


# *Salmonella* Typhimurium Outbreak Linked to Restaurant Salad Dressing

8th Annual OutbreakNet Meeting
August 29th, 2012

VERMONT DEPARTMENT OF HEALTH

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# Background – Salmonellosis in Vermont

- 80-100 cases of salmonellosis are reported in Vermont each year
  - 2010 Incidence = 12.9 cases/100,000
  - 2010 Food Net Average = 17.6 cases/100,000
- Most common serotypes: Enteritidis & Typhimurium
- Few Salmonella PFGE clusters involving 2 or more Vermonters, fewer exclusively in state

# Initial Signs of Outbreak

- October 5, 2011
  - VDH Lab notified epi of a cluster of three matching *Salmonella* Typhimurium isolates
    - Comprised only of Vermont residents
    - Cluster: 1110VTJPX-1
    - XbaI Pattern: JPXX01.3014
      - New to both Vermont and PulseNet databases
- Standard *Salmonella* interviews found:
  - Onsets were within 3 days of each other
  - No common exposures

# Initial Outbreak Investigation

- October 12th
  - Two additional PFGE matches identified
    - One adult, one newborn baby
    - Stool sample collected from mom of newborn
- October 13th
  - Mom tests positive for *S. Typhimurium*
    - PFGE match to cluster on October 17th
    - 5 cases have completed shotgun interviews
      - 3/5 report: crab rangoon, cream cheese, eggs
      - 4/5 report: bananas, block cheese
      - 5/5 report: bagels, local restaurant X

# Case Characteristics

- Total of 6 primary cases identified
  - Newborn treated as secondary case
    - Presumed transmission during water birth
    - Only hospitalized case (5 days in NICU)
- Age
  - 5 adults (average age = 32; range = 20-41)
  - 1 child (<10 years)
- Gender
  - 4 females,  2 males

# Formal Investigation Begins

- October 14th
  - VDH Food & Lodging inspects Restaurant X
    - Passed inspection (score = 84/100)
      - 70 or greater needed to pass
    - Employee questionnaires given to management for distribution to all employees
      - Mid-September work schedule & tasks
      - Recent illness
      - Employment at other local food establishments
  - Case-control study #1 launched

# Case Control Study #1

- Purpose
  - Identify the responsible food item or dining location
- Design
  - Interview cases & controls about food items common among shotgun results
  - Goal: Interview 3 "well" friend controls per case
    - Failed to get the number of controls necessary
  - Actual: Interview 3 "well" VDH staff per case
    - Matched on sex, age group, county of residence

# Case Control Study #1 Results

| Exposure | Odds Ratio | 95% Confidence Interval | # of Cases Exposed |
|---|---|---|---|
| Asian Restaurants | 9.00 | 0.87 - 92.76 | 3 |
| Bagel Shops | 75.00 | 2.56 - 2196.45 | 4 |
| Bagels | 30.56 | 1.39 - 670.90 | 5 |
| Bananas | 3.52 | 0.16 - 79.63 | 4 |
| Block Cheese | 9.00 | 0.41 - 198.21 | 4 |
| Crab Rangoon | 22.50 | 1.51 - 335.34 | 3 |
| Cream Cheese | 3.89 | 0.55 - 27.28 | 3 |
| Eggs | 5.53 | 0.25 - 124.40 | 3 |
| Restaurant X | 363.00 | 6.41 - 20656.48 | 5 |

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- Five cases ate at four different bagel shops
- No shared food items or employees between bagel shops

# Case Control Study #2

- Purpose
  - Identify the responsible food item at Restaurant X
- Design
  - Use reservation list from Restaurant X to identify diners on same dates as cases (Sept. 15th-17th)
  - Interview cases & controls about food items consumed
- Problems
  - Restaurant demanded changes to questionnaire before releasing reservation list
  - 10 days elapsed before delivery of reservation list

# Case Control Study #2 - Controls

- From Sept. 15th-17th reservation list:
  - 1732 diners across 567 parties
  - Contact info provided for147 parties (689 diners)
  - Reached 71 diners
    - 52 "well" diners were used a controls for the study
    - 19 diners were excluded from the study
      - Poor meal recall (3)
      - Incorrect dining date (1)
      - Refusal to provide demographic info (1)
      - Self-reported GI illness following meal (9)
      - Interviewer mistakes (7)

# Case Control Study #2

- Three questionnaires were deployed on Oct. 26th
  - Restaurant X contains sub-restaurant w/ shared kitchen & salad bar
  - Cases dined at both restaurants, lunch & dinner
    1. Restaurant X Lunch menu (118 food items)
    2. Restaurant X Dinner menu (130 food items)
    3. Restaurant $X^U$ – One menu (122 food items)
- Started Oct. 26th, completed Nov. 2nd
- Double-data entry, data reconciliation, analysis using SAS

# Case Control Study #2 - Results

| Exposure | Odds Ratio | 95% Confidence Interval | # Cases Exposed |
|---|---|---|---|
| Salad Bar | | | |
| Any Salad Bar | 2.84 | 0.15 - 54.83 | 6 |
| Lettuce | 3.60 | 0.19 - 68.80 | 6 |
| Broccoli | 1.38 | 0.21 - 9.14 | 2 |
| Cucumbers | 4.23 | 0.46 - 40.00 | 5 |
| Carrots | 5.43 | 0.59 - 50.06 | 5 |
| Beets | 1.58 | 0.26 - 9.75 | 2 |
| Scallions | 2.36 | 0.35 - 15.97 | 2 |
| Olives | 3.55 | 0.45 - 28.13 | 2 |
| Bacon Bits | 8.16 | 0.88 - 75.24 | 5 |
| Sunflower Seeds | 2.22 | 0.33 - 14.89 | 2 |
| Sesame Sticks | 12.50 | 1.37 - 113.81 | 2 |
| Croutons | 13.83 | 0.71 - 270.70 | 4 |
| Shredded Cheese | 14.42 | 0.76 - 274.61 | 5 |
| Cottage Cheese | 3.17 | 0.56 - 17.81 | 3 |
| House Dill Dressing | 9.44 | 1.02 - 87.11 | 5 |
| Bread | 0.57 | 0.09 - 3.70 | 2 |
| Butter | 0.64 | 0.10 - 4.17 | 2 |
| Entrees, Sandwiches & Burgers | | | |
| Teriyaki Chicken | 8.00 | 1.02 - 62.74 | 2 |

