

**RADARS<sup>®</sup> System**  
**Subutex & Suboxone: How Much is**  
**Prescribed vs. Abuse/Diversion Reports**

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# Disclosure of Potential Conflicts of Interest

- The RADARS System is a governmental nonprofit operation of the Rocky Mountain Poison and Drug Center, an agency of Denver Health and Hospital Authority, and provides data to industry and researchers on a subscription basis. RMPDC employees only receive their salary for their participation in system operations and research activities.
- Reckitt Benckiser Pharmaceuticals Inc., supported the pediatric analyses through an unrestricted educational grant but did not participate in the study design or analysis.

# Outline

- RADARS System Overview
- Buprenorphine Abuse and Diversion Overview
- Buprenorphine Abuse Data: Abstracted Poison Center Data
- Buprenorphine Mortality Data
- Buprenorphine Pediatric Exposures

# RADARS System Organization

Rocky Mountain Poison & Drug Center of Denver Health

Drug  
Diversion

Key  
Informant

Poison  
Center

Opioid  
Treatment  
Program

Impaired  
Health Care  
Worker

College  
Survey

Numerators are compiled by each signal detection system

Denominator includes Population and  
Unique Recipients of a Dispensed Drug (URDD)

RADARS System calculation of rates

Review by Scientific Advisory Board

Reports sent to subscribers

Data results are submitted for publication

# Six Views on Prescription Drug Abuse

Law Enforcement

- Drug Diversion
- Criminal justice perspective

Key Informant

- Dependent/addicted patients
- Health care provider perspective

Poison Center

- Acute incident – calling for care advice
- All ages and geographic regions

Opioid Treatment  
Program

- Dependent/addicted patients
- Patient perspective

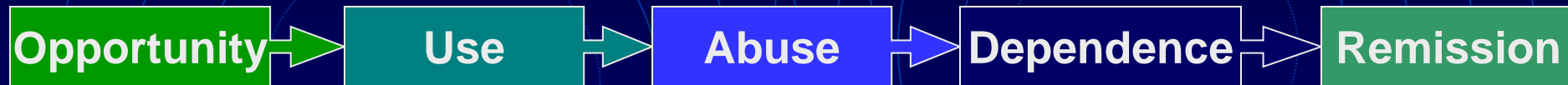
Impaired Health  
Care Worker

- Subset of all signal detection systems
- Early adopter group?

College Survey

- Experimentation
- Early abuse perspective

# Drug Dependence Pathway



Drug Diversion

URDD

College Survey

Poison Center

Impaired Health Care Worker

Key Informant

Opioid Treatment Program

Source: Chilcoat HD, Johanson CE. Vulnerability to Cocaine Abuse. Higgins ST, Ed. *Cocaine Abuse: Behavior, Pharmacology, and Clinical Applications*. San Diego, CA: Academic Press; 1998: 313-341.  
Institute of Medicine – Committee on Opportunities in Drug Abuse Research. *Pathways of Addiction*. Washington, DC: National Academy Press; 1996.



