**Holiday Warning - Touching Canterbury Rivers is becoming Increasingly Dangerous**

Testing of water samples from Canterbury’s Ashley, Selwyn and Rangitata rivers has revealed the presence of the disease-causing STEC bacteria and anti-biotic resistant E. coli.

The samples were collected at two sites on each of the three rivers on 14 May 2018 and 25 September 2018.

The independent testing of the samples was conducted by Massey University’s Institute of Agriculture and Environment.

An explanation of what STEC and E. coli is can be found on the Ministry of Health website <https://www.health.govt.nz/your-health/conditions-and-treatments/diseases-and-illnesses/food-and-water-borne-diseases/escherichia-coli-ecoli>

A detailed explanation is also available on the Atlanta-based Centres for Disease Control and Prevention website.

Below is a Question and Answer explanation from the CDC website.

# Questions and Answers

Escherichia coli (E. coli) bacteria normally live in the intestines of people and animals. Most E. coli are harmless and actually are an important part of a healthy human intestinal tract. However, some E. coli are pathogenic, meaning they can cause illness, either diarrhea or illness outside of the intestinal tract. The types of E. coli that can cause diarrhea can be transmitted through contaminated water or food, or through contact with animals or persons.

E. coli consists of a diverse group of bacteria. Pathogenic E. coli strains are categorized into pathotypes. Six pathotypes are associated with diarrhea and collectively are referred to as diarrheagenic E. coli.

* Shiga toxin-producing E. coli (STEC)—STEC may also be referred to as Verocytotoxin-producing E. coli (VTEC) or enterohemorrhagic E. coli (EHEC). This pathotype is the one most commonly heard about in the news in association with foodborne outbreaks.
* [Enterotoxigenic E. coli (ETEC)](https://www.cdc.gov/ecoli/etec.html)
* Enteropathogenic E. coli (EPEC)
* Enteroaggregative E. coli (EAEC)
* Enteroinvasive E. coli (EIEC)
* Diffusely adherent E. coli (DAEC)

### What are Escherichia coli?collapse

Escherichia coli (abbreviated as E. coli) are a large and diverse group of bacteria. Although most strains of E. coli are harmless, others can make you sick. Some kinds of E. coli can cause diarrhea, while others cause urinary tract infections, respiratory illness and pneumonia, and other illnesses. Still other kinds of E. coli are used as markers for water contamination—so you might hear about E. coli being found in drinking water, which are not themselves harmful, but indicate the water is contaminated. It does get a bit confusing—even to microbiologists.

### What are Shiga toxin-producing E. coli (STEC)?collapse

Some kinds of E. coli cause disease by making a toxin called Shiga toxin. The bacteria that make these toxins are called “Shiga toxin-producing” E. coli, or STEC for short. You might hear these bacteria called verocytotoxic E. coli (VTEC) or enterohemorrhagic E. coli (EHEC); these all refer generally to the same group of bacteria. The strain of Shiga toxin-producing E. coli O104:H4 that caused a large outbreak in Europe in 2011 was frequently referred to as EHEC. The most commonly identified STEC in North America is E. coli O157:H7 (often shortened to E. coli O157 or even just “O157”). When you hear news reports about outbreaks of “E. coli” infections, they are usually talking about E. coli O157.

In addition to E. coli O157, many other kinds (called serogroups) of STEC cause disease. Other E. coli serogroups in the STEC group, including E. coliO145, are sometimes called "non-O157 STECs." Currently, there are limited public health surveillance data on the occurrence of non-O157 STECs, including STEC O145; many STEC O145 infections may go undiagnosed or unreported.

Compared with STEC O157 infections, identification of non-O157 STEC infections is more complex. First, clinical laboratories must test stool samples for the presence of Shiga toxins. Then, the positive samples must be sent to public health laboratories to look for non-O157 STEC.  Clinical laboratories typically cannot identify non-O157 STEC. Other non-O157 STEC serogroups that often cause illness in people in the United States include O26, O111, and O103. Some types of STEC frequently cause severe disease, including bloody diarrhea and hemolytic uremic syndrome (HUS), which is a type of kidney failure.

