Shiga Toxin-Producing *E. coli* O157:H7 Outbreak in an Unlicensed Daycare Center, Tennessee, 2012

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Session V: Stories from the States
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Background

- Shiga toxin-producing *Escherichia coli* (STEC) cause an acute diarrheal illness
- STEC O157:H7 most common STEC reported
- ~95,400 cases/year
- Approximately 5-15% of STEC O157 cases develop hemolytic uremic syndrome (HUS)
  - Children < 5 years old are at highest risk
Initial Report

- April 23, 2012
  - Children’s Hospital reports two STEC cases
  - Reside in county with increased STEC
  - Attend same daycare center (Daycare A)
Daycare A Investigation

- Additional ill/exposed persons identified
- Facility inspected
- Stools collected from ill and well
- No records of foods served
- Ground beef and goat feces collected
- Environmental swabs not collected
Case Definition

• A person reporting either vomiting or diarrhea who was associated with Daycare A
Results

- Unlicensed home-based daycare center
- 16 part-time and full-time children enrolled
  - 11 daycare; 5 aftercare
- 23/24 (96) exposed were interviewed
- 11 (46) reported illness
# Case Characteristics

<table>
<thead>
<tr>
<th>Cases, No. (%)</th>
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<tbody>
<tr>
<td>(N = 11)</td>
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<table>
<thead>
<tr>
<th>Age, years</th>
<th>3</th>
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<tbody>
<tr>
<td>Median</td>
<td>3</td>
</tr>
<tr>
<td>Range</td>
<td>1, 40</td>
</tr>
<tr>
<td>Female</td>
<td>6 (54.5)</td>
</tr>
<tr>
<td>Hospitalized</td>
<td>3 (27.2)</td>
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<tr>
<td>HUS</td>
<td>1 (9.1)</td>
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<tr>
<td>Symptoms</td>
<td>Cases, No. (%)</td>
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<tr>
<td>--------------------------</td>
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<tr>
<td></td>
<td>(N = 11)</td>
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<tr>
<td>Diarrhea</td>
<td>10 (91)</td>
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<tr>
<td>Fever</td>
<td>9 (82)</td>
</tr>
<tr>
<td>Stomach cramps</td>
<td>8 (73)</td>
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<td>Bloody stool</td>
<td>7 (64)</td>
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<tr>
<td>Vomiting</td>
<td>7 (64)</td>
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E. coli O157:H7 Cases — Daycare A
N=11
Results - Specimen Collection

- 19 exposed submitted stool specimens
  - 9 + for STEC O157
    - 8 symptomatic
    - 1 asymptomatic
- Indistinguishable PFGE
- Beef samples and goat feces negative for STEC
Results- DHS Inspection

• Prior history of non-compliance
• Number of children was excessive
  – Limited to 4 children
• Diapering and food handling procedures did not meet DHS requirements
Daycare A
Diaper Changing Station
Recommendations

• Review and comply with daycare licensing regulations regarding diapering practices

• Ensure all high-contact surfaces are cleaned each day to reduce contamination

• Ensure that hand-washing facilities are properly supplied/used
Recommendations (cont.)

- Review and ensure adherence to food handling practices
- Two consecutive negative cultures
Conclusion

- Shiga toxin-producing *Escherichia coli* O157:H7 outbreak associated with Daycare A
- Unregulated environment likely cause of person-to-person transmission
- Public Health measures implemented
- Joint local and FoodCORE response reduced risk of additional transmission
Limitations

• Daycare A not captured on initial interview

• Limited communication between regional health office and DHS before the outbreak

• Likely cases returned to daycare before second stool culture were known
Discussion

• Daycare outbreak require rapid response

• TN FoodCORE has enabled health departments to place more resources in outbreak response activities
Acknowledgements

• East TN Regional Office
  – Tamara Chavez-Lindell
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  – Cathy Goff
  – Sharon Cabbage

• Cocke Co HD
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  – Wendy Ford
  – Mandy Gregg
  – Tim Runions

• TN Dept of Health
  – John Dunn
  – Ben Hampton
  – Kanitha Pope
  – Susan Miller
  – Effie Boothe
## Cohort Study Results

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<tr>
<th></th>
<th>Ill (n=9)</th>
<th></th>
<th>Well (n=13)</th>
<th></th>
<th>OR</th>
<th>(95% CI)</th>
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<tbody>
<tr>
<td></td>
<td>No.</td>
<td>(%)</td>
<td>No.</td>
<td>(%)</td>
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<tr>
<td>Pizza</td>
<td>7</td>
<td>77.7</td>
<td>2</td>
<td>15.4</td>
<td>19.3</td>
<td>2.18 – 169.8</td>
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<tr>
<td>Ground Beef</td>
<td>4</td>
<td>44.4</td>
<td>7</td>
<td>53.8</td>
<td>0.69</td>
<td>0.12 – 3.78</td>
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<tr>
<td>Daycare vs. Aftercare</td>
<td>7</td>
<td>87.5</td>
<td>5</td>
<td>55.6</td>
<td>5.60</td>
<td>0.47 – 66.5</td>
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