

Addiction Medicine Update

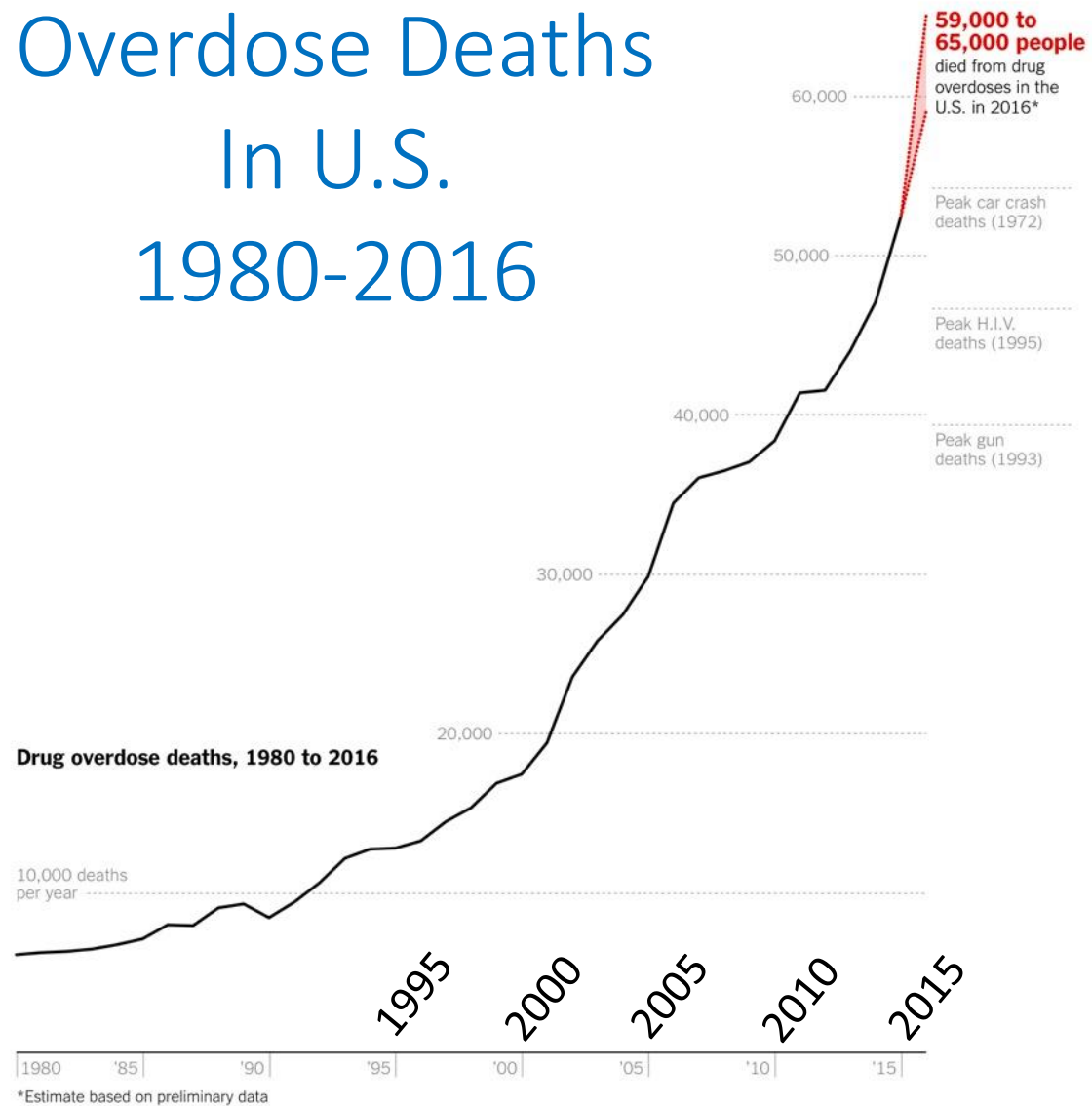
Fentanyl

IVAN WOLFSON, MD
Providence Community Health Centers
ivan_wolfson@brown.edu

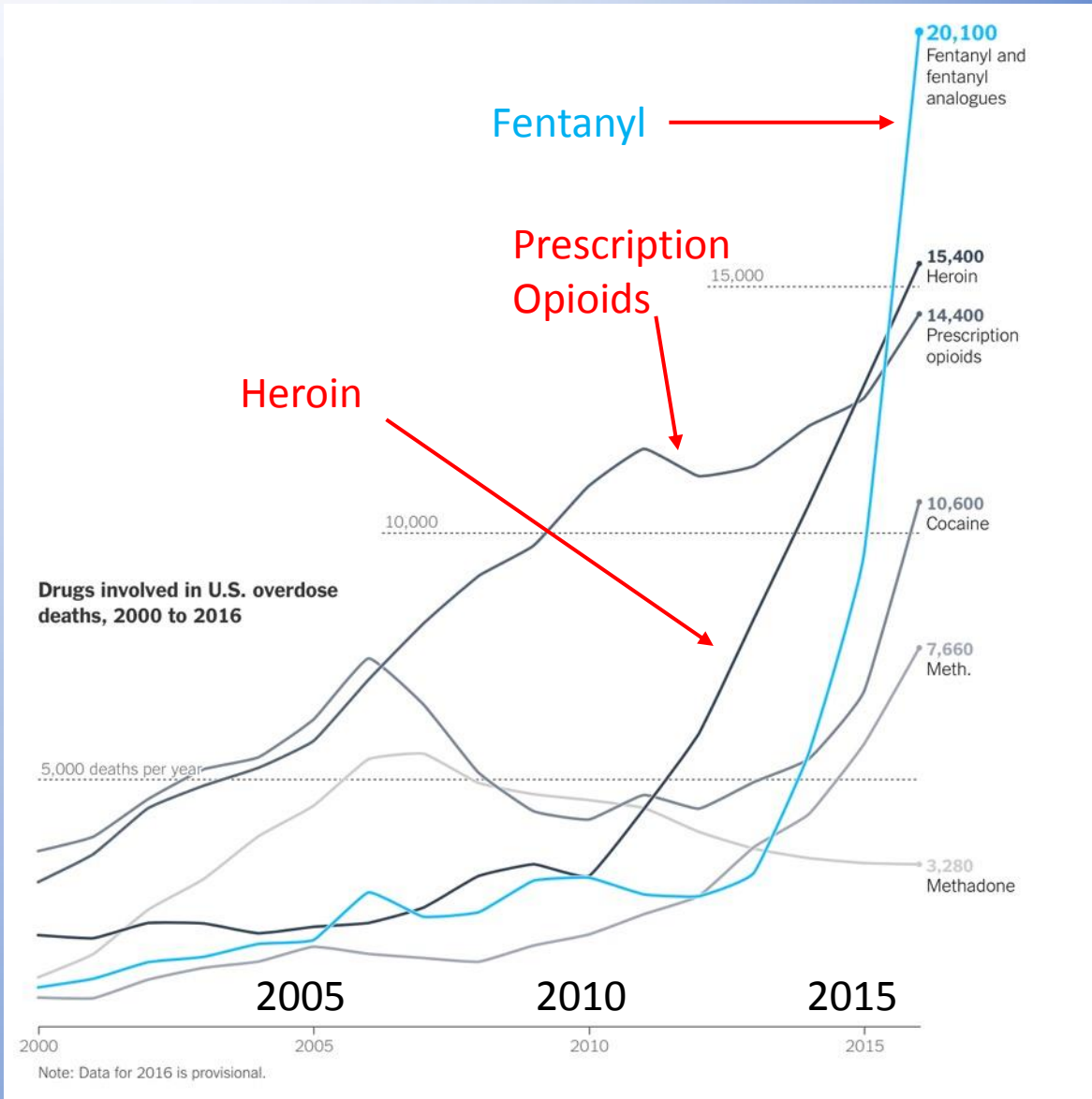
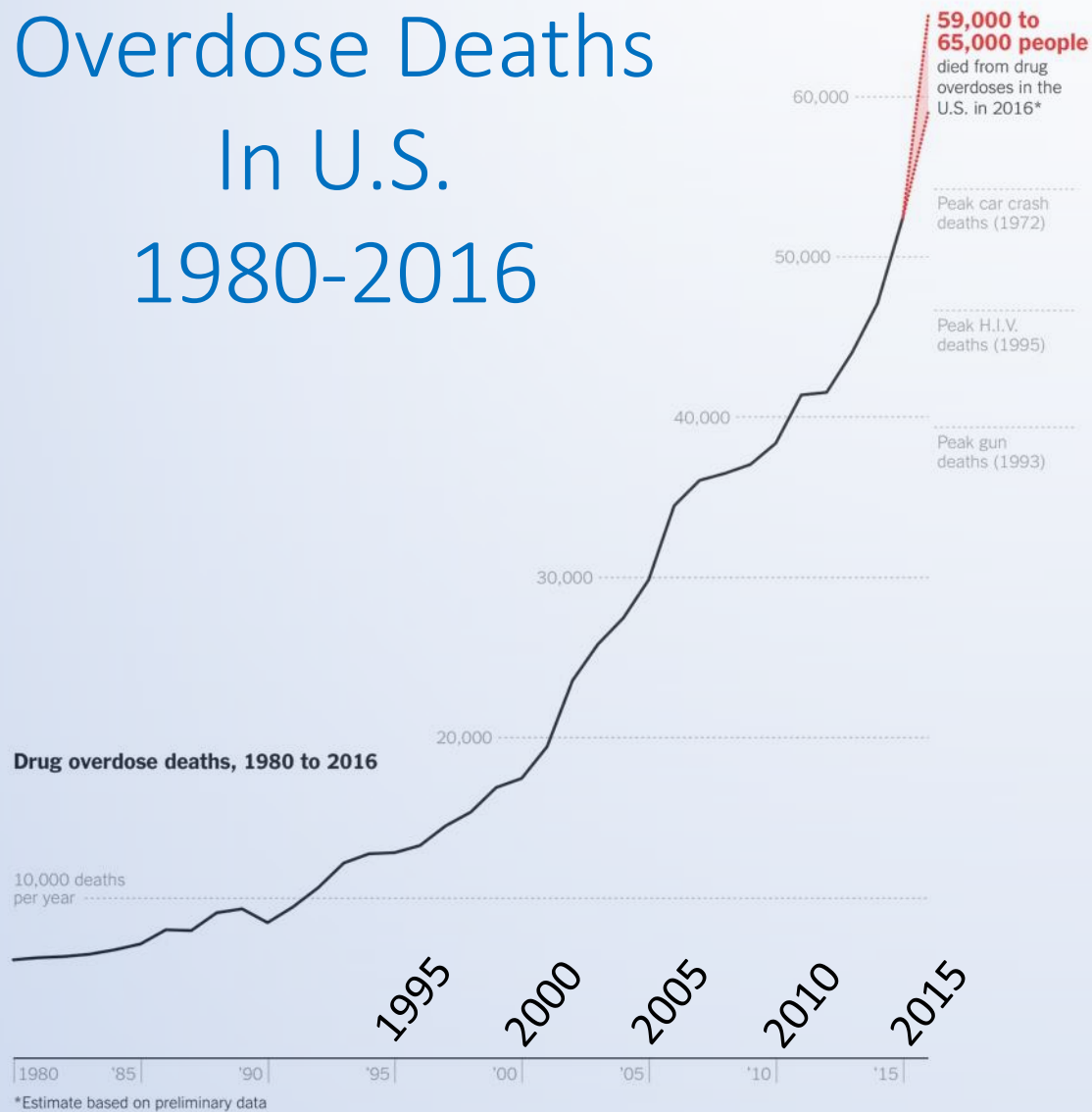
2018 NATIONAL HEALTH CARE FOR
THE HOMELESS CONFERENCE

