Large ongoing outbreak of infection with *Salmonella* Typhimurium U292 in Denmark, February-July 2008

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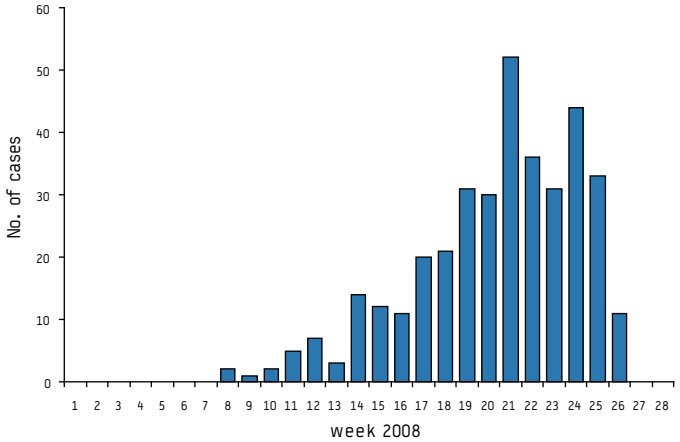
Denmark is currently experiencing an unusually large outbreak of gastrointestinal illness caused by *Salmonella* Typhimurium, phage type U292. The outbreak was discovered in early April by molecular typing (MLVA typing) of S. Typhimurium isolates at the Statens Serum Institut (SSI); the first patients reported onset on illness in February, but the number of reported cases has been particularly high in May and June (Figure 1). There are currently (as of 7 July) 366 confirmed cases, effectively making this the largest outbreak of *salmonella* infections in Denmark since 1993 [1].

Based on two urgent inquiries through the European Centre for Disease Prevention and Control's Food- and Waterborne Disease network (on 17 April and again on 18 June), the outbreak appears to be fully confined to Denmark; no cases have been reported from other countries including neighbouring Scandinavian countries or Germany. The outbreak affects all parts of Denmark, although the incidence varies in different parts of the country. The gender distribution is even (49.7% males), but the age distribution is skewed towards young age groups (Figure 2) with roughly 50% of cases being younger than 15 years compared to roughly 30% in the group of S. Typhimurium patients reported in previous years.

Figure 1

Number of registered *Salmonella* Typhimurium cases of the outbreak MLVA type by week of submission of stool sample to the laboratory, Denmark 2008, n=366

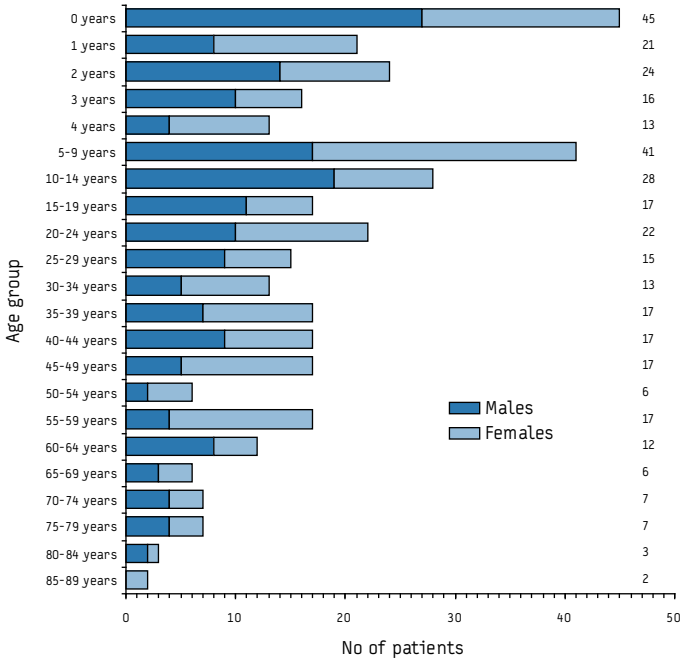


There are several instances in which two cases belong to the same family, but otherwise no embedded outbreaks.

The source of the outbreak has so far not been found and the outbreak appears to be ongoing. This outbreak has led to an extensive investigation using different methods among which are patient interviews (including focus group interviews and home visits), two case-control investigations, comparative analyses of patients' shopping lists obtained from supermarket computers, geographical and trace-back analyses, subtyping of isolates obtained in the surveillance programmes of food, animals and slaughterhouses in Denmark, microbiological analyses of food collected from patients' homes and of selected food production facilities. The results of these investigations indicate that the outbreak may be caused by several types of food vehicles. The main working hypothesis is that

Figure 2

Age and gender distribution of registered *Salmonella* Typhimurium cases of the outbreak MLVA type, Denmark 2008, n=366



the outbreak originates from pigs, but other ideas are also under investigation. Should anyone have information that may be of value to the investigation team please contact the authors.

The phage type U292 is very rarely detected in Denmark and other countries. The phage type pattern is: phage 11: +++, phage 14: +++/SOL, phage 26: +/++, phage 35: +/- and with negative reaction in all other routine phages. The MLVA pattern is (in base pairs): 162-246-341-369-524, in the order: STTR9-STTR5-STTR6-STTR10-STTR3. The outbreak strain is fully susceptible to all antibiotics in the Enter-net panel.

References

1. Wegener HC, Baggesen DL. Investigation of an outbreak of human salmonellosis caused by Salmonella enterica ssp. enterica serovar Infantis by use of pulsed field gel electrophoresis. Int J Food Microbiol. 1996;32(1-2):125-31.

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