Outbreak of Multidrug Resistant *Salmonella* I 4,[5], 12:i:- Infections Linked to Pork — Washington State, 2015

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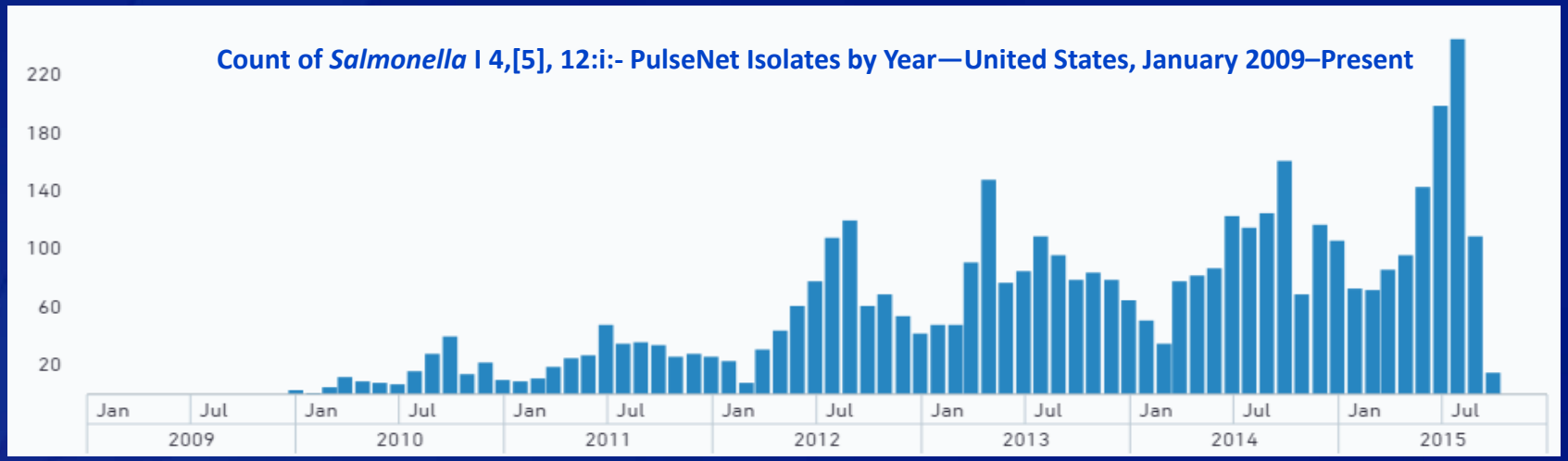
CDC

Salmonella

- **Most common bacterial cause of foodborne illness in the United States**
  - 1 million illnesses
  - 400 deaths

- **Serotype I 4,[5], 12:i:-**
  - **<u>5th</u>** most frequently reported *Salmonella* serotype in the United States



Outbreak Detection: June and July 2015

- **Public Health–Seattle & King County (PHSKC) and Washington State Department of Health (WADOH)**
  - 61 *Salmonella* I 4,[5], 12:i:- infections
  - Indistinguishable pulsed-field gel electrophoresis (PFGE) patterns
  - 8 counties
- **Marked increase above baseline in Washington State**
- **Multiple subclusters with pork exposure**
  - Pig roasts (n=14)
  - Asian restaurants (n=3)
  - Ethiopian (kitfo) (n=2)
  - Live pig exposures (n=3)

Initial Case Definition

- ***Salmonella*** **I 4,[5], 12:i:- infection with isolate matching one of the following PFGE *XbaI* patterns in a WA State resident**
  - JPXX01.1314
  - JPXX01.2311
  - JPXX01.2429
  - JPXX01.3161
  - JPXX01.3336
- **OR *Salmonella* I 4,[5], 12:i:- infection with isolate matching one of the outbreak PFGE patterns with highly related whole genome sequencing (WGS) in a resident of another state**
- **And Illness onset between April 25, 2015–September 25, 2015**

