Invasive Pneumococcal Disease
Quarterly Report

January-March 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. Later this year, a 10-valent pneumococcal conjugate vaccine (PCV-10), Synflorix™, will replace PCV-7.

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 6 April 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 less than 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 invasive pneumococcal disease cases. Serotype data for invasive isolates of *S. pneumoniae* was matched with the relevant IPD case notification.

Case definition

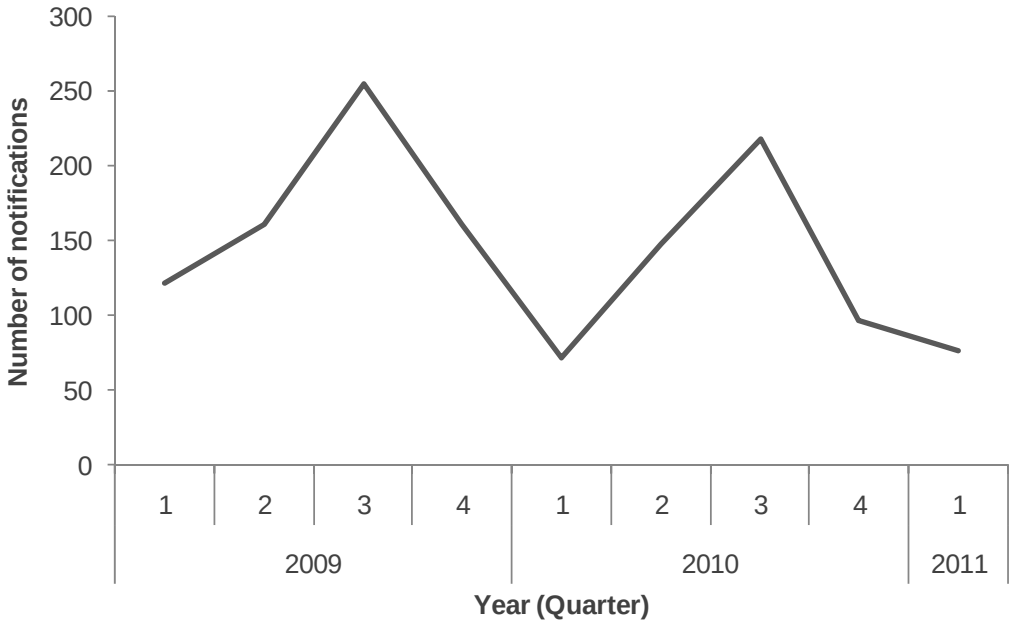
A case of invasive pneumococcal disease is defined as:

- 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 76 cases of invasive pneumococcal disease (IPD) notified in the January-March 2011 quarter (72 cases in January-March 2010). There is a distinct seasonal pattern with peak in the July-September quarter and a trough in the January-March quarter each year (Figure 1). For the 12-month period ending 31 March 2011, the notification rate was 12.3 per 100 000 population (539 cases), compared with 15.0 per 100 000 (648 cases) for the previous 12-month period ending 31 March 2010.

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



The distribution of IPD cases and rates by age group is presented in Table 1. For the 12-month period ending 31 March 2011, the highest rates were reported in the 65+ years (40.8 per 100 000 population, 232 cases) and the less than two years (32.3 per 100 000, 41 cases) age groups. The rates for the 12 months ending March 2011 were lower than the rates in the previous 12 months for all age groups except for those 65+ years old.

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

Age group	Jan-Mar 2011	12-months ending Mar 2011		12-months ending Mar 2010	
	Cases	Cases	Rate[a]	Cases	Rate[a]
<2 years	9	41	32.3	57	44.9
2-4 years	2	25	13.5	35	19.6
5-64 years	31	240	6.9	333	9.6
65+ years	33	232	40.8	223	40.4
Unknown	1	1	-	0	-
Total	**76**	**539**	**12.3**	**648**	**15.0**

[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 31 March 2011, the highest rate was reported in the Northern region. The Midland and Central regions had a significantly lower rate in the 12 months ending March 2011 compared to the previous 12-month period. The Southern region was the only region that had a higher rate in the 12 months ending March 2011 than in the previous 12 months.

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

Region	Jan-Mar 2011	12-months ending Mar 2011		12-months ending Mar 2010	
	Cases	Cases	Rate[a]	Cases	Rate[a]
Northern[b]	27	220	13.5	226	14.0
Midland[c]	13	107	12.8	179	21.7
Central[d]	14	104	10.4	148	14.9
Southern[e]	22	108	12.0	95	10.7
Total	**76**	**539**	**12.3**	**648**	**15.0**

[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, Tairawhiti, and Taranaki DHBs

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

[e] 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, PCV-10, and non-PCV-10 serotypes. Of the 76 cases notified in the January-March 2011 quarter, 62 (81.6%) were culture positive. The predominant PCV-7 serotype reported in the quarter was 19F (10 cases), all cases occurring in the 5+ years age group. The predominant non-PCV serotype reported in this quarter was 19A (7 cases), occurring in the less than 2 years (2 cases) and 5+ years (5 cases) age groups.

Comparing the 12-month period ending 31 March 2011 with the previous 12 months, the number of cases due to each of the PCV-7 types decreased. Similarly, the number of cases due to serotype 1 (PCV-10, not PCV-7), the most common serotype in both 12-month periods, decreased from 139 to 60 cases. However, the number of cases due to serotype 19A (non-PCV) increased from 38 to 54, although all of this increase occurred in the 5+ years age group.

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]		
	Q12011[b]	2011[c]	2010[d]	Q12011[b]	2011[c]	2010[d]	Q12011[b]	2011[c]	2010[d]	Q12011[b]	2011[c]	2010[d]
4	0	0	1	0	2	1	4	45	55	4	47	57
6B	0	1	3	0	1	4	3	18	22	3	20	29
9V	1	1	0	0	2	0	1	27	32	2	30	32
14	0	3	7	1	4	9	4	34	46	5	41	62
18C	0	0	1	0	0	3	0	7	16	0	7	20
19F	0	6	7	0	3	1	10	35	37	10	44	45
23F	0	0	1	0	1	4	1	19	41	1	20	46
Total (PCV-7)	**1**	**11**	**20**	**1**	**13**	**22**	**23**	**185**	**249**	**25**	**209**	**291**
1	0	2	9	0	5	5	4	53	125	4	60	139
5	0	0	0	0	0	0	0	1	0	0	1	0
7F	0	2	1	0	0	0	1	8	16	1	10	17
Total (PCV-10)	**1**	**15**	**30**	**1**	**18**	**27**	**28**	**247**	**390**	**30**	**280**	**447**
3	0	1	4	0	2	0	2	16	25	2	19	29
6A	0	2	1	0	0	1	1	18	9	1	20	11
9N	0	0	0	0	0	2	2	14	9	2	14	11
11A	1	1	1	0	0	0	2	15	3	3	16	4
19A	2	7	10	0	2	2	5	45	26	7	54	38
22F	0	1	1	0	0	0	2	24	18	2	25	19
Other types[e]	4	12	6	1	2	1	9	63	52	15	78	59
Total (non-PCV)	**7**	**24**	**23**	**1**	**6**	**6**	**23**	**195**	**142**	**32**	**226**	**171**

[a] Total includes cases where age of case was unknown

[b] Cases reported in the first quarter of 2011 (January-March 2011)

[c] Cases reported in the 12 months ending 31 March 2011

[d] Cases reported in the 12 months ending 31 March 2010

[e] Other serotypes reported in the January-March 2011 quarter include 6C, 7A, 8, 10A, 15B, 16, 20, 35 (no factor sera), and 38