

Investigating a Deadly Foodborne Outbreak in an Residential Facility for the Mentally Retarded

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Background



Background



Methods – Epidemiology

- Case Definition - "Facility resident or employee with onset of unexpected* diarrhea on November 2 or 3, 2004."
- Active Case Finding - Email to staff to report GI illnesses between 11/2 and 11/5/04
 - Stool samples to be collected on all ill patients



* Unexpected diarrhea is defined as not attributable to medication, dietary or other conditions

Methods - Epi

- Cohort Study
 - Eight CHD staff conducted Proxy interviews
 - Menus medical/activity records were used for food & symptom histories
 - Some kitchen staff were interviewed

**Virginia Department of Health
Enteric Case Report Form**

Demographic Information

Name:	DOB: Age:	Race:	Sex:	SSN:
Mailing Address:	City/County:		Phone (H): (W):	
Occupation/Daycare (include location):			Parent's Name (if patient is a minor):	

Clinical Data

Disense name: _____ Confirmed Probable Epi-link to: _____

Date of onset: Time: ____/____/____	Date well: Time: ____/____/____	Date of initial culture: Time: ____/____/____	Source of report:
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Symptoms (check all that apply):

<input type="checkbox"/> Headache <input type="checkbox"/> Nausea <input type="checkbox"/> Abdominal cramps <input type="checkbox"/> Vomiting, How many times? _____ <input type="checkbox"/> Diarrhea, How many times? _____ <input type="checkbox"/> Bloody stool <input type="checkbox"/> Fever, How high? _____	Hospitalized? <input type="checkbox"/> Yes <input type="checkbox"/> No Hospital name: _____ Physician: _____ Contact #: _____	Treatment (drug name, Rx, start and end dates): _____ _____
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High risk situation? No
 Yes, Specify: Food handler Daycare employee or attendee Other, specify: _____
 Provides direct care in hospital or institutional setting _____

For all high risk cases, be sure to fill out the High Risk Cases section at the end of this form

Open-ended food history for the () hours/days* prior to illness onset. Use additional paper if necessary.

	Date	Date	Date	Date	Date	Date
Breakfast						
Snacks						
Lunch						
Snacks						
Dinner						
Snacks						

* Incubation periods are listed below. Collect a food history for the **maximum incubation period** listed:
 Campylobacteriosis (2-5 days); Giardiasis (7-10 days); Salmonellosis (6-72 hours); Shigellosis (1-3 days)
 Do not use this form for E. coli or Shiga-toxin related cases—use the E.Coli O157 and Shiga-toxin Related Disease Questionnaire.

