Guidance for Conducting Foodborne Outbreak Environmental Assessments

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ENVIRONMENTAL ASSESSMENT
Foodborne Outbreak Investigation Components

- **Epidemiological**
  - Determine the who, what, when, where of an outbreak

- **Laboratory**
  - Identify or confirm the agent causing the outbreak

- **Environmental**
  - Assess how and why the agent got into the environment and spread
  - Recommend steps to stop outbreaks and prevent future ones
Environmental Assessments as Part of Foodborne Outbreak Investigations

- **Environmental Assessment**
  - Describes how the environment contributes to the introduction and/or transmission of agents that cause illness

- **Objectives of an environmental assessment**
  - Identify contributing factors
  - Identify environmental antecedents
  - Generate recommendations for informed interventions
Environmental Assessments as Part of Foodborne Outbreak Investigations

**Contributing Factors**

- Factors that caused the outbreak
- *How* the outbreak occurred

**Environmental Antecedents**

- Factors that led to the contributing factors
- *Why* the outbreak occurred
Environmental Assessments as Part of Foodborne Outbreak Investigations

Outbreak
• Norovirus
• Outbreak caused by salad eaten at a restaurant

Contributing Factors
• Worker did not properly wash hands after using restroom
• Worker prepared coleslaw using bare hands
• Worker worked while ill

Environmental Antecedents
• Hand sinks did not have soap
• Workers lacked training on proper handwashing
• Restaurant did not offer workers paid sick leave
National Environmental Assessment Reporting System (NEARS)

Collects outbreak data on contributing factors and their environmental antecedents.
NEARS Data Reporting Instrument

**Part I: Outbreak Description**
- Did the exposure(s) take place in a single or multiple locations?
- Was this outbreak reported to a national surveillance system?

**Part II: Establishment Description**
- What is the establishment’s source of potable water?
- Do customers have direct access to unpackaged food such as a buffet line or salad bar?

**Part III: Manager Interview**
- Is this an independent or chain establishment?
- Does this establishment have a policy or procedure that requires food workers to tell a manager when they are ill?

**Part IV: Establishment Observation**
- Are hand sinks available in the employee restroom(s)?
- Were the temperatures of all foods measured in cold holding at 41°F or below?
NEARS Data Reporting Instrument

**Part V: Suspected/Confirmed Food**
- Was a specific ingredient or multi-ingredient food suspected or confirmed in this outbreak?
- Is the ingredient an animal product, and if so, what kind?

**Part VI: Sampling**
- Were any samples taken?
- If environmental, where was the sample taken from?

**Part VII: Contributing Factors**
- Were any contributing factors identified in this outbreak?
- During the outbreak investigation, what activities were used to try to identify the contributing factors?
Conducting Environmental Assessments as Part of Foodborne Outbreak Investigations

**Step 1**
Plan and Prepare

**Step 2**
Site Visit

**Step 3**
Assess Information
Identify Contributing Factors

**Step 4**
Recommend Control Strategies

**Step 5**
Report
Step 1: Plan and Prepare

- Communicate and coordinate roles of others involved in the foodborne illness outbreak investigation
  - Epidemiology, laboratory and environmental health staff

- Work with environmental health specialists/rapid response teams to align observational data being collected with NEARS observational data
Step 2: Site Visit

- Conduct Interviews
  - Use NEARS Manager Interview (NEARS - Part III)

- Perform Walkthroughs and Observations
  - Est. Description, Categorization, and Menu Review (NEARS - Part II)
  - Est. Observation (NEARS - Part IV)

- Collect Samples
  - Sampling (NEARS - Part VI)

- Review Establishment Records
Step 3: Assess Information and Identify Contributing Factors

- **Assess Information**
  - General Characterization of the Outbreak Response (NEARS - Part I)
  - Suspected/Confirmed Food (NEARS - Part V)

- **Identify Contributing Factors**
  - Contributing Factors (NEARS - Part VII)
    - Contamination
    - Proliferation/Amplification
    - Survival