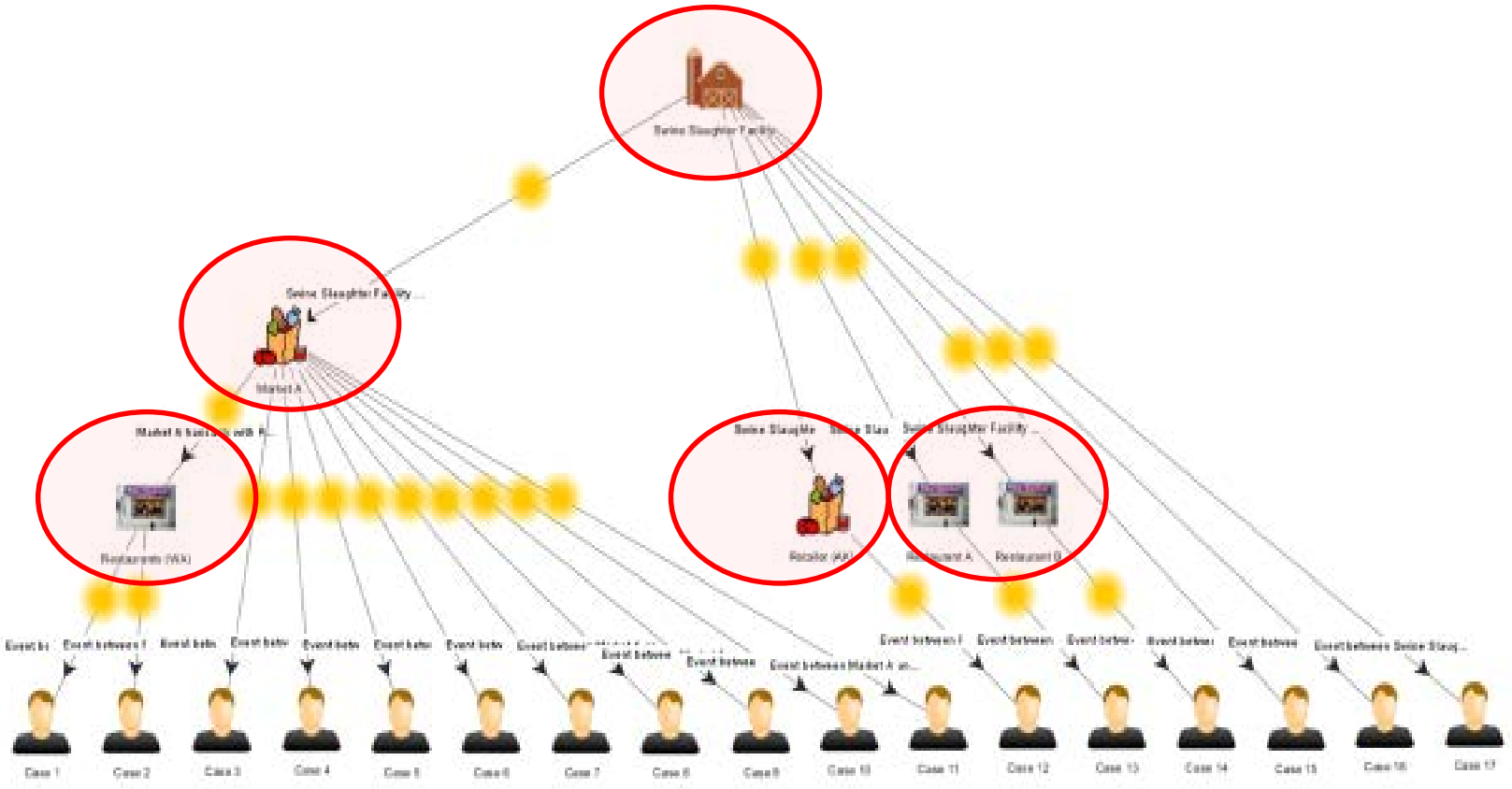
Pork Exposures, as of October 21, 2015

Exposure	n	%	FoodNet %*	p-value
Any pork (n = 93)	121	77%	43%	<0.001
Pork traceback to Establishment A (n = 62)	93	67%	N/A	N/A

Of 93 cases with known pork exposure, 62 (67%) currently traceback to one USDA-FSIS inspected swine slaughter establishment in Washington State (Establishment A)

