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NATIONAL SURVEILLANCE OF COMMUNICABLE DISEASES

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PCV 7 COVERAGE AND INVASIVE PNEUMOCOCCAL DISEASE (IPD) 2008/9 No. 7/8, 2010

The 7-valent conjugate pneumococcal vaccine (PCV7) has been part of the Danish childhood vaccination programme since 1 October 2007. Below we resume the coverage of the vaccination programme and the effect of PCV7 two years after its introduction.

Background

PCV7 is given at the ages of 3, 5 and 12 months in the routine programme. Children who on 1 October 2007 were aged 4-11 months or 12-17 months were offered three and two doses, respectively, as part of a catch-up programme, EPI-NEWS 37a+b/07.

Prior to the introduction of PCV7, the seven pneumococcal serotypes (PS) included in the vaccine comprised 60-65% of all cases of invasive pneumococcal disease (IPD) in children below the age of 5 years.

Vaccination coverage

The so-called code method was used to calculate vaccination coverage, EPI-NEWS 6/10.

As per 30 November 2009, the coverage of the standard programme for the birth cohorts 2007-2009 was 84-87% for the first PCV7 and 85-88% for the second, Table 1. The coverage of the third PCV7 was 86% for those children born in 2007, who were comprised by the routine programme. The 2008 and 2009 birth cohorts were not fully vaccinated when the data was analysed.

Coverage of the catch-up programme was 71, 67 and 55% for the first, second and third PCV7, respectively, for children who were 4-11 months old when the programme was introduced. Among children aged ≥ 12 months, 55 and 55% had received the first and second PCV7, respectively. The third PCV7 was given to 11%, despite the fact that this group of children should only have been offered two doses.

Changes in IPD occurrence

Figure 1 shows the age-specific occurrence of laboratory-confirmed IPD cases per 100,000 inhabitants before and after the introduction of PCV7 to the childhood vaccination programme.

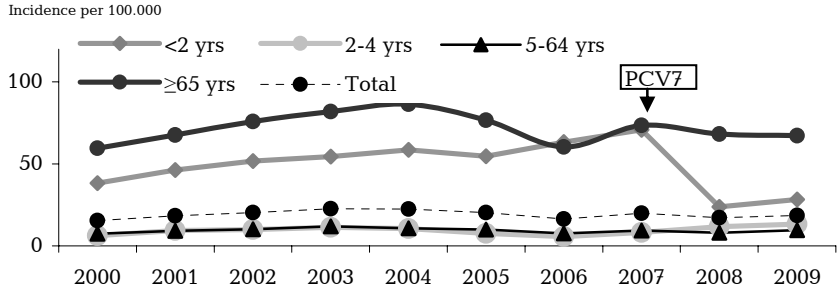
The report is based on national data from the Neisseria and Streptococcus Reference Laboratory, Statens Serum Institut. IPD cases are defined on the basis of positive Streptococcus pneumoniae culture from cerebrospinal fluid, blood or other sterile material.

Table 1. PCV7 vaccination coverage percentages for birth years 2006-2009

	Routine programme			Catch-up-programme	
				Age at programme start	
				4-11 mths	>12 mths
Vaccine	2009*	2008**	2007***	2006/2007	2006****
PCV 1	87	86	84	71	55
PCV 2	86	88	85	67	50
PCV 3	-	73	86	55	11

*) Includes children born before 1 June 2009
**) Includes children aged 11 months, consequently, PCV3 is underestimated
***) Includes children born from 1 June 2007
****) This group is only offered two doses

Figure 1. Age-specific and overall incidence of laboratory-confirmed cases of invasive pneumococcal disease, 2000-2009



The decrease in IPD incidence was strongest in children < 2 years: from 54 cases per 100,000 in 2000-2007 to 26 cases per 100,000 in 2008-2009. In this age-group the IPD incidence caused by vaccine serotypes decreased from 36.7 per 100,000 prior to the introduction of PCV7 to 4.6 after its introduction. This is equivalent to an estimated 87% programme effectiveness against the seven vaccine serotypes, counting vaccinated as well as unvaccinated children.

The average number of annual IPD cases in 2000-2007 was 1,055, compared with an average of 985 annual cases in 2008-2009. The overall IPD incidence before PCV7 was 19.6 cases per 100,000. This incidence decreased to 17.9 cases per 100,000 in 2008-2009.

In children below the age of 5 years, mortality following IPD was nearly 2% before the vaccine was introduced. A single death has been recorded after IPD among children in this age-group in 2008-8009, equivalent to a 1% mortality.

Commentary

The IPD incidence in children < 2 years has been halved compared to the average incidence recorded in the seven-year-period leading up to the introduction of PCV7 to the childhood vaccination programme. This is primarily due to a decrease in the occurrence of the serotypes included in the vaccine.

The various PS may display natural variation over time. It is estimated that PS occurrence not comprised by the PCV7 is covered by this variation. It should, however, be noted that an increase has been observed in a few serotypes such as 7F and 1. These serotypes are covered by PCV10 and PCV13. In the coming years, it will remain important to monitor serotype occurrence to facilitate assessment of the long-term effect of the programme.

