

RADARS[®] System Technical Report # 2012Q2-1

Use of unique recipients of dispensed drug (URDD) in assessing the burden of abuse, misuse, and diversion of prescription opioid products

Key points

- Considering nonmedical use and diversion rates per individuals prescribed a prescription opioid product in addition to population prevalence estimates can provide insight on the:
 - Potential for nonmedical use, abuse, and diversion of new products
 - Insight into the potential for misuse, abuse, and diversion among the population receiving the medication
 - Perspective on the number of individuals who safely use the product relative to those who misuse, abuse, or divert the product
 - Changes in the desirability of the product among those who abuse the product.
- Findings suggest that hydrocodone is the most misused and abused drug class based on intentional exposures reported to participating poison centers and is second only to oxycodone as the most diverted class of prescription opioid products. However, hydrocodone is one of the least misused, abused and diverted drug classes relative to the number of individuals who fill a prescription for hydrocodone products.
- Historically, oxycodone has presented public health challenges in that it had relatively high levels of nonmedical use and diversion in the general population and high levels relative to the number filling prescriptions.
- Buprenorphine and oxymorphone demonstrate drug classes with low nonmedical use and diversion rates among the population but high rates based on individuals filling prescriptions.

Background

National surveys assessing prescription drug abuse, such as the National Survey on Drug Use and Health (NSDUH), provide estimates on the lifetime prevalence of nonmedical prescription drug use within the population. According to the 2010 NSDUH, the two most prevalent drug classes used non-medically are oxycodone products (6.1% lifetime prevalence) and hydrocodone products (9.5% lifetime prevalence).¹ While prevalence values provide information on the scope of nonmedical prescription drug use within the community, these values may not reflect the desirability of a drug. For example, despite high hydrocodone abuse rates among individuals entering treatment programs for opioid dependence, hydrocodone is seldom selected as the drug of choice.

A rate per individuals prescribed the drug may provide information on the desirability of a prescription drug. Below we outline four facets of rates per individuals prescribed a drug that enhance population based estimates. The measure of the number of individuals filling a prescription for a product on a quarterly basis is referred to as the unique recipients of dispensed drug (URDD). URDD rates are essential to understanding the level of abuse, misuse, and diversion of prescription opioid products.

- 1) Rates per URDD provide perspective on the extent of abuse of a product. Low rates of nonmedical use and diversion per URDD would indicate that a number of individuals safely use the product relative to those who misuse, abuse, or divert the product.
- 2) A new product with a high misuse, abuse or diversion rate per URDD could indicate a product that is highly desirable to those who abuse prescription opioids. Abuse of this product could become epidemic if prescriptions were to increase.
- 3) High rates per URDD may indicate the product is prescribed to populations at high risk for abuse. Interventions may be targeted at educating prescribing medical professionals of the potential risks of prescribing the product to some patient populations.
- 4) Rates per URDD are also effective in assessing the impact of abuse deterrent formulations or other interventions aimed at curbing nonmedical prescription drug use. Declines in rates of nonmedical use per population may result from the reformulated product being prescribed less frequently or less available. Declines in URDD rates may indicate that the product has become less desirable to abuse.

The aim of this monograph is to explore both population and URDD rates for both intentional exposure and diversion rates from programs within the RADARS System. We sought to explore five prescription opioid drug classes tracked by the RADARS System (hydrocodone, oxycodone, oxymorphone, fentanyl, and buprenorphine) that may demonstrate the facets outlined above.

