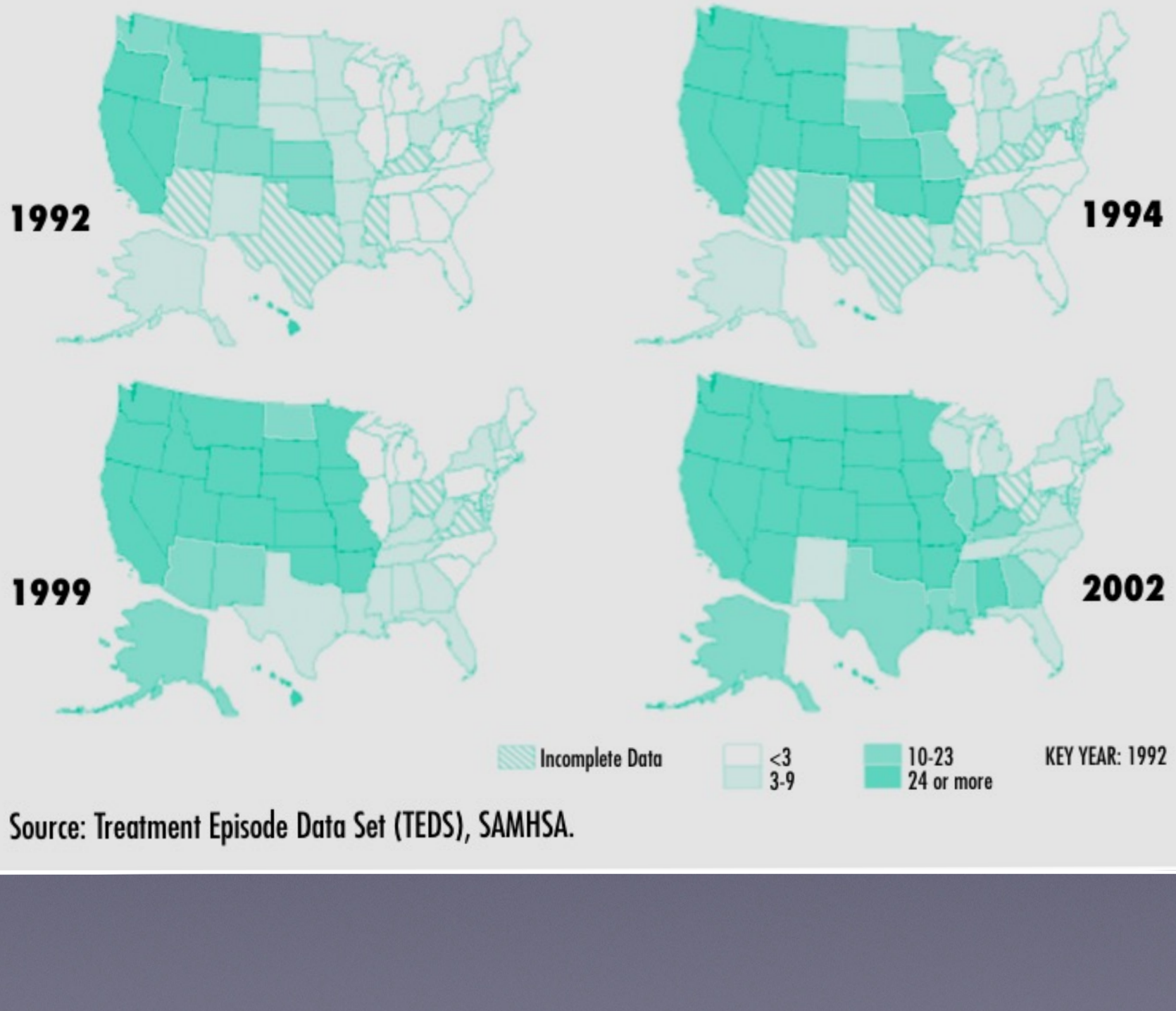
www.methanddeath.com

Roadmap:

1. Politics
2. Physiology
3. Psychology
4. Good Medicine

Where Does Meth Come From?

Primary Methamphetamine/Amphetamine Admission Rates per 100,000 Population Aged 12 and Over



Source: Treatment Episode Data Set (TEDS), SAMHSA.

GLOBAL SEIZURES
2019

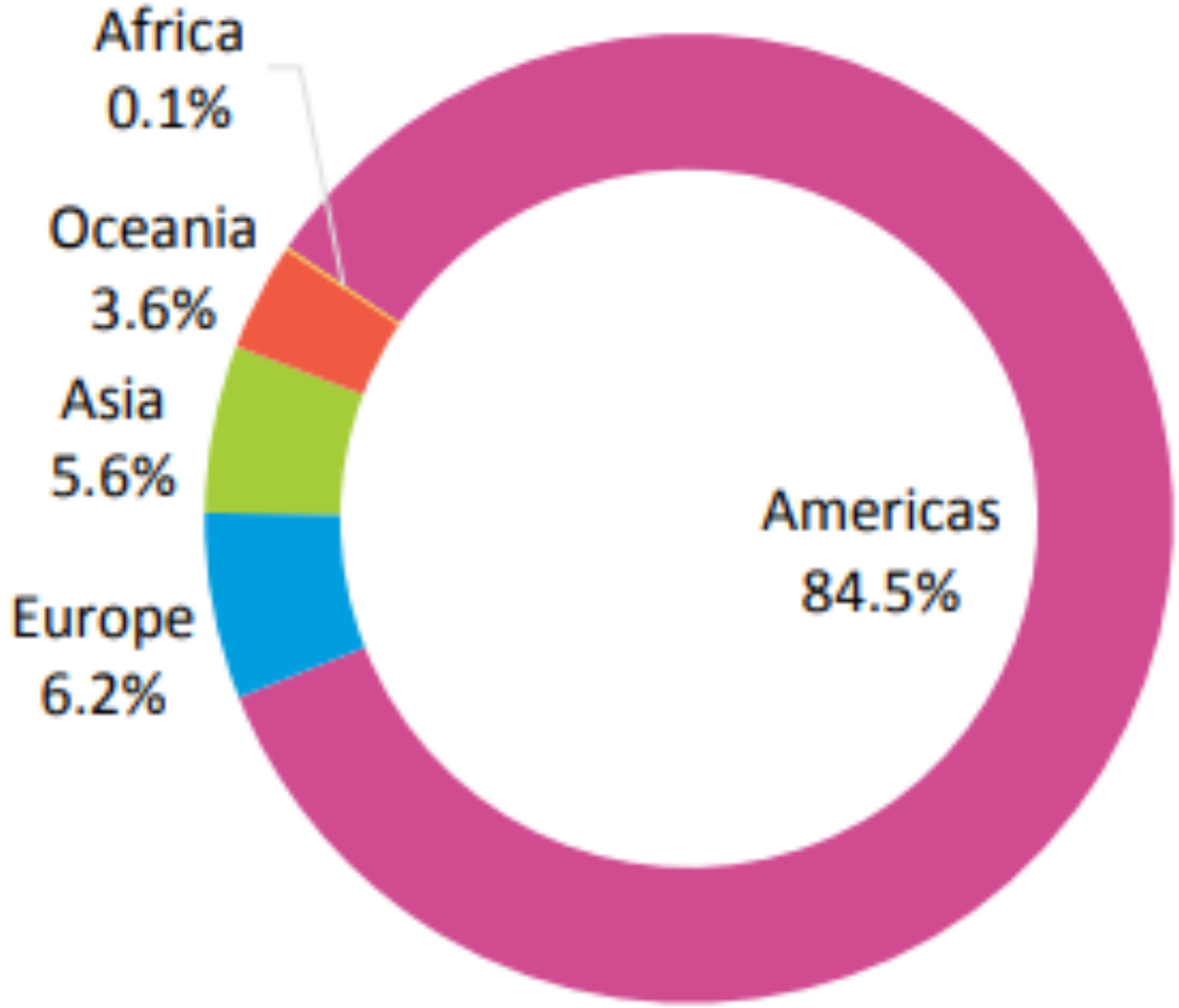
methamphetamine	amphetamine	"ecstasy"	other ATS	all ATS
325 tons	79 tons	16 tons	36 tons	456 tons
Change from previous year				
+ 43%	+ 309%	+ 38%	+ 82%	+ 64%

