



North Carolina Department of Health and Human Services
Division of Public Health

Pat McCrory
Governor

Aldona Z. Wos, M.D.
Ambassador (Ret.)
Secretary DHHS

Laura Gerald, M.D., M.P.H.
State Health Director


Date: July 19, 2013

To: Megan Davies, MD
State Epidemiologist
North Carolina Division of Public Health

Buck Wilson, MS, RD
Health Director
Cumberland County Department of Public Health

From: Nicole Lee, MPH 
Epidemiologist
North Carolina Division of Public Health

Carl Williams, DVM, DACVPM 
State Public Health Veterinarian
North Carolina Division of Public Health

Larry Michael, REHS, MPH 
Food Protection and Facilities Branch Head
North Carolina Division of Public Health

**Subject: Outbreak of *Salmonella* Typhimurium gastroenteritis associated with a hotel-based restaurant ---
Cumberland County, North Carolina, May 2013.**

Summary

*On May 13, 2013, the North Carolina Division of Public Health (NC DPH) was notified by the Cumberland County Health Department (CCHD) of 2 laboratory confirmed cases of salmonellosis and thirteen epidemiologically linked cases in Cumberland County. All fifteen individuals were exposed to food or drink at the Holiday Inn Bordeaux (HIB) hotel in Fayetteville, and ten of the cases were hotel staff, three of them (30%) food service employees. CCHD immediately initiated an investigation and requested assistance from NC DPH. Laboratory testing identified *Salmonella* Typhimurium as the etiologic agent, and molecular testing revealed a strain pattern unique to the state. A total of 100 cases were identified during the investigation. A retrospective cohort study was performed using interviews solicited from hotel staff in order to identify common exposures. Results from the study indicated that eating or drinking at the hotel's All American Grill was significantly associated with illness. CCHD declared the outbreak over by June 6, 2013.*

Methods

On May 13, NC DPH initiated support of CCHD's outbreak investigation. Daily conference calls with state and local outbreak response teams were used to coordinate the following activities:

- enhanced surveillance for persons meeting case definition;
- environmental health site visits for food and lodging;

www.ncdhhs.gov • www.publichealth.nc.gov

Tel 919-707-5000 • Fax 919-870-4829

Location: 5605 Six Forks Road • Raleigh, NC 27609

Mailing Address: 1931 Mail Service Center • Raleigh, NC 27699-1931

An Equal Opportunity / Affirmative Action Employer



!

- interviews of ill persons using standard questionnaires;
- collection of stool specimens for laboratory testing;
- implementation of control measures; and
- messaging to healthcare providers, public health agencies and the general public.

A foodborne epidemiologist and a regional communicable disease nurse consultant were deployed on May 14 to Cumberland County to provide onsite assistance.

Initial Public Health Response

Active and enhanced passive surveillance were performed to determine the extent of the outbreak. A news release was issued by the Cumberland County Health Department on May 14th. All NC local health departments were notified through the NC Health Alert Network (www.nchan.org) on May 14th, and an Epi-X notification to all US state health departments was released on May 15th. CCHD established a call line to provide a description of the outbreak to the public and collect information about possible cases. CCHD and NC DPH staff established daily conference calls to coordinate public health response and communication. Since several of the initial cases were food workers, CCHD Environmental Health staff immediately organized a training session on food safety for all employees to reinforce elements of the Food Code¹. Food employees are defined as “an individual working with unpackaged food, food equipment or utensils, or food-contact surfaces” according to the 2009 FDA Food Code, adopted by reference in the *Rules Governing the Food Protection and Sanitation of Food Establishments* (15A NCAC 18A .2600).

Case Finding and Hypothesis Generation

A case was defined as: A person presenting with onset of nausea, vomiting, abdominal cramps and/or diarrhea, within three days of food or beverage consumption at the Holiday Inn Bordeaux and Conference Center on or after 1 May 2013 OR (secondary case) a person who developed these symptoms after being in close contact with a case as defined above.

Confirmed Case: A clinically compatible case with laboratory confirmed salmonellosis matching PFGE outbreak strain

Probable Case: A clinically compatible case with no positive laboratory result but epidemiologically linked to the outbreak

Exclusion Criteria: A clinically compatible case with *Salmonella* culture of a PFGE pattern different from the outbreak strain

Clinical Laboratory Investigation

Stool specimens were requested of all case-patients. Stool culture, *Salmonella* serotyping and PFGE analysis were conducted on each specimen. Stool cultures were performed at the North Carolina State Laboratory of Public Health (NC SLPH), and the state laboratories in South Carolina and Louisiana where some cases were residents. Serotyping and PFGE were performed at state laboratories of public health. All testing was accomplished in accordance with standard protocol (<http://www.cdc.gov/pulsenet/PDF/ecoli-shigella-salmonella-pfge-protocol-508c.pdf>).

Environmental Investigation

Four environmental health staff from Cumberland County Health Department began an on-site investigation upon notification of a possible foodborne outbreak on May 13, 2013. The Holiday Inn Bordeaux has a first floor and a second floor kitchen. The first floor kitchen services the All American Grill, a sports bar restaurant serving American food from 5pm – 11pm daily. The first floor kitchen also services the Café Bordeaux breakfast buffet. The second floor kitchen services banquet events and the Café Bordeaux lunch buffet. Salads for the lunch buffet are stored in the first floor kitchen. During the investigation, CCHD environmental health staff was accompanied by the Holiday Inn Bordeaux kitchen manager and the assistant general manager. Food sources, storage, and preparation were assessed. Food, refrigerator, freezer, and water temperatures were monitored. Hand washing stations and supplies were inspected. Food products were not sampled. Subsequent to the initial site visit, multiple repeat visits were made to the facility during the course of the investigation to ensure compliance with outbreak control measures (see Environmental Results below). On May 28, 2013, the North Carolina Department of Agriculture collected twenty environmental samples from various components of a faulty dishwasher that was being stored in the facility basement after being disconnected due to improper water temperatures.

