# Norovirus Outbreak Associated with Rosehill Elementary School — Johnson County, August 2012

## Background

On August 15, 2012 the Johnson County Health Department (JCHD) was notified by the school nurse at Rosehill Elementary School in Lenexa, KS of a possible outbreak of gastrointestinal illness. JCHD contacted the Kansas Department of Health and Environment (KDHE) on the same day to report the outbreak. The initial report indicated 28 students became ill after an individual vomited in a classroom on the morning of August 13. Staff members and classmates became ill after this incident. The cases began in the 6th grade classrooms but quickly spread throughout the school.

## Methods

A case was defined as an individual who experienced diarrhea and/or vomiting from August 13 to August 27, 2012. The school nurse developed a line list of ill students and staff. Specimen collection kits were delivered to the school by JCHD. One vomitus specimen and one stool specimen were collected and shipped to the Kansas Health and Environmental Laboratories (KHEL) for testing.

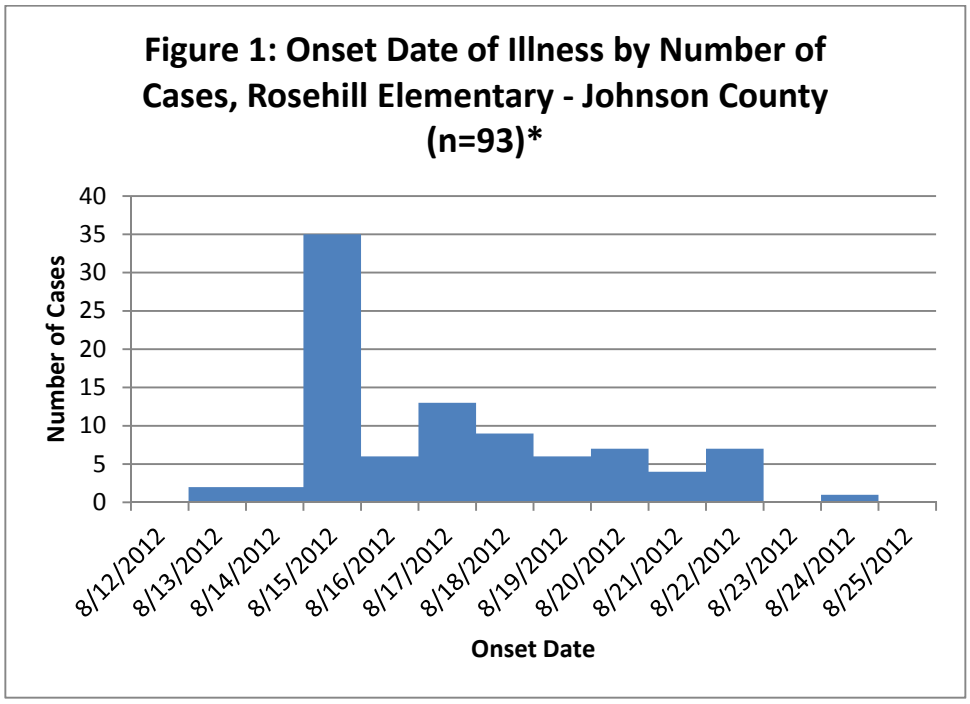
## Results

A total of 142 students and staff members reported illness; 99 met the case definition. Of the 99 cases, 16 were staff members and 83 were students. The most commonly reported symptoms included vomiting, diarrhea, and abdominal cramps (Table 1).

**Table 1: Symptoms Reported among Cases – Johnson County Gastroenteritis Outbreak Associated with Rosehill Elementary, August 2012 (n=99).**

| Symptom | # of Cases with Symptom | % of Cases |
|---|---|---|
| Vomiting | 88 | 89% |
| Diarrhea | 56 | 57% |
| Abdominal Cramps | 31 | 31% |
| Chills | 19 | 19% |
| Nausea | 14 | 14% |
| Headache | 10 | 10% |
| Fever | 6 | 6% |

Onset dates ranged from August 13 to August 24 (Figure 1). Duration of illness ranged from 1 to 6 days (median = 4 days).




**6 onset dates are unknown*

The stool specimen tested positive for norovirus by Polymerase Chain Reaction (PCR) at KHEL. The vomitus specimen tested negative.

## Conclusions

This outbreak of norovirus may have been propagated by exposure to virus particles through aerosolized vomitus, contact with contaminated environmental surfaces, and from person-to-person transmission among students and staff. Each of these routes of transmission has been previously implicated in norovirus outbreaks.[1]

Norovirus is a highly contagious pathogen with a very low infectious dose, estimated to be between 10-100 viral particles.[2] Once an individual is infected, norovirus shedding can begin prior to the onset of symptoms and can persist for weeks after clinical symptoms have ceased. Norovirus has been detected in fecal specimens 3 to 14 hours before the onset of clinical symptoms and can be detected for 13 to 56 days after exposure to the virus.[3]

Prevention measures that were implemented included excluding ill individuals and thoroughly cleaning the facility. The school decided to close on August 16 and 17 for cleaning. The use of chemical disinfectants on contaminated environmental surfaces can interrupt norovirus transmission. Particular attention should be given to the likely areas of greatest environmental contamination such as bathrooms and high-touch surfaces (e.g., door knobs and hand rails). Sodium hypochlorite (chlorine bleach) has been widely recommended to disinfect human norovirus from surfaces, and its efficacy has been well documented.[4]

The JCHD quickly initiated the investigation and delivered stool specimen kits to the school within the first 24 hours. Cooperation of the school, especially through a complete and detailed line list of ill individuals, helped to quantify the extent of the outbreak.

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[1] Centers for Disease Control and Prevention. Norovirus Outbreak in an Elementary School --- District of Columbia, February 2007. MMWR 2008;56(51):1340-1343.
[2] Teunis PFM, Moe CL, Liu P, et al. Norwalk virus: how infectious is it? J Med Virol 2008; 80:1468-76.
[3] Atmar RL, Opekum AR, Gilger MA, et al. Norwalk virus shedding after experimental human infection. Emerg Iinfect Dis 2008; 14:1553-1557.
[4] Centers for Disease Control and Prevention. Updated Norovirus Outbreak Management and Disease Prevention Guidelines. MMWR 2011:60(RR03);1-15.

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