*Centers for Disease Control and Prevention (CDC). Foodborne Diseases Active Surveillance Network (FoodNet): Population Survey Atlas of Exposure. Atlanta, Georgia: U.S. Department of Health and Human Services, CDC, 2006–2007: 17

Traceback Investigation



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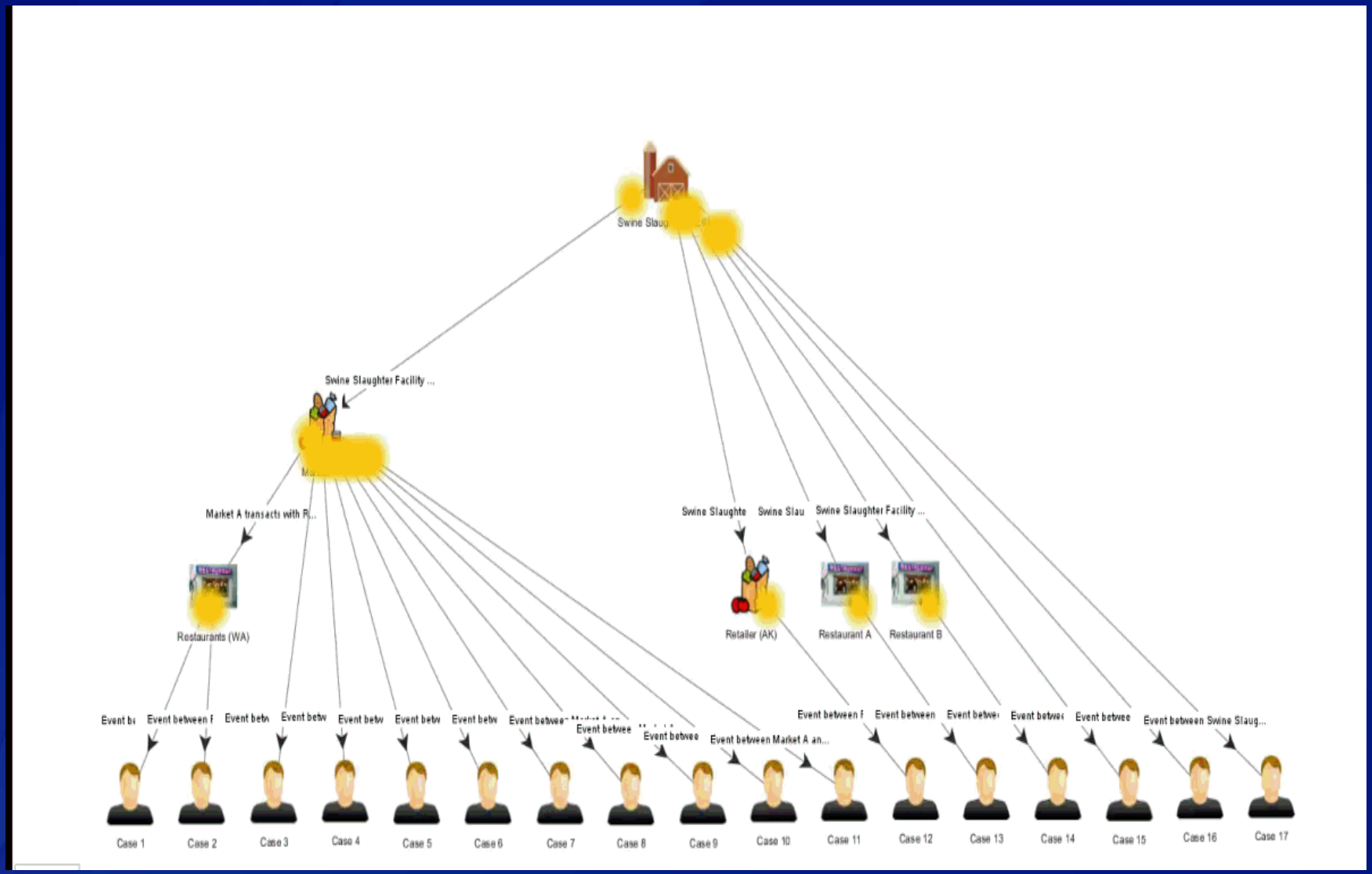