¹ North Carolina Food Code Manual. NC Department of Health and Human Services. September 2012.

!

Analytic Study

A retrospective cohort study using interviews collected from staff of the Holiday Inn Bordeaux was conducted in order to systematically identify the source of the outbreak. A cohort study is used when a well-defined group of people involved in an outbreak is identified (i.e., hotel staff). The study uses interviews to assess common characteristics and/or exposures that may be associated with illness onset. The rate of illness onset among persons exposed to a particular event and/or item is compared to the rate of illness onset among persons who were not exposed to that particular event and/or item (calculated using a statistic called the rate ratio (RR) or relative risk (RR)).

Hotel employees in this setting served as a defined cohort of people with the opportunity for exposure and availability for interviews.

A standardized questionnaire was designed by NC DPH staff to collect information on demographics, employee tasks, hotel events and venues, clinical outcomes, and food exposures (see Appendix A: Cohort Study Questionnaire). Surveys were completed in face-to-face interviews by public health staff (with the exception of four that were completed over the phone). Verbal informed consent was received before completion of questionnaires and confidentiality was emphasized.

Data were entered into Epi Info™ 7 database (CDC, Atlanta, Georgia) by NC DPH staff. Statistical analyses were performed using SAS 9.3 (SAS Institute Inc. Cary, North Carolina).

Results

Case Patients

One hundred case-patients were identified: 25 confirmed; and 75 probable. Twenty-nine (29%) of the 100 case-patients were staff and 71 (71%) were patrons of the hotel and/or hotel restaurants. One staff person likely became ill as a result of secondary transmission. Of the 29 ill staff, ten (35%) were laboratory confirmed with the outbreak strain, one (3%) tested negative, one (3%) had a final result of unsatisfactory, and 17 (59%) did not submit a stool specimen. Of the 71 patrons, 15 (21%) tested positive for the outbreak strain, 26 (37%) tested negative, one (1%) had a final result of unsatisfactory, and 29 (41%) did not submit a stool specimen. Of the 75 probable cases, 27 persons tested negative for *Salmonella*, 46 persons did not submit a stool specimen, and two had unsatisfactory samples as a final result.

Illness onset dates for the 100 case-patients ranged from May 1, 2013, to May 17, 2013 (Figure 1 – Epidemiologic Curve). The majority of case-patients were residents of North Carolina (87%); 4/100 (4%) were from Maryland, 2/100 (2%) South Carolina, 2/100 (2%) Alabama, and 1/100 (1%) from Colorado, Illinois, Louisiana, New Jersey, and New York, respectively. All case-patients reported an association with the Holiday Inn Bordeaux. Fifty-seven percent were female. Ages ranged from 17-81 years (median 45 years) (Table 1).

Among case-patients from whom data were available, 88% experienced diarrhea, 80% abdominal cramps, 51% fever (subjective or measured), 45% vomiting, and 14% bloody diarrhea. Eighteen percent of case-patients sought care from a medical provider; 10/70 (14%) visited an emergency room, and 8/86 (9%) were hospitalized. No case-patients died (Table 2). Of the 29 staff, fourteen were categorized as food employees.

Laboratory results, hospitalization status, employee type, state residency, and patron cases, are reflected in the epidemic curve (Figure 1). One hundred cases are distributed over a period of 17 days, with the highest number of cases occurring on Day 9. Cases continued to be reported over a time interval corresponding to six average incubation periods. Laboratory results showed cases positive for the outbreak strain as early as Day 2 and as late as Day 16. The occurrence of cases over multiple incubation periods is usually an indication of continued exposure to a contaminant.

Laboratory Results

Among 54 people who had specimens submitted for testing, 25 (46%) were positive by culture, 27 (50%) were negative, and two (4%) had a final result of unsatisfactory. Of the 25 positive results, 100% grew *Salmonella* species on stool culture. Of these, 25/25 (100%) were serotype Typhimurium and 25/25 (100%) were a PFGE match to pattern JPXX01.0038. While this pattern is seen each year in North Carolina, it is not a common pattern. The historical incidence rate for this pattern of *Salmonella* Typhimurium in North Carolina is <0.5 to 2% per year.

The onset dates of persons testing positive for this outbreak strain ranged from May 2, 2013, to May 16, 2013.

North Carolina's State Laboratory of Public Health is part of a national surveillance system, PulseNet, which is a database of PFGE patterns for all *Salmonella* specimens submitted to state laboratories across the US. Other than the previously identified epidemiologically linked patients, there were no reports of the outbreak strain from other state laboratories across the country during the time period of this outbreak.

Environmental Results

Site visits to the Holiday Inn Bordeaux were conducted daily from May 13 through May 24. Interviews with managerial staff and observation of food preparation identified multiple opportunities for *Salmonella* contamination, including improper water temperatures and the absence of hand washing supplies in some areas. Other potential food safety issues that were identified included bare hand contact with ready to eat foods, temperature violations, and a dishwasher in one kitchen that was not operating effectively as described by staff members. Food Code requirements that were reinforced and control measures recommended by environmental health included exclusion of ill employees, elimination of bare hand contact with ready to eat foods, consistent logging of food temperatures, and discontinued use of the faulty dishwasher.

