

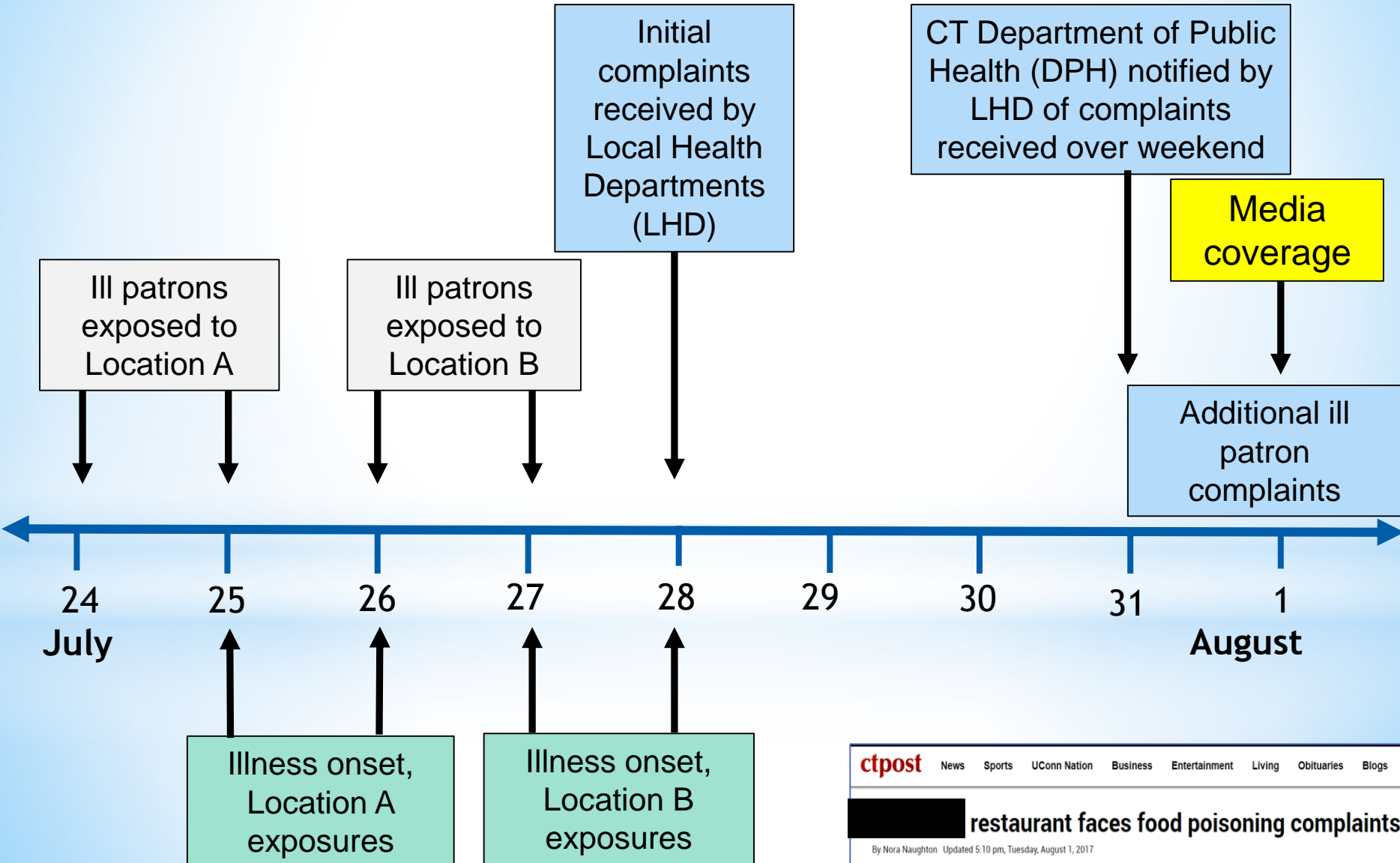
EPEC/EAEC - What the heck?

