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# Assessing the Relationship Between Prescription Opioid Nonmedical Use and Heroin Use

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# Overview

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- Trends in Rx opioid and heroin use
- Heroin use among nonmedical users of Rx opioids
- Influence of Rx opioid abuse prevention policies
- Policy response
- Conclusions

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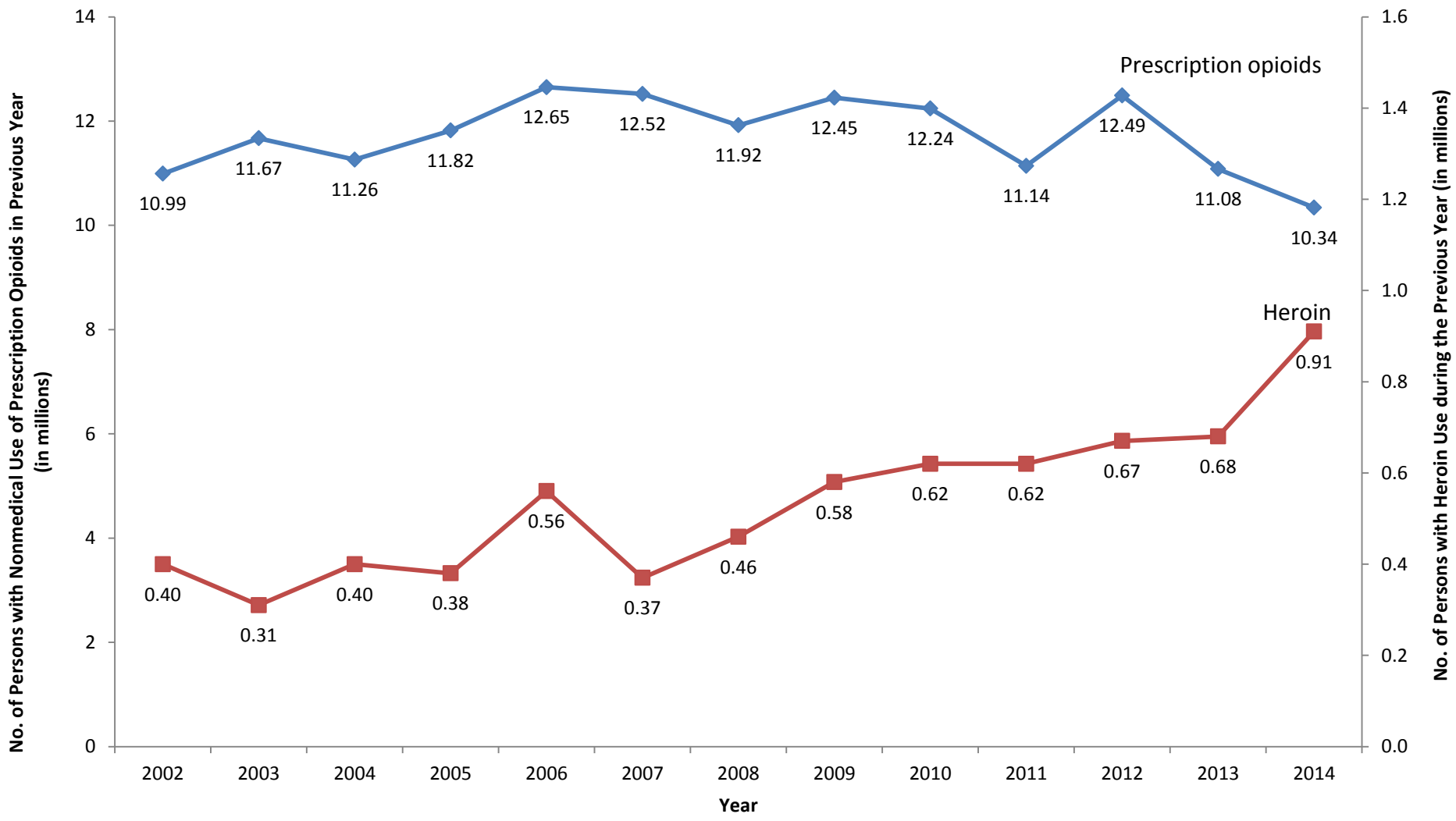
# **RX OPIOID AND HEROIN USE TRENDS**



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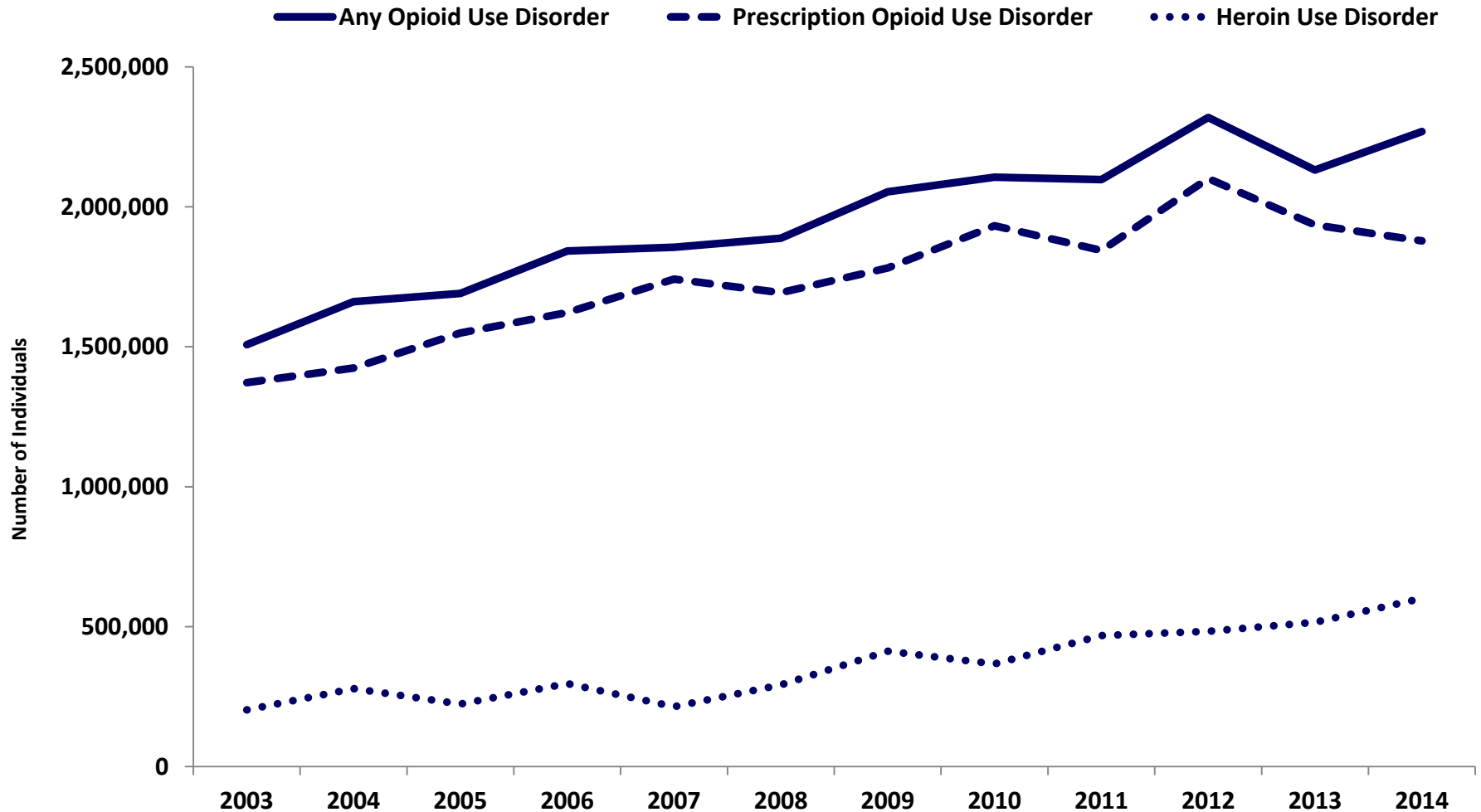
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# Past year nonmedical use of prescription opioids and heroin use



Source: SAMHSA, NSDUH 2003-2014 PUF

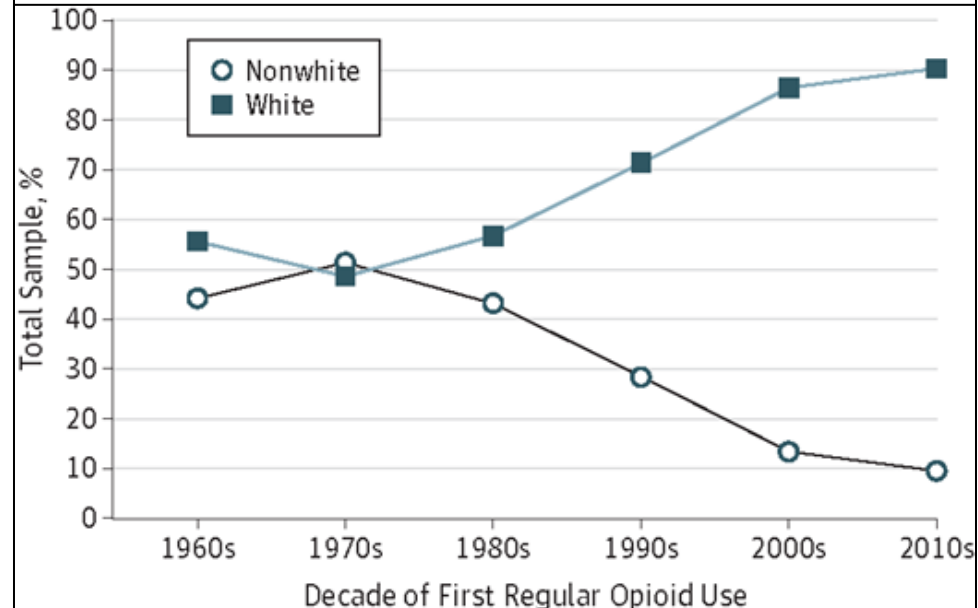
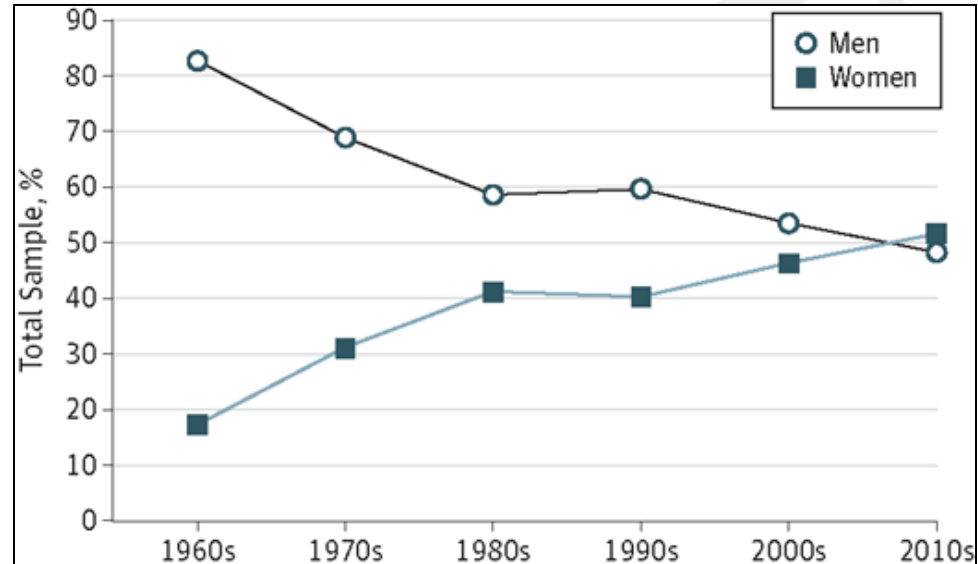
# Past year opioid use disorders, US, 2003-2014