The following points were noted during the first environmental health inspection:

- A fan obstructing access to the hand wash sink near the dish washing machine.
 - This same sink was out of paper towels.
 - Although the minimum temperature for a hand wash sink is 100°F, the temperature reading from the water leaving the faucet for this sink was 75°F.
- Soap dispensers were empty in the hand wash sink near the kitchen toaster area and in the female bathroom at the Café Bordeaux entrance.
- The booster for the hot water sanitizing dish washing machine was not in compliance with the minimum temperature of 140°F as required by the manufacturer's data plate. The temperature was reading 124.4°F. The booster was being used despite the fact that it had not been functioning properly for the prior three weeks. Staff had been instructed to run the dishes through the dish washing machine twice since it was not reaching the proper temperature. In addition, thermo labels indicated that the surface temperature of dishes did not reach 160°F, as required by the Food Code. Environmental health staff instructed the kitchen staff to discontinue this practice and use the 3 compartment sink or use a chemical rinse after running dishes through the dish washing machine.

All twenty environmental samples from the faulty dishwashing machine were negative for *Salmonella* subspecies.

Retrospective Cohort Study Analysis

The hotel agreed to set aside two conference rooms for one day to allow for staff interviews to be conducted by CCHD and NC DPH personnel. Among the 176 hotel staff, 141 (80% participation rate) staff interviews were completed. One interview was excluded from the analysis due to illness likely resulting from secondary transmission. One hundred forty interviews were included in the retrospective cohort analysis.

Twenty-three of 140 staff interviewed met case definition for illness. Twelve (52%) of these 23 were female. Ages ranged from 20 to 58 years (median 34 years). Fifty-seven percent of case-patients in the cohort study were categorized as food employees (i.e. reporting handling food, serving food, or changing ice buckets), and 54% of non-ill hotel staff in the cohort study were food employees (Table 3). All cases (100%) reported eating or drinking at the Holiday Inn Bordeaux during the period of interest.

Self-reported illness onset dates ranged from May 2, 2013 to May 14, 2013. Seventy-eight percent of case-patients experienced diarrhea (6% bloody), 74% abdominal cramps, 70% nausea, 52% fatigue, 43% vomiting, and 39% fever. Five of the case patients reporting having a healthcare provider visit, while four reported an emergency department visit, and three reported being hospitalized (Table 4). No case-patients died. Thirty-nine percent (9 / 23) submitted stool for diagnostic testing. Of the nine stool specimens, seven (78%) tested positive for the outbreak strain, one (11%) tested negative, and one (11%) had a final result reported as unsatisfactory. Of the twelve cases with a single exposure date (i.e., ate/drank at hotel restaurant), the median incubation period was one day (range: 0 – 3 days). Of those who listed a symptom resolution date, the median number of days ill was seven with a range of 2 to 20 days.

A statistically significant increased risk of illness was observed among hotel staff who ate or drank at the All American Grill compared with hotel staff who did not eat/drink at this restaurant (RR= 3.9; 95% confidence interval (CI) 1.9 to 8.1). No significant associations were observed between illness and staffing a banquet event, attending the employee potluck, eating at the Café Bordeaux breakfast or lunch buffet, or any employee duties such as food handling or room service (Table 5).

Conclusions

An outbreak of *Salmonella* Typhimurium gastroenteritis occurred in North Carolina during May 2013. One hundred cases were identified and included residents of North Carolina, Alabama, Colorado, Illinois, Louisiana, Maryland, New Jersey,

!

New York, and South Carolina. All isolates available for PFGE analysis had identical patterns (JPXX01.0038), representing an uncommon but recurring pattern in the national PulseNet database and for the state. The source of the outbreak was the All American Grill within the Holiday Inn Bordeaux. However, a specific food item could not be implicated during the investigation. One likely reason a specific food item was not identified as the vehicle in this outbreak was cross-contamination of food products or surfaces in the restaurant. Although sanitizing solutions were tested by inspectors and found to be in compliance, inadequate dish machine temperatures and hand washing could contribute to the cross-contamination. Furthermore, during the course of this investigation, it was revealed that seven food service employees, as defined by the North Carolina Food Code Manual, continued to work while ill. Hotel management was notified that food service employees should be excluded from work until they are asymptomatic for at least 24 hours. Failure to adhere to guidance requiring exclusion of ill food handlers may have played a role in facilitating ongoing contamination in the facility.

Salmonella Typhimurium with the pattern JPXX01.0038 was found to be the cause of this outbreak, and likely caused illness through a variety of mechanisms, including consumption or handling of undercooked food (due to lack of temperature log), consumption of cross contaminated ready to eat foods, and/or contact with contaminated surfaces.

Limitations

- Recall bias, which is the reliance on the memory of participants to identify exposures when interviewed, may have influenced study findings, but the direction in which the relative risk estimate would have been affected is unknown.
- Cohort study results are being generalized to patrons who were not included in the cohort study. We cannot say the same association would have held up if we would have included patrons in the cohort study.

Recommendations

Environmental health plays a major role in assessing food safety and immediately implementing corrective and preventive actions in foodborne disease outbreak response. The following requirements and recommendations were addressed and reinforced with the facility by CCHD environmental health staff:

- Keep all hand sinks properly supplied with soap, paper towels, and water temp of 100.0°F;
- Keep all hand wash sinks accessible;
- All employees shall use proper hand washing procedures;
- Increase hot water storage to accommodate the hot water sanitizing dish machine;
- All multiuse utensils shall be washed, rinsed, and sanitized ;
- No bare hand contact of ready to eat food (e.g., use of gloves);
- Repair or replace dish machine;
- Provide thin probed thermometers to check food temps;
- Clean and sanitize ice machines.