Food and Environmental Testing Results

Sample collection	Sample type	Site	# of samples yielding outbreak strain
WADOH, WSDA	Environmental	Establishment A	8/11 (pooled)
PHSKC Environmental Health	Environmental, food	2 restaurants, 1 market	7/12
PHSKC Environmental Health	Food	Pig roast (leftovers)	1/1
USDA-FSIS	Environmental, food	Establishment A	≥8

- ***Salmonella*** **Infantis (JFX001.0046) isolated at Establishment A and added to case definition**

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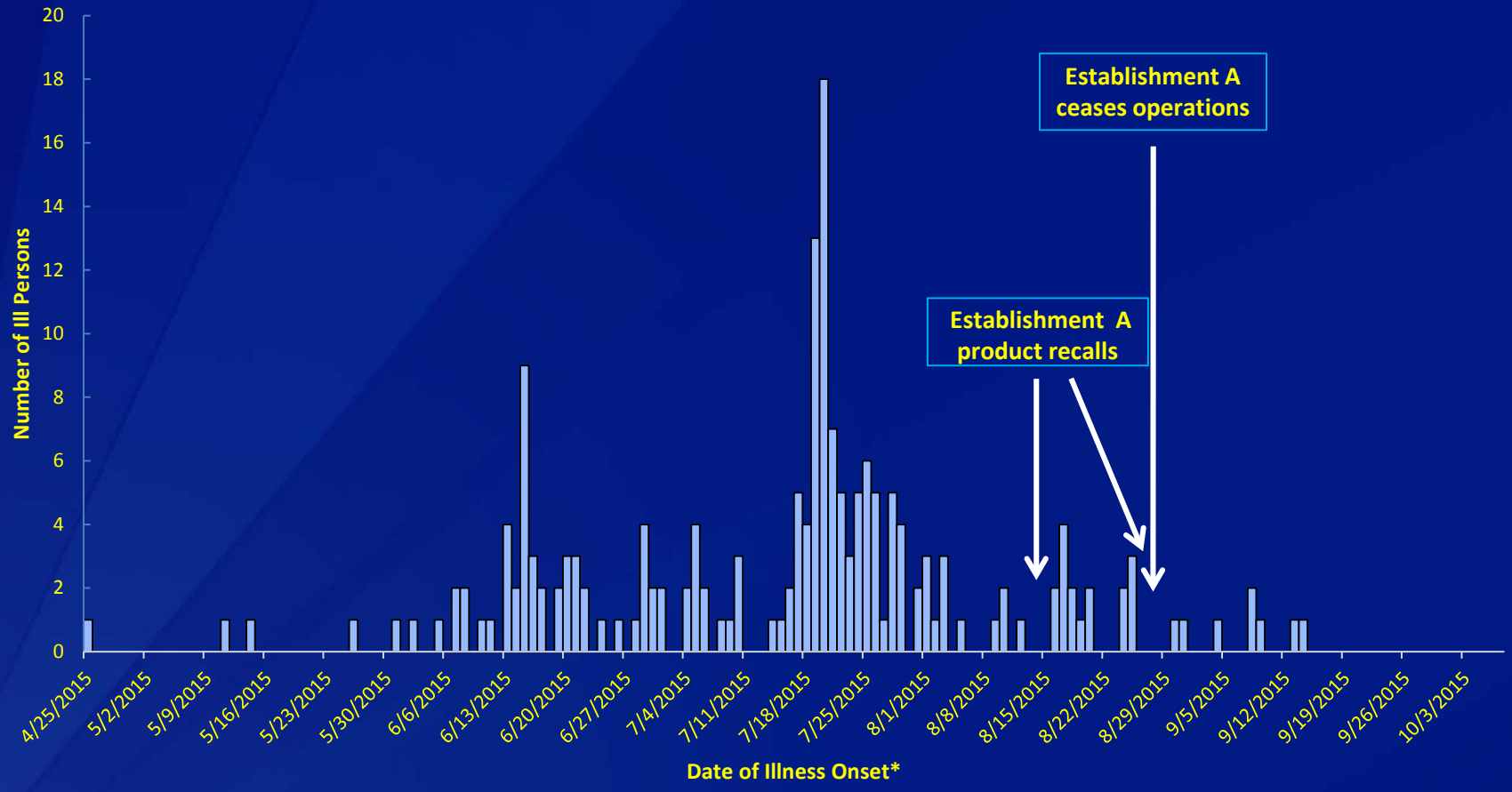
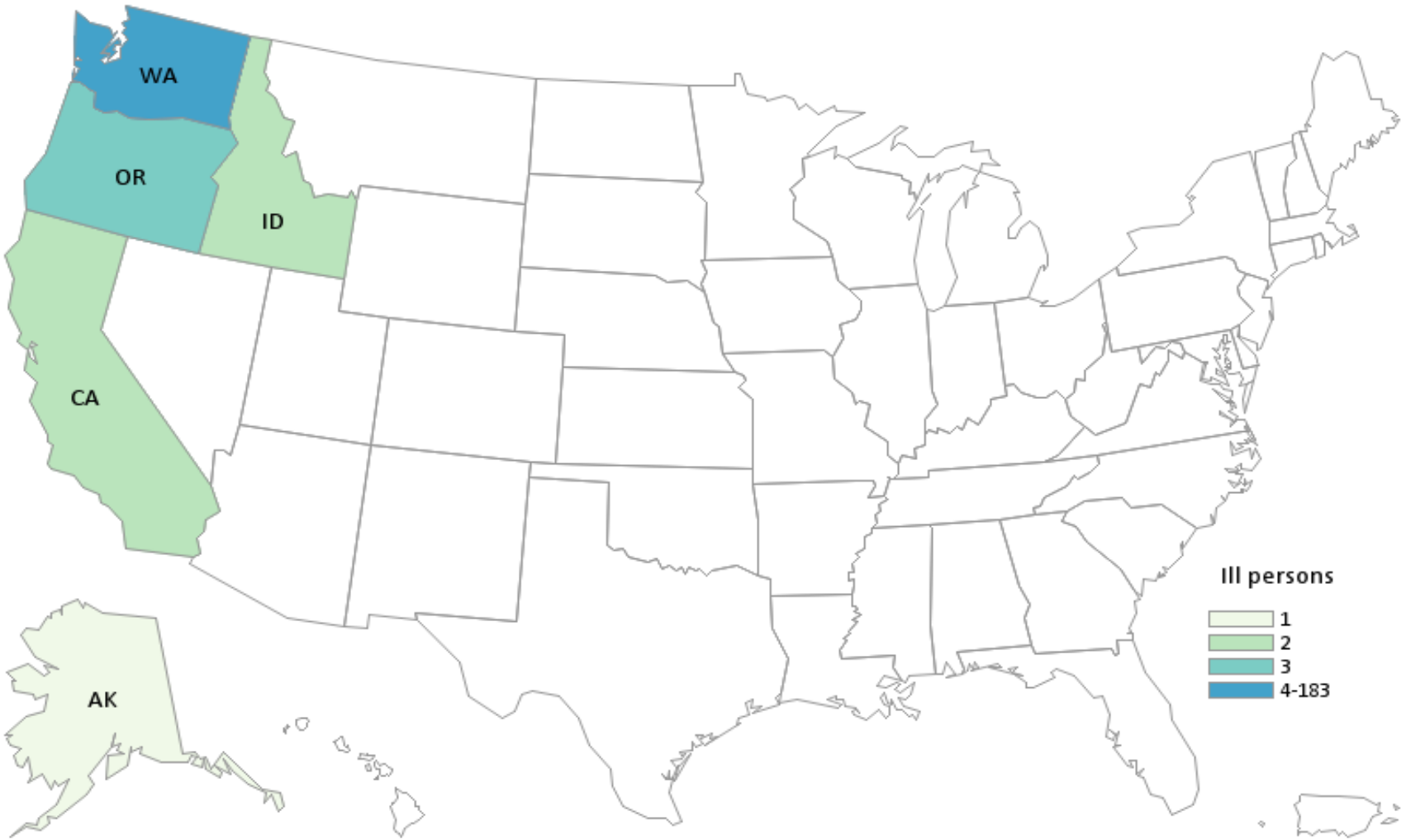
Persons infected with outbreak strains of *Salmonella* I 4,[5], 12:i:- and Infantis, as of October 21, 2015, by date of illness onset, (n=191)*



*Some illness onset dates have been estimated from other reported information.

