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Prescription Drug Abuse and Misuse in Southern Appalachia: An Epidemiologic Perspective

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Prescription Drug Abuse and Misuse in Southern Appalachia: An Epidemiologic Perspective

Prescription Drug Abuse and Misuse in Southern Appalachia: An Epidemiologic Perspective

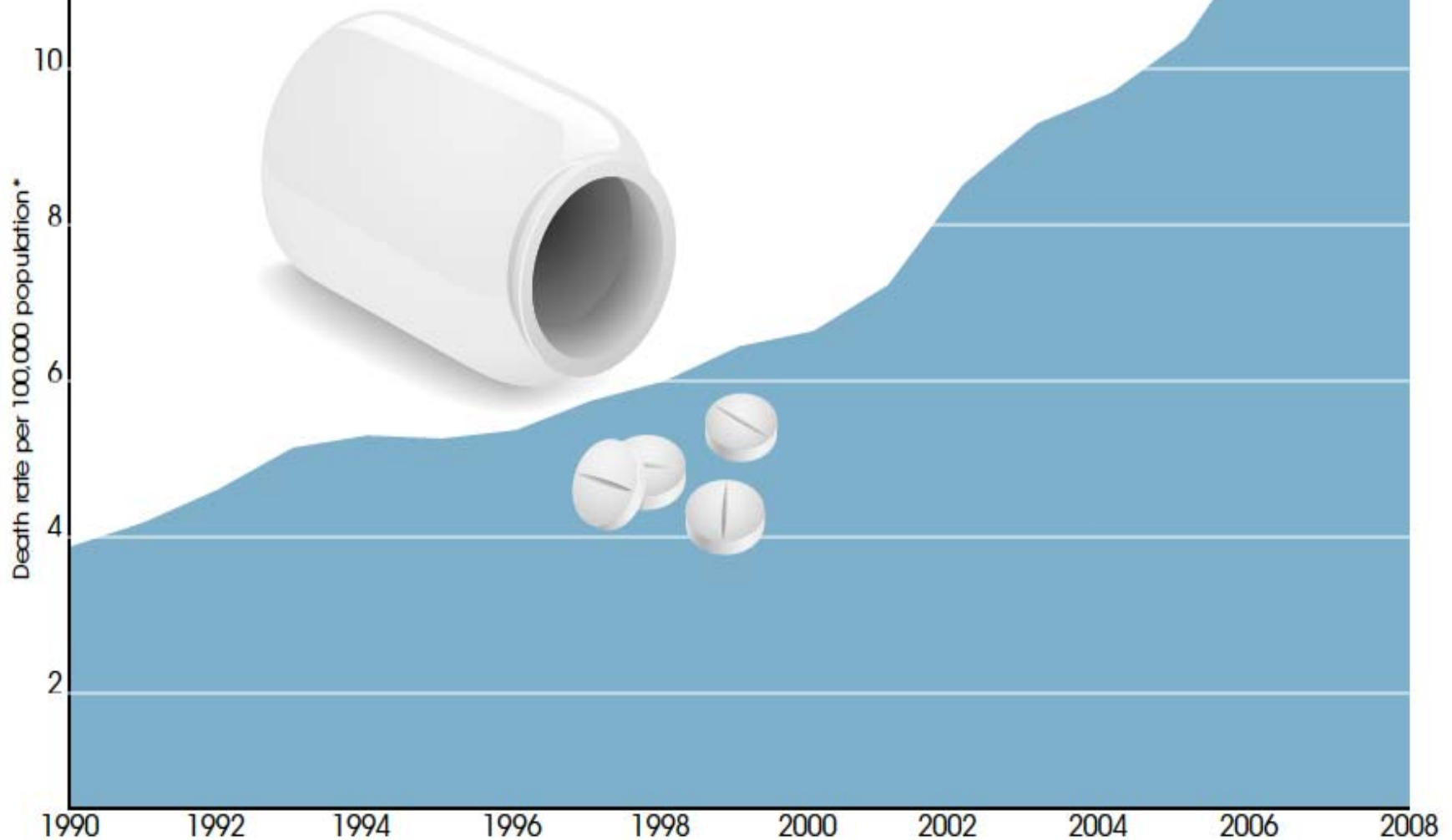
Billy Brooks, DrPH(c), MPH
Department of Biostatistics and
Epidemiology



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Drug overdose death rates in the US have **more than tripled** since 1990.⁵



*Deaths are those for which poisoning by drugs (illicit, prescription, and over-the-counter) was the underlying cause.

National Vital Statistics System. Drug overdose death rates by state, 2008.

In 2008, there were 14,800 prescription painkiller deaths.⁴

For every **1** death there are...



10 treatment admissions for abuse⁹

32 emergency dept visits for misuse or abuse⁶

130 people who abuse or are dependent⁷

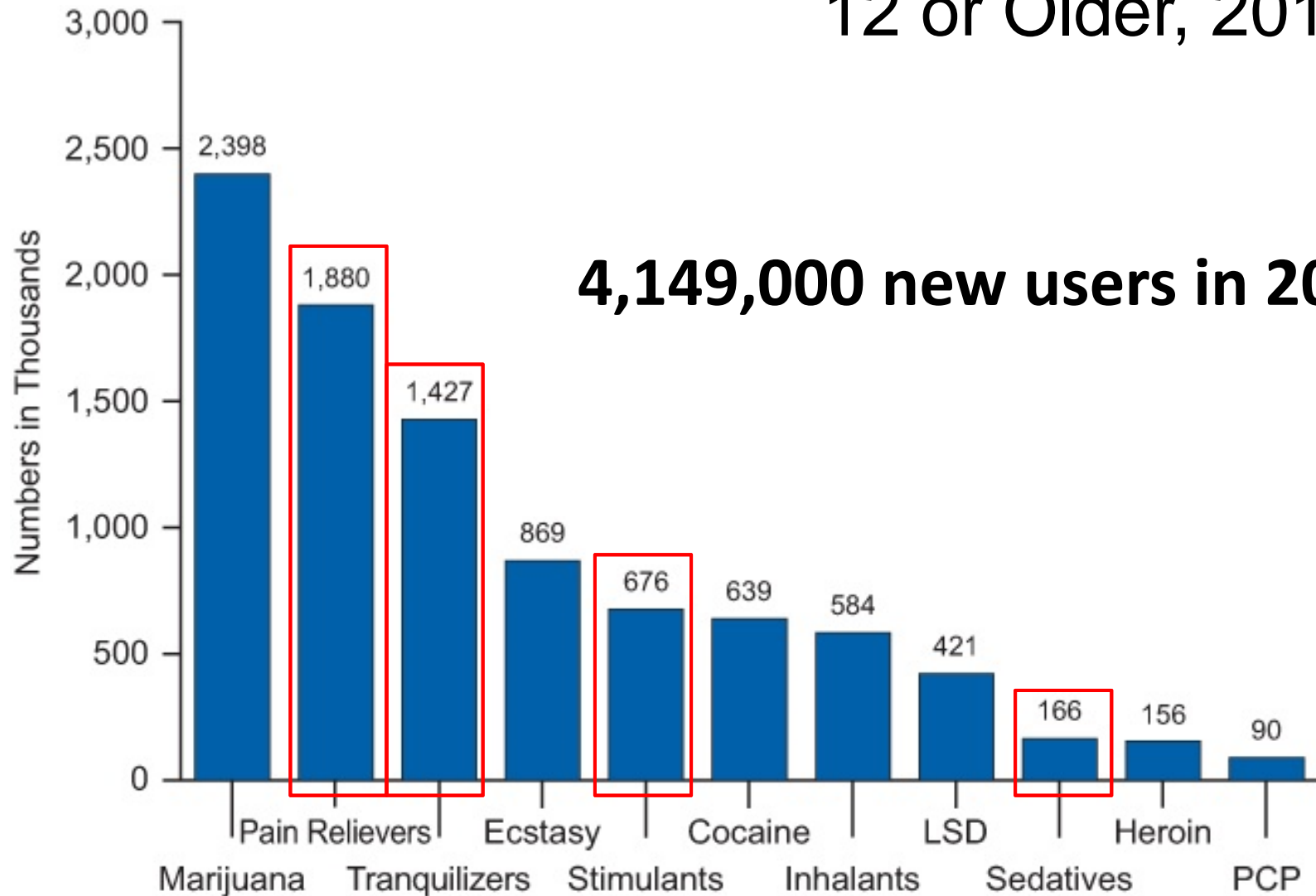
825 nonmedical users⁷

12,210,000

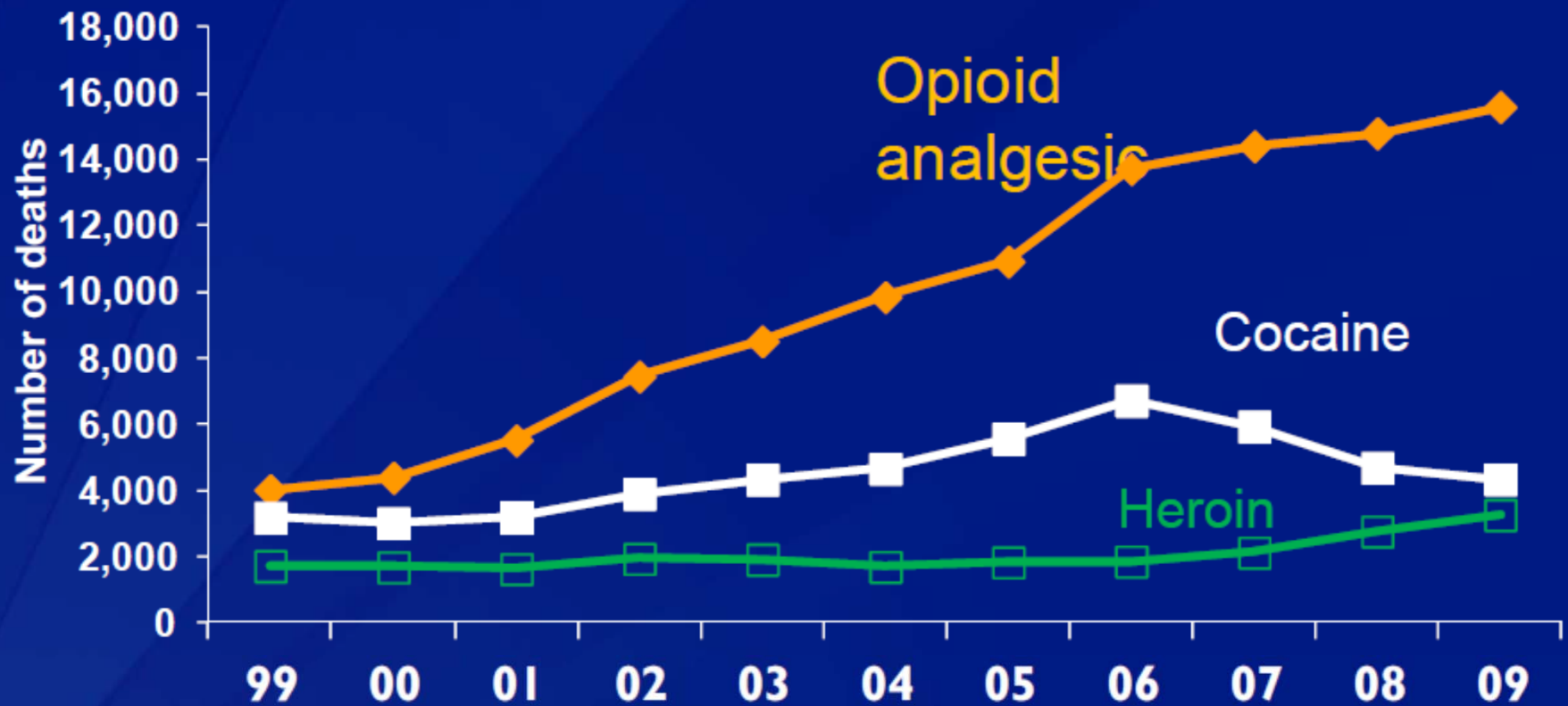
CDC. Vital Signs: Overdoses of Prescription Opioid Pain Relievers—United States, 1999-2008. MMWR 2011; 60: 1-6

Substance Abuse and Mental Health Services Administration. Results from the 2010 National Survey on Drug Use and Health: volume 1: summary of national findings. Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies; 2011. Available from URL: <http://oas.samhsa.gov/NSDUH/2k10NSDUH/2k10Results.htm#2.16>

Past Year Initiates of Illicit Drugs, 12 or Older, 2012



Drug overdose deaths of all intents by major drug type, U.S., 1999-2009



Source: National Vital Statistics System. The reported 2009 numbers are underestimates. Some overdose deaths were not included in the total for 2009 because of delayed reporting of the final cause of death.

Prescription vs. Illicit (2011)

- Drug overdose leading cause of injury death
- 80% (33,071) of overdose deaths unintentional
- 58.3% (1.4 million) of overdose ED Admissions related to pharmaceuticals
- 55% (22,810) of drug overdose deaths related to pharmaceuticals



Non-medical Prescription Drug Use (NMPDU)

“...the use of a medication without a prescription, in a way other than as prescribed, or for the experience or feelings elicited...”

