



## ECDC RAPID RISK ASSESSMENT UPDATE

# Outbreak of Shiga toxin-producing *E. coli* (STEC) O104:H4 2011 in the EU

8 July 2011 (updated from 29 June)

## Source and date of request

This document is an update of the EFSA/ECDC joint rapid risk assessment of 29 June and aims to add new information to this and earlier initial rapid risk assessments (27 May and 14 June 2011).

## Public health issue

Ongoing outbreak of Shiga toxin-producing *Escherichia coli* (STEC) O104:H4 in the EU.

## Consulted experts and organisations

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## Event background information

As of 8 July, 3 774 cases of STEC O104:H4 infections have been reported in the EU since the start of the outbreak in May 2011. Of these, 750 were complicated by haemolytic uremic syndrome (HUS) and 3 024 were non-HUS STEC cases. Forty-four infected persons have died, of which 28 were HUS STEC cases [1]. The vast majority of all cases are reported by Germany (2 952 non-HUS STEC cases and 704 HUS STEC cases), with travel-related cases involving trips to northern

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Germany reported by other EU Member States [1,2]. In addition, Switzerland has reported five non-HUS STEC cases through the International Health Regulations (IHR). The United States reported four HUS STEC cases and two non-HUS STEC cases, all with recent travel history to Germany. Canada has reported one non-HUS STEC case with travel history to Germany [3].

As of 8 July, 12 cases of HUS STEC or bloody diarrhoea have been reported among participants of an event held in Bordeaux, France, where investigations suggest that sprouts had been the vehicle of transmission. In addition, two confirmed cases of STEC O104:H4 infection (one HUS STEC, one case of bloody diarrhoea) have been reported among the household members of one of the cases, and are likely due to person-to-person-transmission. A cohort study is ongoing to provide further epidemiological characterisation [4].

Isolated cases with no travel history to Germany or known consumption of sprouts have been reported from Sweden (1) [5] and Austria (one case with travel history to France), in addition to three possible person to person transmissions (reported by Poland, Norway, and Denmark). Denmark reported on 8 July the occurrence of two new secondary transmissions within families where cases were previously confirmed [6].

The most significant development since June 29 relates to the preliminary results of the screening of children and staff in a school in Kreis Paderborn (Paderborn county), Germany, where three cases of HUS STEC and one case of non-HUS STEC infection have been identified since 13 June 2011 and onwards [7]. In 22 of the 30 children tested (including the three HUS STEC cases, and the non-HUS STEC case), the epidemic strain of *E. coli* was isolated, indicating a significant level of asymptomatic infection. Asymptomatic carriage of STEC infection was also found in three kitchen workers at the school, in four guardians in four different child care centres in the district, and in three staff members of a supplying catering company. Further investigations of this cluster are ongoing [7].

## ECDC threat assessment for the EU

Several pieces of evidence link the outbreaks in Germany and France. Apart from *E. coli* O104:H4 being a very rarely isolated pathotype from humans in Europe, and considering the clinical and epidemiological similarities between the outbreaks in the two countries, there is now microbiological evidence that the strains from both outbreaks are indistinguishable [8].

Results from studies in France and Germany support the hypothesis that seeds used for sprouting (distributed to local producers or retail outlets) contained a level of *E. coli* O104:H4 contamination, ultimately leading to contaminated sprouts destined for human consumption. Trace-back activities conducted by several EU Member States also support this hypothesis. The EFSA technical report published on 5 July concludes that a specific lot of fenugreek seeds imported from Egypt is the most likely common link but that it cannot be excluded that other lots may be implicated. The exact point of contamination in the food chain has not been established but is being considered to have occurred before importation [9].

Following this report, the European Commission on 5 July took the decision to withdraw certain types of seeds imported from Egypt from the market and temporarily ban the import of these products [10]. Regarding seeds already imported, trace-forward activities were advised, as a large number of countries had received parts of the suspected lot of fenugreek. As this is a complex and long operation, there remains a reduced but existing risk connected to the consumption of affected and sprouted seeds. Therefore, EFSA's advice remains valid that consumers should not grow sprouts for their own consumption and should not eat sprouts or sprouted seeds, unless these products are cooked thoroughly [11].