May 16, 2018

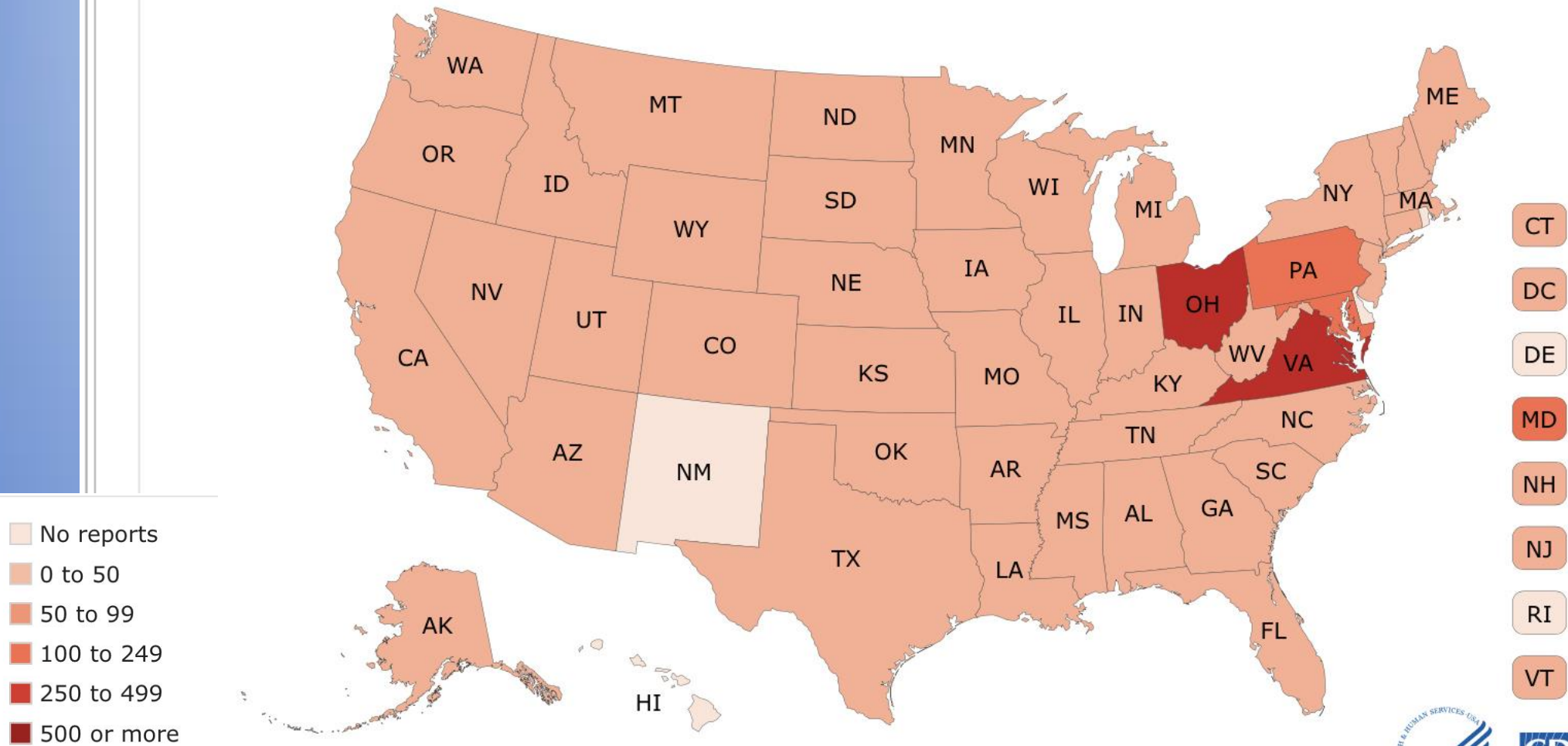
Overdose Deaths In U.S. 1980-2016



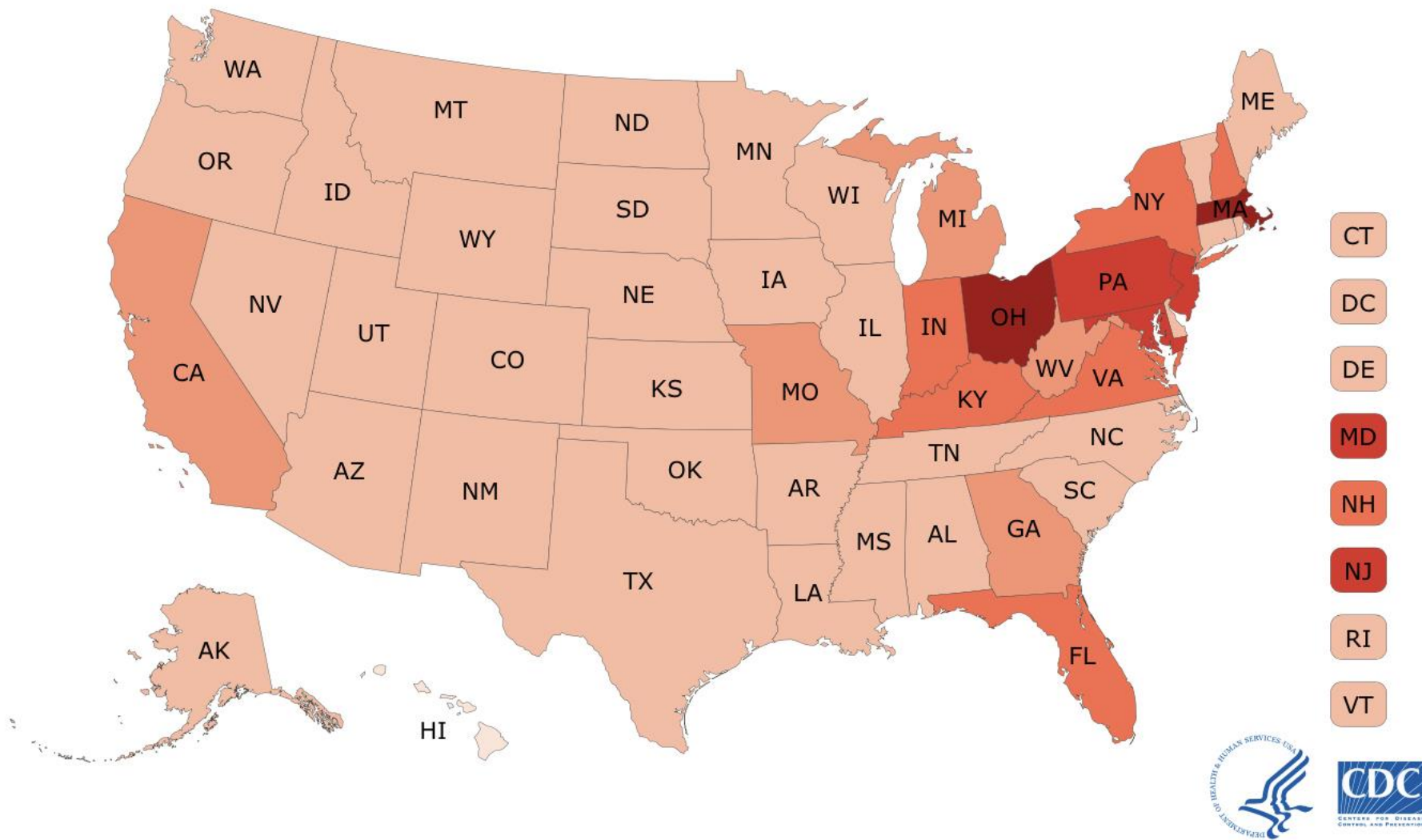
Overdose Deaths In U.S. 1980-2016



2013: Reported Law Enforcement Fentanyl Encounters

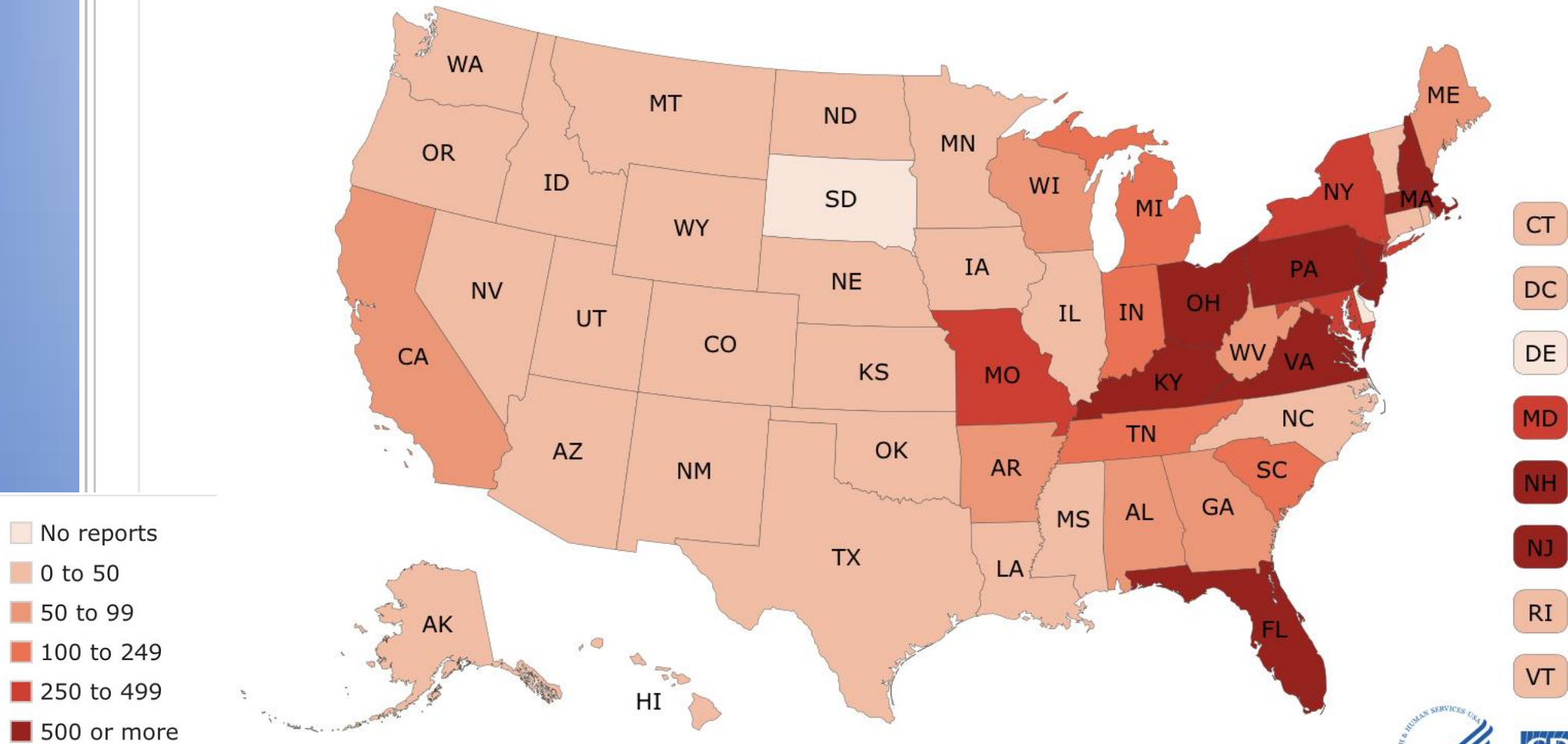


2014: Reported Law Enforcement Fentanyl Encounters



2014: Reported Law Enforcement Fentanyl Encounters

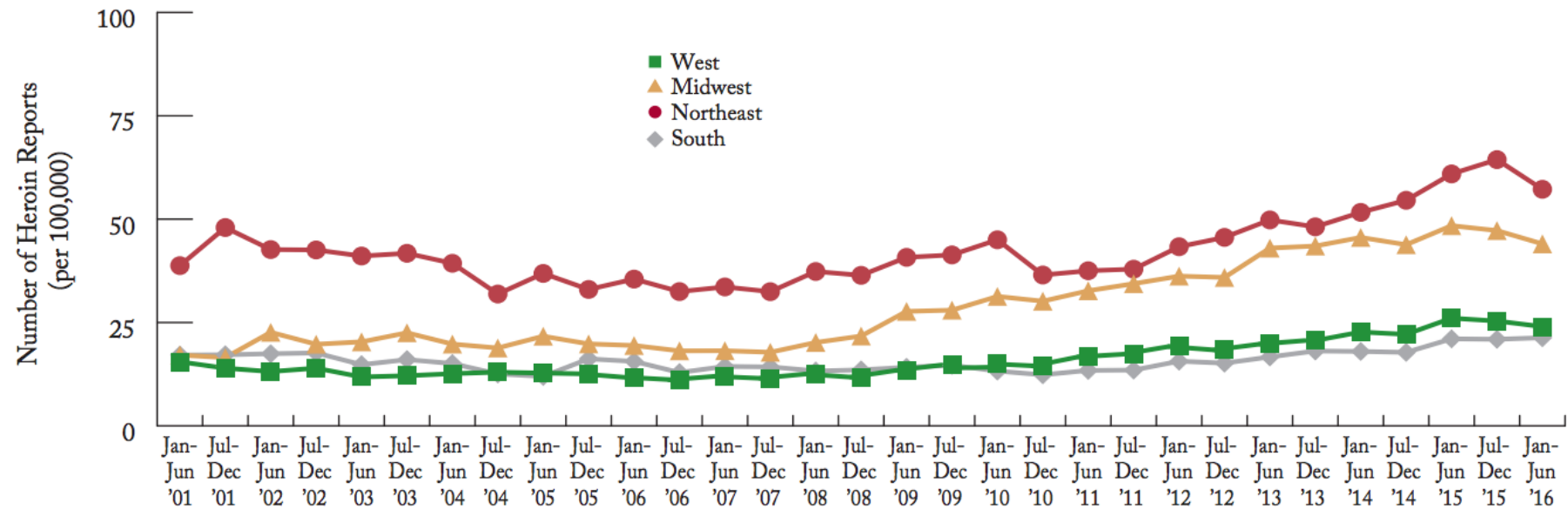
2015: Reported Law Enforcement Fentanyl Encounters



2015: Reported Law Enforcement Fentanyl Encounters

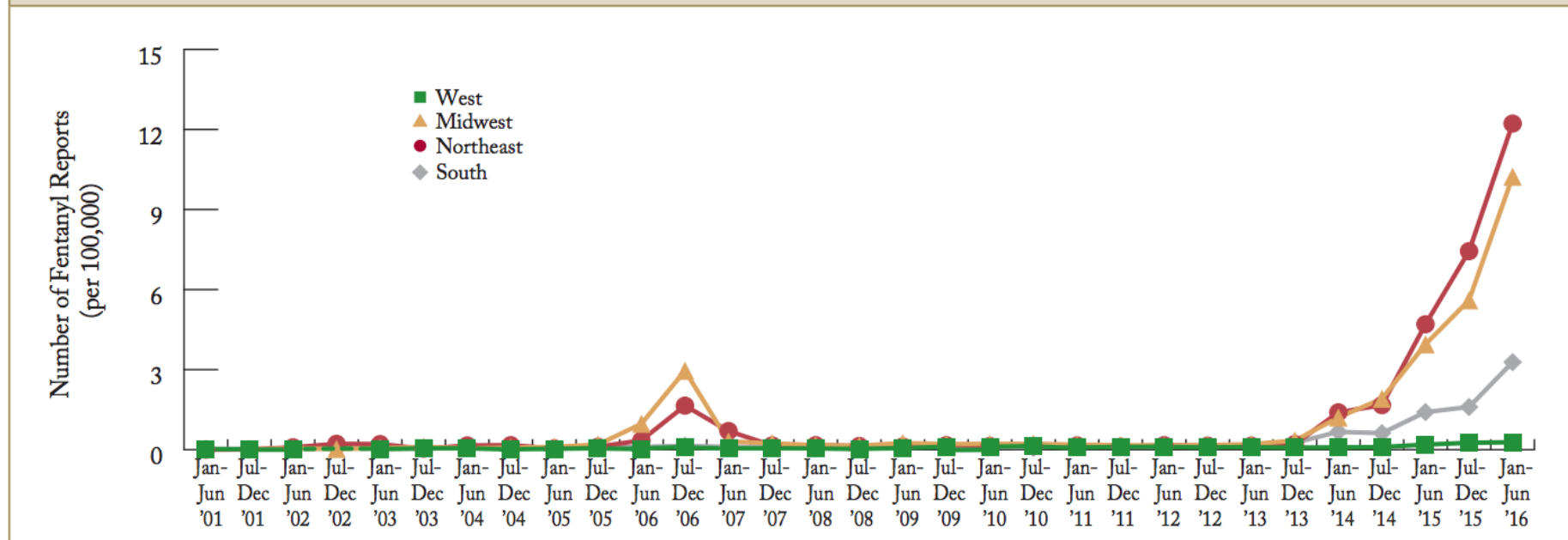
Heroin-Regional Trends

Figure 1.14 Regional trends in heroin reported per 100,000 persons aged 15 or older, January 2001–June 2016



Fentanyl-Regional Trends

Figure 1.7 Regional trends in fentanyl reported per 100,000 persons aged 15 or older, January 2001–June 2016¹



Note: U.S. Census 2016 population data by age were not available for this publication. Population data for 2016 were imputed.

¹ *A dashed trend line indicates that estimates did not meet the criteria for precision or reliability. See Appendix A for a more detailed methodology discussion.*

Fentanyl

- What is Fentanyl?

FENTANYL AND FENTANYL ANALOGS

- ▶ Fentanyl is a Schedule II short-acting synthetic opioid that is often used to treat chronic pain. It is 25 to 40 times more potent than heroin and 50 to 100 times more potent than morphine by weight (DEA, 2015b, 2015c; NIDA, 2012).
- ▶ Fentanyl and fentanyl analogs are abused for their "intense, albeit short-term high and temporary feelings of euphoria" (DEA, 2015c).
- ▶ Pharmaceutical fentanyl can be illegally diverted for abuse. It comes in a variety of forms, including patches, lozenges, tablets, and films (CDC, 2015; DEA, 2015c).
- ▶ Illicitly-produced, non-pharmaceutical fentanyl and fentanyl analogs, such as acetyl fentanyl, are emerging in the illicit drug market. They can be snorted or injected in powder form or swallowed as a pill (DEA, 2015a, 2015b, 2015c).

