

To: The Record

From: Acute Communicable Disease Control Program

Date: July 10, 2015

Subject: Outbreak of suspected gastroenteritis at a restaurant in Los Angeles County
Outbreak 2015-145. FBIR #23973, 23974, 23978, 23987, 24085

BACKGROUND

On Tuesday, March 24, 2015, the Los Angeles County Department of Public Health (LAC-DPH) received a foodborne illness report via the web (FBIR #23973). The initial complainant, Group A, reported 5 out of 5 ill after eating on Friday, March 20, 2015. Approximately 3 hours later, a second complainant, Group B (FBIR 23974), reported 2 out of 2 ill, and 4 hours later, a third complainant, Group C (FBIR 23978), reported 3 out of 7 ill. The following evening, March 25, 2015, a fourth complainant, Group D (FBIR 23987), reported 1 out of 4 ill. All four groups had eaten on the same date. Initial food items reported were enchiladas, tacos, chile relleno, beans, rice, chips, and salsa. Symptoms included diarrhea, abdominal cramps, fevers, body aches, and headaches. The Acute Communicable Disease Control Program (ACDC) initiated an outbreak investigation to determine the extent of the outbreak, risk factors for the disease, and steps needed to prevent further spread.

METHODS

- An outbreak-associated case was defined as a person eating at the restaurant between March 18, 2015 and March 20, 2015 who 1) had a stool, urine, or blood sample taken which grew *Salmonella*, or 2) had diarrhea and fever, or 3) had diarrhea and two other symptoms. An outbreak-associated control was defined as a person who ate at the restaurant during the same period of time but did not become ill with any gastrointestinal symptoms.
- LAC-DPH Environmental Health Services (EHS) contacted the parties on the FBIR complaints to obtain contact information and preliminary information for all members.
- EHS conducted three inspections of the restaurant (3/25/2015, 3/27/2015, 4/1/2015).
- EHS requested contact information for any other complaints of illness to the restaurant and all reservations made between March 16, 2015 and March 20, 2015.
- ACDC contacted individuals on YELP who complained about foodborne illnesses after eating at the restaurant and requested that they report to the public health department.
- ACDC created a food history and illness questionnaire for all the complainants from the FBIR's and the one reservation group, called all patrons with contact information, and interviewed them via telephone.

- ACDC collected data in MS Access and calculated frequency and distribution of symptoms among cases. Analyses of food items and combination of food items were also performed. All analyses were conducted using SAS 9.3 analysis software and MS Excel.
- ACDC sent out a health advisory to hospitals requesting to be notified of salmonellosis patients who could potentially be cases of the outbreak.
- ACDC created a separate questionnaire to interview employees on job duties, food history, and possible illnesses prior to the outbreak.
- ACDC, in conjunction with the District Public Health Nurses (PHNs), conducted a site visit on March 27, 2015 to the restaurant to observe food preparation, interview employees, initiate the process of stool collection, and provide education.
- ACDC and PHNs returned to the restaurant on March 30, 2015 and April 1, 2015 to collect stool samples and provide additional education to the managers and workers.
- PHNs questioned all routinely reported *Salmonella* cases to determine if they had any connection to Restaurant A. Any new cases identified by the PHNs were additionally interviewed over the phone by ACDC with the food and illness history questionnaire.
- PHNs collected any additional stool samples from the employees at their District Health Centers.
- The Public Health Laboratory (PHL) tested all the employee stool specimens and provided results.
- PHL serotyped and determined the pulsed-field gel electrophoresis (PFGE) patterns for all the employee and case isolates.