Methods

The current study utilized data from the RADARS System Poison Center and Drug Diversion programs. Mentions of these drug classes by intentional exposure cases (intentional misuse, intentional abuse, suspected suicide, intentional unknown, and withdrawal) reported to Poison Centers participating in the RADARS System were used. These mentions were by cases who took a product for the feeling it caused, to relieve pain but in a way not intended by the prescribing medical professional, to self-harm, or who reported experiencing withdrawal symptoms. Therefore, intentional exposures were used as a proxy of nonmedical use. Incidents of diversion to illegal markets reported by law enforcement agencies participating in the Drug Diversion program were also included. Mentions were summed by drug class and by calendar quarter. Data included information from the past 2 years or 8 quarters. The population (2010 US Census) and URDD were used as denominators. Population rates are intended to assess the magnitude of nonmedical use and diversion events within the entire population. URDD rates provide estimates of intentional exposures and diversion events relative to the availability of the product.



Results

Figure 1 displays the URDD and population rates over time from the Poison Center and the Drug Diversion programs. The first column displays the population rates, the second column the URDD rates. The first row represents intentional exposure mentions from the Poison Center program and the second row represents diversion incidents from the Drug Diversion program. Results in panel A indicate that hydrocodone has more intentional exposure rate per 100,000 population than any other drug class. Buprenorphine, fentanyl, and oxycodone have the lowest rates. Rates presented in panel B indicate that hydrocodone has the lowest intentional exposure rate per 1,000 URDD. Results also suggest an increase in oxycodone and a decrease in buprenorphine rates over time. Panel C and panel D reveal the same pattern with diversion incidents. Oxycodone is the most diverted opioid drug class followed by hydrocodone per population. Buprenorphine and fentanyl both show higher rates of diversion per 1,000 URDD than hydrocodone. Oxycodone is the most diverted prescription opioid class per 1,000 URDD.

Figure 1
The RADARS System Poison Center and Drug Diversion Programs
Intentional exposure and diversion population rates per 100,000 and URDD rates per 1,000
by drug and time
2nd Quarter 2010 through 1st quarter 2012

