

CONTRA COSTA  
HEALTH



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# A Walk Down Foodborne Outbreak Investigation Lane: Foods Prepared from Private Residences

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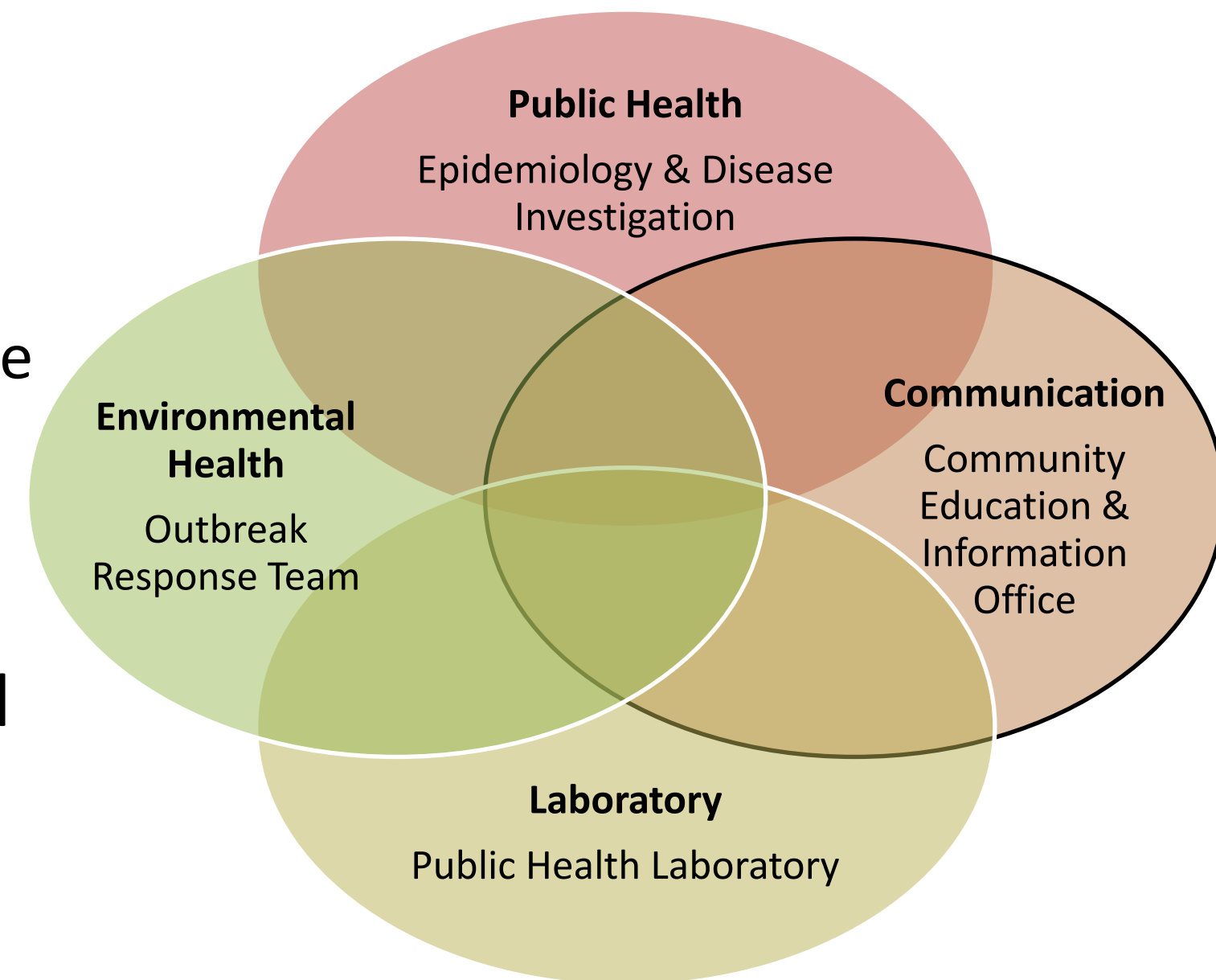
# CONTRA COSTA COUNTY - California

- Contra Costa County is located in California, in the San Francisco Bay Area
- The county is home to ~1.2 million residents.
  - It is the 9<sup>th</sup> most populous county in the state out of 58 counties
- The county is a mix of urban, suburban and rural.
  - Comprised of 19 cities and many established communities unincorporated areas
- Contra Costa County has an integrated Health Department (Contra Costa Health) which includes a Regional Hospital, Public Health, Environmental Health, Health Plan, etc.