A dramatic decrease in the number of new cases has been noted in Germany in the last 14 days. The cluster in France seems to have been a point-source food-borne outbreak with evidence for limited secondary transmission. Although secondary STEC infections have been documented, available data do currently not support a large occurrence of secondary person-to-person transmission.

However, new cases and clusters are continuing to be reported despite the identification of the most likely vehicle of contamination for the outbreak related to Germany (sprouts) and the implementation of public health measures to mitigate it. Such new cases and clusters are expected to continue to occur due to incidental secondary transmission, either through person-to-person transmission, through other contaminated food vehicles, or due to contaminated seeds remaining in circulation.

The evidence, especially from the cluster in a German school, pointing at a substantial proportion of subclinical infections, is the main reason for concern at this stage. This may have an impact on the epidemiology of the disease and the measures needed to prevent further spread. The asymptomatic infections in 22 out of 30 children resulted most likely from a food-borne transmission, rather than from person-to-person transmission. A significant proportion of asymptomatic carriers represent a risk for new food-borne outbreaks, in particular if such asymptomatic contamination affects a food handler.

Considering the large number of summer festivals and mass gatherings in the EU, with sometimes inadequate food hygiene standards, targeted public health messages for such events could be of value to prevent further spread. To complement public health measures regarding food handling, information to the public should stress the need for proper hand washing.

Certain characteristics of the strain remain unknown, which may affect the future epidemiological picture in the EU. The estimated median incubation period is eight days, with a median of five days from the onset of diarrhoea to the development of HUS [12]. This incubation period is longer than the classical incubation period of three to eight days for STEC infections. This may indicate a low infectious dose, which may influence the likelihood of person-to-person and food-borne transmissions by infected persons. However, so far person-to-person transmission does not seem to have played an important role in the transmission of the disease, and in particular no outbreak in institutions such as day-care centres, schools or nursing homes has occurred through person-to-person transmission. Another important factor in monitoring the future epidemiology is whether or not the strain has established – or could establish – itself within an animal reservoir.

## Conclusions and recommendations

The epidemiological picture of the STEC O104:H4 incidence in Europe suggests a transition phase, from the main outbreak events in Germany and France related to the infected seeds used for sprouting, towards a future risk for new clusters or a continued incidence of sporadic cases. Those can result from ongoing risk related to infected seeds still on the market or in individual's households, from food-borne transmission through new vehicles contaminated during food handling, or through person-to-person transmission. It is therefore important to further monitor the epidemiology of cases across Member States and third countries and document likely modes of transmission and potential vehicles of infection.

With this objective in mind, specific reporting of new cases occurring at the EU level has been implemented as of 5 July 2011. Apart from the multi-country monitoring of the situation, the results of ongoing epidemiological studies in Germany and France will need to be incorporated in future public health steering. Further, there is the need for studies to better understand the clinical, microbiological, environmental, and veterinary aspects of this strain. ECDC is supporting the diagnostic capacity by providing the national reference laboratories the opportunity to order antiserum for the detection of O104 *E. coli* serotype, ten control strains with different virulence characteristics, and a control strain of STEC O104:H4.

The implementation of the recommendations of the EFSA technical report on tracing seeds and the decision of the European Commission to withdraw from the market and temporarily ban certain seed imports from Egypt will be important in reducing the risk of outbreaks related to sprouted seeds and understanding the future epidemiological situation.

As cases may still continue to occur in the coming months, it remains important to strengthen surveillance, including raising clinical awareness and building laboratory diagnostic capacity for this STEC strain. Testing of strains for the O104 serogroup should be reinforced in all Member States. Equally, health communication regarding personal hygiene such as hand washing and general hygiene measures in households and institutions will assist in limiting further spread, as will be maintaining adequate food handling practices. Considering the current summer season, special attention may also be drawn to maintaining good food handling and hygiene measures, particularly at large catering and mass gathering events.

Preventative measures have been highlighted in the previous ECDC-EFSA joint statement:

Public health advice on prevention of diarrhoeal illness with special focus on Shiga-toxin producing *E. coli* [13].

## Contact

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