Discussion

Negative laboratory results from symptomatic persons could be due to multiple reasons: intermittent shedding, collection after shedding period, or a truly negative sample.

Initial epidemiologic information indicated onset of illness among staff first followed by patrons. For this and other reasons, a cohort study was conducted only among hotel staff. Although no specific food item was implicated as being associated with illness, eating and/or drinking at the American Grill restaurant was associated with illness. Continued cross contamination of food and the environment likely played a role in perpetuating this outbreak. Several environmental inspection findings bear discussion:

1. The failure of the dish washing machine to raise the surface temperature of the dishes to 160°F may have allowed pathogenic bacteria to persist and serve to propagate infection. Sanitization, as defined by the Food Code, yields a five log reduction of microorganisms of public health importance^{2, 3}.
2. While effective hand washing does not require hot water, the lack of adequate hot water, hand drying material or soap at multiple sinks could serve as a deterrent to hand washing or render it ineffective. Hand washing is a

² North Carolina Food Code Manual. NC Department of Health and Human Services. September 2012. Section 4-5

³ FDA Food Code Annex 3: Public Health Reasons / Administrative Guidelines, 4-501.112

!

critical factor in reducing fecal-oral pathogens that can be transmitted from hands to ready to eat food as well as other pathogens that can be transmitted from environmental sources. Hand washing done properly can result in a 2-3 log reduction in transient bacteria and a 2-log reduction in transient viruses and protozoa^{3,4}.

3. Working while ill, as identified in this outbreak, may serve as an ongoing source of infection even if a patient is not the original source of infection. Vomiting, diarrhea, or jaundice serve as an indication that an individual may be infected with a fecal-oral route pathogen, and are likely to be excreting high levels of the infectious agent. When a food employee is shedding extremely high numbers of a pathogen through stool or vomitus, there is greater chance of transmitting the pathogen to food products. Failure to exclude such employees may result in contamination of the environment or food^{3,5}.

Despite communication from management recommending staff stay home while ill until asymptomatic for 24 hours, records show that some staff continued to work while ill. According to the North Carolina Food Code Manual, food employees with diarrheal illness must be excluded from work until he/she has been asymptomatic for at least 24 hours (2-201.13(A)(1)(a)), but sick leave policies may be a barrier if workers are not compensated while being excluded from work due to illness.

The absence of reports of the outbreak PFGE pattern from other state laboratories during the outbreak window is a likely indication that the source of the outbreak was not a widely distributed contaminated food item further supporting the conclusion that contamination was localized to the hotel restaurant.

⁴ North Carolina Food Code Manual. NC Department of Health and Human Services. September 2012. Section 2-3

⁵ North Carolina Food Code Manual. NC Department of Health and Human Services. September 2012. Section 2-1

!

Acknowledgments

Buck Wilson, Wanda Tart, Amy Levy, Sherrie Miller, Heather Salisbury, Sharon Stanley, Daniel Ortiz, Sally Shutt, Cumberland County Health Department

Megan Davies, Evelyn Foust, Jean-Marie Maillard, Aaron Fleischauer, Jennifer MacFarquhar, Cindi Snider, Anita Valiani, Kathy Dail, Sandy Pace, Stacie Lee, Mary Beth Cox, Lana Deyneka, Braiden Eilers, Jeanette Greene, Mara Larson, Vivian Mears, Vicki Mobley, Susan Sullivan, Jenna Waggoner, Samuel Merritt, Shermalyn Greene, Cami Hartley, Denise Griffin, Debra Springer, Robbie Hall, Cris Harrelson, North Carolina Division of Public Health

Julie Henry, North Carolina Office of Public Affairs

Louisiana, New York City, and South Carolina public health staff

Connie D Jones and Kristen Patterson, HIV/Syphilis Field Services Unit

Kathleen Creppage and Grace Oguntebi, CSTE Fellows

Nirmalla Barros, Gregory Dang, Annie Hirsch, Adam Mannarino, Office of Occupational and Environmental Epidemiology

Figures and Tables

Figure 1. Epi Curve

Number of Ill Patrons and Staff by Date of Illness Onset Salmonellosis Outbreak: Cumberland County (n=100)

