National Hospital Ambulatory Medical Care Survey: Emergency Department Visits for Drug Poisoning

Michael Albert, MD, MPH, Linda McCaig, MPH
National Center for Health Statistics
National Hospital Ambulatory Medical Care Survey (NHAMCS)

- Conducted annually since 1992 by CDC’s National Center for Health Statistics (NCHS)
- Endorsed by organizations including the Society for Academic Emergency Medicine, American College of Emergency Physicians, and Emergency Nurses Association
- Patient visits to EDs and OPDs of non-federal, general, and short-stay (average length of stay <30 days) hospitals
  - Hospitals include children’s, teaching, and tertiary
Multistage Probability Sample Design

- 112 geographic Primary Sampling Units (PSUs)
- Hospitals within PSUs (N≈500)
- In-Scope hospitals with EDs (N ≈ 400)
- Patient visits within EDs (N=30-35,000)
  - 4-week reporting period
- Census Bureau — medical record abstraction
Visit vs. Person Estimates

NHAMCS is a record-based not a population-based survey

• Can calculate visit rates
  ▪ # ED visits/U.S. population
• Cannot calculate incidence or prevalence rates from NHAMCS estimates
NHAMCS Limitations

• Only national and regional estimates

• Not always possible to estimate rare events
Research Objective

• To evaluate the rates and characteristics of ED visits for drug poisoning in the U.S. from 2008-2011

• To compare the rates of ED visits for drug poisoning from 2008-2011 with 2004-2007
Definition of Visit for Drug Poisoning

• An injury-related visit with a first-listed external cause-of-injury code of Drug Poisoning:
  E850-E858 Unintentional
  E950.0-E950.5 Self-inflicted
  E980.0-E980.5 Undetermined

• Based on the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM)
Analysis

Cross-sectional analysis using NHAMCS 2008-2011 ED data

- Variables of interest: age, sex, race/ethnicity, external cause of injury code (E-codes), visit disposition
- Sample weights applied to provide national estimates
- Data represent average annual estimates for 2008-2011
- Standard errors computed using SAS-callable SUDAAN, version 11.0 to account for complex survey design of NHAMCS
Cross-sectional analysis using NHAMCS 2008-2011 ED data

- Visit rates based on set of estimates of civilian noninstitutionalized population of the United States developed by the Population Division, U.S. Census Bureau
- Data imputed for patient birth year and sex. Less than 1% of drug-poisoning visit records had missing data for either of these variables
- Differences among subgroups evaluated using two-tailed $t$ test ($p < 0.05$)
- Linear trend for age evaluated using a weighted least squares test ($p < 0.05$)

• 2004-2007 a sample of 1,156 ED visits for drug poisoning representing a weighted total of 900,000 visits

• 2008-2011 a sample of 1,081 ED visits for drug poisoning representing a weighted total of 1.1 million visits

1. 2004-2007 visit rates are significantly different ($p < 0.05$) for the following comparisons: 0-19 years vs. 35-49 years; 20-34 years vs. 50 years and over; and 35-49 years vs. 50 years and over, based on a two-tailed $t$ test.

2. 2008-2011 visit rates are significantly different ($p < 0.05$) for all age group comparisons except 0-19 years vs. 50 years and over, based on a two-tailed $t$ test.

3. Visit rate is significantly different ($p < 0.05$) for 2008-2011 compared with 2004-2007, based on a two-tailed $t$ test.

Emergency department visit rates for drug poisoning by age according to sex: United States, 2008-2011

Visit rate is significantly different ($p < 0.05$) compared with males of other age groups, based on a two-tailed $t$ test.

Visit rate is significantly different ($p < 0.05$) compared with females aged 0-19 and 50 and over, based on a two-tailed $t$ test.

Visit rate is significantly different ($p < 0.05$) for males compared with females, based on a two-tailed $t$ test.

SOURCE: CDC/NCHS, National Hospital Ambulatory Medical Care Survey, 2008-2011.
Emergency department visit rates for drug poisoning by intent and sex: United States, 2008-2011

Visit rate is significantly different ($p < 0.05$) for unintentional compared with self-inflicted based on a two-tailed $t$ test.

