
Multistate Outbreak of Shiga toxin-producing *Escherichia coli* O121 Infections Linked to Flour

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What's New?

- On July 1, 2016, General Mills expanded its recall to include additional lots of Gold Medal Flour, Signature Kitchens Flour, and Gold Medal Wondra Flour. A list of all the recalled flours and how to identify them is available on the Advice to Consumers page.
- Shiga toxin-producing *Escherichia coli* (STEC O121) was isolated from samples of General Mills flour collected from the homes of ill people in Arizona, Colorado, and Oklahoma.
- Four more ill people have been reported from four states. The most recent illness started on June 8, 2016. One new state, Indiana, has been added to the list of states with ill people.

Highlights

- **Read the Recall & Advice to Consumers, Restaurants, and Retailers>>**
(<http://www.cdc.gov/ecoli/2016/o121-06-16/advice-consumers.html>)
- CDC, multiple states, and the U.S. Food and Drug Administration (FDA) are investigating a multistate outbreak of Shiga toxin-producing *Escherichia coli* O121 (STEC O121) infections.
(<http://www.cdc.gov/ecoli/general/index.html>)
- Forty-two people infected with the outbreak strain of STEC O121 have been reported from 21 states.
- Eleven ill people have been hospitalized. No one has developed hemolytic uremic syndrome, a type of kidney failure, and no deaths have been reported.
- Epidemiologic, laboratory, and traceback evidence indicate that flour produced at the General Mills facility in Kansas City, Missouri is a likely source of this outbreak.
- On May 31, 2016, General Mills recalled (<http://www.generalmills.com/flour>) several sizes and varieties of Gold Medal Flour, Gold Medal Wondra Flour, and Signature Kitchens Flour due to possible *E. coli* contamination.

- In late June 2016, FDA isolated STEC O121 from samples of General Mills flour collected from the homes of ill people in Arizona, and Oklahoma. The flour collected in Oklahoma was not included in the initial General Mills recall.
- In response to these laboratory findings, on July 1, 2016 General Mills expanded the recall (<http://www.generalmills.com/flour>) to include additional lots of flour under the same brands from the initial recall.
- In early June, FDA laboratory testing isolated the outbreak strain of STEC O121 from an open sample of General Mills flour collected from the home of an ill person in Colorado. The flour came from a lot included in the initial recall.
- A list of the recalled flours and how to identify them is available on the Advice to Consumers page.
- CDC recommends that consumers, restaurants, and retailers do not use, serve, or sell the recalled flours.
- Do not eat raw dough or batter, whether made from recalled flour or any other flour. Flour or other ingredients used to make raw dough or batter might be contaminated.
 - Consumers should bake items made with raw dough or batter before eating them. Do not taste raw dough or batter.
 - Restaurants and retailers should not serve raw dough to customers or allow children and other guests to play with raw dough.
- This investigation is ongoing, and we will update the public when more information becomes available.

July 1, 2016

Case Count Update

Since the last update on June 1, 2016, four more ill people have been reported from four states.

As of June 28, 2016, 42 people infected with the outbreak strain of STEC O121 have been reported from 21 states. A list of states and the number of cases in each can be found on the [Case Count Map page](#).

Illnesses started on dates ranging from December 21, 2015 to June 8, 2016. Ill people range in age from 1 year to 95, with a median age of 18. Eighty-one percent of ill people are female. Eleven ill people have been hospitalized. No one has developed hemolytic uremic syndrome, a type of kidney failure, and no deaths have been reported.

This outbreak can be illustrated with a chart showing the number of people who became ill each day. This chart is called an epidemic curve or epi curve. Illnesses that occurred after June 2, 2016, might not yet be reported due to the time it takes between when a person becomes ill and when the illness is reported to CDC. This takes an average of 2 to 3 weeks. Please see the [Timeline for Reporting Cases of *E. coli*O157 Infection](#) for more details.

Investigation Update

In June 2016, laboratory testing by the U.S. Food and Drug Administration (FDA) (<http://www.fda.gov/Food/RecallsOutbreaksEmergencies/Outbreaks/ucm504192.htm>) isolated STEC O121 from samples of General Mills flour collected from the home of an ill person in Oklahoma. The STEC O121 isolated from the flour sample has the same PFGE pattern, or DNA fingerprint, as the outbreak strain. The flour collected in Oklahoma was not included in the initial General Mills recall.

In the same month, FDA identified STEC O121 in an open sample of General Mills flour collected from the homes of ill people in Colorado and Arizona. Whole genome sequencing (WGS) showed that the STEC O121 isolates from the flour samples were closely related genetically to the STEC O121 isolates from ill people. The flour sample that was tested came from lots of flour included in the initial recall announced by General Mills.

On July 1, 2016, General Mills expanded the recall to include some flours sold under the same brand names included in the initial recall: Gold Medal Flour, Gold Medal Wondra Flour, and Signature Kitchens Flour. CDC recommends that consumers, restaurants, and retailers do not use, serve, or sell the recalled flours.

The investigation is ongoing. CDC will update the public when more information becomes available.

