

Investigation of confirmed E. Coli in the Boston Avenue Weekday School and Childcare, 1301
South Boston Avenue, Tulsa, OK 74119 on May 31, 2011

Investigators:

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Oklahoma State Department of Health (OSDH) Acute Disease Service (ADS) Epidemiologist, Lacey Kovar, MPH, notified Tulsa City County Health (TCCHD) Epidemiologist Nicole Schlaefli, MPH, about a child with Hemolytic Uremic Syndrome (HUS) that was in a Tulsa area hospital, St. Francis Children's Hospital, on Sunday, May 29, 2011. Kovar explained that the child was a 19 month old female had started symptoms the week before Halloween. The child was confirmed to be in the Boston Avenue Weekday School daycare facility Monday through Friday. At the time of the call, no other members of the family were sick.

The parents of the 19 month old female were interviewed using the standard *Escherichia coli* questionnaire found in The Epidemiologic Follow-Up of Communicable Disease in Oklahoma ("The Epi Manual"). The case definition used for this investigation was provided by the Centers for Disease Control and Prevention and stated that an *Escherichia coli* (*E. Coli*) infection is defined as an infection of variable severity characterized by diarrhea (often bloody) and abdominal cramps. Diarrhea is to be categorized by ≥ 4 loose unformed stools in a 24 hour period.

Further information about the hospitalized female child, her family, and members of the daycare from the female child's mother was collected by Schlaefli. An outbreak investigation was initiated on Monday, May 30, 2011 with a call to the home of the director of Boston Avenue Weekday School, Patty Banes. Due to the Memorial Day Holiday, the daycare was closed to attendees but the director and associate director agreed to meet with TCCHD epidemiologists Nicole Schlaefli and Patrick Hilton. A summary and results of those findings are outlined in this report.

Monday morning, May 30, 2011, TCCHD Epidemiologists were made aware via the public Health Investigative Database of Disease Outbreaks (PHIDDO) that there was another *E. Coli* positive student, a 16 month old male, in the same school and the same classroom as the 19 month old hospitalized female. The 16 month old male has not been in school since May 25 when he was sent home for bloody diarrhea. The mother of the 16 month old male was called and recommendations made to keep the child and any siblings with the same symptoms at home. Mother agreed to submit stools samples for the 16 month old male and his 4 year old sister. No antibiotics had been prescribed at the time of the call.

Monday morning, May 30, 2011, the Director of Boston Avenue Weekday School, Patty Banes, was contacted in regards to the confirmed *E. Coli* case and a request was made to speak with all staff, faculty, and all parents of students especially those in the same classroom as the 19 month old female. It was found that there were a total of 18 faculty (12 full time teachers, 2 full time "floaters", and 4 part time teachers) and 4 full time staff including one full time cook. On May 31, 2011, all 18 were interviewed using the Hypothesis Generating Outbreak Questionnaire: Suspect Foodborne Source with those found to have had symptoms of diarrhea in the prior two weeks submitting stool samples. Eight stool sample kits were collected from teachers and one stool sample kit was collected from the full time cook for a total of 9 stool kits. Also on May 31, 2011, Director Banes was served with documentation stating that she agreed to comply with the investigation, agreed to close to new admissions and any new employees that were to start in the following two weeks.

An email had been sent out on May 30, 2011 to all parents of the students stating that *E. Coli* had been confirmed in two of the students in the daycare and that a TCCHD Epidemiologist would be at the facility on May 31 and June 1, morning and afternoon, to speak with them. A list was obtained from Director Banes of all students and their parents.

Packets were distributed to the parents of the students on Tuesday, May 31 and June 1, 2011 that contained a notification letter to parents that there had been two confirmed cases of *E. Coli* found in the daycare, Hypothesis Generating Outbreak Questionnaire: Suspect Foodborne Source, information about *E. Coli* and its spread. Parents were told to return the questionnaire the following day and their names were marked off the list as having received a packet. When

questionnaires were returned, they were evaluated and stool sample kit(s) were sent home for each symptomatic child or parent. A total of 18 stool kits were collected from students.