# Importance of a Collaborative Response

- Department Outbreak Response Team (now CCHOMPP) formed in the late 1990's
  - Team included **Environmental Health (EH), Epidemiology, Public Health Communicable Disease (CD) Programs, Public Health Laboratory** and Other health response partners
  - In 2001, the group continued to expand to include additional Response Partners – Public Health Emergency Preparedness Team, Emergency Medical Services, and County Sheriff's Office
- Ongoing coordinated responses with California State and Federal Agencies:



U.S. Department of  
Health and Human Services  
Centers for Disease  
Control and Prevention



U.S. DEPARTMENT OF AGRICULTURE

**Outbreak Scenario:** Raw Milk Products Prepared at Home for Children

**Organism(s):** ???

**Initial Outbreak Report:**

- Public Health staff detected two epi-linked cases during routine public health disease surveillance activities
- Case-patient investigation interviews after receipt of a positive presumptive *Escherichia coli* (*E. coli*) O157 lab reports

## Timeline of Events:



Friday 10/21/2011

- Symptom onset of 1<sup>st</sup> locally detected case

Monday 10/24/2011

- 1<sup>st</sup> locally detected case is hospitalized and transferred to regional children's hospital to treat for HUS

Tuesday 10/25/2011

- Symptom onset of 2<sup>nd</sup> locally detected case

Thursday 10/24/2011

- Public Health receives lab report for the 1<sup>st</sup> and 2<sup>nd</sup> case patients

## Timeline of Events: (cont.)

Friday  
10/28/2011

- Public Health (PH) notifies Environmental Health (EH) of case-patients and recent history of commercially produced raw milk consumed at home
- Joint investigation by PH and EH:
  - Collected food samples from patient's house (kefir and other milk products)
  - Impounded specific raw milk products (sealed) from local grocery store

Saturday  
10/29/2011

- The 2<sup>nd</sup> locally detected case is hospitalized at regional children's hospital, also with HUS

BAG CREDIT			
BAG CREDIT			
2 @	-0.05 EA	-0.10	
BAKERY BREAD			
SF LARGE LOAF			
2 @	3.29 EA	6.58	F
DAIRY			
CLOVER F/FRM C-F LAR		3.89	F
ORGANIC PASTURES-RAW			
6 @	7.99 EA	47.94	F
GROCERY			
W/F DISTILLED VINEGA		3.79	F
W F BAKING SOCA		0.89	F

## Outbreak Scenario: Raw Milk Products Prepared at Home for Children

Organism(s): E. coli O157:H7

## Outcomes:

- 11/14/2011: The California Department of Public Health sent out statewide notices regarding recent cluster of E. coli O157:H7 infections amongst 5 young children with a single strain via PFGE pattern
- 11/15/2011: The California Department of Food and Agriculture issued a statewide recall notice





**Outbreak Scenario:** Community Thanksgiving Meal Event

**Organism(s):** ???

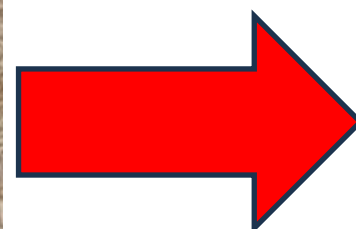
**Initial Outbreak Report:**

Public Health received a phone call (after-hours) from a local Acute Care Hospital Emergency Room (ED) reporting a suspect gastrointestinal outbreak of unknown etiology

- 7 patients had presented to the ED from a small consortium of small adult Residential Care Facilities (RCF)
- Patients had presented with the major symptoms of diarrhea and/or vomiting



# Case Study #2



The Washington Post

Morning Mix

## 3 dead, 5 ill in Calif. after Thanksgiving charity dinner, health officials say

By Derek Hawkins November 29, 2016







A Thanksgiving spread. (Matthew Mead/AP)

On Thanksgiving Day, the American Legion hall in Antioch, Calif., opened its doors to anyone who didn't have a place to go for the holiday. With the help of a local church, the veterans' organization hosted a dinner for those who would have otherwise dined alone, complete with turkey, stuffing, green beans and other Thanksgiving fare.

