

Title: Food Safety in Germany during Escherichia coli Outbreak

Activities: Remove implicated foods from market; Prohibit the sale or use of food or close food premises; Communicate actions to prevent further exposure of illness with the public; Develop hypothesis to explain specific exposure that caused disease

Stakeholders: National and subnational health authorities

Phases: Detection; Intervention; Post-intervention and recovery

Years: 2011

Countries: Germany

Agent: Escherichia coli

Case study prepared by: Madison Berry, December 3, 2019

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In early May 2011, the deadliest and second largest Escherichia coli (E. coli) infection outbreak began in Germany.¹ E. coli infections are primarily caused by contaminated food and often cause diarrhea, abdominal cramping, and sometimes vomiting.²

The rare strain of E. coli in this outbreak, O104:H4, contained genes called enteroaggregative E. coli and the strain was able to produce a Shiga toxin.³ The combined factors are dangerous together and led to an unusually high number of E. coli infections leading to hemolytic-uremic syndrome (HUS), a complication that leads to kidney failure and red blood cell destruction.⁴

The dangerous outbreak rapidly expanded throughout Germany as the source of contamination took a while to identify due to Germany's slow response to the outbreak and the ten day incubation period that E. coli has.⁵ Cases were also found in twelve other European countries

¹ Rogers, Kara. "German E. Coli Outbreak of 2011." Encyclopædia Britannica, inc., February 15, 2016. <https://www.britannica.com/event/German-E-coli-outbreak-of-2011>

² "E. Coli." Mayo Clinic. Mayo Foundation for Medical Education and Research. <https://www.mayoclinic.org/diseases-conditions/e-coli/symptoms-causes/syc-20372058>.

³ "E. Coli (Escherichia Coli)." Centers for Disease Control and Prevention. Accessed December 1, 2019. <https://www.cdc.gov/ecoli/general/germany.html>.

⁴ Rogers, Kara. "German E. Coli Outbreak of 2011."

⁵ Crossland, David. "Backlash Hits German Government over Handling of Deadly E Coli Outbreak." The National, June 8, 2011. <https://www.thenational.ae/world/europe/backlash-hits-german-government-over-handling-of-deadly-e-coli-outbreak-1.442880>.

throughout the long outbreak due to travel to and from Germany.⁶ In total, the outbreak caused over 3,100 confirmed cases and 53 deaths.⁷

On May 26th, 2011, a couple weeks after the outbreak began, German authorities announced that researchers had located E. coli bacteria in four cucumbers imported from Spain.⁸ Additionally, early epidemiological analysis revealed that 92% of infected women had eaten tomatoes while only 60% of non-infected women did.⁹ The results were similar for cucumbers and lettuce so German officials advised against consuming all three, but cucumbers were still cited as the cause of the outbreak.¹⁰ Stores began removing Spain-imported cucumbers from their shelves and Spanish farms suffered severe economic hardship, losing around 7-8 million euros per day.¹¹

Germany was not positive that cucumbers were the root source of their cause, but Cornelia Prüfer-Storcks, the state health minister in Hamburg, Germany and the first official to cite Spanish cucumbers as the cause, claimed that Germany had to warn against them due to the high number of deaths and preliminary test results.¹²

German public health officials, however, later retracted their statement claiming Spanish cucumbers caused the outbreak because subsequent testing revealed a lack of evidence.¹³ They instead found that people who ate sprouts were nine times more likely to be infected with E. coli than people who had not.¹⁴ The contaminated sprouts originated from a farm in Northern

⁶ “Shiga toxin-producing E. coli (STEC): Update on outbreak in the EU (27 July 2011, 11:00).” European Center for Disease Prevention and Control, July 27, 2011.

https://web.archive.org/web/20111004233651/http://ecdc.europa.eu/en/activities/sciadvice/Lists/ECDC%20Reviews/ECDC_DispForm.aspx?List=512ff74f-77d4-4ad8-b6d6-bf0f23083f30&ID=1166&RootFolder=%2Fen%2Factivities%2Fsciadvice%2FLists%2FECDC%20Reviews

⁷ “E. coli: Rapid response in a crisis.” European Food Safety Authority, July 11, 2012.

