



**VIRAL GASTROENTERITIS OUTBREAK ATTRIBUTED TO
NOROVIRUS
OSAGE COUNTY, KANSAS
MARCH, 2005**

FINAL REPORT DATE

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REPORTED BY

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BACKGROUND

On Wednesday, March 30, 2005, the Osage County Health Department (OCHD) notified the Kansas Department of Health and Environment (KDHE) of gastrointestinal illnesses among half the students and the teacher in one classroom. The school nurse also reported that several baby chicks had been kept in the affected classroom for an unknown number of days.

METHODS

KDHE recommended OCHD construct a line list including the symptom history of all ill students, collect both human and chick stool samples for laboratory testing, and conduct a cohort study. The distance between OCHD and the school, combined with a lack of OCHD resources, prevented OCHD from leading the investigation. Instead, an epidemiologist from KDHE drove to the school and worked on-site with the school nurse, the school district nurse, and the grade school administrative staff to construct a line list of ill students. Absenteeism data was obtained from the school's records. KDHE transported stool sample collection kits to the grade school. Kansas Department of Health and Environment Laboratories tested the three stool samples that were submitted by ill students; the baby chicks were removed from the classroom before samples could be collected. The case definition was: absenteeism any time between Monday, March 28 through Monday, April 4 due to vomiting and/or diarrhea. An unconfirmed illness was defined as absenteeism during that time period due to an unspecified illness. The cohort study was deemed an inefficient use of the limited resources available.

RESULTS

Absenteeism was higher than normal from March 28 - April 4. School records indicated 70 students were absent due some sort of illness; 14 of those ill students were known to meet the case definition.

The true number of students experiencing vomiting and/or diarrhea was not known, as not every ill student was interviewed. Eleven of the 14 students that met the case definition were interviewed. All but one of these 11 (91%) reported vomiting, while 8 (73%) reported diarrhea. Symptom onset and duration was not available for many of the confirmed cases; however, three students had recovered—two reported illness duration of 24 hours, while the third reported recovery after 14.5 hours. Anecdotal evidence

indicated that students who were not interviewed had similar symptoms. Information taken from school records (Table 1.0) indicated 55 of the 70 absent students (79%) recovered within one day. Preliminary data suggested the illnesses were a result of person-to-person transmission of norovirus

The epidemic curve (Figure 1.0) generated from the line list suggested a point-source outbreak—illness histories suggested viral gastroenteritis. Contaminated ready-to-eat food has been implicated as a vehicle of viral gastroenteritis in past outbreaks; accordingly, food histories were obtained for those students that were interviewed. All students reported eating the lunch provided by the school, and no common restaurant or event exposures were reported.

The school nurse was alarmed by the number of ill students originating from a sixth grade classroom with baby chicks—chicks have previously been implicated in outbreaks of salmonellosis. The chicks belonged to a student's family, and were brought to the classroom for a learning activity beginning Monday, March 28. The chicks were removed from the school on an unknown date before Thursday, March 31. Seven of the 11 interviewed students reported contact with the chicks, including two students outside of the sixth grade. The incubation and duration of illness in those with exposure to the animals was similar to those without exposure to the animals, and not consistent with salmonellosis.

Three stool samples were submitted to KDHE Laboratories. All were positive for Norovirus—no bacterial pathogens were isolated.

CONCLUSION

The epidemic curve suggests this was a point-source outbreak of Norovirus. Despite attempts to link the ill to a common event or food, none was identified. This outbreak was most likely propagated by person-to-person transmission of Norovirus. A number of students were likely infected during the spring break period and passed the illness to their classmates upon returning to school—the apparent "point-source" of the outbreak was likely the common event of the school's re-opening.

Norovirus is the leading cause of foodborne illness in the United States; an estimated 28 million people are infected with Norovirus every year—40% of these infections may be foodborne.* Onset of diarrhea and vomiting are common 12-48 hours after infection, and may last from 12 to 60 hours. Vomiting is more prevalent in children than adults. The disease is transmitted through fecal-oral routes. Historically, Norovirus outbreaks have been associated with fecally contaminated foods, especially ready-to-eat foods such as salads, sandwiches, ice, cookies, and fruit.# Person-to-person outbreaks propagated by poor hygiene are also common.

* Mead PS. Food related illness and death in the United States. *Emerging Infectious Diseases*, 1999. 5(6):607-625.

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).

TABLE 1.0 – ILL STUDENTS BY GRADE AND DAYS ABSENT

<i>GRADE</i>	<i>ILL STUDENTS</i>		<i>DAYS ABSENT</i>	
	Unconfirmed	Confirmed	1 Day	More than 1 day*
<i>Kindergarten</i>	4	0	3	1
<i>First</i>	8	2	7	1
<i>Second</i>	8	2	6	2
<i>Third</i>	9	1	7	2
<i>Fourth</i>	8	1	6	2
<i>Fifth</i>	7	1	6	1
<i>Sixth</i>	12	7	8	4
<i>Seventh</i>	8	0	6	2
<i>Eighth</i>	6	0	6	0
TOTAL	70	14	55	15

*The median number of days absent among these 15 students was 2 days (mean=2.5 days).

**Figure 1.0 - Grade School X Absenteeism
Osage County, 2005**