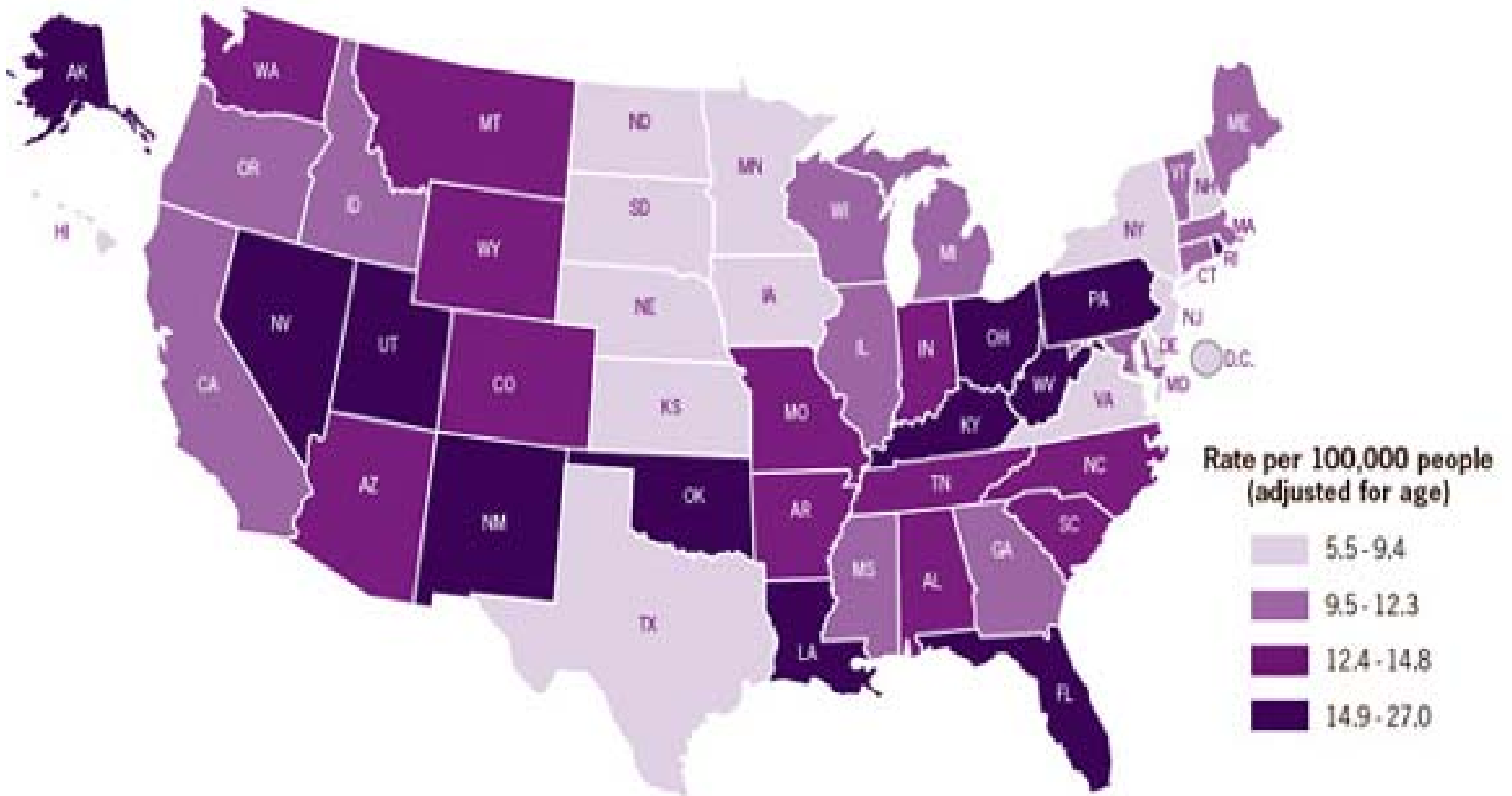
-National Institute on Drug Abuse



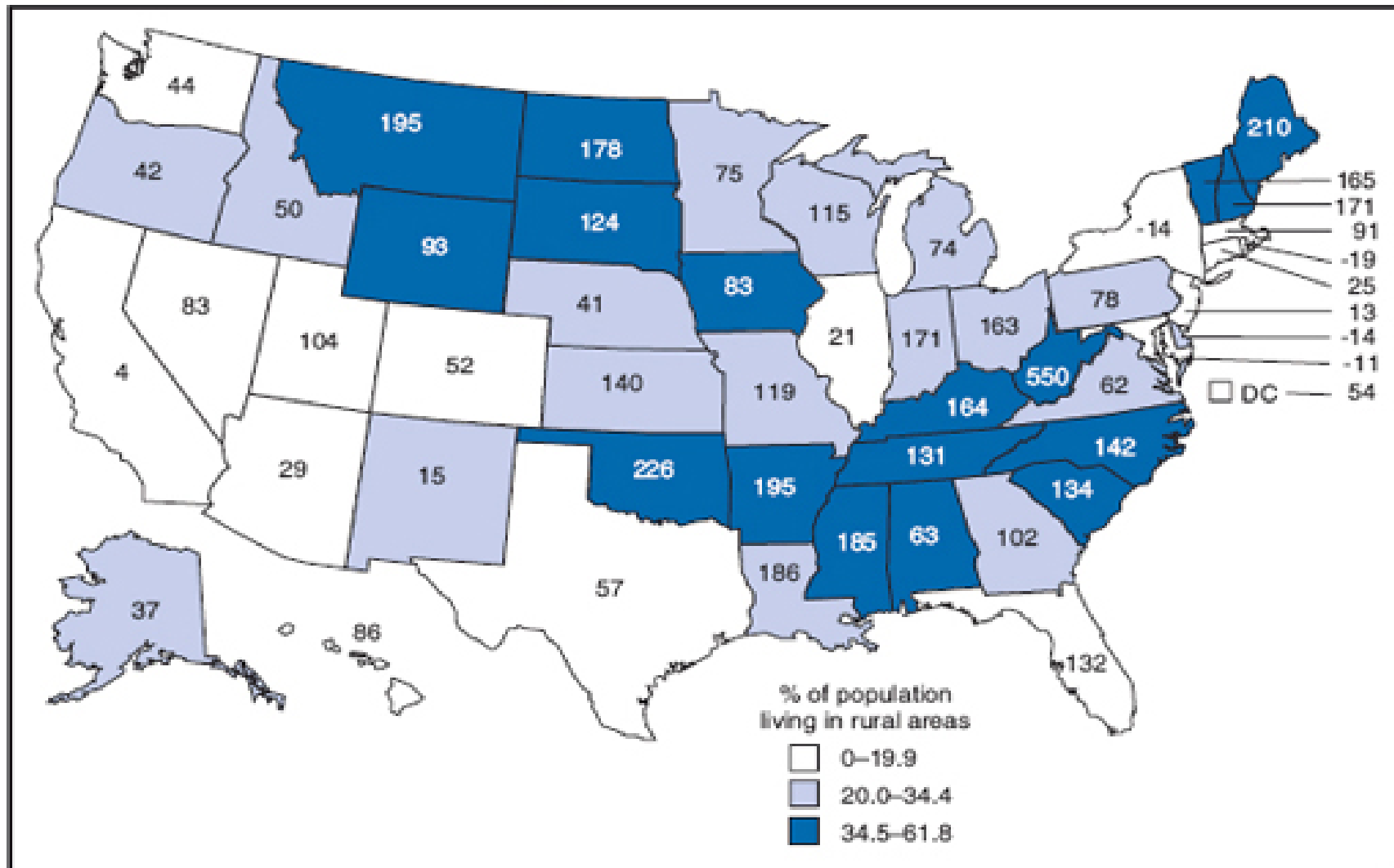
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Drug Overdose Rates by State, 2008



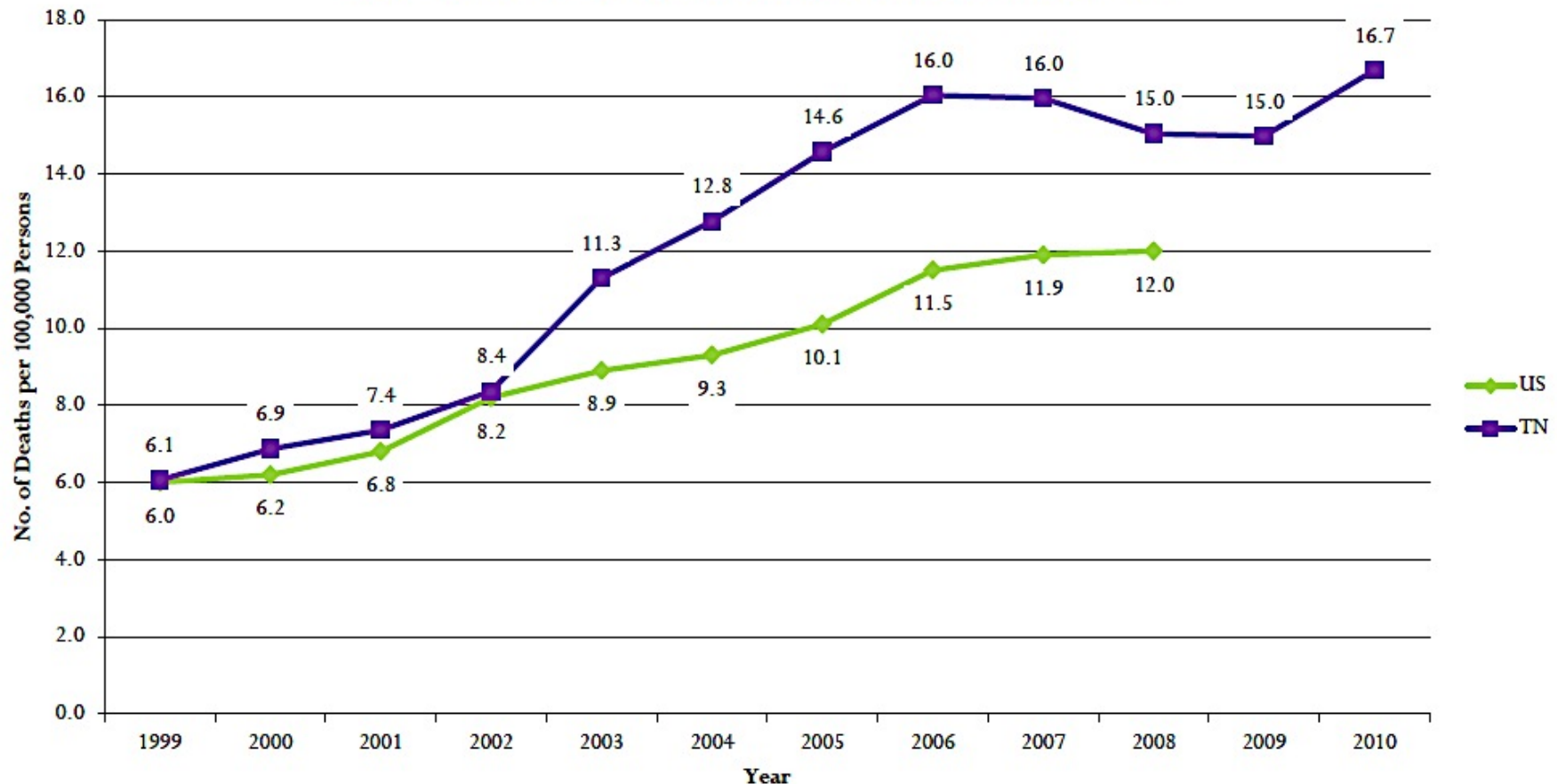
Percent Change in Unintentional Poisoning Mortality Rates, by Rural Status of State – United States, 1999-2004



Centers for Disease Control and Prevention. (2007). Unintentional poisoning deaths -- united state, 1999-2004. Morbidity and Mortality Weekly Report, 56(5), 93-96.

Drug Overdose Death Rates Are Increasing

Death Rates from Drug Overdoses per 100,000 population, Tennessee vs. US



Source: Office of Policy, Planning and Assessment, Tennessee Department of Health – Death Certificates

Source: NCHS Data Brief, No. 81, December 2011, "Drug Poisoning Deaths in the United States, 1980 – 2008", Data table for Figure 1

**Drug Dependence
Surveillance System
(Week 52)¹**

Reporting Summary (Year)

**Maternal County of
Residence
(By Health Department
Region)**

**#
Cases**

**%
Cases**

(
er 28, 2013

ported

Source of Maternal
Supervised replacement
Supervised pain treatment
Therapy for psychological
Prescription substances
Non-prescription substances
No known exposure
No response

Davidson	34	4.0%
East	240	28.1%
Hamilton	17	2.0%
Jackson/Madison	2	0.2%
Knox	99	11.6%
Mid-Cumberland	57	6.7%
North East	124	14.5%
Shelby	18	2.1%
South Central	27	3.2%
South East	12	1.4%
Sullivan	84	9.8%
Upper Cumberland	110	12.9%
West	31	3.6%
Total	855	100%

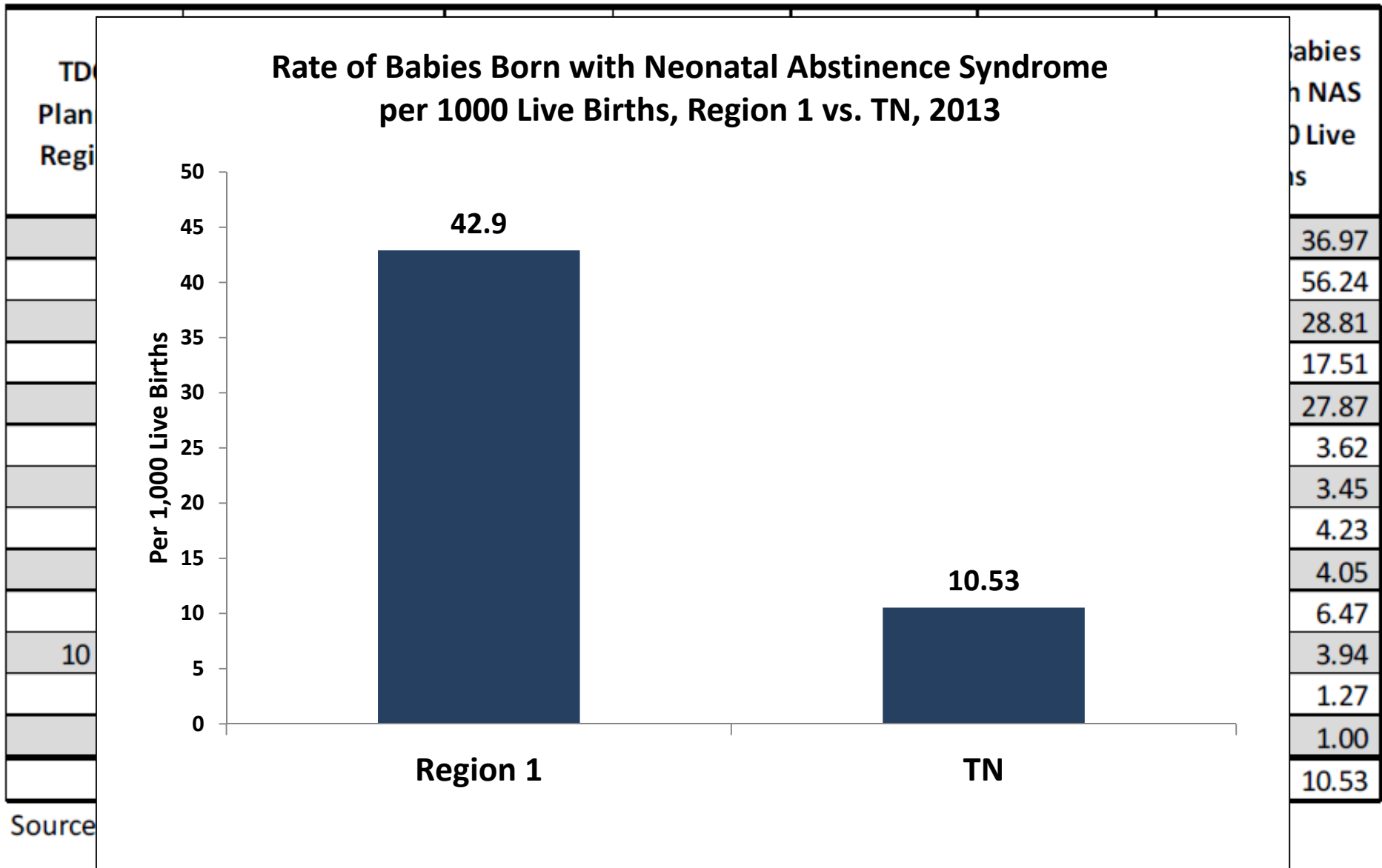
# Cases²	% Cases
397	46.4%
165	19.3%
67	7.8%
341	39.9%
236	27.6%
11	1.3%
19	2.2%

	236	27.6%
	11	1.3%
	19	2.2%

1. Summary reports are archived
2. Multiple maternal substances

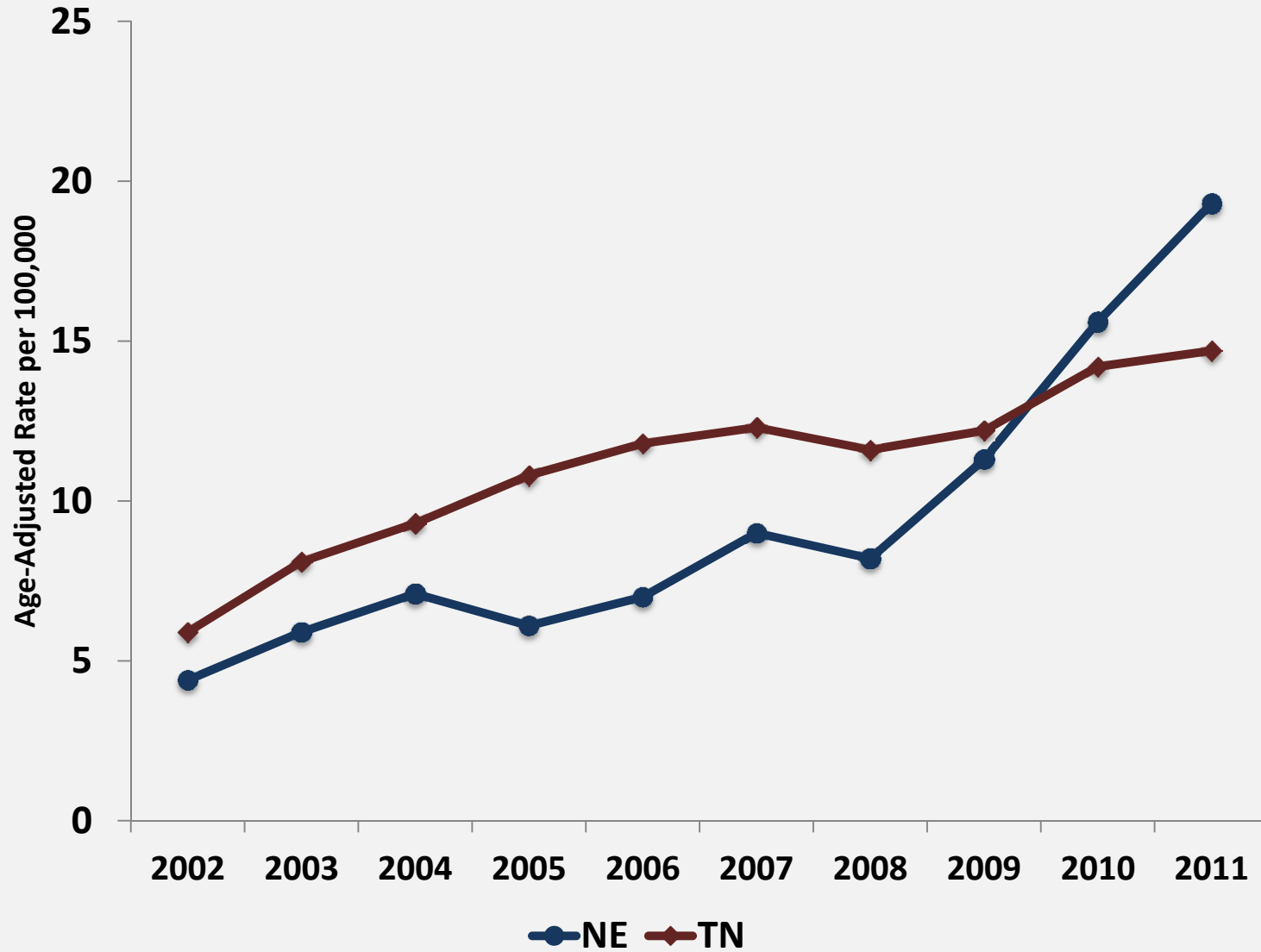
number of cases reported.

