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**Brief Cluster/Outbreak Summary**

**Report Date:** [Date report submitted]

**Outbreak ID:** [state ID and/or CDC multistate cluster/outbreak ID]

**Outbreak Name:** [Simple description of cluster/outbreak, Ex: “Restaurant X - Norovirus”]

**Lead Investigator:** [Investigator name]

**Setting or Source:** [Restaurant/school/nursing home/etc. or food item]

**Etiology (including Serotype):** [etiology (including serotype) or “Unknown” if etiology is not known]

**Date Cluster/Outbreak Identified/State Notified:** [select date] **Date Investigation Concluded:** [select date]

### **Cluster/Outbreak Identification Method:**

 ☐ State Lab/Epi Surveillance Data ☐ Complaint

 ☐ CDC/PulseNet multi-state cluster/outbreak ☐ Other Method: {click to describe}

### **Agencies Involved in Investigation:**

State Agencies (state & local): [list all agencies involved from impacted state]

Federal Agencies: [list all federal agencies]

**Case Definition**: [enter outbreak case definition]

### **Case Counts:**

[Insert State name] Confirmed Cases: [# of cases with a positive lab result] of [number of people tested] people tested

[Insert State name] Probable Cases: [# of cases without a positive lab result but similar symptoms/epi link]

**Date of First Illness Onset:** [select date] **Date of Last Illness Onset:** [select date]

**Epidemic Curve:** *[Insert epidemic curve if 5 or more cases are reported. For multi-state clusters/outbreaks paste in epi curve from CDC]*

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**Background**: {Describe how cluster/outbreak was identified, and basic information about the cluster/outbreak, including relevant dates such as exposure and notification dates.}

*Ex: On November 8, 2010, the Mountain County Department of Public Health (MCDPH) Communicable Disease Program received a complaint of gastrointestinal illness in four coworkers who ate lunch together at Restaurant X. They dined on November 5, 2021 at 11:15 am. Three ate pizza from the buffet and individual salads brought to their table; the fourth had a salad and sandwich brought to the table.*

Optional - Historic Occurrence of Agent: {summarize historical occurrence of the agent in your state (i.e., how often the agent has been seen in your state, whether it’s ever been associated with a cluster/outbreak, whether there is a seasonal distribution, etc.)}

**Methods**: {Describe steps taken in the investigation and document dates when important activities occurred. If a supplemental interview was used, lab testing was conducted, or other agencies were involved, include that information here. If an epidemiologic study (cohort, case-control, binomial comparison) was used, include that information here.

*Ex: Three of four ill persons were interviewed by MCDPH staff on November 8, 2021. One ill person submitted a stool sample to the State Department of Public Health and Environment lab on November 9th, 2021 for norovirus testing. MCDPH Environmental Health Specialists visited the restaurant on November 9th and conducted an environmental assessment.*

**Results**: {include case information (age range/median, sex, hospitalization, outcome, symptoms, etc). If a source was identified, also include the number of cases that reported exposure to the source. Describe any lab results (human, food/environmental, antimicrobial susceptibility results, etc.) including testing conducted (WGS, PCR, CIDT, cluture, etc.) and/or environmental health findings (environmental assessment findings, past inspection results, disease control policies, sick workers, etc.)}

*Ex: Cases reported illness onset between 10:00 pm – 11:15 pm on November 6. Incubation of illness ranged from 34.75 – 36 hours after the meal, with a median incubation of 35 hours. Reported duration of illness varied from 10 – 24 hours. All three ill persons interviewed reported vomiting and stomach cramps; two of three reported non-bloody diarrhea. One ill person submitted a stool sample, which was PCR positive for norovirus at the State Department of Public Health and Environment lab. No secondary spread of illness was documented. During their environmental assessment, MCDPH Environmental Health Specialists did not identify any significant environmental infractions that would contribute to foodborne illness. In particular, there were no reports of ill food handlers or problems with hand hygiene. It was noted that the salads are prepared using tongs by the wait staff. No illness in wait staff was reported.*

**Discussion and Recommendations:**[Describe any investigation conclusions, barriers, or lessons learned.

*Ex: This gastrointestinal illness outbreak was due to norovirus infection. While person-to-person spread of norovirus is well documented and the four ill persons work closely together in one office, the clustering of illness onset suggests a common food exposure associated with the shared meal at Restaurant X on November 5, 2010. No other gastrointestinal illness was reported among their colleagues who did not share this meal. The findings of the investigation were shared with the ill persons and gastrointestinal illness policies and procedures were reviewed with Restaurant X.*

**Attachment(s):** [list attachments here, including but not limited to: cluster/outbreak specific questionnaires, CDC web postings, and any other related documents.]