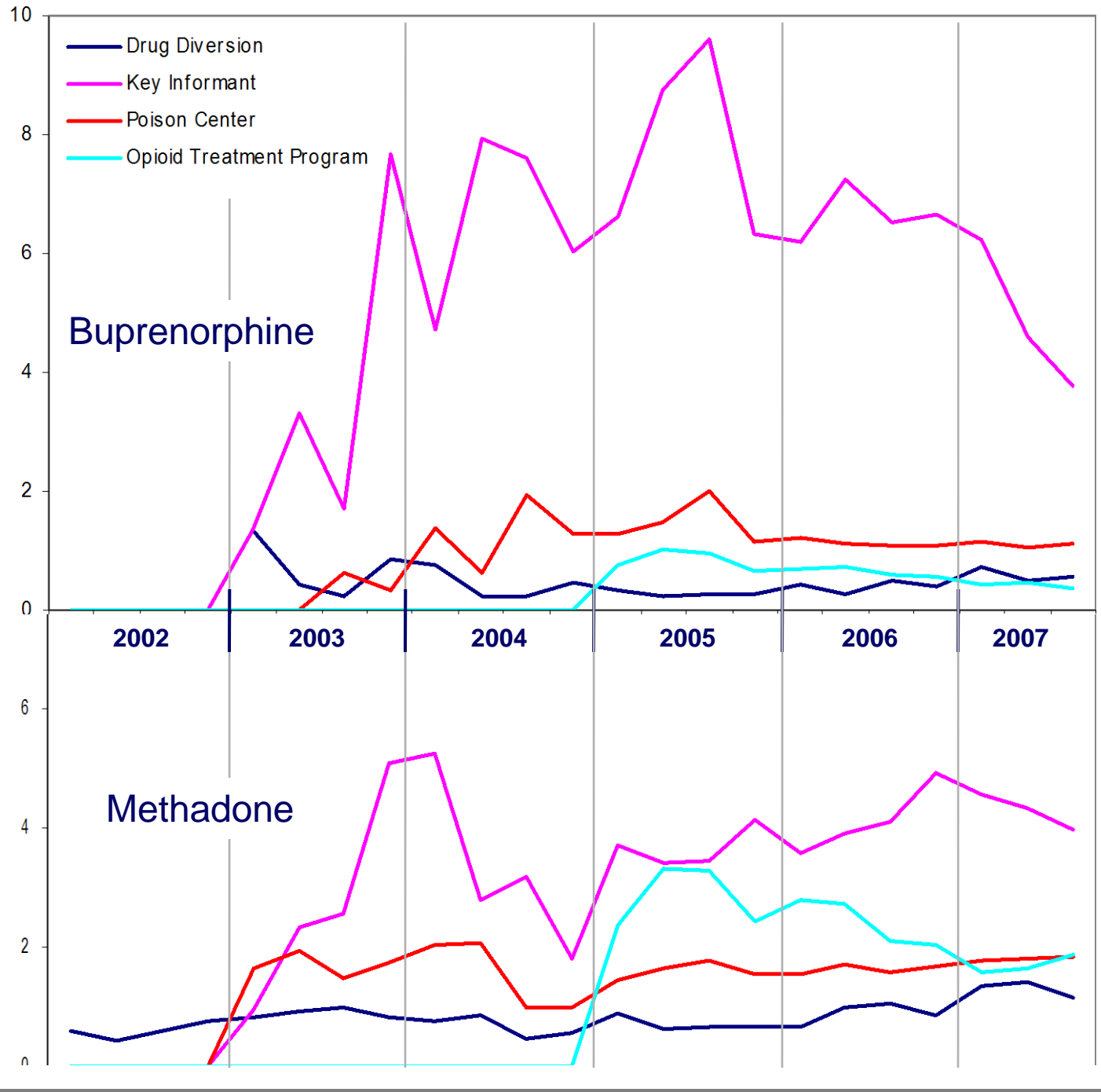
# Buprenorphine Abuse and Diversion Overview

RADARS<sup>®</sup> System

# RADARS System Signal Detection Studies

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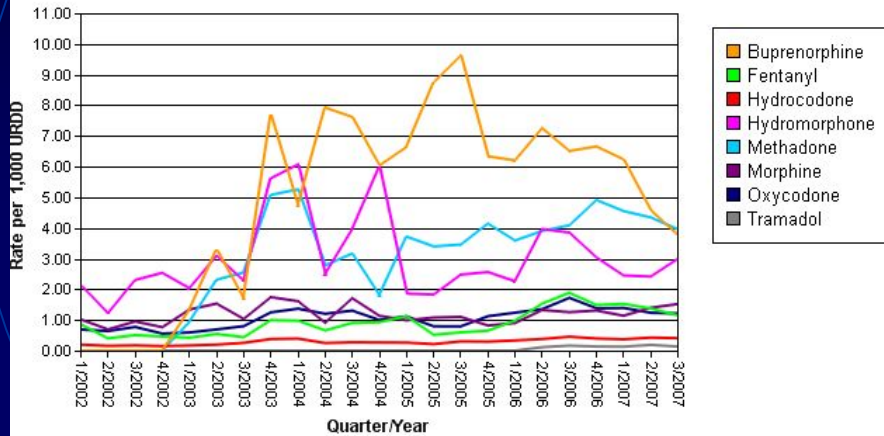
## Abuse & Diversion Rates 2002-07