**Table I-1. Drug Dependent Newborns (Neonatal Abstinence Syndrome)
Surveillance Summary 2013**

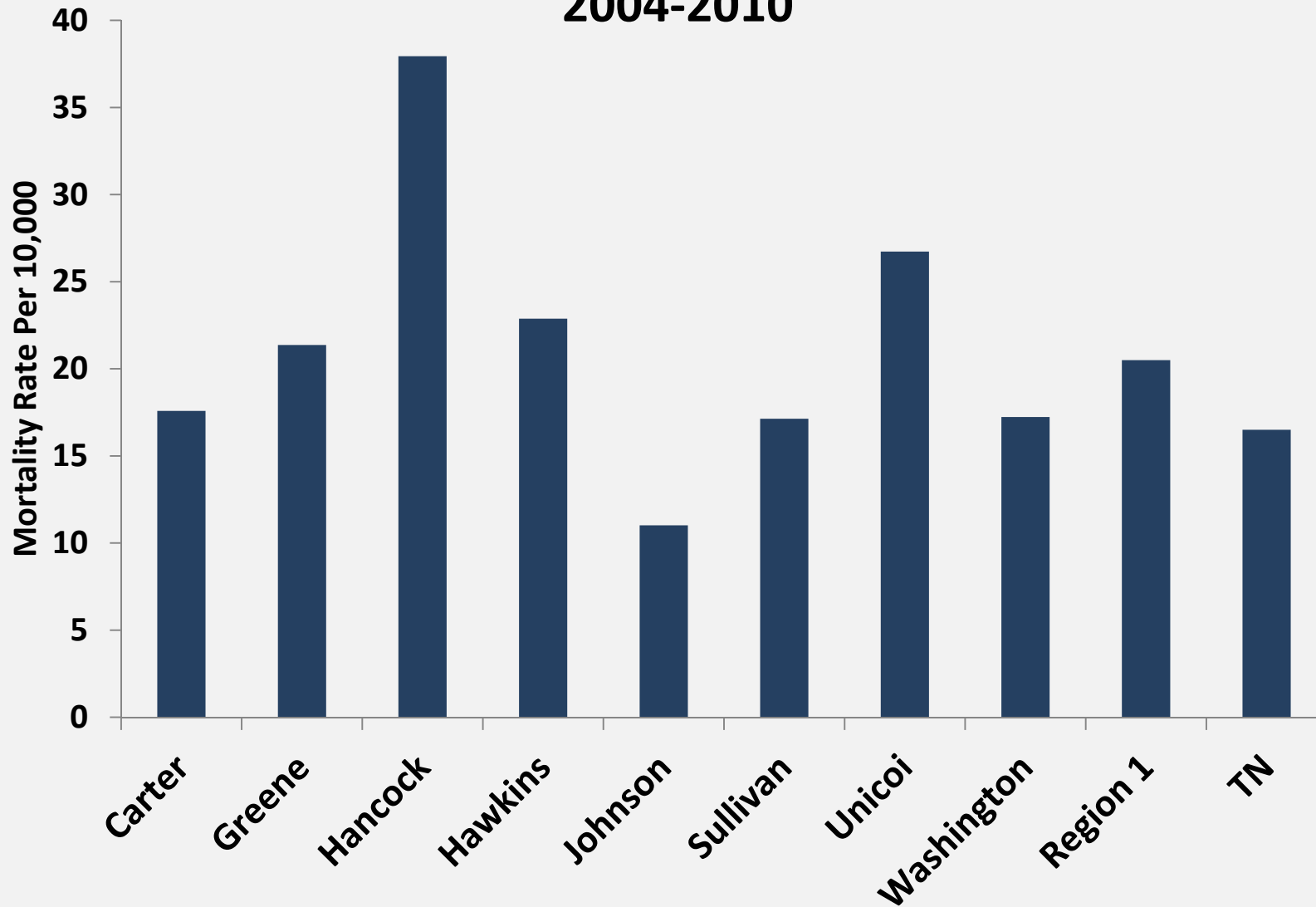


Source

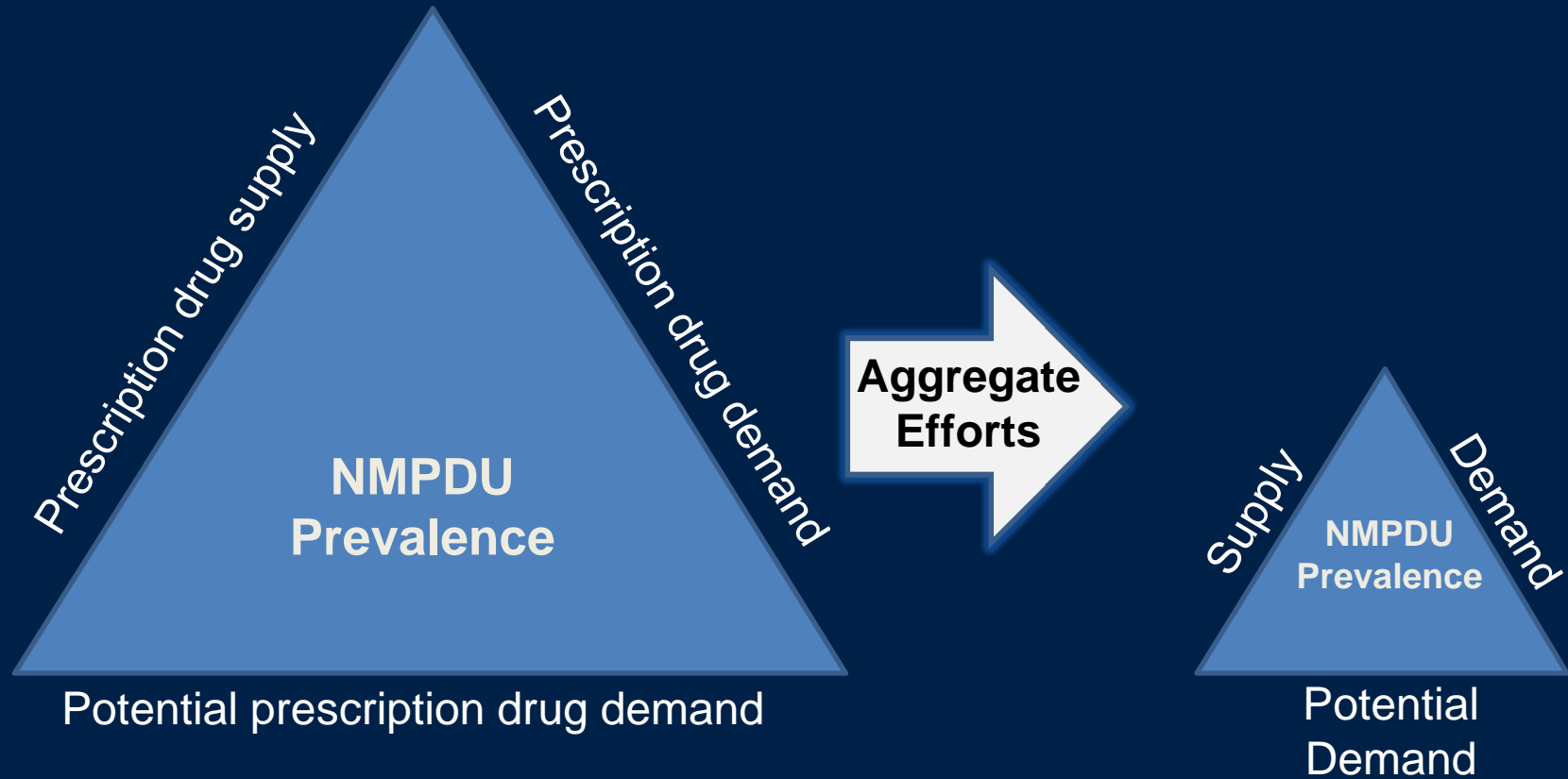
Deaths by Accidental Poisonings, 2002-2011, Region 1 vs. TN



Drug Poisoning Mortality Rate, by Region 1 Counties, 2004-2010



What's Driving NMPDU?



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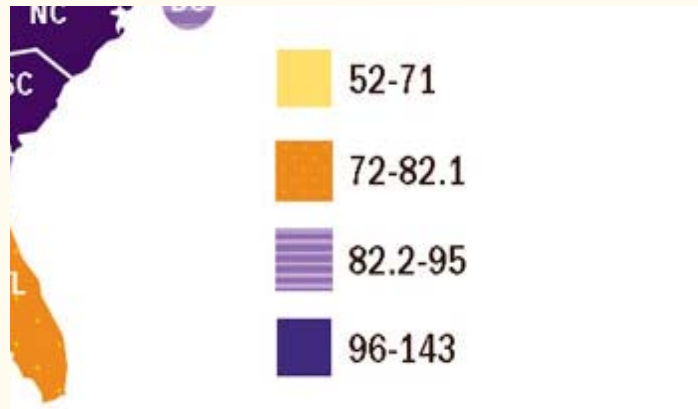
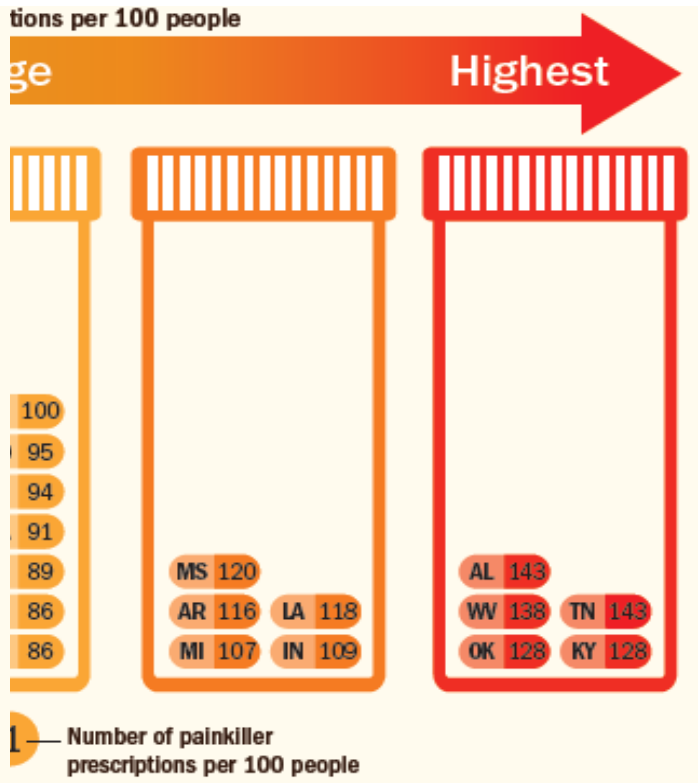
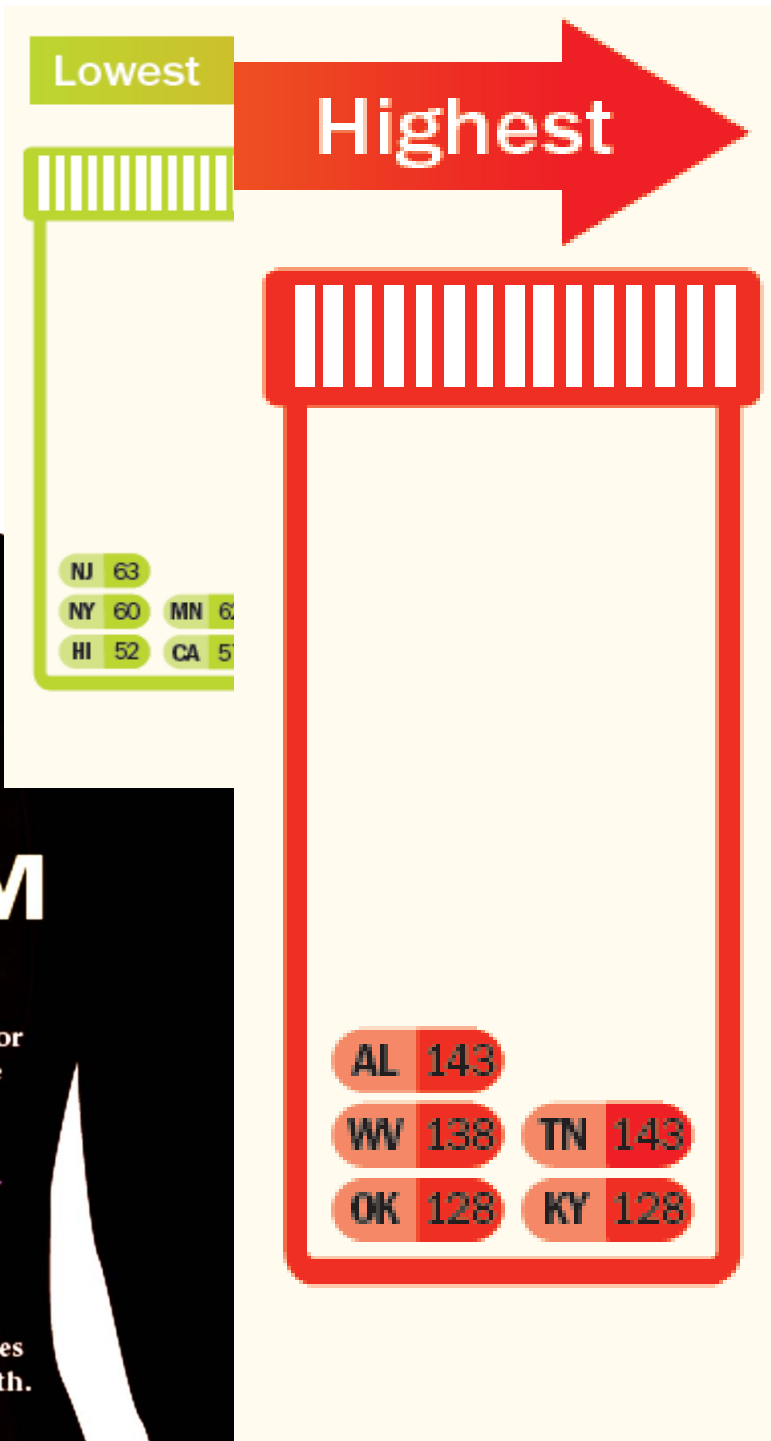
Each day, 46 people die from an overdose of prescription painkillers* in the US.

 **259 M**

Health care providers wrote 259 million prescriptions for painkillers in 2012, enough for every American adult to have a bottle of pills.

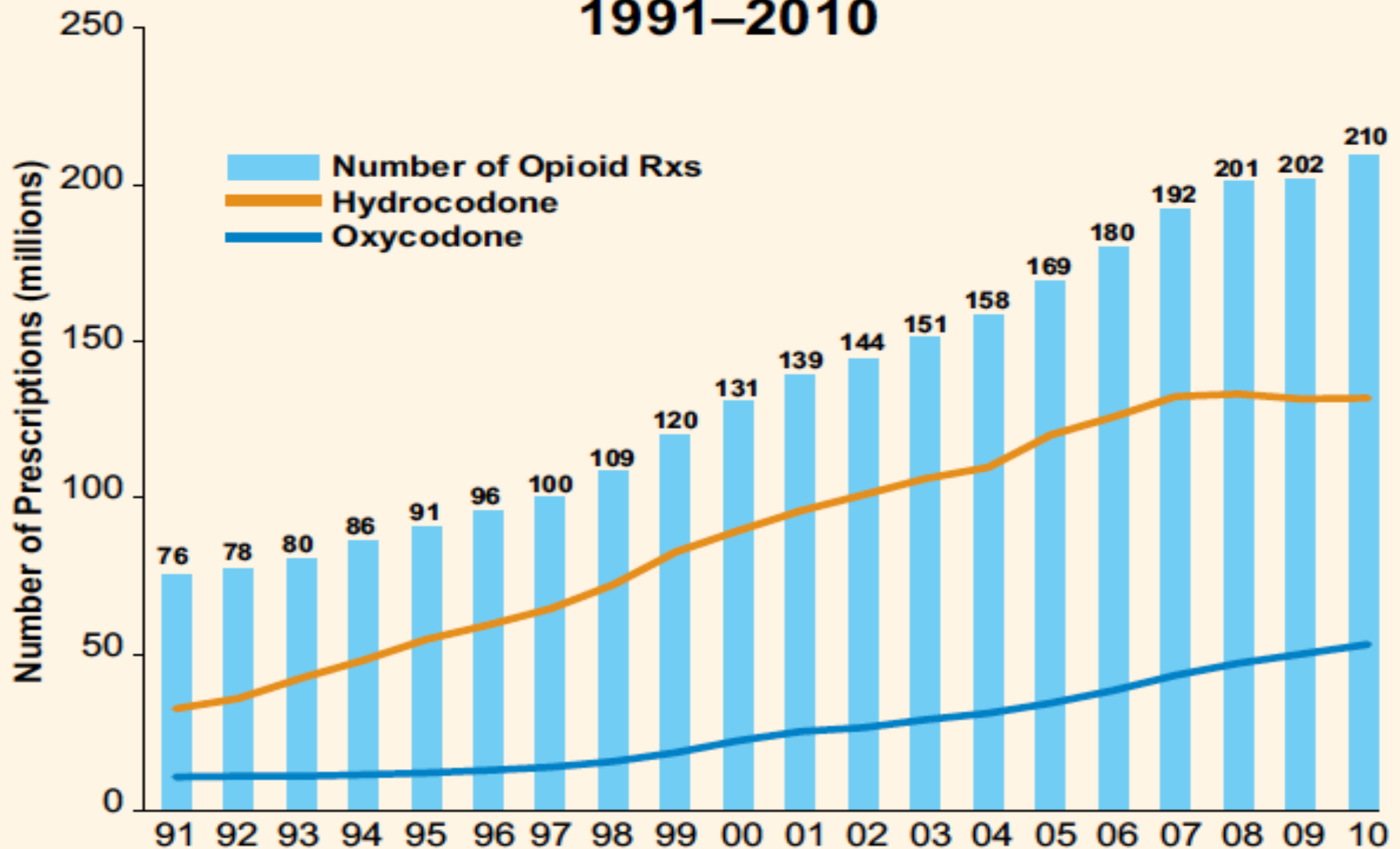
10 

10 of highest prescribing states for painkillers are in the South.



