

Case-Control Study of the Salmonella Enteritidis Outbreak Associated with Toast Café, Mecklenburg County, NC 2012

Anita Valiani, MPH, Epidemiologist
Aaron T Fleischauer, PhD, MSPH, CDC Epidemiologist
NC DPH

The North Carolina Division of Public Health (NC DPH) was notified on April 3, 2012 of three confirmed *Salmonella enteritidis* (*SE*) infections among people dining at a local restaurant in Charlotte, NC. NC DPH supported the Mecklenburg County Health Department and initiated a case-control study to identify the food vehicle(s) and prevent further illness. Cases were defined as sudden onset of abdominal pain, diarrhea, or vomiting, with or without fever, within 72 hours after dining at the restaurant on March 25th, 2012. Controls were randomly selected from credit card receipts of patrons who dined on March 25th. Mecklenburg County communicable diseases nursing staff interviewed cases-patients and controls regarding menu items consumed and hygiene practices. Pulsed-field gel electrophoresis (PFGE) testing was performed at the State Laboratory of Public Health on culture isolates. County environmental health specialists inspected the restaurant and interviewed staff. We calculated odds ratios (OR) and 95% confidence intervals (CIs) using Pearson's chi-square.

A total of 29 *SE* cases meet case definition were identified with illness onset during March 26-28, 2012; 25 (86%) were included in this study. We enrolled and interviewed 29 controls. The median age of cases was 35 years (range: 13-67 years) and median age of controls was 34 years (range: 5-66 years). Among cases, diarrhea occurred in 25 (100%), bloody diarrhea in 9 (36%) and fever in 19 (76%). Among culture isolates from 11 *SE* cases tested using PFGE, all matched the common NC pattern B. Case-patients and

controls ate between 9:15am-12:30pm on March 25th and the median dining time was 11am. Any egg consumption (OR= 20, 95% CI= 2 - 170), 'runny' eggs (OR= 35, 95% CI= 7 - 176), and hollandaise sauce (OR= 115, 95% CI= 12 - 1115) were strongly associated with illness. The environmental health inspection identified that eggs were unpasteurized and hollandaise sauce was not properly prepared and stored according to food safety recommendations.

On Sunday March 25, 2012, breakfast and brunch service at this popular restaurant resulted in a *SE* outbreak among patrons; improperly prepared eggs were the vehicle for infection. This outbreak illustrates the importance of using pasteurized eggs and/or following food preparation standards for egg dishes in which undercooked/raw eggs or hollandaise sauce are consumed.

Summary of Case-Control Study Findings

Mecklenburg County *Salmonella Enteritidis*
Outbreak – Toast Restaurant March 25 2012

Demographics

Age	Cases (25)	Controls (29)
Median	35	34
Range	13-67	5-66

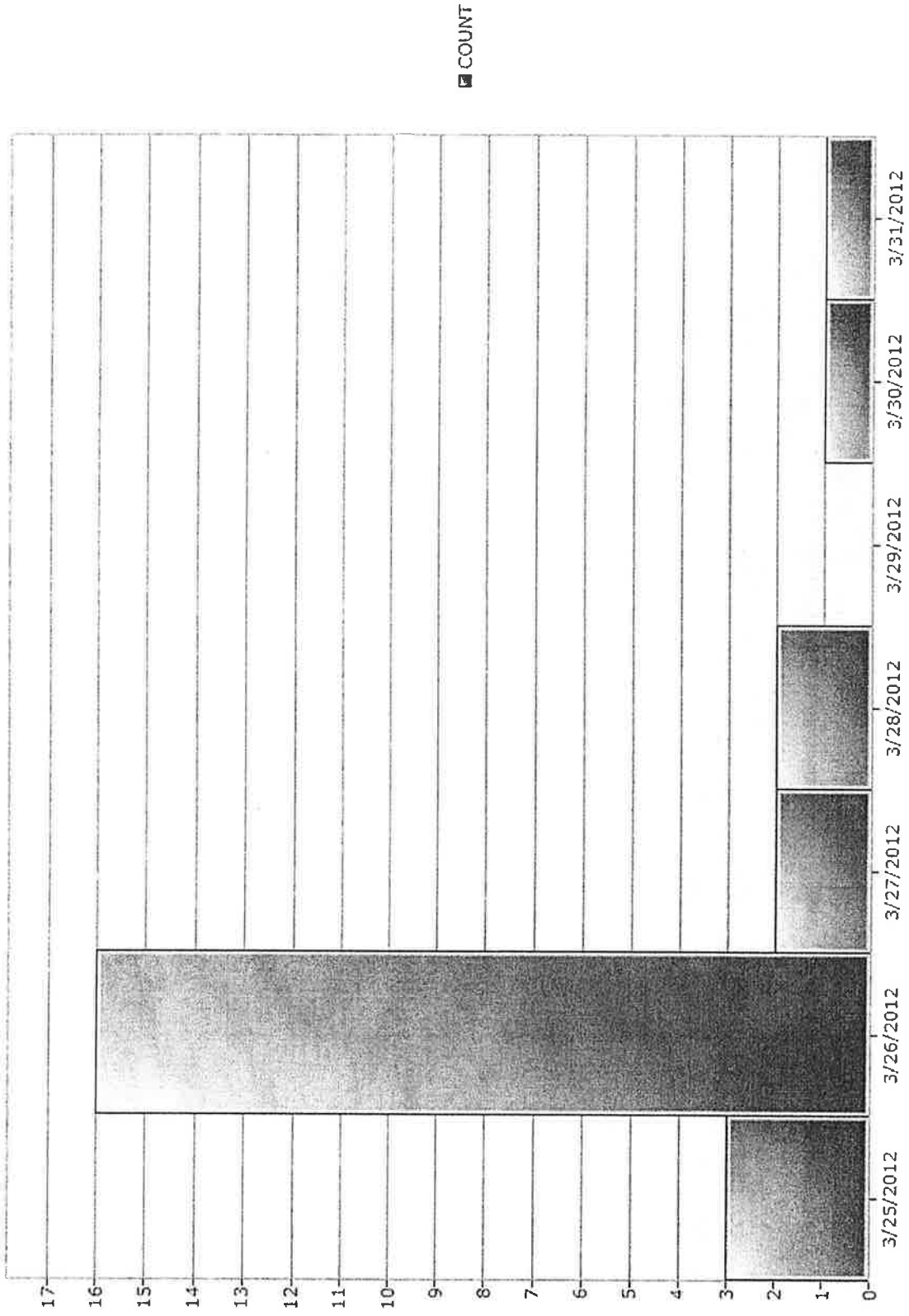
Sex	Cases	Controls
Male	7 (29%)	14 (50%)
Female	17 (71%)	14 (50%)

