

PFGE Cluster Survey

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FoodNet Outbreak Working Group

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Study Overview

- **Purpose:** To determine what epidemiological factors encourage successful investigations of PFGE clusters
 - “When do we start really investigating clusters, to what depth & why”
- **8 FoodNet States Involved:** CO, CT, GA, MD, MN, NM, OR, TN
- **Length of time:** Data were collected for 3 years (2009-2011)
- **Methods:**
 - A cluster was defined as 2 or more isolates that matched by PFGE and had isolation dates within 30 days
 - Data was collected for Salmonella and E.coli only
 - For each cluster, a 2 page survey was filled out.

Identifiers

Pathogen

OB Name

CDC

Outbreak ID

XbaI pattern

BlnI pattern

Reference Dates

Case #1

Specimen collection

PHL receipt

PFGE notice to Epi

Cluster Case Counts

in state

OOS

Start of investigation

Source identified

End of investigation

did not include OOS case

What factors encouraged investigation?

- Uncommon serotype
- Uncommon pattern
- Geo/temporal clustering
- Demographic clustering
- Serotype/pattern spike
- OOS matches with a possible source
- Query from another state
- Query from CDC
- Case hx of high risk food exposure
- Case hx suggested an outbreak
- Routine f/u of all matches
- Match to possible food source
- Hunch that it was worthwhile
- Other (specify in notes)
- Don't recall
- Not applicable

What discouraged investigation?

- Common serotype
- Common pattern
- Cases too spread out in time
- Cases too spread out in space
- No spike of serotype/pattern
- Too few cases locally
- Don't normally investigate
- Not enough time or staff
- Subtype heterogeneity
- Long subtyping delays
- Unable to contact cases/bad hx
- Noticed too late
- Forgot about it
- Other states/CDC uninterested
- Cases stopped coming in
- We tried without success
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Investigation Timeline Dates

qualifier*	date	
<input type="text"/>	<input type="text"/>	Earliest notification or discussion with state lab
<input type="text"/>	<input type="text"/>	First limited/routine questionnaire
<input type="text"/>	<input type="text"/>	Gathered/reviewed interview questionnaires
<input type="text"/>	<input type="text"/>	First notification or discussion with other states
<input type="text"/>	<input type="text"/>	First notification or discussion with CDC
<input type="text"/>	<input type="text"/>	First active query to PulseNet
<input type="text"/>	<input type="text"/>	First posting to FBO listserv or EpiX
<input type="text"/>	<input type="text"/>	Special active surveillance activities in state
<input type="text"/>	<input type="text"/>	First in-depth hypothesis-generating interviews
<input type="text"/>	<input type="text"/>	Initiated first analytic study
<input type="text"/>	<input type="text"/>	First environmental investigation(s)

* Indicate if not applicable, an approximation only, or if the date has been lost

Notes

Was this a common-source outbreak?

- Definitely yes
- Likely
- Don't know
- Unlikely
- Definitely not

What was the overall outcome?

- Specific vehicle identified
- Specific venue/source
- Travel to same specific region
- General idea but no specifics
- No common source identified
- Evidence suggests no outbreak

Primary mode(s) of transmission

- Foodborne (confirmed)
- Foodborne (presumptively)
- Reptile contact
- Other animal contact
- Person-to-person
- Recreational water

NORS Reporting

Reported Yes No ?

NORS ID#

Overview of Data

Total clusters : 1008 (98 had missing NORs status)

Total clusters used in analysis: 910

Pathogen	# of Clusters
<i>Salmonella</i>	822 (90%)
<i>E. coli</i>	88 (10%)

Reported to NORs	# of Clusters
Yes	142 (16%)
No	768 (84%)

The FREQ Procedure

Table of SUBTYPE by STATE

SUBTYPE(Serotype or Serogroup) STATE(State postal code)