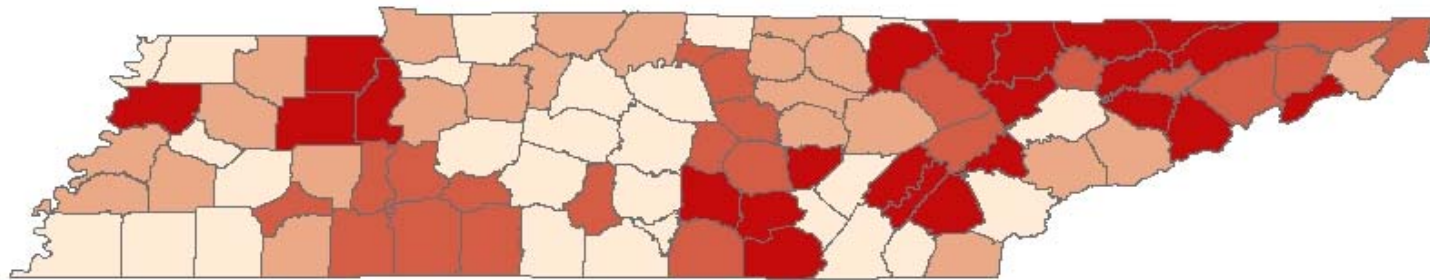
SOURCE: IMS, National Prescription Audit (NPA™), 2012.

Total Number of Opioid Prescriptions Dispensed by U.S. Retail Pharmacies, 1991–2010

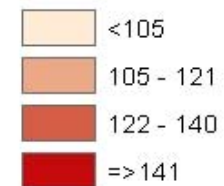


Source: SDI's Vector One®: National (VONA)

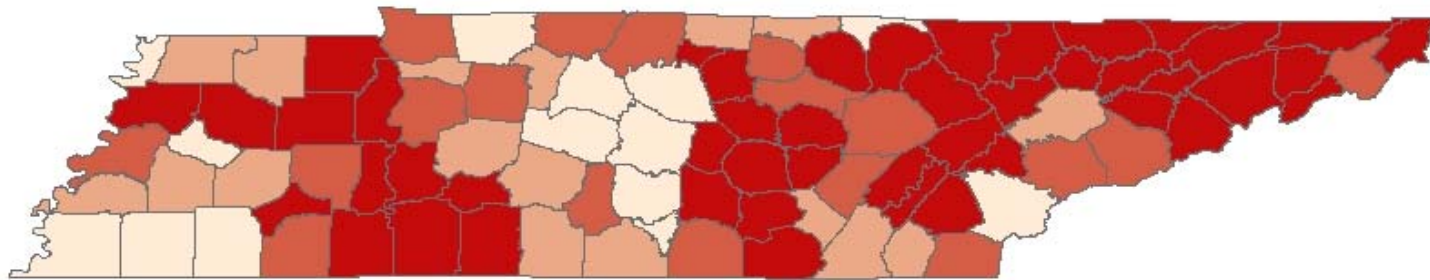
Opioid Prescription Rates by County—TN, 2007



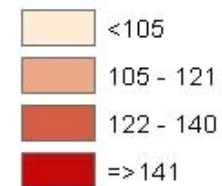
Prescription Rate per 100 Population



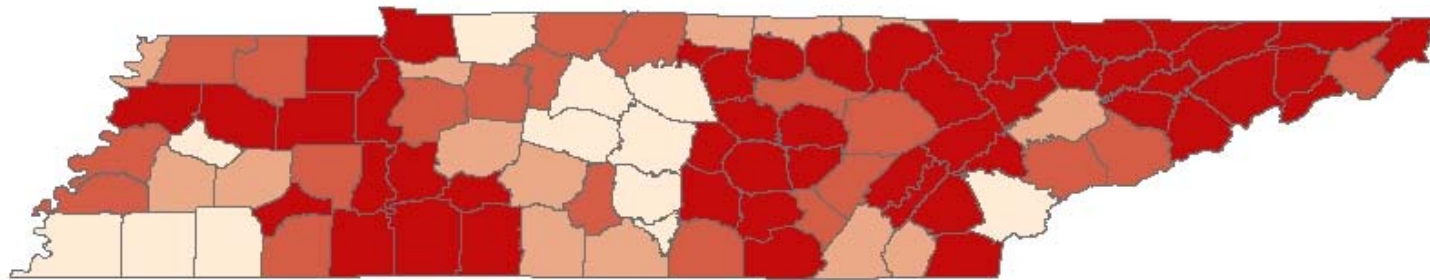
Opioid Prescription Rates by County—TN, 2008



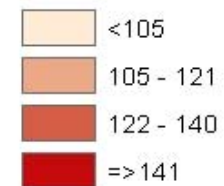
Prescription Rate per 100 Population



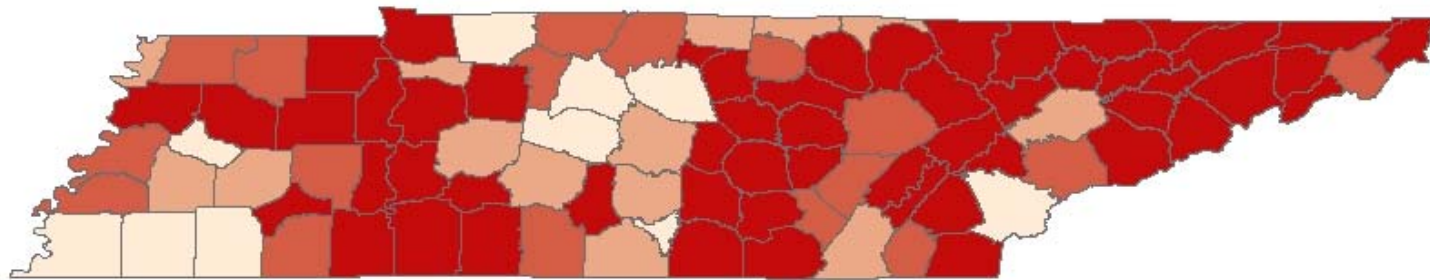
Opioid Prescription Rates by County—TN, 2009



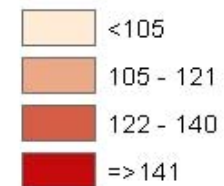
Prescription Rate per 100 Population



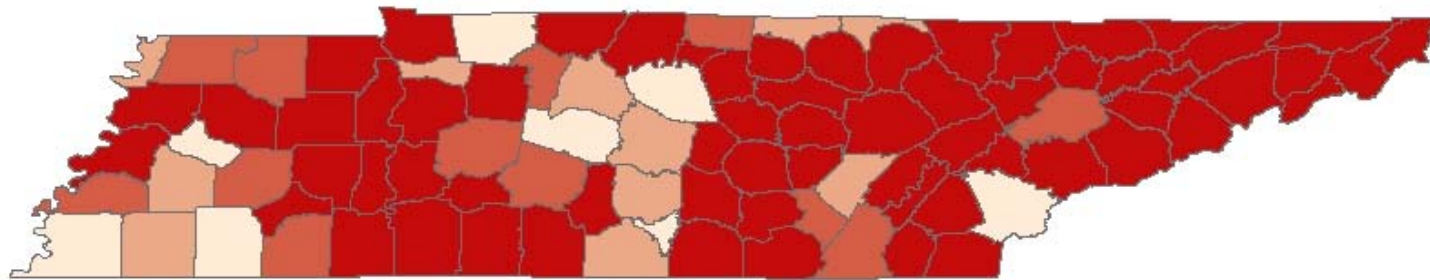
Opioid Prescription Rates by County—TN, 2010



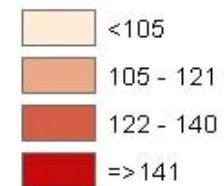
Prescription Rate per 100 Population



Opioid Prescription Rates by County—TN, 2011



Prescription Rate per 100 Population



Drug Dispensing in Tennessee



51 pills
per every
Tennessean
over age 12

275.5 Million Hydrocodone Pills



22 pills
per every
Tennessean
over age 12

116.6 Million Xanax Pills

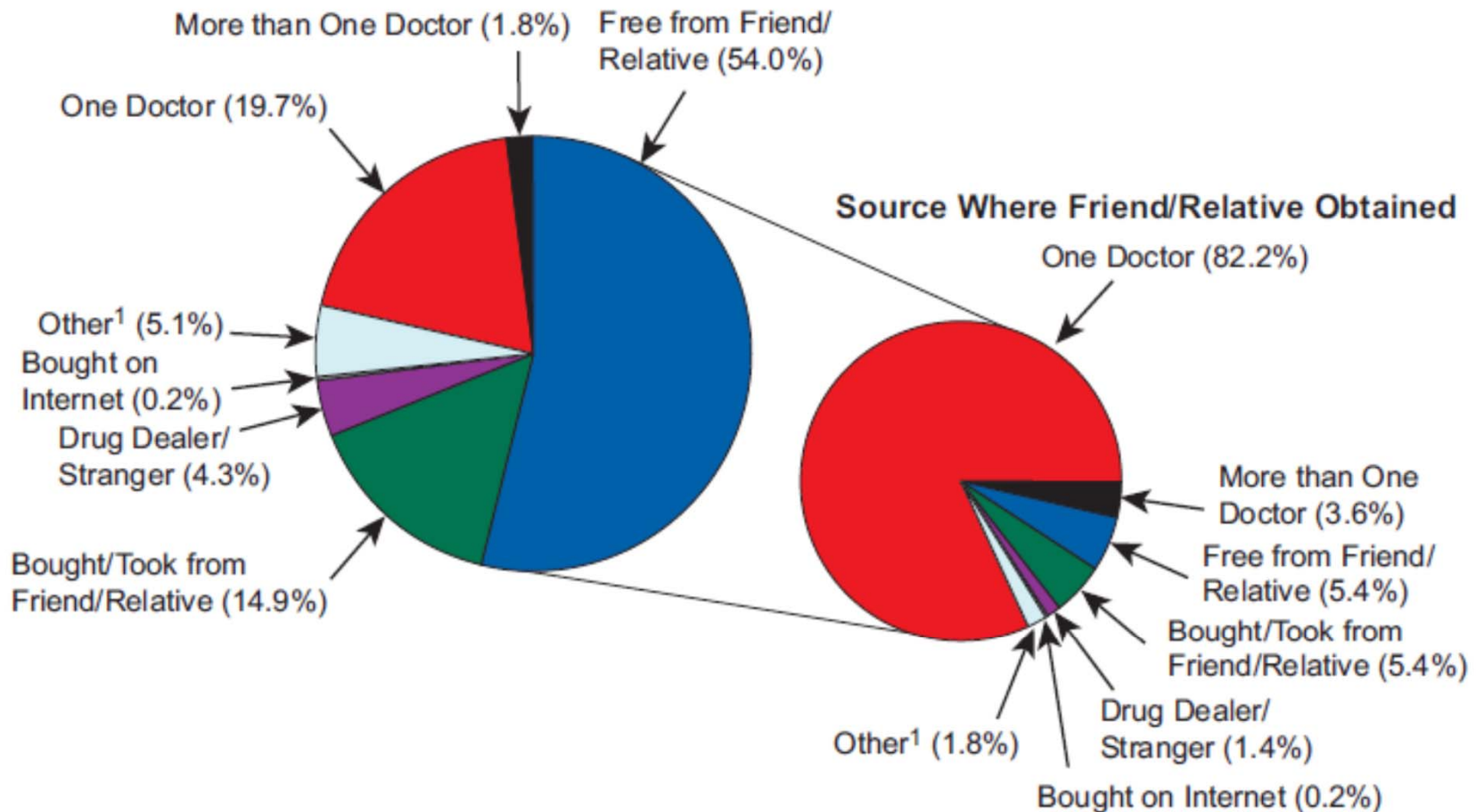


21 pills
per every
Tennessean
over age 12

113.5 Million Oxycodone Pills



Source Where Pain Relievers Were Obtained for Most Recent Nonmedical Use among Past Year Users Aged 12 or Older: 2011-2012



¹The Other category includes the sources "Wrote Fake Prescription," "Stole from Doctor's Office/Clinic/Hospital/Pharmacy," and "Some Other Way."

TABLE 5
Source of Prescription Drugs^a among Those Who Used in Last Year
Grade 12, 2007–2011
 (Entries are percentages.)

Where did you get the [insert drug name here] you used without a doctor's orders during the past year? (Mark all that apply.)

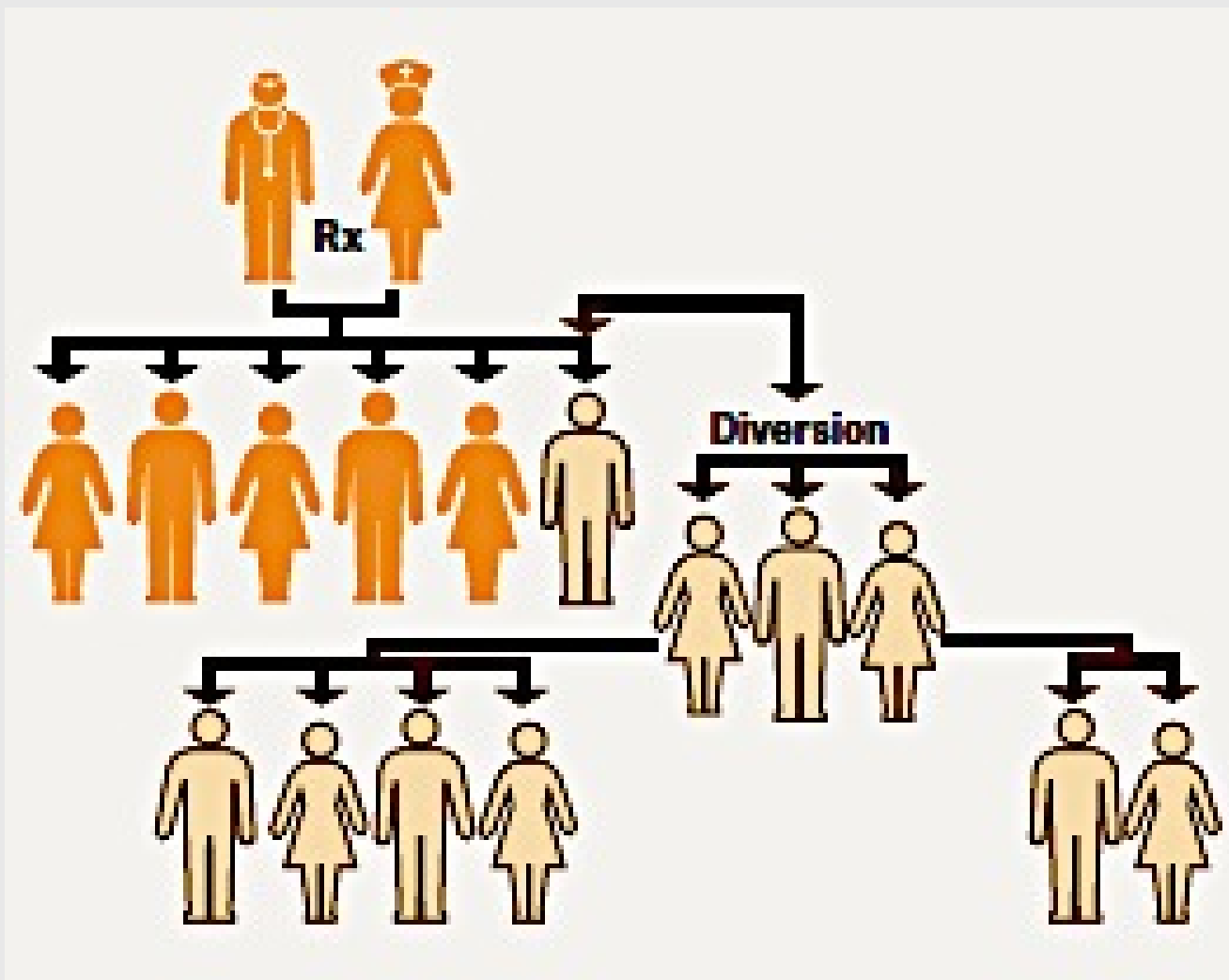
	<u>Amphetamines</u>		<u>Tranquilizers</u>		<u>Narcotics other than Heroin</u>	
	<u>2007–2008</u>	<u>2009–2011</u>	<u>2007–2008</u>	<u>2009–2011</u>	<u>2007–2008</u>	<u>2009–2011</u>
Bought on Internet	4.6	4.5	2.4	5.2	2.3	1.6
Took from friend/relative without asking	19.6	14.2	21.1	22.9	24.2	21.8
Took from a friend	—	4.9	—	6.6	—	4.7
Took from a relative	—	9.3	—	16.3	—	17.2
Given for free by friend or relative	58.2	66.4	59.8	78.3	50.5	70.2
Given for free by a friend	—	15.5	—	19.9	—	19.9
Given for free by a relative	—	9.9	—	21.4	—	19.9
Bought from friend or relative	45.0	41.6	44.1	51.7	37.1	41.4
Bought from a friend	—	4.9	—	4.9	—	3.4
Bought from a relative	—	2.6	—	6.8	—	5.1
From a prescription I had	15.1	18.1	18.4	14.7	40.2	34.7
Bought from drug dealer/stranger	26.7	21.8	24.2	26.7	18.6	16.4
Other method	17.8	13.8	7.5	9.9	8.5	10.5
<i>Weighted N =</i>	261	394	226	289	361	447

Source. The Monitoring the Future study, the University of Michigan.

