Outbreak of Shiga toxin-producing *Escherichia coli* O157—Southeast Kansas, 2017

Report Published: 21 September 2018

Kansas Department of Health and Environment
Division of Public Health

Background

On September 27, 2017, routine surveillance by the Kansas Department of Health and Environment's Infectious Disease Epidemiology and Response section (KDHE) identified a cluster of persons with illness caused by Shiga toxin-producing *Escherichia coli* (STEC) who reported attending a house party on September 18, 2017 in southeast Kansas. The local health department where the ill persons resided was notified, and an outbreak investigation was initiated that day.

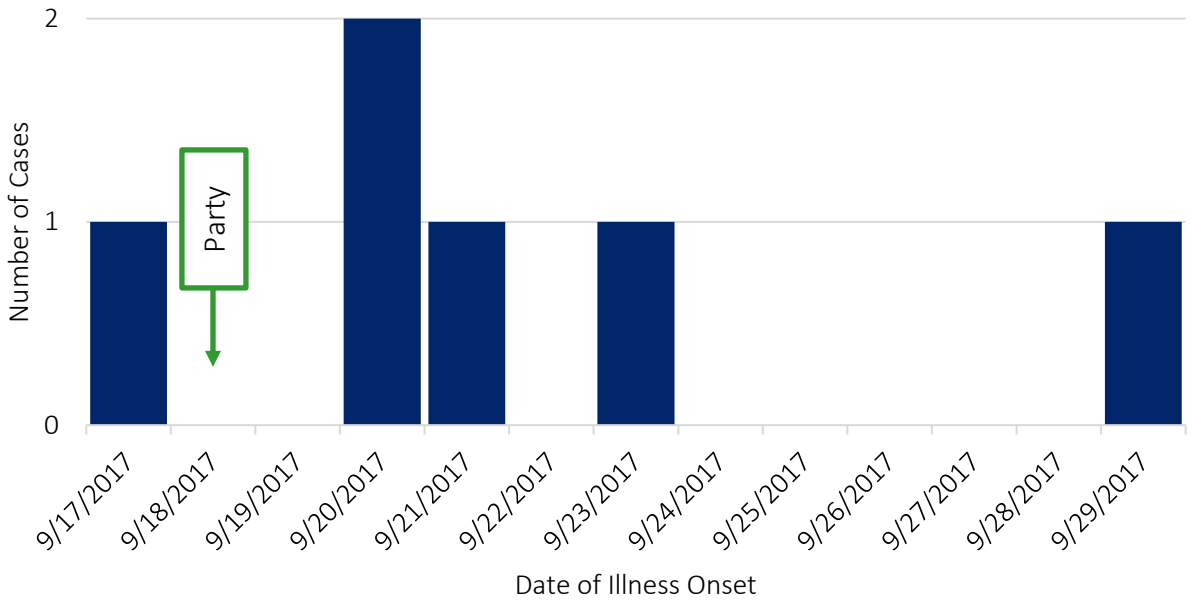
Key Investigation Findings

- A confirmed case was defined as laboratory-confirmed STEC O157 infection in a person who attended the house party, and a probable case was defined as diarrhea experienced by a party attendee within 10 days after the party.
    - Six party attendees reported illness meeting the case definition and were considered to have outbreak cases of STEC (4 confirmed cases, 2 probable).
        - Five (83%) ill persons were female, and all (100%) ill persons were under 18 years of age
        - Symptoms and outcomes reported among ill persons are detailed in Table 1. The median incubation period was 5 days (range: 3-10 days) and the median duration of illness was 5 days (range: 4-7 days). The first ill person's symptom onset was September 17, and the last person became ill on September 29 (Figure 1).
- Party attendees were interviewed about illness as well as food and activities at the party using an online questionnaire, and a cohort study was conducted to identify associations between exposures and illness.
    - Relative risk (RR) and 95% confidence intervals (CI) were calculated using SAS. An exposure was considered to be significantly associated with illness if the 95% CI for the RR did not contain 1.
    - Foods eaten at the party included smoked brisket, baked beans, macaroni and cheese, and cream puffs. Party activities included swimming in a privately-maintained, chlorinated swimming pool.
    - The mode of transmission was considered to be person-to-person, as no exposures were found to be significantly associated with illness, and at least one person with a confirmed case of STEC was ill during the party[1].

Table 1: Clinical Information Reported by Persons with Outbreak Cases of STEC

Symptom	# of Cases	% of Cases
Diarrhea	6	100
Bloody stool	3	50
Vomiting	3	50
Fever	2	33
Outcome		
Sought healthcare	6	100
Hospitalized	5	83

Figure 1. Number of Cases by Date of Illness Onset



Conclusions & Discussion

This STEC O157 outbreak was associated with attending a house party in southeast Kansas where at least one attendee was ill during the party. Four confirmed and two probable cases of STEC were identified. Five children were hospitalized; none developed hemolytic uremic syndrome (HUS) and no deaths were reported.

Multiple families with children attended the house party. Reported activities at the party included swimming in a privately-maintained, chlorinated pool and eating food provided by the hosts. No activity or food item was found to be associated with illness and no fecal incident was reported in the swimming pool, therefore transmission is considered to have been person-to-person[1].

STEC was first identified as a pathogen in 1982 and is a type of bacteria that causes disease by producing a toxin; one serotype of STEC is O157. STEC O157 accounts for approximately 36% of the 265,000 STEC infections annually in the United States, and most of the identified STEC outbreaks in the United States have been caused by STEC O157. About 20% of reported STEC cases are associated with a recognized outbreak. Infection with STEC O157 can cause serious illness characterized by severe and often bloody diarrhea. Vomiting may also be present; fever occurs less often. Symptoms occur one to ten days (usually three to five days) after exposure; duration of illness is usually about one week.[2]

STEC is spread through fecal-oral transmission. STEC lives in the intestines of cattle and other animals including deer, goats, and horses. Animals can carry the bacteria and shed it in their feces without being ill. People become exposed to STEC by having contact with infected animals or their feces, ingesting contaminated food or beverages, or coming into contact with fecal matter from other people who are infected. High risk exposures include contact with cattle, changing diapers of an infected child, and consuming unpasteurized (raw) milk, cheese, or apple cider. Outbreaks of STEC have been caused by a variety of exposures.[2]

Following these guidelines can help to prevent STEC infections:

- WASH YOUR HANDS thoroughly after using the bathroom or changing diapers and before preparing or eating food.
- WASH YOUR HANDS after contact with animals or their environments (at farms, petting zoos, fairs, your own backyard).
- COOK meats thoroughly. Ground beef and meat that has been needle-tenderized should be cooked to a temperature of at least 160°F/70˚C. It's best to use a thermometer, as color is not a very reliable indicator of "doneness."
- AVOID raw milk, unpasteurized dairy products, and unpasteurized juices (like fresh apple cider).
- AVOID swallowing water when swimming or playing in lakes, ponds, streams, swimming pools, and backyard "kiddie" pools.
- PREVENT cross contamination in food preparation areas by thoroughly washing hands, counters, cutting boards, and utensils after they touch raw meat.[2]

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1. https://www.cdc.gov/nors/downloads/guidance.pdf
2. http://www.cdc.gov/ecoli/general