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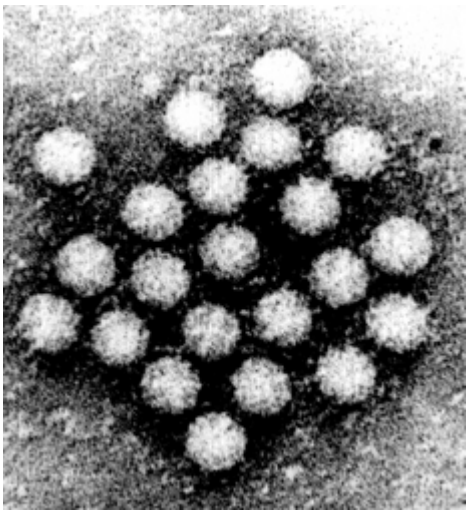
Sea Sickness: Despite cleaner cruises, diarrhea outbreaks persist

Ben Harder

Cruise ships are cleaner than they used to be, but their standard sanitation practices don't reliably wipe out the viruses behind a recent wave of diarrheal outbreaks, according to new reports from the Centers for Disease Control and Prevention (CDC) in Atlanta. Halting viral epidemics on ships may require unusually rigorous measures, such as docking stricken vessels for extreme scrub downs.

Noroviruses, or Norwalk-like viruses, spread easily through casual contact and can survive outside the body for days. In the confined spaces of ships, military camps, and overcrowded institutions, these hardy viruses often set off epidemics of diarrhea and violent vomiting. Noroviruses cause an estimated 23 million illnesses each year in the United States.



Small, round noroviruses cause many shipboard outbreaks.
National Center for Biotechnology Information

Cruise ships hosted at least 23 outbreaks of gastrointestinal illness during 2002, and noroviruses triggered more than three-quarters of those linked to a specific pathogen, says Elaine H. Cramer, a CDC consultant in Vancouver, Canada. In the Dec. 13 *Morbidity and Mortality Weekly Report*, Cramer, Marc-Alain Widdowson, and other CDC investigators describe norovirus outbreaks on five ships operated by four different companies. More than 2,000 people were sickened in these epidemics.

On three of the ships, epidemics affected several consecutive voyages, probably because viruses survived onboard despite the recommended post-outbreak procedures that were carried out between scheduled cruises. These measures range from scrubbing public spaces to sterilizing poker chips. Outbreaks caused by a norovirus struck Holland America's *Amsterdam* on four separate voyages; the epidemic abated only after the ship was sidelined for 10 days and subjected to even more aggressive cleaning.

The spate of outbreaks in 2002 departs from an overall downward trend in gastrointestinal infections at sea. In a separate study, Cramer and two of her colleagues reviewed a trove of CDC data on cleanliness and the occurrence of stomach ailments aboard cruise ships. CDC inspectors periodically board vessels and score them on hygiene.

During the 1990s, inspectors reported improper handling of water on 55 percent of inspections and of food on 62 percent. They noted violations in equipment maintenance and dishwashing procedures in 95 percent

of assessments. Half of all cruise lines nevertheless received scores deemed as passing for at least four-fifths of their inspections.

A rising percentage of cruise ships passed muster toward the end of the decade. Meanwhile, outbreak-related cases of diarrheal diseases declined from 42 per million passenger-days between 1990 and 1995 to 35 per million passenger-days later in the decade, the researchers will report in the April 2003 *American Journal of Preventive Medicine*.

HARBORING VIRUSES. Stomach illnesses affected passengers on the Fascination *and other ships during recent voyages.*
AP/Wideworld

Megan Murray, an epidemiologist at Harvard University, cautions that general public health efforts, for example the reduction of salmonella bacteria in eggs, may explain the 1990s decline of intestinal ills on ships.

Since most of the recent outbreaks haven't been associated with food or water, proper handling of provisions may not avoid norovirus infections, says Cramer.

Once the viruses sneak on board, they don't require lapses in hygiene to spread, so "even ships with extremely high sanitation scores are going to be susceptible to norovirus [outbreaks]," says the CDC's Widdowson.

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