Persons infected with the outbreak strains of *Salmonella* I4,[5],12:i-,
by state of residence, as of October 21, 2015 (n=191)



Patient Characteristics

- Median age = 35 years (range: <1 to 90 years)
- 50% (96/191) female
- 17% (31/180) hospitalized
- No deaths

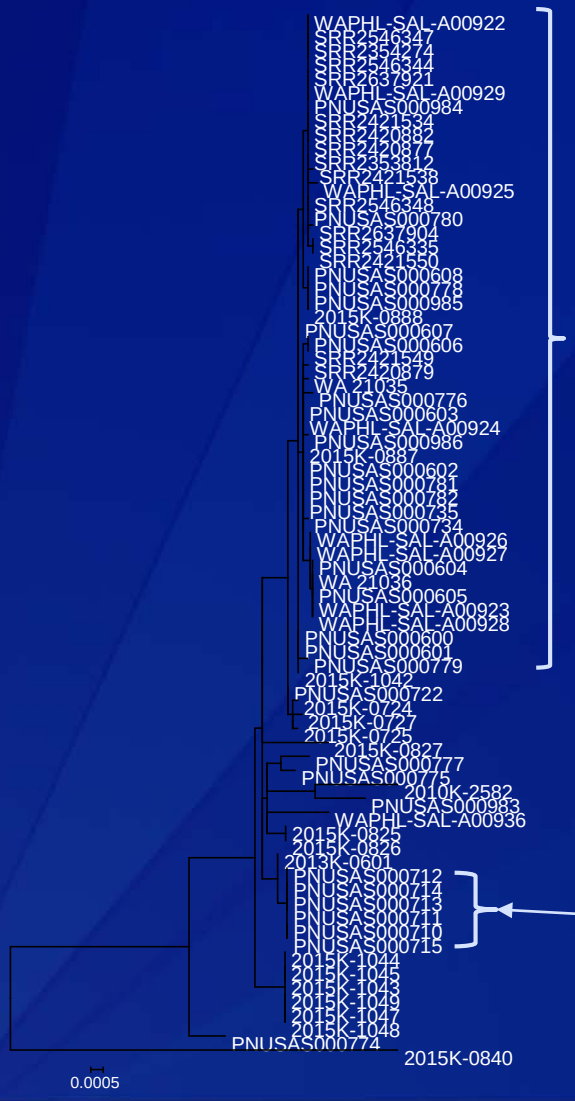
Antimicrobial Susceptibility Testing (AST)

- **10 clinical isolates submitted to CDC National Antimicrobial Resistance Monitoring System (NARMS)**
  - All ten (100%) exhibited **ASSuT** resistant profile
  - Designates resistance to the following antimicrobials:
    - **A**mpicillin
    - **S**treptomycin
    - **Su**lfisoxazole
    - **T**etracycline

Critically important (WHO 2012)

Highly important (WHO 2012)

Whole Genome Sequencing Results for *Salmonella* I 4,5,12:i:-



Primary Clade:

- Human isolates from restaurant and pig roast attendees (WA, OR, CA, AK)
- WA and FSIS slaughter establishment isolates

Secondary Clade:

- Human isolates from pig roast attendees

Isolates from attendees of a single pig roast were found in both clades

Conclusions

- Largest recorded *Salmonella* outbreak in Washington State
- Recommend interventions tailored for multiple points in "farm to fork" chain
- Pork: Increasingly suspect food vehicle for human salmonellosis

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The findings and conclusions in this presentation are those of the author and do not necessarily represent the views of CDC or PHSKC.

Thank you!

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