Diversion, misuse and trafficking of methadone and buprenorphine

Global Addiction Conference
Richard C. Dart, MD, PhD
Professor, University of Colorado
Prescription Opioid Deaths are Rising Internationally

United Kingdom Drug Related Deaths 2001 - 2011

*Note: heroin and morphine are reported as one category in the data from England, Wales and Scotland; since the focus of this analysis is on prescription opioids, that category was not included in this analysis.

Source: RADARS® System, Denver Health and Hospitals
What is the RADARS® System?

• History
  – 2006, Denver Health and Hospital Authority (DHHA)
  – Multiple pharmaceutical subscribers
  – Independent program
  – Denver Public Safety Net Hospital for 150 years
  – State sanctioned independent authority

• Conflict of Interest Statement
  – None, other than running system for DHHA as noted above.
RADARS System
Scientific Advisory Board

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- Hilary Surratt, PhD
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- Nabarun Dasgupta, MPH
  Founder – Epidemico
- Alvaro Muñoz, PhD
  Johns Hopkins University

Law Enforcement
- John Burke
  National Association of Drug Diversion Investigators
Challenges of Prescription Drug Abuse Surveillance

- Clandestine behavior
- Geographical variability
- Changes rapidly
- Multiple age groups
- Product specificity
  - 15 active pharmaceutical ingredients (API)
    - Opioids: Hydrocodone, oxycodone, hydromorphone, oxymorphone, morphine, fentanyl, tapentadol, tramadol, buprenorphine, methadone
    - Stimulants
  - Dozens of specific products (OxyContin, Opana, Suboxone, Subutex, etc.)
RADARS System Mosaic

Acute Events
- 53 Poison Centers
- 46 States

Entering Treatment
- OTP
- 73 programs
- 33 states

New Initiates
- College Survey
- 2000 students
- 50 States

Drug Transactions
- Criminal Justice
- 280 investigator
- 50 states

Entering Treatment
- SKIP
- 125 practices
- 50 states

Illicit Market Price
- StreetRx.com
- Users/Buyers
- 50 states
RADARS® System Process
A Tale of Two Denominators

**Numerators compiled by each program**

**POPOPULATION RATE =** \( \frac{\text{Event Count by Area}}{\text{Population}} \)

- Disease burden on population
- Does not account for drug availability

**UNIQUE RECIPIENTS OF**
**DISPENSED DRUG (URDD) RATE**

\( \frac{\text{Event Count by Area}}{\text{URDD}} \)

- URDD = Number of unique people filling prescription for drug (refills excluded)
TRENDS IN PRESCRIPTION OPIOID ABUSE IN THE UNITED STATES

Population Rate

Availability Rate (URDD)
## RADARS System Opioid Abuse Trends

### URDD Rates (Ranked Highest-Lowest)

#### 2012

<table>
<thead>
<tr>
<th>Rank</th>
<th>Poison Center</th>
<th>Opioid Treatment</th>
<th>Survey of Key Informant Pts</th>
<th>Drug Diversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Methadone</td>
<td>Oxymorphone</td>
<td>Oxymorphone</td>
<td>Oxymorphone</td>
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<tr>
<td>2</td>
<td>Oxymorphone</td>
<td>Methadone</td>
<td>Hydromorphone</td>
<td>Hydromorphone</td>
</tr>
<tr>
<td>3</td>
<td>Buprenorphine</td>
<td>Hydromorphone</td>
<td>Methadone</td>
<td>Methadone</td>
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<tr>
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<td>Hydromorphone</td>
<td>Buprenorphine</td>
<td>Buprenorphine</td>
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<tr>
<td>5</td>
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<td>Morphine</td>
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<tr>
<td>6</td>
<td>Fentanyl</td>
<td>Fentanyl</td>
<td>Fentanyl</td>
<td>Oxycodone</td>
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<tr>
<td>7</td>
<td>Tramadol</td>
<td>Tapentadol</td>
<td>Tapentadol</td>
<td>Fentanyl</td>
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<td>8</td>
<td>Oxycodone</td>
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<tr>
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<tr>
<td>10</td>
<td>Hydrocodone</td>
<td>Tramadol</td>
<td>Tramadol</td>
<td>Tapentadol</td>
</tr>
</tbody>
</table>
BUPRENORPHINE AND METHADONE ABUSE IN THE US
How Many Patients Fill a Prescription for Methadone?
Unique Recipients of dispensed drug (URDD)
2009Q1 - 2012Q4
Buprenorphine Data Comparison
RADARS System & CESAR Fax