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# Conclusions

- Employee Questionnaires
  - No evidence of employee illness from questionnaires
    - Requested questionnaires from all employees
    - Received only from 61% of staff
      - All kitchen staff completed questionnaire
    - Took 26 days for questionnaires to be returned
- Case Control Study #1
  - Illness was statistically associated with dining at Restaurant X
  - No common threads among bagels/bagel shops
  - Case #6 did not report bagel exposure

# Conclusions Continued

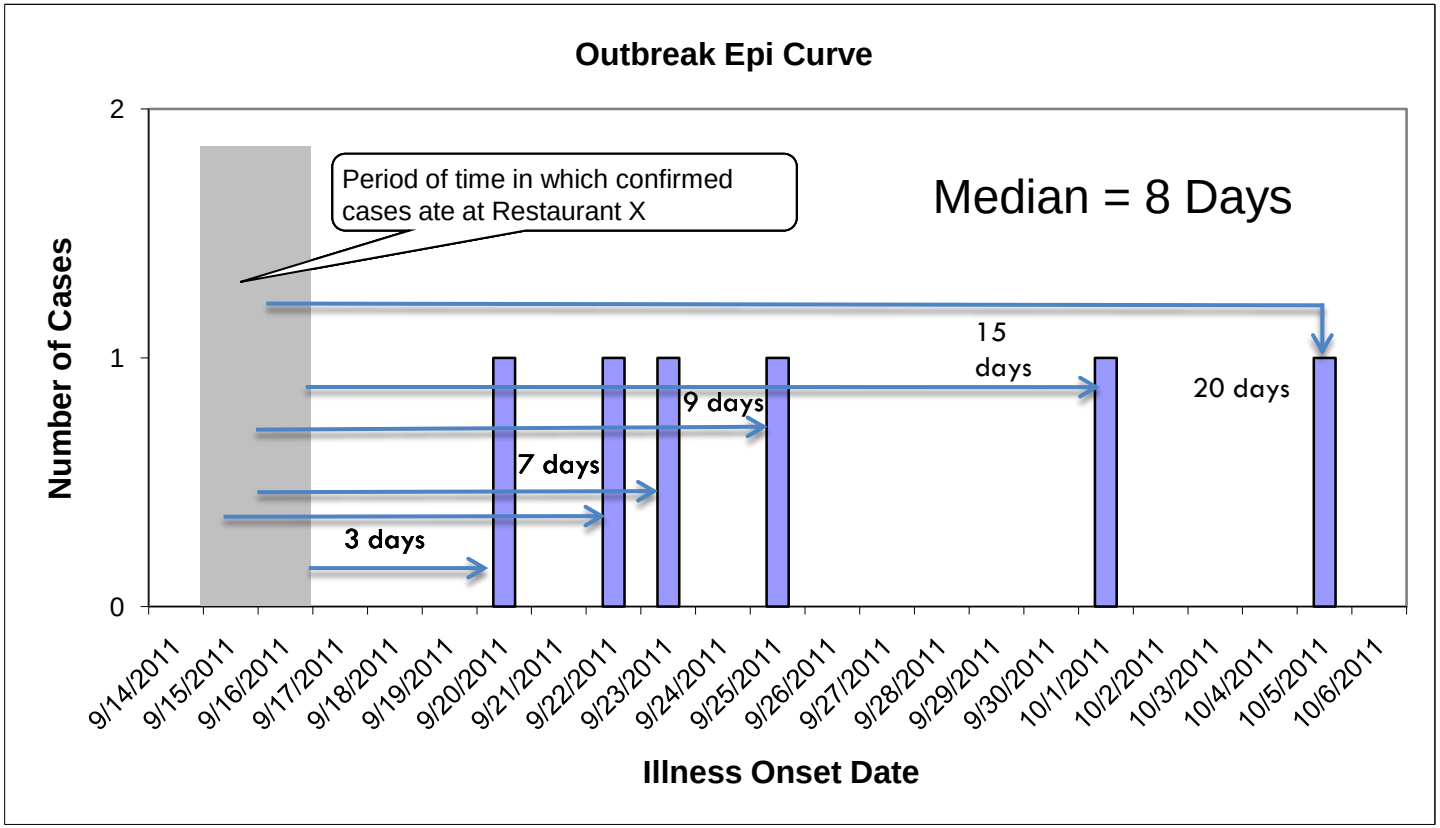
- Case Control Study #2
  - Illnesses were statistically associated with consumption of house made dill salad dressing
- Food & Lodging Inspection
  - No food samples collected for testing
    - ~1 month elapsed between exposures & inspection
  - One batch of dill dressing (~5 gallons) lasts 3 days at restaurant
    - Cases were exposed over 3 days (Sept. 15th – 17th)
  - Dressing was improperly dispensed from its storage container

# Improper Dispensing – Contamination?


Vermont Department of Health

# Wrap Up

- PFGE pattern (JPXX01.3014) has not been seen since outbreak
- Cases reported unusually long incubation periods



# Acknowledgements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## District Offices

Destiny Cadieux

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Sara Moran

## Laboratory

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