Assessing the Relationship Between Prescription Opioid Nonmedical Use and Heroin Use

Christopher M. Jones, PharmD, MPH
CDR, US Public Health Service
Director, Division of Science Policy
Office of the Assistant Secretary for Planning and Evaluation
Overview

• 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
RX OPIOID AND HEROIN USE TRENDS
Past year nonmedical use of prescription opioids and heroin use

Source: SAMHSA, NSDUH 2003-2014 PUF
Past year opioid use disorders, US, 2003-2014

Source: SAMHSA, NSDUH 2003-2014 PUF
Changing demographics of heroin use

Heroin Use Has INCREASED Among Most Demographic Groups

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

Source: Jones CM et al. MMWR 2016; Cicero et al JAMA Psychiatry 2014.
Opioid-related overdose deaths, US, 1999-2014

Source: CDC, NVSS, 2016
Injection drug use increasing in the U.S.

Source: Zibbell et al. MMWR May 8, 2015 / 64(17);453-458
Emerging issues

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

Fentanyl reports in NFLIS, by State
July – December 2014

Increases in Hepatitis C Virus Infection Related to Injection Drug Use Among Persons Aged ≤30 Years — Kentucky, Tennessee, Virginia, and West Virginia, 2006–2012
Nonmedical use of Rx opioids significant risk factor for heroin use

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

- Heroin fairly or very easy to obtain
- Past year heroin use
- Past year heroin abuse or dependence
- Past year Rx opioid abuse or dependence
- Ever inject heroin
- Ever inject Rx opioids

Adjusted Odds Ratio

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

Source: Muhuri et al., Associations of Nonmedical Pain Reliever Use and Initiation of Heroin Use in the United States. SAMHSA, 2013
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 ≥ 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

Source: Carlson et al. Drug Alcohol Depend. 2016;160:127-134
Circumstances of Rx opioid nonmedical use and heroin initiation

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

Groups at increased risk for heroin abuse or dependence

- 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***
INFLUENCE OF PRESCRIPTION OPIOID ABUSE PREVENTION POLICIES
Reformulation of OxyContin

Reformulation of OxyContin

Source: Dart et al. NEJM 2015;372(3):241-8..
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).

Source: Rudd RA et al., MMWR 2014.
State policies

Shift towards heroin deaths started in 2009 in NC

Source: Dasgupta N. Drug Alcohol Depend. 2015.
State policies

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

## Local policies

<table>
<thead>
<tr>
<th>Borough of residence</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>% rate change from 2011 to 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total (Rate)</td>
<td>Total (Rate)</td>
<td>Total (Rate)</td>
<td>2011 to 2013</td>
</tr>
<tr>
<td><strong>New York City</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any drug</td>
<td>567</td>
<td>-8.5</td>
<td>660</td>
<td>-9.8</td>
</tr>
<tr>
<td>Heroin</td>
<td>253</td>
<td>-3.8</td>
<td>339</td>
<td>-5</td>
</tr>
<tr>
<td>Opioid analgesics</td>
<td>201</td>
<td>-3</td>
<td>181</td>
<td>-2.7</td>
</tr>
<tr>
<td><strong>Staten Island</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any drug</td>
<td>69</td>
<td>-18.4</td>
<td>74</td>
<td>-19.9</td>
</tr>
<tr>
<td>Heroin</td>
<td>22</td>
<td>-6.2</td>
<td>36</td>
<td>-10.1</td>
</tr>
<tr>
<td>Opioid analgesics</td>
<td>40</td>
<td>-10.7</td>
<td>37</td>
<td>-10</td>
</tr>
<tr>
<td><strong>Other four boroughs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any drugs</td>
<td>498</td>
<td>-7.9</td>
<td>586</td>
<td>-9.3</td>
</tr>
<tr>
<td>Heroin</td>
<td>231</td>
<td>-3.7</td>
<td>303</td>
<td>-4.8</td>
</tr>
<tr>
<td>Opioid analgesics</td>
<td>161</td>
<td>-2.6</td>
<td>144</td>
<td>-2.3</td>
</tr>
</tbody>
</table>

**Source**: 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.
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

- 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
THANK YOU

QUESTIONS?

CHRISTOPHER.JONES@HHS.GOV