▼ Initial Announcement

June 1, 2016

CDC is collaborating with public health and regulatory officials in multiple states and the U.S. Food and Drug Administration (FDA) (<http://www.fda.gov/Food/RecallsOutbreaksEmergencies/Outbreaks/ucm504192.htm>) to investigate a multistate outbreak of Shiga toxin-producing *Escherichia coli*O121 (STEC O121) infections.

Public health investigators are using the [PulseNet \(http://wwwdev.cdc.gov/pulsenet/index.html\)](http://wwwdev.cdc.gov/pulsenet/index.html) system to identify illnesses that may be part of this outbreak. PulseNet, coordinated by CDC, is the national subtyping network of public health and food regulatory agency laboratories. PulseNet performs DNA fingerprinting on STEC bacteria isolated from ill people by using techniques called [pulsed-field gel electrophoresis](#) (PFGE) and [whole genome sequencing](#) (WGS). CDC PulseNet manages a national database of these DNA fingerprints to identify possible outbreaks.

Thirty-eight people infected with the outbreak strain of STEC O121 have been reported from 20 states. A list of the states and the number of cases in each can be found on the [Case Count Map page](#). WGS showed that isolates from ill people are closely related genetically. This close genetic relationship means that people in this outbreak are more likely to share a common source of infection.

Illnesses started on dates ranging from December 21, 2015 to May 3, 2016. Ill people range in age from 1 year to 95, with a median age of 18. Seventy-eight percent of ill people are female. Ten ill people have been hospitalized. No one has developed hemolytic uremic syndrome, a type of kidney failure, and no deaths have been reported.

This outbreak can be illustrated with a chart showing the number of people who became ill each day. This chart is called an [epidemic curve or epi curve](#). Illnesses that occurred after May 5, 2016, might not yet be reported due to the time it takes between when a person becomes ill and when the illness is reported. This takes an average of 2 to 3 weeks. Please see the [Timeline for Reporting Cases of *E. coli* O157:H7 Infection](#) for more details.

Investigation of the Outbreak

Collaborative investigative efforts of state, local, and federal health and regulatory officials indicate that flour produced at General Mills' Kansas City, Missouri facility is a likely source of this outbreak. This investigation is ongoing.

In interviews, ill people answered questions about the foods they ate and other exposures in the week before they became ill. Sixteen (76%) of 21 people reported that they or someone in their household used flour in the week before they became ill. Nine (41%) of 22 people reported eating or tasting raw homemade dough or batter. Twelve (55%) of 22 people reported using Gold Medal brand flour. Three ill people reported eating or playing with raw dough at restaurants.

In an epidemiologic investigation, investigators compared the responses of ill people in this outbreak to those of people of similar age and gender reported to state health departments with other illnesses. Preliminary results of this investigation indicate an association between STEC O121 infection and someone in the household using Gold Medal brand flour to make something to eat.

Federal and state and local regulatory officials performed traceback investigations using package information collected from ill people and records collected from restaurants where ill people were exposed to raw dough. These investigations indicated that the flour used by ill people or used in restaurant locations was produced in the same week in November 2015 at the General Mills facility in Kansas City, Missouri. General Mills produces Gold Medal brand flour.

On May 31, 2016, General Mills recalled (<http://www.generalmills.com/flour>) several sizes and varieties of Gold Medal Flour, Gold Medal Wondra Flour, and Signature Kitchens Flour due to possible *E. coli* contamination. The recalled flours were produced in the Kansas City facility during a time frame identified by traceback and sold nationwide. CDC recommends that consumers, restaurants, and retailers do not use, serve, or sell the recalled flours.