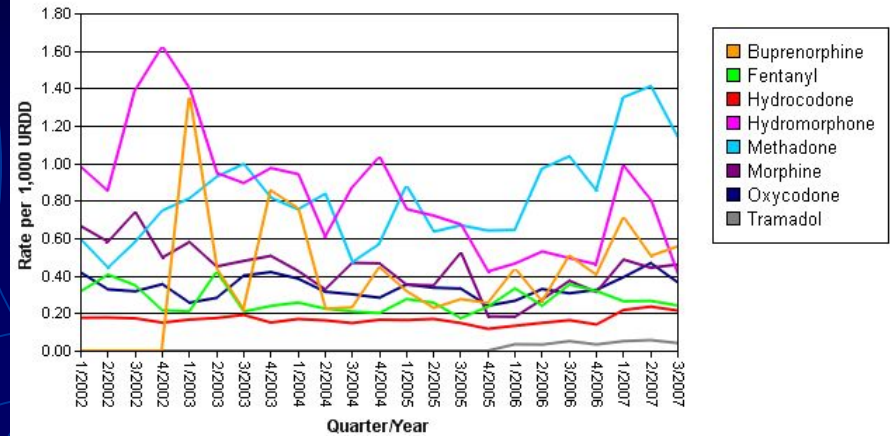


# Abuse, Misuse and Diversion Rates per 1,000 URDD

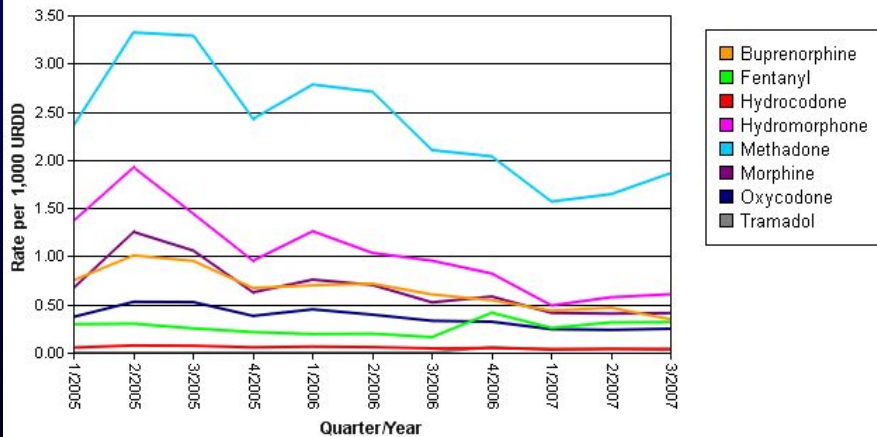
## Drug Diversion



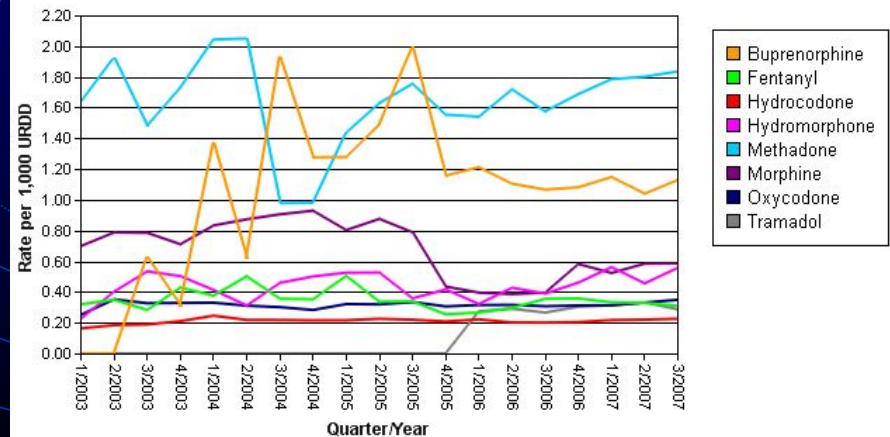
## Key Informant



## Opioid Treatment Program



## Poison Center

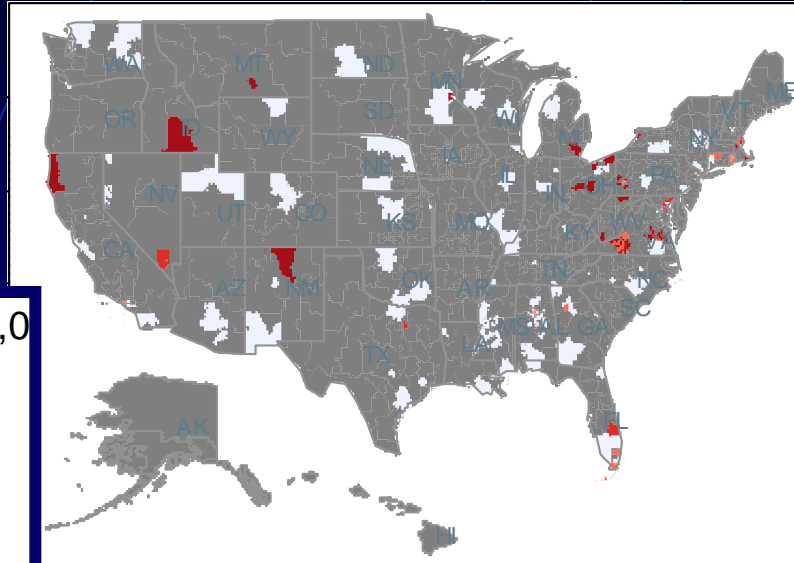
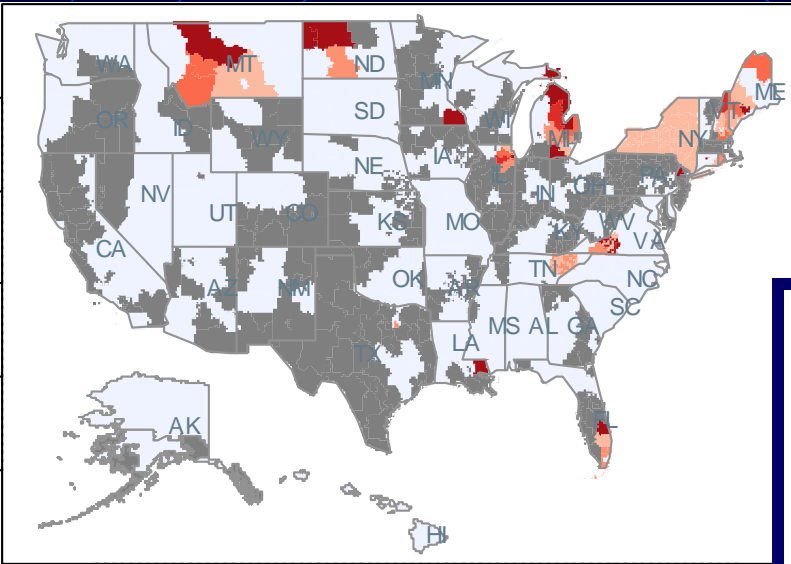