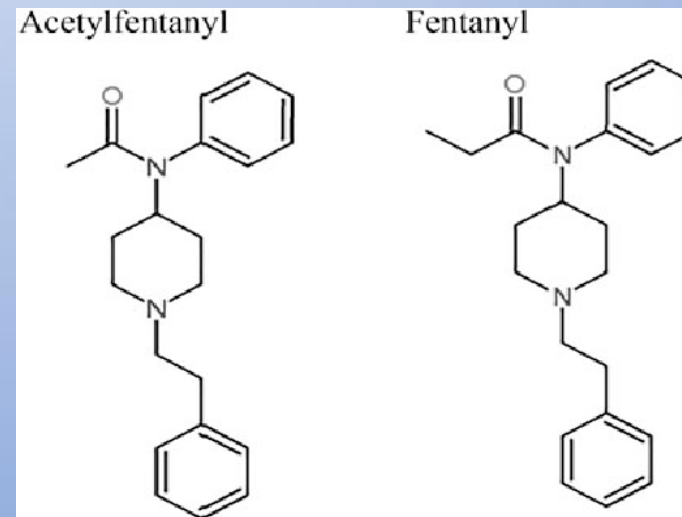
Designer Opioids

- **Fentanyl analogs:**

- Acetyl-, Acryl-
- Butyryl-, Furanyl-
- Carfentanil
- 4-ANPP
- Methoxyacetyl
- FIBF 4-Fluoroisobutyryl
- Cyclopropyl

- **Other Designer Opioids:**

- U49900
- U-47700 (Pink/Pinky)



Fentanyl Analogs

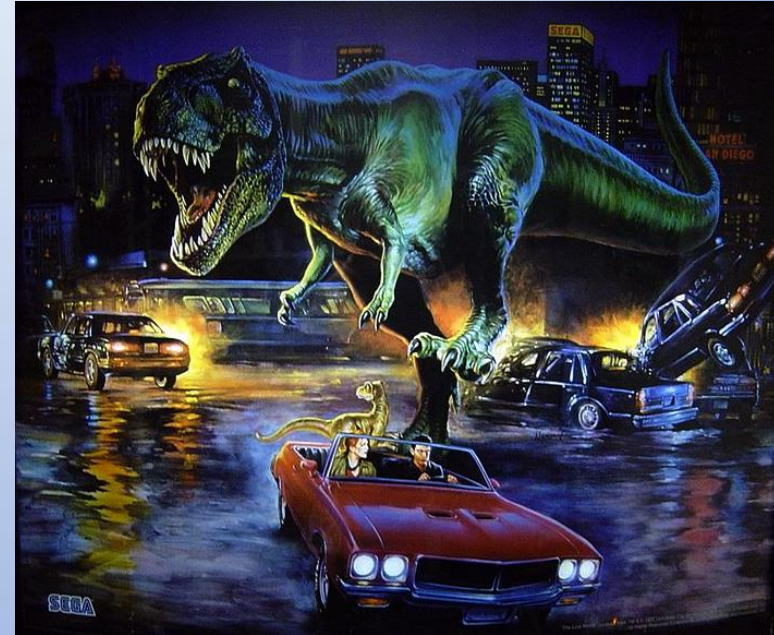
- **Acetyl Fentanyl:**
 - tablets or powder
 - ~10 times more potent than morphine
 - less potent than fentanyl
 - Rhode Island: 2013, 15 deaths
- **Furanyl Fentanyl:**
 - pills or powder
 - More potent than morphine
 - Less potent than fentanyl
- Both cross-react with fentanyl ELISA assay
- Both DEA Schedule I



Fentanyl Analogs

- **Carfentanil:**

- tranquilizing agent for large mammals
- DEA Schedule II drug
- small amount is fatal
- absorbed through skin
- 10,000 times the potency of morphine
- 100 times more potent than fentanyl
- white powder or pills
- mixed in heroin
- No cross-reactivity with fentanyl ELISA screening assay



Opioids Potency



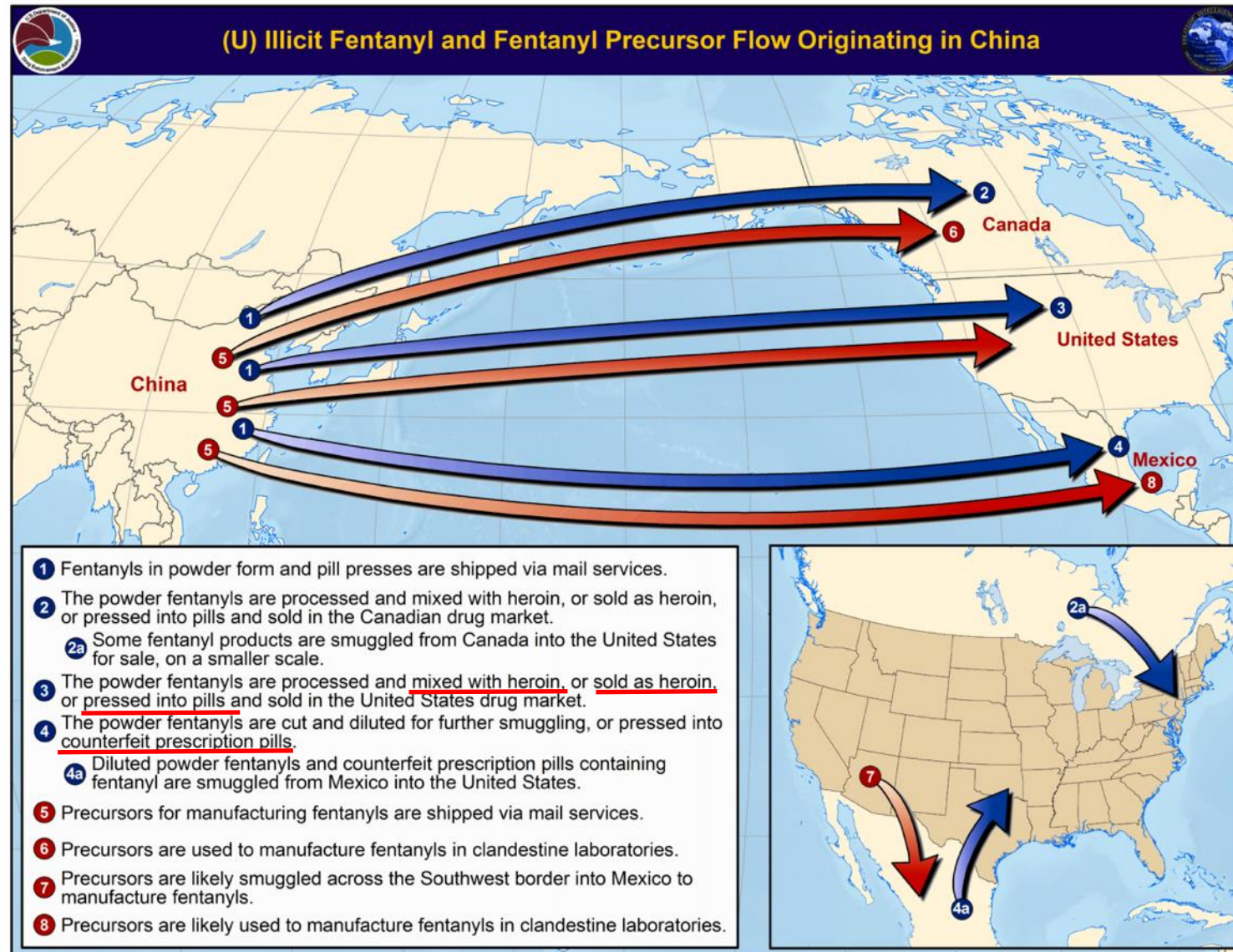
Fentanyl-High Affinity for Opioid Receptor

- In addition to high potency, high affinity means
- Requires more naloxone to reverse overdose
- May overcome buprenorphine blockade

DEA Fact Sheets

- **What are some common street names for fentanyl?**
- Apache, China Girl, China Town, Dance Fever, Friend, Goodfellas, Great Bear, He-Man, Jackpot, King Ivory, Murder 8, and Tango & Cash.
- **What are some common street names for marijuana?**
- Aunt Mary, BC Bud, Blunts, Boom, Chronic, Dope, Gangster, Ganja, Grass, Hash, Herb, Hydro, Indo, Joint, Kif, Mary Jane, Mota, Pot, Reefer, Sinsemilla, Skunk, Smoke, Weed, and Yerba

Figure 1: Illicit Fentanyl and Fentanyl Precursor Flow Originating in China



Source: DEA

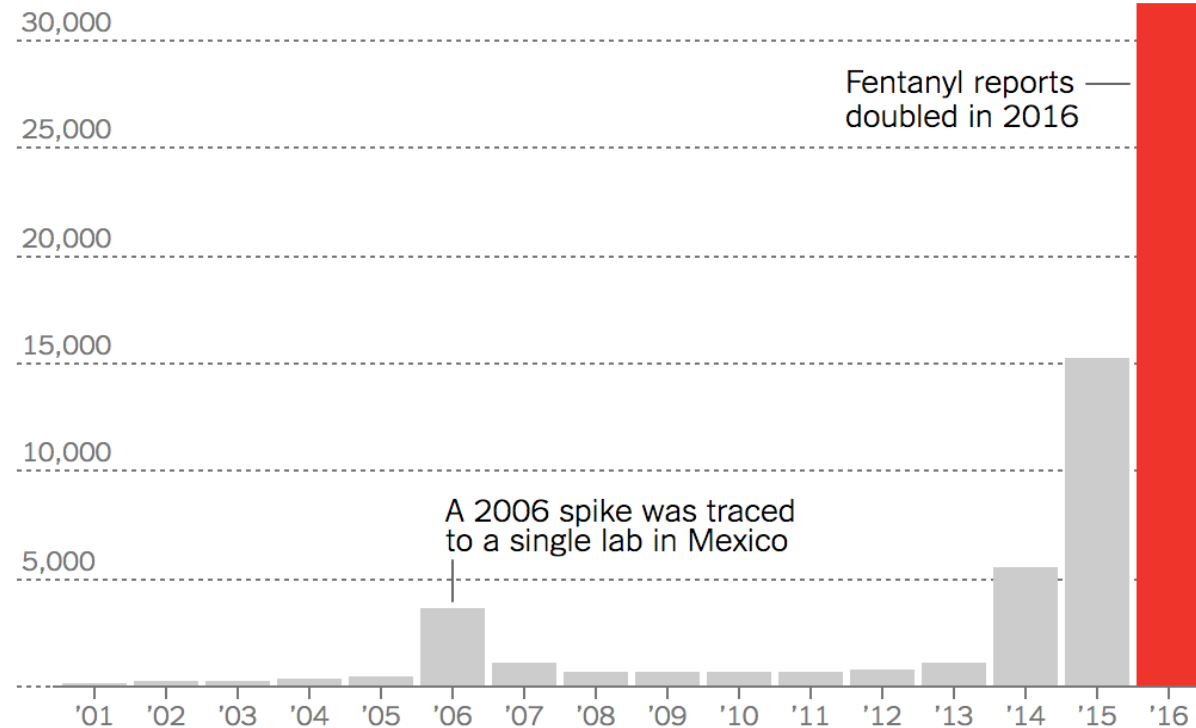
*Arrows do not represent specific transportation routes.

