

**Outbreak of Gastroenteritis Associated with Sullivan Elementary School
Grant County, October 2010**



Background

On October 27, 2010, the Bureau of Epidemiology and Public Health Informatics (BEPHI) at the Kansas Department of Health and Environment (KDHE) was notified of a possible gastrointestinal illness outbreak associated with the Sullivan Elementary school in Ulysses, Kansas. Initial reports indicated that 50 out of 368 students and staff were out ill with vomiting and diarrhea. The Sullivan Elementary school has grades 3rd through 5th and it was reported that the majority of ill students were in the fifth grade. In response to this complaint an investigation was initiated by Grant County Health Department (GCHD), the Kansas Department of Agriculture (KDA), and BEPHI to determine the cause of illness and to implement prevention and control measures. A paper survey was developed and sent home with the students and staff of the school.

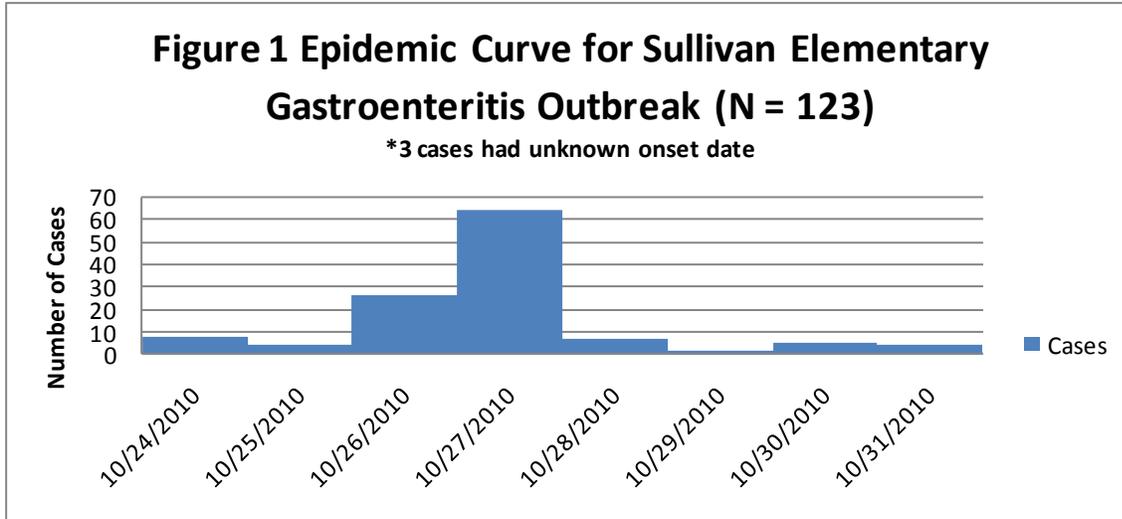
Key Findings

- A cohort study was initiated, and 298 individuals returned the survey to the school. Of those, 156 individuals reported illness and 123 met the case definition. A case is defined as an individual who works or attends the Sullivan Elementary school and experienced vomiting or diarrhea on or after October 24.
- The most commonly reported symptoms among the 123 cases were vomiting, abdominal cramps, nausea, and diarrhea (Table 1). Three individuals were unsure if they had bloody stools. Ten sought care from a healthcare provider, and two individuals reported going to the hospital.

