

# This is an official **CDC Health Advisory**

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## **Notice to Health Care Providers — Shiga Toxin-producing *E. coli* O104 (STEC O104:H4) Infections in U.S. Travelers Returning from Germany**

CDC is monitoring a large outbreak of Shiga toxin-producing *Escherichia coli* O104:H4 (STEC O104:H4) infections ongoing in Germany. The responsible strain shares virulence characteristics with enteroaggregative *E. coli* (EAEC). As of May 31, 2011, the Robert Koch Institute (RKI) reported 470 patients with hemolytic uremic syndrome, or HUS (a severe condition associated with STEC infection that can lead to kidney failure), and nine deaths. The strain of STEC that is causing this illness, STEC O104:H4 is very rare. The illness that it causes is similar to that caused by *E. coli* O157:H7 or STEC O157:H7, which is also a Shiga toxin-producing *E. coli*.

CDC is not aware of any cases of STEC O104:H4 infection ever being previously reported in the United States. However, as of May 31, 2011, three cases of HUS in the United States have been reported in persons who recently traveled to Hamburg, Germany. CDC is working with state health departments to learn more about these suspected cases and obtain bacterial isolates for further characterization.

CDC has recommended that any person who has recently traveled to Germany and has signs or symptoms of STEC infection, or HUS, should seek medical care and let the medical provider know about the outbreak of STEC infections in Germany and the importance of being tested for STEC infection.

Symptoms of STEC infection include severe stomach cramps, diarrhea (which is often bloody) and vomiting. If there is fever, it usually is not very high. Most people get better within 5–7 days, but some patients go on to develop HUS, usually about a week after the diarrhea starts. The classic triad of findings in HUS is acute renal damage, microangiopathic hemolytic anemia (evidence of schistocytes and helmet cells on peripheral blood smear), and thrombocytopenia.

It is not recommended to give antibiotics to patients with suspected STEC infections until complete diagnostic testing can be performed and STEC infection is ruled out. Some studies have shown that administering antibiotics in patients with STEC infections might increase their risk of developing HUS. However, clinical decision making must be tailored to each individual patient. There may be indications for antibiotics in patients with severe intestinal inflammation if perforation is of concern. Of note, isolates of STEC O104:H4 from patients in Germany have demonstrated resistance to multiple antibiotics.

Guidelines to ensure as complete as possible detection and characterization of STEC infections include the following:

- All stools submitted for testing from patients with acute community-acquired diarrhea should be cultured for STEC O157:H7. These stools should be simultaneously assayed for non-O157 STEC with a test that detects the Shiga toxins or the genes encoding these toxins.
- Clinical laboratories should report and send *E. coli* O157:H7 isolates and Shiga toxin-positive samples to state or local public health laboratories as soon as possible for additional characterization.
- Specimens or enrichment broths in which Shiga toxin or STEC are detected, but from which O157:H7 STEC isolates are not recovered, should be forwarded as soon as possible to a state or local public health laboratory so that non-O157:H7 STEC can be isolated.
- It is often difficult to isolate STEC in stool by the time a patient presents with HUS. Immunomagnetic separation (IMS) has been shown to increase recovery of STEC from HUS

patients. For any patient with HUS without a culture-confirmed STEC infection, stool can be sent to a public health laboratory that performs IMS or to the CDC (through a state public health laboratory). In addition, serum can be sent to CDC (through a state public health laboratory) for serologic testing of common STEC serogroups.

The benefits of adhering to the recommended testing strategy include early diagnosis, improved patient outcome, and detection of all STEC serotypes.

All patients with Shiga toxin-positive diarrheal illness or HUS should be reported to health departments, regardless of a travel history to Germany.

**For more information:**

[http://www.rki.de/EN/Home/homepage\\_node.html](http://www.rki.de/EN/Home/homepage_node.html)

[http://www.rki.de/cln\\_109/nn\\_217400/EN/Home/EHEC\\_O104\\_H4,templateId=raw,property=publicationFile.pdf/EHEC\\_O104\\_H4.pdf](http://www.rki.de/cln_109/nn_217400/EN/Home/EHEC_O104_H4,templateId=raw,property=publicationFile.pdf/EHEC_O104_H4.pdf)

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