- 1 Fentanyl in powder form and pill presses are shipped via mail services.
- 2 The powder fentanyl is processed and mixed with heroin, or sold as heroin, or pressed into pills and sold in the Canadian drug market.
 - 2a Some fentanyl products are smuggled from Canada into the United States for sale, on a smaller scale.
- 3 The powder fentanyl is processed and mixed with heroin, or sold as heroin, or pressed into pills and sold in the United States drug market.
- 4 The powder fentanyl is cut and diluted for further smuggling, or pressed into counterfeit prescription pills.
 - 4a Diluted powder fentanyl and counterfeit prescription pills containing fentanyl are smuggled from Mexico into the United States.
- 5 Precursors for manufacturing fentanyl are shipped via mail services.
- 6 Precursors are used to manufacture fentanyl in clandestine laboratories.
- 7 Precursors are likely smuggled across the Southwest border into Mexico to manufacture fentanyl.
- 8 Precursors are likely used to manufacture fentanyl in clandestine laboratories.

Illicitly Manufactured Fentanyl

Then in 2014, fentanyl began entering the drug supply in large amounts.

Drug seizures containing fentanyl



Source: D.E.A. National Forensic Laboratory Information System

1 Kilogram of Fentanyl ~\$3500.00 from China

Figure 13. Potential Revenue Generated from Fentanyl Pill Sales Using 1 Kilogram of Fentanyl (in USC)

Amount of Fentanyl Per Pill	Price Per Pill	Price Per Pill	Price Per Pill
	\$10	\$15	\$20
1.5 milligrams (666,666 pills)	\$6.6 million	\$9.9 million	\$13.3 million
1 milligram (1 million pills)	\$10 million	\$15 million	\$20 million

Source: DEA, 2016

1 Kilogram of Heroin costs about the same, but only brings in \$500,000

- Fentanyl, others, showing up in counterfeit pills
- Oxycodone
- Benzodiazepines
- Others

Figure 5: Counterfeit Oxycodone Pills Containing U-47700.



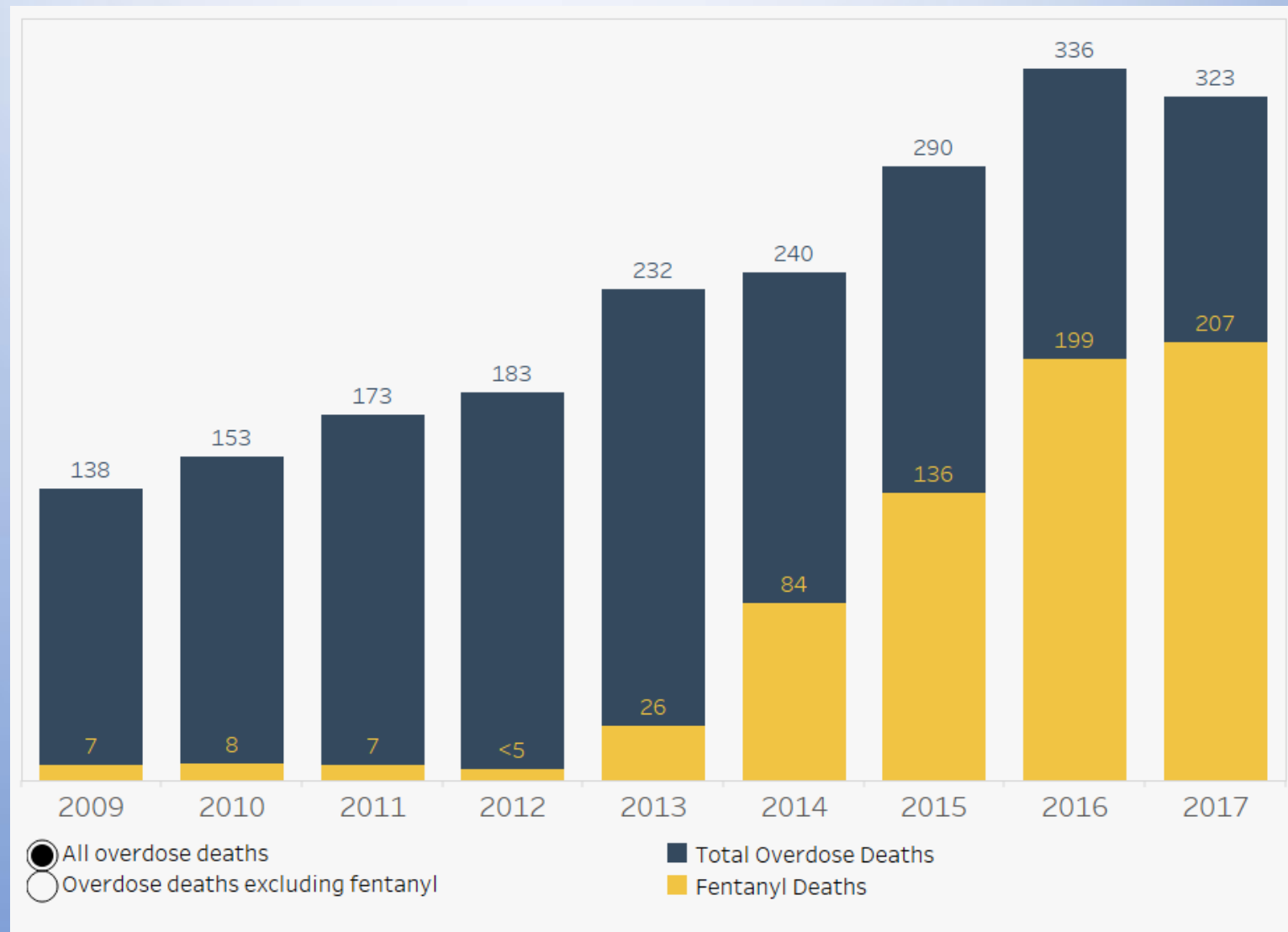
Source: Lorain County, Ohio, Sheriff's Office

What is the relative prevalence of Fentanyl versus Heroin in RI?

- Asked a single lab that specializes in UDT to provide all results by month in RI.
- January 2016 through end of June 2017
- Relative prevalence of Fentanyl and Heroin in RI
- What % of Fentanyl positive screens also contain Heroin?
- What % of Heroin positive screens also contain Fentanyl?

Potency is the Problem: illicit fentanyl was responsible for 60% of overdose deaths in 2017 in Rhode Island

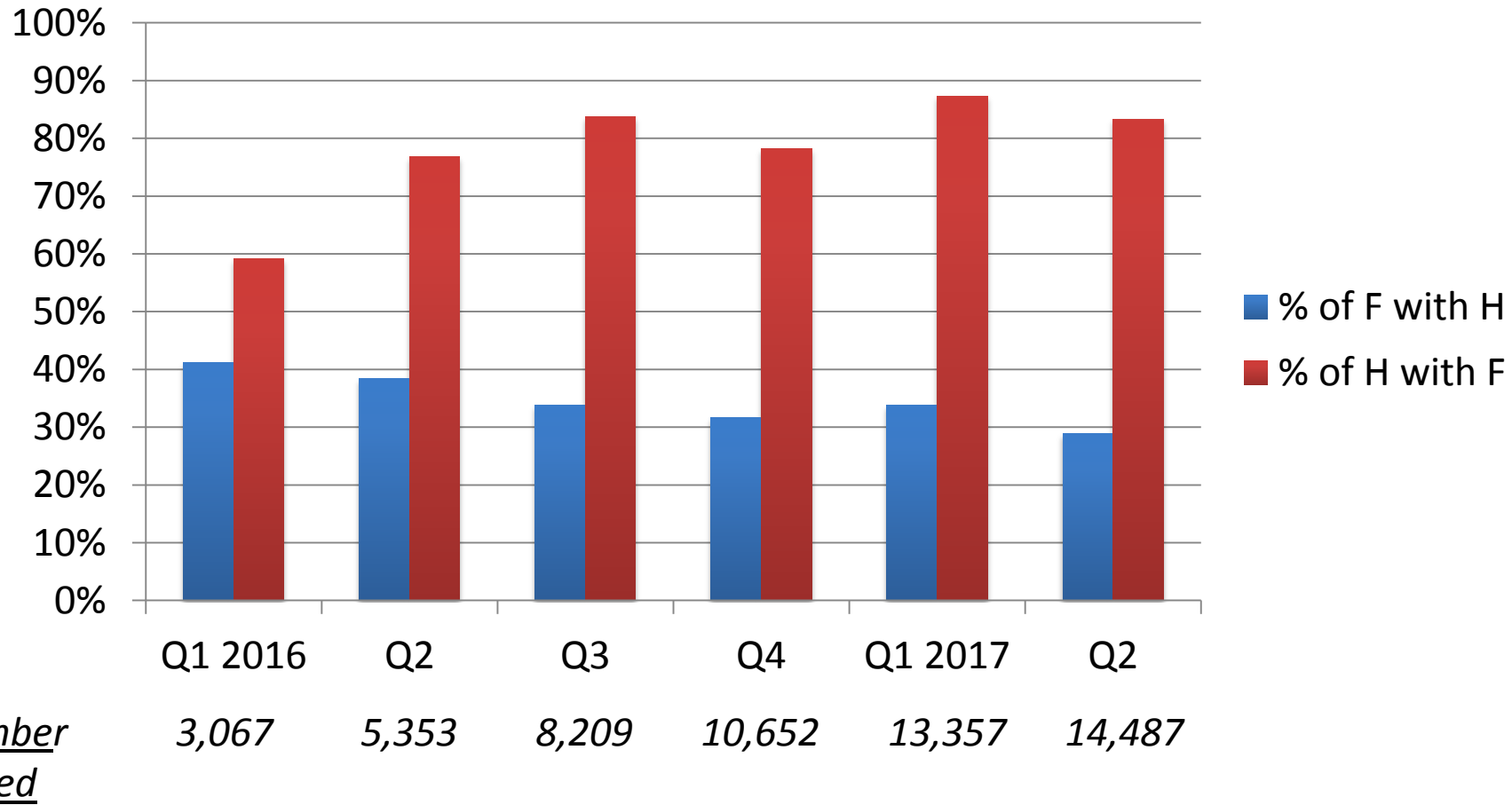
RI Overdose Deaths due to Fentanyl (2009 to 2017)



