

## Introduction



- Prescription opioid abuse and diversion have become major public health problems in recent years, contributing to a wide range of health and socioeconomic consequences among affected populations.

- Within this context, there is an ongoing need to identify and examine new, proactive indicators to better characterize the prescription opioid abuse and diversion problem.
- In this regard, we implemented a national street price surveillance program with law enforcement investigators.
- Monitoring trends in street prices for prescription opioids may provide an indicator of drug availability, demand, and abuse potential within targeted geographic areas.

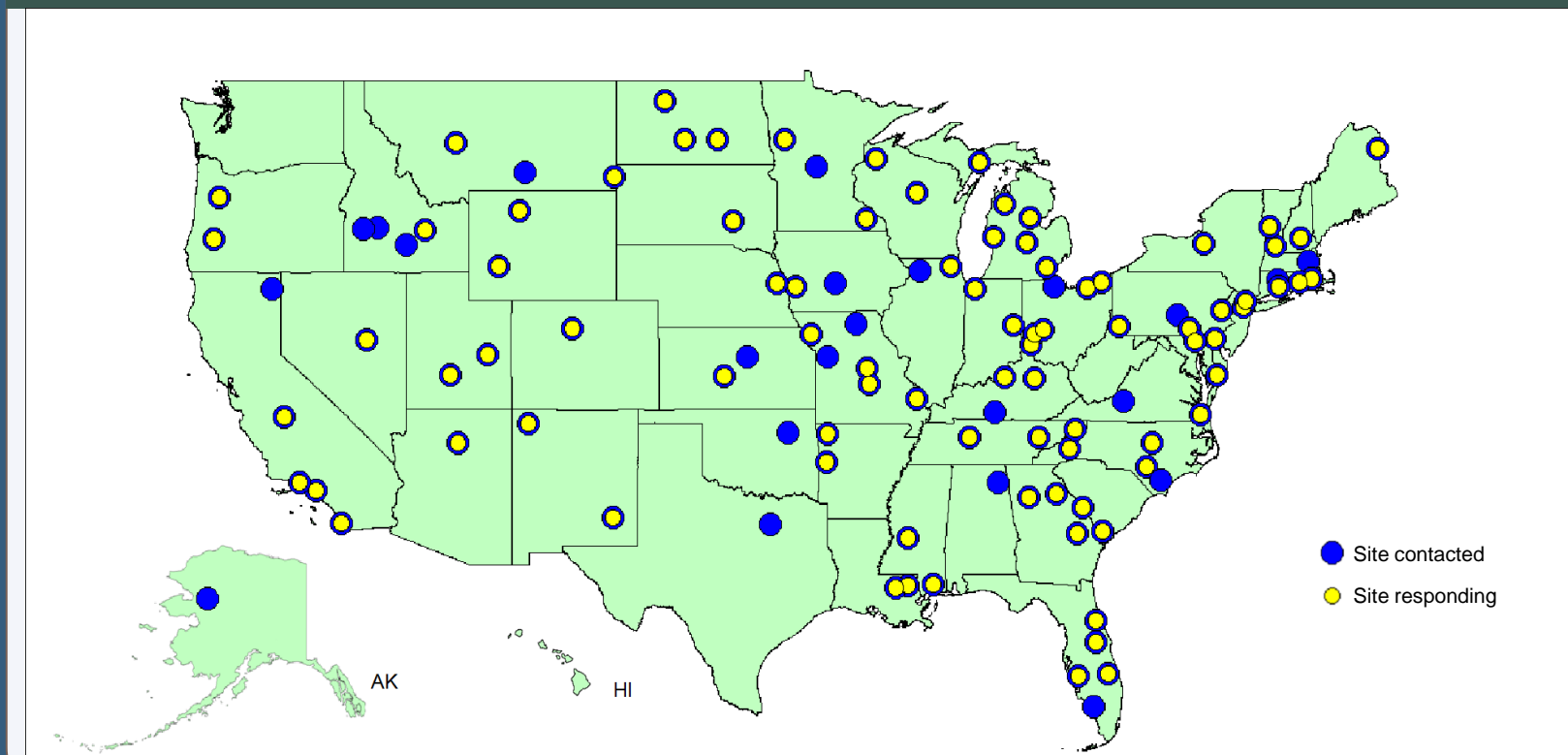
## Methods

**Aim:** To examine street prices of diverted prescription opioids using surveillance data from a nationwide network of law enforcement officers, collected as part of the RADARS<sup>®</sup> (Researched Abuse, Diversion and Addiction-Related Surveillance) System.