GLOBAL NUMBER OF USERS
2019

20 million
"ecstasy"

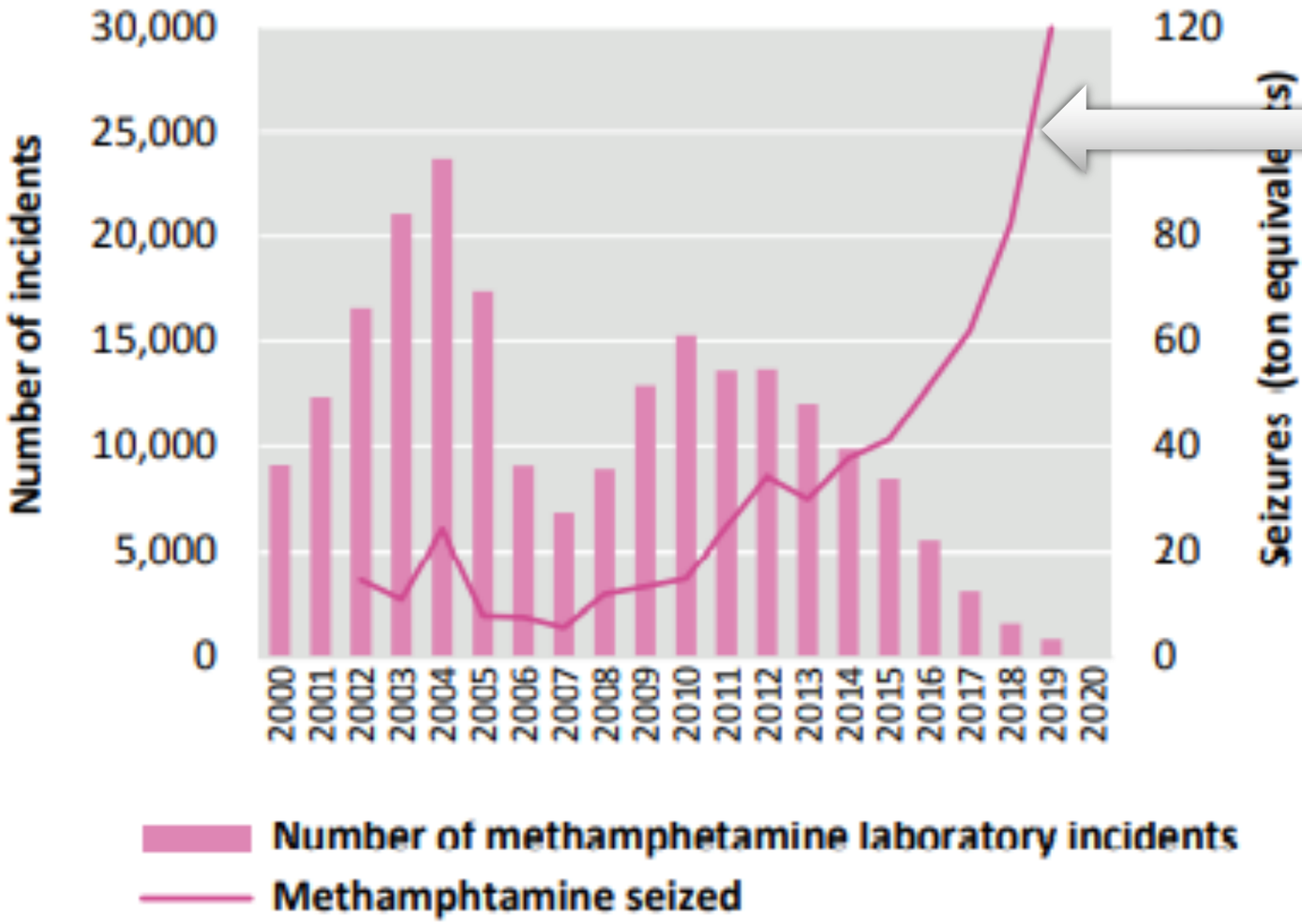
27 million
amphetamines
(methamphetamine and amphetamine)

FIG. 26 **Distribution of detected methamphetamine laboratories, 2015–2019**



Source: UNODC, responses to the annual report questionnaire.

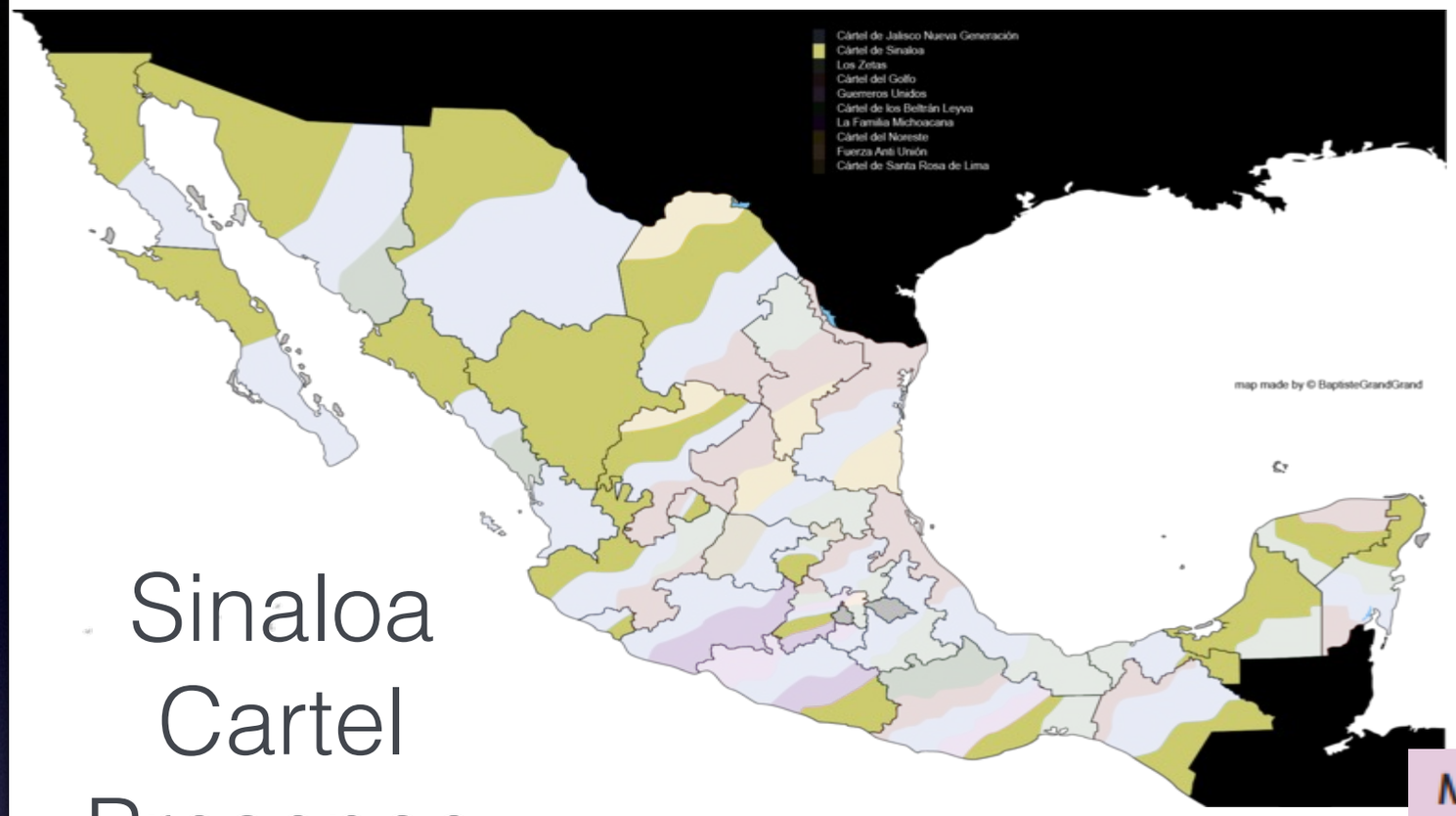
FIG. 27 **Methamphetamine laboratory incidents and quantities of methamphetamine seized, United States, 2000–2019**