**Note: Do not include any Protected Health Information (PHI) in the attachments or final report.**

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**Long Cluster/Outbreak Report**

**Report Date:** [Date report submitted]

**Outbreak ID:** [Outbreak #]

**Outbreak Name:** [Simple description of cluster/outbreak, Ex: “Norovirus outbreak among students and staff at Happy Child Elementary School following class trip to Restaurant X”]

**Lead Investigator:** [Investigator name]

**Setting or Source:** [Restaurant/school/nursing home/etc. or food item]

**Etiology (including Serotype):** [etiology (including serotype)]

**Date Cluster/Outbreak Identified/State Notified:** [select date] **Date Investigation Concluded:** [select date]

### **Cluster/Outbreak Identification Method:**

 ☐ State Lab/Epi Surveillance Data ☐ Complaint

 ☐ CDC/PulseNet multi-state cluster/outbreak ☐ Other Method: {click to describe}

### **Agencies Involved in Investigation:**

State Agencies (state & local): [list all agencies involved from impacted state]

Federal Agencies: [list all federal agencies]

**Case Definition**: [enter outbreak case definition]

### **Case Counts:**

[Insert State name] Confirmed Cases: [# of cases with a positive lab result] of [number of people tested] people tested

[Insert State name] Probable Cases: [# of cases without a positive lab result but similar symptoms/epi link]

[Insert State name] Counties with Cases (# of cases): [list case counts by county]

*For multi-state clusters/outbreaks also include:*

Total Cases: [# of cases]

Other States with Cases (# of cases): [list case counts by state]

**Date of First Illness Onset**: [select date] **Date of Last Illness Onset:** [select date]

### **Introduction/Background:**

Single paragraph that provides an overview of the investigation, including:

* How the cluster/outbreak was reported to public health, including the date public health learned of the cluster/outbreak.
* How the existence of the outbreak was confirmed.
* List agencies and/or programs and/or persons that assisted in the investigation.
* Identify/describe the type of facility or location involved in the outbreak (if applicable).
* Describe the demographics of the affected population (if available).
* Briefly describe the suspected agent, its epidemiology, and surveillance trends.
* State the goals of the investigation.

*Ex: Rocky Mountain County Health Department (RMCHD) and the State Health Department jointly investigated an outbreak of gastrointestinal illness among children who attend a Rocky Mountain County elementary school. As part of a school outing, approximately 75 children and 8 adults ate lunch at Restaurant X in Snowflake on Monday April 28. On Wednesday, April 30, 24 students and 3 adults who went on the trip reported gastrointestinal illness, including vomiting, diarrhea, myalgia and low-grade fevers. On the afternoon of May 1, the school’s principal notified RMCHD about the outbreak. RMCHD inspected the restaurant on May 2.*

## **Methods**

* Provide the case definition
* Describe the **Epi** methods (agency responsible, case finding/case ascertainment methods, case definitions, interview techniques, questionnaires, study designs, analytical plan and methods, etc.)
* Describe **Environmental** methods (agency responsible, sites visited, type of environmental assessments that were done, tracebacks, etc.)
* Describe **Laboratory** methods (labs that were used, specimens tested, tests that were done, etc.)
* If ICS was used, briefly describe how it was used. Include a copy of the ICS structure flow chart.

*Ex: A case was defined as: A Happy Child Elementary School student or parent who went on the class trip to Restaurant X on April 28 and who subsequently reported gastroenteritis (diarrhea, vomiting, or fever plus abdominal cramps).*

*To identify additional cases, characterize the illness and attempt to identify the cause of the outbreak, a questionnaire was distributed on Friday May 2 to the parents of all students and to all adults who went on the class trip. A cohort analysis was conducted using food history results from the questionnaire.*

*Rocky Mountain Environmental Health conducted an environmental inspection of the restaurant.*

*Six stool samples were collected by RMCHD and sent to the State Laboratory for norovirus testing. Norovirus testing was performed using the NASBA method.*

## **Results**

* Describe the Epi results (number of cases; descriptive data including case demographics, clinical symptoms, illness duration, and incubation period if known; analytic study results including attack rates and relative risks for cohort studies and odds ratios for case-control studies; tables that show the results; epi-curve, etc.)
* Describe the Environmental results (results/findings during assessments, traceback results, etc.)
* Describe the Laboratory results (lab test results, etc.) and type of testing conducted (WGS, culture, PCR, CIDT, etc.)