### Are there important differences between E. coli O157 and other STEC?collapse

Most of what we know about STEC comes from studies of E. coli O157 infection, which was first identified as a pathogen in 1982. Less is known about the non-O157 STEC, partly because older laboratory practices did not identify non-O157 infections. As a whole, the non-O157 serogroups are less likely to cause severe illness than E. coli O157, though sometimes they can. For example, E. coli O26 produces the same type of toxins that E. coliO157 produces, and causes a similar illness, though it is typically less likely to lead to kidney problems (called hemolytic uremic syndrome, or HUS).

### Who gets STEC infections?collapse

People of any age can become infected. Very young children and the elderly are more likely to develop severe illness and hemolytic uremic syndrome (HUS) than others, but even healthy older children and young adults can become seriously ill.

### What are the symptoms of STEC infections?collapse

The symptoms of STEC infections vary for each person but often include severe stomach cramps, diarrhea (often bloody), and vomiting. If there is fever, it usually is not very high (less than 101˚F/less than 38.5˚C). Most people get better within 5–7 days. Some infections are very mild, but others are severe or even life-threatening.

### What is hemolytic uremic syndrome (HUS), a complication of STEC infections?collapse

Around 5–10% of those who are diagnosed with STEC infection develop a potentially life-threatening complication known as hemolytic uremic syndrome (HUS). Clues that a person is developing HUS include decreased frequency of urination, feeling very tired, and losing pink color in cheeks and inside the lower eyelids. Persons with HUS should be hospitalized because their kidneys may stop working and they may develop other serious problems. Most persons with HUS recover within a few weeks, but some suffer permanent damage or die.

### How soon do symptoms appear after exposure?collapse

The time between ingesting the STEC bacteria and feeling sick is called the “incubation period.” The incubation period is usually 3-4 days after the exposure, but may be as short as 1 day or as long as 10 days. The symptoms often begin slowly with mild belly pain or non-bloody diarrhea that worsens over several days. HUS, if it occurs, develops an average 7 days after the first symptoms, when the diarrhea is improving.

### Where do STEC come from?collapse

STEC live in the guts of ruminant animals, including cattle, goats, sheep, deer, and elk. The major source for human illnesses is cattle. STEC that cause human illness generally do not make animals sick. Other kinds of animals, including pigs and birds, sometimes pick up STEC from the environment and may spread it.

### How are these infections spread?collapse

Infections start when you swallow STEC—in other words, when you get tiny (usually invisible) amounts of human or animal feces in your mouth. Unfortunately, this happens more often than we would like to think about. Exposures that result in illness include consumption of contaminated food, consumption of unpasteurized (raw) milk, consumption of water that has not been disinfected, contact with cattle, or contact with the feces of infected people. Some foods are considered to carry such a high risk of infection with E. coli O157 or another germ that health officials recommend that people avoid them completely. These foods include unpasteurized (raw) milk, unpasteurized apple cider, and soft cheeses made from raw milk. Sometimes the contact is pretty obvious (working with cows at a dairy or changing diapers, for example), but sometimes it is not (like eating an undercooked hamburger or a contaminated piece of lettuce). People have gotten infected by swallowing lake water while swimming, touching the environment in petting zoos and other animal exhibits, and by eating food prepared by people who did not wash their hands well after using the toilet. Almost everyone has some risk of infection.

### What is the best treatment for STEC infection?collapse

Non-specific supportive therapy, including hydration, is important. Antibiotics should not be used to treat this infection. There is no evidence that treatment with antibiotics is helpful, and taking antibiotics may increase the risk of HUS. Antidiarrheal agents like Imodium® may also increase that risk.

### How can STEC infections be prevented?collapse

* WASH YOUR HANDS thoroughly after using the bathroom or changing diapers and before preparing or eating food. WASH YOUR HANDS after contact with animals or their environments (at farms, petting zoos, fairs, even your own backyard).
* COOK meats thoroughly. Ground beef and meat that has been needle-tenderized should be cooked to a temperature of at least 160°F/70˚C. It’s best to use a thermometer, as color is not a very reliable indicator of “doneness.”
* AVOID raw milk, unpasteurized dairy products, and unpasteurized juices (like fresh apple cider).
* AVOID swallowing water when swimming or playing in lakes, ponds, streams, swimming pools, and backyard “kiddie” pools.
* PREVENT cross contamination in food preparation areas by thoroughly washing hands, counters, cutting boards, and utensils after they touch raw meat. To learn more about how to protect yourself from E. coli, see CDC’s feature, [E. coli Infection](https://www.cdc.gov/features/ecoliinfection/index.html).