

Invasive Pneumococcal Disease Quarterly Report

July-September 2011

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by
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Introduction

Since 17 October 2008, invasive pneumococcal disease (IPD) has been notifiable to the local Medical Officer of Health under the Health Act 1956. In June 2008, a 7-valent pneumococcal conjugate vaccine (PCV-7), Prevenar[®], was added to the New Zealand childhood immunisation schedule. From approximately October 2011, the 10-valent pneumococcal conjugate vaccine (PCV-10), Synflorix[®], will replace PCV-7 as supplies of the latter are depleted.

PCV-10 includes the seven serotypes in PCV-7 (4, 6B, 9V, 14, 18C, 19F, and 23F) as well as serotypes 1, 5, and 7F. The recommended schedule is four doses, given at 6 weeks, 3 months, 5 months and 15 months of age.

These quarterly reports are part of an enhanced surveillance programme to monitor the impact of PCV vaccination, including the change from PCV-7 to PCV-10, on the epidemiology of IPD in New Zealand.

Methods

The data presented in this report is based on the information recorded on EpiSurv, the national notifiable disease surveillance system, as at 10 October 2011. Any changes made to EpiSurv data by public health unit staff after this date will not be reflected in this report.

Denominator data used to determine all disease rates in this report was derived from the 2010 mid-year population estimates published by Statistics New Zealand. Rates have not been calculated where there are fewer than five notified cases in any category.

The Pearson chi-square test or, where necessary, Fisher's exact test were used to determine statistical significance. P-values <0.05 are considered to be significant at the 95% level of confidence.

Streptococcus pneumoniae isolates are serotyped at ESR by the capsular antigen reaction (Neufeld test) using the Danish system of nomenclature and sera obtained from the Statens Serum Institut. Methods have not been established at ESR to identify the strain type when only pneumococcal DNA, rather than an isolate, is available. Therefore, serotype can only be determined for culture-positive IPD cases. Serotype data for invasive isolates of *S. pneumoniae* was matched with the relevant IPD case notification.

Case definition

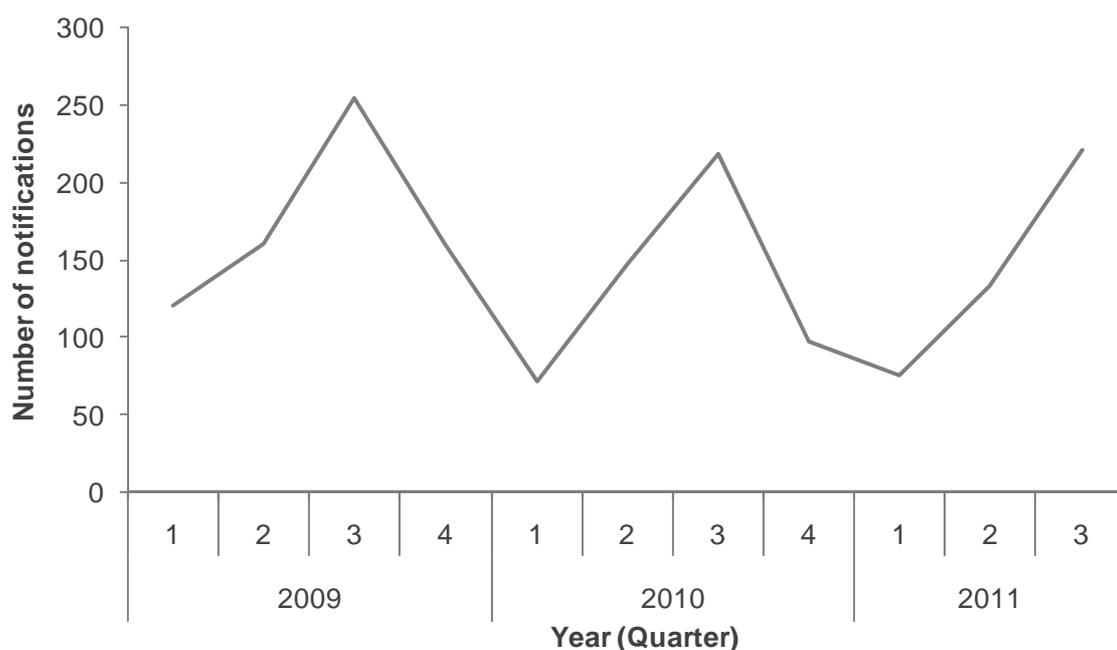
A case of invasive pneumococcal disease is defined as:

- the isolation of *S. pneumoniae* from CSF, blood or other normally sterile site; or
- the detection by nucleic acid amplification test of pneumococcal DNA in CSF, blood or other normally sterile site; or
- a positive newer-generation *S. pneumoniae* antigen test (i.e. Binax NOW) on CSF.

Results

There were 221 IPD cases notified in the July-September 2011 quarter (218 cases in July-September 2010). There is a distinct seasonal pattern with a peak in the July-September quarter and a trough in the January-March quarter each year (Figure 1). For the 12-month period ending 30 September 2011, the notification rate was 12.1 per 100 000 population (527 cases), compared with 13.7 per 100 000 (599 cases) for the previous 12-month period ending 30 September 2010.

Figure 1. Number of cases of invasive pneumococcal disease by quarter reported, Jan 2009–Sep 2011



The distribution of IPD cases and rates by age group is presented in Table 1. For the 12-month period ending 30 September 2011, the highest rates were reported in the 65+ years (39.0 per 100 000 population, 222 cases) and the <2 years (23.7 per 100 000, 30 cases) age groups. The rates for the 12 months ending September 2011 were lower than the rates in the previous 12 months for all age groups.