# Buprenorphine Rates per 1,000 URDD

3<sup>rd</sup> Quarter 2007

Drug Diversion

Key Informant

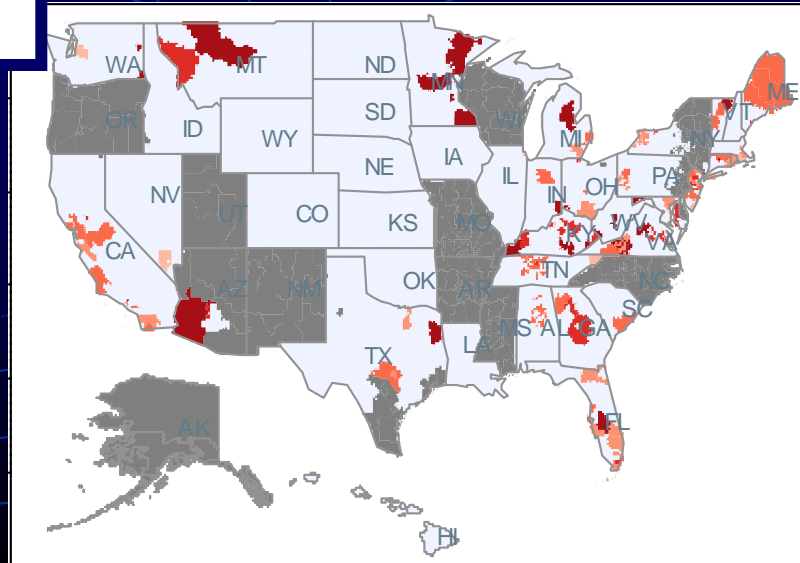
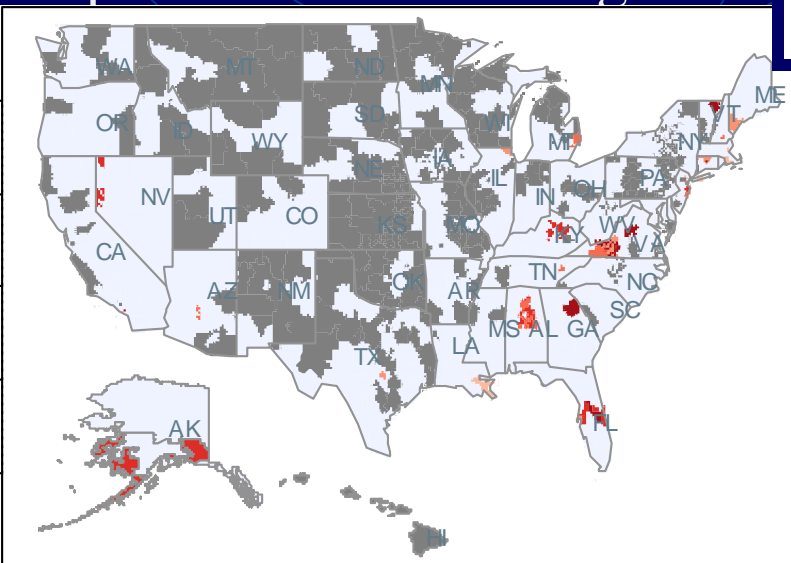


