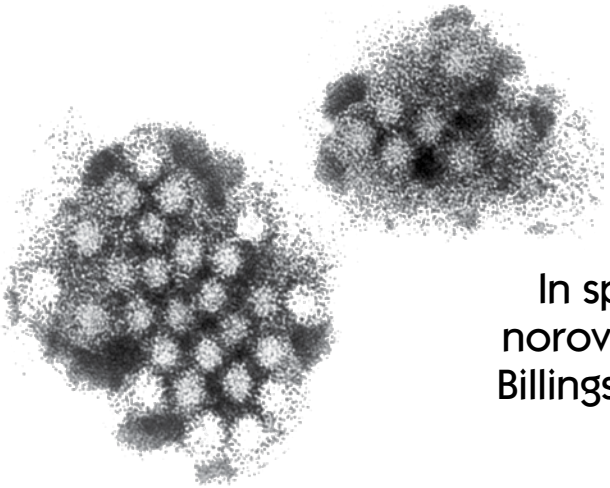

Quelling a Norovirus Outbreak

In spring 2006, the largest reported outbreak of norovirus sickened more than 1,100 people in the Billings area, particularly in long-term care facilities.

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Noroviruses cause acute gastroenteritis in humans. Symptoms typically last 24 to 60 hours and include severe diarrhea, vomiting, fatigue, fever, muscle ache, and headache. A sudden attack of diarrhea and vomiting is nobody's idea of a good time, particularly when victims report feeling worse than they have ever felt in their entire life. But among older adults, many of whom are already physically compromised, the symptoms can be especially debilitating.

Literature on noroviruses suggests that no serious long-term consequences result from them; however, long-term effects can be substantial. For some older adults, in particular, a case of norovirus might require a much longer recovery period than for their younger counterparts and may even mean the end of independent living. Local clinicians in Billings, Montana, surmise that the greater morbidity seen in the elderly is largely related to the effects of dehydration resulting from extensive vomiting and diarrhea.

A key clinical characteristic of noroviruses is their transmissibility. As few as 100 particles are needed to cause infection, which is spread primarily through the fecal-oral route. The viruses can also spread via fomite contamination or aerosolized vomit. Unfortunately, noroviruses spread easily through nursing homes and other long-term care facilities. Close contact and susceptibility to infection make their residents particularly vulnerable to norovirus infection.

Challenges beyond public health

During the spring 2006 norovirus outbreak in Billings, 1,178 cases of gasterointestinal illness were reported to Yellowstone City-County Health Department and assumed to be norovirus. Of the 102 laboratory tests performed, 80 were confirmed norovirus cases. Six care facilities and two restaurants were connected with the spread of the virus. As the outbreak progressed, laboratory testing confirmed that cases from nearly all the facilities and restaurants involved had the same norovirus strain (genotype II).

Early identification and swift intervention are crucial for preventing further transmission of noroviruses. Interventions include mass media messaging to the public as well as targeted outreach to providers and facilities about handwashing and cleaning practices.

In addition to the clinical and epidemiologic challenges typically confronted with any outbreak of infectious disease, this outbreak had economic, policy, and social consequences that affected the response. The staffing and publicity concerns of the involved restaurant and long-term care facilities, in particular, complicated the community response and facilitated the spread of the disease.

Sick workers. The wage level for the majority of employees in restaurants and long-term care facilities is at or near minimum wage. Workers typically live from paycheck to paycheck. Like many service businesses, care facilities and restaurants are rarely able to provide paid sick leave and vacation benefits for their employees. As a result, workers come to work even when they are ill.

In addition to individuals' need to work, the absence of ill workers also affects fellow workers. Montana, in general, and Billings, in particular, have low unemployment rates. Many vacancies exist for minimum-wage jobs, resulting in chronic short-staffing conditions. Calling in sick generates an additional burden on already overextended co-workers, creating another disincentive for employees to stay home when sick.

Cross-site infections. Although the linkage to an outbreak is difficult to quantify, direct care, housekeeping, and dietary staff often work at more than one long-term care facility, creating the opportunity to transmit the virus from site to site. Similarly, a single company might own or operate multiple care facilities, again creating opportunities for staff to carry the viruses from one site to the next.

