

# Cases of *Salmonella* Urbana in Finland, the Czech Republic and Latvia, January-February 2010

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**A cluster of 14 cases of *Salmonella* Urbana cases in Finland, the Czech Republic and Latvia were identified in January-February, 2010. The majority of cases (11) were male and children under 16 years of age. The investigation is currently ongoing and comparison of pulsed-field gel electrophoresis (PFGE) profiles of the isolates suggests that the cases may have a common source of infection.**

On 5 February, the Finnish National Salmonella Centre (NSC) in the Bacteriology Unit of the Finnish National Institute for Health and Welfare (THL) reported four laboratory confirmed cases of *S. Urbana* (30:b:enx) to the THL Unit of Epidemiologic Surveillance and Response. Isolates originated from different parts of the country. The samples were taken between 13 and 30 January. According to the patients' physicians, none of them had been travelling abroad prior to the onset of illness with symptoms of diarrhoea and fever. Three of the cases were children under four years. A link between the cases

was suspected because of temporal association of isolates of a very unusual *Salmonella* serotype. During the last 30 years, only three human cases of domestically acquired *S. Urbana* were reported in Finland. According to the Finnish Food Safety Authority, *S. Urbana* was found once in peanuts (in 2003) and in dog treats (in 2008). [H. Kuronen; personal communication].

In order to build a hypothesis of the source of the infection, cases or their guardians were interviewed using an extensive questionnaire focussing especially on food items generally consumed by children and to animal contacts, or contacts to animal feed. To map the occurrence of *S. Urbana* infection in other European countries, an inquiry to detect potentially linked cases in other countries was conducted through the Programme on Food- and Waterborne Diseases and Zoonoses network [5].

## TABLE

Clinical characteristics of *S. Urbana* cases, Finland, Latvia and the Czech Republic, 2010

Country	Age	Gender	Clinical picture	Sample	Hospital care
Finland	11 months	F	bloody diarrhoea	faecal	yes
Finland	1 year	F	bloody diarrhoea	faecal	yes
Finland	13 years	F	bacteraemia, no gastrointestinal symptoms	blood	yes
Finland	3,5 years	M	diarrhoea	faecal	no
Finland	2 years	M	bacterial arthritis, no gastrointestinal symptoms	faecal+synovial fluid	yes
Finland	13 years	M	diarrhoea	faecal	no
Finland	35 year	M	diarrhoea	faecal	yes
Latvia	2 years	M	diarrhoea	faecal	
Czech Republic	7 years	M	watery diarrhoea	faecal	yes
Czech Republic	4 years	M	diarrhoea	faecal	no
Czech Republic	6 years	M	vomiting*	faecal	yes
Czech Republic	1,3 years	M	diarrhoea	faecal	yes
Czech Republic	20 years	M	bacteraemia, no gastrointestinal symptoms	blood	yes
Czech Republic	2,5 years	M	diarrhoea	faecal	yes

\* Vomiting since November 2009, no diarrhoea/abdominal pain, hospitalised 18.1.2010

## Investigations to date

A case was defined as a person with *S. Urbana* (30:b:enx, PFGE profile SURBxB.0002 and SURBxB.0003) infection in the European Union (EU) with the date of sampling between 1 January and 14 February 2010. In total 14 cases met the case definition (Table 1).

Twelve of the cases were children under 16 years. The median age was five years (age range 11 months old to 35 years old). Eleven were males. Three cases had a bacterial invasive disease, *Salmonella* isolated from blood or synovial fluid. Ten cases were hospitalised. Seven cases were from different parts of Finland, six from different parts of the Czech Republic and one from Latvia. In Finland, the descriptive epidemiological study suggested that all cases could have been exposed to dogs and all children had eaten raisins. In the Czech Republic, the epidemiological investigation revealed contact with dogs only in two cases and consumption of raisins in one case. No potential common source was detected in the Czech cases. The Latvian case had had no contact with dogs and had not consumed raisins, but the family had a cat whose feed was sampled and tested with negative results. The dog faeces, dog treats and raisins collected from the homes of the Finnish cases tested negative for salmonella.

PFGE profiles from the three countries, Finland, the Czech Republic and Latvia, were indistinguishable

when compared to each other (Figure 1) indicating that the infections might have had a common source.

One Finnish PFGE profile (SURBxB.0003) had an extra band. This minor difference might be caused by a plasmid which salmonellae can spontaneously lose or acquire. It is also possible that a recent point mutation, deletion or insertion in the DNA had occurred. *S. Urbana* strains were sensitive to all antimicrobial agents tested (ampicillin, chloramphenicol, cefotaxime, imipenem, mecillinam, nalidixic acid, neomycin, sulfonamide, tetracycline, trimethoprim, streptomycin, and ciprofloxacin).