An Outbreak Investigation Using Culture-Independent Diagnostic Testing (CIDT), Connecticut, 2017

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Background



Methods

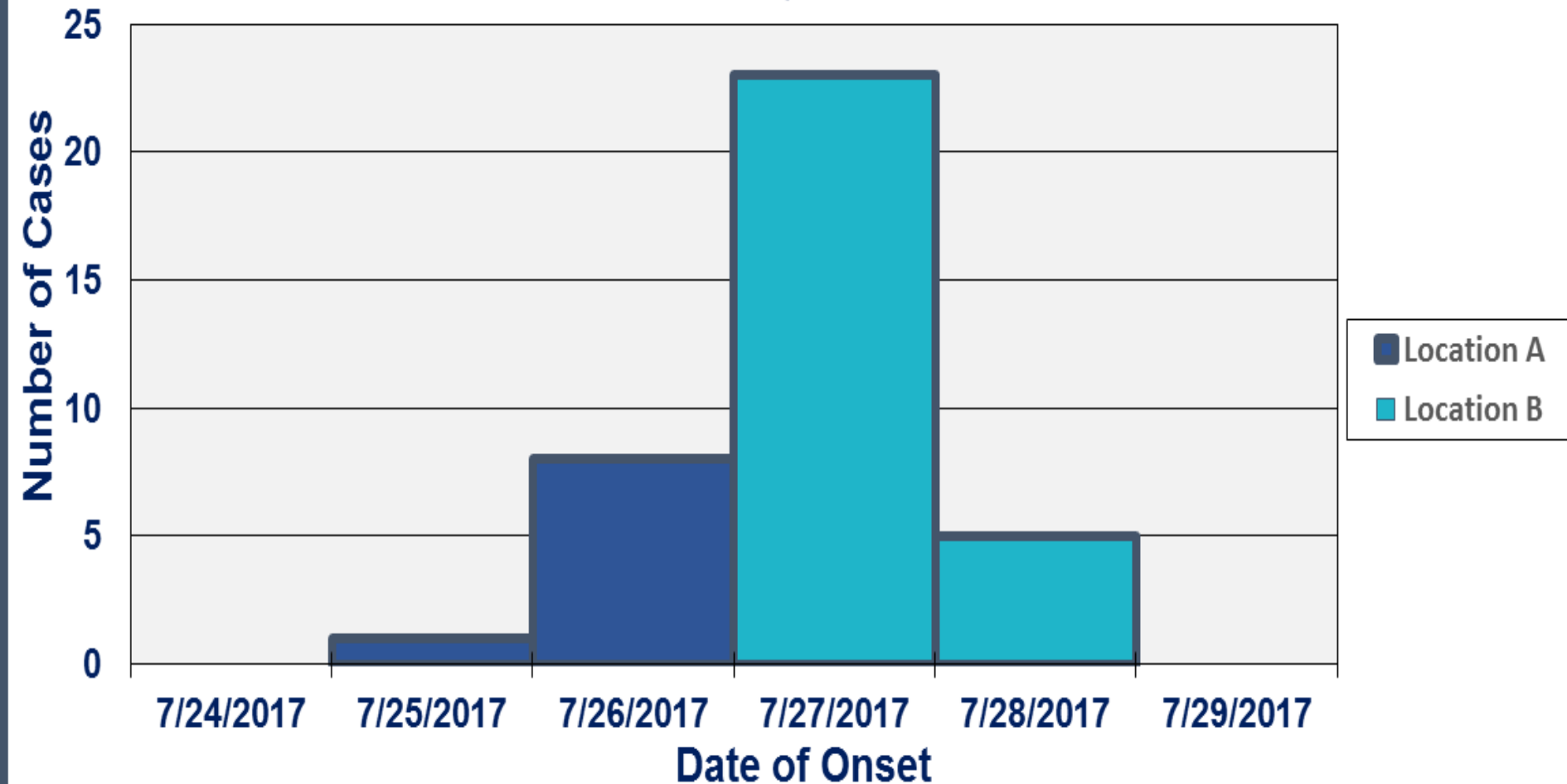
- Stool samples collected from ill patrons and food workers (FW) and tested at CT DPH Laboratory
 - All stools tested using multiplex polymerase chain reaction gastrointestinal screening panel (BioFire FilmArray)
- Positive patron and selected “interesting” FW samples forwarded to Minnesota Department of Health

