EPI-NEWS

NATIONAL SURVEILLANCE OF COMMUNICABLE DISEASES

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SALMONELLA TYPHIMURIUM U292 OUTBREAK

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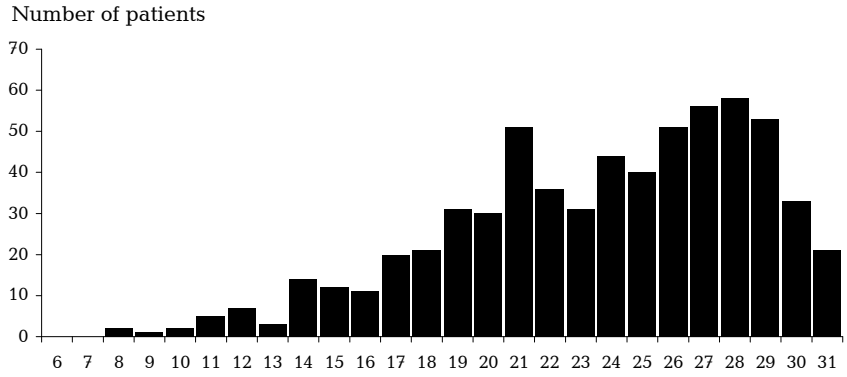
Denmark is currently experiencing the largest salmonella outbreak since surveillance was initiated in 1980. The outbreak is caused by Salmonella Typhimurium phage type U292 (outbreak type). The outbreak type has previously only rarely been observed in Denmark. The first patients presented with symptoms in mid-February 2008 and the outbreak was recognised in week 14, Figure 1. During the summer, a further 30-60 weekly cases have been found. The decrease observed in weeks 30 and 31 is most likely due to delayed registration. At present, 633 patients have been registered.

Figure 1. Weekly number of outbreak patients according to laboratory stool sample reception date



Outbreak facts

- The outbreak is limited to Denmark. All patients reside in Denmark, except six foreign cases who have all had contact to Denmark.
- The outbreak is nationwide.
- The outbreak is protracted.
- The outbreak comprises all age groups, but counts a slight overweight of children and slightly fewer persons above 40 years of age than is usually the case for S. Typhimurium, Table 1.

Table 1. Age distribution (%) in the current outbreak and in all registered S. Typhimurium cases, 2000-2007

Age group (yrs)	% Current outbreak	% S. Typhim. 2000-2007
0	10	5
1	6	5
2	7	4
3	4	3
4	3	2
5-9	10	6
10-14	7	5
15-19	6	6
20-29	10	12
30-39	8	11
40-49	9	12
50-59	8	12
60-69	7	10
70+	4	8

- The male/female distribution is even.
- No obvious common denominator links the patients.
- The outbreak type has been found in swine farms and pork, and recently in cattle herds.

On this basis we assess that the source of infection is one or more foods marketed as a retailing good in the majority of Denmark, a product which is equally appealing to males and females, and which is ingested by adults as well as by children. Furthermore, the source does not seem to be foods exported to other countries or appealing to tourists staying in Denmark as very few cases have been found in neighbouring countries. Additionally, the duration of the outbreak seems to indicate that the item (s) in question enter(s) the market continually or have considerable shelf-life.

The investigation

The efforts to document the outbreak are handled by the Central Outbreak Group (Den Centrale Udbrudsgruppe) which counts participants from Statens Serum Institut, Danish Veterinary and Food Administration, and National Veterinary Institute, DTU. Furthermore, the medical officers of health, the clinical microbiological laboratories and the food control units participate. During the last four months an intensive hunt for the source has been going on. The initiative has comprised:

- Continuous analyses of the distribution of patients' age, gender, and geographical occurrence.
- Trawling interviews to create hypothesis as regards the source of the outbreak.
- Two case-control studies.
- Focus group interviews with patients.
- Analysis of the affected families' food purchases based on information from large supermarkets' credit card and sales databases.
- Comparison of DNA-typing of specific isolates from humans and production animals.
- Collection and analysis of foods from refrigerators and freezers.
- Investigation of "sub-outbreaks" in confined groups of persons.
- Trace-back tracking of foods, meat, etc. in a number of specific situations.
- Collection and analysis of samples from companies based on concrete hypotheses.

Comment

In spite of the considerable efforts, the source or sources of infection have not currently been identified. Several hypotheses have been tested, but have not yet yielded any breakthroughs.

The investigative efforts are hampered by the fact that the source is probably not a single product, but rather a whole range of different products made from ingredients which have the same origin.

The main hypothesis is that the source is one or more pork products. This is based on the outbreak type which has been found in several swine farms and in fresh pork. Furthermore, patient interviews have shown that all interviewed patients have had pork. Additionally, the scope of the outbreak indicates that the food type concerned may be one frequently ingested by the Danish population. In Denmark, salmonella outbreaks of such scope have previously only been observed in connection with pork.