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## Timeline of Events

Thursday 11/24/2016 Thanksgiving Day	Friday 11/25/2016	Saturday 11/26/2016	Monday 11/28/2016	Tuesday 11/29/2016	Friday 12/02/2016
An estimated 800 individuals were served a holiday meal hosted by a local church. -Turkey, turkey gravy, stuffing, mashed potatoes, sweet potato casserole, & pies.	2:30PM to 4:30PM, 7 patients from RCF admitted at hospital ED complaining of diarrhea and/or vomiting. -2 case patients reported as dead -Stool specimens requested by CCCPHL for testing. <b>*Initial hypothesis formulated.</b>	A total of 3 case patients now reported as dead by CCC Coroner's Office.	*CCH PH reported Norovirus negative stool samples (3). *Environmental Health conducted Environmental Assessment. Event organizer (church) identified. *CCHPH created questionnaire. <b>*Hypothesis reformulated.</b>	*CCH EH interviewed event coordinator and Church pastor. *Church members prepared food at event center and within their private residences. -Turkey, turkey gravy, sweet potato casserole, and pies. *Autopsies revealed acute hemorrhagic and necrotizing enterocolitis. *Coordination with CDPH for C. perfringens testing.	*CDC Enteric Diseases Laboratory Branch reported 4 of 6 patient stool samples + C. perfringens foodborne enterotoxin (CPE) by reversed passive latex agglutination. -11 (46%), including 3 deceased, reported taking 1 or more atypical antipsychotic medications - <b>which are known to slow gut motility.</b>

## Case Study #2



Figure 1. Example of colon with necrosis. Fatal Necrotizing Colitis Following a Foodborne Outbreak of Enterotoxigenic *Clostridium perfringens* Type A Infection

Source: CID 2005:40 (15 May) DOI: [10.1086/429829](https://doi.org/10.1086/429829)

