



RAPID RISK ASSESSMENT

Cluster of new *Salmonella* serotype cases with antigenic formula 11:z41:enz15 in four EU Member States

20 March 2017

Summary

Since March 2016, four EU Member States have reported a total of 40 cases of a new *Salmonella* serotype with an antigenic formula 11:z41:enz15, which has never been described before. The cases have been reported from Greece (N=22), Germany (N=10), Czech Republic (N=5) and Luxembourg (N=3). Pulsed-Field Gel Electrophoresis (PFGE) and Whole Genome Sequencing (WGS) have confirmed the genetic closeness of the *Salmonella* isolates, suggesting a common source of infection. The latest case reports are from February 2017.

An epidemiological analytical study performed in Greece in 2016 found an association between infection and a sesame-based product. This hypothesis was confirmed by the identification of the same *Salmonella* serotype in sesame seeds in October 2016 in Germany. As sesame seeds have a long shelf life and new cases have been reported recently, it is likely that contaminated batches have been circulating in the food chain for several months in a number of Member States.

Although few new cases have been reported in the last three months, the outbreak still appears to be ongoing.

Source and date of request

ECDC Internal Decision, 15 March 2017.

Public health issue

A multi-country outbreak of a new serotype of *Salmonella*, linked to consumption of sesame-based food products.

Consulted experts

ECDC experts: Sergio Brusin, Denis Coulombier, Josep Jansa, Saara Kotila, Taina Niskanen, Daniel Palm, Johanna Takkinen.

External experts representing national authorities:

- Germany: Anika Schielke (Robert Koch Institute), Sandra Simon, Angelika Fruth (German National Reference Centre for Salmonella, Robert Koch Institute).
- Luxembourg: Joël Mossong (Laboratoire National de Santé).
- Czech Republic: Daniela Dedicova, Lucie Safarikova (National Reference Laboratory for Salmonella, National Institute of Public Health, Czech Republic), and Marta Prikazska (Department of Infectious Disease Epidemiology, National Institute of Public Health, Czech Republic).
- Greece: Kassiani Mellou (Hellenic Centre for Disease Control and Prevention), Georgia Mandilara (Greek National Reference Centre for Salmonella - National School of Public Health).

Event information

On 10 May 2016, Greece reported a cluster of *Salmonella* cases with an antigenic formula 11:z41:enz15, not previously described in the White-Kauffmann-Le Minor-scheme [1]. The isolates from these cases were susceptible to 16 antimicrobial agents, and their PFGE profiles were indistinguishable (The European Surveillance System (TESSy) reference Xba1.2460): <https://tessy.ecdc.europa.eu/TessyWeb/OnlineQueryTool/Query.aspx?type=ClusterAnalysis&subject=SALMISO&method=Cluster&clustercode=2016-07.SALM.03.XBAI.2460>

On 26 May 2016, the Pasteur Institute in Paris confirmed the results of the Greek laboratory, verifying a putative new serotype of *Salmonella enterica* subspecies *enterica*. If this finding is confirmed by the additional testing which is currently being performed, a name will be given to the new serotype.

For the purpose of the Rapid Risk/Outbreak Assessment the following case definition is used:

A confirmed outbreak case

- A laboratory-confirmed case of salmonellosis yielding isolates with an antigenic formula 11:z41:enz15 according to the White-Kauffmann-Le Minor-scheme
OR
- A laboratory-confirmed *Salmonella* with whole genome sequence matching the outbreak strain.

Sequence data from a representative isolate with the sequence identification code 239-2016 have been uploaded to Enterobase (<https://enterobase.warwick.ac.uk/>)

Epidemiological situation

Between March 2016 and 15 March 2017, four EU Member States reported 40 cases infected with the new *Salmonella* serotype:

Greece has reported 22 cases since March 2016, including 15 children aged under 15 years. Two cases have been detected in 2017, the most recent case at the end of February. By the end of the last quarter of 2016, the National Reference Centre had received around 200 *Salmonella* isolates which are waiting to be serotyped; thus, additional cases reported during that period could emerge at a later date. In August 2016, Greece reported an extended-spectrum beta-lactamase (ESBL) -producing *Salmonella* 11:z41:enz15 carrying a blaSHV-5 like gene isolated from a relapse case.

Germany has reported 10 cases with the new *Salmonella* serotype since May 2016 and the last case was notified in February 2017. Four cases reported an epidemiological link to Greece, either through travel to Greece or a case visited by Greek relatives. The other six cases were exposed in Germany.

Czech Republic has reported five cases (two males and three females) three of which are children. The most recent case was notified at the end of June 2016. None of the cases were travel-related.