Cases/1,000

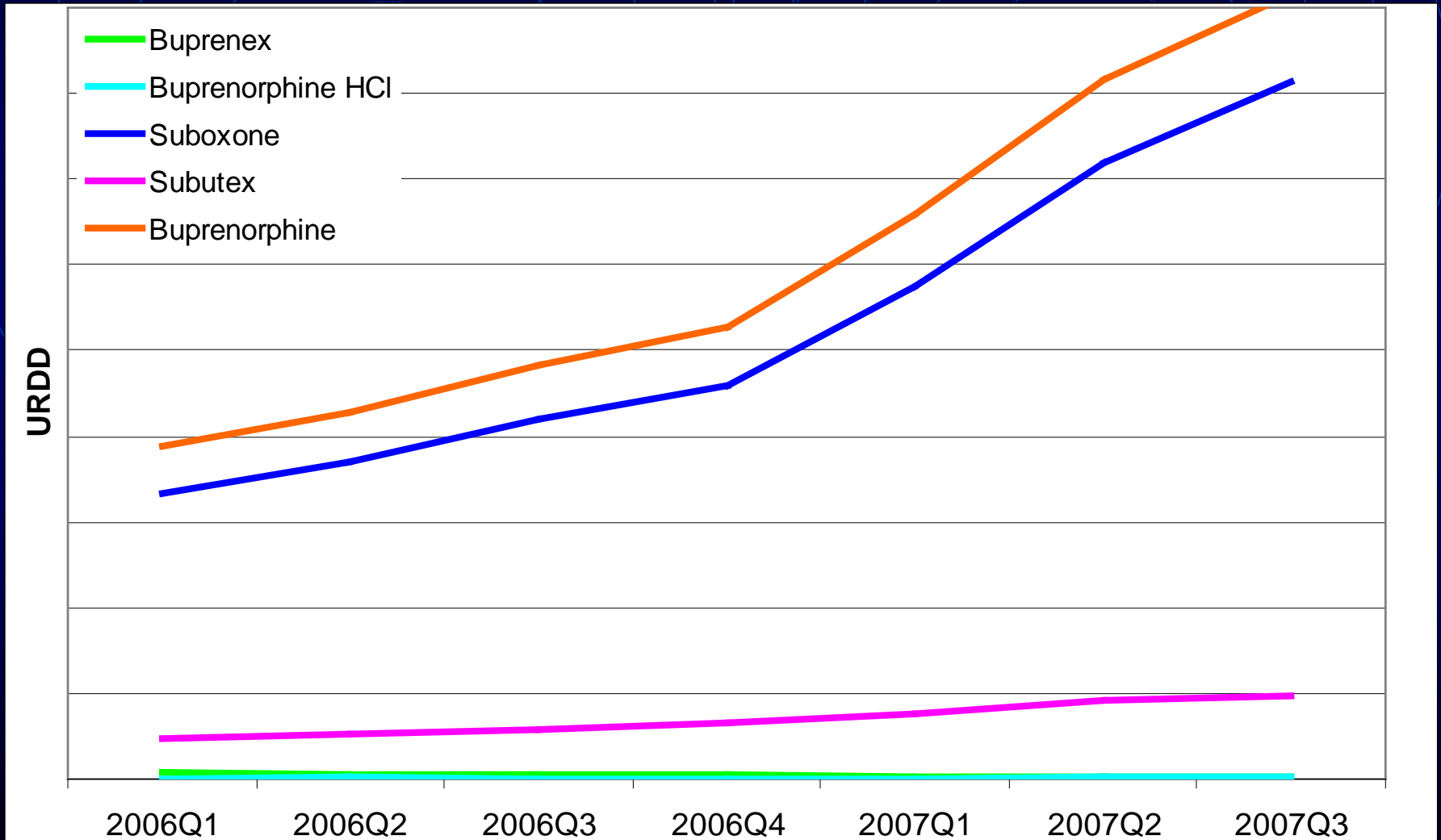
- > 10
- 5.01 - 10
- 2.01 - 5
- 1.01 - 2
- 0.01 - 1
- 0.00
- Noncovered

