Recent Trends in Heroin Mortality in Cuyahoga County

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Medical Examiner
Heroin - Background

- Typically sold as white or brown powder or as a sticky black substance known as “black tar”
- Abused by injecting, snorting or smoking
Heroin- Background

- Heroin is 1-5x more potent than morphine
- Able to pass through blood-brain barrier more easily than morphine (due to acetyl groups)
- Heroin has a half-life of only a few minutes
Heroin-Background

- Heroin- Diacetylmorphine
- Synthetic opioid derived from the morphine found in the opium poppy
- First synthesized in 1874 by C.R. Alder Wright
- Introduced to medicine in the early 20th century as a replacement for morphine and codeine (thought to be non-addictive)
Heroin - Chemistry/Pharmacology

Diacetylmorphine (Heroin) → 6-monoacetylmorphine → Morphine

\[
\begin{align*}
\text{Diacetylmorphine (Heroin)} & \quad \text{6-monoacetylmorphine} & \quad \text{Morphine} \\
% CH_{3}CO & \quad \text{CH}_{3} & \quad \text{CH}_{3} \\
% \text{O} & \quad \text{O} & \quad \text{HO} \\
% \text{CH}_{3}CO & \quad \text{OCH}_{3} & \quad \text{OCH}_{3} \\
\end{align*}
\]
Heroin is rapidly deacetylated in the blood to 6-monoacetylmorphine (6-AM, 6-MAM)

- 6-AM has a half-life of 36 minutes and is 4x more potent than morphine
- 6-AM is further hydrolyzed to morphine (most likely in the liver)
- Implications for testing and reporting
2007 - 2012 Medical Examiner Ruled Deaths - Drug Overdoses

- **Cocaine**
  - 2007: 98
  - 2008: 102
  - 2009: 112
  - 2010: 97
  - 2011: 94
  - 2012: 132

- **Heroin**
  - 2007: 46
  - 2008: 64
  - 2009: 84
  - 2010: 90
  - 2011: 107
  - 2012: 138

- **Oxycodone**
  - 2007: 13
  - 2008: 21
  - 2009: 36
  - 2010: 36
  - 2011: 34
  - 2012: 44

**Total OD Deaths**
- 2007: 220
- 2008: 239
- 2009: 257
- 2010: 262
- 2011: 296
- 2012: 356

Projected for 2012*
### 2007-2012 Heroin as a growing % of Total Overdose Deaths

<table>
<thead>
<tr>
<th>Year</th>
<th>Total OD Deaths</th>
<th>Heroin as% of total OD Deaths</th>
<th>Cocaine as% of total OD Deaths</th>
<th>projected 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>220</td>
<td>18.18%</td>
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<tr>
<td>2008</td>
<td>239</td>
<td>26.78%</td>
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<tr>
<td>2009</td>
<td>257</td>
<td>24.90%</td>
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<tr>
<td>2010</td>
<td>262</td>
<td>34.35%</td>
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<tr>
<td>2011</td>
<td>296</td>
<td>36.15%</td>
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<tr>
<td>2012</td>
<td>356</td>
<td>44.88%</td>
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</table>
Heroin Deaths Reported to the Cuyahoga County Medical Examiner, 2010

Number of Deaths

- 0
- City of Cleveland
- 1
- 2 - 3
- 4 - 6
- 7 - 9
Heroin Deaths Reported to the Cuyahoga County Medical Examiner, 2011

Number of Deaths

- 0
- City of Cleveland
- 1
- 2 - 3
- 4 - 6
- 7 - 9
- 10+
Heroin Deaths Reported to the Cuyahoga County Medical Examiner, 2012*  
*Through July 5, 2012

Number of Deaths

- 0
- City of Cleveland
- 1
- 2 - 3
- 4 - 6
- 7 - 9
- 10+

[Map showing the distribution of heroin deaths across Cuyahoga County with different shades indicating the number of deaths in each area.]

Cuyahoga County Board of Health
Office of Epidemiology, Surveillance and Information
Data Source: Cuyahoga County Medical Examiner
State Plane Ohio North
September 10, 2012
Comparing Injury and Residence Locations 2007-2012
(By County Council District)

CUYAHOGA COUNTY STATISTICS: HEROIN-RELATED DEATHS IN MEDICAL EXAMINER-RULED CASES

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<tr>
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<td>Out of County</td>
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<td>Grand Total</td>
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<td>107</td>
<td>260</td>
<td>Grand Total</td>
<td>63</td>
<td>91</td>
<td>107</td>
<td>260</td>
</tr>
</tbody>
</table>

NOTE 1: Difference between residence and incidence - While these places do overlap at times, there are a number of out of county residents and those where the incidence takes place out of county but decedent was transported IN county for hospitalization prior to death.

NOTE 2: Heroin-related deaths - Meaning that heroin was either the cause, or a contributing factor in the cause of death.

NOTE 3: Medical Examiner-ruled case - Cases are only those that have been ruled upon by the Medical Examiner’s Office. They do include cases from residents and incidents that originated outside of Cuyahoga County but because the decedent dies with the borders of Cuyahoga County, they become the jurisdiction of the Cuyahoga County Medical Examiner.
Comparing Injury and Residence Locations 2009

2009 Injury Location

2009 Residence Location
Comparing Injury and Residence Locations 2010

2010 Injury Location  
2010 Residence Location
Comparing Injury and Residence Locations 2011

2011 Injury Location

2011 Residence Location
Heroin Overdose Deaths

Typical 2007 Case Profile
- Male 85%
- White 75%
- Age 45-60 50%
  - Age 19-29 only 7.5% of overdose deaths
- City of Cleveland or Suburban equal 42.5%; rest Out of County

Typical 2011 Case Profile
- Male 76%
  - Female use growing from 6 to 25 cases since 2007
- White 82%
- Age 45-60 40%
  - Age 19-29 now 25-30% of overdose deaths; from 3 to 27 cases since 2007
- Majority Suburban 47%
Responding to the Crisis

- Heroin Subgroup of Opiate Task Force
  - Announcement on 9/26
  - Public Health Strategies
  - Educational Strategies
  - Law Enforcement Strategies