Data from RI
Dept of Health

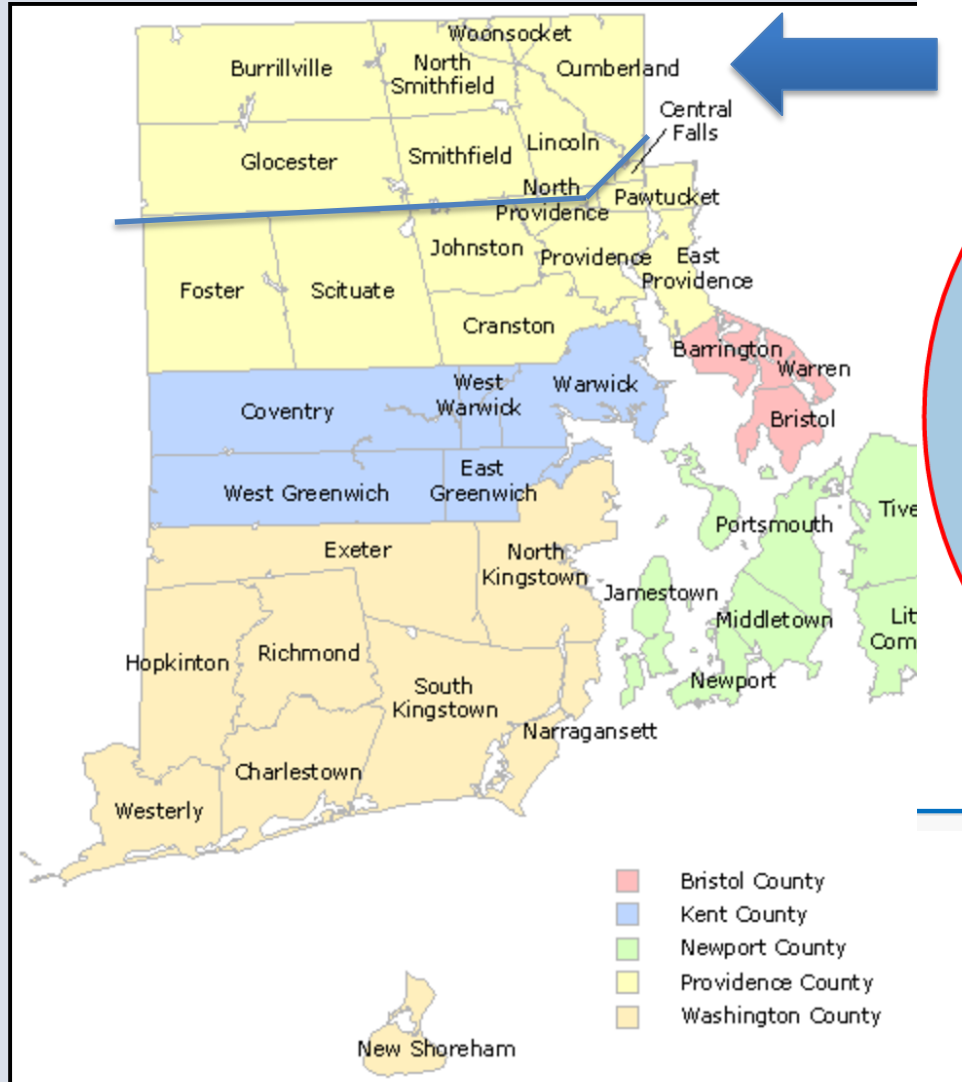
Fentanyl less likely to be cut with Heroin. Heroin very likely to be cut with Fentanyl

(RI)