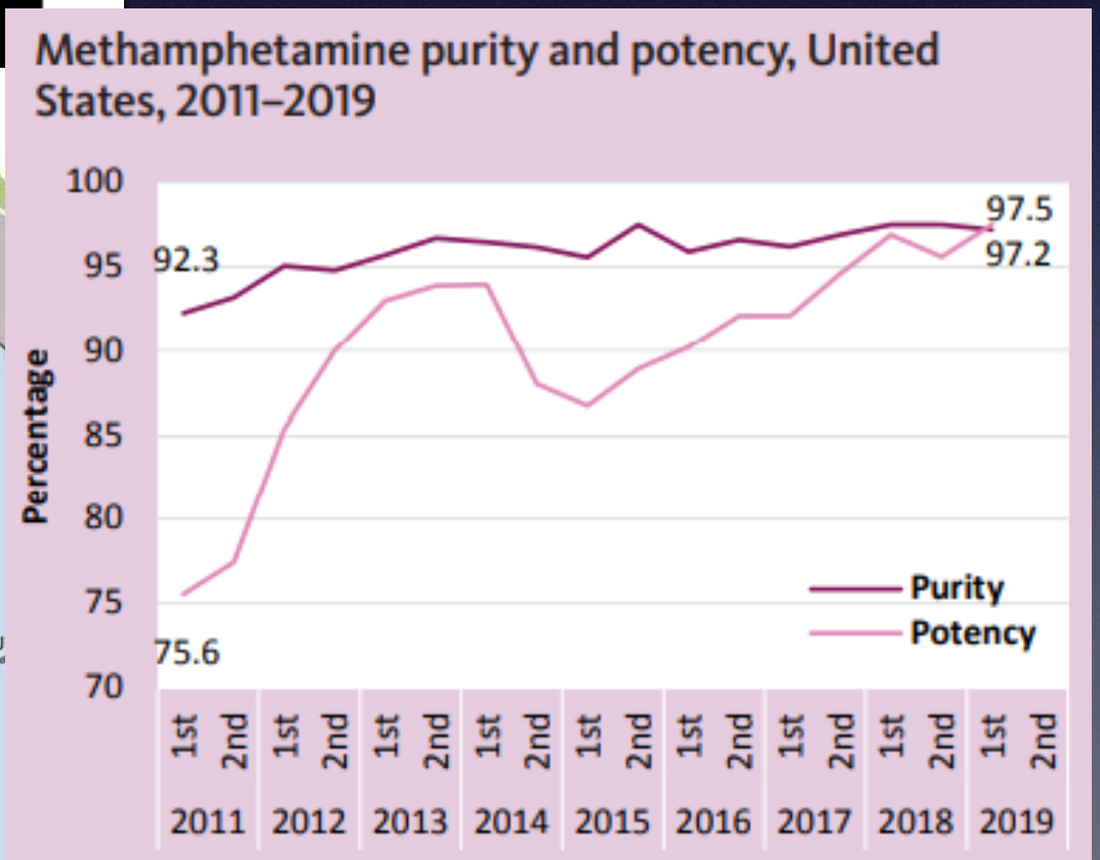


Sources: United States, Department of Justice, Drug Enforcement Administration, 2020 Drug Threat Assessment (March 2021); and UNODC, responses to the annual report questionnaire.

Where did all the meth come from as US manufacturin g declined??

Sinaloa Cartel Presence



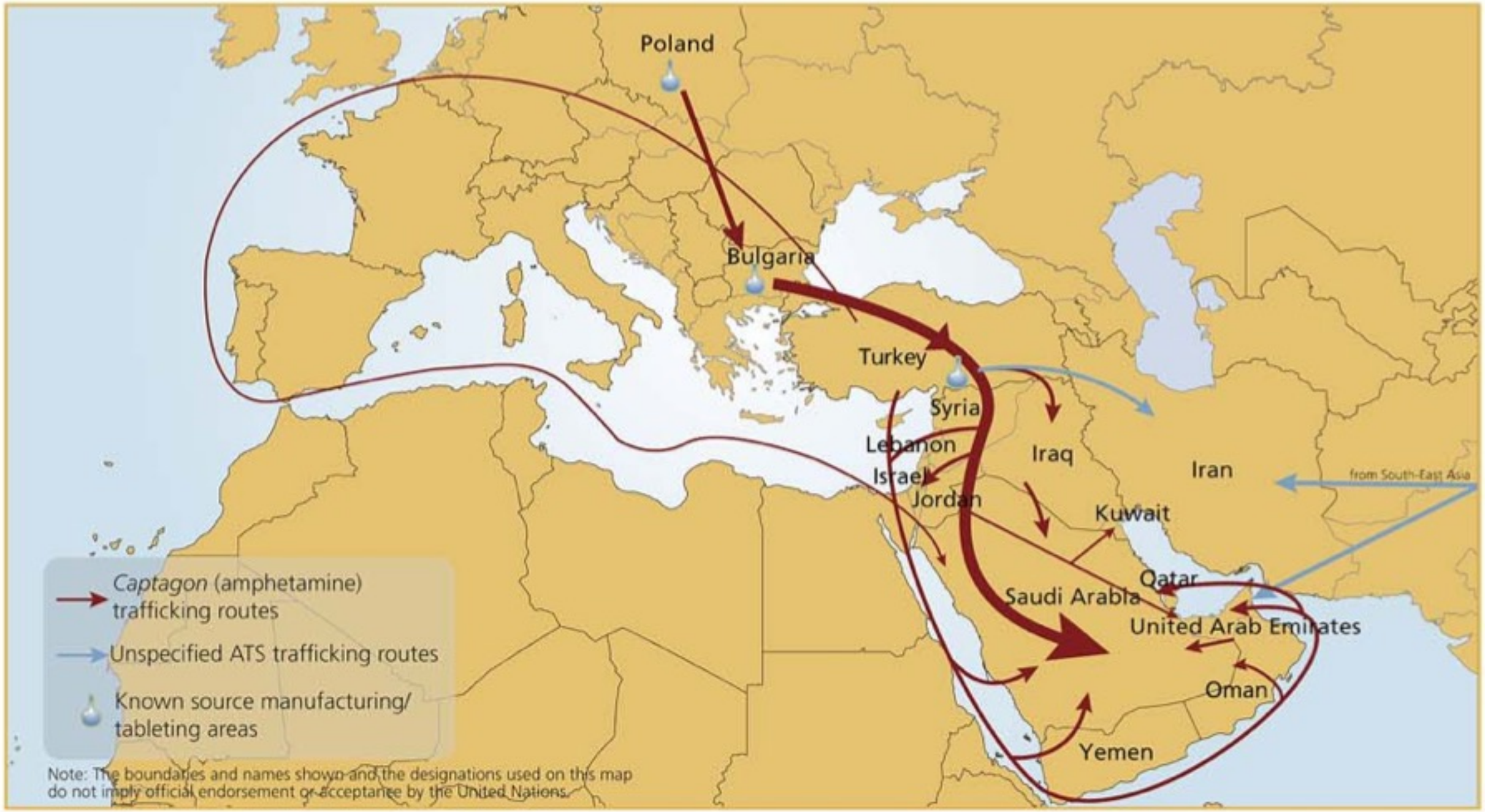


Source: United States, Department of Justice, Drug Enforcement Administration, *Drug Threat Assessment 2020* (March 2021), and previous years.