Vaccination coverage of PCV7 in the catch-up programme was lower than the coverage observed for the HPV catch-up programme, EPI-NEWS 6/10. Coverage of the DTaP-IPV/Hib vaccination, which is administered concurrently and which will be reported in a subsequent EPI-NEWS issue, is approx. three percentage points higher than that of the PCV7 routine programme. The cause is currently unknown, but the vaccine's effectiveness is assessed to be satisfactory at the current coverage.

During the next year, the decision will be made to replace PCV7 with either PCV10 or PCV13. In spring, however, PCV13 will temporarily replace PCV7 as this vaccine will be discontinued. This will be discussed in a later issue of EPI-NEWS.

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Individually notifiable diseases

Number of notifications received in the Department of Epidemiology, SSI (2010 figures are preliminary)

Table 1	Week 7 2010	Cum. 2010 [1]	Cum. 2009 [1]
AIDS	1	12	4
Anthrax	0	0	0
Botulism	0	0	0
Cholera	0	0	0
Creutzfeldt-Jakob	1	5	1
Diphtheria	0	0	0
Food-borne diseases	10	39	56
of these, infected abroad	0	8	4
Gonorrhoea	5	101	90
Haemorrhagic fever	0	0	0
Hepatitis A	0	8	5
of these, infected abroad	0	1	3
Hepatitis B (acute)	0	4	3
Hepatitis B (chronic)	0	18	9
Hepatitis C (acute)	0	0	2
Hepatitis C (chronic)	0	44	22
HIV	8	32	52
Legionella pneumonia	0	17	15
of these, infected abroad	0	3	0
Leprosy	0	0	0
Leptospirosis	0	0	0
Measles	0	0	8
Meningococcal disease	0	9	18
of these, group B	0	0	8
of these, group C	1	4	2
of these, unspec. + other	0	0	0
Mumps	1	2	1
Neuroborreliosis	1	4	2
Ornithosis	0	0	0
Pertussis (children < 2 years)	2	10	9
Plague	0	0	0
Polio	0	0	0
Pneum. disease, invasive (IPD) [2]	4	29	27
Purulent meningitis			
Haemophilus influenzae	0	0	2
Listeria monocytogenes	0	2	1
Other aethiology	0	2	1
Unknown aethiology	0	0	1
Under registration	0	0	0
Rabies	0	0	0
Rubella (congenital)	0	0	0
Rubella (during pregnancy)	0	0	0
Shigellosis	1	15	15
of these, infected abroad	0	10	15
Syphilis	1	46	34
Tetanus	0	0	0
Tuberculosis	9	51	60
Typhoid/paratyphoid fever	0	7	3
of these, infected abroad	0	5	0
Typhus exanthematicus	0	0	0
VTEC/HUS	3	21	16
of these, infected abroad	0	2	4

[1] *Cumulative number 2010 and in corresponding period 2009*

[2] *Meningitis, all age groups, invasive pneumococcal disease < 5 years*

Selected laboratory diagnosed infections

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

Table 2	Week 7 2010	Cum. 2010 [3]	Cum. 2009 [3]
Bordetella pertussis (all ages)	3	27	17
Gonococci	5	82	57
of these, females	3	22	12
of these, males	2	60	45
Listeria monocytogenes	0	7	11
Mycoplasma pneumoniae			
Resp. specimens [3]	1	20	17
Serum specimens [4]	6	51	20
Streptococci [5]			
Group A streptococci	10	36	34
Group B streptococci	3	17	14
Group C streptococci	0	4	5
Group G streptococci	1	26	20
S. pneumoniae	26	210	254
Table 3	**Week 5 2010**	**Cum. 2009 [3]**	**Cum. 2008 [3]**
MRSA	7	48	87
Pathogenic int. bacteria [6]			
Campylobacter	46	208	134
S. Enteritidis	5	23	24
S. Typhimurium	5	32	120
Other zoon. salmonella	12	50	59
Yersinia enterocolitica	4	12	15
Verocytotoxin-producing E. coli	2	11	7
Enteropathogenic E. coli	2	17	13
Enterotoxigenic E. coli	6	52	12

[3] *Cumulative number 2010 and in corresponding period 2009*

[4] *Resp. specimens with positive PCR*

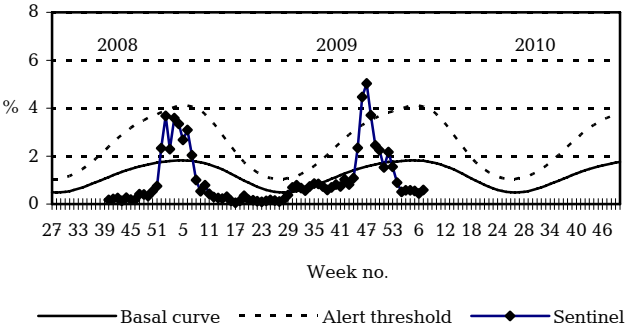
[5] *Serum specimens with pos. complement fixation test*

[6] *Isolated in blood or spinal fluid*

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

Sentinel surveillance of the influenza activity

Weekly percentage of consultations, 2008/2009/2010



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