Frequency					
Percent					
Row Pct					
Col Pct	CO	CT	GA	MD	Total
COTHAM	1	0	0	0	1
	0.10	0.00	0.00	0.00	0.10
	100.00	0.00	0.00	0.00	
	1.47	0.00	0.00	0.00	
D [9,12,46:-]	0	0	0	0	1
	0.00	0.00	0.00	0.00	0.10
	0.00	0.00	0.00	0.00	
	0.00	0.00	0.00	0.00	
DERBY	0	0	0	0	1
	0.00	0.00	0.00	0.00	0.10
	0.00	0.00	0.00	0.00	
	0.00	0.00	0.00	0.00	
DUBLIN	1	0	0	0	3
	0.10	0.00	0.00	0.00	0.30
	33.33	0.00	0.00	0.00	
	1.47	0.00	0.00	0.00	
ENTERITIDIS	10	49	4	30	186
	1.00	4.88	0.40	2.99	18.51
	5.38	26.34	2.15	16.13	
	14.71	39.84	4.76	17.05	
GIVE	0	0	0	0	1
	0.00	0.00	0.00	0.00	0.10
	0.00	0.00	0.00	0.00	
	0.00	0.00	0.00	0.00	
HADAR	0	0	0	3	9
	0.00	0.00	0.00	0.30	0.90
	0.00	0.00	0.00	33.33	
	0.00	0.00	0.00	1.70	
Total	68	123	84	176	1005
	6.77	12.24	8.36	17.51	100.00

(Continued)

RESULTS

Characteristics associated with investigations reported to NORS

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Case hx suggested an outbreak	19.22 (9.4-39.33)
Hunch that it was worthwhile	11.71 (5.31-25.76)
Case hx of high risk food exposure	7.59 (2.59-22.20)
Serotype/pattern spike	5.33 (3.3-8.63)
OOS matches with possible confirmed source	5.01 (2.99-8.39)
Match to possible food source	4.60 (1.88-11.28)
Query from another state	3.23 (1.73-6.02)
Geographic and/or temporal clustering	2.80 (1.93-4.01)

Characteristics associated with investigations that were not reported to NORS

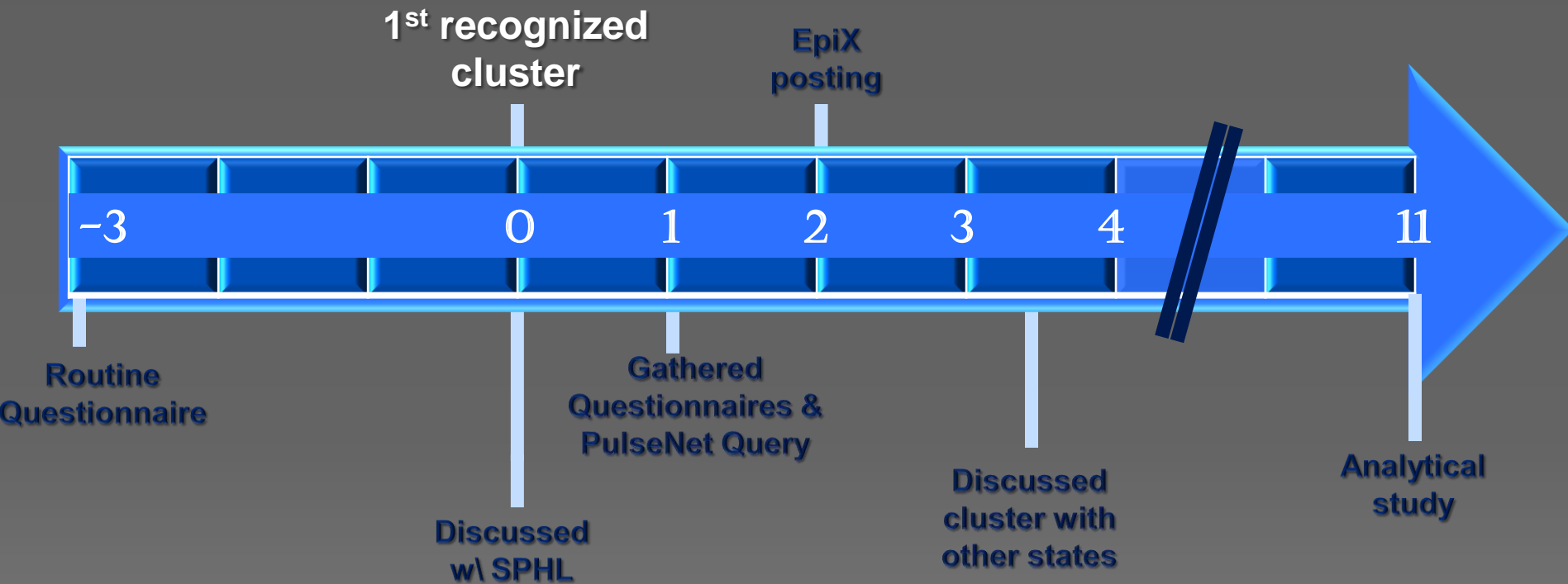
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Case too spread out in space	0.04 (0.005-0.27)
Too few cases locally	0.17 (0.09-0.32)
Cases too spread out in time	0.23 (0.09-0.57)
Noticed too late	0.36 (0.18-0.74)
Common Serotype	0.43 (0.24-0.76)