“Captagon”

Map 19: Notable Near and Middle East Trafficking Routes of Amphetamines-group Substances

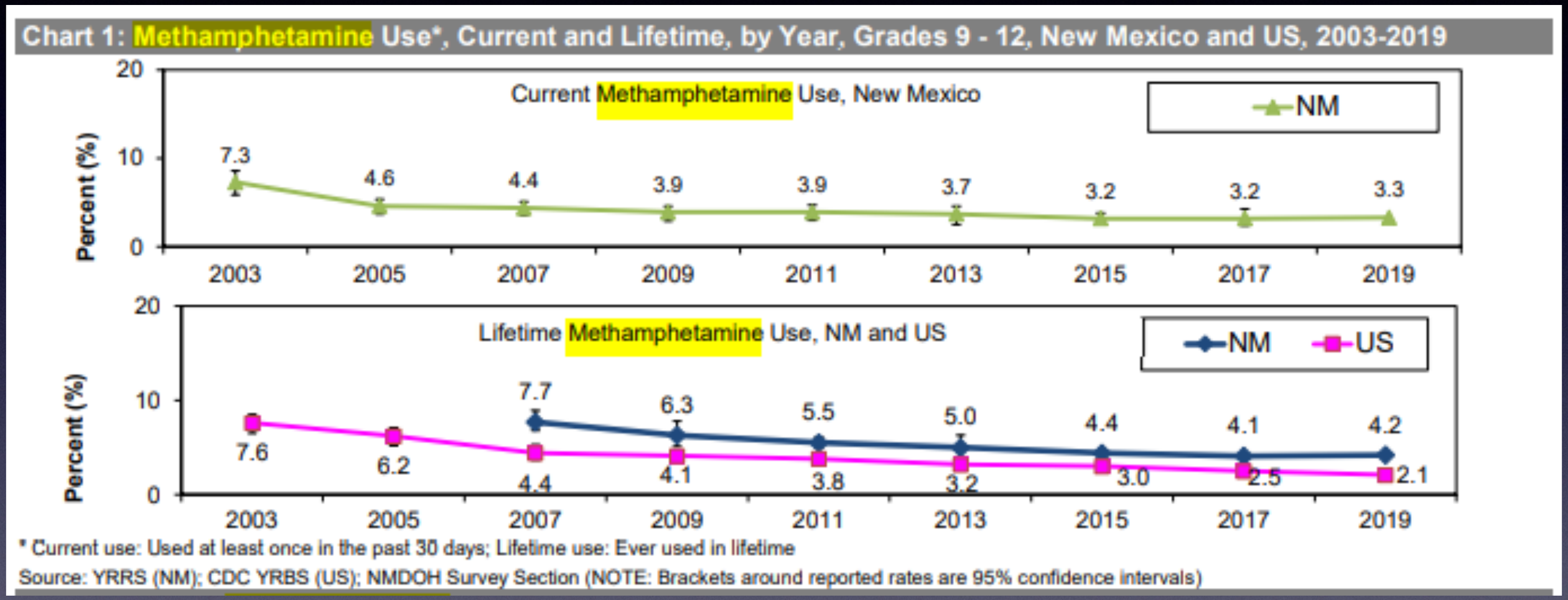
Sources: Lebanon Drug Enforcement Central Bureau, presentation at the Working Group Meeting on Captagon Smuggling to the Middle East Region, Beirut, Lebanon (December 2008); Turkish National Police, Department Of Anti-Smuggling and Organized Crime (KOM), presentation at the Working Group Meeting on Captagon Smuggling to the Middle East Region, Beirut, Lebanon (December 2008); Policies Achievements Ongoing programs and Future Plans. Drug Control Headquarters Islamic Republic of Iran (Tehran, 2008); World Customs Organization (WCO), Customs and Drugs Report 2007 (June 2008).