- **Identify Environmental Antecedents**
  - People
  - Process
  - Equipment
  - Economics
  - Food
Step 4: Make Recommendation for Control Strategies

- **Immediate control strategies**
  - Stop the current outbreak
  - Prevent further spread of the agent

- **Long-term control strategies**
  - Reduce the likelihood of future outbreaks
Step 5: Report

- Summarize findings of the environmental assessment
  - Record review of the establishment
  - Interviews with the manager and food workers
  - Observation of food preparation and food preparation and storage areas
  - Food flows for implicated foods/ingredients
  - Environmental and food sampling
  - Other reviews as needed to understand how and why food became contaminated

- Report findings to NEARS
Programs Reporting Environmental Assessment Data to NEARS
How Outbreak Data are Reported to NEARS and Summarized by CDC

1. People are exposed to a hazard
2. People get sick and may or may not seek treatment
3. Health department is notified of possible outbreak
4. Health department conducts an environmental assessment as part of outbreak investigation
5. Health department enters environmental assessment data into NEARS
6. CDC reviews environmental assessment data for accuracy and analysis
7. Data is summarized and published
### CDC's National Environmental Assessment Reporting System (NEARS)

In 2015, a total of 114 outbreaks were reported to NEARS. This summary provides information on characteristics of those outbreaks and the establishments where the outbreaks occurred.

The data included in this summary were collected by NEARS participants in California, Connecticut, Davis County, Utah; Fairfax County, Virginia; Harris County, Texas; Minnesota; New York City; New York State; Rhode Island; Tennessee; and Wisconsin.

### Outbreak Characteristics

#### Foodborne Illness Outbreaks

<table>
<thead>
<tr>
<th>Average # of Visits to Complete an Environmental Assessment</th>
<th>2 Visits</th>
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</thead>
</table>

#### Outbreak Response

- The average number of days between the date the outbreak establishment was identified for an environmental assessment and the date of the following activities with the outbreak establishment:
  - 1st contact = 1 day (min = 0, max = 15)
  - Establishment observation = 2 days (min = 0, max = 29)
  - Manager interview = 14 days (min = 0, max = 121)

- The average number of visits to the outbreak establishment needed to complete an environmental assessment = 2 visits (min = 1, max = 16)

#### Outbreak Investigation Characteristics

<table>
<thead>
<tr>
<th>% of outbreak <strong>reported to NORS</strong></th>
<th>88%</th>
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</table>

### Contributing Factors

- C10
- C11
- C12

### Most Common Outbreak Contributing Factors

<table>
<thead>
<tr>
<th>Contributing Factor</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>C10</td>
<td>25%</td>
</tr>
<tr>
<td>C11</td>
<td>17%</td>
</tr>
<tr>
<td>C12</td>
<td>20%</td>
</tr>
<tr>
<td>Other</td>
<td>52%</td>
</tr>
</tbody>
</table>

* Each outbreak may identify more than 1 contributing factor, so percentages may equal more than 100%.

### Outbreak Contributing Factors

<table>
<thead>
<tr>
<th>% of outbreaks with identified contributing factor</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribution</td>
<td>81%</td>
</tr>
<tr>
<td>Preparation</td>
<td>28%</td>
</tr>
<tr>
<td>Served</td>
<td>17%</td>
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</tbody>
</table>

* Each outbreak may identify more than 1 contributing factor, so percentages may equal more than 100%.
ENVIRONMENTAL ASSESSMENT TRAINING
Environmental Assessment Training

Release: April 2014

Current: June 2017

Over 5,500 Users
User Profile: Difference in Pretest and Mastery Test Scores for All Users

Pretest: 62%
Mastery Test: 86%
CDC Needs Your Help!

Consider using our Environmental Assessment Training and reporting environmental assessment data to NEARS

Things to think about...

- Do you think knowing *how* and *why* outbreaks appear to occur would be helpful?
- Would more training on how to conduct foodborne illness outbreak environmental assessments be helpful?
- Would a characterization of your program involvement in investigating foodborne outbreaks be helpful?
- Would more details than we now have about outbreak food vehicles be helpful?