v. 06/20/2005

Methods – Laboratory

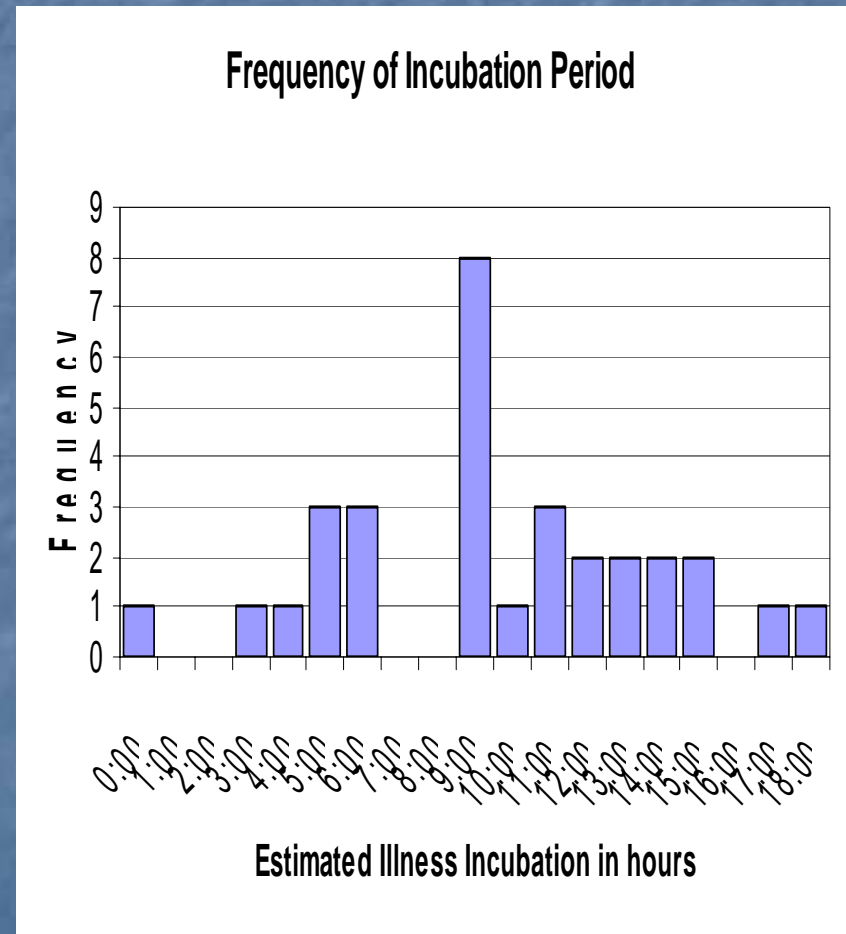
- 7 stools samples submitted to Va state lab for viral & bacterial:
 - Bacterial Testing
 - *Yersinia, C. perfringens, Salmonella, Shigella, Campylobacter, Staphylococcus aureus-enterotoxin, Ecoli O157:H7, Bacillus cereus, Vibrio, Shiga Toxins*
 - Norovirus
- Gastric Content of deceased
- Frozen BBQ sauce & Shredded Pork with sauce

Methods- Environmental Health

- Kitchen Inspection
- Interviews with Kitchen staff
- Food flow analysis
- Two affected cottages and common use areas were assessed

Results - Epi

Pork BBQ	III	Not III	Total Ix
Yes (exposed)	30	28	58
No (not exposed)	1	11	12
Total	31	39	70