As of 2pm 6/6/13

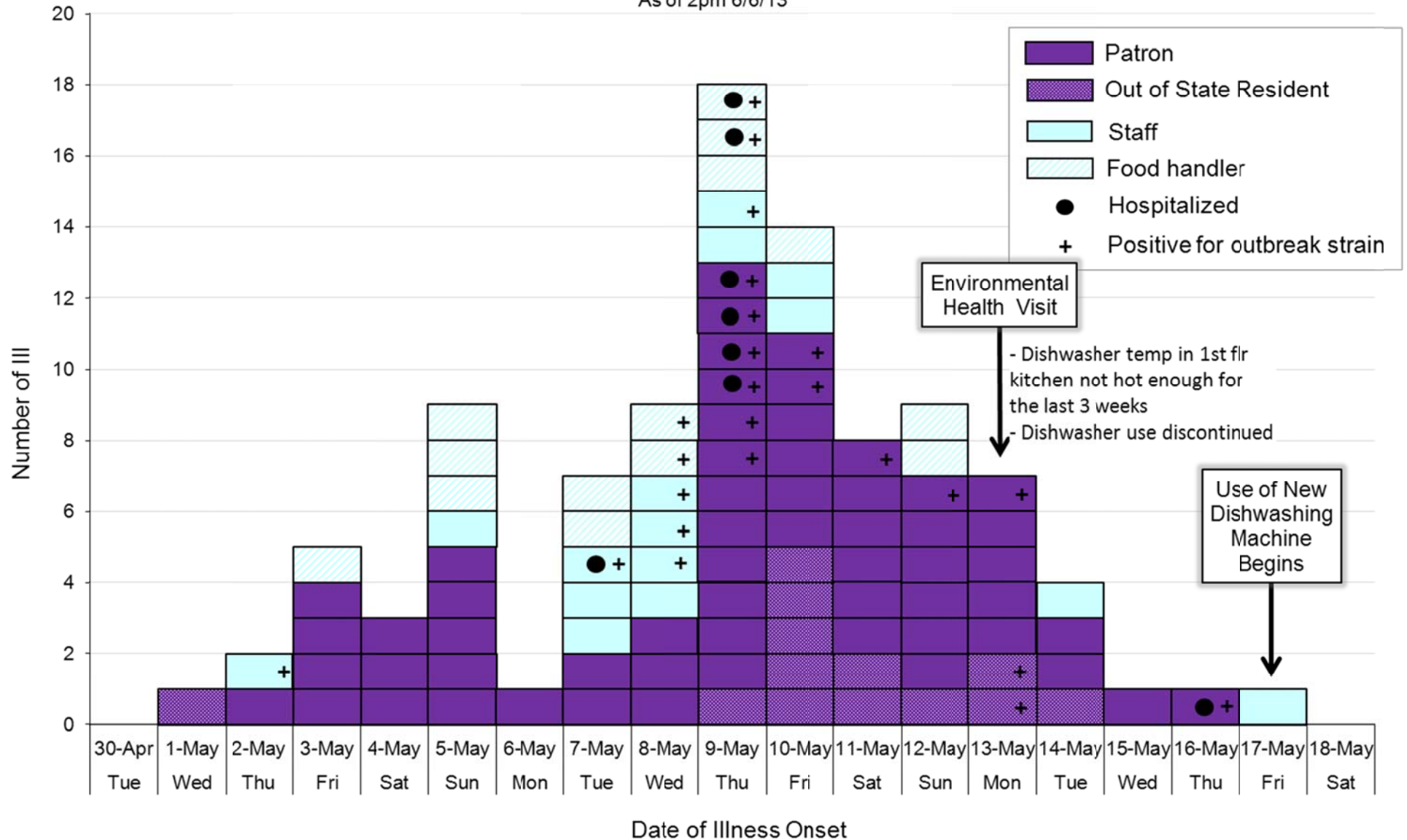


Table 1. Demographic characteristics of persons meeting case definition, Cumberland County - NC, 2013

	<i>Number</i>	<i>%</i>
<i>Case Classification</i>		
Lab confirmed	25	25%
Probable	75	75%
<i>Age</i>		
	<i>Years</i>	
Range	17 - 81	
Median	45	
Less than 18	1	1%
18 and above	99	99%
<i>Gender</i>		
Female	57	57%
Male	43	43%
<i>Type</i>		
Hotel Patrons	71	71%
Hotel Staff	29	29%
Food handler*	14	48%
Non-food handler	15	52%
<i>State of Residence</i>		
North Carolina	87	87%
Out of State	13	13%
Maryland	4	30%
Alabama	2	15%
South Carolina	2	15%
Colorado	1	8%
Illinois	1	8%
Louisiana	1	8%
New Jersey	1	8%
New York	1	8%
<i>Total Cases</i>	100	

* Includes handling food, serving food, or changing ice buckets

!

Table 2. Clinical characteristics of persons meeting case definition, Cumberland County - NC, 2013

	<i>Frequency</i>	<i>%</i>
<i>Symptomology</i>		
Diarrhea	88 / 100	88%
Bloody diarrhea	11 / 78	14%
Abdominal cramps	78 / 98	80%
Fever	50 / 99	51%
Vomiting	44 / 98	45%
<i>Healthcare Utilization</i>		
Healthcare Provider Visit	13 / 72	18%
Emergency Dept Vist	10 / 70	14%
Hospitalization	8 / 86	9%
<i>Total Cases</i>	100	

Table 3. Demographic characteristics of persons enrolled in cohort study, Cumberland County - NC, 2013

Exposures	Ill Staff (n=23)		Well Staff (n=117)	
	#	%	#	%
<i>Case Classification</i>				
Lab confirmed	3	13%	0	0%
Probable	20	87%	0	-
<i>Age (years)</i>				
Range	20 - 58		19 - 80	
Median	34		37	
Less than 18	0	0%	0	0%
18 and above	23	100%	117	100%
<i>Gender</i>				
Female	12	52%	67	57%
Male	11	48%	50	43%
<i>Type</i>				
Hotel Patrons	0	0%	0	0%
Hotel Staff	23	100%	117	100%
Food handler*	13	57%	63	54%
Non-food handler	10	43%	54	46%
<i>Residence</i>				
North Carolina	23	100%	117	100%
Out of State	0	0%	0	0%
<i>Employee Type</i>				
All Amer Grill Cook	3	13%	4	3%
All Amer Grill Server	2	9%	5	4%
All Amer Grill Supervisor	3	13%	2	2%
Café Cook	1	4%	10	9%
Café Server	2	9%	8	7%
Café Supervisor	1	4%	4	3%
Banquet Cook	0	0%	7	6%
Banquet Server	3	13%	28	24%
Banquet Supervisor	2	9%	6	5%
Bartender	2	9%	4	3%
Dishwasher	4	17%	7	6%
Housekeeping	4	17%	31	26%
Security	0	0%	5	4%
Other	8	35%	37	32%
Total Cases	23		117	

* Reports handling food, serving food, or changing ice buckets

!

