# EPI-NEWS

NATIONAL SURVEILLANCE OF COMMUNICABLE DISEASES



Editor: Peter Henrik Andersen
Dept. of Epidemiology
Statens Serum Institut • 5 Artillerivej • DK 2300 Copenhagen S

Tel.: +45 3268 3268 • Fax: +45 3268 3874
www.ssi.dk • epinews@ssi.dk • ISSN: 1396-4798


## WATER CONTAMINATION IN KØGE, JANUARY 2007


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On 15 January 2007, Køge Municipality received the first complaints from citizens living in the northern part of the municipality concerning cases of diarrhoea and vomiting during the two previous days. In addition, discoloured, foul-smelling and -tasting drinking water was reported. On suspicion of water contamination, any use of the water–except for toilet flushing - was immediately prohibited in the entire area supplied by the local waterworks; the area including 5802 citizens and a number of companies. Køge Municipality established a working group with participation from the Køge Municipality Technical Department, consultant water engineers, MOH Zealand, the Food Inspectorate Region East, The Emergency Services, the police, and SSI. Microbiological testing of water samples from the distribution system detected a massive faecal contamination of the drinking water. However, testing of the water at the waterworks indicated no contamination. On the basis of the geographical distribution of indicator bacteria in 530 water samples taken at 200 sites across the water distribution system, the affected area was limited to a total of 177 households (450 residents) and a number of companies, including six food companies.

**Figure 1. Date of disease onset for persons registered with gastrointestinal infection in the contaminated area in Køge, 8-24 January 2007**

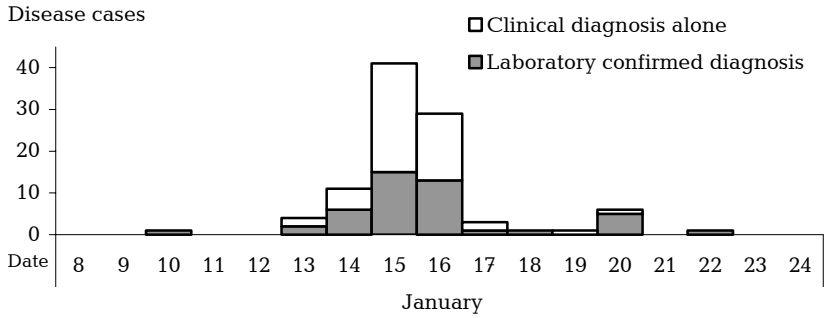



**Table 1. Detected enteropathogens in connection with the Køge water contamination, January 2007**

| | No. |
|---|---|
| Bacterium | |
| Campylobacter jejuni | 16 |
| Campylobacter coli | 4 |
| Campylobacter lari | 3 |
| Escherichia coli (A/EEC) | 15 |
| Escherichia coli (EPEC O55) | 1 |
| Escherichia coli (EPEC O119) | 3 |
| Escherichia coli (EPEC O128) | 1 |
| Escherichia coli (ETEC LT) | 1 |
| Escherichia coli (VTEC VT1+VT2) | 1 |
| Salmonella Stanley | 2 |
| Salmonella Senftenberg | 1 |
| Yersinia enterocolitica | 1 |
| Virus | |
| Norovirus | 32 |
| Rotavirus | 3 |
| Parasite | |
| Giardia intestinalis | 4 |
| Blastocystis hominis | 12 |
| Entamoeba histolytica/dispar | 1 |
| Entamoeba coli | 6 |
| Endolimax nana | 2 |

**Disease cases**

Cases of gastrointestinal disease were registered on the basis of:
- reports from the treating physicians
- enquiries made to the MOH and the emergency medical service in Roskilde/Køge
- a hotline established by Køge Municipality
- submission of patient stool samples
- a house-to-house survey at the most severely affected street.