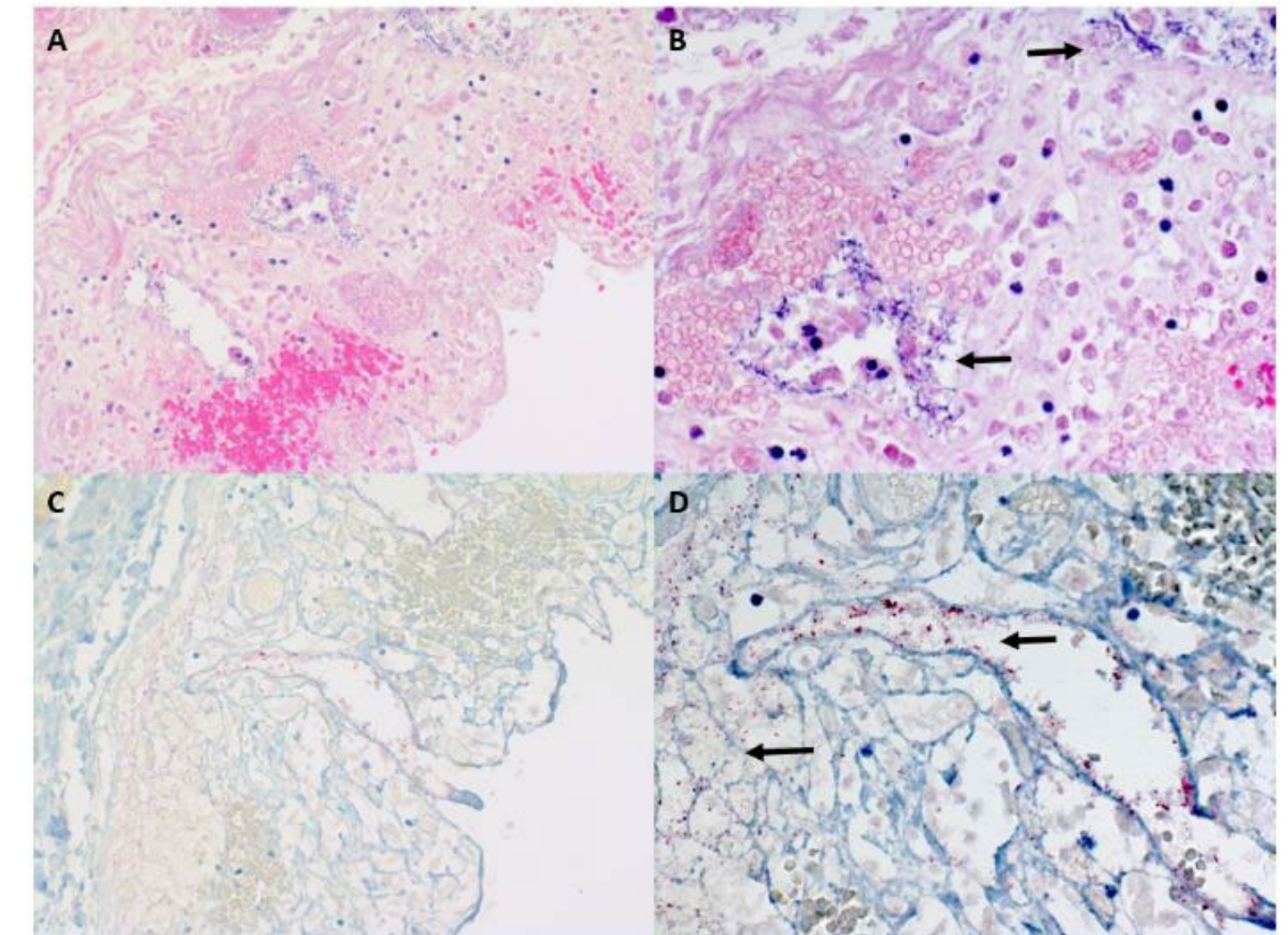


Figure 2: **H and E and immunohistochemical (IHC) staining targeting *Clostridium* spp. in the colon of one autopsy case.** A, 20X - H and E staining shows hemorrhagic and necrotizing colitis with abundant bacterial rods in crypts. B, 40X – Higher magnification of the hemorrhagic and necrotizing colitis with large bacterial rods within crypts. C, 20X - Bacterial rods within crypts label by an IHC assay targeting *Clostridium* spp. with invasion into the lamina propria. D, 40X – Higher magnification of the bacterial rods within the crypts, labeled by an IHC assay targeting *Clostridium* spp. Arrows point to the positive immunostaining of bacteria.