Opioid Treatment Program

Poison Center



# Unique Recipients of Dispensed Drug (URDD)



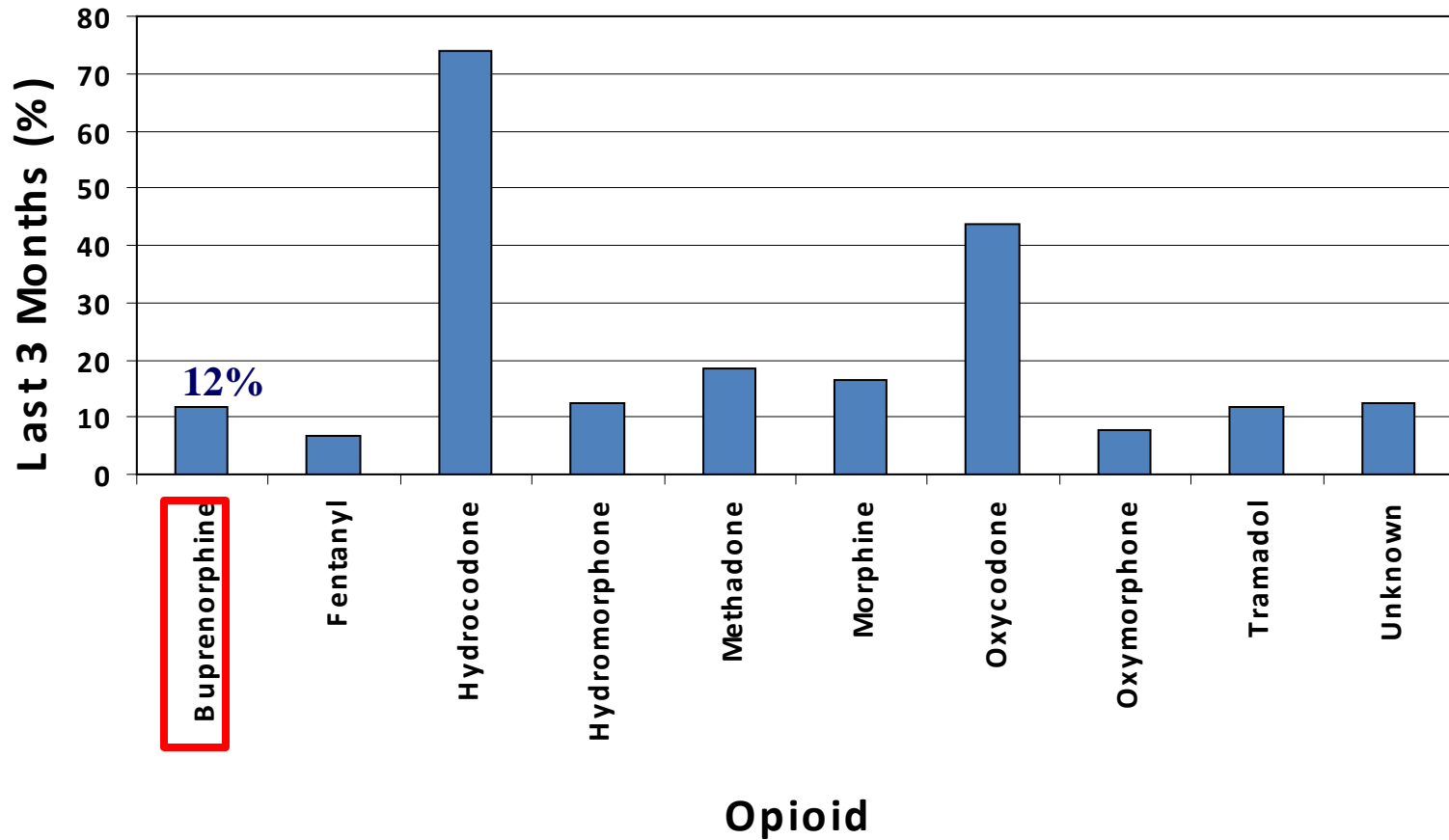
# Buprenorphine Endorsement

Table 1  
Opioid abuse among MMTP enrollees, by primary drug of choice

	Prescription opioid ( <i>n</i> = 2174) (%)	
	Ever	Past 30 days
Heroin	33	13
Prescription opioids	100	99
Oxycodone, any formulation	89	79
CR-Oxycodone (e.g., OxyContin <sup>®</sup> )	89	71
IR-Oxycodone (e.g., Percocet <sup>®</sup> )	81	59
Hydrocodone (e.g., Vicodin <sup>®</sup> )	88	67
Methadone	58	40
Morphine	59	29
Hydromorphone (e.g., Dilaudid <sup>®</sup> )	37	16
Fentanyl	30	9
Buprenorphine	5	1
Ever injected primary drug	33	<i>n/a</i>