Table 4. Clinical characteristics of persons enrolled in cohort study, Cumberland County - NC, 2013

Exposures	Ill Staff (n=23)		Well Staff (n=117)	
	Freq.	%	Freq.	%
<i>Symptomology</i>				
Diarrhea	18	78%	2	2%
Bloody Diarrhea	1	6%	0	0%
Abdominal cramps	17	74%	1	1%
Nausea	16	70%	0	0%
Fatigue	12	52%	0	0%
Vomiting	10	43%	1	1%
Fever	9	39%	0	0%
Other	9	39%	0	0%
<i>Healthcare Utilization</i>				
Healthcare Provider Visit	5 / 18	28%	-	-
Emergency Dept Vist	4 / 17	24%	-	-
Hospitalization	3 / 20	15%	-	-
<i>Total Cases</i>	23		117	

Table 5. *Risk factors among participants of the cohort study, Cumberland County - NC, 2013

Exposure	Relative Risk	95% Confidence Interval	
		Lower	Upper
Food Sources			
Employee Potluck	0.63	0.2	1.7
Café Breakfast Buffet	0.82	0.4	1.8
Café Lunch Buffet	1.06	0.5	2.2
All American Grill	3.90	1.9	8.1
Staffing Banquet Events	0.73	0.3	1.9
Work Tasks			
All American Grill Supervisor	4.05	1.8	9.2
All American Grill Cook/Chef	2.83	1.1	7.3
Dishwasher	2.47	1.0	6.0

* Food items with less than 10 exposed persons are not included due to low statistical power

Appendix A

Cohort Study Questionnaire

III or Not-III (circle one) ID # _____

"Hello, we are from the NC Division of Public Health. We are contacting you because there have been several cases of gastrointestinal (stomach) illness among people who work or stayed at the Holiday Inn Bordeaux recently. We are gathering additional information in order to help determine the source of the illness. This survey should take about 10 minutes."

"Are you willing to answer these additional questions?" **YES or NO**

If no: "Your participation would be very helpful in understanding this outbreak. Is there a better time when you could participate?"

If yes: Schedule date/time _____

If no: "Thank you for your time."

I. General information

Date of interview: _____ Name of Interviewer: _____

Did you eat at Holiday Inn Bordeaux & Conference Center any time since May 1, 2013?

YES or NO

II. Demographics

Name: _____

Contact phone number: _____

Date of Birth: ____/____/____ Age: ____ Gender: ____M ____F

III. Holiday Inn Employees

Are you employed by the Holiday Inn Bordeaux & Conference Center? **YES or NO**

If no, stop questionnaire.

If yes:

1. How long have you been employed by the Holiday Inn Bordeaux & Conference Center?

Date employment began ____/____/____ Still employed? **YES or NO**

I'm going to ask you some questions about what you do when you work at the Holiday Inn. Please answer "Yes" "No" or "I don't know" for each question.

2. Do you work in a kitchen? **YES or NO** If yes, which kitchen do you work in? (circle which applies)

Upper level (Bordeaux convention center kitchen) **YES NO N/A**

Lower level (café Bordeaux/all am grill kitchen) **YES NO N/A**

Both **YES NO N/A**

	Yes	No	DK (99)
Are you security personnel?			
If so, do you handle food?			
If so, do you serve food?			
If so, do you set tables?			
If so, do you change ice buckets?			
If so, do you deliver food to room service?			
Are you a cafe chef/cook?			
If so, do you handle food?			
If so, do you serve food?			
If so, do you set tables?			
	Yes	No	DK (99)
If so, do you change ice buckets?			
If so, do you deliver food to room service?			

Are you an All Am grill chef/cook?			
If so, do you handle food?			
If so, do you serve food?			
If so, do you set tables?			
If so, do you change ice buckets?			
If so, do you deliver food to room service?			
Are you a banquet chef/cook?			
If so, do you handle food?			
If so, do you serve food?			
If so, do you set tables?			
If so, do you change ice buckets?			
If so, do you deliver food to room service?			
Are you a café server?			
If so, do you handle food?			
If so, do you serve food?			
If so, do you set tables?			
If so, do you change ice buckets?			
If so, do you deliver food to room service?			
Are you an All Am grill server?			
If so, do you handle food?			
If so, do you serve food?			
If so, do you set tables?			
If so, do you change ice buckets?			
If so, do you deliver food to room service?			
Are you a banquet server?			
If so, do you handle food?			
If so, do you serve food?			
If so, do you set tables?			
If so, do you change ice buckets?			
If so, do you deliver food to room service?			
Are you a supervisor at Café Bordeaux?			
If so, do you handle food?			
If so, do you serve food?			
If so, do you set tables?			
If so, do you change ice buckets?			
If so, do you deliver food to room service?			
Are you a supervisor at All Am grill?			
If so, do you handle food?			
If so, do you serve food?			
If so, do you set tables?			
If so, do you change ice buckets?			
If so, do you deliver food to room service?			
	Yes	No	DK (99)
Are you a supervisor at Banquet Hall?			
If so, do you handle food?			
If so, do you serve food?			
If so, do you set tables?			