**Procedures:** On a quarterly basis, Street Price Questionnaires (SPQs) are sent to approximately 125 drug diversion investigators, requesting information on the street values of prescription opioids diverted in their jurisdictions. Targeted prescription opioids include buprenorphine, hydrocodone, hydromorphone, methadone, morphine, oxycodone, oxymorphone, tramadol, and tapentadol. The response rate was 77% in 4Q2012.

**Analyses:** Street price data were obtained from 1,080 questionnaires collected during 11 quarters from 2010 through 2012. We computed mean prices per milligram for the targeted prescription opioids in order to make standardized price comparisons across drug classes. Trends in price data over time were also examined.

## Sites Reporting in 4Q2012 (N = 92)

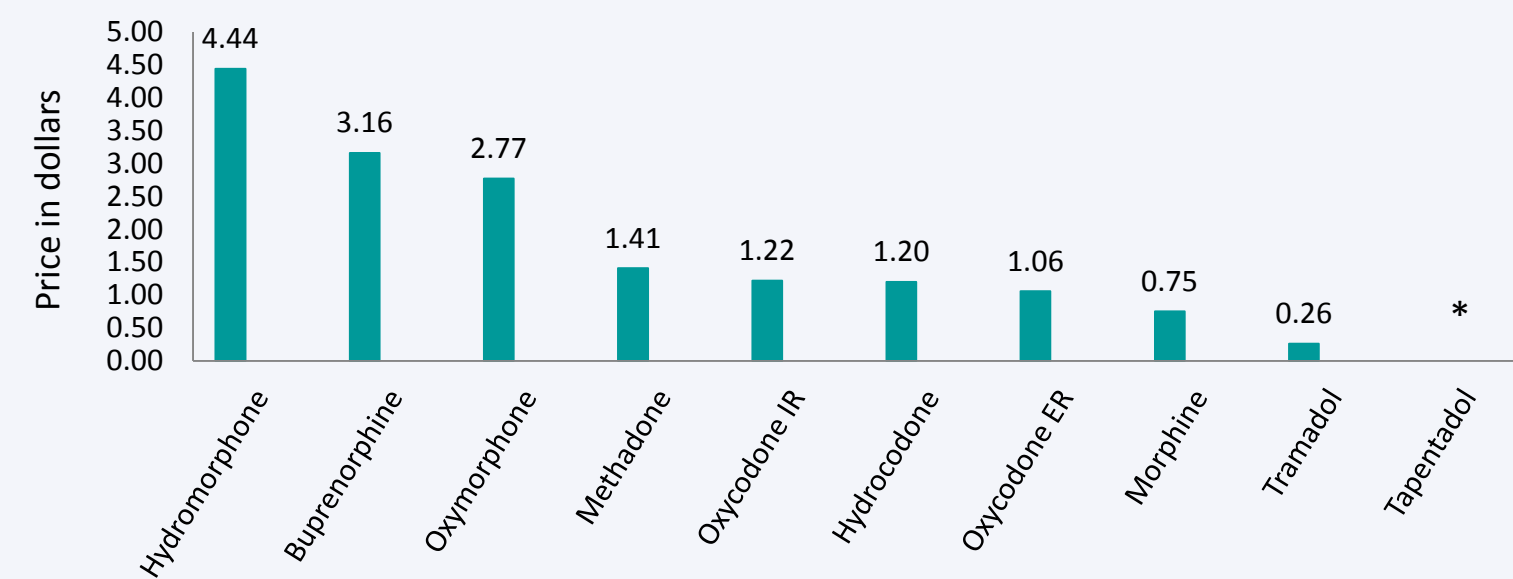


## Results

### Street Price Reports for Opioid Tablets (4Q2012)

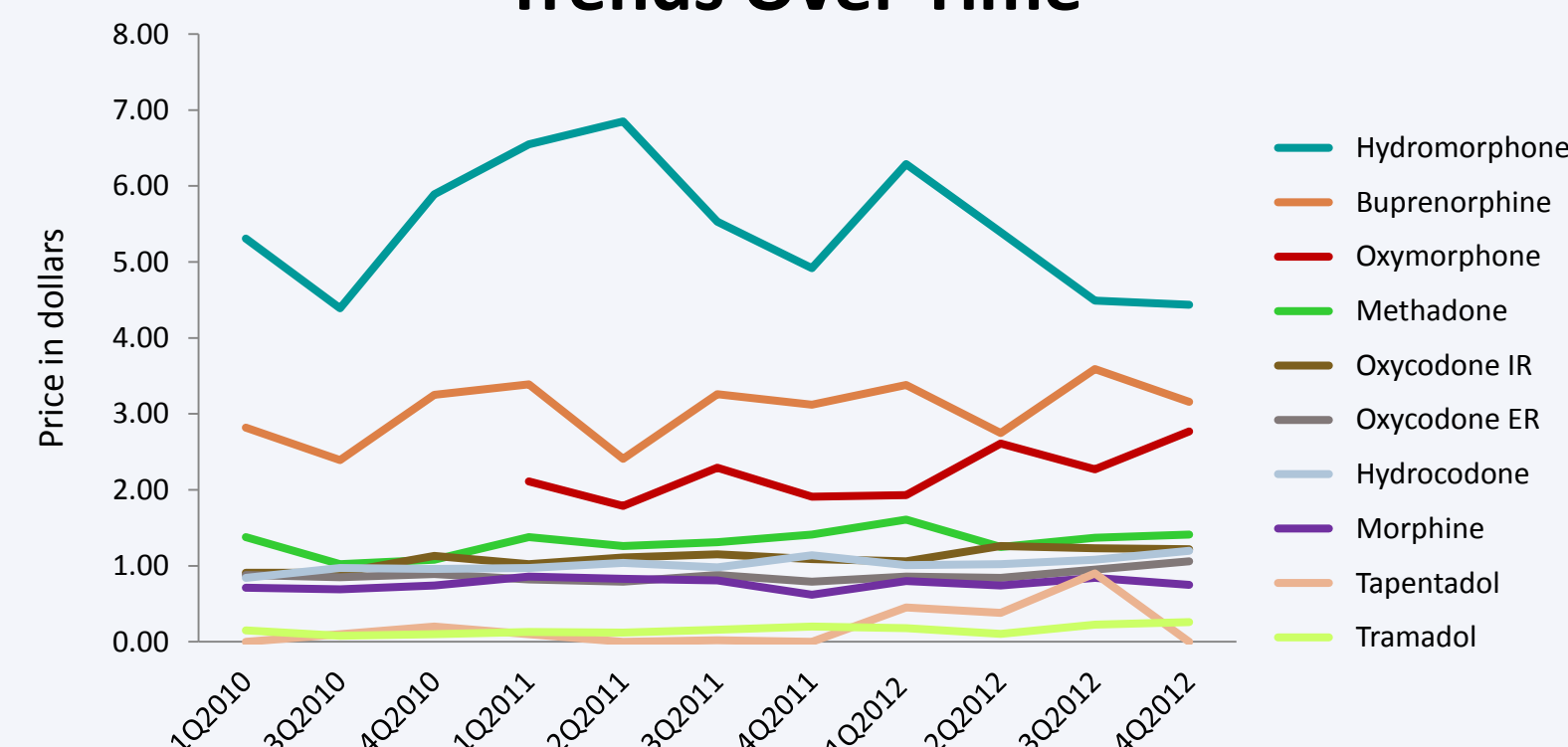
• Hydrocodone	N = 70
• Oxycodone ER	N = 44
• Oxycodone IR	N = 37
• Morphine	N = 33
• Methadone	N = 27
• Buprenorphine	N = 21
• Hydromorphone	N = 20
• Tramadol	N = 14
• Oxymorphone	N = 12
• Tapentadol	N = 0

### Mean Price per Milligram: Opioids in Tablet Form (4Q2012)



\*Tapentadol had no street price reports in 4Q2012; value cannot be determined.

