

Norovirus Outbreaks and Prevention

While the arrival of the winter months brings cold weather, it also brings greater norovirus transmission. Noroviruses are the most common cause of vomiting and diarrhea from inflammation of the stomach and intestines. Although sometimes referred to as the “stomach flu”, noroviruses are not related to the flu which is caused by the influenza virus. Noroviruses are very contagious and cause thousands of outbreaks each year in the United States. The best way to stay protected from noroviruses is to frequently wash your hands with soap and water for at least 20 seconds and be aware of the increased risk in the winter months.

Did You Know?

- Each year in the United States noroviruses cause an estimated 19-21 million illnesses and 900 deaths, mostly among adults aged 65 and older
- Children under 5 years old and adults 85 years and older are more likely to have an outpatient or emergency department visit due to norovirus infection
- On average there are about 2,500 norovirus outbreaks reported each year in the United States
- From 2020-2023 Michigan had the 8th highest amount of norovirus outbreaks with 292 reported

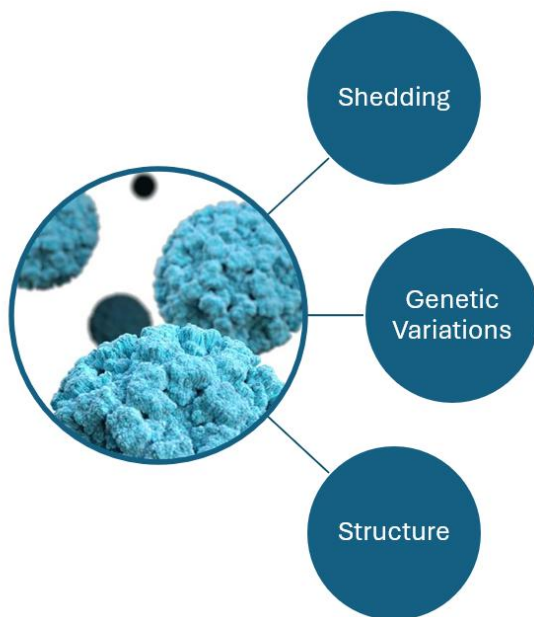
Single-State Outbreaks of Norovirus from 2020-2023



Sources: [BEAM Dashboard | CDC](#)
[Norovirus Facts and Stats | Norovirus | CDC](#)

Why are Noroviruses so Contagious?

Noroviruses infect humans using the fecal-oral pathway. This means that infected people shed the virus in their stool and vomit which can then contaminate food, water, and surfaces. People then become infected with norovirus when they consume contaminated food or water, put their hand in their mouth after touching a contaminated surface or object, or by being in close contact with someone who is infected. Noroviruses have several characteristics that give them better opportunities to spread throughout the infection pathway. These characteristics are ultimately why norovirus outbreaks are so common.



Norovirus Characteristics

- Once infected with a norovirus, you shed billions of norovirus particles, and it only takes a few particles to make someone else sick. You are most contagious when you have symptoms like diarrhea and vomiting. However, studies have shown you can still spread norovirus for two weeks or more after you feel better.
- There are many different types of noroviruses, and infection from one type might not protect you against others. This is because there are genetic differences that make them different enough from each other to not be recognized by your immune system. Additionally, it is not known exactly how long protection from noroviruses lasts after infection.
- Noroviruses are a very small resilient virus that can remain infectious on surfaces and objects for days to weeks. Additionally, noroviruses are resistant to heat, cold, and many disinfectants. Washing hands with soap and water is the most effective way to prevent norovirus since alcohol-based sanitizers are not very effective.

Sources: [Norovirus infection - Symptoms & causes - Mayo Clinic](#)
[How Norovirus Spreads | Norovirus | CDC](#)

Norovirus Outbreaks

Putting together all those characteristics it's clear how easily norovirus can spread, and why there are thousands of norovirus outbreaks annually in the United States. Norovirus outbreaks are defined as an occurrence of two or more similar illnesses resulting from a common exposure that is either suspected or laboratory-confirmed to be caused by norovirus. While the threshold for an outbreak is just two related cases, past norovirus outbreaks have had hundreds of people involved. Norovirus outbreaks can occur in almost any setting, but some are at a greater risk of developing an outbreak as shown below.