If so, do you change ice buckets?			
If so, do you deliver food to room service?			
Are you a bartender at All Am grill?			
If so, do you handle food?			
If so, do you set tables?			
If so, do you change ice buckets?			
If so, do you deliver food to room service?			
Are you a dish washer?			
If so, do you handle food?			
If so, do you set tables?			
If so, do you change ice buckets?			
If so, do you deliver food to room service?			
Are you part of the housekeeping staff?			
If so, do you handle food?			
If so, do you serve food?			
If so, do you set tables?			
If so, do you change ice buckets?			
If so, do you deliver food to room service?			
Do you work as anything other than what I have mentioned?			
If so, do you handle food?			
If so, do you serve food?			
If so, do you set tables?			
If so, do you change ice buckets?			
If so, do you deliver food to room service?			

Specify _____

3. What days and shifts did you work during the following days?

Shifts	May 3 Fri	May 4 Sat	May 5 Sun	May 6 Mon	May 7 Tues	May 8 Wed	May 9 Thurs	May 10 Fri	May 11 Sat	May 12 Sun

IV. Clinical Information

1. Were you ill with nausea, vomiting, or diarrhea on or after Wednesday May 1, 2013? **YES or NO**

If no: Go to **Section V, Dining**

If yes: a. What date did your symptoms start? ____/____/____

b. Please give your best estimate of symptom onset time: _____ AM / PM

2. What symptoms did you have? (check all that apply)

- ☐ Nausea ☐ Vomiting ☐ Diarrhea (bloody) ☐ Diarrhea (non-bloody)
☐ Abdominal cramps ☐ Fever ☐ Fatigue
☐ Other: _____

3. Are you still experiencing symptoms? **YES or NO**

If yes: Which symptoms: _____

If no: Date of last episode: ____/____/____ Time: _____ AM / PM

4. Did you seek medical care? **YES or NO**

If yes:

A. Were you admitted to the hospital (at least 24 hours)? **YES or NO**

Name of facility: _____

Number of days _____

Admission Date: ____/____/____ Time: _____ AM / PM

Discharge Date: ____/____/____ Time: _____ AM / PM

Was a stool sample collected for testing? **YES or NO**

B. Were you seen in the ED (not admitted)? **YES or NO**

Name of facility: _____

Date: ____/____/____ Time: _____ AM / PM

Was a stool sample collected for testing? **YES or NO**

C. Were you seen in a private physician's office/clinic? **YES or NO**

Name of facility: _____

Date: ____/____/____ Time: _____ AM / PM

Was a stool sample collected for testing? **YES or NO**

5. Did any family or friends have a similar illness around the same time you did (before or after)?

Name: _____ Relation: _____ Phone: _____ Onset: ____/____/____

Did he/she eat/drink at Holiday Inn? **YES or NO** Date: ____/____/____

Name: _____ Relation: _____ Phone: _____ Onset: ____/____/____

Did he/she eat/drink at Holiday Inn? **YES or NO** Date: ____/____/____

Name: _____ Relation: _____ Phone: _____ Onset: ____/____/____

Did he/she eat/drink at Holiday Inn? **YES or NO** Date: ____/____/____

V. Dining

6. Did you dine with anyone else? **YES or NO**

If yes: Could you share their names and phone numbers? We would also like to speak to them about their dining experience **YES or NO**

Name: _____ Phone Number: _____

Name: _____ Phone Number: _____

Name: _____ Phone Number: _____

VI. Staff Activities

7. Did you attend the Cinco de Mayo potluck for staff on Friday, May 3, 2013? **YES or NO**

a. Did you bring a dish to the Cinco de Mayo potluck? **YES or NO**

If yes, what dish(es) did you bring? _____

b. Did you eat at the Cinco de Mayo potluck? **YES or NO**

If yes, which of the following dishes did you eat?

Dishes at Cinco de Mayo potluck	YES	NO	DK (99)
By Chef			
Full taco bar w/ toppings			
Assorted enchiladas			
Assorted burritos			
Enchilada chicken			
Spinach enchilada			
Shredded beef enchilada			
Beefy enchiladas			
Pork carnita shredded pork (hot item)			
Brought in from home			
Pasta salad			
Chicken salad			
Mac & Cheese			
Mexican rice			
Jerk chicken			
Cornbread dressing			

!

Ice cream			
Banana pudding			
Assorted desserts			
Iced tea			
Other salad			
Other Item 1 _____			
Other Item 2 _____			
Other Item 3 _____			

VII. On-site menu questions

[illegible]

	5/1/13 Wed	5/2/13 Thurs	5/3/13 Fri	5/4/13 Sat	5/5/13 Sun	5/6/13 Mon	5/7/13 Tues	5/8/13 Wed	5/9/13 Thurs	5/10/13 Fri	5/11/13 Sat	5/12/13 Sun
Salads												
House salad (lettuce, tomato, onion, cucumber, cheese, dressing)												
Caesar salad (lettuce, parm cheese, croutons, dressing)												
Tropical chicken salad (chicken, fruits, nuts)												
Grilled chicken salad (chicken, tomato, onion, mixed greens,												
Salmon salad (salmon, mixed greens, tomato, vogs)												
Sirloin steak salad (tomato, onion, mixed greens)												
Entrée Sides												
Squash												
Steamed												
Baked potato												
Loaded baked potato												
Buttered white rice												
Desserts												
Chocolate mousse												
Key lime												
Cheesecake												
Apple fritter												
Pound cake												
Amaretto mousse cake												
Classic & Specialty Beverages												
Coke												
Diet coke												
Sprite												
Water												
Iced tea												
Coffee												
Lemonade												
Fruit punch												
Caribbean												
1st and ten												
Mean green												
Tart-tini												
4th and goal												
Caramel bliss												
Scorpion												

!