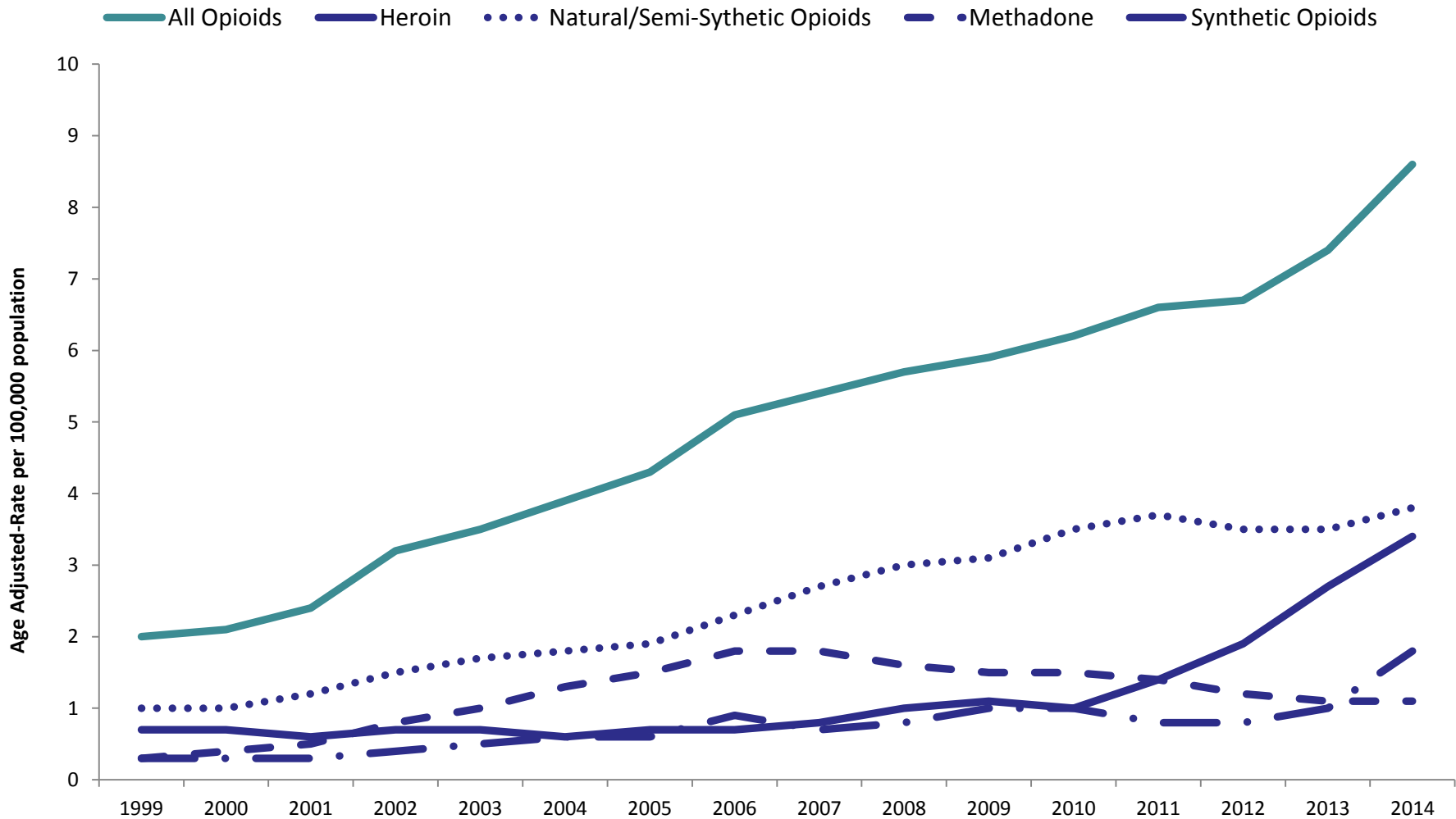
# Changing demographics of heroin use

## Heroin Use Has INCREASED Among Most Demographic Groups

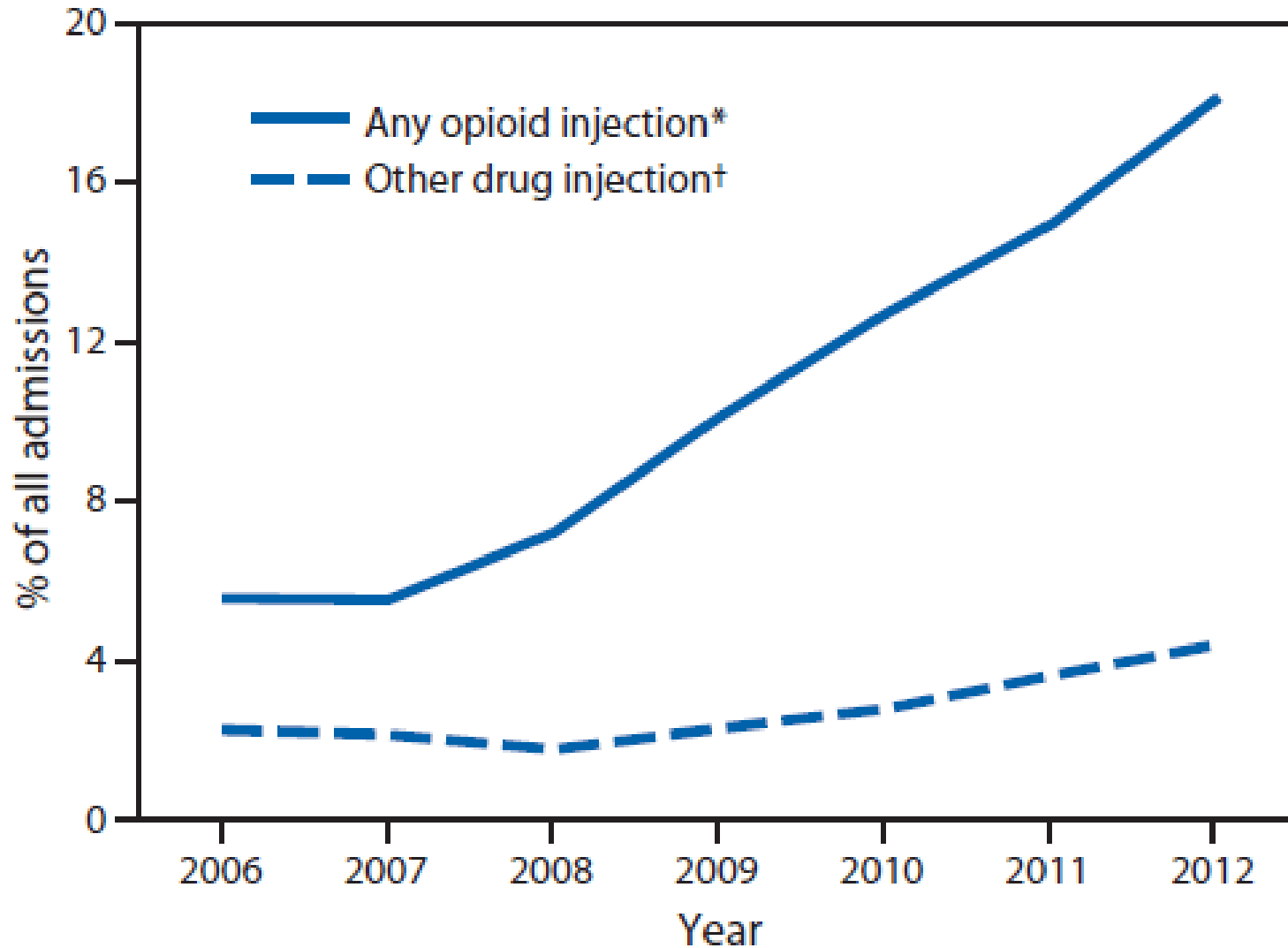
	2002-2004*	2011-2013*	% CHANGE
<b>SEX</b>			
Male	2.4	3.6	50%
Female	0.8	1.6	100%
<b>AGE, YEARS</b>			
12-17	1.8	1.6	--
18-25	3.5	7.3	109%
26 or older	1.2	1.9	58%
<b>RACE/ETHNICITY</b>			
Non-Hispanic white	1.4	3	114%
Other	2	1.7	--
<b>ANNUAL HOUSEHOLD INCOME</b>			
Less than \$20,000	3.4	5.5	62%
\$20,000-\$49,999	1.3	2.3	77%
\$50,000 or more	1	1.6	60%
<b>HEALTH INSURANCE COVERAGE</b>			
None	4.2	6.7	60%
Medicaid	4.3	4.7	--
Private or other	0.8	1.3	63%