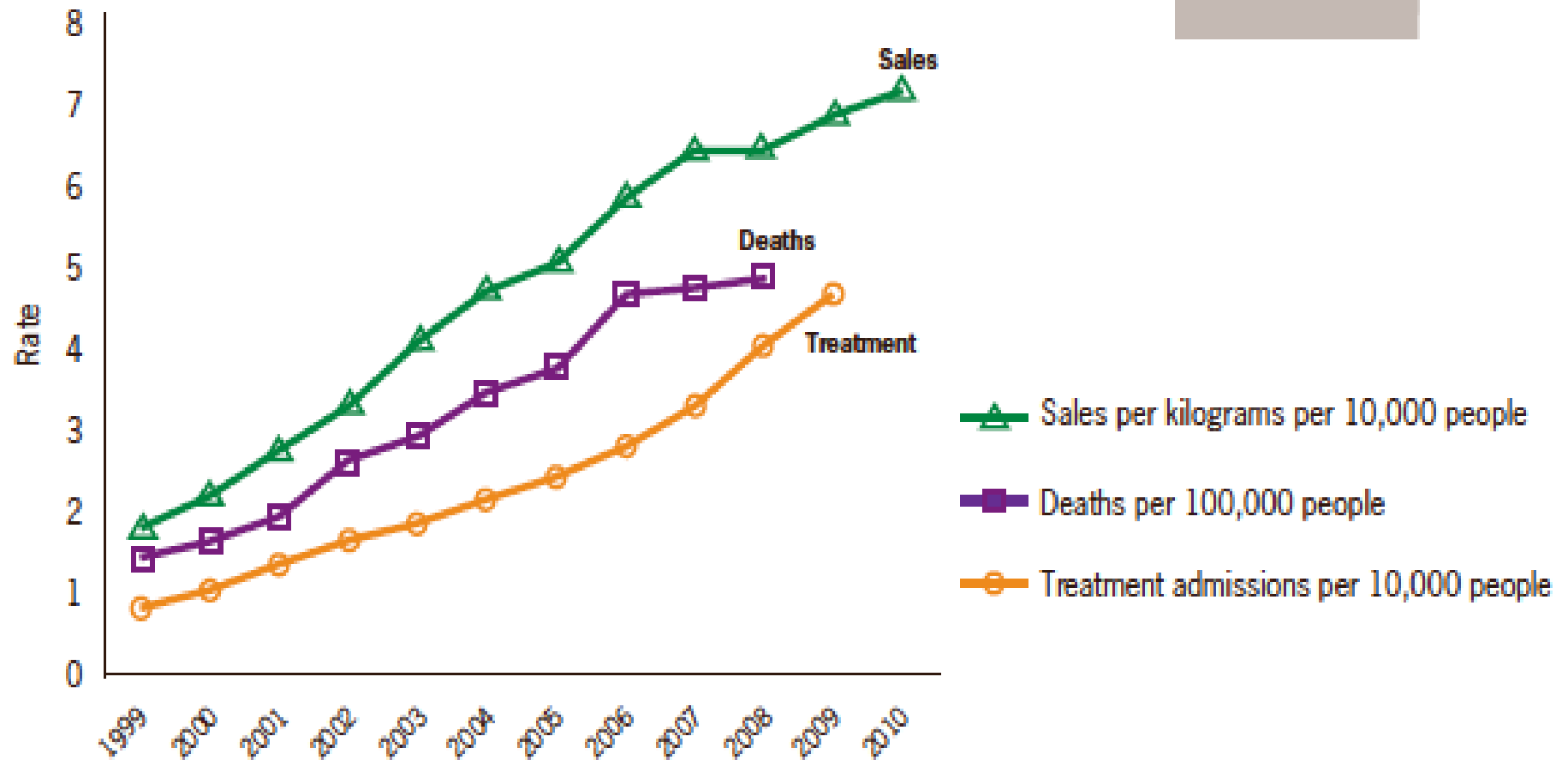
Note. '—' indicates data not available.

^aIn 2009, the response categories were expanded to differentiate between friends and relatives.

Diversion Tree

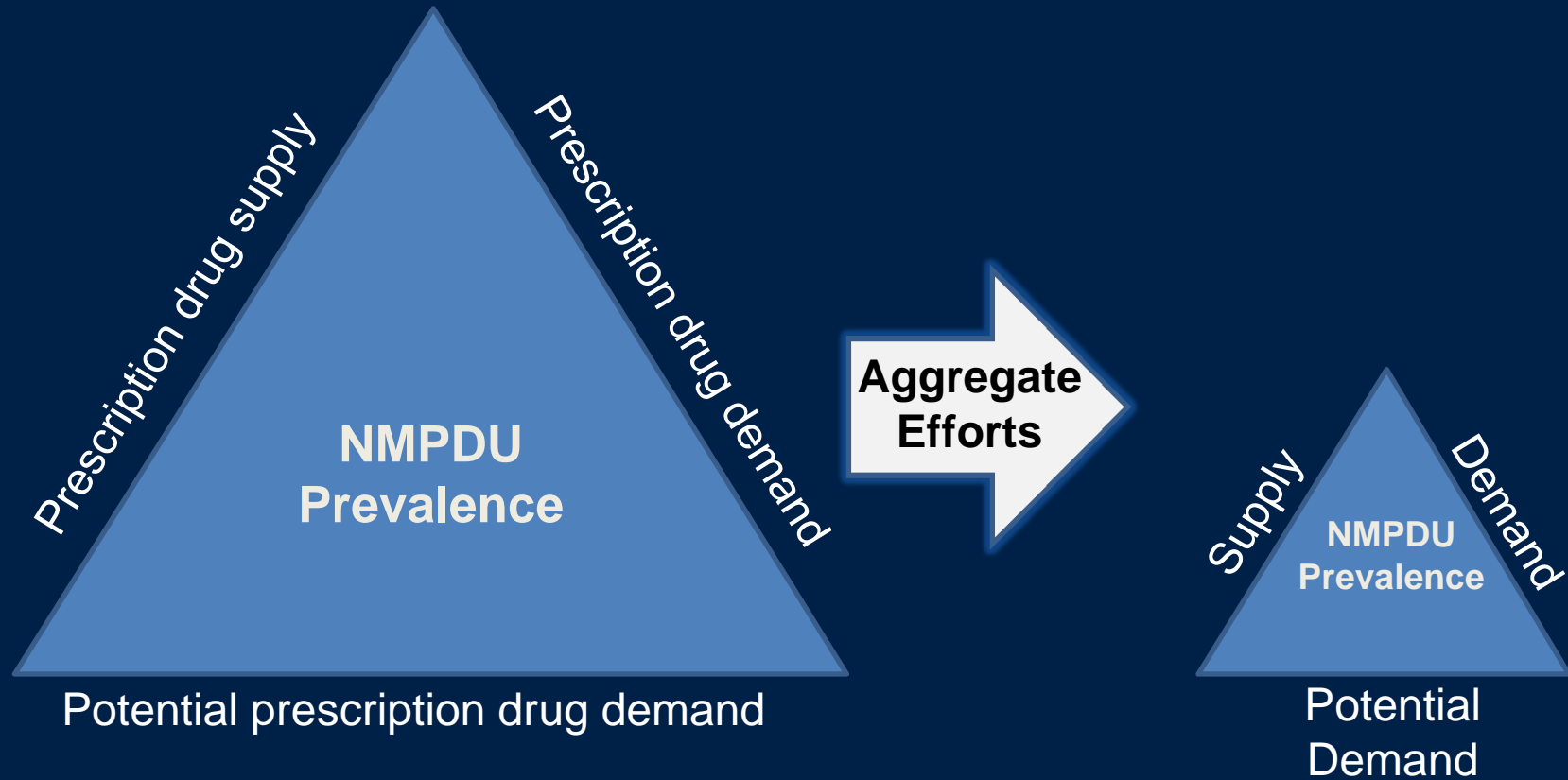


Rates of prescription painkiller sales, deaths and substance abuse treatment admissions (1999-2010)



SOURCES: National Vital Statistics System, 1999-2008; Automation of Reports and Consolidated Orders System (ARCOS) of the Drug Enforcement Administration (DEA), 1999-2010; Treatment Episode Data Set, 1999-2009

What's Driving NMPDU?



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In 2008, there were 14,800 prescription painkiller deaths.⁴

For every **1** death there are...



10 treatment admissions for abuse⁹

32 emergency dept visits for misuse or abuse⁶

130 people who abuse or are dependent⁷

825 nonmedical users⁷

CDC. Vital Signs: Overdoses of Prescription Opioid Pain Relievers—United States, 1999–2008. MMWR 2011; 60: 1–6

Substance Abuse and Mental Health Services Administration. Results from the 2010 National Survey on Drug Use and Health: volume 1: summary of national findings. Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies; 2011. Available from URL: <http://oas.samhsa.gov/NSDUH/2k10NSDUH/2k10Results.htm#2.16>



KEY

- Only require screening
- Require brief intervention
- Require referral to treatment

13.3%

3.3%

Source: SAMHSA funded MASBIRT program, N=173,714



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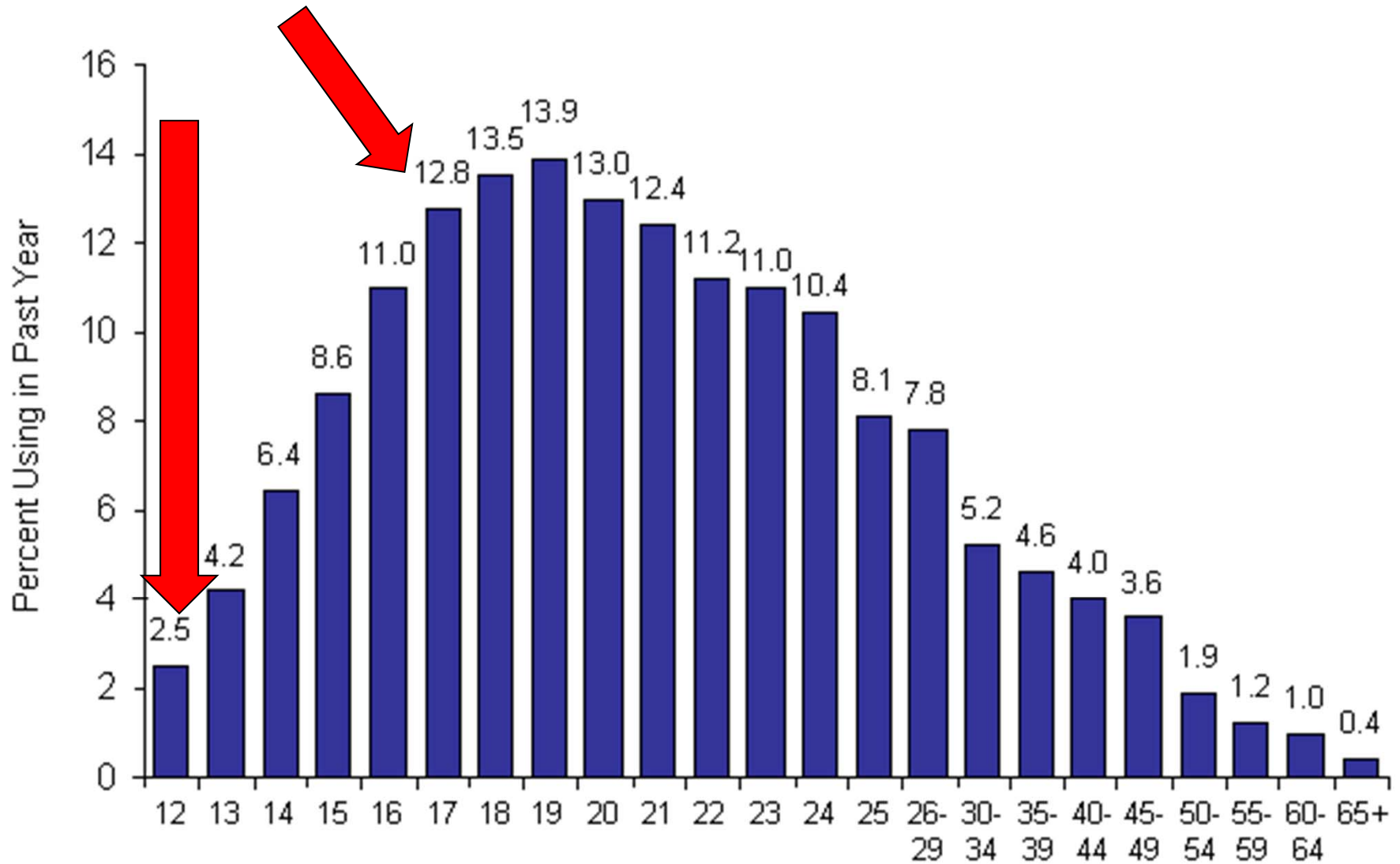
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Individual-Level Determinants

- Age
- Gender
- Social/ Emotional competence
- Mental health
- Educational Attainment
- Employment Status
- Marital status
- Housing
- History of trauma
- Age of drug use initiation

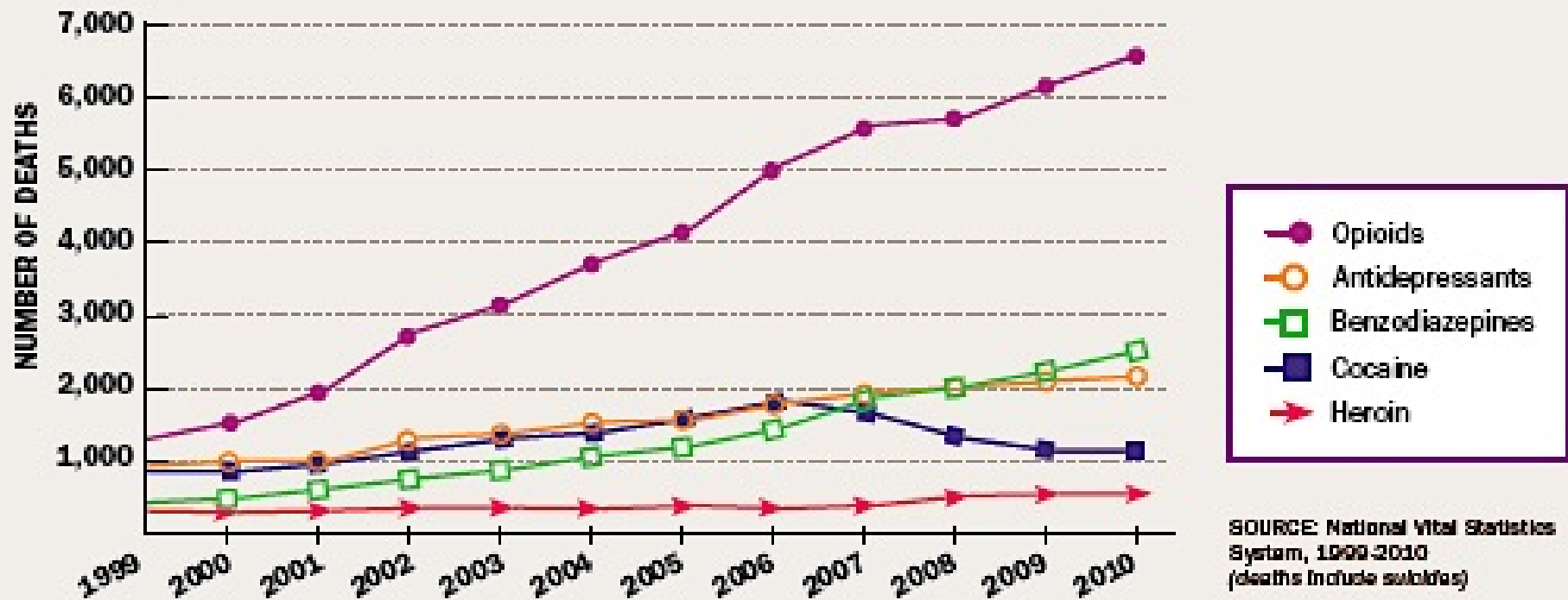


Past Year Nonmedical Use of Pain Relievers, by Detailed Age Category



SOURCE: <http://www.oas.samhsa.gov/nhsda/>

Prescription painkiller overdose deaths are a growing problem among women.