One family was unable to be interviewed and sampled because they were on vacation at the time or unable to be reached. This family had two students in the facility but neither of which was in the classroom in question. Director Banes was able to email the family and find that no one in the family was experiencing any symptoms of gastroenteritis.

An inspection of the facility kitchen was conducted by Patrick Hilton, sanitarian, for possible foodborne contamination. An interview was also conducted with the full time cook about what practices she and the teachers participated in. It was found that meals were served in a central cafeteria and snacks were distributed to students in their classrooms by teachers. Snacks were fruit, homemade cookies (made by parents), and juice boxes. The fruit was cut up into pieces and the cookies were handed out by the teachers. Teachers admitted that they did not always wash their hands between picking up toys, diapering, and food preparation.

Epidemiological investigation conducted by Nicole Schlaefli, MPH found that several of the diaper changing pads in the classroom in question had cracks on them or that they were using pillows to lay the children on, both of which could harbor bacteria and possibly be transferred from one child to another. All classrooms had rugs that were only cleaned on weekends, hard and soft toys that were only cleaned on Tuesday and Thursdays, and that there was intermingling of daycare attendees with school age children after 3pm when school age kids were dropped off for after school care. In addition, the bleach solution used in 6 of the 11 classrooms had been made earlier in the week and were found to not contain proper concentration level.

Of the 29 stool sample kits collected, only one came back positive for *E. Coli*. The positive case was in the 4 year old sister of the confirmed 16 month old male that was at home with her parents during the week he was sick and the following week. All students, teachers, or faculty that were present in the facility at the time of testing came back with negative results even though 27/27 (100%) reported abdominal cramps, 25/27 (93%) reported diarrhea, 20/27 (74%) reported nausea, 18/27 (67%) reported a fever of 101 ° F and 4/27 (15%) reported vomiting. Age range of the cases was from 15 months to 63 years.

Recommendations made from inspection results were for the kitchen to replace gaskets around the walk-in refrigerator door, and to have the kitchen worker and teachers wear gloves when preparing food. The facility was also made aware that they are not to be serving homemade baked goods and that individually packaged items should be used. The epidemiological inspection recommendations were to get new diaper changing pads without cracks, pillows be replaced with nonporous, easy to wipe down changing pads, gloves be worn during diaper changing and that they are changed between children and that bleach solutions be made fresh each morning. Bleach concentration requirements were given to the director as well as instructions for proper diaper changing and hand hygiene along with guidelines to clean the rugs daily and that hard and soft toys should be sanitized after a child has put it in their mouth or played with it.

The source of illness found in this situation was found to be *E. Coli* O157:H7. An estimated 265,000 *E. Coli* infections occur each year in the United States. *E. Coli* O157:H7 causes about 36% of these infections, and non-O157 *E. Coli* cause the rest. Public health experts rely on estimates rather than actual numbers of infections because not all *E. Coli* infections are diagnosed, for several reasons. Many infected people do not seek medical care however many of those who do seek care do not provide a stool specimen for testing. Infections start when a person gets a tiny (usually invisible) amount of human or animal feces in their mouth. Exposures that result in illness include consumption of contaminated food, consumption of unpasteurized (raw) milk, consumption of water that has not been disinfected, contact with cattle, or contact with the feces of infected people. Some foods are considered to carry such a high risk of infection with *E. coli* O157:H7 or another germ that health officials recommend that people avoid them completely. These foods include unpasteurized (raw) milk, unpasteurized apple cider, and soft cheeses made from raw milk. People have gotten infected by swallowing lake water while swimming, touching the environment in petting zoos and other animal exhibits, and by eating food prepared by people who did not wash their hands well after using the toilet.

The symptoms of *E. Coli* infections vary for each person but often include severe stomach cramps, diarrhea (often bloody), and vomiting. If a fever is present, it is usually low grade (less than 101°F). Most infections are very mild with symptoms resolving within 5–7 days. Around 5–10% of those who are diagnosed with *E. Coli* infection develop a potentially life-threatening

complication known as hemolytic uremic syndrome (HUS). Symptoms of developing HUS include decreased frequency of urination, feeling very tired, and losing pink color in cheeks and inside the lower eyelids. Persons with HUS should be hospitalized because their kidneys may stop working and they may develop other serious problems.