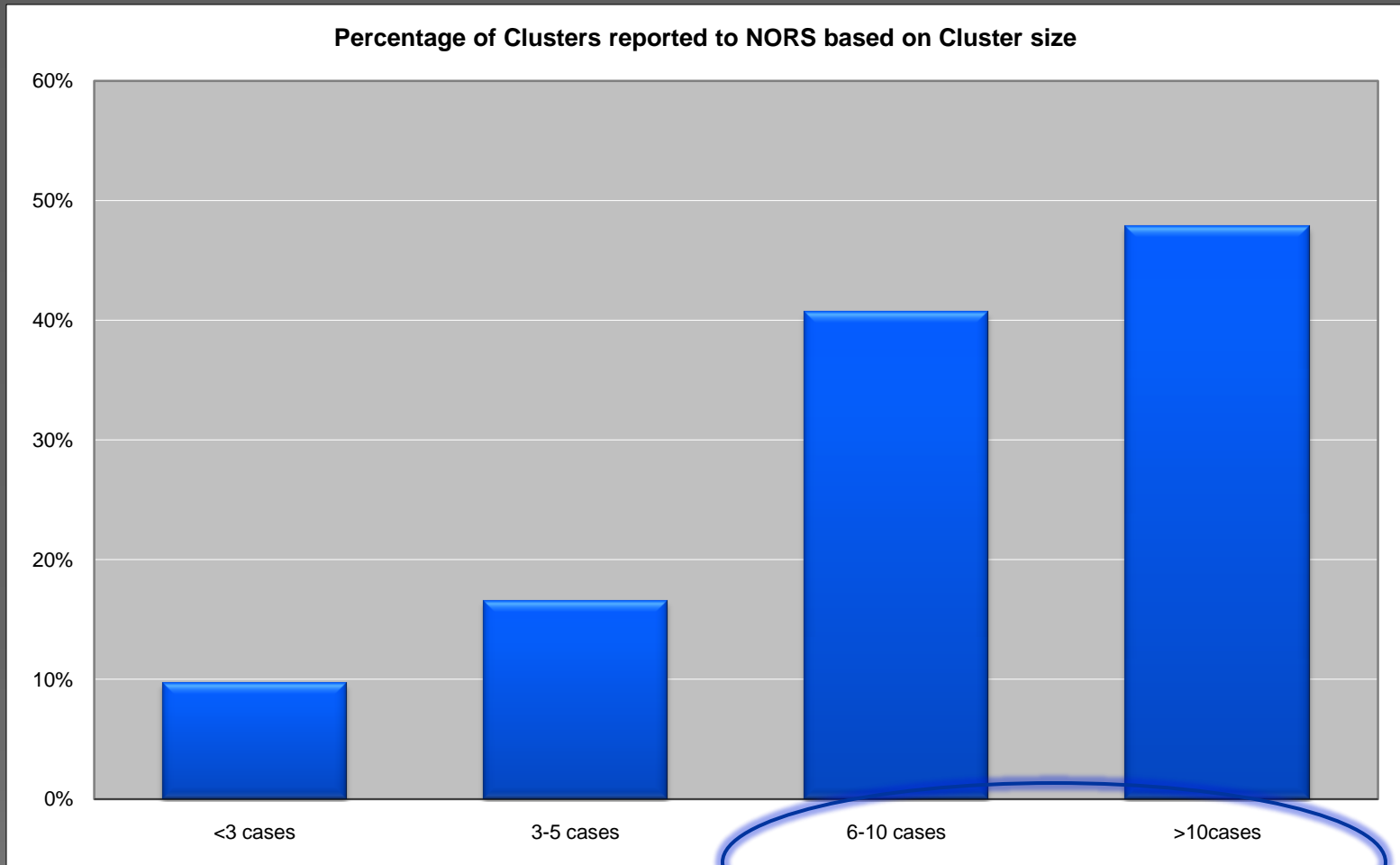
Investigation Timeline:

Days from cluster recognition to investigation activity



Looking at number of in-state cases reported only

* Cluster size: at end of investigation



Conclusions:

- Beyond lab data, there are key epidemiological factors that are associated with investigations reported to NORS, such as:
 - Geographic clustering
 - Number of cases per cluster
 - Correspondence with other states and public health agencies
 - Inclination that cluster is worthwhile

Limitations:

- It would have been helpful to know if each cluster investigation was state led or CDC led?
- Many answers were subjective in nature

Questions??