# Opioid-related overdose deaths, US, 1999-2014



# Injection drug use increasing in the U.S.



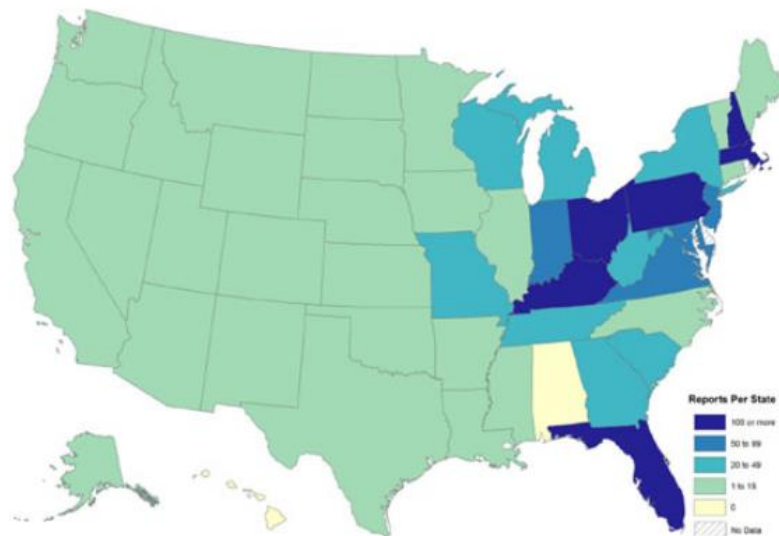


# Emerging issues

Morbidity and Mortality Weekly Report

## Community Outbreak of HIV Infection Linked to Injection Drug Use of Oxymorphone — Indiana, 2015

### Fentanyl reports in NFLIS, by State July – December 2014



Morbidity and Mortality Weekly Report

May 8, 2015

### Increases in Hepatitis C Virus Infection Related to Injection Drug Use Among Persons Aged $\leq 30$ Years — Kentucky, Tennessee, Virginia, and West Virginia, 2006–2012

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# HEROIN USE AMONG NONMEDICAL USERS OF RX OPIOIDS



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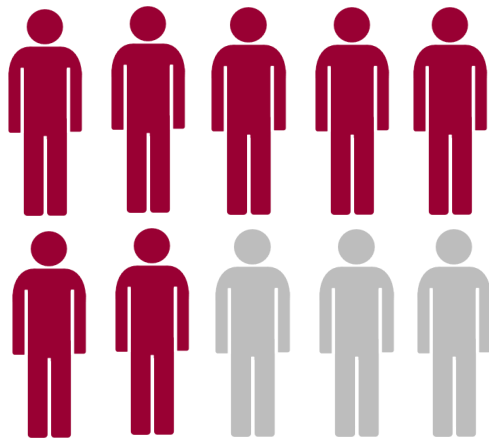
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# Nonmedical use of Rx opioids significant risk factor for heroin use

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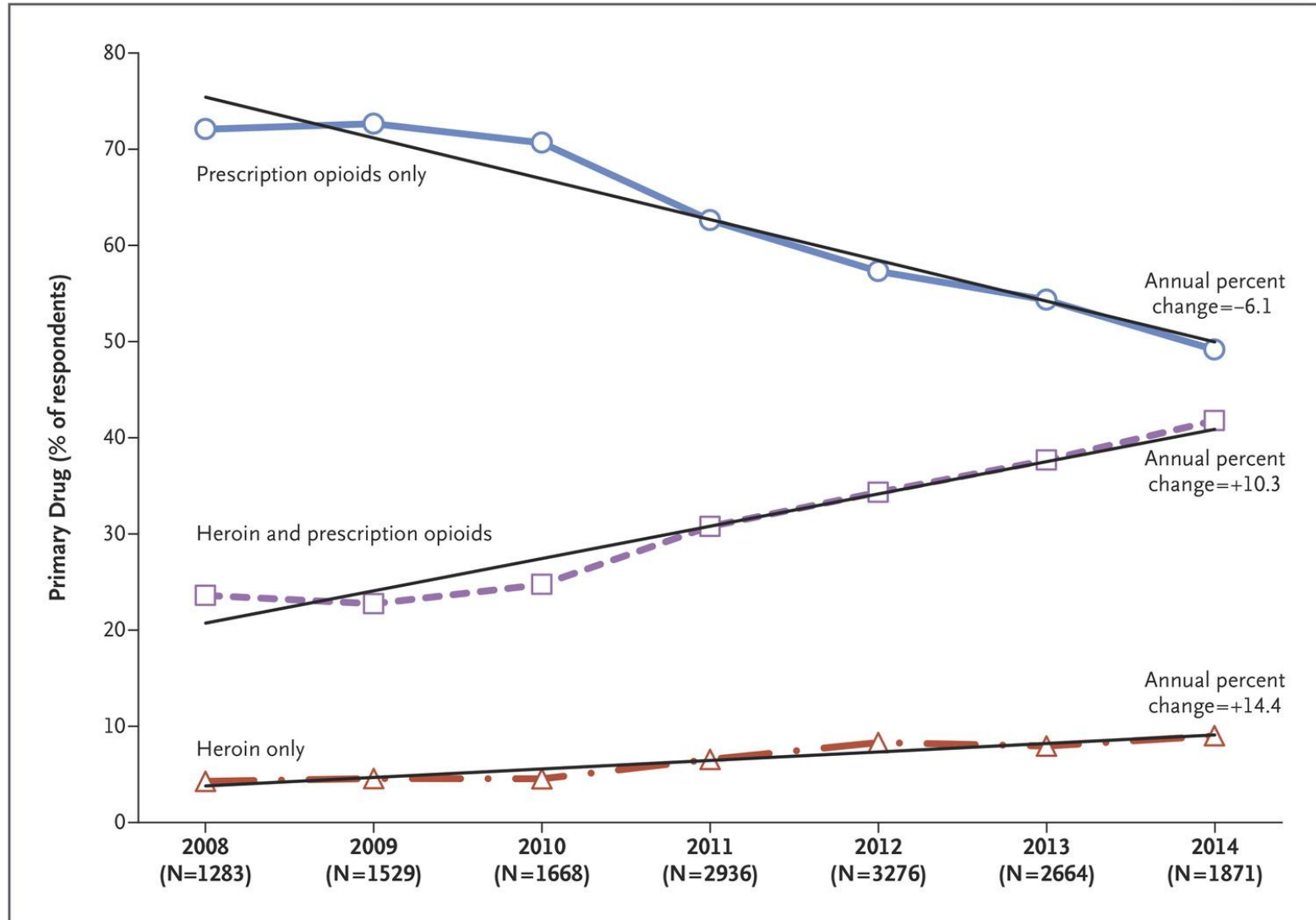