### Mean Price per Milligram: Trends Over Time

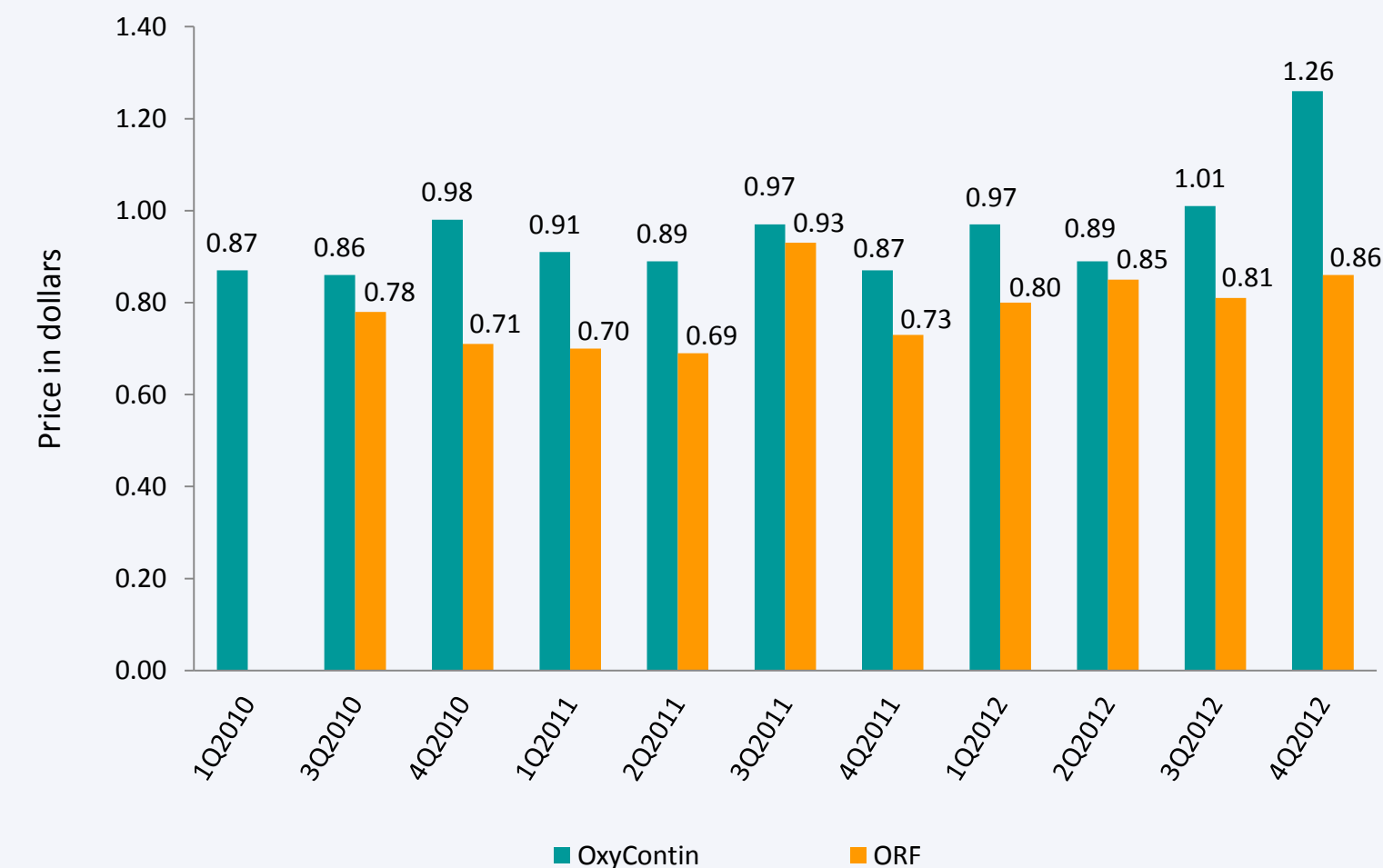


## Results

### Mean Price per Milligram: Impact of Formulation



### Mean Price per Milligram: OxyContin<sup>®</sup> and OxyContin Reformulated (ORF<sup>®</sup>)



## Discussion

- Our analyses yielded substantial differences in street price by opioid class. Higher street values appear to reflect greater desirability among abusers, as well as issues of availability. Some opioids, such as tapentadol, had very few street price reports (n = 8) over the 11-quarter surveillance period, suggesting limited presence in the illicit market.
- Abuser preference for high-potency opioids appears to drive street prices in large part. Opioids with dual mechanisms of action (tramadol, tapentadol) tend to have lower street values. In addition, the lower prescribing of buprenorphine, hydromorphone, and oxymorphone products, relative to hydrocodone and oxycodone, suggests reduced availability for diversion, which may impact street values.
- Ease of abuse is an additional factor impacting street value.
  - Within class, immediate-release opioids may carry higher street values than the extended-release (ER) counterparts, particularly when the ER products have tamper-deterrent properties. Oxymorphone data illustrate this phenomenon.
  - The reformulated OxyContin<sup>®</sup> (ORF), a tamper-deterrent product, carries a lower street value than its predecessor.

## Conclusion

- Observations across 11 quarters indicate that reliable street price estimates can be achieved using a nationwide network of law enforcement officers. SPQs appear sensitive enough to discern differences in price per milligram at the drug or brand level.
- Using longitudinal data, it is possible to monitor price changes in response to the introduction of tamper-deterrent formulations (TDFs). This may provide useful evidence in evaluating the success of TDFs in reducing diversion and abuse.
- Information on the street prices of diverted drugs may be useful for healthcare practitioners in formulary and treatment decision making.

## Acknowledgements/Disclosures

This research was supported by a contract from Denver Health and Hospital Authority. The RADARS<sup>®</sup> System is a public non-profit organization providing post-marketing surveillance of prescription medications. Drs. Surratt, Kurtz, Cicero, and Dart are Scientific Advisory Board members for the RADARS<sup>®</sup> System or employees of Denver Health and Hospital Authority. The authors have no relationships with pharmaceutical companies outside of their roles in the RADARS<sup>®</sup> System. Drs. Baker and Vorsanger are employees of Janssen Scientific Affairs, LLC, and are Johnson & Johnson stockholders.