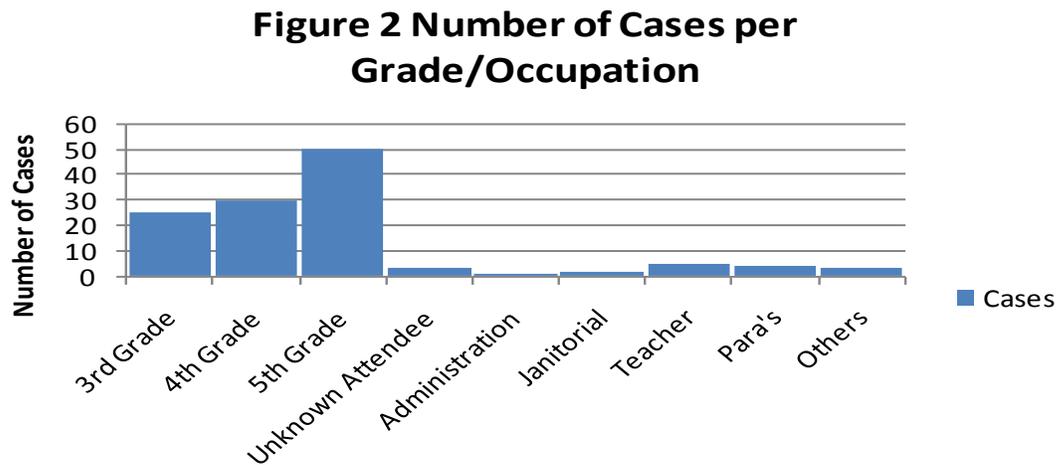
Table 1: Clinical Information of Cases

Symptoms	Number with Symptoms/ Total Reporting (%)
Vomiting	104/122 (85)
Abdominal cramps	103/122 (84)
Nausea	91/118 (77)
Diarrhea	73/121 (60)
Fever	32/120 (27)
Headache	24/45 (53)
Dizzy	9/45 (20)
Muscle aches	5/45 (11)

- Onset of illness ranged from October 24 to October 31 (Figure 1).
- Recovery date was reported by 111 individuals, and duration of illness ranged from less than one day to a maximum of 8 days with a median of 2 days.
- Ages of cases ranged from 8 - 61 years (median = 10 years) and cases were equally distributed between males and females (four cases did not report gender). A majority of the cases were in the 5th grade class (Figure 2).
- A routine inspection of the Sullivan Elementary cafeteria was conducted on October 25th and no violations were noted during the routine inspection. A follow-up inspection was not conducted but employee gastrointestinal survey forms were dropped off for cafeteria staff to complete. No cafeteria staff reported illness.
- One stool specimen from an ill individual was collected and tested positive for norovirus, genogroup I.



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Preliminary Discussion and Conclusions

This was an outbreak most likely caused by norovirus; however, the causative agent for this outbreak was not confirmed according to the Centers for Disease Control and Prevention criterion which requires two laboratory-confirmed cases to confirm a norovirus outbreak¹. It appears that some students were sick on Sunday, October 24th and some of those students returned to school on the 25th. Information regarding potential food exposures was not assessed due to time constraints. It should be noted that the school does have a salad bar that they allow the students to serve themselves. A student could have potentially contaminated the salad bar and caused the additional cases to occur. The fifth grade class is the last group scheduled to eat lunch and this class of students had the greatest occurrence of illnesses in the school. An ill individual could have also contaminated a contact surface after using the restroom and not washing their hands. No vomiting events were noted in the school on October 25th.

Norovirus is a highly contagious pathogen with a very low infectious dose, estimated to be between 10-100 viral particles². Transmitted primarily through the fecal-oral route, norovirus particles may be spread through direct contact or through consuming fecally-contaminated food or water. Spread via aerosolized

vomitus is also possible. Once 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 could be detected for 13 to 56 days after exposure to the virus³. Approximately 20% of norovirus infected individuals do not have clinical symptoms⁴. However, these individuals can still shed norovirus and can be potential sources of contamination.

Investigations of foodborne norovirus outbreaks have implicated multiple food items, including oysters, salads, sandwiches, cakes, frosting, raspberries, drinking water, and ice. The risk for contamination is increased with ready to eat foods (food items consumed without further cooking) the potential to infect many individuals is possible⁵. It is recommended to obtain food histories during outbreaks to identify the cause of illness and to make recommendations on how to prevent such illnesses.

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¹ Centers for Disease Control and Prevention. “Diagnosis and Management of Foodborne Illnesses: A Primer for Physicians and other Health Care Professionals.” MMWR 2004;53(No. RR-4).

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 Infect Dis 2008; 14: 1553-1557.

⁴ Moe CL. “Preventing Norovirus Transmission: How Should We Handle Food Handlers?” Clin Infect Dis 2009; 48: 38-40.

⁵ Centers for Disease Control and Prevention. “Norwalk-like Viruses, Public Health Consequences and Outbreak Management.” MMWR 2001; 50(RR 09): 1-18.