**3 out of 4 people**  
who used heroin in the  
past year misused  
opioids first

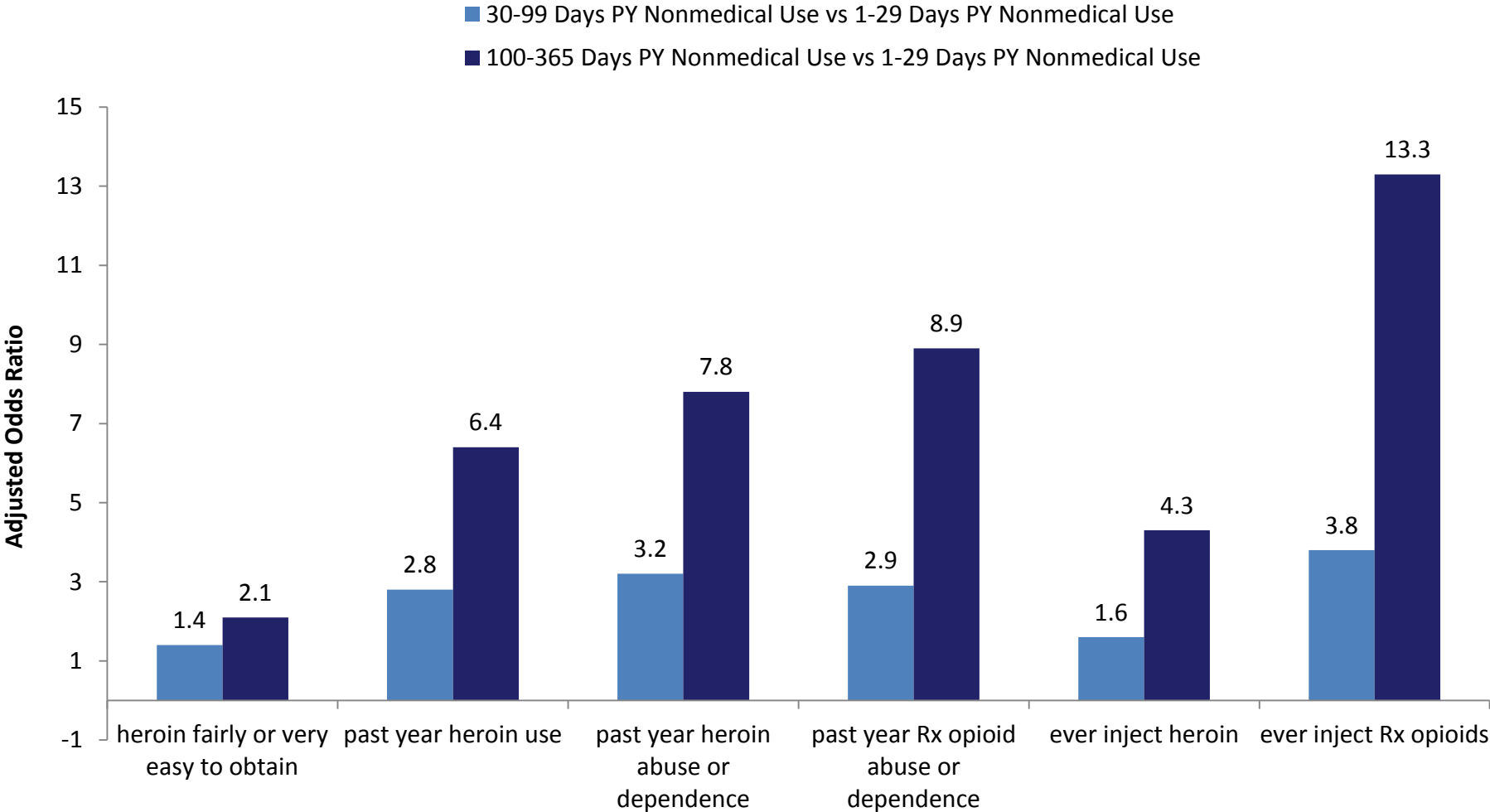


**7 out of 10 people**  
who used heroin in the  
past year also misused  
opioids in the past year

# National Rates of Abuse of Opioids in the Previous Month among 15,227 Respondents



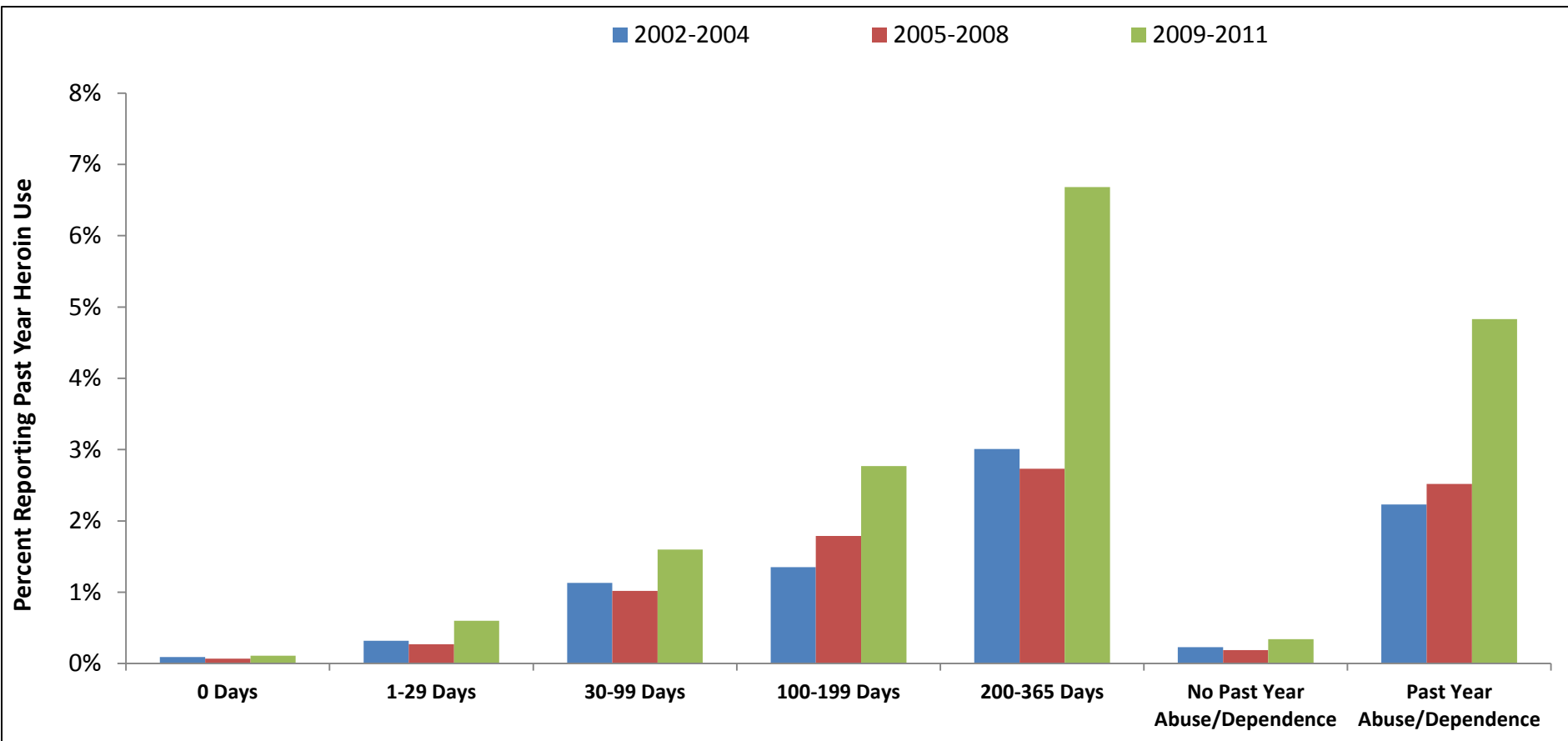
# Risk of heroin use and high-risk behaviors by frequency of Rx opioid nonmedical use



Source: Jones, C.M., Heroin use and heroin use risk behaviors among nonmedical users of prescription opioid pain relievers – United States, 2002–2004 and 2008–2010. Drug Alcohol Depend. (2013). Slide credit – Grant Baldwin, CDC

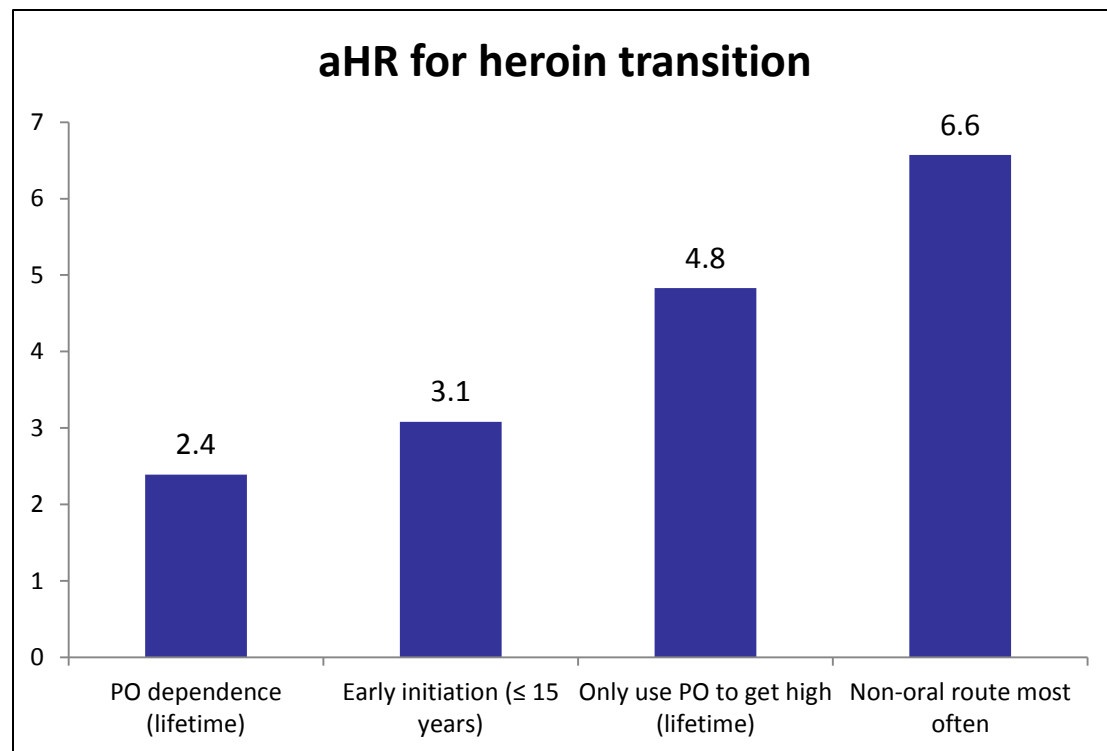
# Frequent nonmedical users of Rx opioids and those with abuse/dependence most likely to initiate heroin

- 3.6% of nonmedical users of Rx opioids had initiated heroin use within 5 years of initiating nonmedical use
- Initiation rate of <1.0 per year



# Heroin initiation rates among people nonmedically using Rx opioids

- Carlson et al – 2016
  - Columbus, Ohio
  - Age 18-23 at recruitment in 2009-2010
  - NMU of Rx opioids  $\geq 5$  day in past 90 days
  - No Hx of lifetime opioid dependence
  - No Hx of heroin use or IDU
  - Not involved in CJ system or SUD Tx in past 30 days
  - Followed for 3 years
- 27 of 362 (7.5%) initiated heroin use during 36 months of study
  - Transition rate of 2.8% per year