On 1 March 2007, a total of 140 cases (defined as diarrhoea, vomiting and/or abdominal pain/convulsions with fever) had been registered: 110 among residents of the contaminated area, 12 among shoppers or employees at the food companies in the area, and 18 among people not living in the area. Figure 1 shows the epidemic curve for persons with known disease onset in the contaminated area. No new cases were registered after 24 January. A total of 24% of the residents of the contaminated area were registered with the disease, compared with 0.3% in the other sections of the waterworks supply area (relative risk 79; 95% CI 48-128). From the most severely affected street, 43% of residents were reported to have fallen ill. Four patients were admitted to hospital. Stool samples from 139 patients were tested for enteropathogenic bacteria, virus and parasites, Table 1.
A total of 77 patients yielded one or more positive findings, including 23 patients with 2-5 different pathogenic intestinal organisms. Not all samples were tested for the entire range of pathogens mentioned in Table 1.

**Cause and intervention**

Technical and water-microbiological investigations indicated that the most probable cause was a combination of a technical and a human error at a sewage treatment facility in the area which allowed filtered waste water to enter the drinking water supply in the period 12-14 January. The conclusion drawn from the technical investigation was supported by the finding of a range of different enteropathogens suggesting that the contamination comprised waste water from a large area. The technical report is available at www.koege.dk. Flushing of the area's distribution system was initiated immediately and sustained for several weeks. As faecal indicator bacteria were still found in the drinking water, the distribution system was subsequently disinfected by chlorination on 10 and 11 February. After another two days of flushing, the drinking water prohibition was repealed, allowing the water to be used for ordinary purposes after boiling. This boil order remains in force.

**Commentary**

In Denmark, disease cases are rarely registered in connection with drinking water contamination. There are, however, exceptions, including an outbreak of Campylobacter jejuni in Klarup in 1996. The Køge outbreak was unusual because of the mixed aetiology and the high morbidity among the exposed persons. The outbreak was caused by an extremely massive contamination of part of the distribution system. The consequences were considerable for the affected families, but also for the food companies, which were not able to resume production until the middle of February. The handling of the outbreak called for interdisciplinary cooperation and the epidemiological investigation supported the technical and water-microbiological surveys.
In connection with disease registration, it was of considerable importance that many treating physicians remembered to report the cases using form 1515.


(L.S. Vestergaard, K. Mølbak, Dept. of Epidemiology, K. Olsen, R. Stensvold, DBMP, B. Böttiger, Dept. of Virology, M. Adelhardt, MOH Zealand)


7 March 2007

## Individually notifiable diseases

Number of notifications received in the Department of Epidemiology, SSI (2007 figures are preliminary)

| Table 1 | Week 9 2007 | Cum. 2007 [1] | Cum. 2006 [1] |
|---|---|---|---|
| AIDS | 0 | 8 | 9 |
| Anthrax | 0 | 0 | 0 |
| Botulism | 0 | 0 | 0 |
| Cholera | 0 | 0 | 0 |
| Creutzfeldt-Jakob | 0 | 7 | 4 |
| Diphtheria | 0 | 0 | 0 |
| Food-borne diseases | 6 | 105 | 74 |
| of these, infected abroad | 0 | 11 | 18 |
| Gonorrhoea | 6 | 73 | 68 |
| Haemorrhagic fever | 0 | 0 | 0 |
| Hepatitis A | 1 | 9 | 3 |
| of these, infected abroad | 0 | 2 | 0 |
| Hepatitis B (acute) | 0 | 4 | 4 |
| Hepatitis B (chronic) | 6 | 44 | 52 |
| Hepatitis C (acute) | 0 | 1 | 1 |
| Hepatitis C (chronic) | 3 | 62 | 46 |
| HIV | 5 | 48 | 37 |
| Legionella pneumonia | 3 | 19 | 15 |
| of these, infected abroad | 0 | 1 | 2 |
| Leprosy | 0 | 0 | 0 |
| Leptospirosis | 0 | 4 | 3 |
| Measles | 0 | 0 | 4 |
| Meningococcal disease | 0 | 4 | 20 |
| of these, group B | 0 | 0 | 12 |
| of these, group C | 0 | 3 | 2 |
| of these, unspec. + other | 0 | 1 | 6 |
| Mumps | 0 | 3 | 8 |
| Neuroborreliosis | 2 | 20 | 11 |
| Ornithosis | 0 | 2 | 4 |
| Pertussis (children < 2 years) | 0 | 17 | 15 |
| Plague | 0 | 0 | 0 |
| Polio | 0 | 0 | 0 |
| Purulent meningitis | | | |
| Haemophilus influenzae | 0 | 0 | 1 |
| Listeria monocytogenes | 0 | 1 | 3 |
| Streptococcus pneumoniae | 0 | 11 | 17 |
| Other aethiology | 0 | 1 | 1 |
| Unknown aethiology | 0 | 0 | 5 |
| Under registration | 4 | 18 | - |
| Rabies | 0 | 0 | 0 |
| Rubella (congenital) | 0 | 0 | 0 |
| Rubella (during pregnancy) | 0 | 0 | 0 |
| Shigellosis | 0 | 8 | 17 |
| of these, infected abroad | 0 | 4 | 15 |
| Syphilis | 5 | 20 | 15 |
| Tetanus | 0 | 0 | 0 |
| Tuberculosis | 10 | 68 | 63 |
| Typhoid/paratyphoid fever | 0 | 1 | 7 |
| of these, infected abroad | 0 | 1 | 7 |
| Typhus exanthematicus | 0 | 0 | 0 |
| VTEC/HUS | 2 | 18 | 20 |
| of these, infected abroad | 0 | 6 | 7 |

