

## WHOOPING COUGH 2007

No. 42/43, 2008

This report comprises all cases of laboratory-diagnosed whooping cough detected in Denmark in 2007 by culture and/or PCR.

It is based on data from whooping cough cases diagnosed at Statens Serum Institut (SSI), Department of Clinical Microbiology (DCM) Herlev Hospital, DCM Odense University Hospital, DCM Regional Hospital Viborg and DCM Aarhus University Hospital, Skejby. Distribution by part of country is shown in [Table 1](#).

**Table 1. Laboratory-confirmed whooping cough cases by area, and incidence per 10<sup>5</sup>, 2007**

Area	No.	Incidence
Copenhagen city	59	9
Copenhagen subs	31	6
Northern Zealand	32	7
Bornholm	1	2
Eastern Zealand	26	11
W & S	31	5
Zealand	102	21
Southern Jutland	41	6
Western Jutland	9	2
Eastern Jutland	93	12
Northern Jutland	28	5
Other/not stated	2	-
<b>Total</b>	<b>455</b>	<b>8</b>

With an aggregate incidence of 8 per 10<sup>5</sup>, the 2007 whooping cough incidence was at par with the last couple of years. The 2006 and 2005 incidences were 6 and 11 per 10<sup>5</sup>, respectively, while during the latest epidemic in 2002 the incidence reached 36 per 10<sup>5</sup>. Please find the incidence curve for 1996-2006 in [EPI-NEWS 4/07](#).

**Table 2. Laboratory-confirmed whooping cough cases by age, and incidence per 10<sup>5</sup>, 2007**

Age (yrs)	No.	Incidence
< 2	96	74
2-4	40	21
5-9	62	18
10-14	101	29
15-19	21	7
20-29	31	5
30-39	32	4
40-49	42	5
50+	30	2
<b>Total</b>	<b>455</b>	<b>8</b>

### Distribution by age and sex

Age distribution is shown in [Table 2](#).

The primary whooping cough age groups in 2007 were children below the age of 2 years (96), including 80 (83%) infants below 1 year, and children aged 10-14 years (101), including 64 (63%) aged 10-11 years. Such distribution corresponds to that of the previous years as infants are not yet fully vaccinated and as the group of 10-11 year-olds represent the last birth cohorts who have not been offered the five-year booster. Persons aged  $\geq 15$  years comprised 34% of all whooping cough cases. Among the 0-14 year-olds, females comprised 55% of the cases and among persons aged  $\geq 15$  years females comprised 66% of the cases.

### Mandatory laboratory notification

As per 1 October 2007 laboratory-confirmed whooping cough became notifiable for all age groups. The minimum requirement is that the diagnosing laboratory sends a quarterly statement including all confirmed whooping cough cases and corresponding person-identifiable data (National Board of Health Executive order no. 1102 of 20 September 2007).

### Commentary

Whooping cough is extremely infectious and can be fatal in unvaccinated infants. Neither vaccination nor natural whooping cough provides life-long immunity, and protection is presumed to last 5-10 years for both types of immunity. The majority of the adult population is therefore susceptible to whooping cough infection and - as the condition occurs in a milder version in adults - it may be underdiagnosed in adults.

Whooping cough typically occurs in epidemics at 3-5 year intervals, and as the previous epidemic occurred in 2002, another is likely to occur within the next 1-2 years, based on past data.

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### WHOOPING COUGH IN CHILDREN < 2 YEARS

For children < 2 years of age whooping cough infection is notifiable. Form 1515 is to be used in laboratory-confirmed cases.

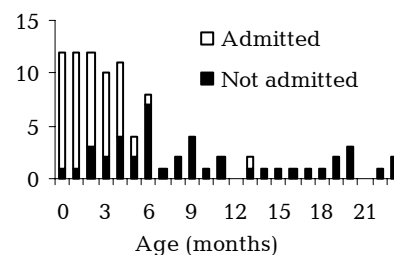
In 2007, a total of 94 children < 2 years were notified with whooping cough, 47 males and 47 females. One case was reportedly epidemiologically linked to a confirmed case.

Reminders were sent out for 40% of the notifications. Individual notification is still outstanding in five of the laboratory-confirmed whooping cough cases < 2 years. Differences between the number of laboratory-confirmed and notified cases < 2 years are caused by different registration procedures and reporting at year's end. The highest occurrence was found on Funen.

The age distribution was as follows: 36 children (38%) were aged < 2 months, 21 (22%) were 3-4 months, 22 (23%) were 5-11 months and 15 (16%) were 12-23 months.