## Outbreak Scenario: Community Thanksgiving Meal Event

Organism(s): *Clostridium perfringens*

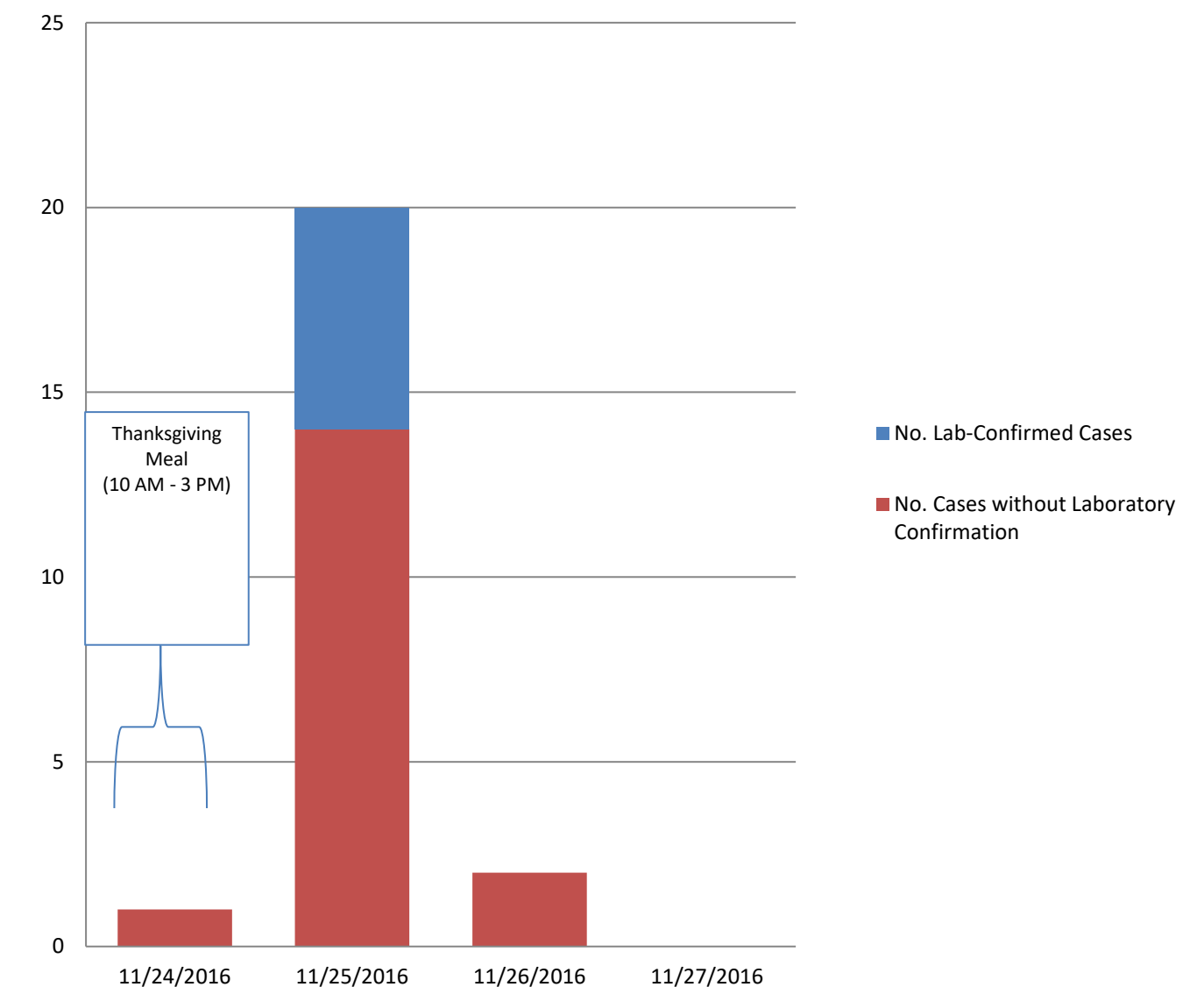
## Outbreak Summary

- Case Count: 23 (of ~800 attendees)
  - 13 cases were hospitalized
  - 3 cases deceased

## Outcomes:

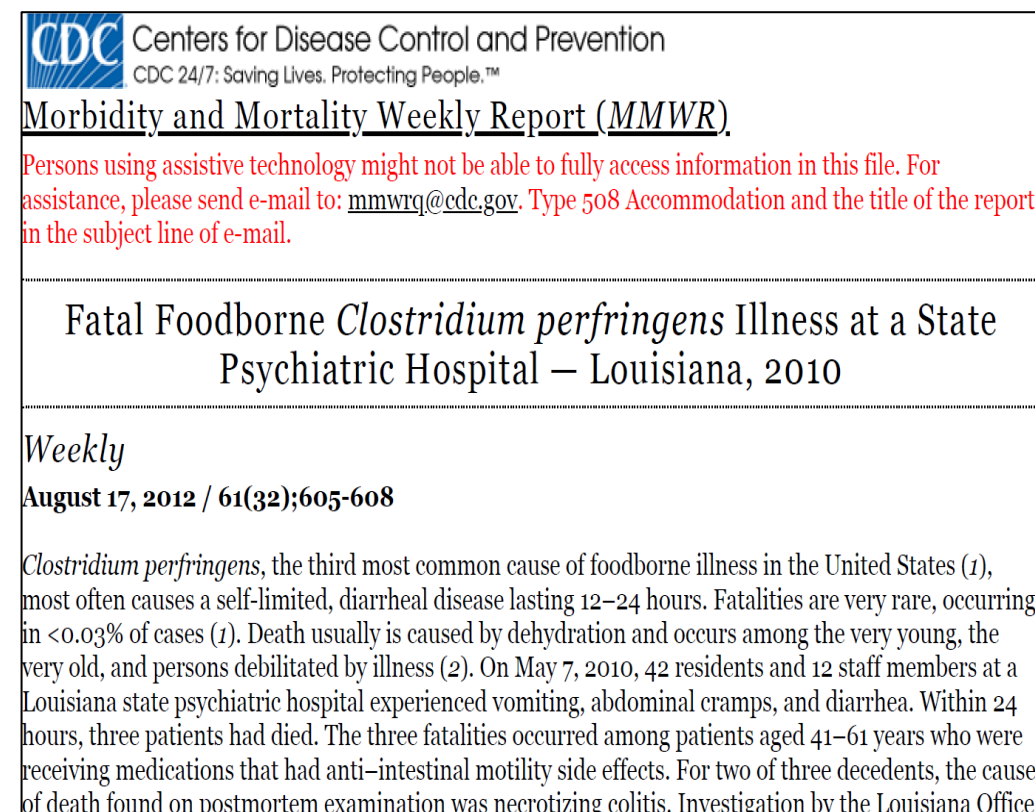
- Public Health wrote up response as white paper for potential publication
- Environmental Health performed outreach to community organizations including churches ahead of future holiday seasons for food safety education and event permitting

Dates of symptom onset among cases (n=23) of gastroenteritis associated with a Thanksgiving meal—Contra Costa County, November 2016