US Judicial System

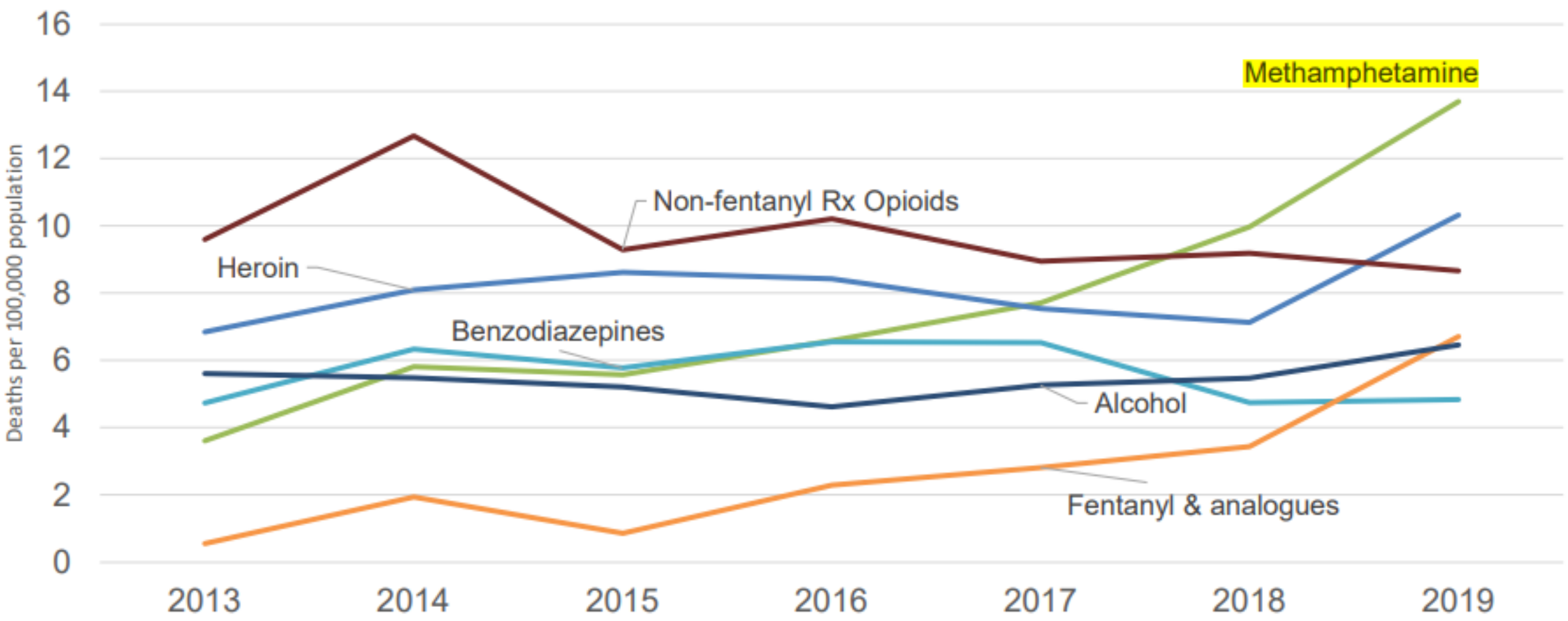
The New Mexican Perspective

Meth Use Among New Mexican Youth



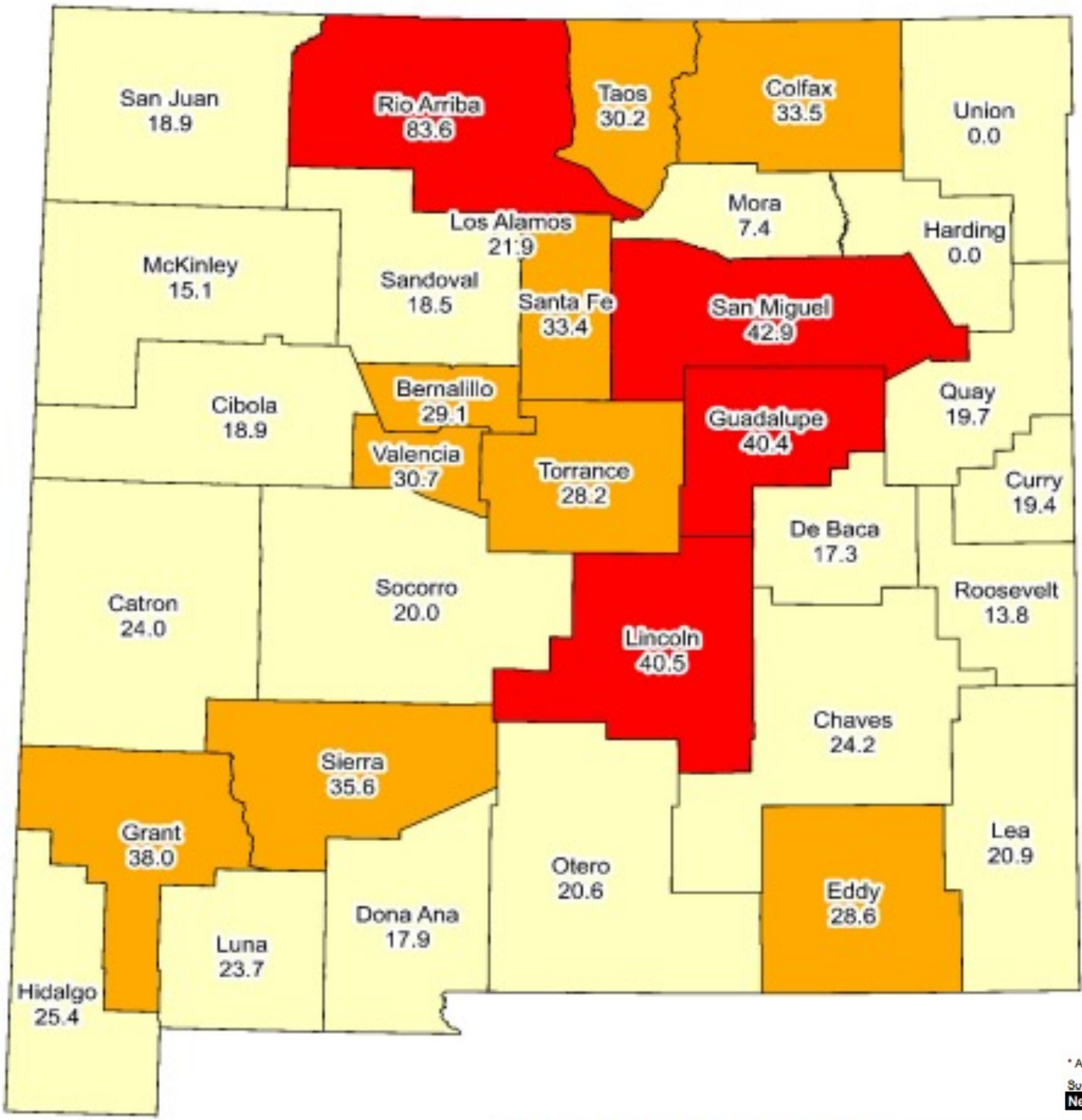
DRUG OVERDOSE DEATH - Methamphetamine

Chart 4: Drug Overdose Death Rates* by Drug Class, New Mexico, 2013-2019



Drug categories in this chart are **not** mutually exclusive - many deaths involve more than one class. Rates are age adjusted to the US 2000 standard population.
Source: Bureau of Vital Records and Health Statistics; UNM-GPS population files; SAES

Meth involved in 32% of all drug ovderdose deaths.
40% meth alone, 52% meth + opioids, 8% meth + others
(benzos, alcohol, cocaine, etc.)



Drug Overdose Deaths
(Rate per 100,000 population)

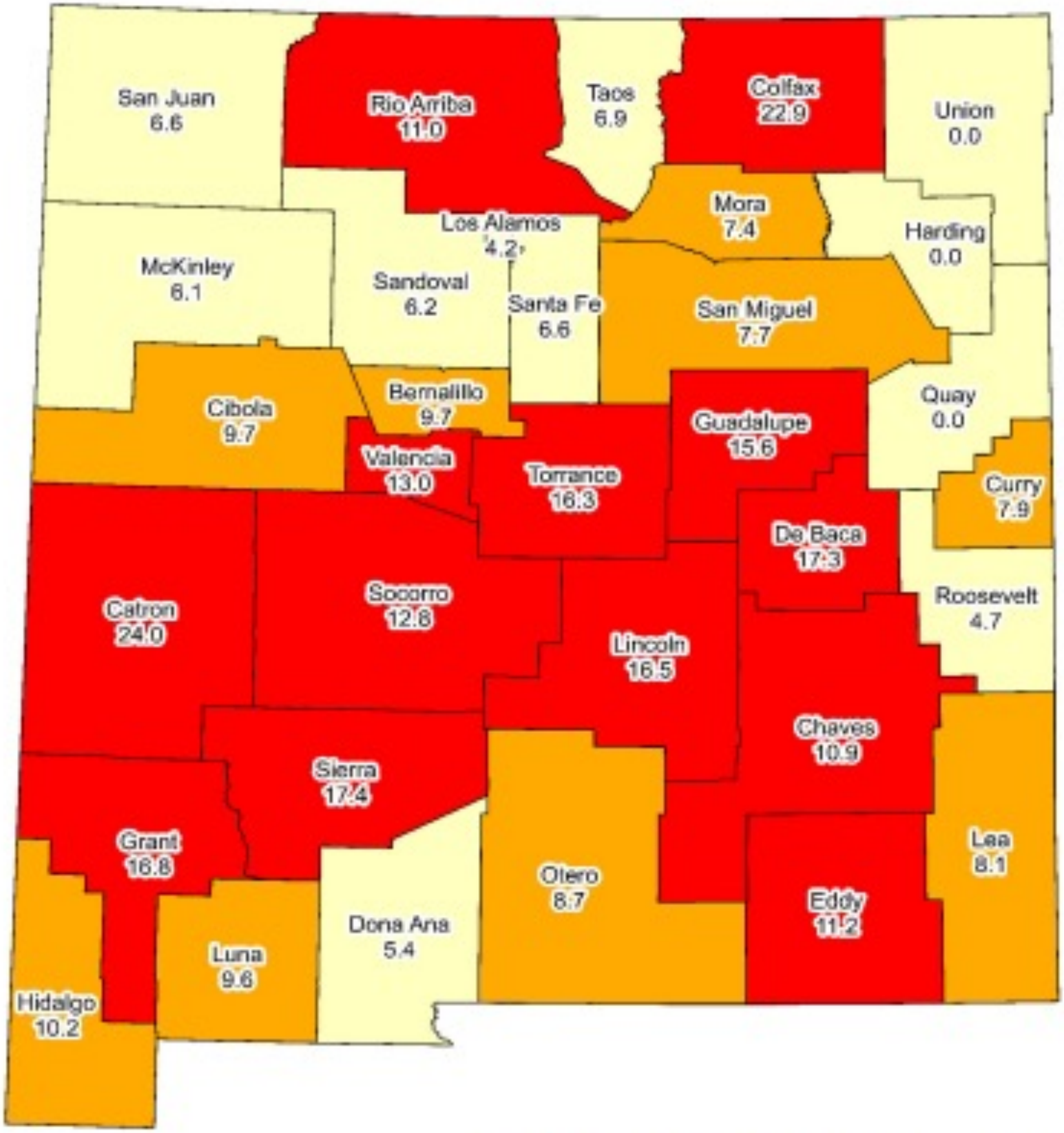
State Rate = 26.2

- < 26.2
- 26.2 < 39.3
- >= 39.3

* All rates are per 100,000, age-adjusted to the 2000 US standard population

Sources: NMDOH BVRHS death files and UNM-GPS population files; SAES

New Mexico Substance Use Epidemiology Profile



Methamphetamine Overdose Deaths
(Rate per 100,000 population)
State Rate = 7.1

- < 7.1
- 7.1 < 10.7
- >= 10.7

* All rates are per 100,000, age-adjusted to the 2000 US standard population

Sources: NMDOH BVRHS death files and UNM-GPS population files; SAES

New Mexico Substance Use Epidemiology Profile

Physiology

Drugs hijack the brain.

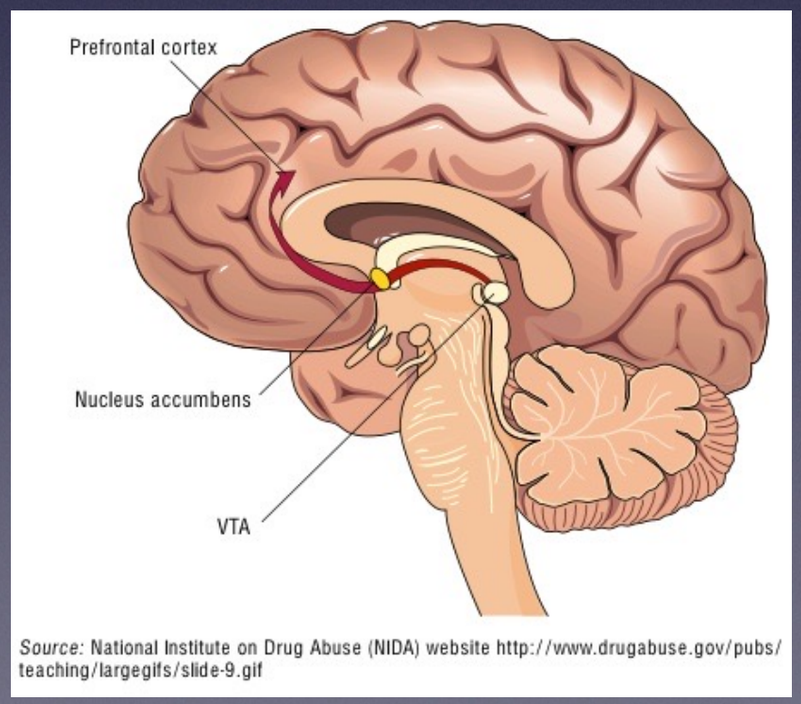
Food increases [DA] in the shell of the NAcc by 45%