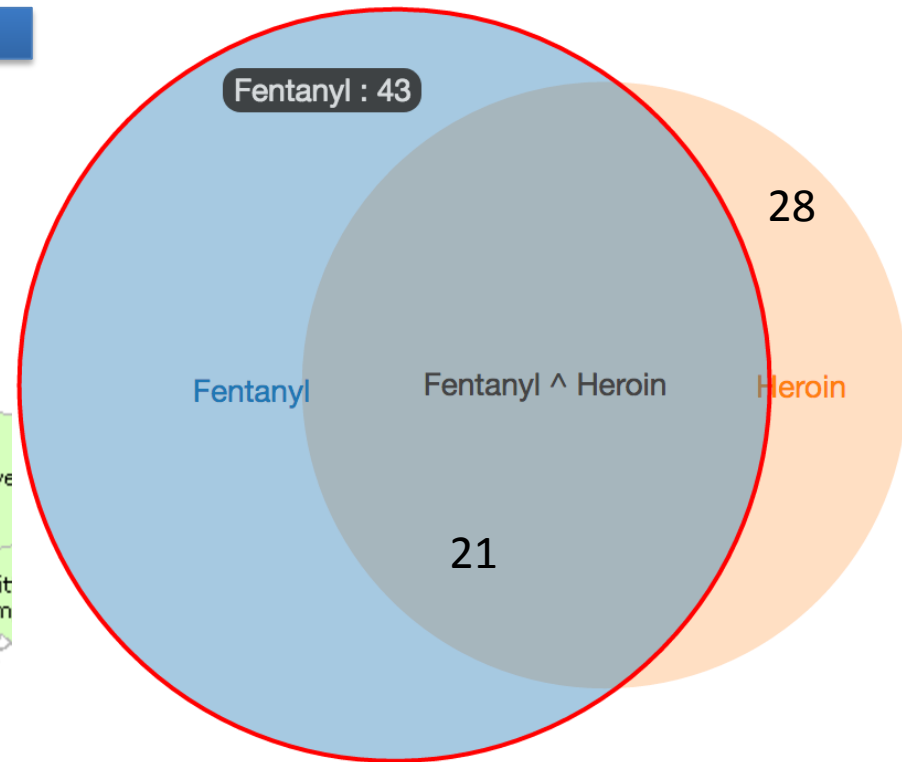


Northern RI / MA

Map of Rhode Island Counties, Cities, and Towns

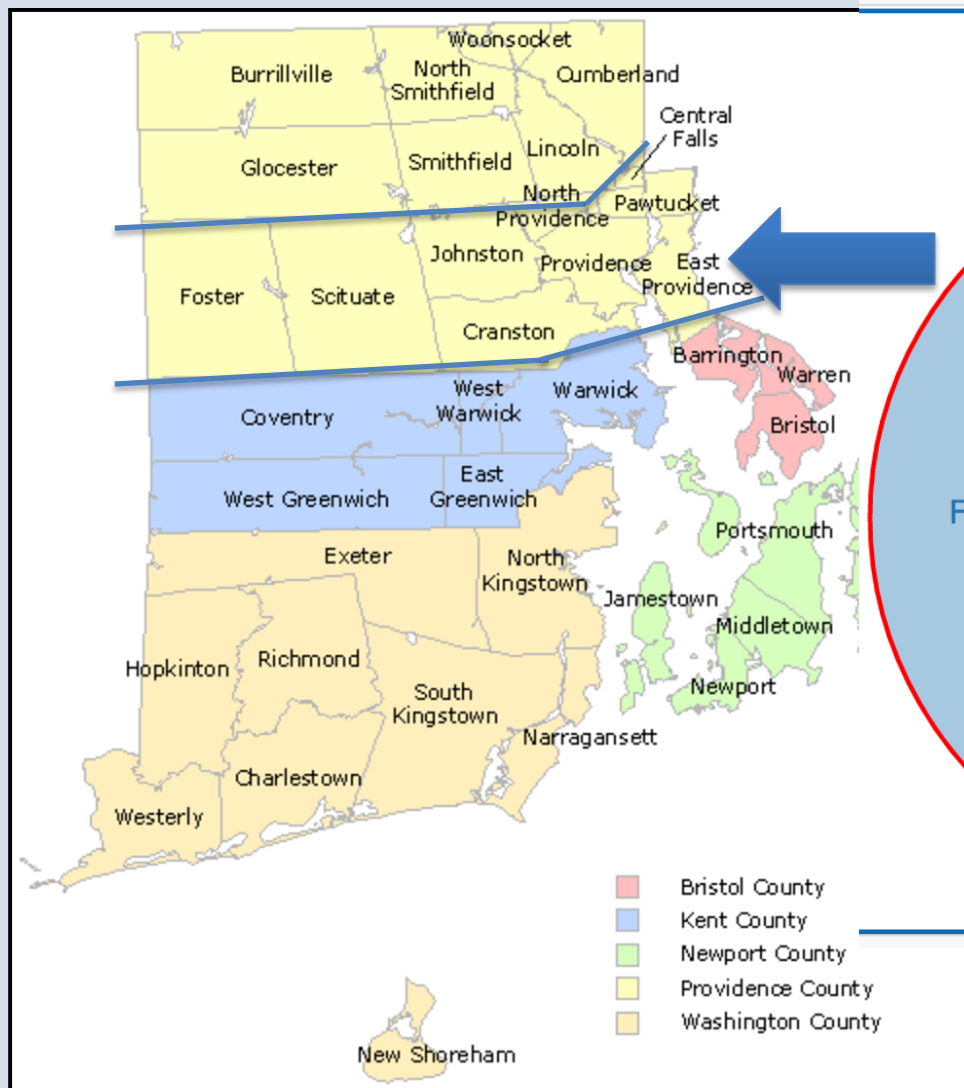


North RI / MA

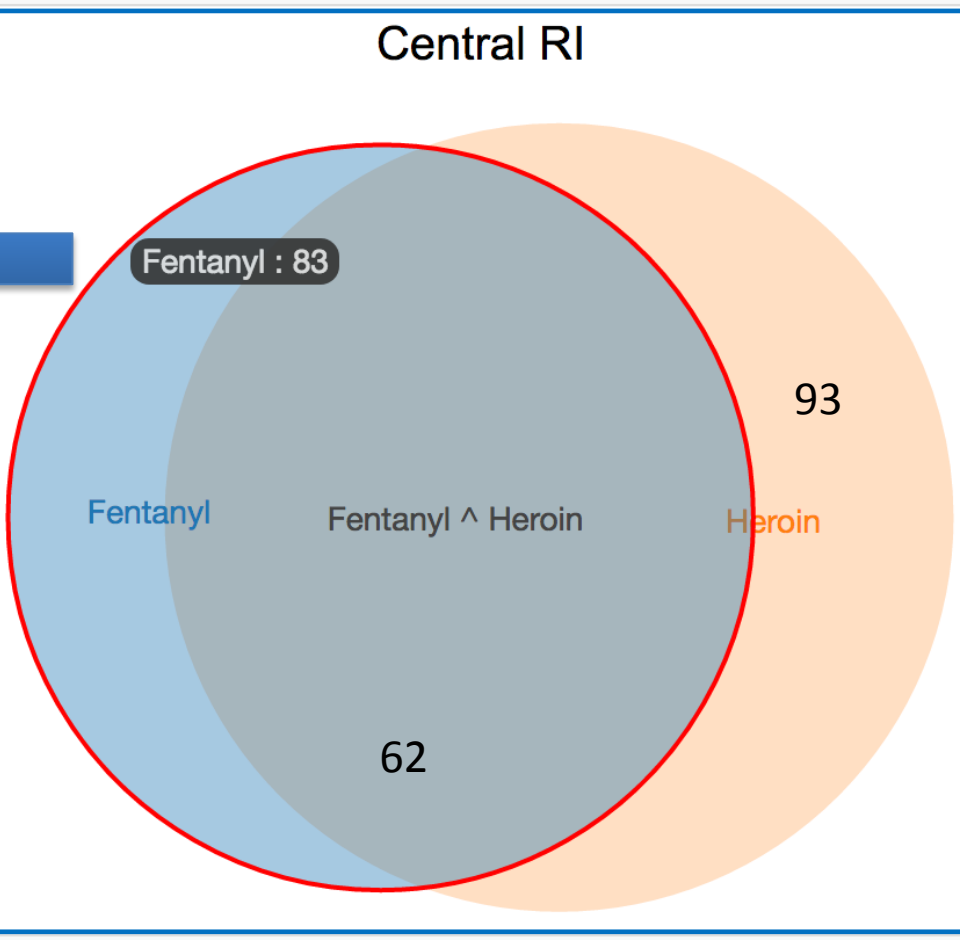


Central RI

Map of Rhode Island Counties, Cities, and Towns

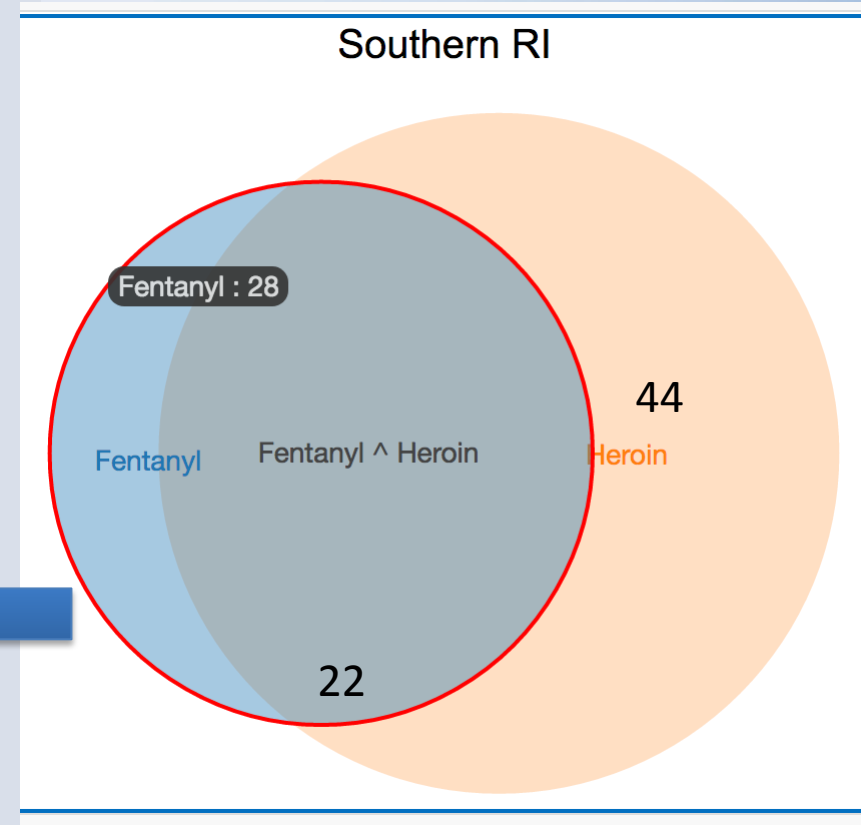
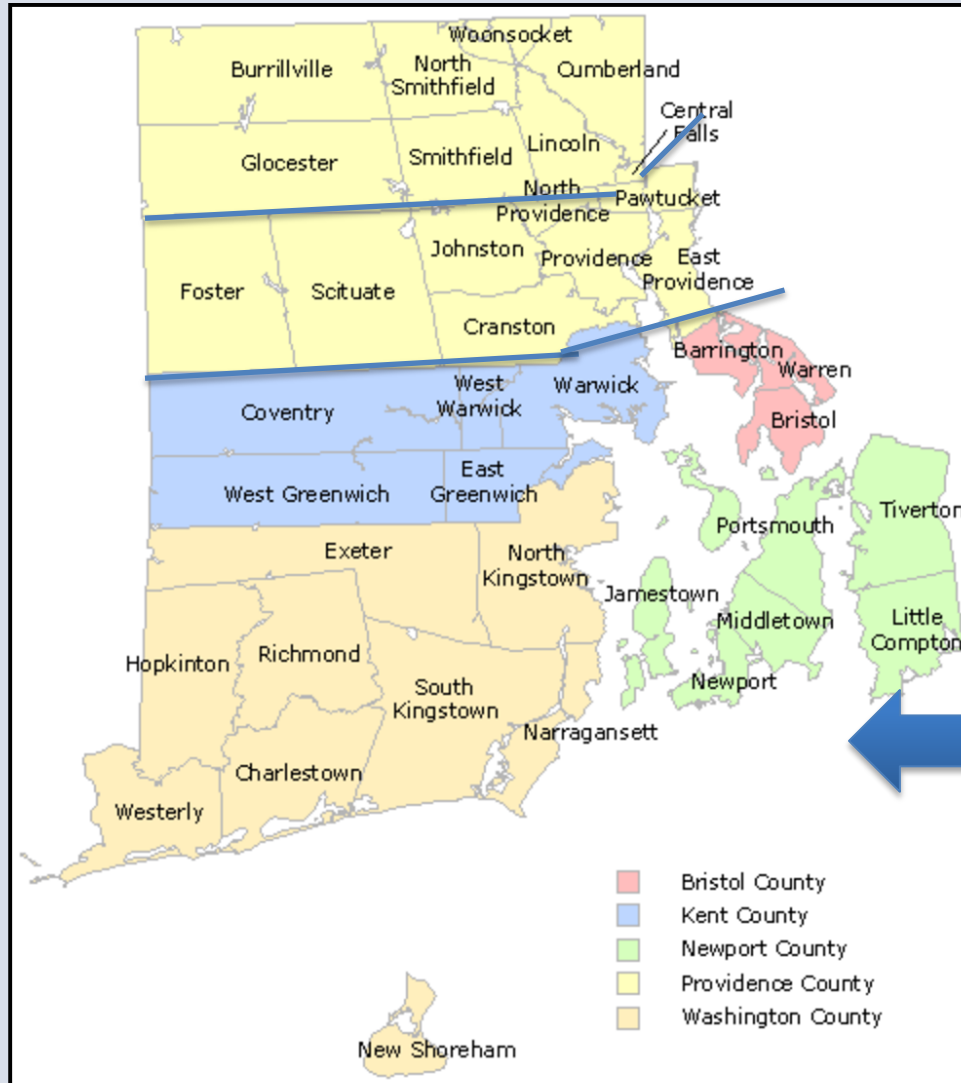


Central RI



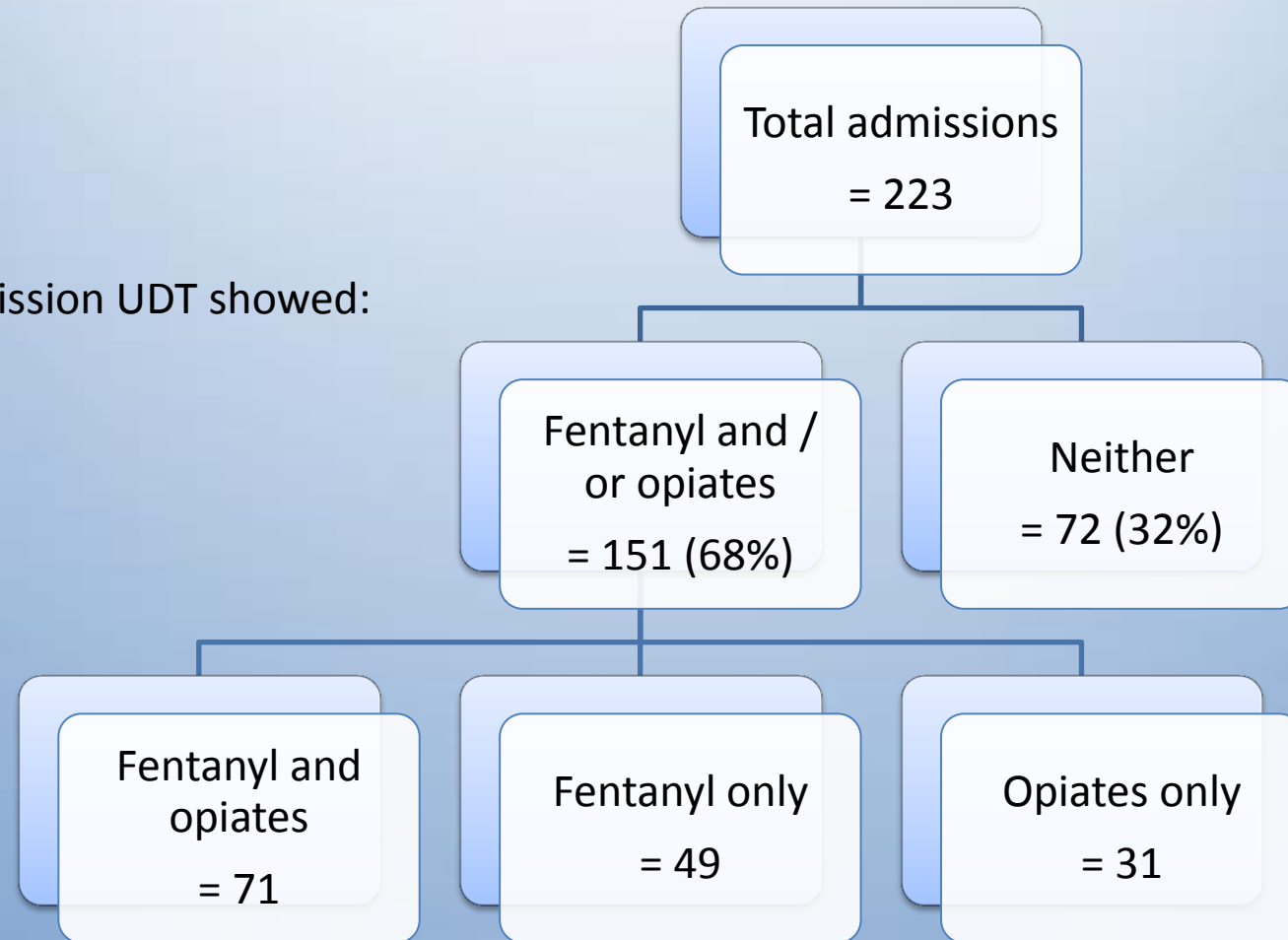
Southern RI

Map of Rhode Island Counties, Cities, and Towns



November 1, 2016 -> August 31, 2017

Admission UDT showed:



