

Shigellosis Outbreak Associated with
Daycare and Elementary School –
Wyandotte County, Kansas, 2016



Background

On October 25, 2016 at 1:00 PM the Wyandotte County Health Department (WCHD) notified the Infectious Disease Epidemiology and Response section at the Kansas Department of Health and Environment (KDHE) of a potential outbreak of shigellosis in Wyandotte County. Through routine surveillance WCHD identified a cluster of five cases of shigellosis among students at an elementary school and attendees at a daycare. An outbreak investigation was initiated on October 26, 2016 at 08:30 AM to determine scope of illness and appropriate measures for control and prevention.

Methods

Epidemiologic Investigation

WCHD contacted the school nurse at the elementary school and the provider at the daycare to identify any additional ill individuals. A confirmed case was defined as diarrhea and fever with laboratory evidence of *Shigella* infection between September 26, 2016 and October 23, 2016 in a person associated with the daycare or elementary school. A probable case was defined as diarrhea and fever with an epidemiologic link to a confirmed case between September 26, 2016 and October 23, 2016. The child care licensing programs at KDHE and Wyandotte County were notified of the outbreak.

Recommendations were made for the elementary school and daycare to exclude children with diarrhea, or those that tested positive for *Shigella*, until completion of 5 days of antibiotic regime and symptom free for 24 hours; in accordance with WCHD's exclusion protocol for shigellosis.

Laboratory Analysis

Four stool specimens were collected by physicians and sent to commercial laboratories for testing. Isolates were then sent to Kansas or Missouri state public health laboratories for confirmatory testing.

Results

Epidemiologic Investigation

A total of eight cases were identified, four were classified as confirmed cases. Four cases were probable, of which two were secondary transmission among family members of a confirmed case. Parents of each individual were interviewed by WCHD. All persons were residents of

Wyandotte County. Five (63%) of the cases were male, ages ranged from 2 to 16 years with a median age of 6 years.

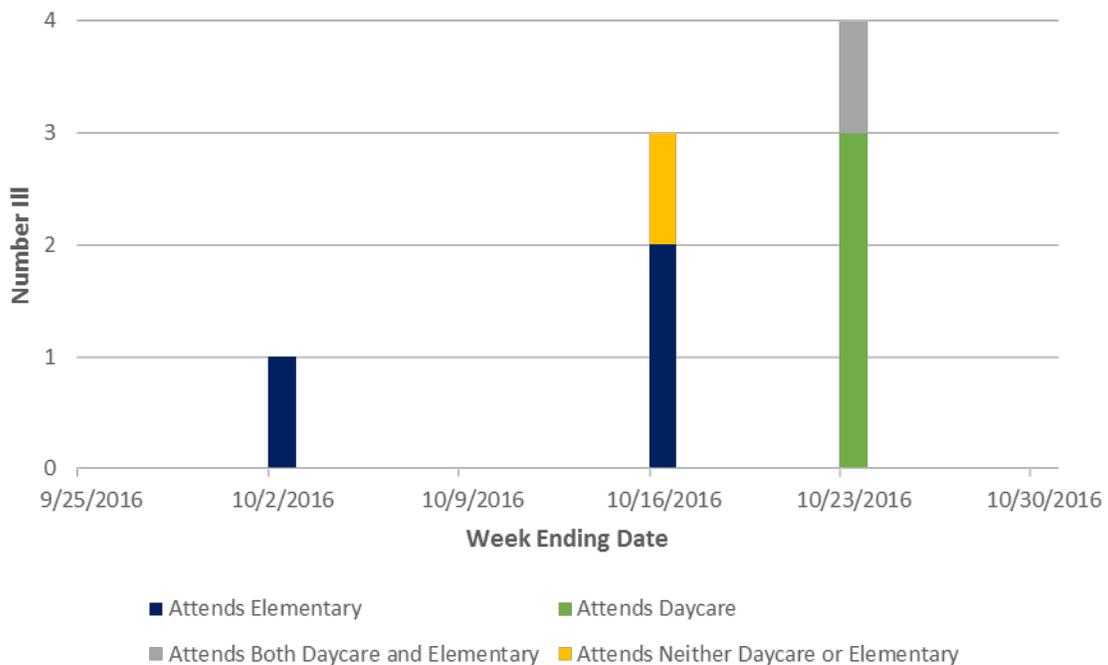
All cases experienced diarrhea, abdominal pain, and fever (Table 1). No one reported hospitalization, however, one case reported going to the emergency department and four sought medical care from a physician for their illness.