Estimated Number of Total Methadone and Buprenorphine Reports,
U.S. Law Enforcement-Seized Drug Exhibits Analyzed by Forensic Laboratories, 2003-2010

RADARS System Drug Diversion Program
Diversion Reports 2002 - 2012

CESAR = Center for Substance Abuse Research
Opioid Treatment Program
Past 30 Day Endorsements, 2009-2012

Population Rate

Population rate per 1,000

Availability Rate (URDD)

URDD rate per 1,000


Methadone high, but decreasing
Bup-Single Ingredient Increasing
Bup-Naloxone Film Strip increasing slightly
Bup-Naloxone Combination Decreasing Slightly
Bup-Single Ingredient Highest, Increased, Flat
Methadone Decreasing
Bup-Naloxone Combination Lower, Flat
Bup-Naloxone Film Strip Lowest, Decreasing
Survey of Key Informant Patients
Past 30 Day Endorsements, 2009-2012

Population Rate

Methadone high, but decreasing
Bup-Single Ingredient Increasing
Bup-Naloxone Combination Increasing Flat
Bup-Naloxone Film Strip Increasing slightly

Availability Rate (URDD)

Bup-Single Ingredient Increasing Dramatically
Methadone Slight Decrease
Bup-Naloxone Combination Increasing
Bup-Naloxone Film Strip low, flat
RADARS System Drug Diversion Cases 2009-2012

Population Rate per 100,000

- Methadone high, but decreasing slightly
- Bup-Naloxone Combination Decreasing Slightly
- Bup-Naloxone Film Strip Increasing
- Bup-Single Ingredient Increasing

Availability Rate (URDD) per 1,000

- Bup-Naloxone Combination Increasing Greatly
- Bup-Single Ingredient Increasing Greatly
- Methadone Slight Decrease
- Bup-Naloxone Film Strip increasing slightly
• **Population**
  – Any person in US with access to the internet

• **Definition/Type of Cases**
  – Utilize crowdsourcing methodology to calculate average price of specific prescription drug in particular location
  – Validated by DD

• **Coverage**
  – All 50 states
Comparison of StreetRx, RADARS System Drug Diversion and Silk Road

Dasgupta, Suratt, et al, manuscript submitted
Death Cases in Poison Center Program
All Ages, 2009Q1 - 2012Q4

- Total Methadone
- Total Combination Buprenorphine Tablets
- Total Single Ingredient Buprenorphine Tablets
- Total Buprenorphine Oral Films
Death Cases in Poison Center Program
Ages under 12 years, 2009Q1 - 2012Q4
Poison Center Program
Intentional Abuse Exposures of Opana ER
1st Quarter 2009 through 3rd Quarter 2012

Introduction of OxyContin ORF
Pre ADF
Post ADF
Total Oxymorphone

Rate per 1,000 URDD

Year/Quarter
Conclusions

• Prescription opioid abuse in the US may be plateauing, but still causes 16,000 deaths per year
• Methadone
  – Endorsements in treatment programs decreasing
  – More deaths than any other opioid
  – But most deaths involve pills (treatment of pain)
• Buprenorphine
  – Abuse is increasing quickly perhaps due to generic availability
    • Single-ingredient “Subutex”
    • Combination tablet (Bup-naloxone; “Suboxone”)
  – Exceptional safety in all groups
  – Abuse of buprenorphine strip has been very low
  – Why is the price of buprenorphine so high?
Thank you!