Epidemiology Results

- Case definition: patron who developed vomiting and/or diarrhea (3 or more stools in a 24 hour period) within 24 hours after eating at either one of the two FSE locations
- 39 patrons were interviewed
 - 37 (95%) met the case definition
- Food items could not be statistically implicated due to a lack of controls for comparison

Epi Curve

Number of Cases by Date of Onset, Fairfield County, CT, July 2017





Demographics and Clinical Features

Incubation: Median = 11 hours (range 4-24 hours)

Duration: Median = 3 days (range 1-7 days)

Symptom	% of Cases
Diarrhea	100%
Cramps	89%
Fever	27%
Vomiting	19%
Bloody stool	5%

CT Laboratory Results

Patrons

- 4/4 positive for Enteropathogenic E. coli (EPEC)
- 4/4 positive for Enteroaggregative E. coli (EAEC)

Food Workers

- 12/17 positive for EPEC
- **1/17 positive for EPEC & EAEC**
- 1/17 positive EPEC, Shigella/EIEC, Giardia
- 1/17 positive for Norovirus

Enteropathogenic *E.coli* and Enteraggregative *E. coli*

EPEC

- Infection mainly among young children (<2 years)
- Disappeared as important cause of outbreaks of infant diarrhea in North America and Europe.
- “Typical EPEC” *eae* and *bfpA* gene (usually detected by PCR) and is known pathogen

EAEC

- Cause of epidemic and sporadic diarrhea
 - Role as enteric pathogen not fully understood
- Associated with persistent and acute child and adult diarrhea



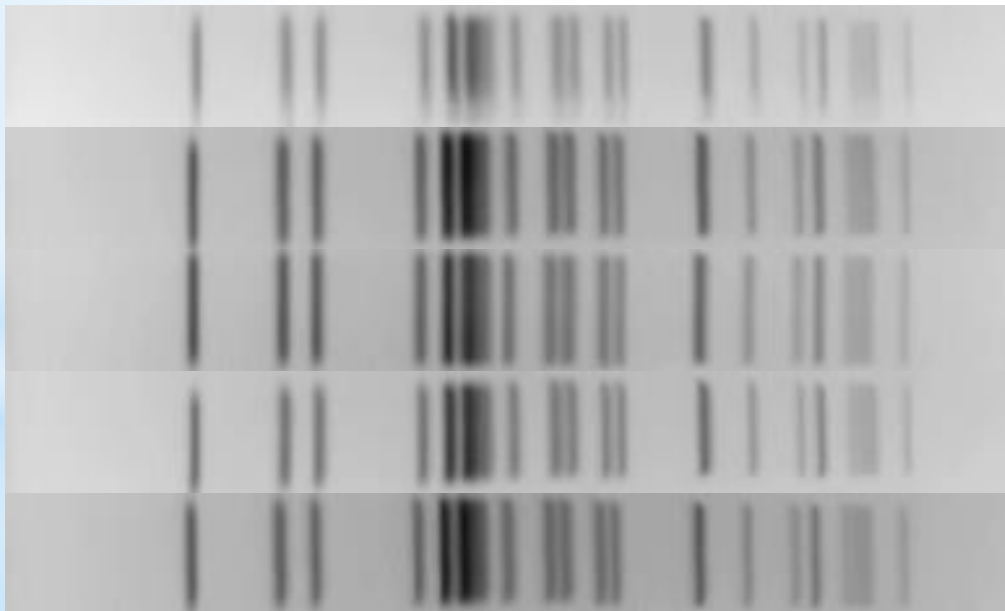
MN Laboratory Results

Sample	CT Results (BioFire FilmArray)	MN EPEC& EAEC Results Sweep PCR / Isolate PCR
Patrons		
Patron 1	EPEC & EAEC	EAEC / Isolates Not Found
Patron 2	EPEC & EAEC	EAEC / EAEC & tEPEC
Patron 3	EPEC & EAEC	EAEC / EAEC
Patron 4	EPEC & EAEC	EAEC / EAEC
Food Workers		
Food Worker 1	EPEC	tEPEC / tEPEC
Food Worker 2	Negative	Negative / Not Tested
Food Worker 3	EPEC & EAEC	tEPEC & EAEC / tEPEC
Food Worker 4	EPEC	Negative / Not Tested
Food Worker 5	EPEC, Shigella/EIEC, Giardia	EPEC / Not Found