RESULTS

Setting

On Friday, March 20, 2015, multiple small groups gathered separately for meals at an LAC Restaurant. This restaurant is a dine-in Mexican restaurant offering a variety of traditional Mexican dishes, a full bar, and an outdoor seating option. Some food items include burritos, enchiladas, tacos, tamales, taquitos and tostadas. Margaritas and other alcoholic beverages are additionally available upon order. Patrons typically consume their food at the establishment. However, the restaurant also offers a take-out option. Among the four groups, 11 out of 18 people eating at the restaurant reported becoming ill. EHS obtained line lists of the diners and ACDC interviewed patrons via telephone. For Group A,

interviews were obtained for 5 individuals (100%). For Group B, two interviews were completed (100%) and for Group C, 2 out of 7 (29%). For Group D, we made contact with 2 out of 5 (40%) members. ACDC emailed electronic copies of the survey to Group D's controls because only email addresses had been provided. Approximately 3 weeks later (on 4/14/2015), a FBIR was received for Group E reporting 3 ill individuals who ate on 3/19/15. Three out of 3 (100%) case interviews were completed. Collectively, food and illness history questionnaires were completed for 14 out of 22 (64%) individuals.

The PHNs were notified of the outbreak and 9 additional cases connected to the restaurant were discovered. These cases had eaten at the restaurant between 3/18/15 and 3/20/15. ACDC made contact with 8 out of the 9 cases (89%). One case did not want to return the phone calls from ACDC. However, the District Nurse was able to gather some preliminary food and illness history during her standard *Salmonella* surveillance interview.

From these 9 confirmed cases, 5 controls were identified. One eating partner of a confirmed case reported illness but did not meet the case definition. Many controls were non-responsive and could not be included in the analysis. In total, 23 cases and 6 controls were identified. Stool and blood samples were collected by the private medical facilities the cases visited. Isolates from these cases are routinely forwarded to the PHL for PFGE testing. Therefore, ACDC did not need cases to submit stools to the PHL for confirmation.

Cases - Restaurant Patrons

The median age of cases was 37 years, ranging from 3-83 years (**Table 1**). Cases were both male (40%) and female (60%). The controls also included males (33%) and females (67%) with a median age of 30 years (range: 17-47 years) (**Table 2**). Main symptoms of cases included diarrhea (100%), abdominal cramps (95%), nausea (77%), fever (68%), and chills (64%) (**Table 3**). Illness onsets occurred between March 20, 2015 and March 25, 2015 (**Figure 1**). The median incubation period was 26.5 hours (range: 2 to 122 hours). The duration for cases was approximated due to several cases still experiencing major symptoms at the time of the interview. The median duration was at least 5 days (range: at least 3 days to at least 11 days). Thirteen restaurant patrons had confirmed positive *Salmonella* Enteritidis laboratory cultures with the PFGE pattern JEGX01.0002. This includes the party of the fifth complainant, FBIR 24085, who reported on 4/14/2015. Two case isolates were submitted to CDC for whole genome sequencing.

Food Analysis

The results of the analysis of food items eaten by the patrons are shown in **Table 4**. All groups were combined for food analysis because many food items were shared across parties. Each party also had a limited number of individuals or respondents. Since only a few groups ate with people who did not report illness, these controls could also be compared to cases from other groups. No food items were found to be significantly associated with illness. The most common food items eaten by cases were rice

(78%), chips (78%) and beans (67%). For controls, it was chips (78%), rice (78%), beans (67%) and salsa (67%). These foods are commonly served to all patrons as an appetizer or sides to the main dish. Also, because they were eaten by both ill and non-ill individuals, they are unlikely to be the source of illness.

Restaurant A

Inspection

Restaurant A is a casual dining restaurant open 7 days a week for lunch and dinner. It is frequented by families and friends who gather to share a meal or to celebrate special events. Employees are responsible for all the preparation and service of the food. Some patrons reported consuming items at the establishment and others had consumed the food elsewhere. The inspection by EHS on March 25, 2015 revealed violations such as improper holding temperatures, unapproved equipment usage, and the need for sanitization of utensils. During the inspection on March 27, 2015, EHS noticed failure to clean a cutting board after pounding raw chicken and an unapproved immersion blender paddle in use. The possibility for cross contamination during preparation of chile rellenos from raw shell eggs was also observed. The restaurant voluntarily closed that weekend (March 27-March 28, 2015) for terminal cleaning.

On April 1, 2015, EHS conducted a third inspection of the restaurant. All violations that were noted on the prior two inspections had been abated. The District Inspector followed up within two weeks with a standard graded inspection.