AR = 51.7; RR = 6.2069; p = 0.000587

Campus Map



Administration

Kitchen

Cluster 3
52%

Cluster 4

21.08

Cluster 5

Cluster 2
19%

Cluster 1
29%

Building 29

Building 30

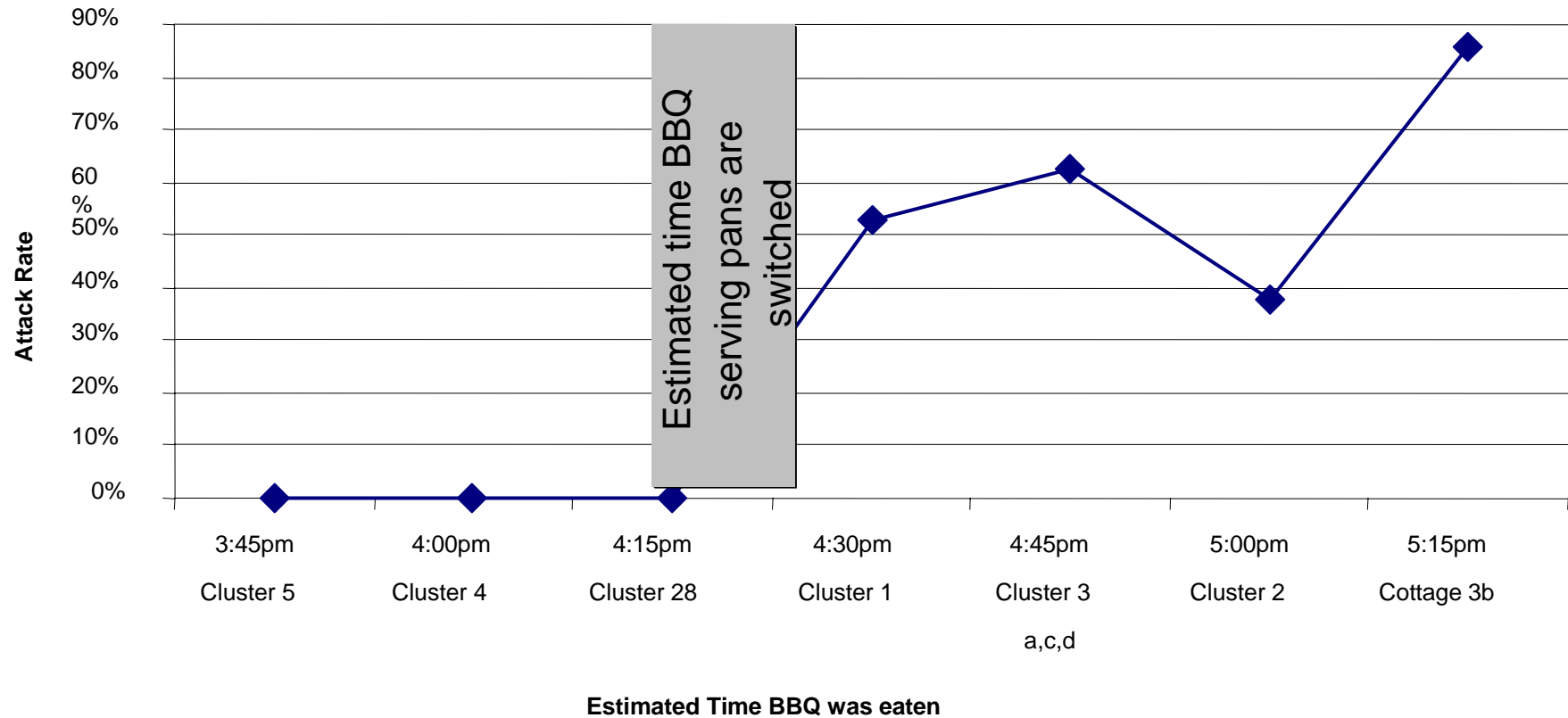
21.47

21.41

21.08

Results – Epi Investigation

Attack Rate by Estimated Time of Consumption



Results - Laboratory

Direct Stool	Clostridium Perfringens	
	Toxin	Colonies per gram
Resident A	Positive	140,000,000
Resident B	Positive	1,500,000
Resident C	Positive	2,000,000
Resident D	Positive	130,000
Resident E	Positive	2,700,000
Resident F	Negative	Not Done
Resident G	Positive	2,100,000

Frozen BBQ Sauce and BBQ with Sauce tested negative for *C. perfringens*

Results -Environmental

- One delivery trip takes about 15 minutes.
- Not all meals are consumed immediately upon arrival.



Results-Environmental

- 2 to 3 day process
- Communication between Shifts
- No time and temperature monitoring
- Shortage of staff
- Management delivered food
- Serving trays did not maintain temp.



Discussion

- *Clostridium perfringens* implicated
 - Food prep management
 - Meal Delivery
 - Type of food served
- *C. perfringens* is a common food borne illness
- Death from *C. perfringens* is rare
- Challenges to overcome with food prep and delivery

Recommendations

- Assess the number of kitchen staff
- Improve communications with cottages
- Rethermalization units in cottages
- Reduce the processing steps
- Prepare foods same day as consumed
- Fill the serving trays just before delivery
- Monitor time and temperature, incorporate HACCP.

Recommendations

- Use covered trailer
- CFM monitor in the cottage kitchens.
- All cottage staff receive food handling training
- Rethermalization units in cottages



Outcome

- Food Service CQI Teams
 - 2 new enclosed trailers
 - New product vendors
 - Rethermalizing Units
 - Staff Training
- Quality Assurance Indicators
 - HACCP implemented
 - Ongoing CQI reviews



Questions?

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