## Implications for future Public Health & Environmental investigations:

- Patients on atypical antipsychotic medications may be more vulnerable to severe health outcomes from *C. perfringens*. Persons caring for patients on these drugs should be aware of their risk for adverse outcomes when exposed to enterotoxin-producing *C. perfringens*
- Food-service operators of large-scale events, including charitable community meal events, should be aware of the risks associated with improper preparation and storage of food and the need for diligent monitoring of food temperatures during food preparation, storage, and handling. Event organizers and operators would benefit from education on food safety practices



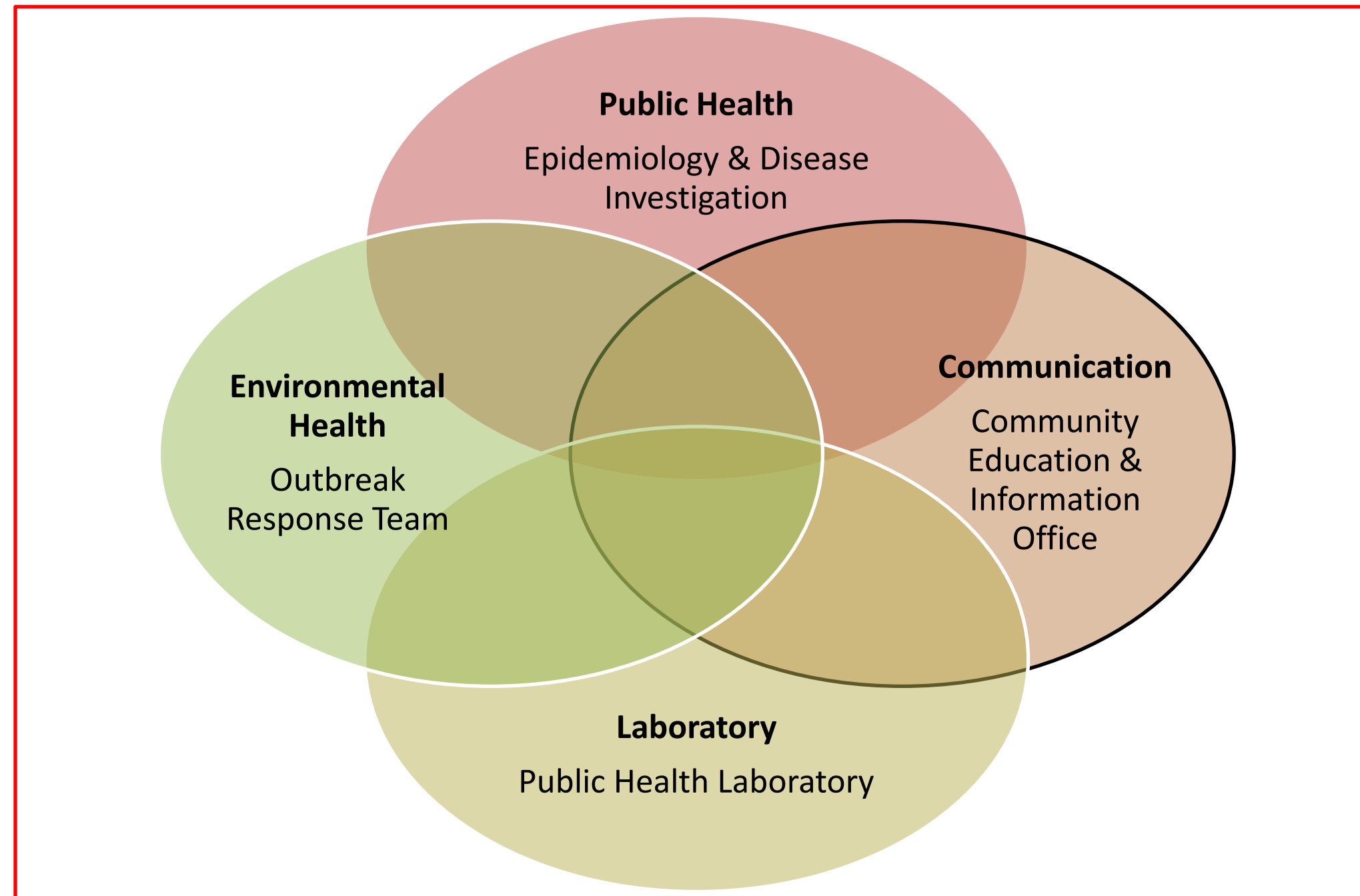
### Gastroenteritis Outbreak with Fatalities Caused by *Clostridium perfringens* and Associated with a Community-Based Thanksgiving Meal—Contra Costa County, California, 2016

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# The Health Department In Action!