# Circumstances of Rx opioid nonmedical use and heroin initiation

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Inciardi et al., 2009

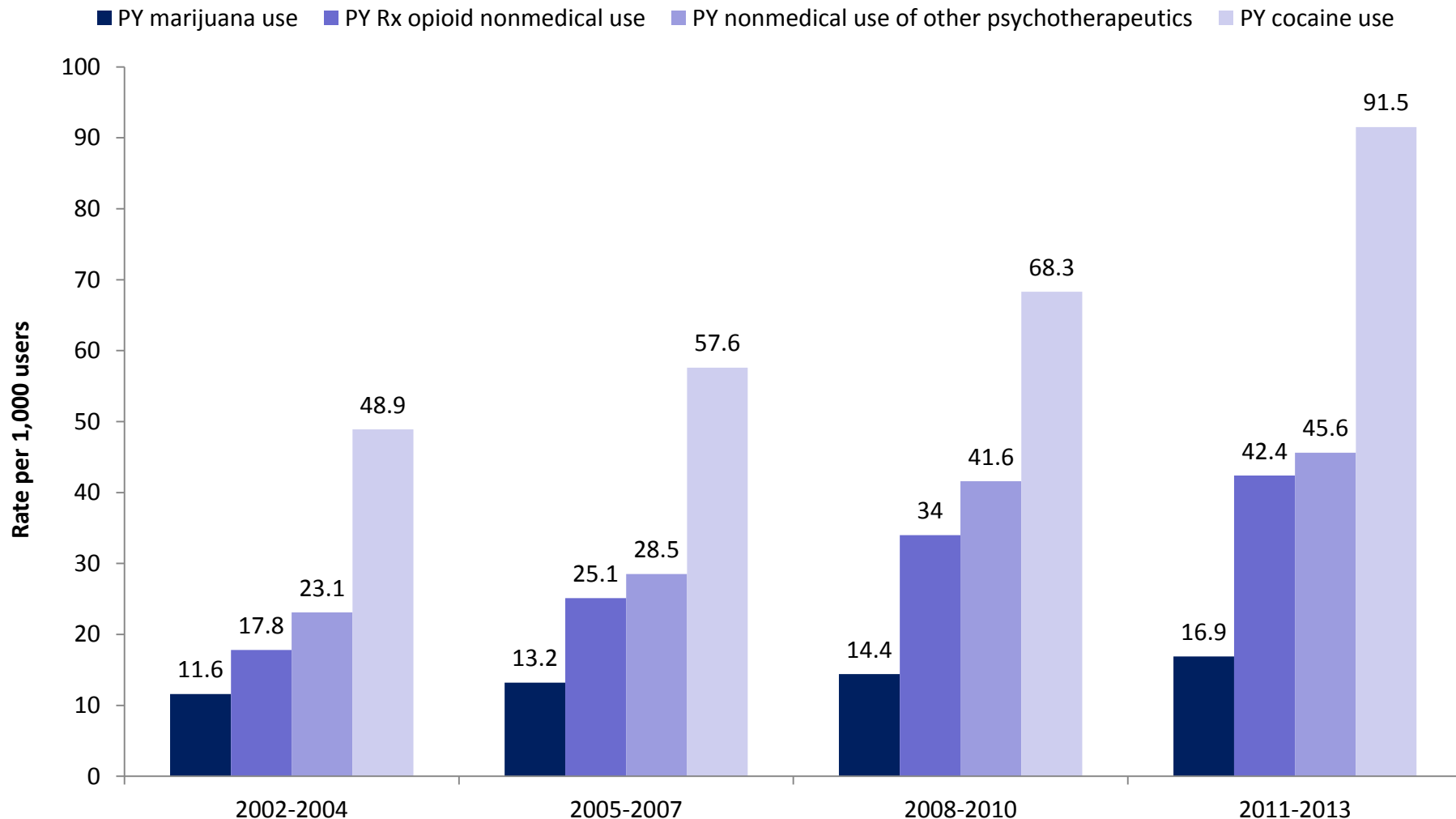
- Interviews in 12/2006
- Rx opioids preceded heroin
- Rx opioid dependence, social context, economics, and availability major factors in heroin initiation

Harocops et al., 2016

- Interviews between 8/2013 and 1/2015
- Cycle of oral to intranasal to injection
- Dependence, social context, economics, and availability all factors in heroin initiation
- Median time from first Rx opioid misuse to heroin use was 3 years
- Among those with no Hx of IDU prior to heroin initiation, median time between intranasal and IV heroin use was six months

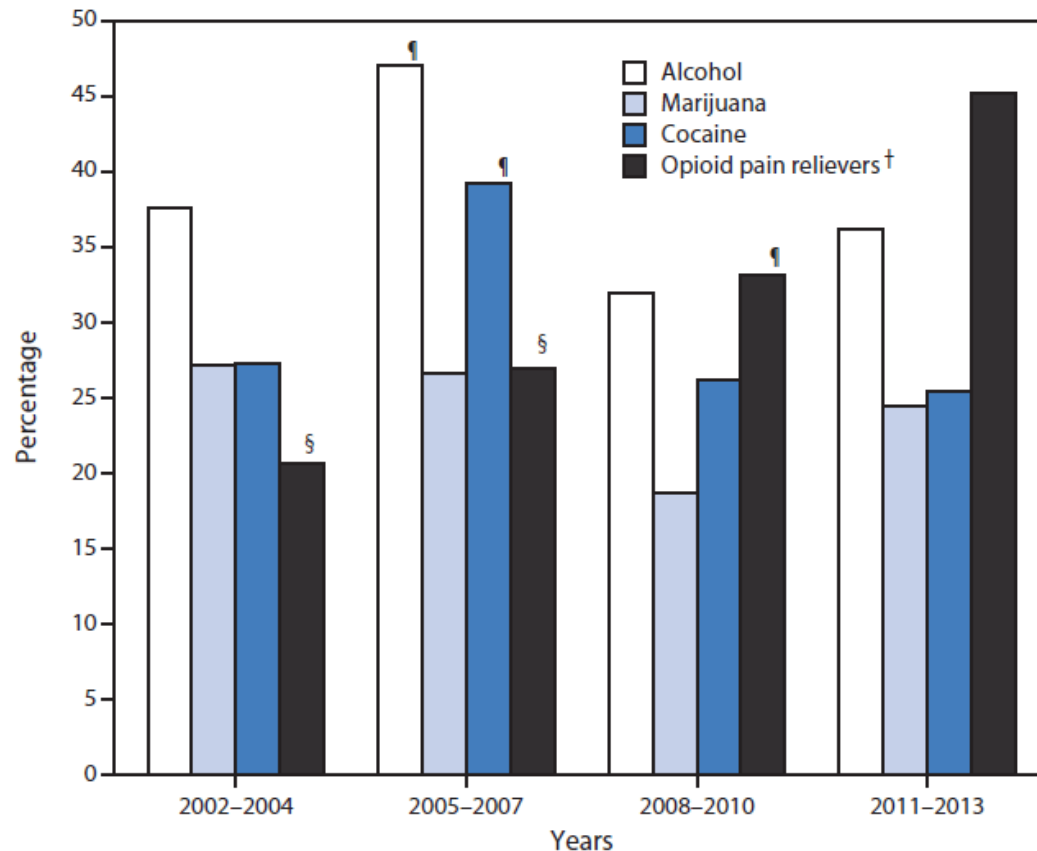


# Rate of heroin use among users of other substances



# Past year substance abuse or dependence among past year heroin users

FIGURE 1. Annual average percentage of past-year heroin users\* with past-year selected substance abuse or dependence, by time interval — United States, 2002–2013



\* Past-year heroin use defined as any use of heroin in the 12 months preceding the National Survey on Drug Use and Health survey interview.

† p-value for trend <0.05.

§ Rate is statistically significantly different from 2011–2013 rate;  $p < 0.001$ .

¶ Rate is statistically significantly different from 2011–2013 rate;  $p < 0.05$ .

# Groups at increased risk for heroin abuse or dependence

Characteristic	Past-year heroin abuse or dependence	
	aOR	(95% CI)
<b>Sex</b>		
Male	2.1 <sup>+++</sup>	(1.4–3.0)
Female	1.0	
<b>Age (yrs)</b>		
12–17	0.3 <sup>++</sup>	(0.1–0.6)
18–25	1.0	
26	0.6 <sup>++</sup>	(0.4–0.9)
<b>Race/Ethnicity</b>		
Non-Hispanic white	3.1 <sup>+++</sup>	(1.8–5.1)
Other	1.0	
<b>Geography</b>		
Residing in CBSA with ≥1 million persons	2.4 <sup>+++</sup>	(1.5–3.6)
Residing in other area	1.0	
<b>Household income (annual)</b>		
<20,000	1.0	
\$20,000–\$49,999	0.5 <sup>++</sup>	(0.3–0.7)
≥\$50,000 or more	0.6 <sup>†</sup>	(0.3–0.9)
<b>Insurance coverage</b>		
None	3.1 <sup>+++</sup>	(2.2–4.3)
Medicaid	3.2 <sup>+++</sup>	(1.9–5.4)
Private or other	1.0	
<b>Past-year substance abuse or dependence<sup>§</sup></b>		
Alcohol	1.8 <sup>++</sup>	(1.2–2.9)
Marijuana	2.6 <sup>++</sup>	(1.5–4.6)
Cocaine	14.7 <sup>+++</sup>	(7.4–29.2)
Opioid pain relievers	40.0 <sup>+++</sup>	(24.6–65.3)
Other psychotherapeutics <sup>¶</sup>	1.6	(0.8–3.2)

Abbreviations: aOR = adjusted odds ratio; CBSA = core based statistical area; CI = confidence interval.

\* Past-year heroin abuse or dependence is based on diagnostic criteria contained in the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition*.

† Statistically significant finding; †p<0.05; ++p<0.01; +++p<0.001.

§ Referent group is no past-year abuse or dependence.

¶ Other psychotherapeutics includes tranquilizers, sedatives, and stimulants.

- Abuse or dependence on other substances significant predictors of heroin abuse or dependence
- Alcohol; aOR=1.8\*\*
- Marijuana; aOR=2.6\*\*
- Cocaine; aOR=14.7\*\*\*
- Rx opioids; aOR=40.0\*\*\*