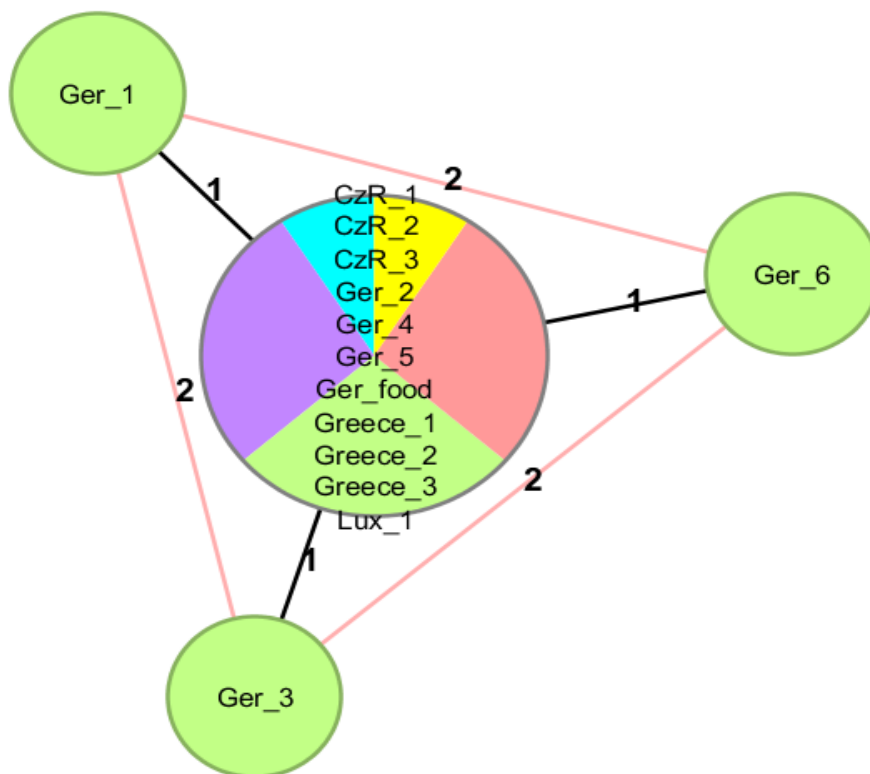
Luxembourg has reported one symptomatic and two asymptomatic cases, with the latest notification in February 2017.

Microbiological information

At least eleven (11) isolates from Czech Republic, Germany, Greece and Luxembourg share an indistinguishable PFGE profile (TESSy reference Xba1.2460). An ECDC contractor has performed WGS for nine isolates. WGS data analysis performed in Germany concluded that 13 human isolates from Germany (exposed either in Greece or in Germany), Greece, Luxembourg and Czech Republic were clustered tightly together by cgMLST (Figure 1).

Twelve countries (Austria, Cyprus, Denmark, Finland, France, Ireland, Italy, the Netherlands, Norway, Scotland, Sweden and Switzerland) reported not having observed any human *Salmonella* isolates with this antigenic formula. *Salmonella* isolates/cases with antigenic formula 11:z41:enz15 or PFGE profile Xba1.2460 had not been reported to TESSy before April 2016.

Figure 1. Minimum spanning tree of sequencing analysis showing 14 *Salmonella* isolates with an antigenic formula 11:z41:enz15 from Czech Republic, Germany, Greece and Luxembourg



Ridom Seqsphere + MST for 14 samples based on 2116 columns, no missing values

Distance based on columns from *S.enterica* cgMLST 2143 targets LT2 (2109), *S.enterica* MLST (7)

Comparison table definition: Ssp.I_11_z41_e,n,z15

Comparison table created: 16.03.2017 13:27

Task templates: *S.enterica* cgMLST 2143 targets LT2, *S.enterica* MLST, *S.enterica* Accessory 2201 targets LT2

To cite the tools used for this analysis correctly in publications please see menu Help – Citations.

- Czech Republic
- Germany
- Germany_food
- Greece
- Luxembourg

Note: This figure was kindly provided by the Robert Koch Institute.

Suspected vehicle

In Greece, a case study consisting of 11 cases with the new serotype and 22 cases of *Salmonella* Enteritidis indicated an association between the occurrence of disease and the consumption of tahini (a sesame-based product). Cases reported the consumption of commercial products but no specific trademark was implicated. In the Czech Republic, two of five cases mentioned possible consumption of sesame-based products. In Germany and Luxembourg, epidemiological data are supportive of the hypothesis that there may be an association with the consumption of sesame-based products.

In Germany, the new *Salmonella* serotype was detected during a company's own check of a food sample (sesame seeds) made in October 2016. WGS analysis concluded that the *Salmonella* food isolate was identical to the human isolates by cgMLST (Figure 1). Germany issued an RASFF notification on 22 February 2017 (RASFF notification 2017.0221).

ECDC public health threat assessment for the EU/EEA

In the past nine months four EU Member States have reported 40 cases with the infection of a new *Salmonella* serotype 11:z41:enz15 with an antigenic formula that has never been described before. PFGE and WGS analyses have confirmed that the isolates from these cases are genetically very close, and thus they are probably associated with a common source of infection.

An epidemiological analytical study performed in Greece found an association between infection with the new *Salmonella* serotype and a sesame-based product. This hypothesis was later supported by Germany, where the same *Salmonella* serotype was found in imported sesame seeds.

As sesame seeds have a long shelf life and new cases have been reported recently, it is likely that contaminated batches are circulating in the food chain in EU Member States. Although the human infection is relatively rare, it is likely that new cases may occur.

References

1. Mandilara G, Mellou K, Karadimas K, Georgalis L, Polemis M, Georgakopoulou T, Vatopoulos A. An outbreak of a possibly new *Salmonella enterica* subspecies enterica serovar with the antigenic formula 11:z41:e,n,z15, Greece, March to May 2016: preliminary results. Euro Surveill. 2016 Jun 23;21(25). doi: 10.2807/1560-7917.ES.2016.21.25.30265.