Socio-Familial Determinants

- Social-network size and characteristics
- Parental involvement
- Peer drug use
- Familial support/ bonding
- Divorced parents



Adverse Childhood Experiences

	Number Resp.*	Wt. %	95% CI		Adj. Odds Ratio [†]	95% CI	
			LL	UL		LL	UL
Misuse of Prescription Pain Medications							
0 ACEs	3,815	1.4	0.9	2.1	1.00	Referent	
1 to 3 ACEs	3,679	4.1	3.2	5.1	2.76	1.62	4.70
4 or more ACEs	1,232	9.6	7.2	12.6	6.25	3.49	11.20



Neighborhood-Level Determinants

- Unemployment rate
- Average educational attainment
- Drug arrest rate
- Average income
- Community cohesion
- Diversion control (e.g. drug drop boxes, PDMPs)



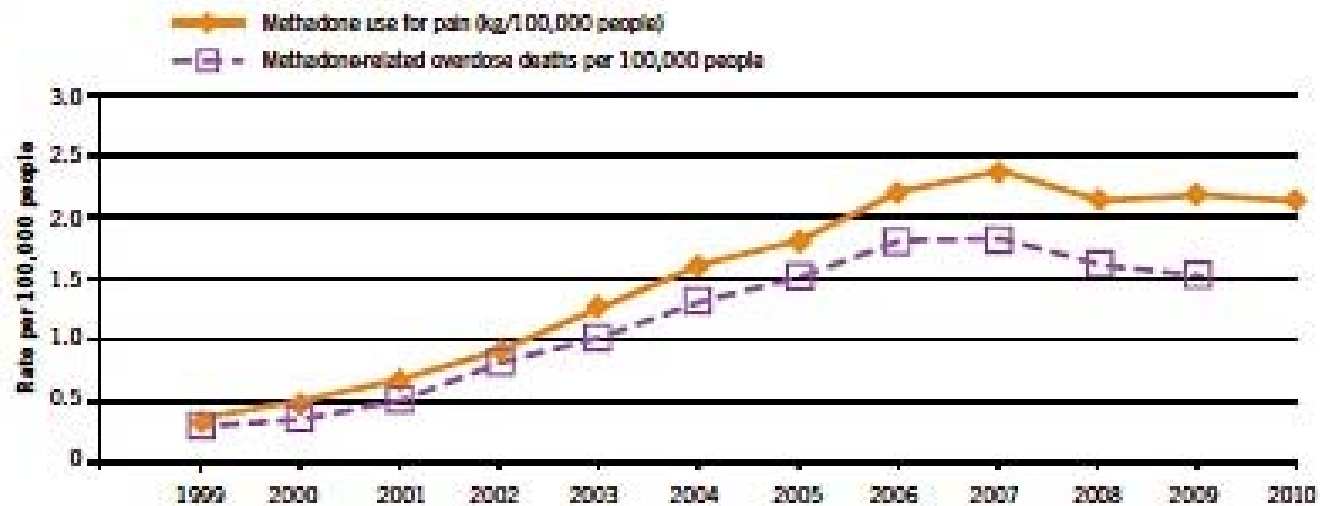
Opioid-Related Mortality

Prescriber Behavior

- High volume prescribing
- Sales
- Dosage
- Oxycodone prescribing
- Methadone prescribing

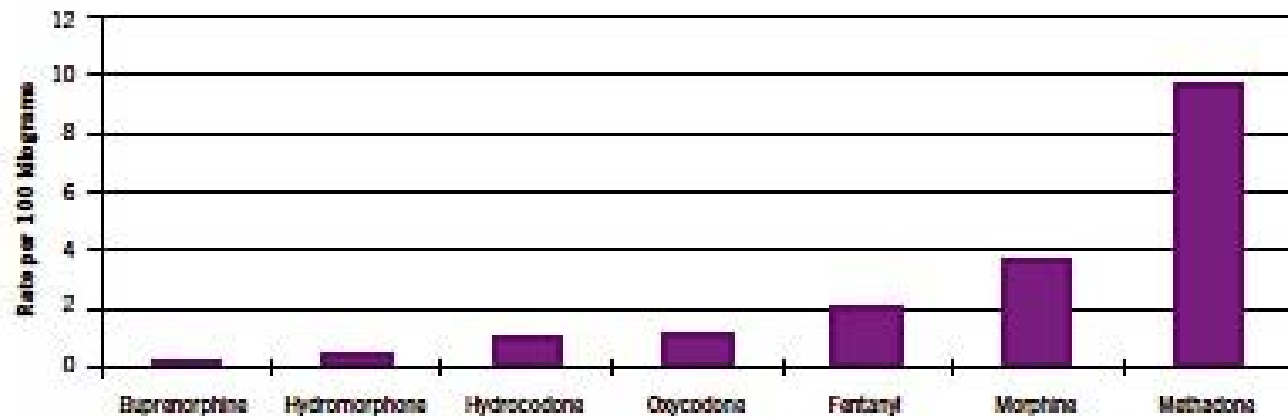


Growth of methadone use for pain and methadone overdoses



Sources: National Vital Statistics System, 1999-2009; Drug Enforcement Administration Automation of Reports and Consolidated Orders System (ARCOS), 1999-2010.

Death rate from overdoses caused by a single prescription painkiller



Source: Substance Abuse and Mental Health Services Administration, Center for Behavioral Statistics and Quality, Drug Abuse Warning Network Medical Examiner Component, 2009.

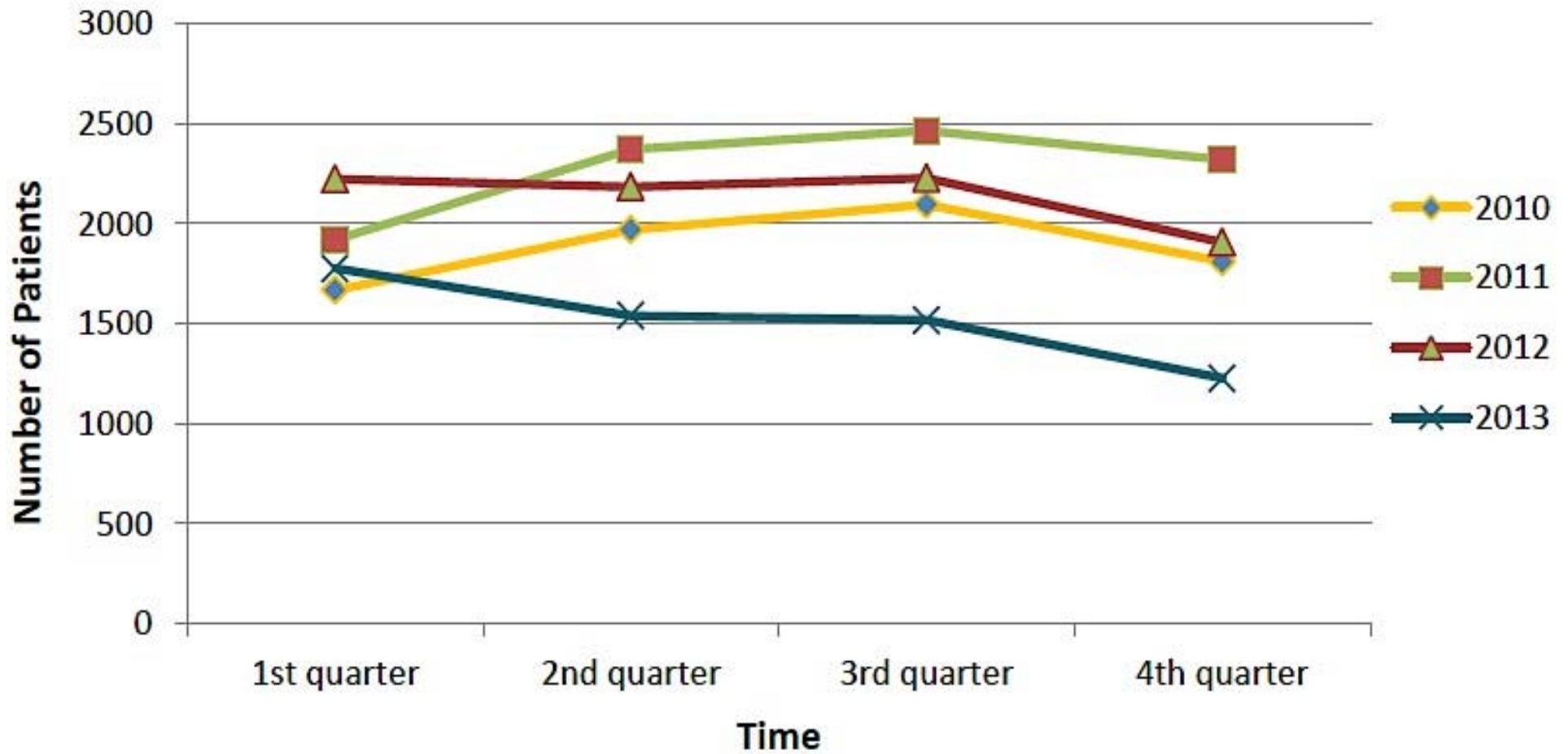
Opioid-Related Mortality

Individual Determinants

- SA history
- Diversion
- Doctor shopping
- Drug substitution
- Polydrug toxicity
- Socio-demographics



Number of High Utilization Patients by Quarter in TN CSMD, 2010-2013

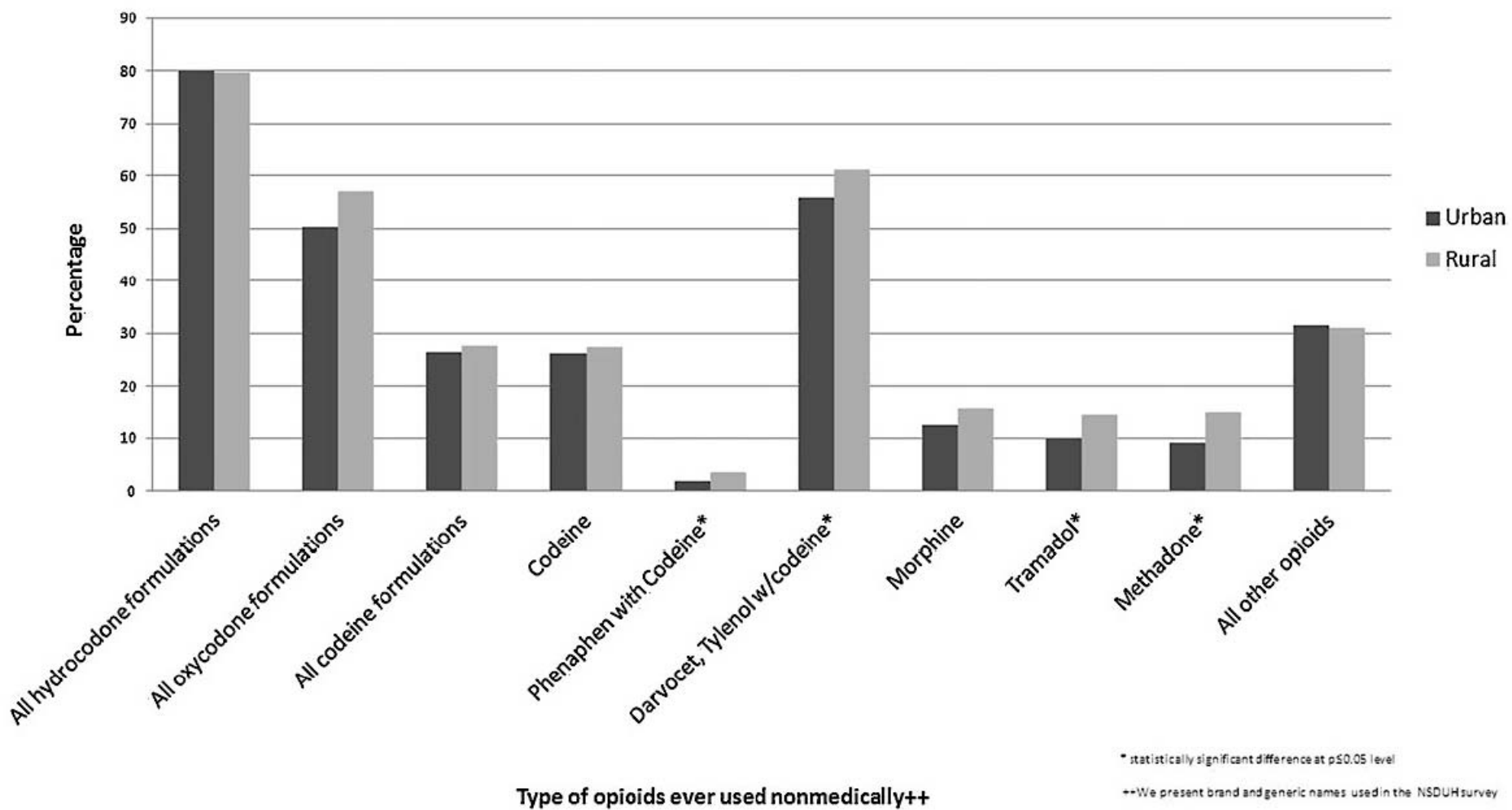


Opioid-Related Mortality

Environmental Determinants

- Urbanization
- Geography
- Public policy
- Intervention
- Media
- PDMP





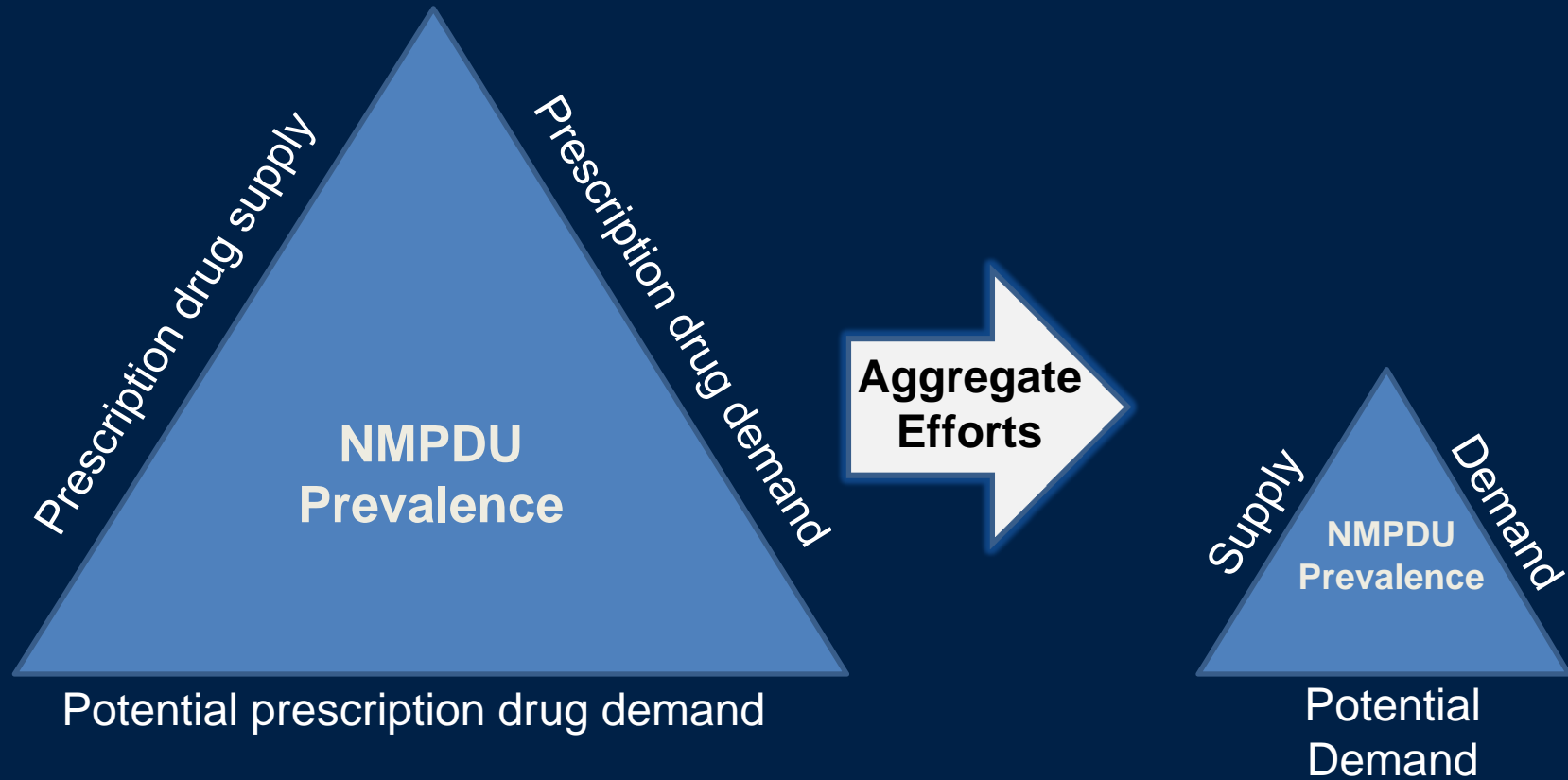
What Can be Done?