www.cs.iusb.edu

Amphetamines and cocaine increase it by 500%

DEA.gov

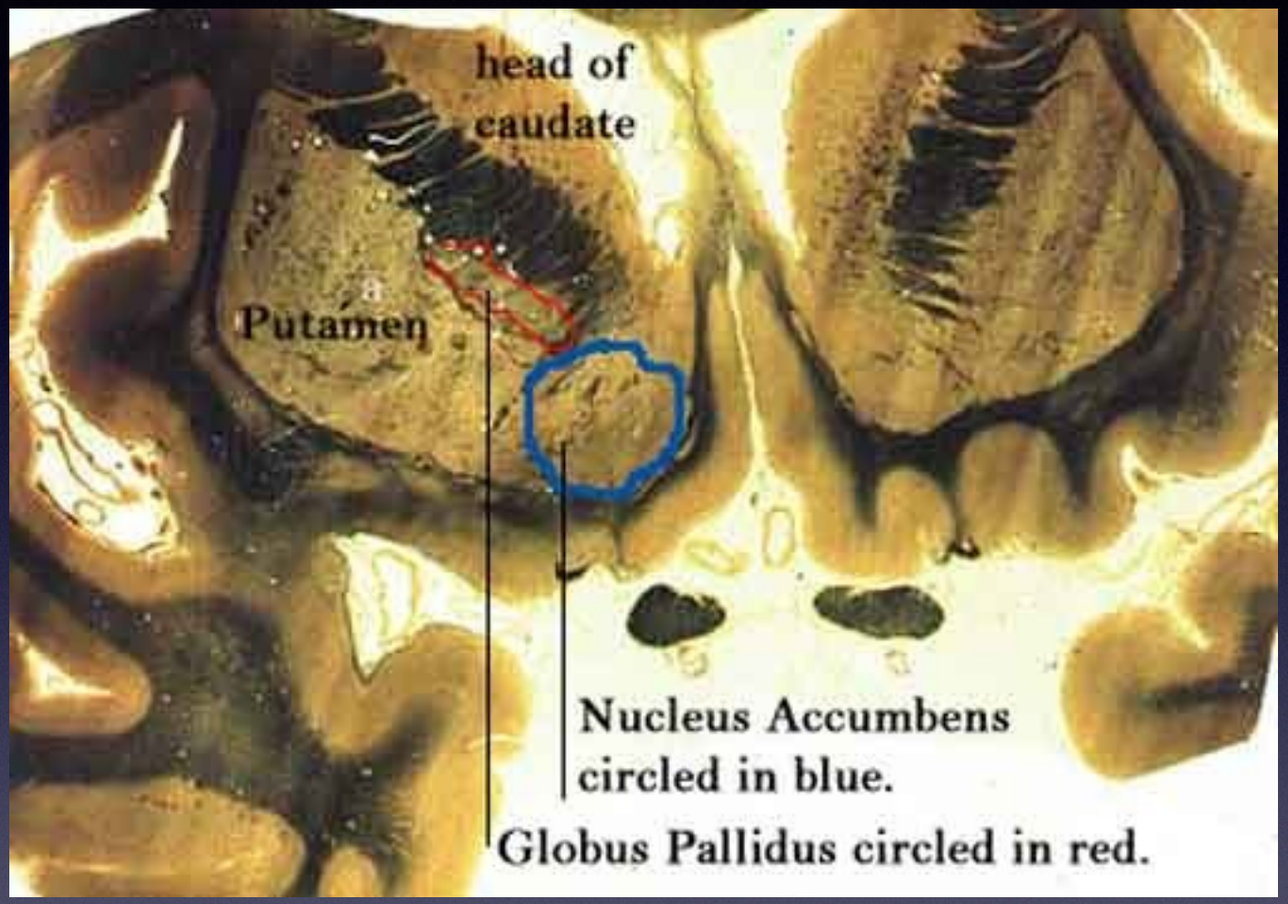
In this way, drug use can feel like it is critical to survival

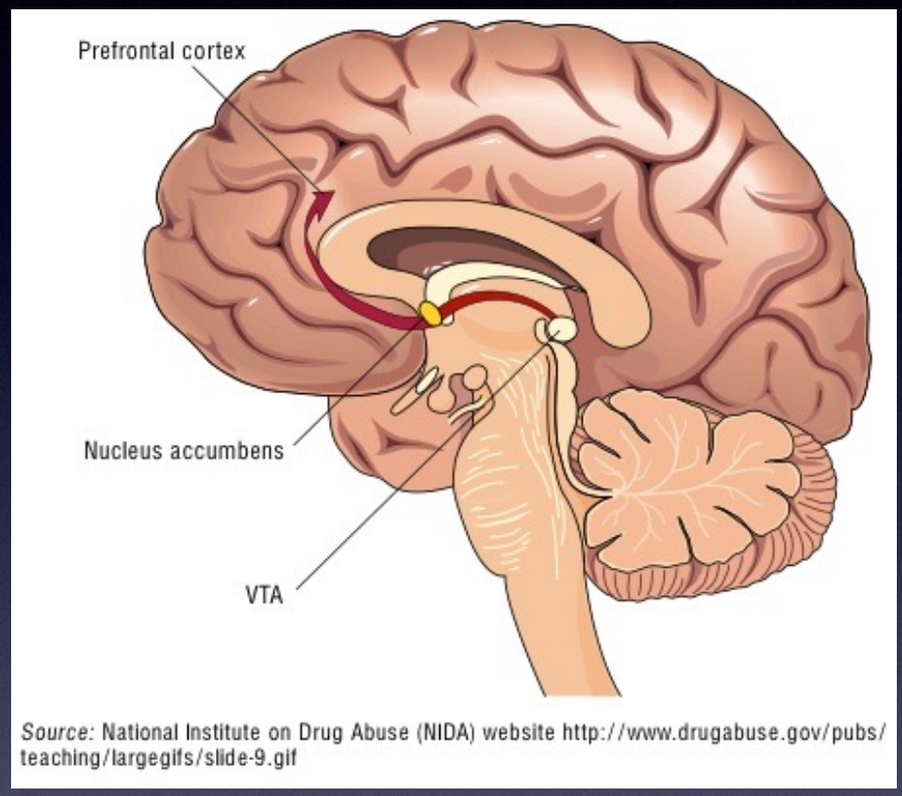


Source: National Institute on Drug Abuse (NIDA) website http://www.drugabuse.gov/pubs/teaching/largegifs/slide-9.gif

Hernandez & Hoebel, Life Sciences, 42:1705-1712

Nucleus Accumbens





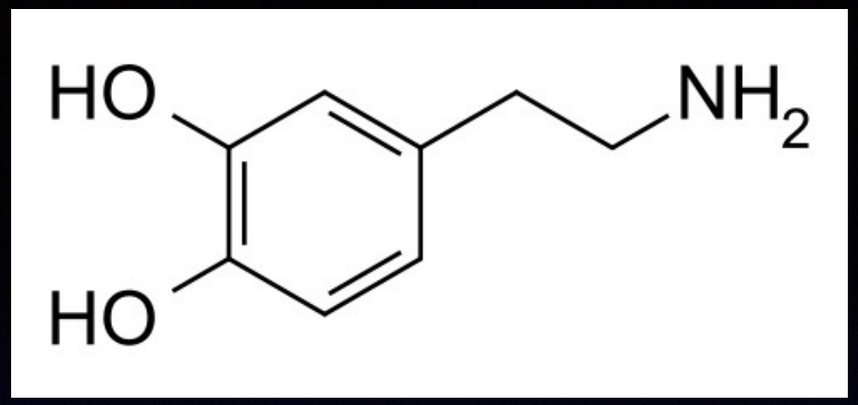
Source: National Institute on Drug Abuse (NIDA) website http://www.drugabuse.gov/pubs/teaching/largegifs/slide-9.gif

"They commonly report a feeling that something very interesting and exciting is going on."