In the Restaurant

Characteristic	Median: 11:00 AM	Cases	Controls
Time of Exposure	Median: 11:00 AM	Range: 10:00 AM-12:30 PM	9:15 AM-12:30 PM
Restroom Use	Yes	3 (12%)	16 (55%)
	No	20 (80%)	11 (38%)
Hand Washing	Yes	5 (20%)	12 (41%)
	No	17 (68%)	12 (48%)

* All exposures occurred on March 25, 2012

Epidemic Curve



Clinical Features

Symptom	Number Reporting	Percent Reporting
Nausea	16	64%
Diarrhea	25	100%
Bloody Diarrhea	9	37%
Fever	19	76%
Abdominal cramps	22	88%

Cases = 30 in the outbreak, 25 enrolled in the study
9 have lab confirmation overall, 6 enrolled in the study
Culture and PCR + *Salmonella Enteritidis* (PFGE pending)

Exposures and Statistics

Exposure	Cases	Controls	Odds Ratio	95% CI
Eat any eggs	96%	56%	20	2 -170
Eat runny, raw, undercooked eggs	88%	17%	35	7 -176
Eat hollandaise sauce	96%	5%	115	12 - 1115
Eat french toast/pancakes	32%	44%	0.6	0.20 - 2
Eat hamburger/hot dog	0	0	--	--
Eat any sandwich	0%	7%	0.5	.04 - 6
Eat any salads	0%	7%	0.5	0.4 - 6
Drink juice	10%	20%	0.42	.07 - 2

Outbreak Statistics (as of 06/29/2012)**Name: Mecklenburg Couty Salmonella Outbreak at Restaurant March 2012****Date investigation started: 04/03/2012****Date investigation closed:****Owner:**

County	Confirmed	Probable	Suspect	Not a case
Iredell County	1	0	0	0
Mecklenburg County	15	17	0	0
Total	16	17	0	0

County	Contacts under investigation
Iredell County	0
Mecklenburg County	0
Total	0

Age Group

Age Group	Number of Records	Percent
< 1	0	0.00%
1 - 4	1	3.03%
5 - 9	0	0.00%
10 - 14	1	3.03%
15 - 19	0	0.00%
20 - 24	2	6.06%
25 - 29	8	24.24%
30 - 39	9	27.27%
40 - 49	7	21.21%
50 - 59	2	6.06%
>= 60	2	6.06%
Unknown	1	3.03%
Total	33	100.00%

Gender

Classification	Number of Records	Percent
Female	21	63.64%
Male	12	36.36%
Transgender	0	0.00%
Unknown	0	0.00%

Total	33	100.00%
-------	----	---------

Race

Classification	Number of Records	Percent
American Indian Alaskan Native	0	0.00%
Asian	0	0.00%
Black or African American	0	0.00%
Native Hawaiian or Pacific Islander	0	0.00%
White	31	93.94%
Other	0	0.00%
Unknown	2	6.06%
Total	33	100.00%

