SUDDEN UNEXPECTED INFANT DEATH: SLEEP ENVIRONMENT AND CIRCUMSTANCES BY CAUSE OF DEATH CATEGORY
Methods

- Data are from the National Child Death Review Case Reporting System (NCDR-CRS)
- Nine States agreed to the use of their data for this analysis
- Infant deaths that occurred between January 1, 2005 through December 31, 2008
- Death identified as occurring while the infant was sleeping or in sleeping environment
- Cause of death recorded as SIDS, accidental suffocation, undetermined or unknown
Methods

- Descriptive analysis
- Deaths classified into 3 categories:
  - SIDS
  - Suffocation
  - Undetermined
- Frequency and proportions for each category by child, caregiver, and sleep environment characteristics
- Odds ratios and 95% confidence intervals calculated to assess differences in characteristics, comparing suffocation deaths to SIDS and undet
Results

- 3,148 deaths met inclusion criteria.
- 12 excluded as suspicious for inflicted injury
- 3,136 deaths included in this analysis
  - 961 (30.6%) SIDS
  - 939 (29.9%) suffocation
  - 1,236 (39.4%) undetermined cause
Study Characteristics

- Child
  - Age at death (months), sex, race

- Caregiver
  - Relationship to infant, sex, age

- Sleep environment
  - Place
  - Sleep surface
  - Position when found
  - Airway obstruction
  - Sleeping with person/animal
Infant Age by Cause of Death Category

- **SIDS**
  - < 2 months: 20%
  - 2-3 Months: 60%
  - 4-5 Months: 10%
  - 6-12 Months: 20%

- **Suffocation**
  - < 2 months: 10%
  - 2-3 Months: 80%
  - 4-5 Months: 10%
  - 6-12 Months: 10%

- **Undetermined**
  - < 2 months: 30%
  - 2-3 Months: 40%
  - 4-5 Months: 10%
  - 6-12 Months: 20%
Infant Age by Cause of Death Category

- SIDS
  - OR 1.7 (1.2-2.3)

- Suffocation
  - OR 1.6 (1.3-1.9)

- Undetermined
  - OR 1.3 (1.1-1.7)

Reference: 6-12 Months
4-5 Months
2-3 Months
< 2 months
Infant Race by Cause of Death Category

<table>
<thead>
<tr>
<th>Category</th>
<th>SIDS</th>
<th>Suffocation</th>
<th>Undetermined</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIDS</td>
<td></td>
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<tr>
<td>Suffocation</td>
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<tr>
<td>Undetermined</td>
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</tr>
</tbody>
</table>

**Reference**

- OR 1.4 (1.2-1.8)
- OR 0.4 (0.3-0.6)
Caregiver Relationship to Infant by Cause of Death Category

Missing: 3.6% SIDS; 3.9% Suffocation; 2.6% Undet
Caregiver Relationship to Infant by Cause of Death Category

- **SIDS**
  - OR 2.2 (1.4-3.4)

- **Suffocation**
  - OR 2.2 (1.5-3.3)

- **Undetermined**

Missing: 3.6% SIDS; 3.9% Suffocation; 2.6% Undet
Missing: 11.2% SIDS; 3.6% Suffocation; 4.5% Undet
Incident Place by Cause of Death

Category

OR 0.7 (0.5-0.9)

Missing: 11.2% SIDS; 3.6% Suffocation; 4.5% Undet
Infant Sleep Surface by Cause of Death Category

Missing: 9.8% SIDS; 5.9% Suffocation; 5.0% Undet
Infant Sleep Surface by Cause of Death

Category

- SIDS
- Suffocation
- Undetermined

**Missing: 9.8% SIDS; 5.9% Suffocation; 5.0% Undet**
Position when Found by Cause of Death Category

Missing: 3.9% SIDS; 7.7% Suffocation; 3.2% Undet
Position when Found by Cause of Death Category

Missing: 3.9% SIDS; 7.7% Suffocation; 3.2% Undet
Airway Obstruction Documented by Cause of Death Category

Missing: 43.4% SIDS; 43.7% Suffocation; 36.9% Undet
Airway Obstruction Documented by Cause of Death Category

Missing: 43.4% SIDS; 43.7% Suffocation; 36.9% Undet
Infant Sleeping with Person/Animal by Cause of Death Category

Missing: 47.1% SIDS; 23.5% Suffocation; 29.7% Undet
Response options changed in release 1/2010 – prior to this only yes responses were recorded
Infant Sleeping with Person/Animal by Cause of Death Category

Missing: 47.1% SIDS; 23.5% Suffocation; 29.7% Undet

Response options changed in release 1/2010 – prior to this only yes responses were recorded
Summary

- Over 3,000 SUIDs, stratified by cause of death
- Only ¼ of infants were found in a crib, on their back
- 70% were on a surface not intended for infant sleep
- 64% were on their stomach or side when found
- 64% were sharing a sleep surface; 50% sleeping with an adult
Limitations

- Could not confidently determine an appropriate denominator for deaths in this study, so rates could not be calculated.
- No comparison group so risk could not be determined.
- Potential for differences in data quality across states using the NCDR-CRS.
- Large proportion of missing data for some of the sleep environment variables.
- Etiologic component of sleep environment characteristics on risk of SUID cannot be determined.
Conclusions

- Infants whose deaths were classified as suffocation were more likely to be
  - Sleeping on a surface not intended for infant sleep
  - Sharing that sleep surface with others, usually an adult
  - Have documentation of an obstructed airway

- Deaths with hazards in the sleep environment clearly documented are more likely to be classified as suffocation
Implications for Prevention

- Modifiable sleep environment risk factors were identified for a large proportion of SUIDs, regardless of the ultimate cause of death classification.
- These findings contribute to the mounting evidence that hazards in sleep environment contribute all classifications of SUIDs.
- Possible to develop prevention strategies before etiology is definitely determined.
- The time for developing effective interventions for ensuring a safe sleep environment for all infants is here.