Employees

There were 36 employees reported to ACDC. Contact was made with all 36 employees (100%). One food server admitted to gastrointestinal symptoms which began on 3/23/2015 and lasted for 5 days. This individual took time off while sick and tested negative for *Salmonella/Shigella*. Like the rest of the restaurant staff, this employee frequently eats at the restaurant and did not admit to any ill contacts. All other employees denied symptoms of gastrointestinal illnesses in themselves and members of their household during the month preceding the outbreak. Stool samples were collected from the entire staff, 36 out of 36 employees (100%). The PHL performed the test for results. Nine employees had positive culture for *S. Enteritidis*, with PFGE pattern JEGX01.0002. These are identical to the serotypes and PFGE patterns of the patrons. One employee isolate was submitted to CDC for whole genome sequencing.

ACDC worked with the restaurant owner to ensure that these nine employees were either removed from the restaurant until they were cleared by standard procedures or were placed in duties that did not involve food handling. No employee tested positive for *Shigella*. All other workers yielded negative test results for both *Salmonella* and *Shigella*.

DISCUSSION

This is a laboratory confirmed *S. Enteritidis* outbreak. The PHL, in conjunction with private labs, yielded a total of 22 positive *Salmonella* tests. The nine positive employees included managers, cooks, waiters, bartenders and cleaning staff. Patrons who tested positive were from separate groups and had eaten at different times or dates. Several cases were identified from routine *Salmonella* surveillance rather than foodborne illness reporting. Presumptive cases also reported severe symptoms such as ongoing diarrhea, fever, headaches and body aches. No food item was found to be significantly associated with illness.

According to the Centers for Disease Control and Prevention, *Salmonella* results in symptoms of diarrhea, fever and abdominal cramps. Individuals generally become symptomatic 12 to 72 hours after being infected and remain so for approximately 4-7 days. Children, the elderly, those immunocompromised, and individuals with severe symptoms may require hospitalization. *Salmonella* infections are more commonly seen in the summer. Certain food items and meats are known to cause *Salmonellosis* when not properly heated. Such products served at this restaurant include eggs, pork, beef and chicken. When undercooked, these foods can be the source of bacterial infections. Raw fruits and vegetables such as lettuce, tomatoes and radishes could also be contaminated by the drippings of these products, while in the field, or during packaging and shipping¹.

The spread of *Salmonella* in this restaurant could have been through employees, cross contamination or an undercooked or raw ingredient that infected both patrons and the employees. Infected individuals can excrete the bacteria in their feces for a few days or several weeks, depending on how quickly their bodies are able to get rid of the illness² (Heymann). *Salmonella* can remain in a person's system even after symptoms have resolved. Food handlers are possible sources of *Salmonella* due to the nature of their work^{2,3,4}. Appropriate measures were taken to prevent additional spread. No cases occurred after *Salmonella* positive employees were removed and thorough cleaning and sanitizing of the kitchen.

LIMITATIONS

The food analysis is limited by the small number of controls available for the analysis. Having few cases and even fewer controls reduces statistical power and decreases the likelihood of calculated p-values being statistically significant. A small number of groups had controls. Due to a low response rate, attempts to get controls through reservations, take-out orders, and online solicitation were not successful.

Cases that are found through routine *Salmonella* surveillance occasionally have difficulties recalling when and what they ate at the restaurant. Persons may eat out frequently and the restaurant is one of many exposures. More time has also passed for these cases compared to the individuals who report foodborne illness. As a result, it is also harder to remember the date and time their symptoms first began. These are individuals who have already been diagnosed and may be several days out from their symptoms.

PREVENTION

EHS educated restaurant owners and managers about sanitization and ways to prevent future *Salmonella* infections. Some recommendations included using separate preparation surfaces for raw foods and produce, methods to properly rid surfaces of contamination and buying pasteurized products to eliminate risk. Additional recommendations include proper hand washing after using the restroom and monitoring employees for signs of illnesses³. The PHNs and ACDC educated all the restaurant workers and individual salmonellosis cases on the spread of *Salmonella* and the importance of staying home when ill to prevent spreading sickness.