<https://web.archive.org/web/20181120064044/http://www.efsa.europa.eu/en/press/news/120711>

⁸ Kupferschmidt, Kai. “Cucumbers May Be Culprit in Massive E. Coli Outbreak in Germany.”

⁹ Kupferschmidt, Kai. “Cucumbers May Be Culprit in Massive E. Coli Outbreak in Germany.” Science, May 26, 2011. <https://www.sciencemag.org/news/2011/05/cucumbers-may-be-culprit-massive-e-coli-outbreak-germany>.

¹⁰ Kupferschmidt, Kai. “Cucumbers May Be Culprit in Massive E. Coli Outbreak in Germany.”

¹¹ Kelsey, Eric. “Germany E.coli Cucumber Death Toll Rises to 14.” Reuters. Thomson Reuters, May 30, 2011. <https://www.reuters.com/article/us-germany-ecoli/germany-e-coli-cucumber-death-toll-rises-to-14-idUSTRE74S12V20110530>.

¹² Tremlett, Giles, and Helen Pidd. “Germany Admits Spanish Cucumbers Are Not to Blame for E Coli Outbreak.” The Guardian. Guardian News and Media, May 31, 2011.

<https://www.theguardian.com/uk/2011/may/31/e-coli-deaths-16-germany-sweden>.

¹³ “Deadly E. Coli Found on Bean Sprouts.” thelocal.de, June 10, 2011. <https://www.thelocal.de/20110610/35583>.

¹⁴ “Deadly E. Coli Found on Bean Sprouts.”

Germany, that officials later shut down¹⁵, who had received the sprout seeds from Egypt.¹⁶ While the sprout seeds, similarly to the cucumbers, did not test positive for *E. coli* in a laboratory, officials still cited sprouts as the cause and issued a warning against them while lifting the warning against cucumbers, tomatoes, and lettuce.

Germany declared the outbreak over on July 26th.¹⁷ Even with the outbreak over, the government faced a lot of backlash in their handling of this outbreak. Because of their incorrect assumption that Spanish cucumbers were the cause of the outbreak, Spain lost upwards of 350 million Euros in the first two weeks of the outbreak, as estimated by the European Commission.¹⁸ Additionally, German officials were criticized for not testing sprouts initially as they are a common food associated with food borne illnesses.¹⁹

The poor response on Germany's end led to improved surveillance measures to prevent another *E. coli* outbreak as widespread as this one.²⁰ Some of the measures implemented shortly after included increased research on threats and preparedness activities.²¹

Please include case study summary text below this line.

Germany experienced a widespread and deadly *Escherichia coli* (*E. coli*) outbreak in 2011 lasting almost three months. Public health officials initially issued a warning against Spanish cucumbers as the cause of the outbreak but later discovered the culprit was sprouts from a German farm who imported the seeds from Egypt. German public health officials faced widespread criticism for their slow response on the outbreak and the incorrect claim that Spanish cucumbers were to blame. The outbreak led to increased preparedness to prevent and contain other food borne outbreaks.

¹⁵ Dempsey, Judy, and William Neuman. "Deadly *E. Coli* Outbreak Linked to German Sprouts." *The New York Times*, June 5, 2011. <https://www.nytimes.com/2011/06/06/world/europe/06germany.html>.

¹⁶ Köckerling, Elena, Laura Karrasch, Aparna Schweitzer, Oliver Razum, and Gérard Krause. "Public Health Research Resulting from One of the World's Largest Outbreaks Caused by Enterohemorrhagic *Escherichia coli* in Germany 2011: A Review." *Frontiers in Public Health* 5 (November 2017). <https://doi.org/10.3389/fpubh.2017.00332>.

¹⁷ Rogers, Kara. "German *E. Coli* Outbreak of 2011."

¹⁸ "Lessons learned from the 2011 outbreak of Shiga toxin-producing *Escherichia coli*." Commission of the European Communities. https://ec.europa.eu/food/sites/food/files/safety/docs/biosafety-crisis-cswd_lessons_learned_en.pdf

¹⁹ Dempsey, Judy, and William Neuman. "Deadly *E. Coli* Outbreak Linked to German Sprouts."

²⁰ Rogers, Kara. "German *E. Coli* Outbreak of 2011."

²¹ "Lessons learned from the 2011 outbreak of Shiga toxin-producing *Escherichia coli*." Commission of the European Communities.