*Ex: Reports from school officials and questionnaire data indicate that 29/75 (39%) students and 3/9 (33%) adults experienced illness after the trip, for an overall attack rate of 38%. In total, 56 completed questionnaires were received (9 adults, 47 students), yielding a response rate of 67%.*

 **Table 1:**

| Demographics | n(%) |
| --- | --- |
| Gender |  |
| Female | 7 (23) |
| Male | 24 (77) |
| Age, median (range) | 8 years (5-57) |
| Grade level, median (Among students) | 2nd  |
| Duration of illness (hrs), median (range)  |  24 (8-72) |
| Incubation period (hrs), median (range) | 36 (24-90) |
| Symptoms | n(%) |
| Nausea | 28/30 (93%) |
| Vomiting | 29/32 (91%) |
| Fatigue | 22/29 (76%) |
| Abdominal Cramps | 20/27 (74%) |
| Diarrhea | 16/29 (55%) |
| Myalgia | 13/28 (46%) |
| Fever | 10/25 (40%) |
| Chills | 11/29 (38%) |
| Bloody Diarrhea | 0/32 (0%) |

*Onset dates and times are shown in the epidemic curve below. No respondents reported gastrointestinal illness prior to the trip. The case with onset on Friday evening has a sibling who also attended the event and who became ill on Wednesday. We suspect that this case represents secondary transmission within the family. Only one case went to the doctor; no stool specimen was obtained at that visit.*



*We estimate that 27 families had at least one ill member. Eleven (41%) of these families reported that between one and three family members who had not attended the event became ill with symptoms of gastroenteritis. Most reported that symptoms began 2 days after onset of illness in the family member who attended the event; the incubation periods for this secondary transmission ranged between 1 and 3 days. Based on the incubation period, reported symptoms and duration of illness, we suspected norovirus was the etiologic agent.*

***Laboratory***

*Five of the six specimens submitted to the state lab for norovirus testing were positive for norovirus by RT-PCR.*

***Environmental inspection***

*The restaurant inspection found that little actual direct food handling occurs in the kitchen (the salad is poured out of a bag with no additional vegetables added, the salad dressing is pre-made, etc). Two areas of concern were identified. First, the large salad bowl into which the bagged salad was poured prior to distribution to individual customers was not routinely sanitized. Second, wooden boards on which individual loaves of bread are served were not sanitized between customers; they were only wiped with a dishtowel prior to reuse. In addition, the inspector noted that ice cream is the only food item served while employees are not wearing gloves. The ice cream is scooped from a large container into individual dishes with an ice cream scoop, but employees do not wear gloves.*

*No workers had reported gastrointestinal illness or had been absent due to illness in the week prior to the event. Rocky Mountain Environmental Health received no complaints from other patrons of the restaurant around the time of the outbreak.*

# ***Analytic Study:***

If an analytic study was conducted, present the results here. Only one type of study (ex: Cohort **OR** Case-control **OR** Binomial) should be presented.

*Results of the cohort study are presented in the table below. No single food item was identified as the likely vehicle. The relative risk for illness following consumption of meat sauce was 1.48, for garlic butter was 1.72, for bread was 1.75 and for ice cream was 2.09. Garlic butter was the only food item for which the relative risk was statistically significant, although only 11 persons ate the garlic butter and only nine illnesses occurred among them.*

|   | **Persons who ate item** | **Persons who did not eat item** |   |
| --- | --- | --- | --- |
| Food item | Ill | Total | Attack rate (%) | Ill | Total | Attack rate (%) | Relative Risk (CI) |
| Spaghetti | 25 | 46 | 54 | 5 | 8 | 63 | 0.87 (0.5, 1.6) |
| Marinara | 9 | 19 | 47 | 21 | 35 | 60 | 0.79 (0.5, 1.4) |
| Meat sauce | 16 | 24 | 67 | 14 | 31 | 45 | 1.48 (0.9, 2.4) |
| Salad | 20 | 38 | 53 | 10 | 16 | 63 | 0.84 (0.5, 1.4) |
| Pesto | 9 | 20 | 45 | 21 | 34 | 62 | 0.73 (0.4, 1.3) |
| Ice cream | 28 | 47 | 60 | 2 | 7 | 29 | 2.09 (0.6, 6.9) |
| Butter | 19 | 35 | 54 | 10 | 18 | 56 | 0.98 (0.6, 1.6) |
| Garlic butter | 9 | 11 | 82 | 20 | 42 | 48 | 1.72 (1.1,2.6) |
| Bread | 28 | 48 | 58 | 2 | 6 | 33 | 1.75 (0.6, 5.6) |