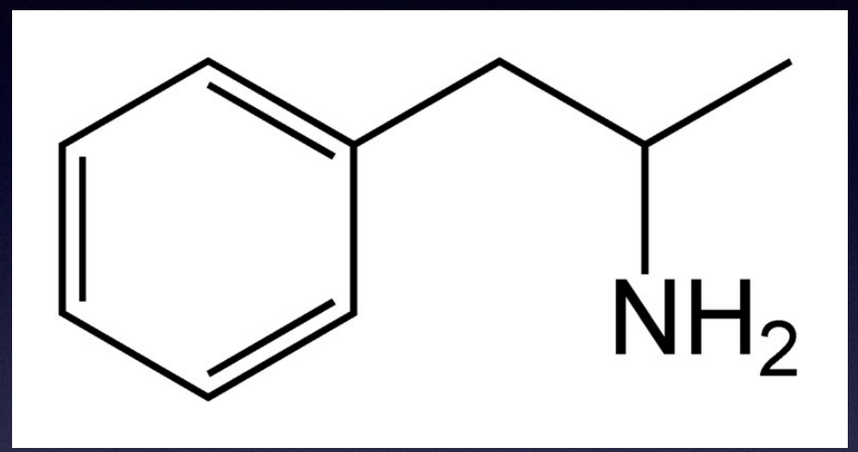
Jaan Panskepp, describing the effect of stimulating the NAcc in conscious subjects

Raymond C. Truex, MD
Oxford University Press, Jeffrey Kochan, MD, H. Branch Coslett, MD