	5/1/13 Wed	5/2/13 Thurs	5/3/13 Fri	5/4/13 Sat	5/5/13 Sun	5/6/13 Mon	5/7/13 Tues	5/8/13 Wed	5/9/13 Thurs	5/10/13 Fri	5/11/13 Sat	5/12/13 Sun
Did you eat at the Café Bordeaux breakfast buffet?												
Buttered grits												
Cheesy grits												
Corned beef hash												
Sausage country gravy												
Pork sausage links												
Turkey patties												
French toast w. maple syrup												
Sliced apples												
Scrambled eggs												
Scrambled eggs w/ cheese												
Biscuits												
Country peppered gravy												
Seasoned potatoes w/ peppers & onions												
Bacon												
Omelet station												
Waffle station												
Hash round patties												
Eggs to order												
Did you eat at the Café Bordeaux lunch buffet?												
Smothered Chicken												
Fried chicken, white rice												
Salisbury Steak w/ gravy, mashed potatoes												
Mixed veggies												
Black eyed peas												
Mustard greens												
Apple cobbler												
Soup of the Day												
Beefy enchiladas												
Taco bar w/ toppings												
Fried pork chops												
Collard greens												
BBQ chicken												
Sliced NY strip loin of beef w/ gravy												
Fried rice												
Vegetarian pasta dish												
Buttered corn												
Pinto beans												
Hot Dessert												
Soup of the Day												

Items in black were not available on the specified days according to kitchen management.

	5/1/13 Wed	5/2/13 Thurs	5/3/13 Fri	5/4/13 Sat	5/5/13 Sun	5/6/13 Mon	5/7/13 Tues	5/8/13 Wed	5/9/13 Thurs	5/10/13 Fri	5/11/13 Sat	5/12/13 Sun
Corn chowder												
Pepper steak, steam rice												
Chicken & dumplings												
Fried chicken wings												
Steam broccoli												
Mac & Cheese												
Steam cabbage												
Lima beans												
Vegetarian pasta dish												
Chili w/ beans												
Soup of the Day												
Peach cobbler												
Chili mac & cheese												
Stew beef, steam rice												
Broccoli & cheese												
Smothered chicken												
Garlic bread												
Fried chicken												
Shrimp fried rice												
Corn on the cob												
Green beans												
Potatoes-peas & mushrooms												
Hot dessert												
Soup of the Day												
Slow roasted top round of beef												
Southern buffet theme- chef creations												
Soul food for the heart-pigs feet												
Catch of the day												
Salmon croquettes												
Corn bread muffins												
Seafood creole												
Hot banai												
Clam chowder												
Hot dessert- banana pudding												
Soup of the Day												

Items in black were not available on the specified days according to kitchen management.

!

	5/1/13 Wed	5/2/13 Thurs	5/3/13 Fri	5/4/13 Sat	5/5/13 Sun	5/6/13 Mon	5/7/13 Tues	5/8/13 Wed	5/9/13 Thurs	5/10/13 Fri	5/11/13 Sat	5/12/13 Sun
Bordeaux meatloaf												
Mashed potatoes												
Fried chicken												
Baked chicken												
Rice												
Corn												
Mixed veggies												
Soup of the Day												
Salad bar												
Slow roasted prime rib (beef)												
Pineapple glazed ham (carved)												
Cold seafood bar (shrimp & crab legs)												
Salad bar w/ toppings												
Smoked turkey wings												
Fried chicken												
Cornish hens (baked)												
Sliced roast beef w/ gravy												
Steamed white rice												
Corn on the cob												
Meat Lasagna												
Vegetable lasagna												
Mac & cheese												
Three cheese potato casserole												
Mashed potatoes												
Black eyed peas												
Collard greens												
Steam broccoli												
Fresh rutabagas												
Yam patties												
Dinner rolls												
Combread muffins												
Cakes												
Pies												
Homemade key lime mousse												
Fruit display												

Items in black were not available on the specified days according to kitchen management.

VIII. Did you staff any banquet events at Holiday Inn? (circle →) YES or NO

If no: Go to **Section IX, Hygiene.**

If yes: Complete the table below.

Banquet Events	YES	NO	DK (99)
Tuesday May 7, 2013			
RDR – Debbie Mecomber			
Bell Business Systems			
Wednesday May 8, 2013			
RDR – Debbie Mecomber			
Distance Learning			
Mall Handlers Assoc.			
Masco Contractor Services			
National Association of Credit Management South Atlantic			
HIB – Stay Real			
Thursday May 9, 2013			
RDR – Debbie Mecomber			
Fred Pryor			
Friday May 10, 2013			
Military Interviews			
Douglas Byrd Middle School			
Exchange Club			

I. Hygiene:

II. Did you use the restroom at the restaurant? YES or NO

If yes: Were the restrooms well maintained? **YES or NO** **If no, please specify** _____

III. Did you wash your hands at the restaurant? YES or NO

If yes:

- a. Was there soap available to wash your hands? **YES or NO**
- b. Was hand sanitizer available to disinfect your hands? **YES or NO**
- c. Were paper towels available to dry your hands? **YES or NO**

IV. Closing

Thank you for your time in completing the questionnaire. Do you have any questions/comments for me?

If you think of any questions or have any concerns, please feel free to contact the Cumberland County Department of Public Health at 910.433.3600.