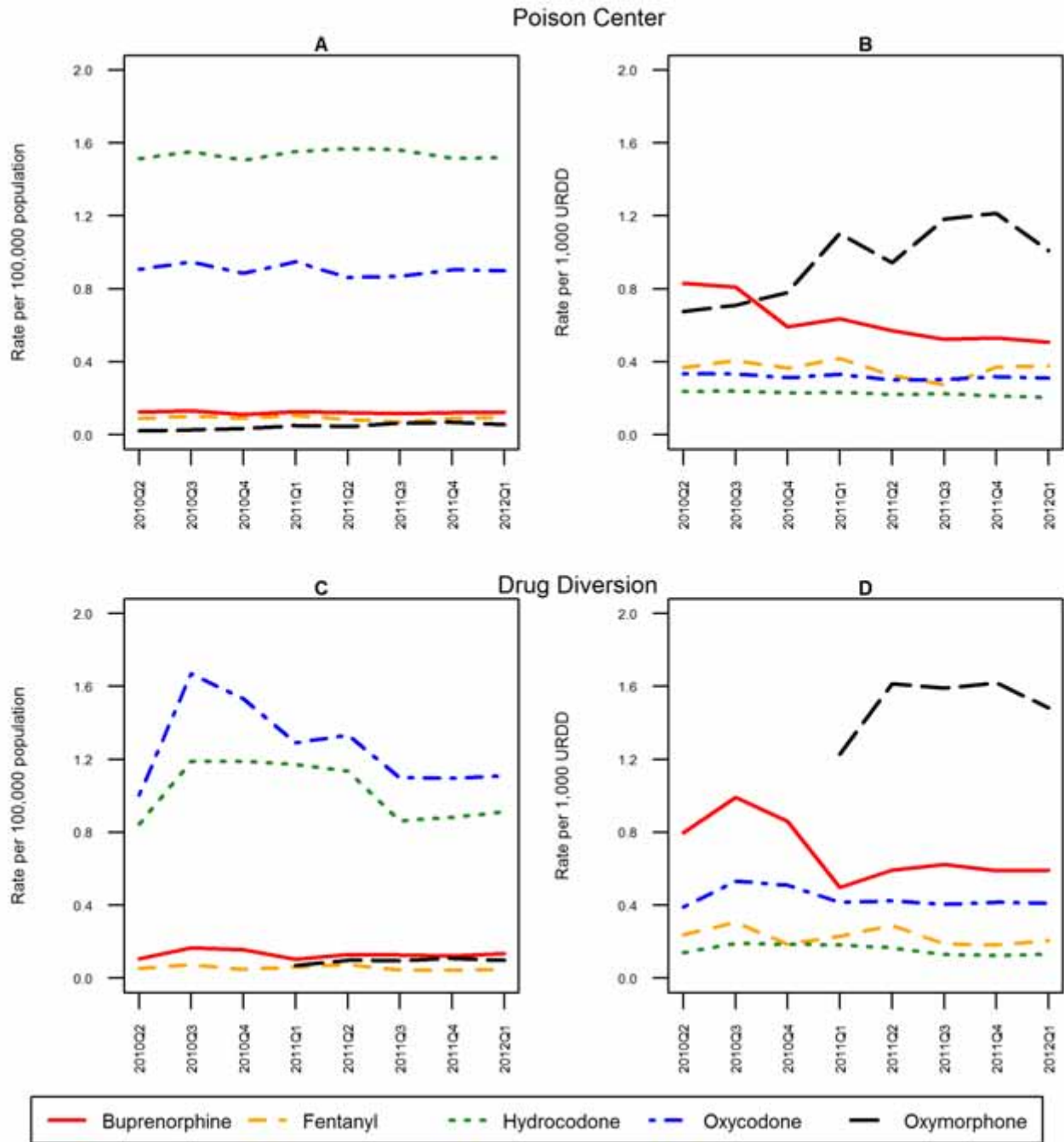
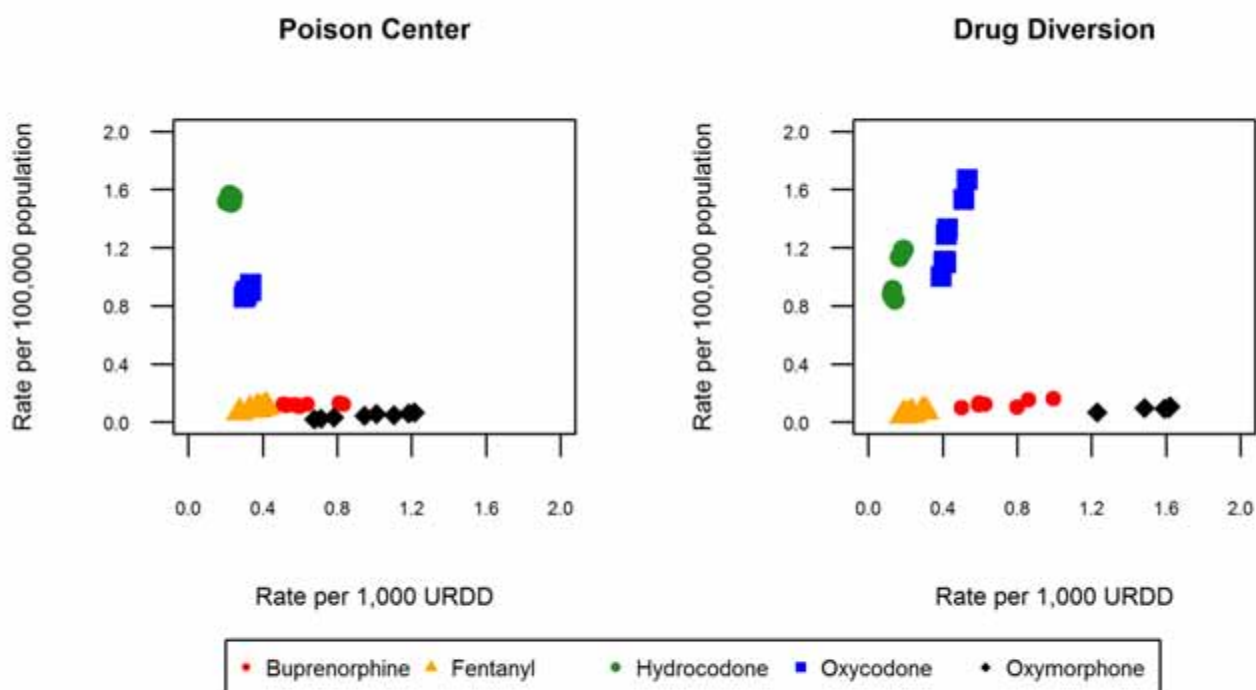