The efforts to solve the outbreak continue. The majority of the above-mentioned activities will be continued and further initiatives will be added.

(Department of Epidemiology on behalf of the Central Outbreak Group)

13 August 2008

Individually notifiable diseases

Number of notifications received in the Department of Epidemiology, SSI (2008 figures are preliminary)

Table 1	Week 32 2008	Cum. 2008 [1]	Cum. 2007 [1]
AIDS	0	19	36
Anthrax	0	0	0
Botulism	0	0	0
Cholera	0	1	0
Creutzfeldt-Jakob	1	3	8
Diphtheria	0	0	0
Food-borne diseases	0	381	344
of these, infected abroad	0	63	61
Gonorrhoea	3	227	230
Haemorrhagic fever	0	0	0
Hepatitis A	0	24	17
of these, infected abroad	0	8	7
Hepatitis B (acute)	0	10	15
Hepatitis B (chronic)	0	99	179
Hepatitis C (acute)	0	5	3
Hepatitis C (chronic)	1	189	231
HIV	0	147	178
Legionella pneumonia	0	68	64
of these, infected abroad	0	19	16
Leprosy	0	0	0
Leptospirosis	0	3	7
Measles	0	7	1
Meningococcal disease	0	36	52
of these, group B	0	16	29
of these, group C	0	9	16
of these, unspec. + other	0	11	7
Mumps	0	20	3
Neuroborreliosis	0	24	48
Ornithosis	0	2	7
Pertussis (children < 2 years)	0	62	44
Plague	0	0	0
Polio	0	0	0
Purulent meningitis			
Haemophilus influenzae	0	2	2
Listeria monocytogenes	0	1	7
Streptococcus pneumoniae	0	59	79
Other aethiology	0	16	10
Unknown aethiology	0	15	11
Under registration	0	10	-
Rabies	0	0	0
Rubella (congenital)	0	1	0
Rubella (during pregnancy)	0	0	0
Shigellosis	0	43	35
of these, infected abroad	0	35	22
Syphilis	0	75	59
Tetanus	0	1	0
Tuberculosis	0	253	248
Typhoid/paratyphoid fever	0	19	11
of these, infected abroad	0	14	10
Typhus exanthematicus	0	0	2
VTEC/HUS	0	87	94
of these, infected abroad	0	30	26

[1] *Cumulative number 2008 and in corresponding period 2007*

Selected laboratory diagnosed infections

Number of specimens, isolates, and/or notifications received in SSI laboratories

Table 2	Week 32 2008	Cum. 2008 [2]	Cum. 2007 [2]
Bordetella pertussis			
(all ages)	6	111	109
Gonococci	7	223	236
of these, females	1	46	36
of these, males	6	177	200
Listeria monocytogenes	0	32	32
Mycoplasma pneumoniae			
Resp. specimens [3]	1	48	253
Serum specimens [4]	0	59	299
Streptococci [5]			
Group A streptococci	3	105	76
Group B streptococci	8	77	53
Group C streptococci	0	10	11
Group G streptococci	5	87	70
S. pneumoniae	9	644	694
Table 3	**Week 30 2008**	**Cum. 2008 [2]**	**Cum. 2007 [2]**
MRSA	10	345	344
Pathogenic int. bacteria [6]			
Campylobacter	80	1541	1990
S. Enteritidis	23	204	254
S. Typhimurium	65	1013	169
Other zoon. salmonella	26	541	406
Yersinia enterocolitica	6	186	159
Verocytotoxin-producing E. coli	2	84	96
Enteropathogenic E. coli	4	81	96
Enterotoxigenic E. coli	13	190	125

[2] *Cumulative number 2008 and in corresponding period 2007*

[3] *Resp. specimens with positive PCR*

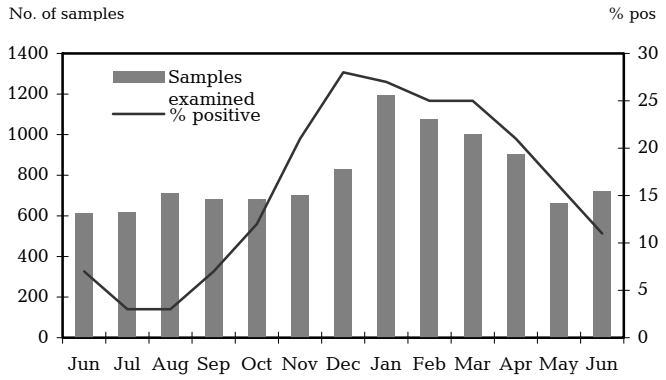
[4] *Serum specimens with pos. complement fixation test*

[5] *Isolated in blood or spinal fluid*

[6] *See also www.germ.dk*

Norovirus 2007-2008

Examined samples and percent positive, Jun 07- Jun 08



Samples from clinical microbiology departments at Odense Hospital, Copenhagen University Hospital, and the Department of Virology, SSI

13 August 2008