**The key is a coordinated response**

**Outbreak Scenario:** Catered Lunch at Acute Care Facility for Healthcare Leadership

**Organism(s):** ???

**Initial Outbreak Report:**

Public Health received a phone call from the administration of local Acute Care Hospital system reporting a suspect outbreak:

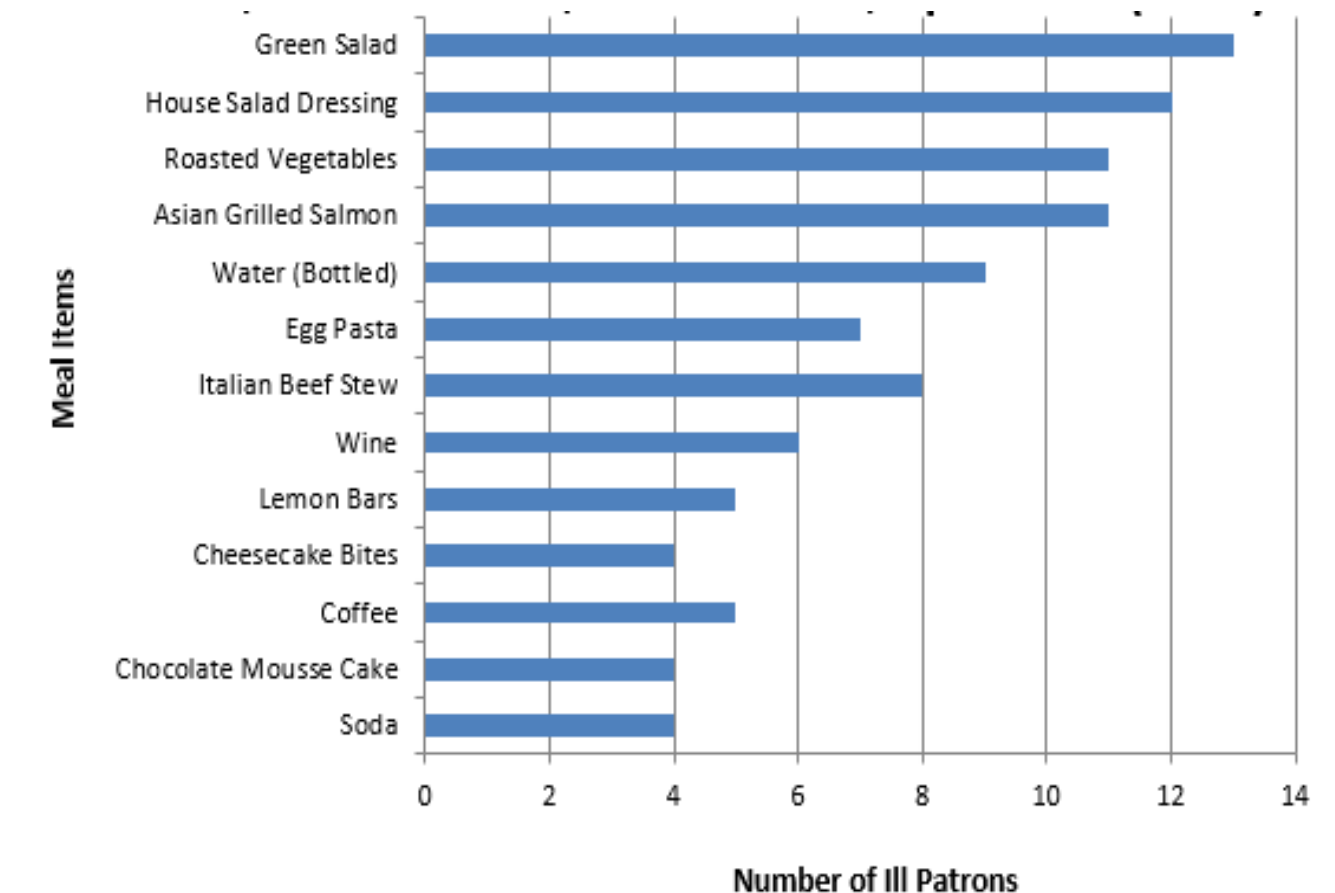
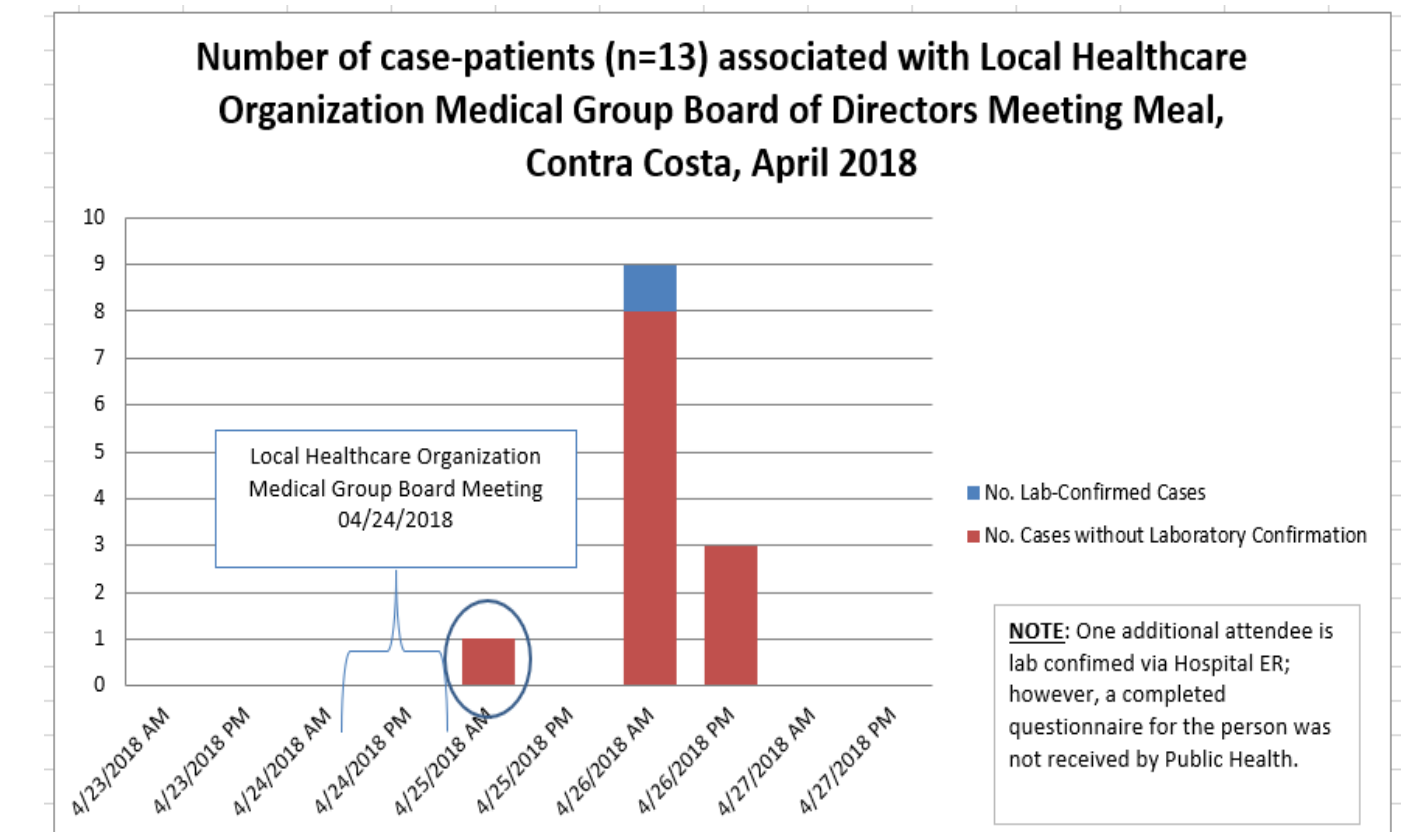
- 12 of the 28 attendees were symptomatic
- All were healthcare staff of hospital – some with direct patient care and others in key leadership administration roles

## Event Details:

- The major symptoms included: Nausea, Vomiting, and Diarrhea
- Catered Dinner: Menu included both ready-to-eat items (salad) and cooked items (roasted vegetables, grilled salmon, pasta, Italian beef stew, cheesecake bites, lemon bars and chocolate mousse)
- All symptomatic healthcare workers had to be excluded and then cleared from work for a communicable disease

## Outbreak Summary

- Case Count: 22 (of 28 attendees)
- Incubation Period: ranged from 33-48 hours
- Attack Rate: 79%



### **Outbreak Scenario:** Catered Lunch at Acute Care Facility for Healthcare Leadership

**Organism(s):** Norovirus G.I

### **Outcomes:**

- Hearing with County District Attorney's Office resulted in large fines for the caterer for operating without a health permit and refusing to cooperate with Contra Costa Health Department around the outbreak investigation.



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for all you  
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