**OR**

*Results of the case control study are presented in the table below. No single food item was identified as the likely vehicle. The relative risk for illness following consumption of meat sauce was 2.43, for garlic butter was 4.95, for bread was 2.80 and for ice cream was 3.68. Garlic butter was the only food item for which the odds ratio was statistically significant.*

|   | **Persons who ate item** | **Persons who did not eat item** |   |
| --- | --- | --- | --- |
| Food item | Ill | Total | Ill | Total | Odds Ratio(CI) |
| Spaghetti | 25 | 46 | 5 | 8 | 0.71 (0.2, 3.3) |
| Marinara | 9 | 19 | 21 | 35 | 0.60 (0.2, 1.9) |
| Meat sauce | 16 | 24 | 14 | 31 | 2.43 (0.8, 7.3) |
| Salad | 20 | 38 | 10 | 16 | 0.67 (0.2, 2.2) |
| Pesto | 9 | 20 | 21 | 34 | 0.51 (0.2, 1.6) |
| Ice cream | 28 | 47 | 2 | 7 | 3.68 (0.6, 21.0) |
| Butter | 19 | 35 | 10 | 18 | 0.95 (0.3, 3.0) |
| Garlic butter | 9 | 11 | 20 | 42 | 4.95 (1.0, 25.7) |
| Bread | 28 | 48 | 2 | 6 | 2.80 (0.5, 16.8) |

**OR**

*To determine if the consumption rates of each food item could be due to chance alone, a binomial probability study was conducted. Transaction records were used to determine background consumption rates for each food item at the restaurant. Results showed that the probability of at least 16 cases eating meat sauce by chance alone was 0.08, the probability of at least 9 cases eating garlic butter was 0.002, the probability of at least 28 cases eating bread was 0.004, and the probability of at least 28 cases eating ice cream was 0.002. All four of these food items were statistically significant.*

| **Sample size=30 cases** | **# Cases with Exposure** | **% Cases with Exposure** | **Background consumption** | **Cumulative Probability** | **P** |
| --- | --- | --- | --- | --- | --- |
| Spaghetti | 25 | 83% | 80% | 0.43 | 0.17 |
| Marinara | 9 | 30% | 35% | 0.78 | 0.13 |
| Meat sauce | 16 | 53% | 39% | 0.08 | 0.04 |
| Salad | 20 | 67% | 65% | 0.51 | 0.15 |
| Pesto | 9 | 30% | 22% | 0.24 | 0.11 |
| Ice cream | 28 | 93% | 70% | 0.00 | 0.00 |
| Butter | 19 | 63% | 65% | 0.65 | 0.15 |
| Garlic butter | 9 | 30% | 10 | 0.00 | 0.00 |
| Bread | 28 | 93% | 72% | 0.00 | 0.00 |

## **Discussion**

* Discuss all aspects of the investigation and propose and justify hypotheses and/or conclusions as to the cause of the cluster/outbreak.
* Discuss control measures that were implemented.
* List recommendations public health made to control the outbreak.
* Discuss problems encountered during the investigation.
* Discuss lessons learned from the investigation.
* Provide recommendations to prevent future outbreaks.

*Ex: In this outbreak, 32 persons became ill following a school lunch at the School Trip Restaurant. Laboratory testing confirmed that norovirus was the etiologic agent. No single food item has been identified as the likely vehicle. Consumption of garlic butter is the only food item with an elevated relative risk that is statistically significant, however, only 9 of the cases ate this food item, so it is unlikely that contaminated garlic butter was the cause of the outbreak. Those who ate ice cream and those who ate bread had a higher attack rate than those who did not consume these items, however, these results are not statistically significant. The numbers of persons who did not eat these items were very small, severely limiting the power of the analysis. It is possible that an employee who was ill could have contaminated the ice cream as it was served (since gloves were not worn for that task), however, the restaurant reported no illness among employees. Similarly, because breadboards were not sanitized between customers, norovirus could have been introduced either from a patron or a staff member who was ill.*

*The problematic kitchen practices discussed above could have contributed to cross-contamination and spread of norovirus in the kitchen. Rocky Mountain Environmental Health has instructed restaurant workers in the correct practices for salad bowl and breadboard handling and will continue to monitor the restaurant’s compliance with these regulations.*

*These results have been communicated to the school principal and to the trip leader. A State health department epidemiologist answered all questions both had about the outbreak and stressed the importance of handwashing as a method for prevention of future intra-family transmission of illness.*

**Supporting Documents**

* Items such as environmental assessment reports, a blank copy of the questionnaire, letters or HAN alerts developed specific to the cluster/outbreak, menus, a chronology of events, detailed results, press releases, etc.

**Note: Do not include any Protected Health Information (PHI) in the attachments or final report.**