Table 1: Symptoms reported among cases (n=8)

<i>Clinical Information</i>	<i># Cases with Symptom</i>	<i># of Cases Reporting</i>	<i>% of Cases with Symptom</i>
Diarrhea	8	8	100%
Abdominal Pain	8	8	100%
Fever	8	8	100%
Fatigue	8	8	100%
Headache	4	7	57%
Nausea	2	8	25%
Bloody Stool	2	8	25%

Onset of illness ranged from September 26 to October 23, 2016 (Figure 1). Duration of illness ranged from 3 to 16 days with a median duration of 7.5 days.

Figure 1: Onset of Ill Persons by Week Ending Date and Facility, Wyandotte County, 2016 (n=8)



Laboratory Analysis

Four stool specimens were positive for *Shigella*. Kansas Health and Environmental Laboratories (KHEL) and Missouri State Public Health Laboratory confirmed three specimens as *Shigella sonnei* one specimen was not sent to a state public health laboratory.

Conclusions/Discussion

Eight cases of shigellosis were identified among attendees of one daycare and one elementary school between September 26 and October 23, 2016. *Shigella sonnei* was confirmed as the causative agent for this outbreak; four ill persons provided stool specimens that tested positive. Additionally, four ill individuals had a clinical presentation of symptoms consistent with shigellosis. Although the daycare and elementary school were associated with illness, the vehicle of transmission could not be confirmed and was most likely person-to-person.

Shigella sonnei has historically been associated with developing countries; however, there has been an increased prevalence among industrialized nations¹. This highly contagious bacteria only requires 10 to 200 organisms to cause infection. In the United States alone, there was an average of 4.82 cases of shigellosis per 100,000 individuals in 2013². Secondary attack rates can be as upwards of 40% among household or close contacts. Symptoms of shigellosis typically include diarrhea, fever, nausea, vomiting and abdominal pain. Incubation period is typically 1 to 2 days after infection by *Shigella* bacteria and may last for 5 to 7 days in persons with healthy immune systems². Many outbreaks are associated with daycares and schools with illness commonly spread among young children to family members and onward into the community. Transmission is frequently through fecal-oral route, either by consumption of fecally contaminated food or water or by direct person-to-person spread. Environmental and fomite contamination may also act as a source of infection.

The outbreak investigation was deemed over November 4, 2016, when 14 days had passed without a reported case.

Report by:

Kelly Gillespie, MPH

Kansas Department of Health and Environment

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Investigation by:

Wyandotte County Public Health Department

619 Ann Ave

Kansas City, Kansas 66101

<http://www.wycokck.org/health/>

Kansas Department of Health and Environment
Bureau of Epidemiology and Public Health Informatics
1000 SW Jackson Street, Suite 075
Topeka, Kansas 66612
<http://www.kdheks.gov/epi>

¹ *The Rising Dominance of Shigella sonnei: An Intercontinental Shift in the Etiology of Bacillary Dysentery.* **Thomas, Corinne N.** 6, s.l. : PLOS Neglected Tropical Diseases, 2015, Vol. 9.

² Centers for Disease Control and Prevention. "Shigellosis: Technical Information", Accessed on November 15, 2016 at: <http://www.cdc.gov/nczved/divisions/dfbmd/diseases/shigellosis/technical.html>.