# RADARS System College Survey

## Abuse & Misuse by Self Identified College Students





# Buprenorphine Abuse Data: Abstracted Poison Center Data

RADARS<sup>®</sup> System

# Buprenorphine Case Abstraction Methodology

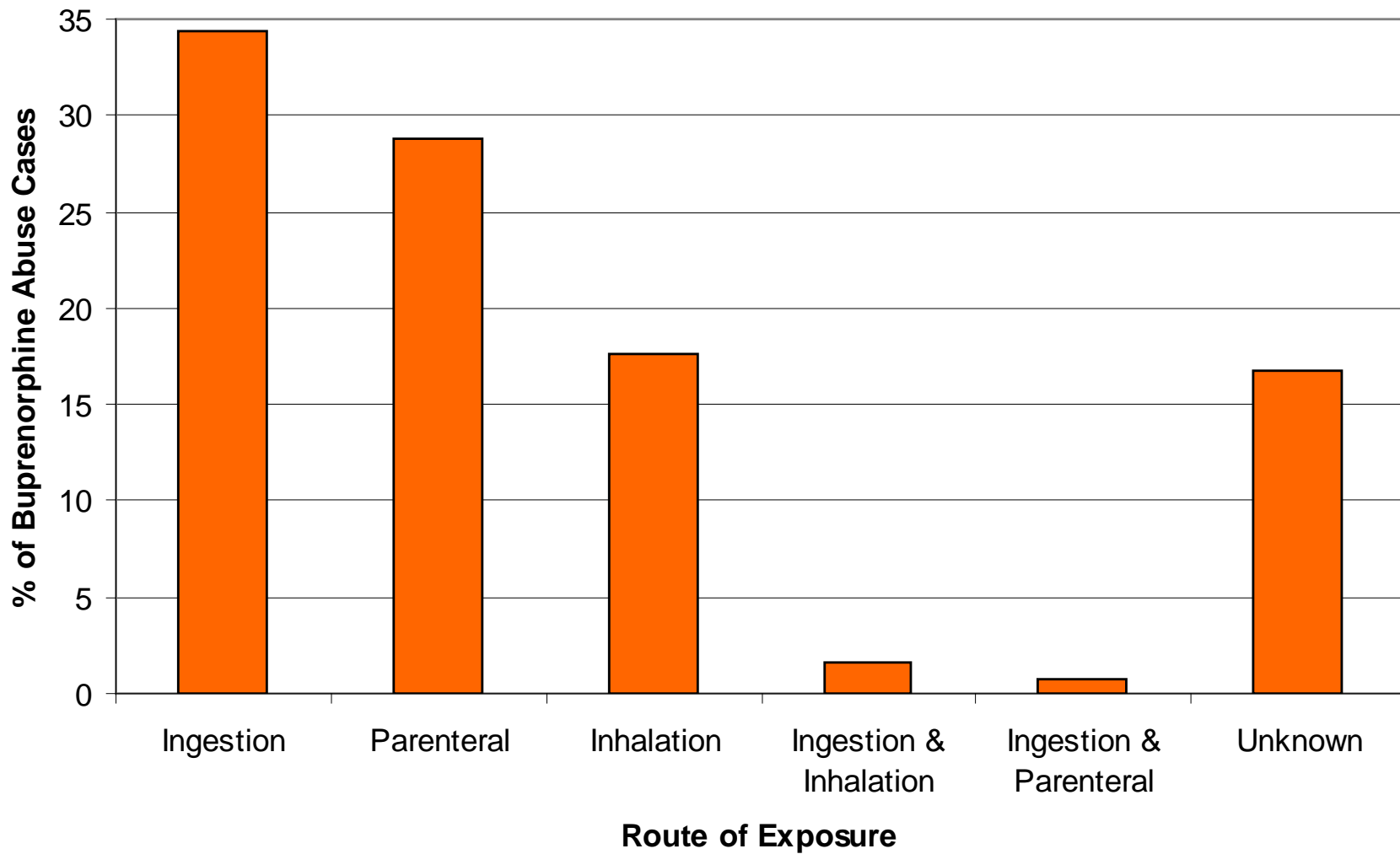
- Data collected from 2003 – 2007Q2
  - 11 of 60 US centers (18%) in 1<sup>st</sup> quarter 2003
  - 43 of 60 US centers (72%) in 2<sup>nd</sup> quarter 2007
- All intentional exposure case notes were reviewed for abuse
  - “injected”, “snorted”, “abused”, “to get high”, “recreationally”, and similar terms

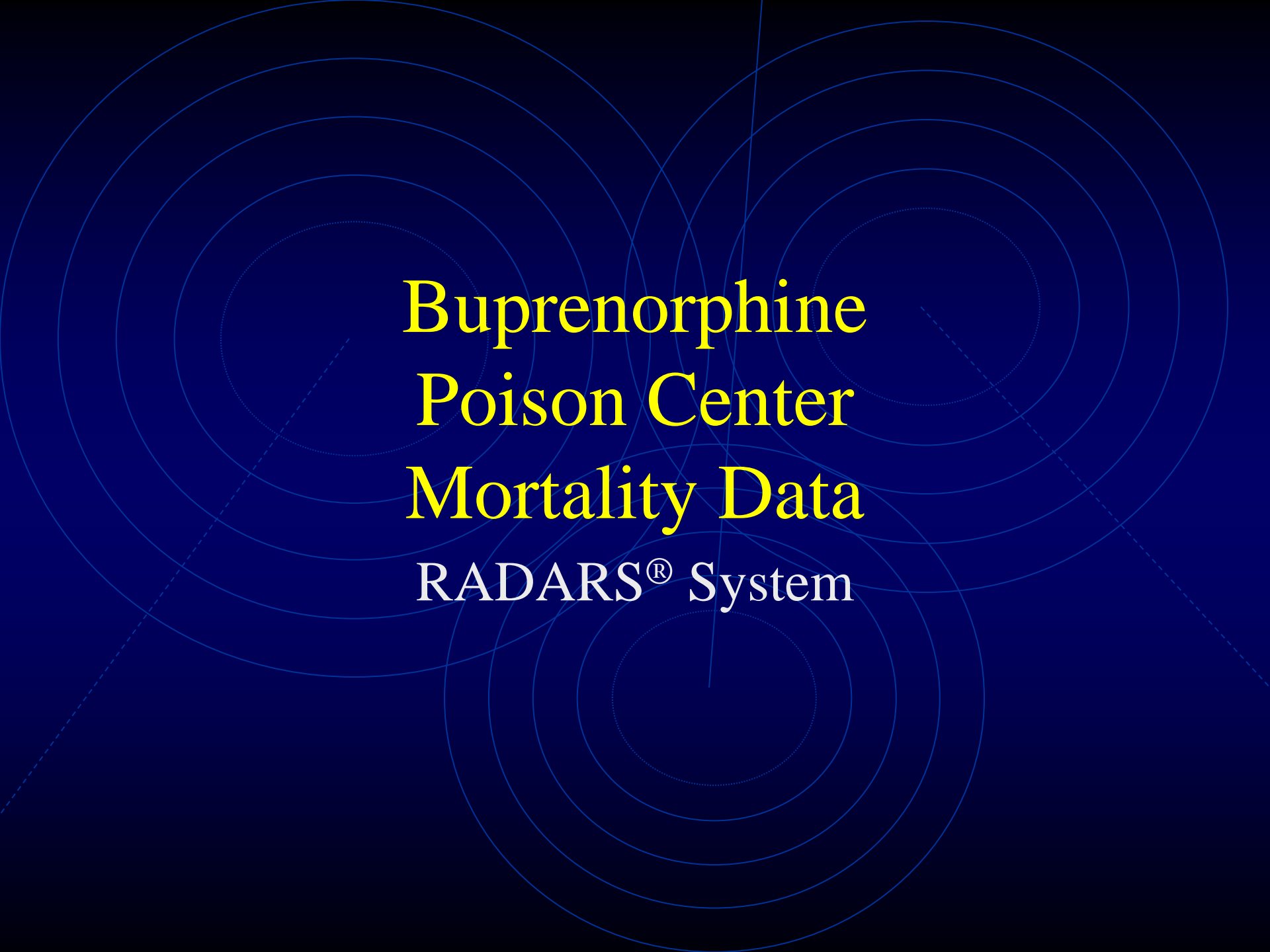
# Buprenorphine Case Abstraction Results