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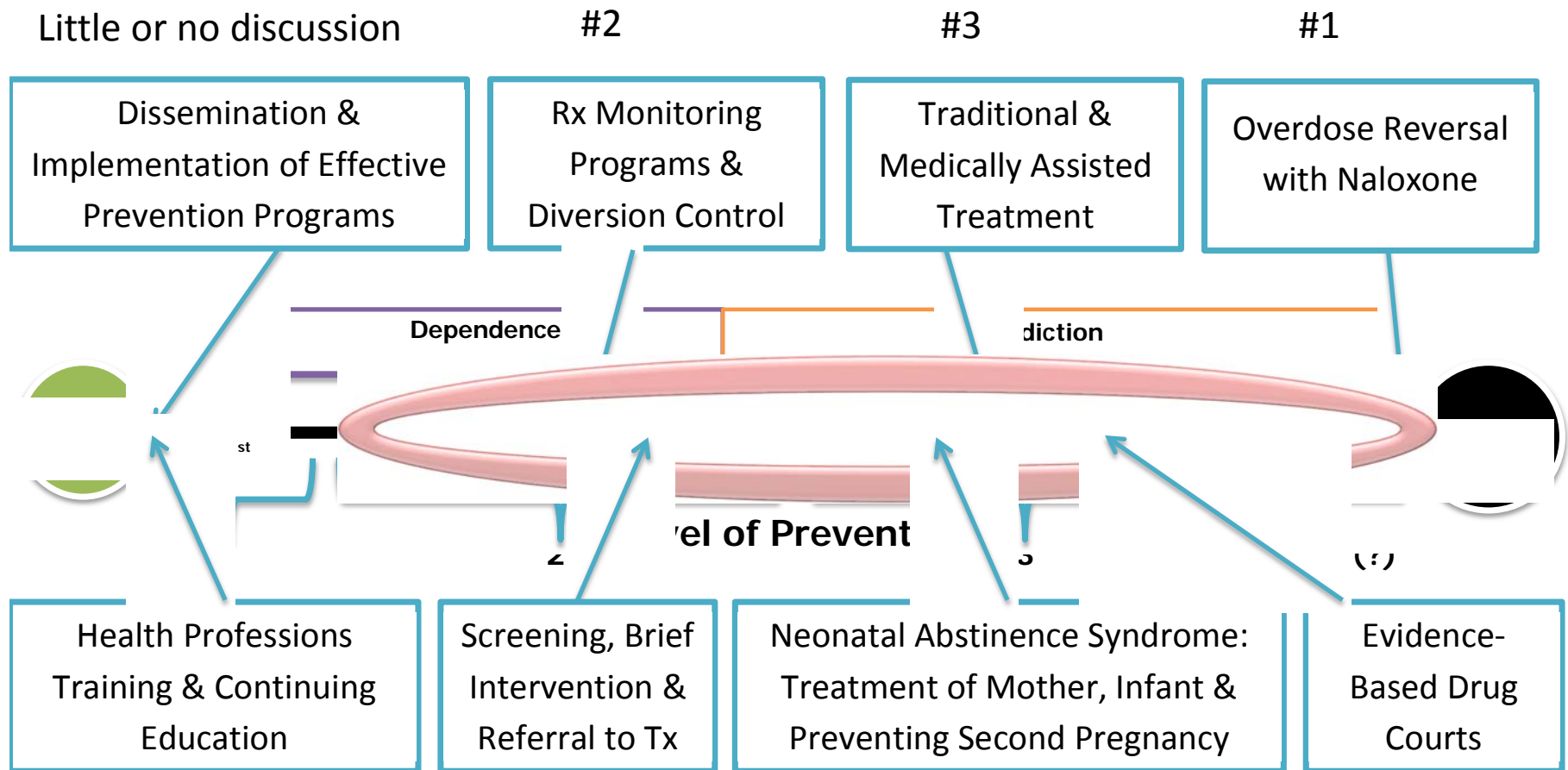
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Aggregate Efforts



Prescribing Guidelines

Five studies in different states have shown that ~10-15% of prescribers prescribe ~65-80% of OPRs



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Prescribing Guidelines

MED: Morphine Equivalent Dose;
method of standardizing the volume of
consumed opioids in a day

Strong epidemiologic evidence for a
significant increase in opioid related morbidity
and mortality above 100-120 mg/d MED

MED. Morphine Equivalent

Dosage

- Study of 45 overdoses
- Hazard ratio:
 - 50-100 mg/d MED = almost 4x increase in risk
 - >100 mg/d MED = almost 9x increase in risk

Dunn et al. 2010. Ann Int Med 152; 85-92

Table 3. Hazard Ratios Between Recent Opioid Doses and Overdose*

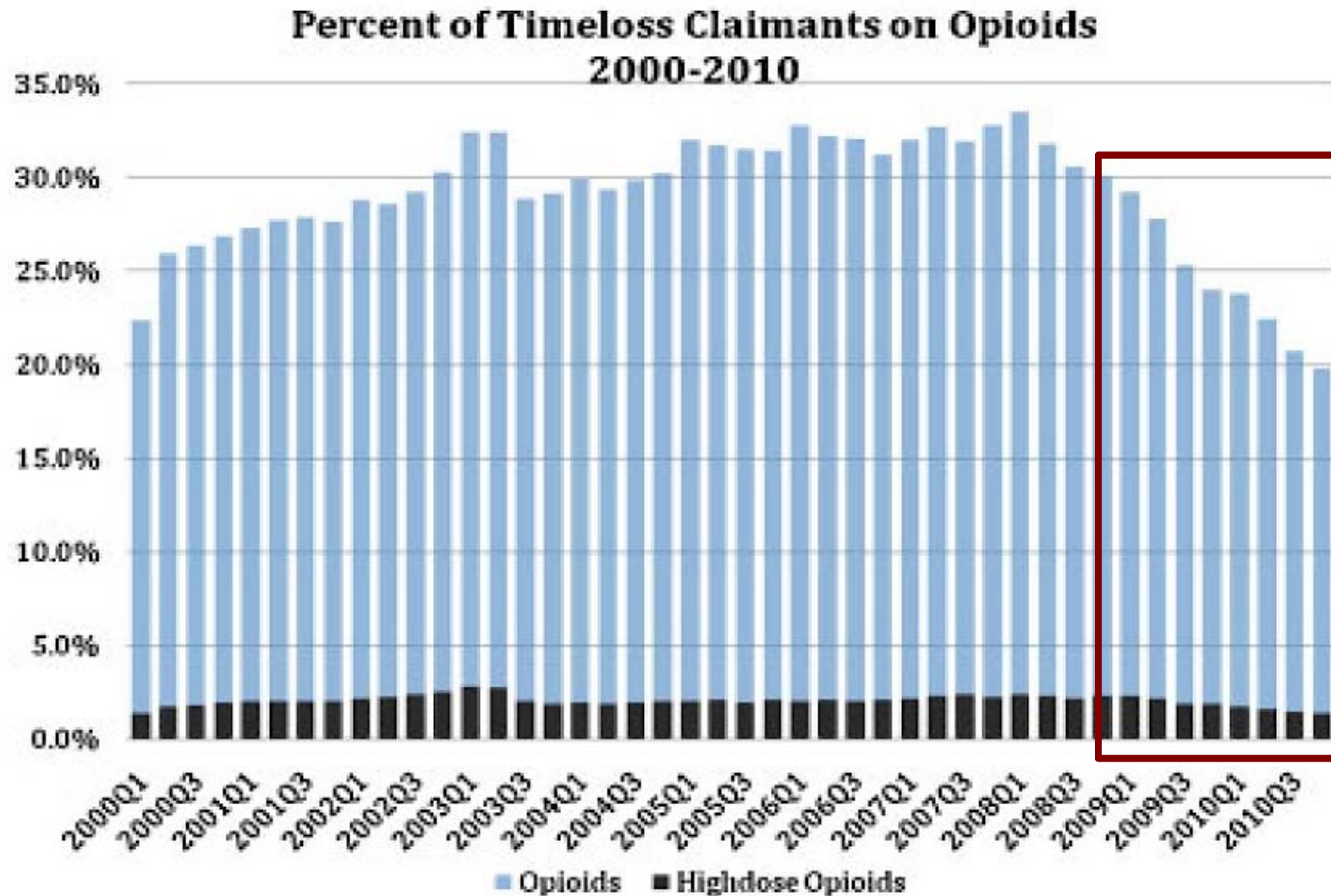
Opioid Dose	Patients Who Overdosed, n	Person-Years	Overdose Rate (95% CI) per 100 000 Person-Years	Hazard Ratio for All Overdose Events (95% CI)†	Hazard Ratio for Serious Overdose Events (95% CI)†‡
None	6	16 780	36 (13–70)	0.31 (0.12–0.80)	0.19 (0.05–0.68)
1 to <20 mg/d				1.00	1.00
20 to <50 mg/d	6	2311	260 (95–505)	1.44 (0.57–3.62)	1.19 (0.40–3.60)
50 to <100 mg/d				3.73 (1.47–9.50)	3.11 (1.01–9.51)
≥100 mg/d				8.87 (3.99–19.72)	11.18 (4.80–26.03)
Any opioid use	45	17 582	256 (187–336)	5.16 (2.14–12.48)	8.39 (2.52–27.98)

* Opioid-related overdose death or nonfatal event.

† Adjusted for smoking, depression, substance abuse, comorbid conditions, pain site, age, sex, recent sedative-hypnotic prescription, and recent initiation of opioid use.

‡ Opioid-related overdose death or serious nonfatal event (n = 40).

Opioid prescribing guidelines



Higher dose opioids = >/+ 120 mg/day MED

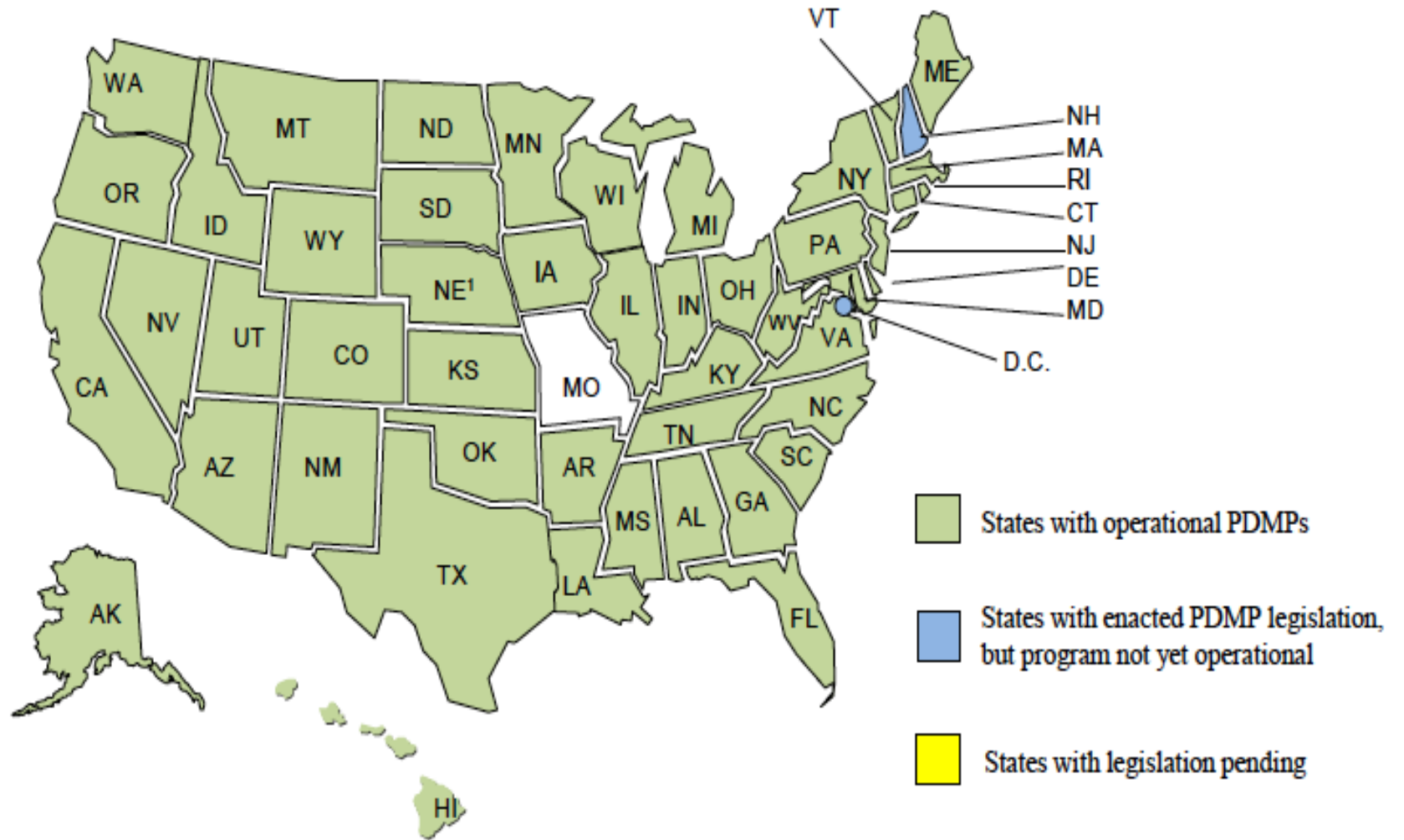
Controlling the Supply



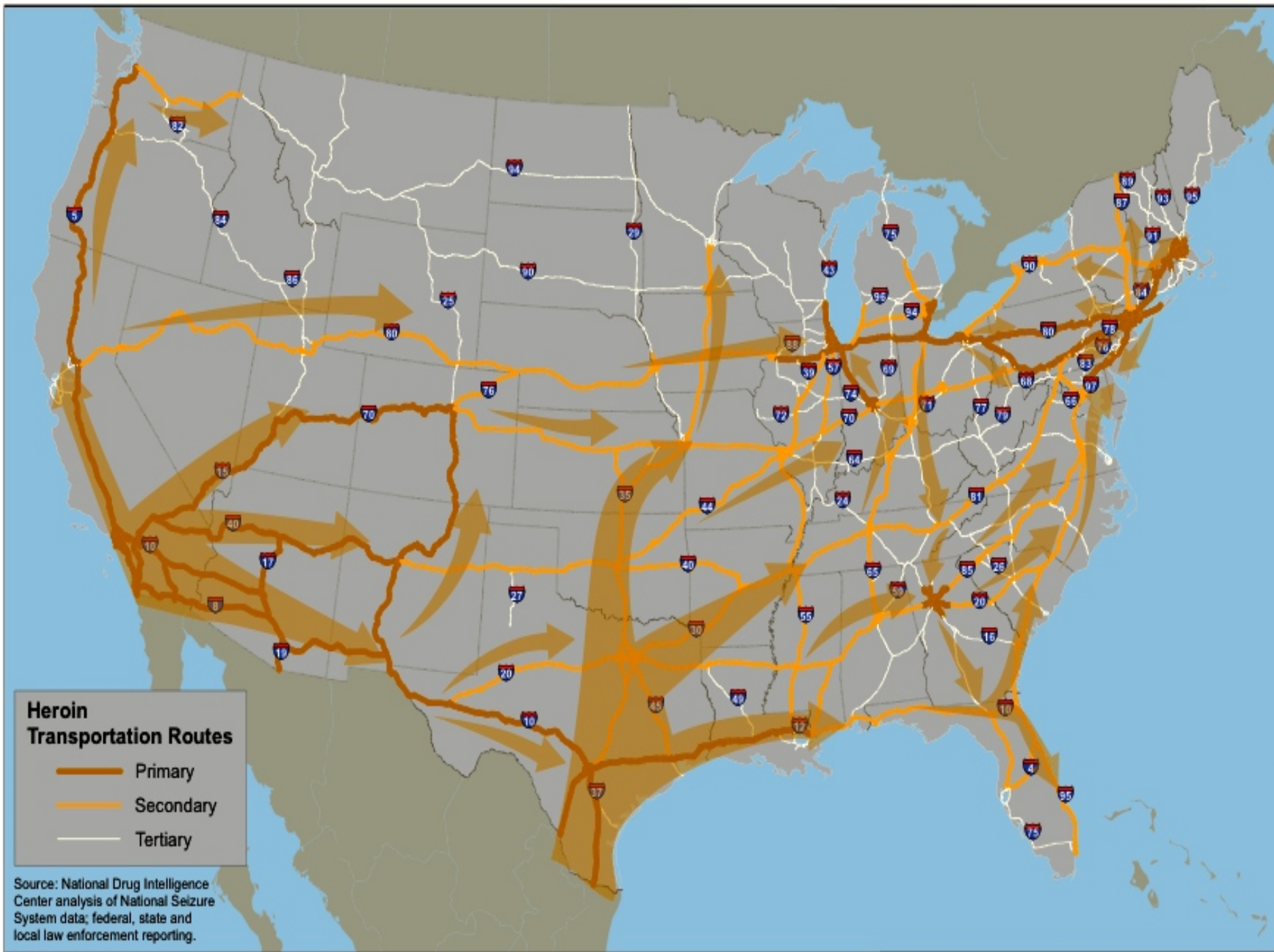
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Status of State Prescription Drug Monitoring Programs (PDMPs)



