Epidemiology and scope of Neonatal Abstinence Syndrome
NAS Hospitalizations in TN: 1999-2012

Data sources: Tennessee Department of Health; Office of Health Statistics; Hospital Discharge Data System (HDDS) and Birth Statistical System.

Analysis includes inpatient hospitalizations with age less than 1 and any diagnosis of drug withdrawal syndrome of newborn (ICD-9-CM 779.5). HDDS records may contain up to 18 diagnoses. Infants were included if any of these diagnosis fields were coded 779.5.
Why the increase in NAS?

• Downstream consequence of prescription drug overuse, misuse and abuse

• Other consequences include:
  – Accidental ingestion
  – Unintentional overdose
  – Driving under the influence
  – Unintentional injury
  – Increased transmission of HIV and Hepatitis B and C
TN’s Prescription Drug Problem

Prescription Painkillers Sold By State, 2010

TN: 2nd highest in country for kilograms of prescription painkillers sold per 10,000 people

Opioid Prescription Rates by County—TN, 2007-2011

Data source: Tennessee Department of Health; Controlled Substance Monitoring Database.
TN’s Prescription Drug Problem

275.5 Million Hydrocodone Pills

116.6 Million Xanax Pills

113.5 Million Oxycodone Pills

51 pills per every Tennessean over age 12

22 pills per every Tennessean over age 12

21 pills per every Tennessean over age 12

Data source: Tennessee Department of Health; Controlled Substance Monitoring Database.
NAS Hospitalizations by County—TN, 2010-2012

Rate per 1,000 Live Births

- 26.1 - 123.4
- 10.4 - 25.0
- 5.0 - 10.3
- 2.3 - 4.9
- 0.0 - 2.2
- Data Suppressed
2. Total percentage may not equal 100.0% due to rounding.
3. Multiple maternal substances may be reported; therefore the total number of cases in this table may not match the total number of cases reported.
4. Other exposure may include cases reported to the archived surveillance system with classifications not captured in the current system.

**Year to Date Reporting Summary**

<table>
<thead>
<tr>
<th>Maternal County of Residence</th>
<th>#Cases</th>
<th>%Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Davidson</td>
<td>10</td>
<td>6.3</td>
</tr>
<tr>
<td>East</td>
<td>30</td>
<td>19.0</td>
</tr>
<tr>
<td>Hamilton</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Jackson/Madison</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Knox</td>
<td>18</td>
<td>11.4</td>
</tr>
<tr>
<td>Mid-Cumberland</td>
<td>17</td>
<td>10.8</td>
</tr>
<tr>
<td>North East</td>
<td>28</td>
<td>17.7</td>
</tr>
<tr>
<td>Shelby</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>South Central</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>South East</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Sullivan</td>
<td>16</td>
<td>10.1</td>
</tr>
<tr>
<td>Upper Cumberland</td>
<td>25</td>
<td>15.8</td>
</tr>
<tr>
<td>West</td>
<td>8</td>
<td>5.1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>158</td>
<td>100.1</td>
</tr>
</tbody>
</table>

**Maternal Substance Reporting Summary**

<table>
<thead>
<tr>
<th>Source of Exposure</th>
<th>#Cases</th>
<th>%Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication assisted treatment</td>
<td>116</td>
<td>73.4</td>
</tr>
<tr>
<td>Legal prescription of an opioid pain reliever</td>
<td>12</td>
<td>7.6</td>
</tr>
<tr>
<td>Legal prescription of a non-opioid</td>
<td>9</td>
<td>5.7</td>
</tr>
<tr>
<td>Prescription opioid obtained without a prescription</td>
<td>36</td>
<td>22.8</td>
</tr>
<tr>
<td>Non-opioid prescription substance obtained without a prescription</td>
<td>18</td>
<td>11.4</td>
</tr>
<tr>
<td>Heroin</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td>Other non-prescription substance</td>
<td>18</td>
<td>11.4</td>
</tr>
<tr>
<td>No known exposure</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Other⁴</td>
<td>12</td>
<td>7.6</td>
</tr>
</tbody>
</table>

2. Total percentage may not equal 100.0% due to rounding.
3. Multiple maternal substances may be reported; therefore the total number of cases in this table may not match the total number of cases reported.
4. Other exposure may include cases reported to the archived surveillance system with classifications not captured in the current system.
NAS Rate by Region, 2013

Rate per 1,000 births

- Shelby: 1.8
- West: 5.6
- Jackson-Madison: 1.6
- Mid-Cumberland: 3.9
- Davidson: 3.5
- South Central: 6.6
- Upper Cumberland: 30.9
- South East: 3.3
- Hamilton: 4.1
- East: 34.4
- Knox: 41.6
- North East: 54.7
- Sullivan: 11.6
- TOTAL: 41.6

Rate per 1,000 births
The highest rate of NAS cases (per 1,000 live births) observed in 2013 were in the East and Northeast regions of Tennessee, consistent with historical patterns.

The statewide rate was 11.6 cases per 1,000 live births.

There was no statistically significant change in rate throughout 2013 (at the state level or by region).

Sullivan County had the highest rate, 54.7 per 1,000 live births, followed by the Northeast region (41.6 per 1,000) and the East Region (34.4 per 1,000).

The Upper Cumberland Region is ranked a close fourth, with 30.9 cases per 1,000 live births.

NAS Rates by Region 2014

• Statewide rate of 12.7 NAS cases per 1,000 live births
• Highest rates in Sullivan County (49.1 per 1,000 live births), Northeast Region (42.7 per 1,000), and East Region (39.8 per 1,000)
• Sullivan County and Upper Cumberland Region saw decreased rates in 2014 compared to 2013
NAS Rates by Region 2015

• 2015 Annual Update not yet available
• According to the NAS Monthly Update for December 2015 (including data through 01/02/2016):
  – The highest rates of NAS in 2015 have occurred in Sullivan County and the Northeast region
NAS - Reportable Disease

• Important caveat:
  – *Reporting is for surveillance purposes only*
  – *Does not constitute a referral to any agency other than the Tennessee Department of Health*
  – *Does not replace requirement to report suspected abuse/neglect*