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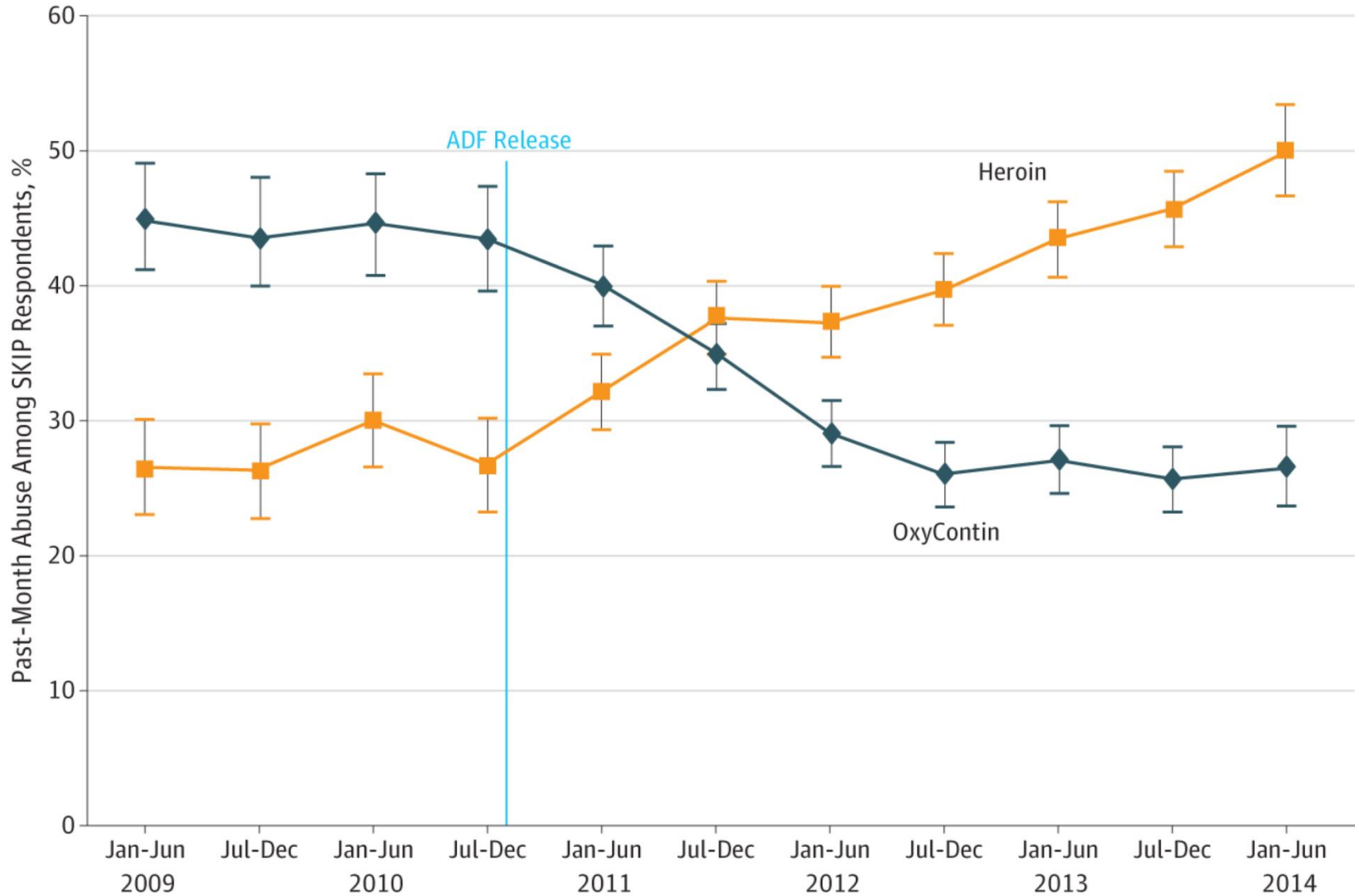
# **INFLUENCE OF PRESCRIPTION OPIOID ABUSE PREVENTION POLICIES**

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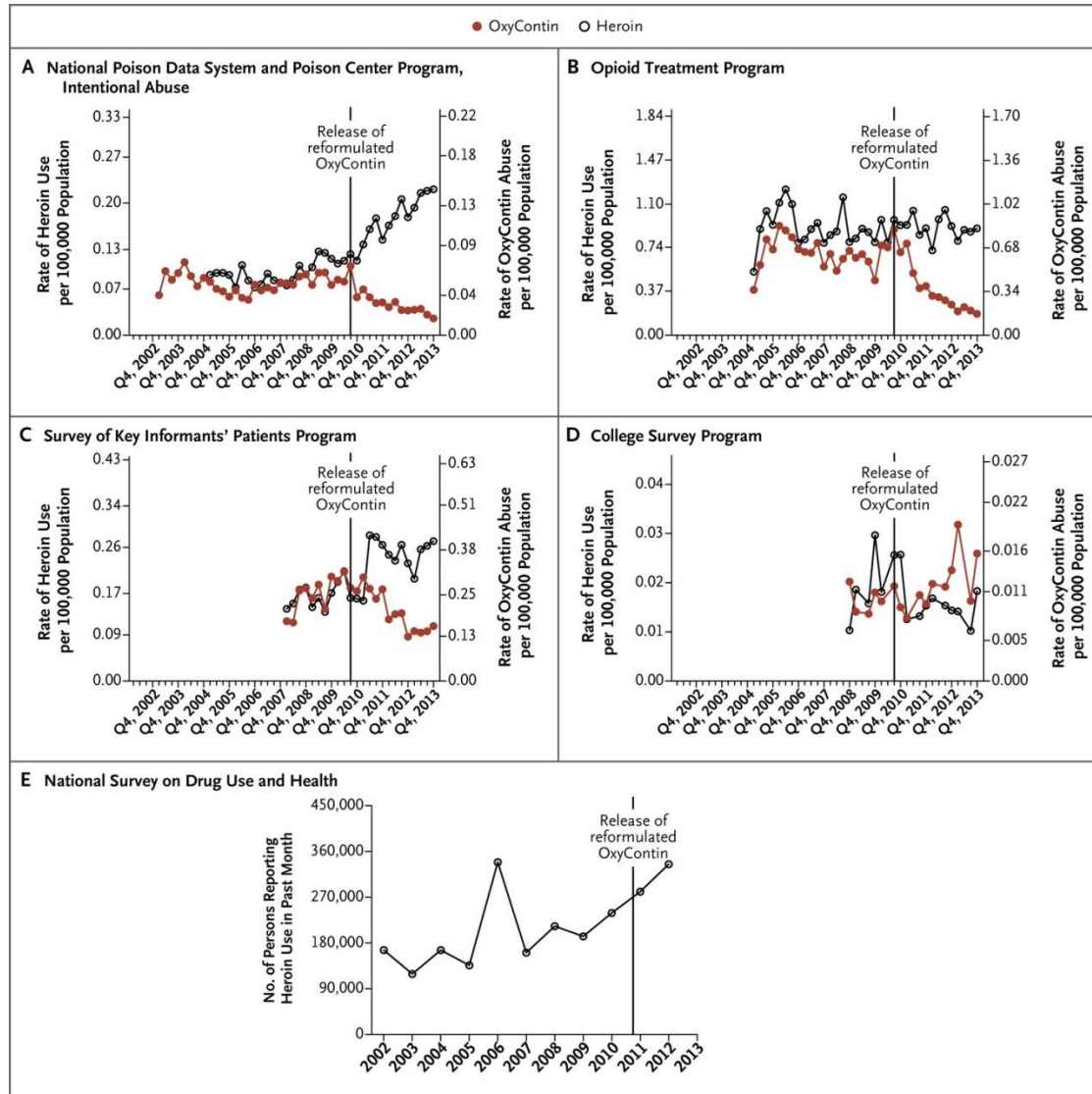


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# Reformulation of OxyContin