Hospitals and Long-term Care Facilities	Restaurants and Catered Events	Schools and Childcare Centers	Cruise Ships
<ul style="list-style-type: none"> Over half of all norovirus outbreaks in the United States occur in this setting Patients, staff, visitors or foods could all be potential sources of introduction Norovirus can be more severe in older adults and those who are already ill 	<ul style="list-style-type: none"> Norovirus is the leading cause of outbreaks from contaminated food in the United States Infected food handlers are often the source Contamination of food can also occur at the source <ul style="list-style-type: none"> Example: oysters harvested from contaminated water or fruits/vegetables sprayed with contaminated water 	<ul style="list-style-type: none"> Schools, childcare centers, colleges, and universities can experience long lasting outbreaks that require closures to contain the outbreak Close quarters, shared spaces, and high-touch surfaces make it easy for noroviruses to spread in these settings 	<ul style="list-style-type: none"> Norovirus is responsible for over 90% of outbreaks of diarrheal disease on cruiseships Close living quarters, shared dining areas, and rapid turnover of passengers make controlling norovirus outbreaks on cruise ships very challenging

Source: [Norovirus Outbreaks | Norovirus | CDC](#)

Case Study: Norovirus Outbreak in The Grand Canyon National Park

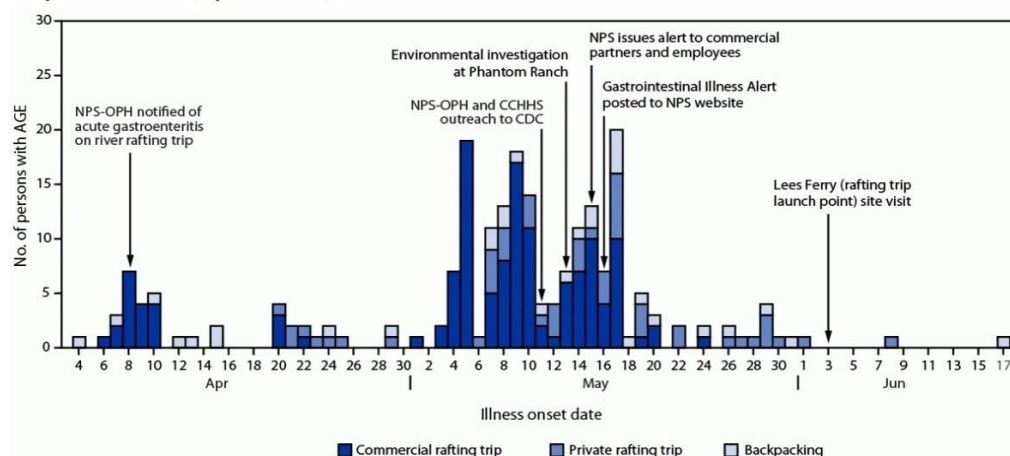
Background

From April through October commercially operated river rafting trips are allowed within the Grand Canyon. Due to the close person to person contact and decreased access to hand hygiene during these trips, norovirus is highly transmissible. During the 2022 season, the largest outbreak of acute gastroenteritis (AGE) was documented in the Grand Canyon National Park backcountry.

Timeline

- April 8th:** National Parks Services (NPS) Office of Public Health (OPH) was notified of a rafting group with seven people experiencing vomiting or diarrhea.
- May 11th:** Following more reports of AGE from the last nine rafting trips, OPH contacted the CDC, and an investigation was later initiated.
- May 16th:** NPS posted multiple AGE alerts on their website to inform and educate park goers and staff. Norovirus infection prevention and control actions then took place. This included: screening and exclusion of ill-person from rejoining rafting trips, strict precautions for food storage and preparation, and increased hand washing with soap and water.
- June 17th:** Last date of reported AGE, and a total of at least 222 rafters and backpackers became infected.