[1] *Cumulative number 2007 and in corresponding period 2006*

## Selected laboratory diagnosed infections

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

| Table 2 | Week 9 2007 | Cum. 2007 [2] | Cum. 2006 [2] |
|---|---|---|---|
| Bordetella pertussis (all ages) | 5 | 30 | 46 |
| Gonococci | 9 | 67 | 70 |
| of these, females | 1 | 10 | 14 |
| of these, males | 8 | 57 | 56 |
| Listeria monocytogenes | 0 | 12 | 5 |
| Mycoplasma pneumoniae | | | |
| Resp. specimens [3] | 9 | 178 | 166 |
| Serum specimens [4] | 21 | 165 | 119 |
| Streptococci [5] | | | |
| Group A streptococci | 2 | 27 | 26 |
| Group B streptococci | 3 | 15 | 19 |
| Group C streptococci | 0 | 1 | 6 |
| Group G streptococci | 1 | 23 | 22 |
| S. pneumoniae | 41 | 253 | 268 |
| **Table 3** | **Week 7 2007** | **Cum. 2007 [2]** | **Cum. 2006 [2]** |
| Pathogenic int. bacteria [6] | | | |
| Campylobacter | 27 | 315 | 235 |
| S. Enteritidis | 6 | 30 | 38 |
| S. Typhimurium | 5 | 24 | 40 |
| Other zoon. salmonella | 11 | 74 | 69 |
| Yersinia enterocolitica | 6 | 34 | 21 |
| Verocytotoxin-producing E. coli | 3 | 17 | 9 |
| Enteropathogenic E. coli | 1 | 36 | 34 |
| Enterotoxigenic E. coli | 1 | 19 | 24 |

[2] *Cumulative number 2006 and in corresponding period 2005*

[3] *Resp. specimens with positive PCR*

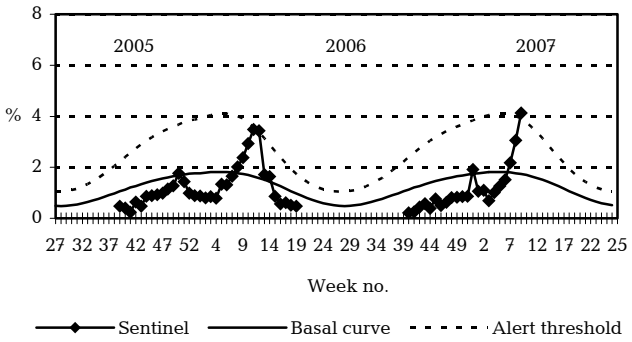
[4] *Serum specimens with pos. complement fixation test*

[5] *Isolated in blood or spinal fluid*

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

## Sentinel surveillance of the influenza activity

Weekly percentage of consultations, 2005/2006/2007




| | |
|---|---|
| Sentinel: | Influenza consultations (as percentage of total consultations) |
| Basal curve: | Expected frequency of consultations under non-epidemic conditions |
| Alert threshold: | Possible incipient epidemic |

7 March 2007