MN Laboratory Results

EAEC Isolates

PFGE-XbaI



6-EA3-1L EAEC134* (Patron 2)

6-EA3-1M EAEC134 (Patron 2)

7-EA2 EAEC134 (Patron 3)

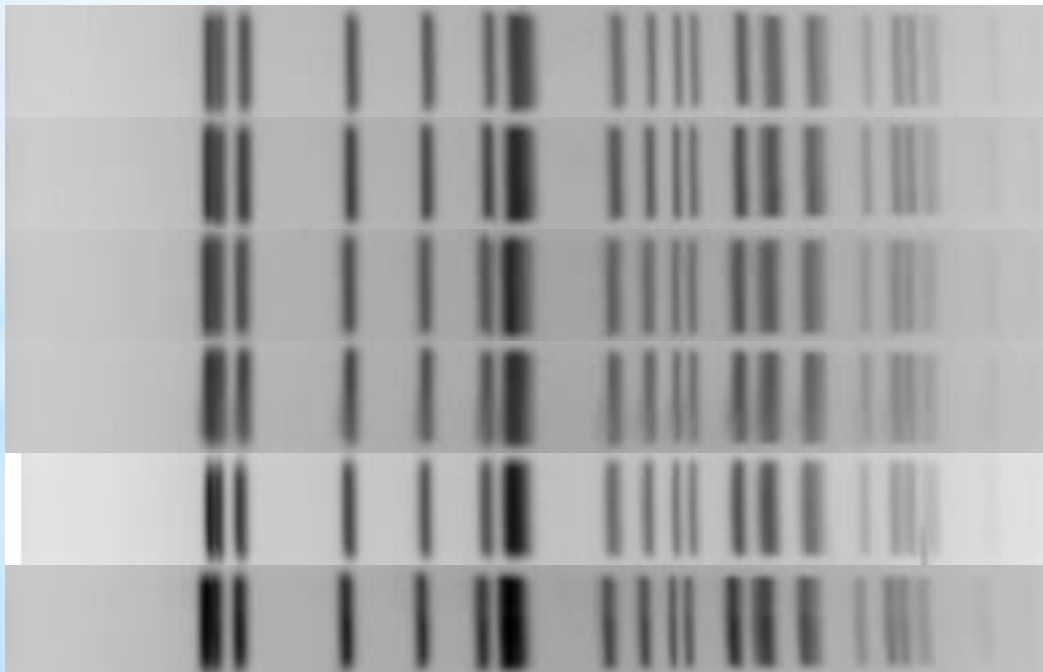
8-EA3-2 EAEC134 (Patron 4)

8-EA3-8 EAEC134 (Patron 4)

MN Laboratory Results

EPEC Isolates

PFGE-XbaI



1-EP1 EPEC13 (FW 1)

1-EP2 EPEC13 (FW 1)

3-EP3 EPEC13 (FW 3)

3-EP5 EPEC13 (FW 3)

6-EP5-1 EPEC13 (Patron 2)

3-EP2 EPEC13* (FW 1)

Conclusions

- An outbreak of GI illness due to both EPEC & EAEC occurred in CT in July 2017
- Use of CIDT (multiplex PCR panels) during outbreaks can identify pathogens not commonly tested for or linked to outbreaks
- Challenges in interpreting results and determining etiology especially when multiple pathogens detected
- Consider additional testing to determine etiology of outbreak
- Identifying, investigating, and documenting these outbreaks will improve understanding of these once 'novel or undetected' pathogens



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Thank You!