FIGURE. Number of persons with acute gastroenteritis among rafters and backpackers (N = 222*), by illness onset date – Grand Canyon National Park, April 1–June 17, 2022



Source: [Outbreak of Acute Gastroenteritis Among Rafters and Backpackers in the Backcountry of Grand Canyon National Park, April–June 2022 | MMWR](#)

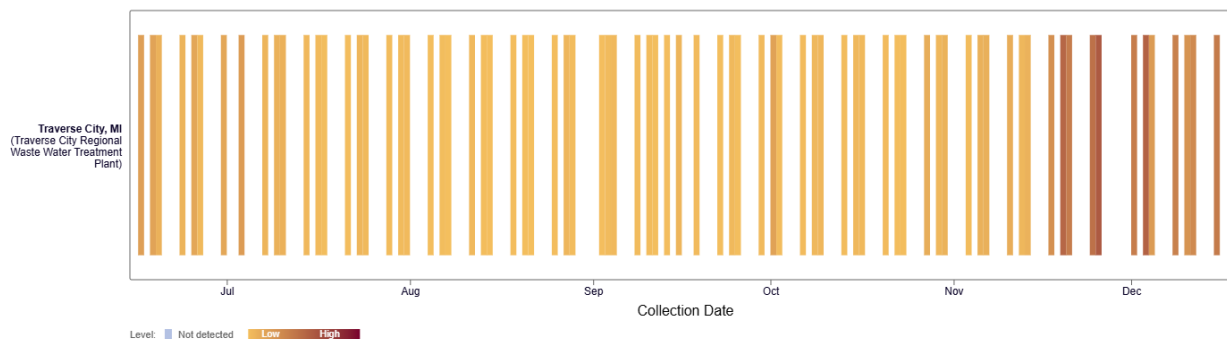
Conclusion

After the events had occurred, investigators were able to test pooled portable toilet specimens from 9 affected trips and found norovirus in all nine specimens. This case highlights how contagious norovirus is and how easily it can spread from person to person and even from trip to trip. Additionally, after awareness of the situation and education to increase hand washing was shared, cases decreased as shown in the graph. This shows that with awareness and proper prevention methods norovirus can be limited.

Outlook in Grand Traverse County

While Grand Traverse County is more isolated than many urban counties, it is not immune to the seasonal spikes in norovirus. One useful tool that Grand Traverse County has to monitor norovirus levels is the wastewater surveillance system. Recently higher amounts of norovirus are being detected in the wastewater as shown by the darker color bars in late November and early December in the heat map below. Awareness of this rise in norovirus is necessary to reinforce frequent hand washing with soap and water, and to regularly disinfect high touch surfaces with the proper cleaning product. The impact of noroviruses can be limited with awareness and proper infection control practices.

Norovirus, Traverse City, MI



Source: [WastewaterSCAN Dashboard](#)

FAQ

Q: Which cleaning products work against noroviruses?

A: A solution of ¾ cup household bleach to 1 gallon of water is effective at killing noroviruses when sprayed and left on surfaces for at least five minutes. The EPA also has a list of commercial products that are registered to be effective against noroviruses that can be found in the links below. For a step-by-step process for cleaning up vomit or diarrhea, see the attached video in the links below.

[How to Prevent Norovirus | Norovirus | CDC](#)

[EPA's Registered Antimicrobial Products Effective Against Norovirus \(feline calicivirus\) \[List G\] | US EPA](#)

[Clean Up After Someone with Norovirus Vomits or has Diarrhea](#)

Q: Can norovirus spread through the air?

A: It is possible for tiny droplets of vomit with noroviruses to spray through the air and land on surfaces or enter another person's mouth. While noroviruses are primarily transmitted through contaminated surfaces and direct contact, airborne transmission remains a possibility. This is also why it is recommended to wear a mask while cleaning up vomit or diarrhea.

[How Norovirus Spreads | Norovirus | CDC](#)

Q: Is there a vaccine for norovirus?

A: There currently is not a licensed vaccine for noroviruses. One of the major challenges in developing a vaccine for noroviruses is the genetic differences between different strains. Due to the many different variations in noroviruses, a vaccine for one strain wouldn't necessarily provide protection against another. Also, due to the rise in new strains of noroviruses, existing vaccines would need to be modified to provide protection against new strains. Currently the best methods to protect against noroviruses are hand washing with soap and water and disinfecting surfaces with appropriate cleaning products.

[Advances in Norovirus Biology - PMC](#)