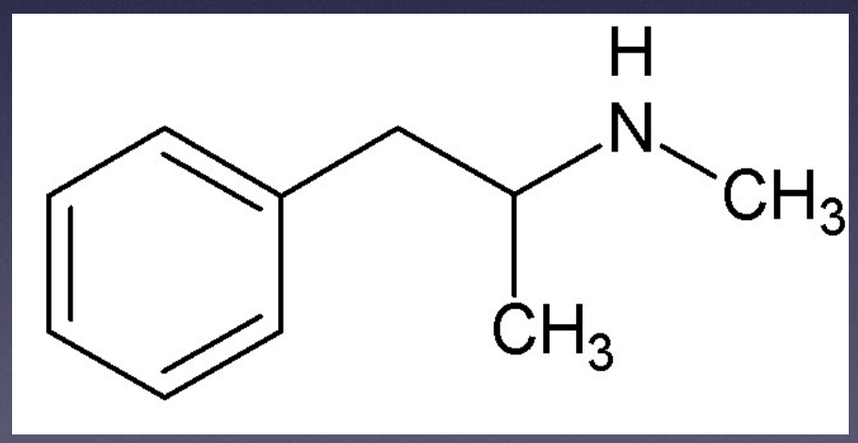
Methamphetamine and the Brain



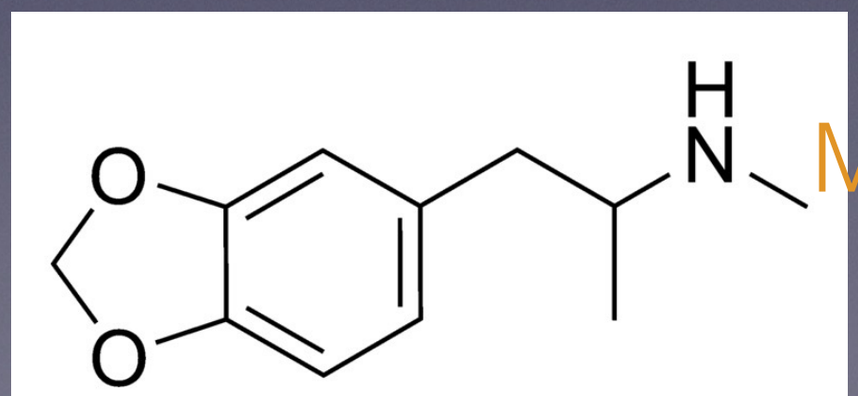
Dopamine



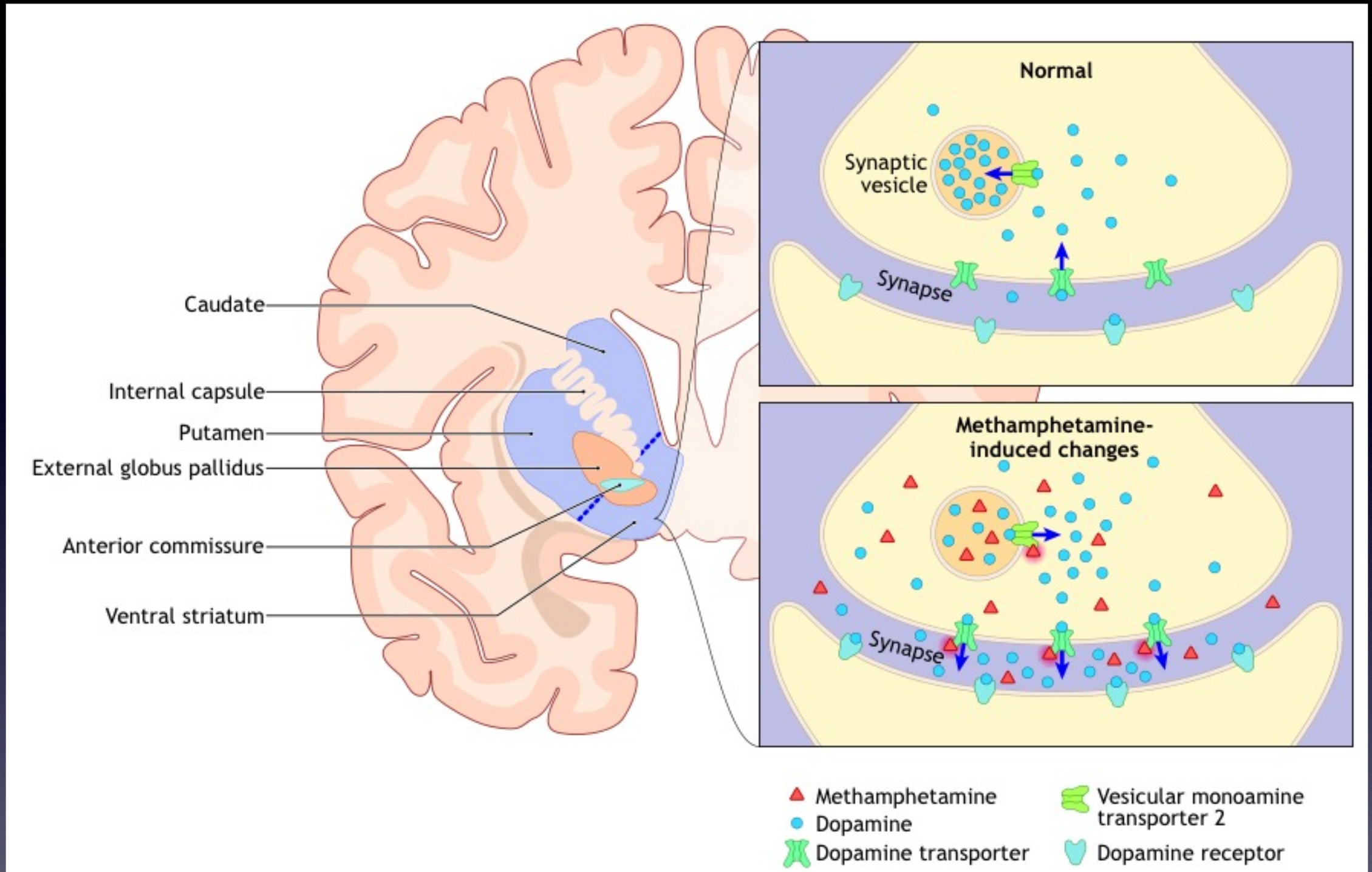
Amphetamine



Methamphetamine



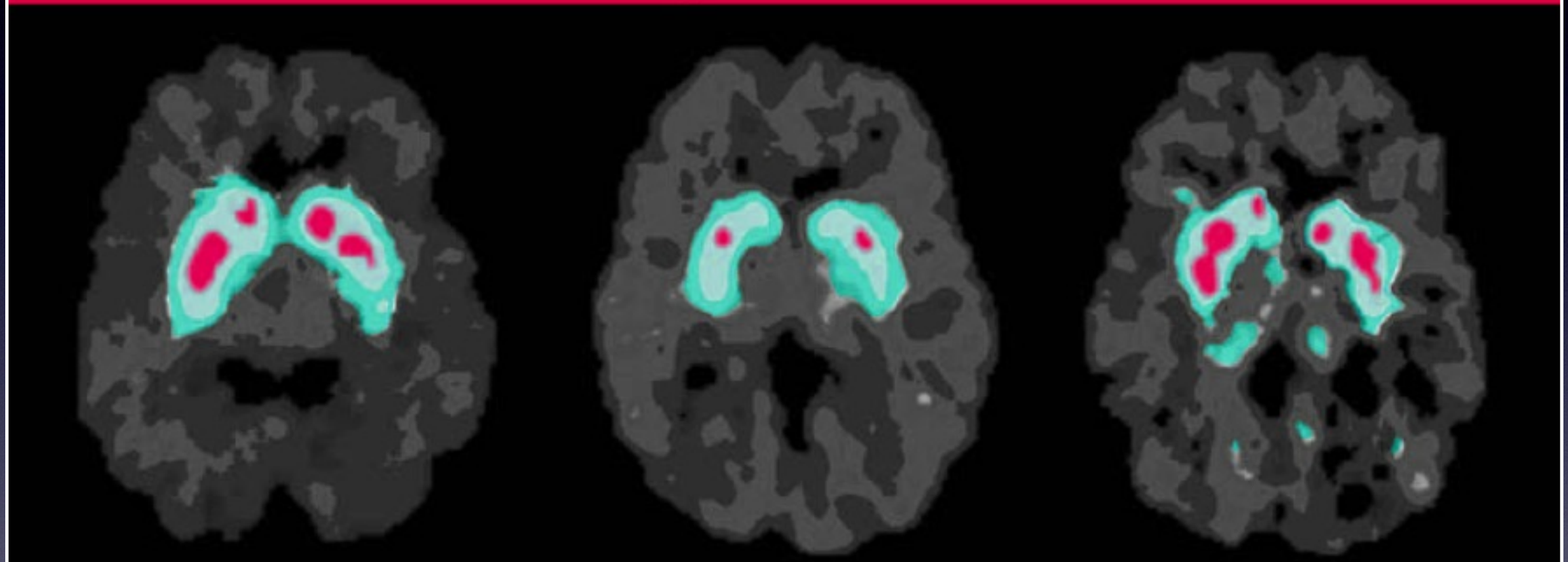
Methylinedioxymethamphetamine (ecstasy)



e decreases DA reuptake and triggers dopamine release via

Galanter, et al. The American Psychiatric Publishing Textbook of Substance Abuse Treatment, 2008

Recovery of Brain Dopamine Transporters in Chronic Methamphetamine (METH) Abusers



Normal Control

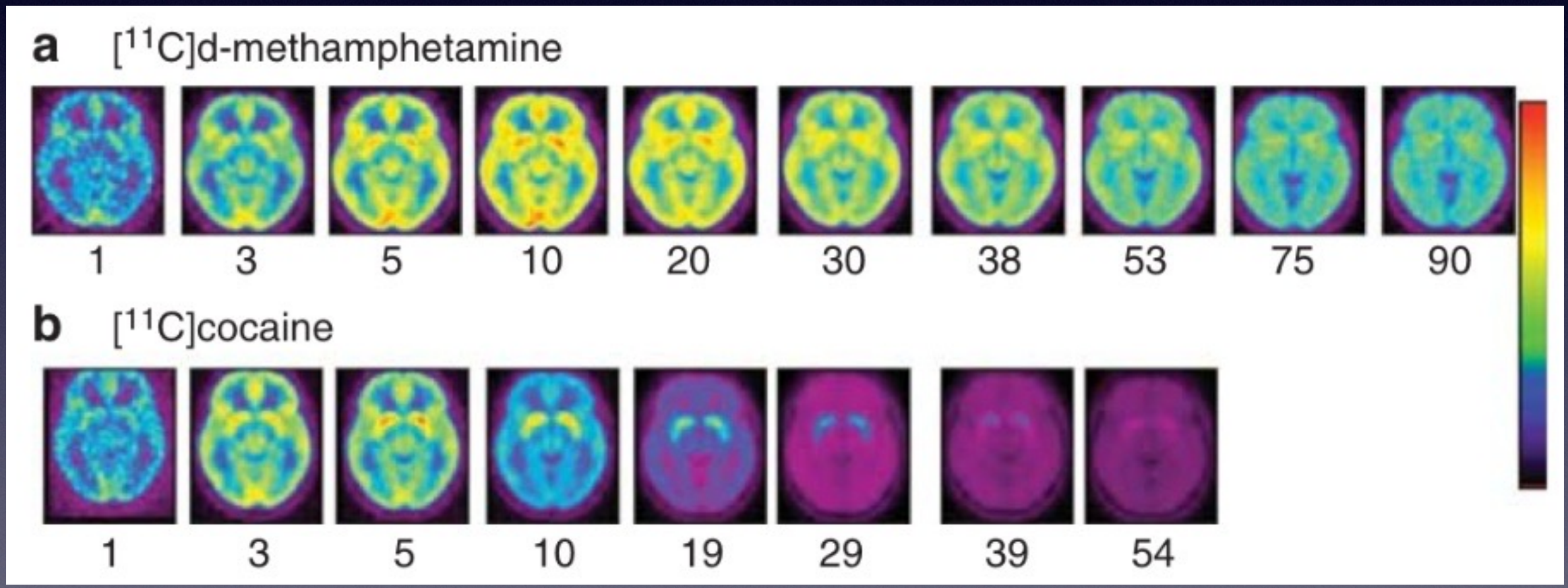
METH Abuser
(1 month abstinence)

METH Abuser
(24 month abstinence)

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

Psychostimulants

Cocaine
Methamphetamines
Methylinedioxymethamphetamine (MDMA)



Koob & Volkow, 2010

Neurobiology of Stimulant Use

Reward: Nucleus Accumbens, Ventral Pallidum

Motivation: Orbitofrontal Cortex

Memory: Amygdala, Hippocampus

Impulse Control: Prefrontal Cortex, Cingulate Gyrus

Galanter, et al. The American Psychiatric Publishing Textbook of Substance Abuse Treatment, 2008

Psychology

Psychology of substance use

- Positive Reinforcement
- Negative Reinforcement
- Punishment

Good Medicine

Complications from use

Risks of Use

- **Mode of administration**: I.V. use increases risk of infectious disease transmission
- **Bingeing**: using for multiple consecutive days increases risk of psychosis, accidents
- **Unsafe sex**: use is associated with increased sexual desire, increased number of sexual encounters, increased number of sexual partners, and decreased use of condoms, especially among men who have sex with men (MSM)
- **Agitation & aggression**: use increases risk of violent behavior and legal trouble
- **Poor nutrition**: anorexia resulting from use causes malnutrition, weight loss
- **Neurocognitive impairment**: use is associated with deficits in decision-making and working memory
- **Overdose**: psychosis, seizures, dysrrhythmias, stroke, cerebral hemorrhage

Clinical treatment guidelines, Turning Point

Amphetamine-related Disorders

Amphetamine:

- Use Disorder
- Intoxication
- Withdrawal
- Intoxication delirium
- Induced psychotic disorder with delusions
- Induced psychotic disorder with hallucinations
- Induced mood disorder
- Induced anxiety disorder
- Induced sexual dysfunction
- Induced sleep disorder

DSM 5

Treatment

Non-pharmacological therapies:

- Contingency Management
- Matrix Model

Pharmacological therapies:

Bupropion
Modafinil
d-amphetamine
Topiramate
Vigabatrin

Tried and failed

Naltrexone ER IM q3 weeks + Bupropion XL 450 mg daily

Reduced meth use by 11%

In summary

Questions?
Comments?
Refutations?

Thank you.