Figure 2 plots URDD rates per 1,000 against population rates per 100,000 for both the Poison Center and Drug Diversion programs, respectively. Each symbol represents a rate for a different quarter. This plot allows for an assessment of whether a drug class displays a high or a low population rate and a high or a low URDD rate relative to other drug classes. In the Poison Center program, hydrocodone has a high intentional exposure rate per population but a low rate per URDD. Intentional exposure population rates for oxycodone are lower than those for hydrocodone but higher than fentanyl, buprenorphine, and oxymorphone. The intentional exposure URDD rates for oxycodone are higher than for hydrocodone but lower than other drug classes.

Figure 2
The RADARS System Poison Center and Drug Diversion Program
Quarterly intentional exposure and diversion rates per 1,000 URDD by 100,000 Population
2nd Quarter 2010 through 1st quarter 2012



The plot of data from the Drug Diversion program suggests that these drug classes may fall across four distinct categories. Hydrocodone shows high diversion rates per population and low diversion rates per URDD. Fentanyl shows low diversion rates per population and low rates per URDD. Buprenorphine and oxymorphone show low diversion rates per population and high rates per URDD. Oxycodone shows high diversion rates per population and moderate diversion rates per URDD.

Conclusions

This report presents data on the URDD and population rates of five drug classes measured by the Poison Center and Drug Diversion programs of the RADARS System. The results demonstrate the importance of considering rates per URDD in assessing the abuse potential and risk of different prescription pain medications. Our results demonstrate that while hydrocodone presents a significant problem in the amount of nonmedical use and diversion mentions per person, rates are low relative to the number of individuals who fill a prescription for hydrocodone products. Therefore, while nonmedical use of hydrocodone is greater than other opioid drug classes, relative to other opioids a substantial number of patients safely use these medications. Oxycodone shows relatively high rates of abuse per population and moderate rates per URDD, suggesting that it presents a public health challenge in both the extent of use in the population and in the risk for nonmedical use and diversion among those prescribed the products. This may reflect high desirability of oxycodone products among individuals intending to abuse and misuse prescription opioids. Buprenorphine and oxymorphone show low levels of nonmedical use and diversion in the population as a whole, but high rates of nonmedical use and diversion among those filling a prescription for these products. Oxymorphone URDD rates have increased in recent quarters. These results indicate that oxymorphone may present a public health challenge in that it is a drug with a high abuse potential. This is consistent with recent media reports of increases in the desirability of oxymorphone.² Buprenorphine rates may reflect prescriptions written to individuals at high risk for abuse of prescription opioids. Buprenorphine URDD rates have dropped in recent quarters, suggesting that the introduction of formulations including naloxone may be contributing to decreases in diversion and nonmedical use. Finally, fentanyl shows relatively low levels of nonmedical use and diversion. Overall, results indicate that rates of nonmedical use per individuals prescribed the drug provides valuable information on the abuse, misuse, and diversion potential of a product and assists in understanding the scope of the public health burden of different prescription opioids.

Suggested citation: Severtson, SG; Davis, J; Bartelson, B.B. & Dart, R. (2012). Use of unique recipients of dispensed drug (URDD) in assessing the burden of abuse, misuse, and diversion of prescription opioid products. *RADARS System Technical Report, 2012Q2-1*.

References

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