Among the 94 notified children < 2 years, 50 (53%) were unvaccinated, while 12 (13%) had received three whooping cough vaccinations. The proportion of children < 6 months admitted to hospital with whooping cough was 65%, in addition to which two children, aged 6 and 13 months respectively, were admitted, [Figure 1](#).

**Figure 1. Notified whooping cough cases in children < 2 years, by age in months and admission, 2007**



### Mode of transmission

The source of infection was known in 60% of the notified cases in children. Among known infection sources siblings comprised 47%, other family members 25%, other known persons 14%, whooping cough in the environment 9% and child-care institutions 5%. Prophylaxis for exposed children: [EPI-NEWS 45/02](#).

### Commentary

In 2007 the occurrence of whooping cough in children < 2 years was somewhat higher than in 2006, when only 55 cases were notified. 2008 has currently seen 57 notifications, which is in line with expectations.

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## Individually notifiable diseases

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

Table 1	Week 42 2008	Cum. 2008 <sup>1)</sup>	Cum. 2007 <sup>1)</sup>
AIDS	2	31	43
Anthrax	0	0	0
Botulism	0	0	0
Cholera	0	1	0
Creutzfeldt-Jakob	0	2	6
Diphtheria	0	0	0
Food-borne diseases	13	695	535
of these, infected abroad	2	118	103
Gonorrhoea	5	308	291
Haemorrhagic fever	0	0	0
Hepatitis A	1	39	20
of these, infected abroad	0	20	10
Hepatitis B (acute)	0	19	24
Hepatitis B (chronic)	0	145	276
Hepatitis C (acute)	0	6	6
Hepatitis C (chronic)	0	368	518
HIV	0	193	244
Legionella pneumonia	2	102	90
of these, infected abroad	0	36	24
Leprosy	0	0	0
Leptospirosis	1	3	12
Measles	0	10	2
Meningococcal disease	1	43	61
of these, group B	1	18	33
of these, group C	0	13	18
of these, unspec. + other	0	12	10
Mumps	1	24	6
Neuroborreliosis	3	47	78
Ornithosis	0	2	8
Pertussis (children < 2 years)	0	82	65
Plague	0	0	0
Polio	0	0	0
Purulent meningitis			
Haemophilus influenzae	0	2	2
Listeria monocytogenes	0	1	10
Streptococcus pneumoniae	0	72	85
Other aethiology	0	17	11
Unknown aethiology	0	16	13
Under registration	4	12	-
Rabies	0	0	0
Rubella (congenital)	0	2	0
Rubella (during pregnancy)	0	0	0
Shigellosis	0	66	189
of these, infected abroad	0	54	37
Syphilis	0	105	79
Tetanus	0	1	2
Tuberculosis	4	315	321
Typhoid/paratyphoid fever	0	28	17
of these, infected abroad	0	22	16
Typhus exanthematicus	0	0	2
VTEC/HUS	4	123	133
of these, infected abroad	0	39	45

<sup>1)</sup> 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 42 2008	Cum. 2008 <sup>2)</sup>	Cum. 2007 <sup>2)</sup>
Bordetella pertussis (all ages)	3	156	170
Gonococci	6	293	293
of these, females	1	61	46
of these, males	5	232	247
Listeria monocytogenes	0	40	48
Mycoplasma pneumoniae			
Resp. specimens <sup>3)</sup>	2	68	295
Serum specimens <sup>4)</sup>	1	66	356
Streptococci <sup>5)</sup>			
Group A streptococci	0	115	92
Group B streptococci	0	99	77
Group C streptococci	0	15	18
Group G streptococci	0	102	101
S. pneumoniae	15	742	829
Table 3	Week 41 2008	Cum. 2008 <sup>2)</sup>	Cum. 2007 <sup>2)</sup>
MRSA	15	537	475
Pathogenic int. bacteria <sup>6)</sup>			
Campylobacter	58	2657	3272
S. Enteritidis	20	518	453
S. Typhimurium	29	1626	275
Other zoon. salmonella	21	813	599
Yersinia enterocolitica	4	254	217
Verocytotoxin- producing E. coli	3	118	130
Enteropathogenic E. coli	4	199	146
Enterotoxigenic E. coli	4	316	239

<sup>2)</sup> Cumulative number 2008 and in corresponding period 2007

<sup>3)</sup> Resp. specimens with positive PCR

<sup>4)</sup> Serum specimens with pos. complement fixation test

<sup>5)</sup> Isolated in blood or spinal fluid

<sup>6)</sup> See also [www.germ.dk](http://www.germ.dk)

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