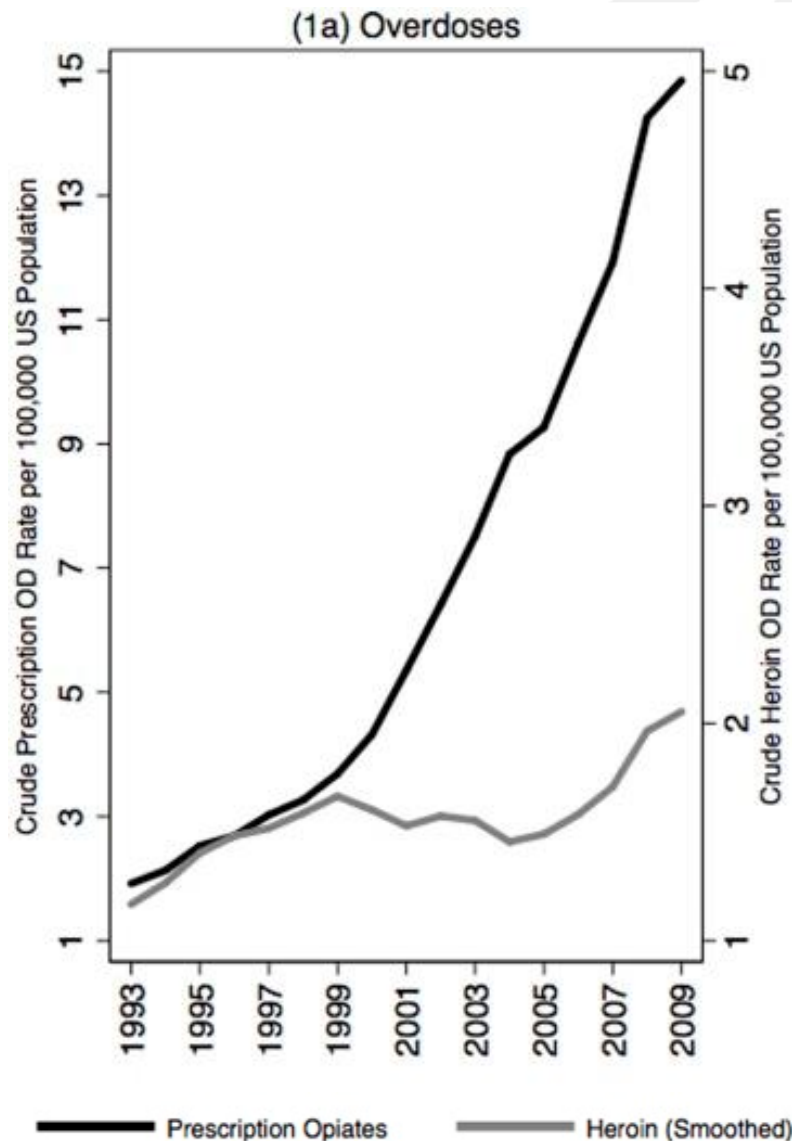


# Reformulation of OxyContin

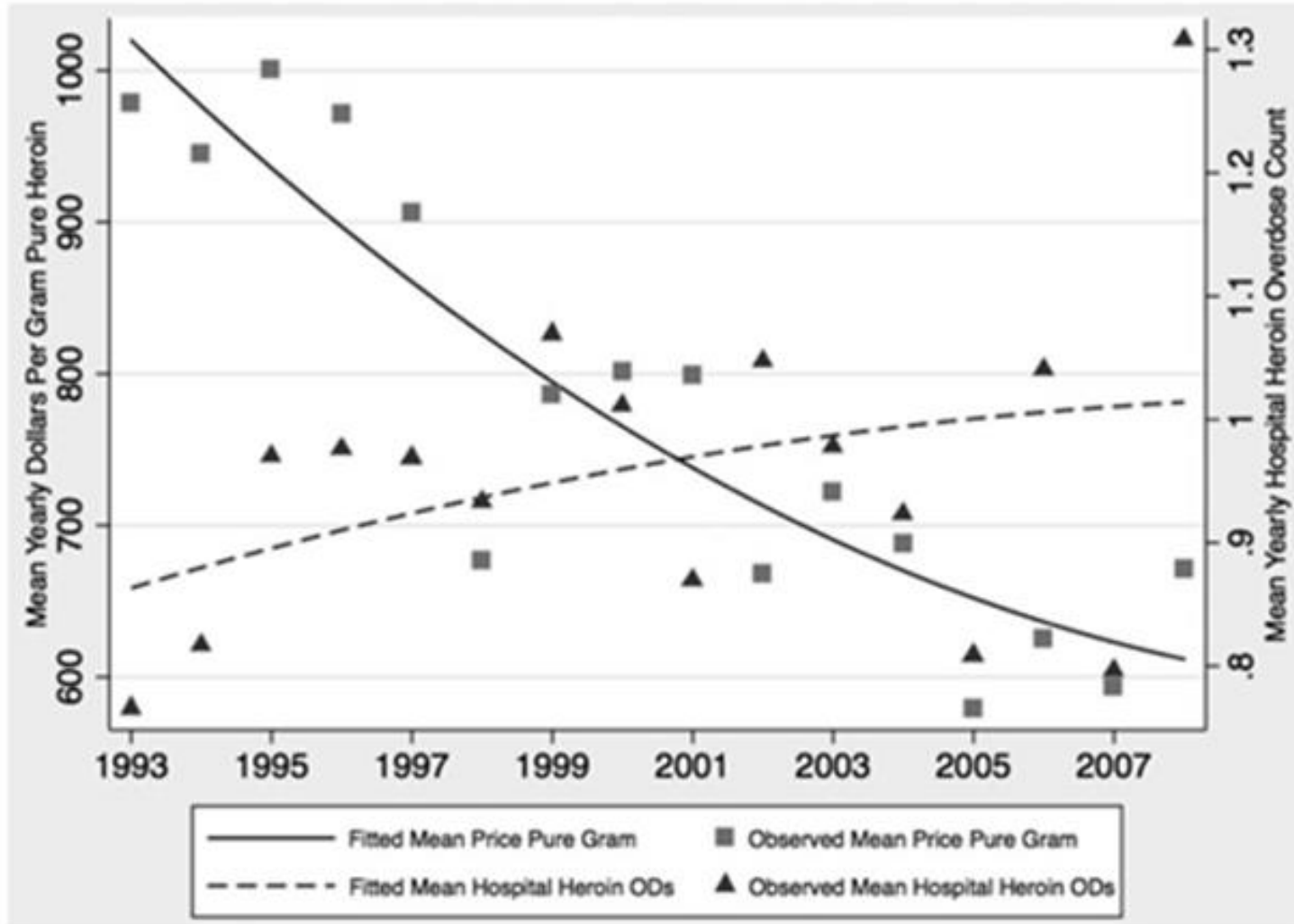


# National perspective

- 69% increase in heroin overdose hospitalizations between 1993-2006
- Sharper increase, 44% between 2005-2009
- These increases occurred in the context of continued increase in Rx opioid overdose hospitalizations



# The role of economics

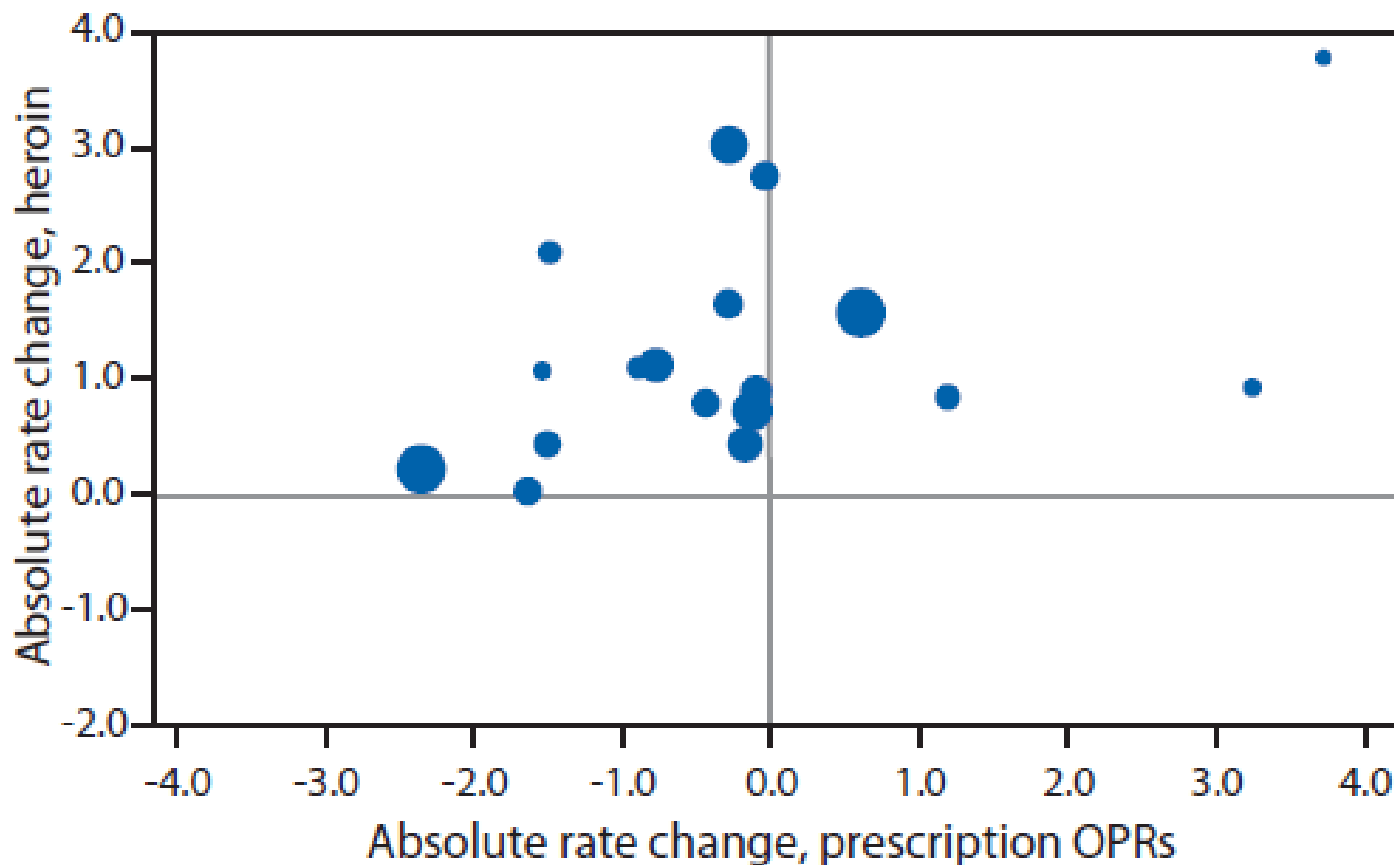


Every \$100 decrease in price of pure gram of heroin resulted in a 2.9% increase in number heroin overdose hospitalizations



# State policies

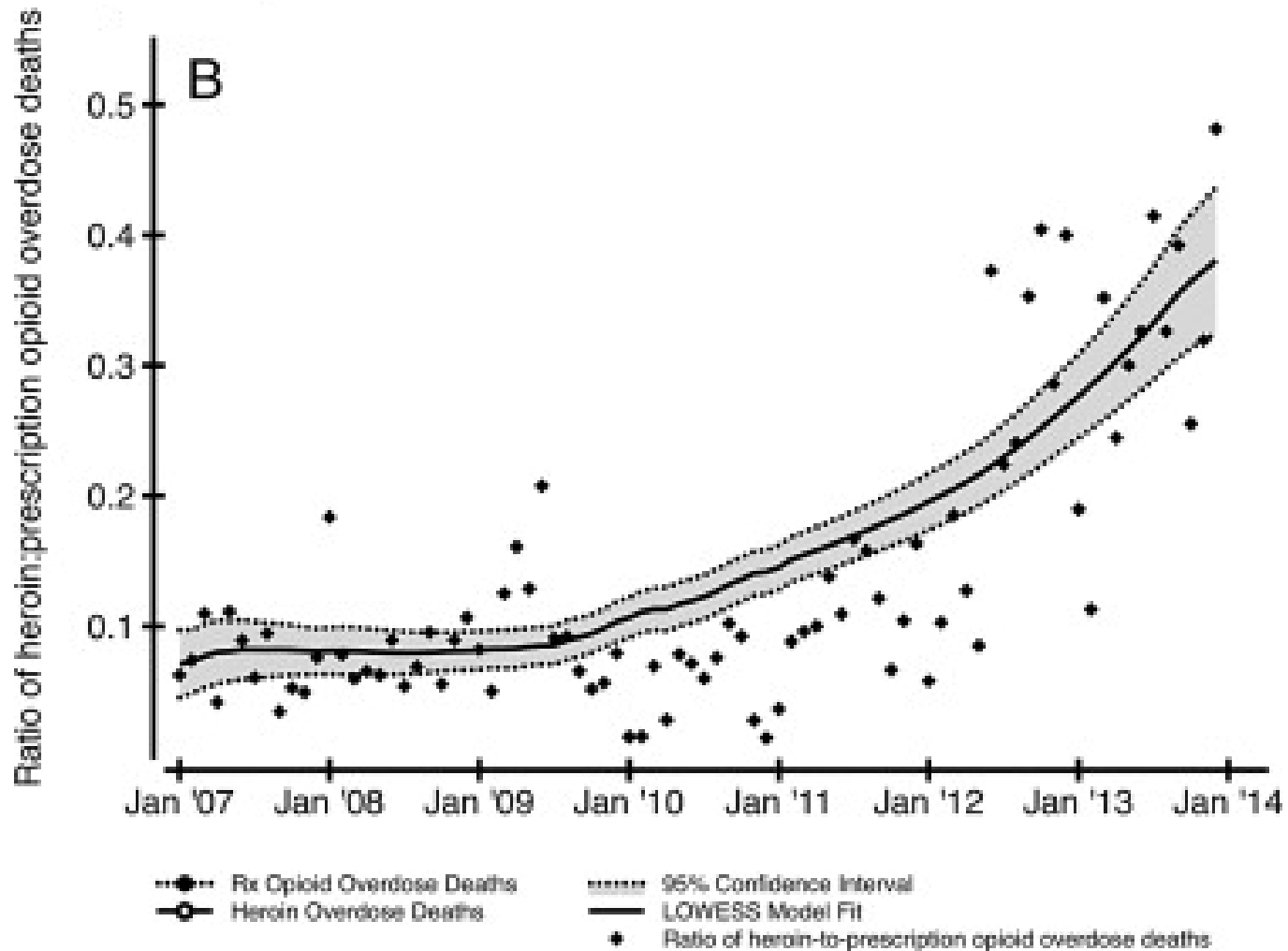
**Absolute change in heroin overdose death rates compared with change in Rx opioid overdose death rates — 18 states, 2010 to 2012**



Rate change per 100,000 persons ( $r = 0.47$ ,  $p = 0.05$ ).