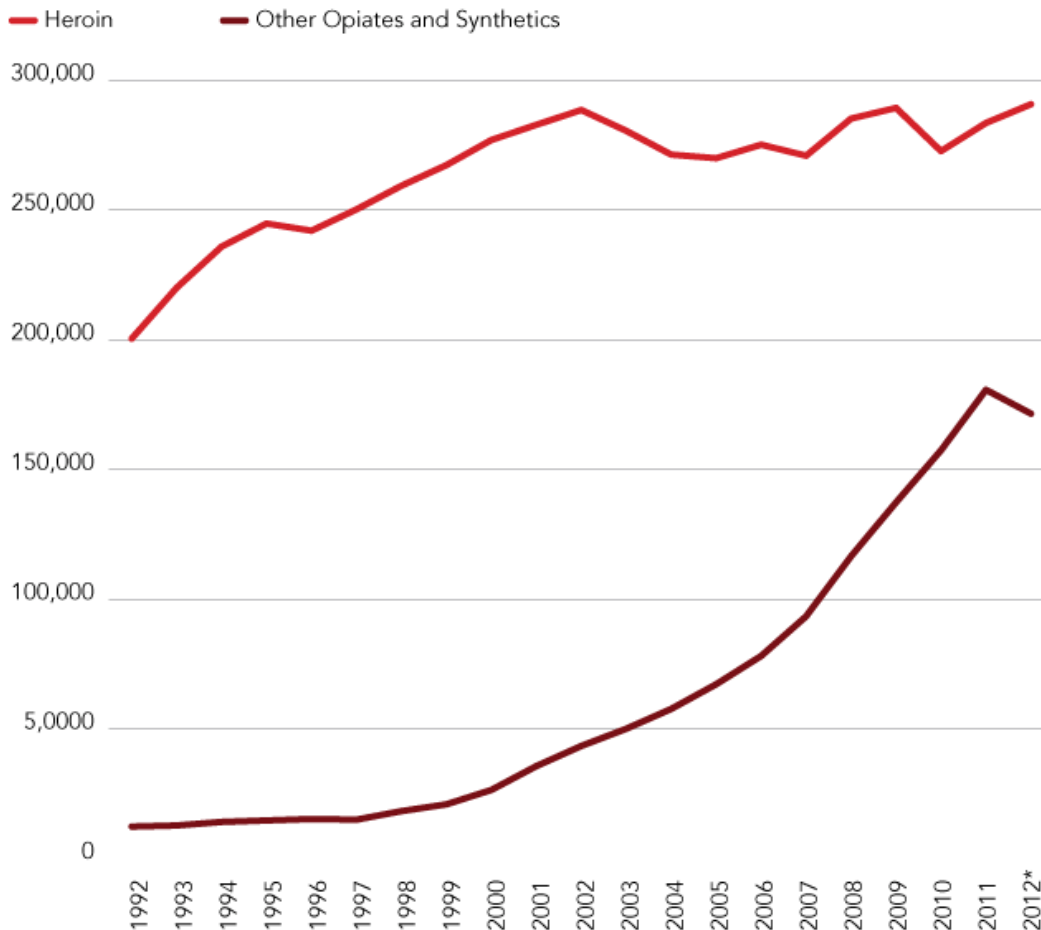
© 2014 The National Alliance for Model State Drug Laws (NAMSDL). Headquarters Office: 420 Park Street, Charlottesville, VA 22902. This information was compiled using legal databases, state agency websites and direct communications with state PDMP representatives.



Painkillers And The Heroin Market

A growing number of people are using heroin in recent years, in part because it can be cheaper and easier to find than opioid painkillers purchased on the black market. Most heroin users were first hooked on prescription opioids, which generated \$11 billion in 2010 for the pharmaceutical industry.

Substance abuse treatment facilities admissions by primary drug



*2012 data for Mississippi, Pennsylvania, and West Virginia are not available.

4 out of 5

new heroin users have abused painkillers.

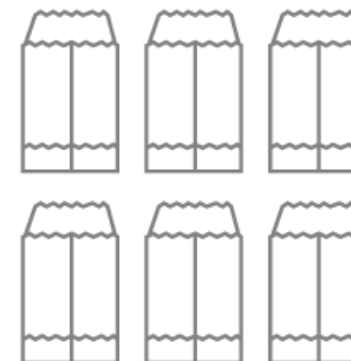


A Cheaper High

\$30 can buy one oxycodone pill on the street in New York...

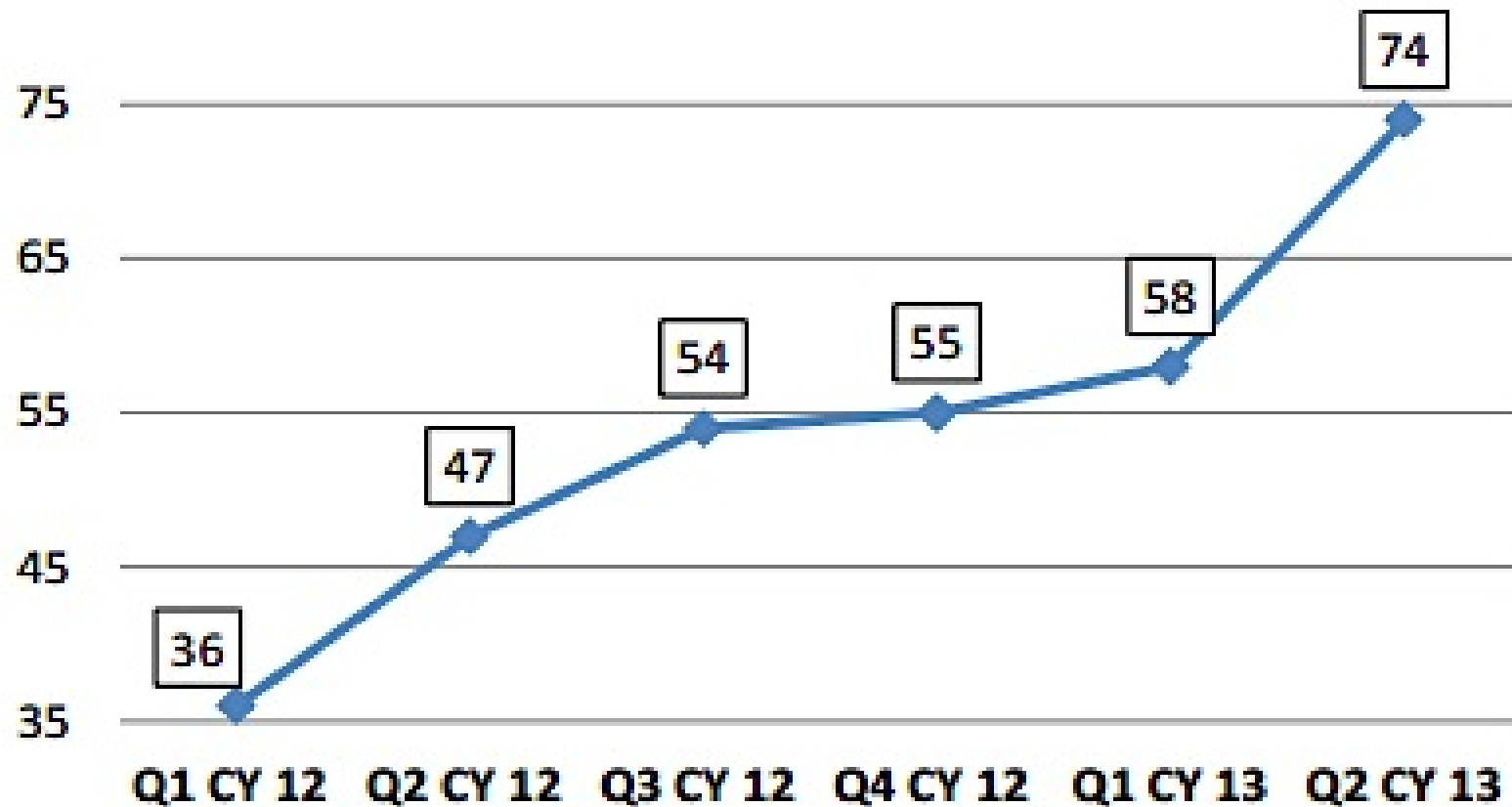


or six hits of heroin.



Permanent Collection Boxes

Figure II-2. Number of Permanent Prescription Drug Collection Boxes



Source: Tennessee Department of Mental Health and Substance Abuse Services (2013)

Breaking News

D.E.A. to Allow Return of Unused Pills to Pharmacies

By CATHERINE SAINT LOUIS SEPT. 8, 2014

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Concerned by rising rates of prescription drug abuse, the Drug Enforcement Administration announced Monday that it would permit consumers to return unused prescription medications like opioid painkillers to pharmacies.

The move is intended to help reduce stockpiles of unneeded medicines in homes, which are often pilfered by teenagers. Under the new regulation, patients and their relatives will also be allowed to mail unused prescription drugs to an authorized collector using packages to be made available at pharmacies and other locations, like libraries and senior centers.

The new regulation, which will go into effect in a



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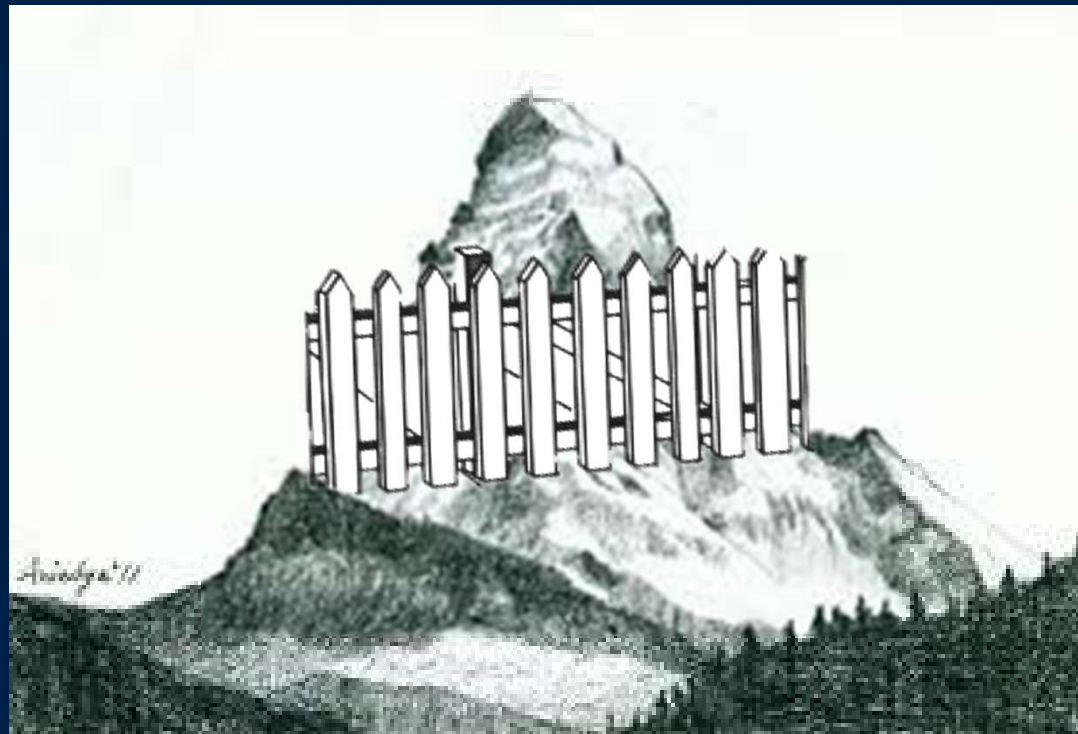


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The Ambulance or the Fence?

Prevention Approach
Usual Approach



Primary Prevention Works

- Parenting programs work:
 - Parental monitoring
 - Authoritative parenting
- Parents need to be engaged
- Kids at risk need to be trained
- We can scale up effective programs to prevent uptake of NMPDU



NREPP is a searchable online registry of [more than 300 interventions](#) supporting mental health promotion, substance abuse prevention, and mental health and substance abuse treatment. We connect members of the public to intervention developers so they can learn how to implement these approaches in their communities.

NREPP is not an exhaustive list of interventions, and inclusion in the registry does not constitute an endorsement. [Learn More >](#)

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New Intervention Summary Available - 09/23/2013

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300th Intervention Summary Posted

SAMHSA's NREPP reached a new milestone, publishing its 300th summary of an evidence-based substance abuse or mental health intervention. See the [SAMHSA Bulletin](#) for more information about NREPP and this milestone.

Early Intervention

Screening, Brief Intervention, and Referral to Treatment (SBIRT)



Naloxone



KEEP
CALM
AND
CARRY
NALOXONE

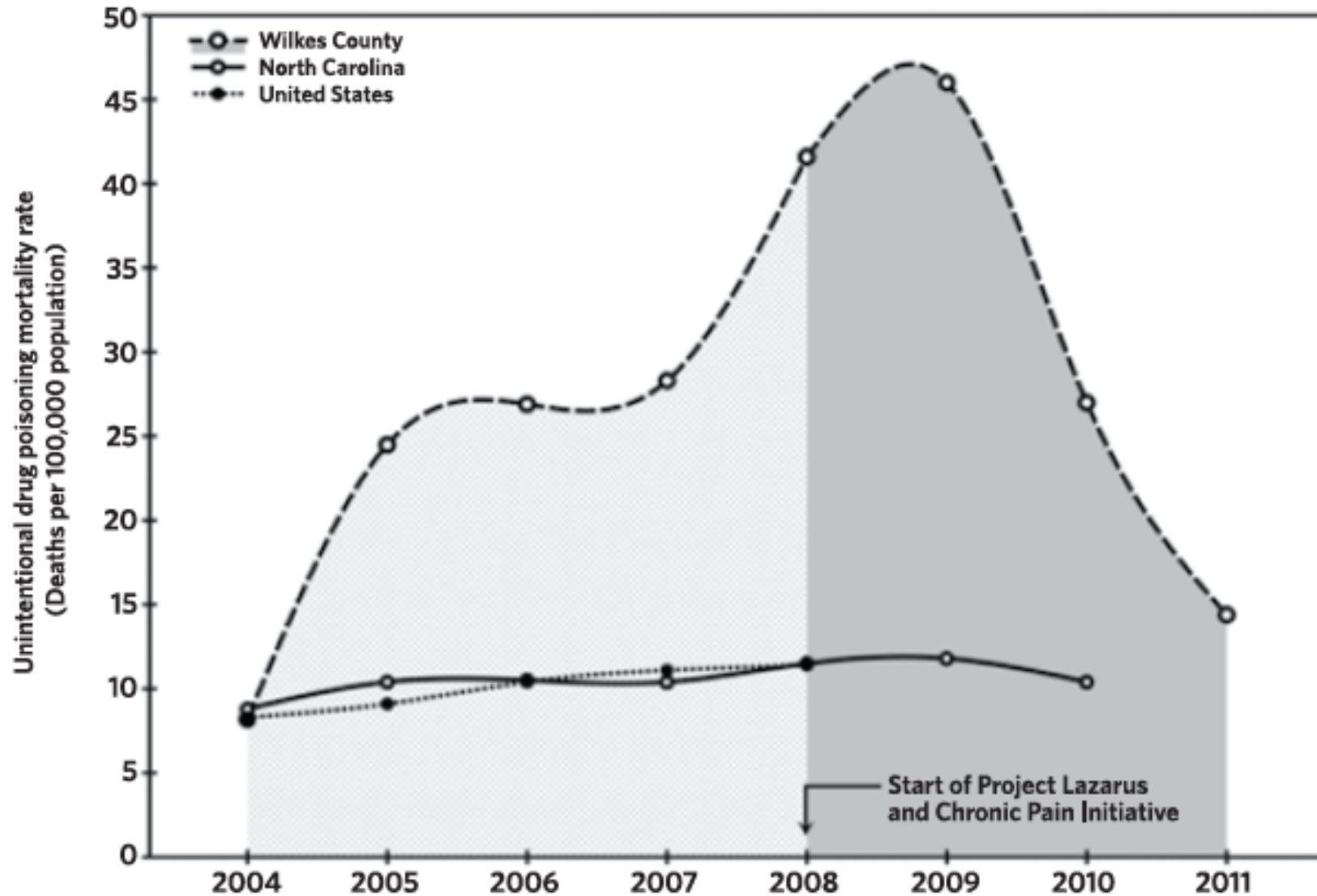
- Reverses overdose by blocking receptors
- White House (ONDCP) and Attorney General encourage first responders to carry
- In conjunction with “Good Samaritan” law can effectively reduce mortality rate



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Number of Deaths per 100,000 Population from Unintentional Drug Poisoning in Wilkes County, NC, 2004-2011



Northeast TN Resources

Generation Rx

<http://etsugenerationrxprovidertoolkit.weebly.com/prescriber-resources.html>

Prescription Drug Abuse and Misuse Working Group

<http://www.etsu.edu/cph/pdam/>



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Questions?



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