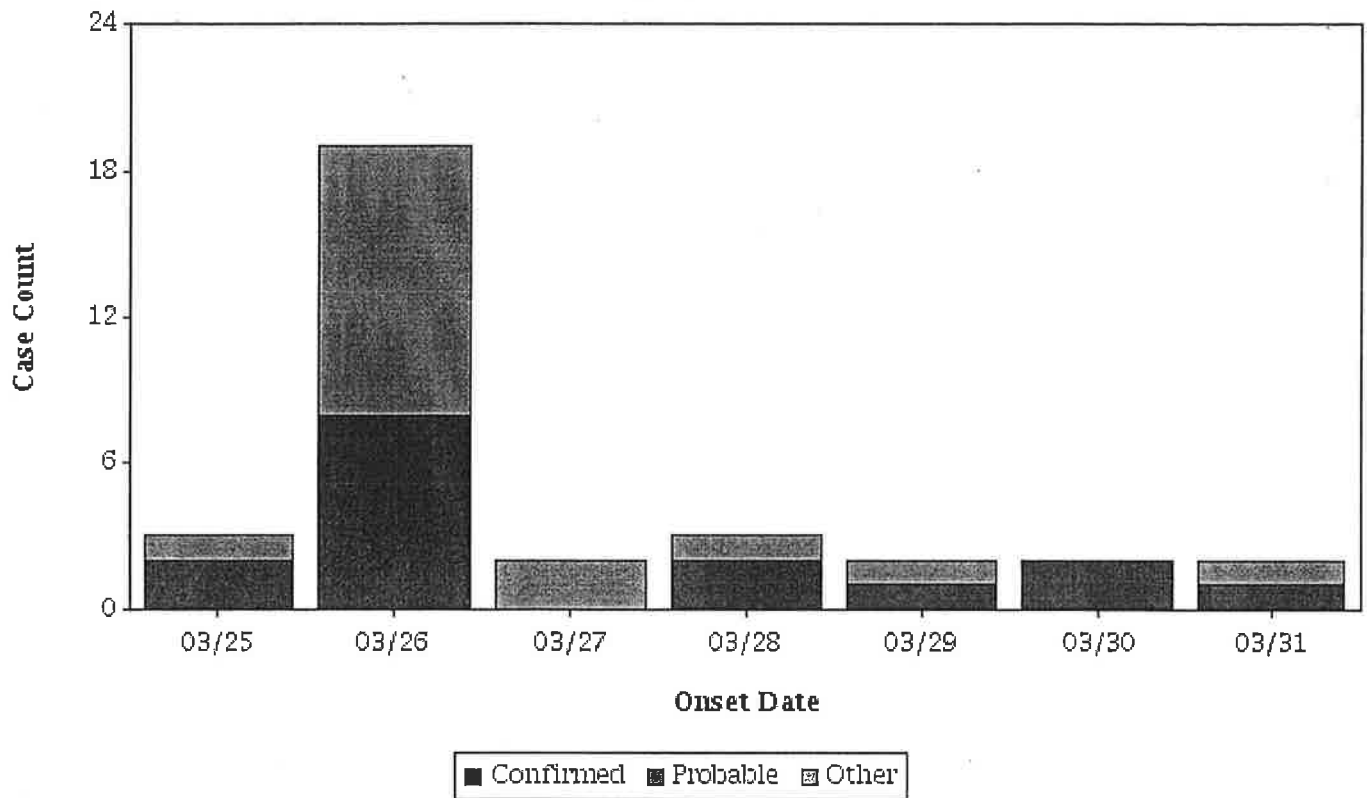
Ethnicity (Hispanic)

Classification	Number of Records	Percent
Yes	1	3.03%
No	27	81.82%
Unknown	4	12.12%
Missing	1	3.03%
Total	33	100.00%

Onset Date

Onset Date	Number of Records	Percent
03/25/2012	3	9.09%
03/26/2012	19	57.58%
03/27/2012	2	6.06%
03/28/2012	3	9.09%
03/29/2012	2	6.06%
03/30/2012	2	6.06%
03/31/2012	2	6.06%
Total	33	100.00%

Epi Curve



Hello,

This cluster of Salmonella Enteritidis posted by NC has been given the cluster code 1204NCJEG-1. The PFGE XbaI Pattern associated with this cluster is JEGX01.0004, comprising 46.3%(25,712/55,53

In the last 60 days, this pattern has been seen 3 times from the following states:

SourceStates: NC (3);

LabIDs: NC (3).

JEGX01.0004 is the most common pattern in the Salmonella database and is currently not above baseline nationally. Please be mindful of this, and only respond to this posting if your cases have exp

Thank you,

Beth McGlinchey

PulseNet Database Administration Team

Phone: (404) 639-3627

PulseNet: (404) 639-4558