Outcomes New Admissions Time in Treatment (follow-up as of 9/10/17)

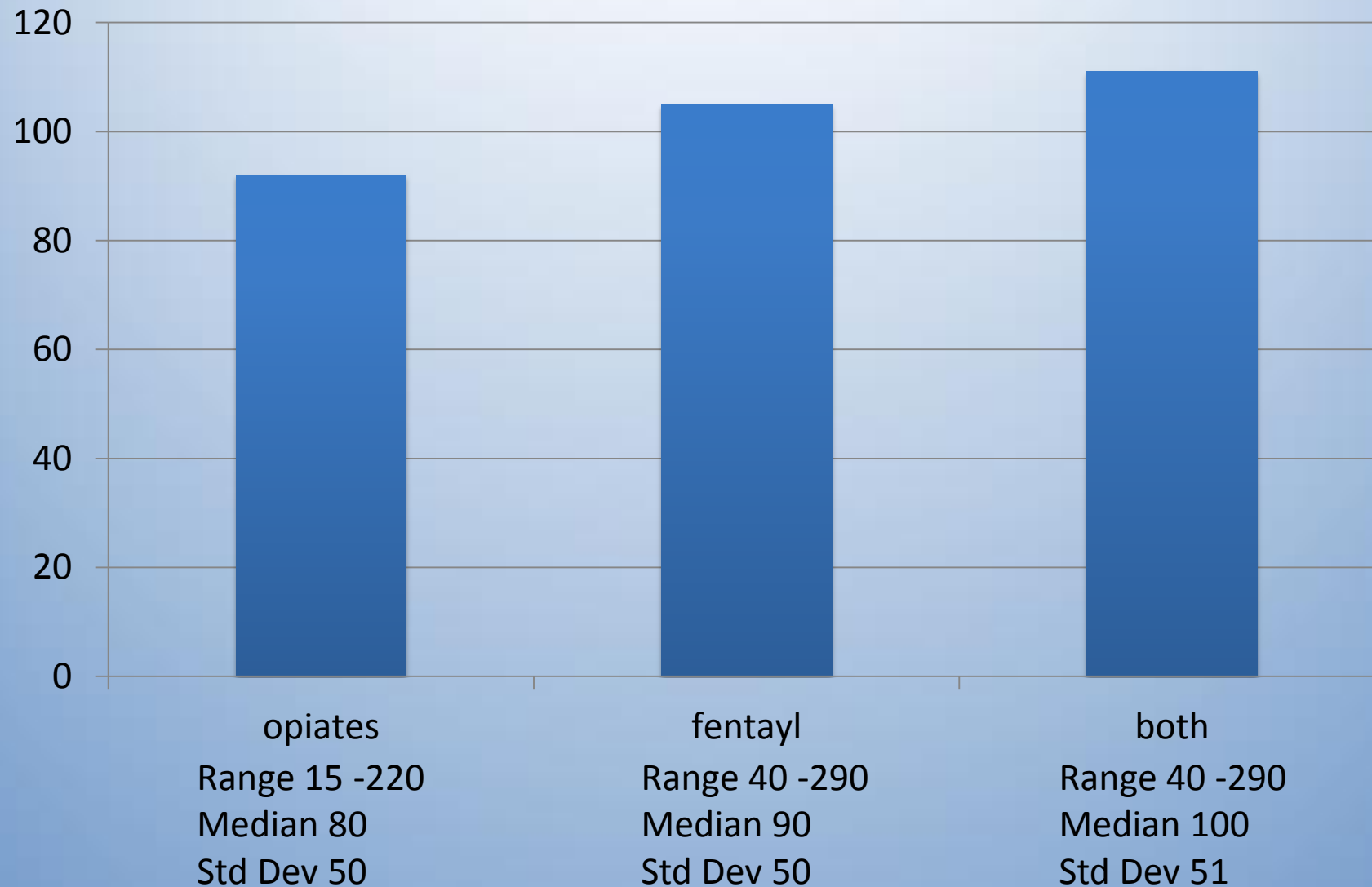
	Ave Follow-up	SD	Range
FENTANYL AND OPIATES N = 71 (47%)	128 days (median 101)	89	2 – 311 days
FENTANYL ONLY N = 49 (32%)	131 days (median 108)	86	11 – 315 days
OPIATES ONLY N = 31 (21%)	141 days (median 116)	95	18 – 311 days
TOTAL N = 151	132 days (median 113)	86	2 – 315 days

Outcomes New Admissions

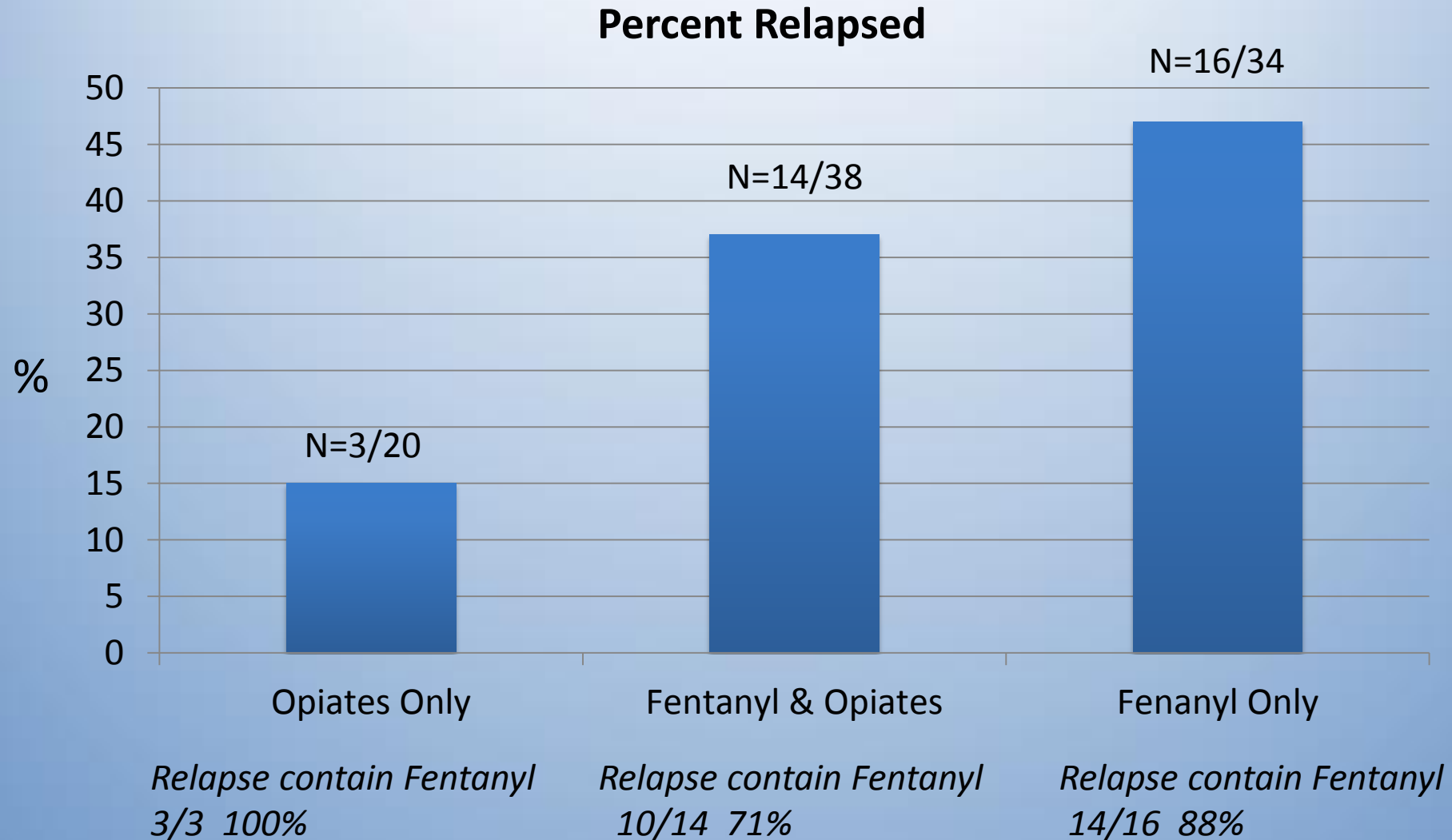
	RETENTION	NEGATIVE X3	RELAPSE after 3 neg
FENTANYL AND OPIATES N = 71	53 / 71 75%	38 / 71 54%	14 / 38 37%
FENTANYL ONLY N = 49	38 / 49 78%	34 / 49 69%	16 / 34 47%*
OPIATES ONLY N = 31	22 / 31 71%	20 / 31 65%	3 / 20 15%*
TOTAL N = 151	113 / 151 75%	92 / 151 61%	33 / 92 36%

* p<0.05

Average Dose (mg) of Methadone at 3rd Negative



% Relapse after obtaining 3 (-) screens by Substance(s) found at Intake



Summary

- Fentanyl is in the illicit drug market (may be replacing heroin in some areas not simply augmenting)
- Fatal overdoses are rapidly increasing anywhere Fentanyl is found (often the user does not know what they are using)
- Public health surveillance is hampered by incomplete testing for fentanyl in the addicted populations who use opioids (Testing is needed to warn users -> keep people alive until they reach treatment)
- Universal testing may be advisable in some areas
- MAT appears to be effective treatment; however higher doses may be required and relapses may be more common