CONCLUSION

This is a single outbreak that occurred among patrons who dined at Restaurant A between March 18, 2015 and March 20, 2015. The agent *S. Enteritidis* was confirmed by laboratory results. An ill food handler is the likely source of illness. No additional complaints or illnesses have been reported for Restaurant A since the restaurant has taken appropriate measures to remove all potential causes of this outbreak. ACDC in conjunction with EHS will monitor for future reports of foodborne illness from Restaurant A.

REFERENCES

- 1) Centers for Disease Control and Prevention. General Information on *Salmonella*.
Website: <http://www.cdc.gov/Salmonella/general/index.html>
Last Accessed: April 20, 2015
- 2) Heymann, David et. al. *Control of Communicable Disease*. Salmonellosis. Baltimore: United Book Press, Inc.; 2008.
- 3) Greig JD, Todd EC, Bartleson CA et. al. Outbreaks where food workers have been implicated in the spread of foodborne disease. Part 1. Description of the problem, methods, and agents involved. *J Food Prot.* 2007 July; 70(7):1752-61.
- 4) Hedican E, Hooker C, Jenkin T, et. al. Restaurant *Salmonella* Enteritidis outbreak associated with an asymptomatic infected food worker. *J Food Prot.* 2009 Nov;72(11):2332-6.

APPENDIX

Table 1. Case Demographics (N=23) OB2015-145		
	n	Percent
Male	9	40%
Female	14	60%
Age Group		
<1	0	0%
1-4	1	4%
5-9	0	0%
10-19	2	9%
20-49	12	52%
50-74	7	31%
>74	1	4%
Median age: 37 yrs		range: 3-83 yrs

Table 2. Control Demographics (N=6) OB2015-145		
	n	Percent
Male	2	67%
Female	4	33%
Age Group		
<1	0	0%
1-4	0	0%
5-9	0	0%
10-19	1	20%
20-49	4	80%
50-74	0	0%
>74	0	0%
Median age: 30 yrs		range: 17-47 yrs
*Age of one control unknown		

Table 3. Reported Symptoms (N=22) OB2015-145		
Symptom	n	Percent
Diarrhea	22	100%
Bloody Diarrhea	0	0%
Abdominal cramps	21	95%
Nausea	17	77%
Fatigue	16	73%
Chills	14	64%
Body Aches	14	64%
Headache	14	64%
Fever	15	68%
Fever > 102°F	1	1%
Dizziness	11	50%
Vomiting	11	50%
Tingling	0	0%
Rash	0	0%
Median Duration=5 days (range 3 -11 days)		
Median Incubation=26.5 hours (range 2 hours-122 hours)		

*Missing case not included in analysis

Table 4. Food Items Eaten

OB2015-145

Cases (N=23)**Controls (N=6)**

Food Item	Cases (N=23)				Controls (N=6)				Attack Rate	p-value
	Percent	n	unknown*	N	Percent	n	unk*	N		
enchilada	41%	9	1	23	17%	1		6	90%	0.470
taco	41%	9	1	23	50%	3		6	75%	0.805
tamale	5%	1	1	23	0%	0		6	100%	0.756
taquito	9%	2	1	23	0%	0		6	100%	0.646
chile relleno	36%	8	1	23	0%	0		6	100%	0.182
beans	59%	13	1	23	83%	5		6	72%	0.470
rice	68%	15	1	23	83%	5		6	75%	0.666
chips	68%	15	1	23	100%	6		6	71%	0.237
salsa	59%	13	1	23	83%	5		6	72%	0.470
guacamole	27%	6	1	23	33%	2		6	75%	0.836
beef	32%	7	1	23	67%	4		6	64%	0.255
chicken	32%	7	1	23	17%	1		6	88%	0.666
pork	9%	2	1	23	0%	0		6	100%	0.646
shrimp	9%	2	0	23	33%	2		6	50%	0.119
fish	0%	0	1	23	17%	1		6	0%	0.124
water	45%	10	1	23	17%	1		6	91%	0.207
ice	59%	13	1	23	50%	3		6	81%	0.805
soda	18%	4	1	23	0%	0		6	100%	0.455
alcohol	14%	3	1	23	50%	3		6	50%	0.131

*Number of respondents who cannot recall whether they consumed the food item. This number is subtracted from the denominator to calculate percent.

