



## LABORATORY DIAGNOSED WHOOPING COUGH 2005 AND 2006 No. 4, 2007

This survey comprises all cases of laboratory diagnosed whooping cough found in Denmark in 2005 and 2006, diagnosed by culture and/or PCR, [Table 1](#).

**Table 1. Laboratory-diagnosed cases of whooping cough in 2005-2006 by age. Incidence per 10<sup>5</sup> in ( )**

Age (yrs)	Number	
	2005	2006
< 2	154 (119)	82 (63)
2-4	88 (44)	32 (16)
5-9	143 (42)	77 (23)
10-14	95 (27)	65 (19)
15-19	25 (8)	15 (5)
20-29	11 (2)	12 (2)
30-39	40 (5)	18 (2)
40-49	26 (3)	13 (2)
50+	30 (2)	17 (1)
<b>Total</b>	<b>612 (11)</b>	<b>331 (6)</b>

The survey is based on data from whooping cough cases diagnosed at Statens Serum Institute (SSI), Dept. of Clinical Microbiology (DCM) Herlev Hospital, DCM Odense University Hospital and DCM Viborg Regional Hospital, [Table 2](#).

**Table 2. Laboratory diagnosed cases of whooping cough 2005-2006, by diagnostic lab and method used. Percentages in ( )**

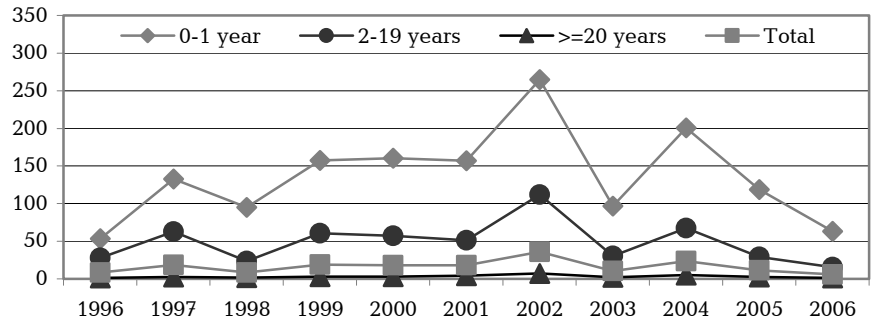
	PCR		Cul- ture		PCR+ culture	
	05	06	05	06	05	06
SSI	390	171	60	33	44	21
Herlev	14	23	6	-	-	-
Hvidovre	-	20	-	-	-	-
Odense	75	34	-	-	-	-
Viborg	23	29	-	-	-	-
<b>Total</b>	<b>502</b>	<b>277</b>	<b>66</b>	<b>33</b>	<b>44</b>	<b>21</b>
(%)	(82)	(84)	(11)	(10)	(7)	(6)

[Figure 1](#) shows that the 2005-2006 mean incidence of 9 cases per 10<sup>5</sup> was considerably lower than the 2002-2004 mean incidence of 24 cases per 10<sup>5</sup>, EPI-NEWS 46/05, and the mean of 18 per 10<sup>5</sup> found in 1999-2001, EPI-NEWS 44/02. In 2005 and 2006, PCR was the primary diagnostic method for whooping cough as 89% and 90% was diagnosed by PCR in the two years, respectively.

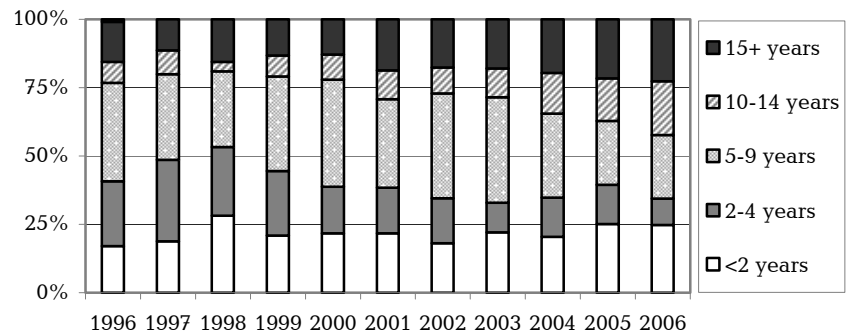
### Age distribution

The number of cases <2 years dropped markedly from 2005 to 2006, [Figure 1](#), while this age group's proportion of all cases remained unchanged, [Figure 2](#).

**Fig. 1. Cases of laboratory diagnosed whooping cough per 10<sup>5</sup> per annum, diagnosed by culture, January 1996-December 1997, and by culture and/or PCR, January 1998-December 2006**



**Fig. 2. Laboratory diagnosed whooping cough by age distribution, 1996-2006**



The proportion of 2-4-year-olds has decreased since 1997 (29.9% in 1997 and 9.7% in 2006), while the proportion of 5-9-year-olds (31%) remained largely unchanged from 1997 to 2003 and then decreased gradually to 23% in 2006.

### Distribution by sex

Girls comprised 53% of cases among children aged <10 years. In the age group ≥10 years, girls/women comprised 66% of cases.

### Sampling and diagnosis

Please refer to the relevant laboratory for recommendations on sampling as laboratories employ different diagnostic methods.