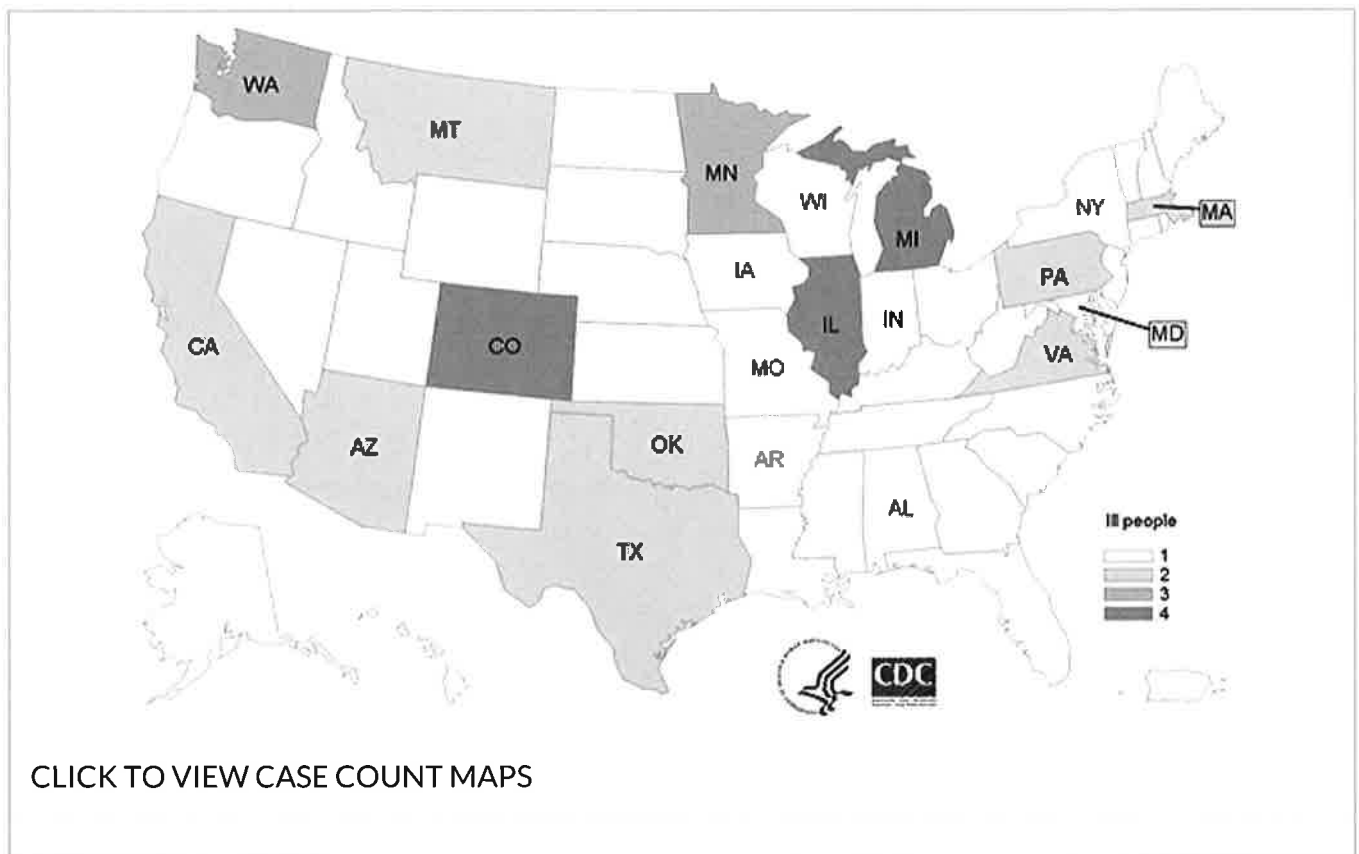
We will update the public when more information becomes available. CDC and state and local public health partners are continuing laboratory surveillance through PulseNet to identify additional ill people and to interview those people about foods they ate before they got sick.

At A Glance

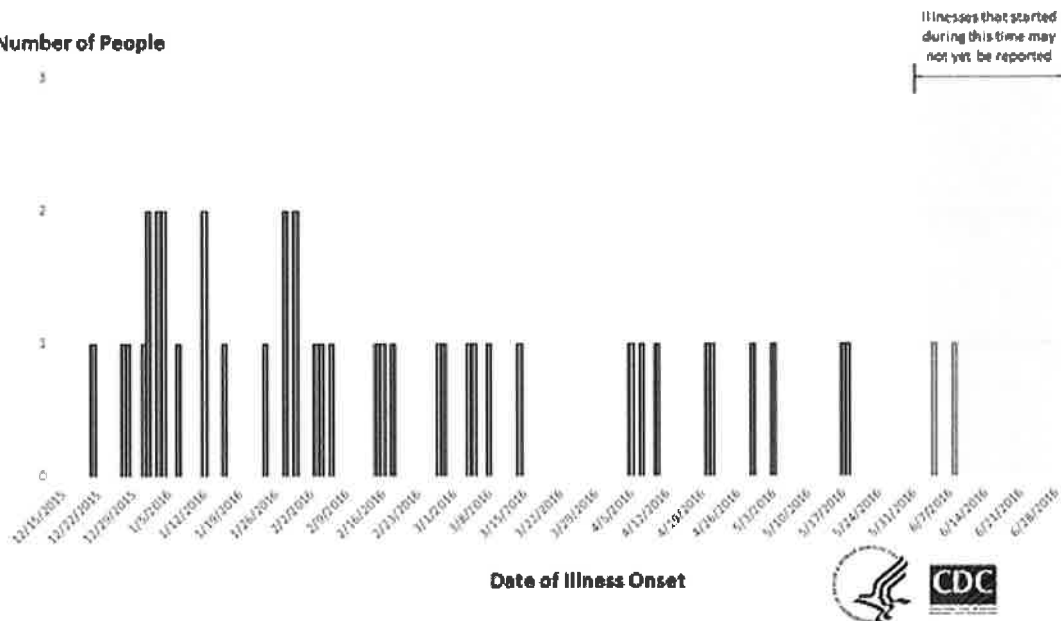
- Case Count: 42
- States: 21
- Deaths: 0
- Hospitalizations: 11
- Recall: Yes

More Information

- Recall & Advice to Consumers and Retailers
- Signs & Symptoms
- Key Resources



Number of People



[CLICK TO VIEW EPI CURVE GRAPHS](#)

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National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) (/ncezid/)

Division of Foodborne, Waterborne, and Environmental Diseases (DFWED) (/ncezid/dfwed/index.html)