- 125 cases were abuse cases as defined in the methodology
- Mean age: 27 years
- 65% male
- 7% of the case notes described chronic buprenorphine abuse



# Route of Exposure





**Buprenorphine  
Poison Center  
Mortality Data  
RADARS<sup>®</sup> System**

# Mortality Data Methodology

- Poison center “associated medical outcome”
- Poison center intentional exposures
- Data collected from 2003 – 2007Q3
  - 11 of 60 US centers (18%) in 1<sup>st</sup> quarter 2003
  - 43 of 60 US centers (72%) in 3<sup>rd</sup> quarter 2007
- 5 deaths associated with buprenorphine intentional exposures
- Not causally linked to death



# Buprenorphine Pediatric Exposures

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# Rx Opioid Pediatric Exposures

## RADARS System Poison Center 2003 - 2006

	<i>Buprenorphine</i> (n=176)	<i>Hydrocodone</i> (n=6,003)	<i>Fentanyl</i> (n=123)	<i>Oxycodone</i> (n=2,036)
Age Mean (SD)	2.1 (0.9)	2.3 (1.2)	2.0 (1.2)	2.1 (1.1)
Male N (%)	99 (56.3) Referent	3,232 (53.9) OR 1.1 (0.81, 1.5)	64 (52.5) OR 1.2 (0.75, 1.89)	1,081 (53.5) OR 1.1 (0.83, 1.54)
Site N (%)				
Own Home	169 (96.0) Referent	5,581 (93.0) OR 1.8 (0.85, 3.91)	<b>111 (90.2)</b> OR 2.6 (1.00, 6.83)	<b>1,821 (89.4)</b> OR 2.8 (1.32, 6.15)
Other Home	3 (1.7)	335 (5.6)	4 (3.3)	155 (7.6)
Route N (%)				
Ingestion	175 (99.4) Referent	5,993 (99.8) OR 0.29 (0.04, 2.30)	<b>77 (62.6)</b> OR 104.5 (14.2, 771)	2,020 (99.1) OR 1.39 (0.18, 10.5)

# Rx Opioid Pediatric Exposures

## RADARS System Poison Center 2003 - 2006

	<i>Exposure Mentions (URDD Rate)</i>	<i>Mentions Associated with Major Outcome (URDD Rate)</i>	<i>Mentions Associated with Death (URDD Rate)</i>
Buprenorphine	0.5	0.02	0
Fentanyl	0.03	0.0008	0
Hydrocodone	0.06	0.00006	0.00002
Hydromorphone	0.06	0	0
Methadone	0.2	0.006	0.0008
Morphine	0.1	0.001	0
Oxycodone	0.06	0.0003	0.0001

# Conclusion

- Buprenorphine abuse and diversion appears to be localized, but occurs in many parts of the country
- While there was an initial increase in abuse/diversion reports, rates appear to have stabilized or decreased since 2006
- Buprenorphine abuse/diversion follow similar patterns to other opioids

# Acknowledgements

## **Key Informant Signal Detection System**

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Hilary Surratt, PhD, *Co-Principal Investigator*, University of Delaware

Yamilka Lugo, *Research Associate II*, University of Delaware

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Andrew Rosenblum, PhD, *Co-Principal Investigator*, National Development and Research Institutes, Inc. (NDRI)

Carleen Maxwell, *Project Director*, American Association for the Treatment of Opioid Dependence (AATOD)

Chunki Fong, *Project Director and Senior Methodologist*, National Development and Research Institutes, Inc. (NDRI)



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