Table 1. Number of cases and rates of invasive pneumococcal disease by age group

Age group	Jul-Sep 2011	12-months ending Sep 2011		12-months ending Sep 2010	
	Cases	Cases	Rate ^a	Cases	Rate ^a
<2 years	8	30	23.7	41	32.3
2-4 years	7	17	9.2	30	16.2
5-64 years	122	257	7.4	285	8.2
65+ years	84	222	39.0	243	42.7
Unknown	0	1		0	
Total	221	527	12.1	599	13.7

^a Rate is expressed as cases per 100 000 population.

The distribution of IPD cases and rates by region is presented in Table 2. For the 12-month period ending 30 September 2011, the highest rate was reported in the Midland region (13.7 per 100 000 population, 114 cases). The Southern region was the only region that had a higher rate in the 12 months ending September 2011 compared to the previous 12-month period.

Table 2. Number of cases and rates of invasive pneumococcal disease by region

Region	Jul-Sep 2011	12-months ending Sep 2011		12-months ending Sep 2010	
	Cases	Cases	Rate ^a	Cases	Rate ^a
Northern ^b	94	203	12.4	244	14.9
Midland ^c	46	114	13.7	139	16.7
Central ^d	42	100	10.0	113	11.3
Southern ^e	39	110	12.2	103	11.4
Total	221	527	12.1	599	13.7

^a Rate is expressed as cases per 100 000 population.

^b Includes Northland, Waitemata, Auckland, and Counties Manukau DHBs.

^c Includes Waikato, Lakes, Bay of Plenty, Tairāwhiti, and Taranaki DHBs.

^d Includes Hawke's Bay, Whanganui, MidCentral, Hutt Valley, Capital and Coast, Wairarapa, and Nelson Marlborough DHBs.

^e Includes West Coast, Canterbury, South Canterbury, and Southern DHBs.

Table 3 shows the culture-positive cases due to each of the serotypes included in PCV-7 and PCV-10, and due to non-PCV-10 serotypes. Of the 221 cases notified in the July-September 2011 quarter, 209 (94.6%) were culture positive. The predominant PCV-7 serotype reported in the quarter was type 4 (21 cases). There was only one case of IPD in the <2 years age group due to a PCV-7 serotype during the quarter.

Comparing the 12-month period ending 30 September 2011 with the previous 12 months, the number of cases due to each of the PCV-7 types except 18C had decreased. The increase in the number of serotype 18C cases occurred in the 5+ years age group.

The number of cases due to serotype 1 (PCV-10, but not PCV-7, type), which was the most common serotype in the 12-month period ending September 2010, more than halved in the latest 12-month period (91 to 42 cases). The number of cases due to the non-PCV-10 serotypes 3 and 22F increased by 10 and 8 cases, respectively, between the two 12-month periods. Most of this increase occurred in the 5+ years age group.

The predominant non-PCV-10 serotype reported in the July-September 2011 quarter was 19A (28 cases). There was no increase in the number of cases of type 19A disease in the latest 12-month period ending 30 September 2011 compared with the previous 12 months, with 58 cases in both periods.

Table 3. Number of invasive pneumococcal disease cases by serotype and age group

Serotypes	Age group											
	<2 years			2-4 years			5+ years			Total ^a		
	Q3 2011 ^b	2011 ^c	2010 ^d	Q3 2011 ^b	2011 ^c	2010 ^d	Q3 2011 ^b	2011 ^c	2010 ^d	Q3 2011 ^b	2011 ^c	2010 ^d
4	0	0	0	1	1	2	20	39	54	21	40	56
6B	0	0	2	0	0	2	5	19	20	5	19	24
9V	0	1	0	0	0	2	7	19	31	7	20	33
14	0	2	5	0	2	3	14	29	41	14	33	49
18C	1	1	1	0	1	2	2	12	8	3	14	11
19F	0	2	6	0	3	3	13	32	34	13	37	43
23F	0	0	0	0	0	2	9	17	34	9	17	36
Total (PCV-7)	1	6	14	1	7	16	70	167	222	72	180	252
1	0	2	2	1	3	5	13	37	84	14	42	91
5	0	0	0	0	0	0	0	0	1	0	0	1
7F	1	1	2	1	1	0	6	11	8	8	13	10
Total (PCV-10)	2	9	18	3	11	21	89	215	315	94	235	354
3	0	1	2	0	0	2	11	31	18	11	32	22
6A ^e	0	0	0	0	0	0	4	9	12	4	9	12
9N	0	0	0	0	0	0	3	14	11	3	14	11
11A	0	1	1	0	0	0	3	14	9	3	15	10
19A	2	6	7	2	3	3	24	49	48	28	58	58
22F	0	1	0	0	0	0	17	30	23	17	31	23
Other types ^f	3	10	11	1	2	2	45	97	72	49	110	85
Total (non-PCV-10)	5	19	21	3	5	7	107	244	193	115	269	221

^a Total includes cases where age of case was unknown.

^b Cases reported in the third quarter of 2011 (July-September 2011).

^c Cases reported in the 12 months ending 30 September 2011.

^d Cases reported in the 12 months ending 30 September 2010.

^e Factorised sera to distinguish serotypes 6A and 6C was not used until 2010.

Therefore, some of the cases designated as serotype 6A in the 12 months ending 30 September 2010 may be 6C.

^f Other serogroups/serotypes reported in the July-September 2011 quarter include 6C, 7 (non-typable), 7A, 8, 10A, 12F, 15B, 16, 17F, 20, 21, 22 (non-typable), 23A, 23B, 31, 33F, 35, 37, and 38.