### Comment

The 2005 and 2006 whooping cough incidence was low compared with previous years. Whooping cough occurs epidemically every three to five years, and the latest whooping cough epidemic, comprising 1946 cases, occurred in 2002. The current low incidence may thus reflect an inter-epidemic period. The age distribution among the diagnosed cases display a trend possibly indicating a positive effect of the latest vaccination programme which

introduced acellular whooping cough vaccine at the beginning of 1997 and added a booster at the age of five years from September 2003. An assessment of the effect of the 5-year booster is currently being prepared.

The larger proportion of females among children/adults ≥10 years was also observed in the period 1995-2004. The proportion remains unexplained, but may be caused by biological and/or social factors.

Whooping cough is notifiable in children <2 years. On average, notifiable cases comprised only 25% of the laboratory diagnosed whooping cough cases in 2005 and 2006.

A continuous national surveillance of laboratory diagnosed whooping cough in all age groups is essential to the understanding of whooping cough prevalence in Denmark. It is needed to assess the vaccination programme's effect and to swiftly detect any epidemics.

(T. Dalby, J.J. Christensen, DBMP, P.H. Andersen, Dept. of Epidemiology, T. G. Jensen, DCM Odense University Hospital, J.O. Jarløv, DCM Herlev Hospital, G. Lisby, DCM Hvidovre Hospital, J. Prag, DCM Viborg Regional Hospital)

## Individually notifiable diseases

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

Table 1	Week 3 2007	Cum. 2007 <sup>1)</sup>	Cum. 2006 <sup>1)</sup>
AIDS	1	4	7
Anthrax	0	0	0
Botulism	0	0	0
Cholera	0	0	0
Creutzfeldt-Jakob	1	2	3
Diphtheria	0	0	0
Food-borne diseases	5	20	36
of these, infected abroad	2	4	7
Gonorrhoea	6	14	31
Haemorrhagic fever	0	0	0
Hepatitis A	1	3	1
of these, infected abroad	0	2	0
Hepatitis B (acute)	1	1	1
Hepatitis B (chronic)	5	13	9
Hepatitis C (acute)	0	1	0
Hepatitis C (chronic)	10	20	16
HIV	4	10	10
Legionella pneumonia	2	5	7
of these, infected abroad	0	0	1
Leprosy	0	0	0
Leptospirosis	0	1	2
Measles	0	0	0
Meningococcal disease	0	0	4
of these, group B	0	0	3
of these, group C	0	0	0
of these, unspec. + other	0	0	1
Mumps	0	0	4
Neuroborreliosis	4	10	5
Ornithosis	0	0	2
Pertussis (children < 2 years)	1	6	7
Plague	0	0	0
Polio	0	0	0
Purulent meningitis			
Haemophilus influenzae	0	0	0
Listeria monocytogenes	0	0	2
Streptococcus pneumoniae	0	1	5
Other aethiology	0	0	1
Unknown aethiology	0	0	3
Under registration	8	16	-
Rabies	0	0	0
Rubella (congenital)	0	0	0
Rubella (during pregnancy)	0	0	0
Shigellosis	0	2	9
of these, infected abroad	0	0	8
Syphilis	0	8	6
Tetanus	0	0	0
Tuberculosis	9	19	20
Typhoid/paratyphoid fever	0	0	3
of these, infected abroad	0	0	3
Typhus exanthematicus	0	0	0
VTEC/HUS	1	2	9
of these, infected abroad	1	2	2

<sup>1)</sup> 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 3 2007	Cum. 2007 <sup>2)</sup>	Cum. 2006 <sup>2)</sup>
Bordetella pertussis (all ages)	6	14	20
Gonococci	16	23	22
of these, females	2	3	4
of these, males	14	20	18
Listeria monocytogenes	5	8	4
Mycoplasma pneumoniae			
Resp. specimens <sup>3)</sup>	21	76	70
Serum specimens <sup>4)</sup>	19	47	44
Streptococci <sup>5)</sup>			
Group A streptococci	1	9	10
Group B streptococci	2	6	8
Group C streptococci	0	1	4
Group G streptococci	2	6	14
S. pneumoniae	24	97	127

Table 3	Week 1 2007	Cum. 2007 <sup>2)</sup>	Cum. 2006 <sup>2)</sup>
Pathogenic int. bacteria <sup>6)</sup>			
Campylobacter	36	36	37
S. Enteritidis	0	0	7
S. Typhimurium	1	1	9
Other zoon. salmonella	6	6	17
Yersinia enterocolitica	0	0	4
Verocytotoxin-producing E. coli	2	2	3
Enteropathogenic E. coli	5	5	5
Enterotoxigenic E. coli	1	1	4

<sup>2)</sup> Cumulative number 2006 and in corresponding period 2005

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

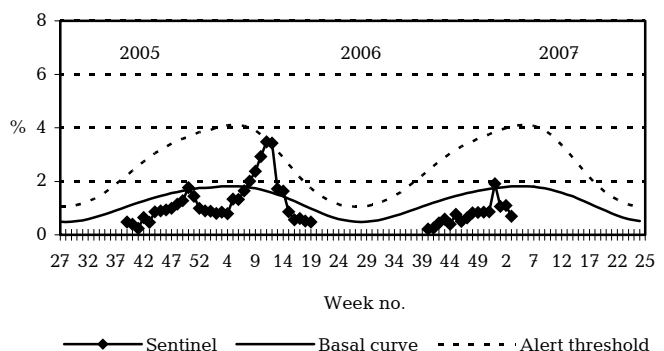
<sup>4)</sup> Serum specimens with pos. complement fixation test

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

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

## 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