Concerns about bad publicity. Another key challenge is created when outbreaks are focused in restaurants. No establishment wants negative publicity, but public education was crucial because

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The image above is an electron micrograph of norovirus, with 27-32nm-sized viral particles. Centers for Disease Control and Prevention.

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the buffet restaurant linked to the norovirus outbreak catered to seniors, providing another opportunity for rapid spread of virulent norovirus among this vulnerable population. Many seniors, for example, would enjoy a meal at the buffet and then make either direct or indirect contact with institutionalized peers, unwittingly carrying the norovirus with them.

Key intervention: Communication

To address these challenges, the Department communicated both internally among staff and externally with partner organizations, including the local hospitals, affected facilities and workers, the media, and the public in general.

Internal communication occurred primarily through an e-mail listserv, which also provided documentation of the ongoing management of the outbreak. The Department held face-to-face meetings on an as-needed basis—during peak times, two meetings a day was standard practice. E-mail allowed for rapid information sharing, but no central database existed that multiple people could access simultaneously. The Department is taking measures to create a dynamic database that can be updated as an outbreak progresses.

External communication efforts were particularly challenging. Department staff, especially public health nurses, were in constant communication with the hospitals during the outbreak. Phone calls were the most common form of contact, followed by facility site visits to interview patients and perform chart reviews. The hospitals and their affiliated providers received Health Alert Network messages, via e-mail or fax, with current recommendations and updates. Hospital staff members were also present at the meetings of the partners' Unified Health Command.

Public health nurses and sanitarians conducted site visits to the care facilities. The nurses met with the directors of nursing and reviewed charts while the sanitarians inspected the kitchen and laundry areas and reviewed cleaning procedures. Sanitarians performed the same functions at restaurants.

The long-term care facilities were often reluctant to let the Department know of new cases of norovirus because of potential negative media attention. To increase communication, Department staff stressed that reporting the outbreak was in the facilities' best interest, as timely reporting allowed for quicker identification of potential sources and quicker implementation of interventions, which resulted in fewer cases.

To reinforce **health and hygiene messages**, sanitarians worked with restaurants to educate them on the spread of norovirus and additional precautions they could take. They placed emphasis on handwashing, cleaning practices, and not allowing sick employees to come to work. Individuals who became ill were encouraged to call the Department's hotline and speak with staff to complete a case report form. Groups that had eaten at the buffet restaurant provided a contact list, and staff contacted group members directly. The Department distributed handwashing reminders and posted them at area restaurants as well as other large gathering sites such as conference and concert facilities.

The media played a key role in quelling the outbreak by conveying prevention messages and providing contact information to the public on how to report cases. During the spring 2006 outbreak, a total of 40 stories ran on norovirus, including 19 newspaper articles, 16 television stories, and 5 radio stories.

Fortunately, prior to the outbreak, Department staff had already spent time establishing a strong and credible relationship with the media. When misinformation appeared in stories or when additional information needed to reach the public, staff members were able to follow up and communicate the correct information via multiple media outlets. Staff members also monitored the newspaper's online blogs for potential rumors and to track the public's view of the Department's management of the outbreak.

Looking forward

As a follow-up to the outbreak, the Department facilitated a community meeting involving infectious disease specialists, the local media, hospital representatives, and long-term care facility medical, nursing, and administrative leaders in a successful and positively received effort to help all constituencies understand each other's perspectives and concerns.

Despite the multiple news stories focused on the outbreak, a portion of the population remained unaware of it, as evidenced by anecdotal information gathered through contact with community members. The Department is working on new ways to reach populations that might not use traditional media such as newspapers and local television stations. Information on norovirus, prevention methods, and cleaning recommendations remain available on the Department's Web site (www.ycchd.org).

Noroviruses are not likely to be eradicated through any preventive measures, and the likelihood exists that the viruses will always be present in the community. Local public health agencies play a key role in identifying the initiation, sources, and extent of an outbreak. And just as important is their role in educating the public with clinical guidelines to reduce further infection, as well as working with relevant stakeholders—many of whom have disparate or competing interests—to develop an effective community response. ■

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The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.