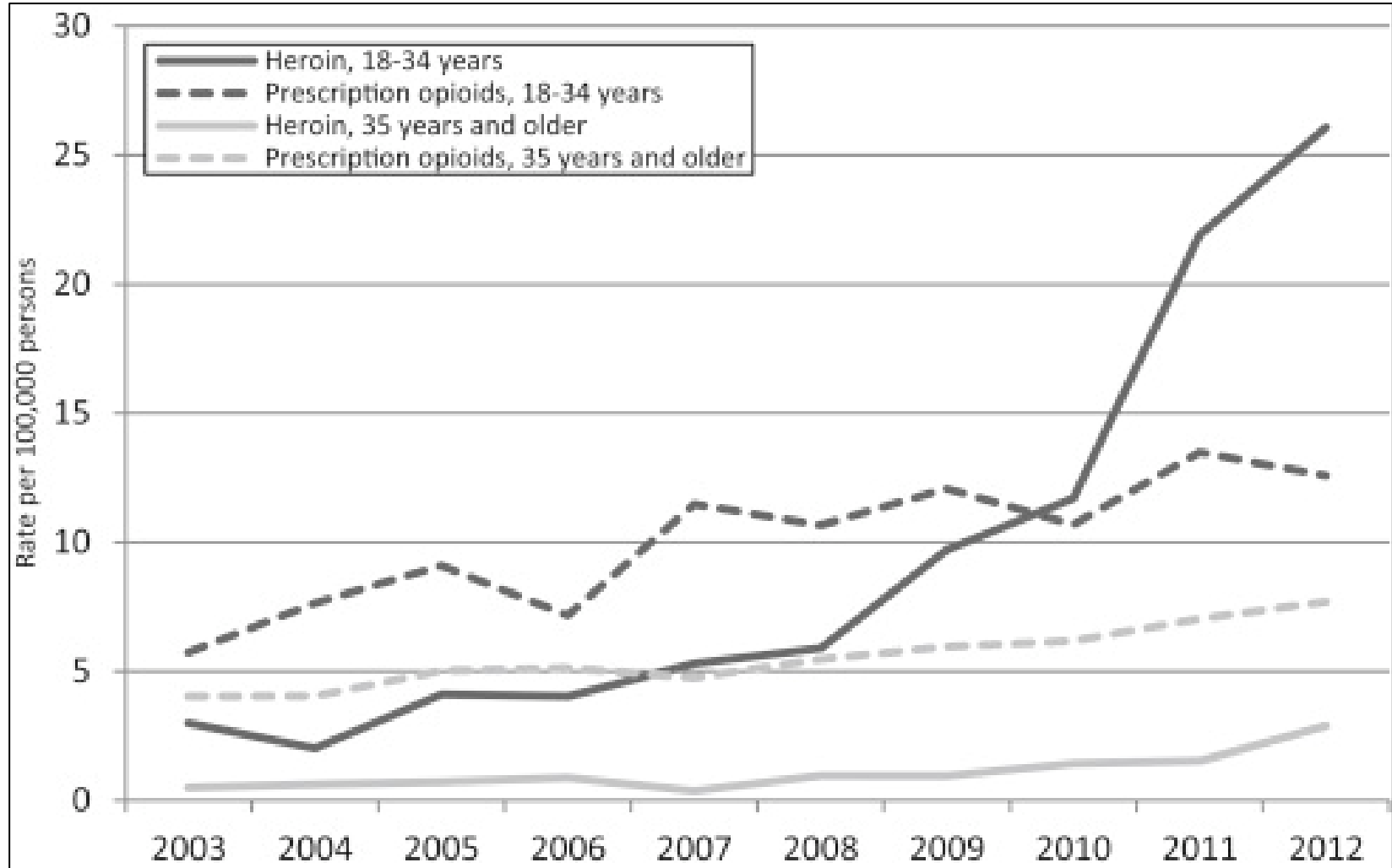
# State policies

Shift towards heroin deaths started in 2009 in NC



# State policies

Heroin ED visits in Wisconsin increased as Rx opioid ED visits increased



# Local policies

Borough of residence	2011		2012		2013		% rate change from 2011 to 2013
	Total	(Rate)	Total	(Rate)	Total	(Rate)	
<b>New York City</b>							
Any drug	567	-8.5	660	-9.8	672	-9.9	+16.4¶
Heroin	253	-3.8	339	-5	352	-5.2	+36.8¶
Opioid analgesics	201	-3	181	-2.7	197	-2.9	-3.3
<b>Staten Island</b>							
Any drug	69	-18.4	74	-19.9	64	-17.6	-4.3¶
Heroin	22	-6.2	36	-10.1	32	-8.6	+38.7¶
Opioid analgesics	40	-10.7	37	-10	28	-7.6	-29.0¶
<b>Other four boroughs</b>							
Any drugs	498	-7.9	586	-9.3	608	-9.5	+20.3¶
Heroin	231	-3.7	303	-4.8	320	-5	+35.1¶
Opioid analgesics	161	-2.6	144	-2.3	169	-2.6	0
<b>Source:</b> Office of Chief Medical Examiner, New York City.							
* Age-adjusted rates are calculated using intercensal estimates updated in December 2014, and are weighted to U.S. Census Standard 2000.							
† The drug types are not mutually exclusive; most overdoses involved more than one substance.							
§ Analysis limited to residents of Staten Island and the other four New York City boroughs (Bronx, Brooklyn, Manhattan, and Queens), based on data reported on death certificates.							
¶ Statistically significant rate change ( $p < 0.05$ ), determined by z-tests and 95% confidence interval comparisons based on gamma confidence intervals distribution.							

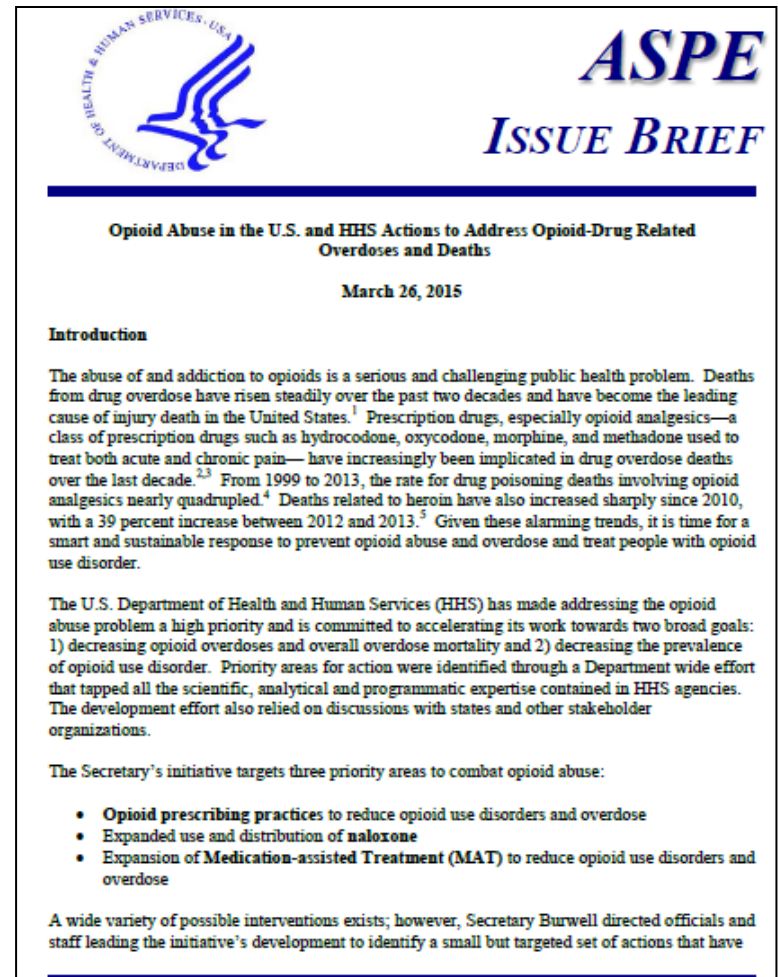
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# **POLICY RESPONSE**

# HHS Opioid Initiative

- Launched by Secretary Burwell in March 2015
- Three focus areas
  - Improve opioid prescribing
  - Increase use of naloxone to reverse opioid overdose
  - Expand use of Medication-Assisted Treatment (MAT) for opioid use disorders



# Conclusions

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- Trends in Rx opioid and heroin-related morbidity and mortality continue to change
- More research needed to track patterns of use and overdose and the impacts (intended and unintended) of policy and practice change on prescribing, use, and health outcomes
- Data support a comprehensive approach that focuses on improving prescribing practices, expanding access to evidence-based treatment for opioid use disorders, and increasing use of naloxone



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# THANK YOU

# QUESTIONS?

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