## Conclusions to date

An unusual *Salmonella* serotype leading to a high rate of hospitalisation and the severe clinical picture of the cases detected in Finland and in the Czech Republic were important reasons for triggering the epidemiological investigation. According to data from the Finnish Infectious Disease Registry data base gathered between 2000 and 2009, less than 2% of all non-typhoidal salmonella findings were from blood. Similarly, in a large Spanish study, 4.5% of the patients with salmonellosis had septicaemia [1]. In the current cluster of *S. Urbana*, three cases of 14 had an invasive extraintestinal disease; two with bacteraemia and one with hematogenous septic arthritis.

*S. Urbana* is rarely described in the literature. In the 1990s, a large outbreak occurred in a neonatal ward in Thailand [2] and a case of *S. Urbana* encephalopathy was reported from Japan [3]. The inquiry to the experts in the Programme on Food- and Waterborne Diseases and Zoonoses revealed that *S. Urbana* is rare in Europe in general, and mostly reported in children. Some of these cases had been associated with contacts with reptiles [4]. *S. Urbana* has also been found in sesame and equi (melon) seeds, black pepper, animal feed and sewage sludge, according to experts in the Programme on Food- and Waterborne Diseases and Zoonoses network.

Only one of the cases (in the Czech Republic) had had contact with a reptile. According to our investigations, neither animals nor their feed seem to be the source of the current infections. Milk products appear to be less likely to be the source of infection, since one of the cases suffered from severe milk allergy. Fish, nuts, soya products and health food items were rarely consumed by the Finnish cases. Most of the cases were males, but we were not able to reveal any exposure common to the cases that could have been linked to being male.

Since the beginning of February, no further cases of *S. Urbana* have been detected in the three countries. Most of the cases had accumulated in two weeks in January in all three countries. The cases detected in the beginning of February were in a cancer patient without gastrointestinal symptoms (*Salmonella* found in blood)

**FIGURE 1**

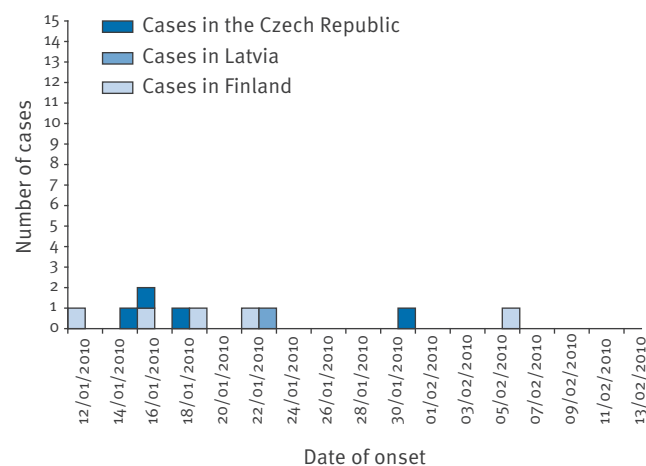
PFGE profiles of *S. Urbana* isolates from Finland, Czech Republic and Latvia when digested with *Xba*I enzyme.



PFGE; Pulsed-field gel electrophoresis

**FIGURE 2**

Cases of *S. Urbana* by date of onset of gastrointestinal symptoms and country, 12 January-7 February 2010



and an adult male who was considered a secondary case to his children that also suffered from gastrointestinal symptoms. When tested, however, the family members were negative for *Salmonella*. The accumulation of most cases with gastrointestinal symptoms in two weeks (Figure 2) suggests that the source of the infection could have been a product with a short shelf-life such as a batch of fresh produce, or a minor contamination of some other product. To date however, the source of the outbreak remains unknown.

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## References

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1. Gil Prieto R, Alejandre CG, Meca AA, Barrera VH, de Miguel AG. Epidemiology of hospital-treated *Salmonella* infection; data from a national cohort over a ten-year period. *J Infect.* 2009;58(3):175-81.
2. Sirinavin S, Hotrakitya S, Suprasongsin C, Wannaying B, Pakeechep S, Vorachit M. An outbreak of *Salmonella urbana* infection in neonatal nurseries. *J Hosp Infect.* 1991;18(3):231-8.
3. Minami K, Yanagawa T, Okuda M, Suzuki H, Tamura A, Izumi G, et al. Cerebrospinal fluid cytokines in *Salmonella urbana* encephalopathy. *Tohoku J Exp Med.* 2004;203(2):129-32.
4. Kocianova H, Litvova S, Stefkovicova M, Gavacova D, Rovny I, Glosova L, et al. [Exotic Pets as a Potential Source of *Salmonella*]. *Epidemiol Mikrobiol Immunol.* 2010;59(1):9-12. [Czech].
5. European Centre for Disease Prevention and Control (ECDC). [Internet]. Programme on food and water-borne diseases and zoonoses. Available from: [http://www.ecdc.europa.eu/EN/ACTIVITIES/DISEASEPROGRAMMES/Pages/Programme\\_on\\_food\\_and\\_water-borne\\_diseases\\_and\\_zoonoses.aspx](http://www.ecdc.europa.eu/EN/ACTIVITIES/DISEASEPROGRAMMES/Pages/Programme_on_food_and_water-borne_diseases_and_zoonoses.aspx)