Visit rate is significantly different ($p < 0.05$) for males compared with females, based on a two-tailed $t$ test.

SOURCE: CDC/NCHS, National Hospital Ambulatory Medical Care Survey, 2008-2011.
### Distribution of emergency department visits for drug poisoning by intentionality according to cause of visit: United States, 2008-2011

<table>
<thead>
<tr>
<th>Intent and drug category</th>
<th>Cause of injury ICD-9-CM code</th>
<th>Number of visits in thousands</th>
<th>Percent distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>All drug poisoning-related visits</td>
<td></td>
<td>1,071</td>
<td>100.0</td>
</tr>
<tr>
<td>Unintentional drug poisonings</td>
<td>E850-E858</td>
<td>515</td>
<td>48.1</td>
</tr>
<tr>
<td>Analgesics, antipyretics, antirheumatics</td>
<td>E850</td>
<td>126</td>
<td>11.7</td>
</tr>
<tr>
<td>Sedatives, hypnotics, tranquilizers and other psychotropic agents</td>
<td>E851-E854</td>
<td>141</td>
<td>13.1</td>
</tr>
<tr>
<td>Other drug categories</td>
<td>E855-E858</td>
<td>249</td>
<td>23.2</td>
</tr>
<tr>
<td>Self-Inflicted drug poisonings</td>
<td>E950.0-E950.5</td>
<td>405</td>
<td>37.8</td>
</tr>
<tr>
<td>Analgesics, antipyretics, antirheumatics</td>
<td>E950.0</td>
<td>88</td>
<td>8.2</td>
</tr>
<tr>
<td>Sedatives, hypnotics, tranquilizers and other psychotropic agents</td>
<td>E950.1-E950.3</td>
<td>128</td>
<td>12.0</td>
</tr>
<tr>
<td>Other drug categories</td>
<td>E950.4-E950.5</td>
<td>189</td>
<td>17.6</td>
</tr>
<tr>
<td>Drug poisonings of undetermined intent</td>
<td>E980.0-E980.5</td>
<td>151</td>
<td>14.1</td>
</tr>
</tbody>
</table>

**NOTE:** Other drug categories and undermined intent include other specified and unspecified drugs.

**SOURCE:** CDC/NCHS, National Hospital Ambulatory Medical Care Survey, 2008-2011.
Percent of emergency department visits admitted to the hospital by age according to cause of visit: United States, 2008-2011

1 Percentages are significantly different (p < 0.05) for drug poisoning injury visits compared with other emergency department visits based on a two-tailed t test.

2 Linear trend for age is significant (p < 0.05) based on a weighted least squares test.

SOURCE: CDC/NCHS, National Hospital Ambulatory Medical Care Survey, 2008-2011.
Summary

• During 2008-2011 an average of 1.1 million ED visits were made each year for drug poisoning.

• The drug-poisoning ED visit rate was highest among persons aged 20-34. The rate declined after 20-34 with rates for those aged 0-19 similar to those aged 50 and over.

• The drug poisoning ED visit rate among adults aged 20-34 was higher in 2008-2011 compared with 2004-2007.
Summary (Continued)

- Drug-poisoning ED visit rates did not differ by sex and age with the exception of 35-49 where women had a higher visit rate than men.

- The ED visit rate for unintentional drug poisoning was higher than self-inflicted drug poisoning overall and for males but did not differ for females.

- About one-quarter (24.5%) of drug-poisoning ED visits resulted in hospital admission.
Contact information

- NHAMCS website
  - [http://www.cdc.gov/nchs/ahcd/about_ahcd.htm](http://www.cdc.gov/nchs/ahcd/about_ahcd.htm)

- NHAMCS public use files – Ambulatory and Hospital Care Statistics Branch Data Request Line
  - Voice Mail: (301) 458-4600

- Research Data Center
  - Website: [www.cdc.gov/rdc](http://www.cdc.gov/rdc)
  - E-mail: rdca@cdc.gov