

Invasive Pneumococcal Disease Quarterly Report

January–March 2012

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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[®], replaced PCV-7 as supplies of the latter were 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 11 April 2012. 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 2011 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

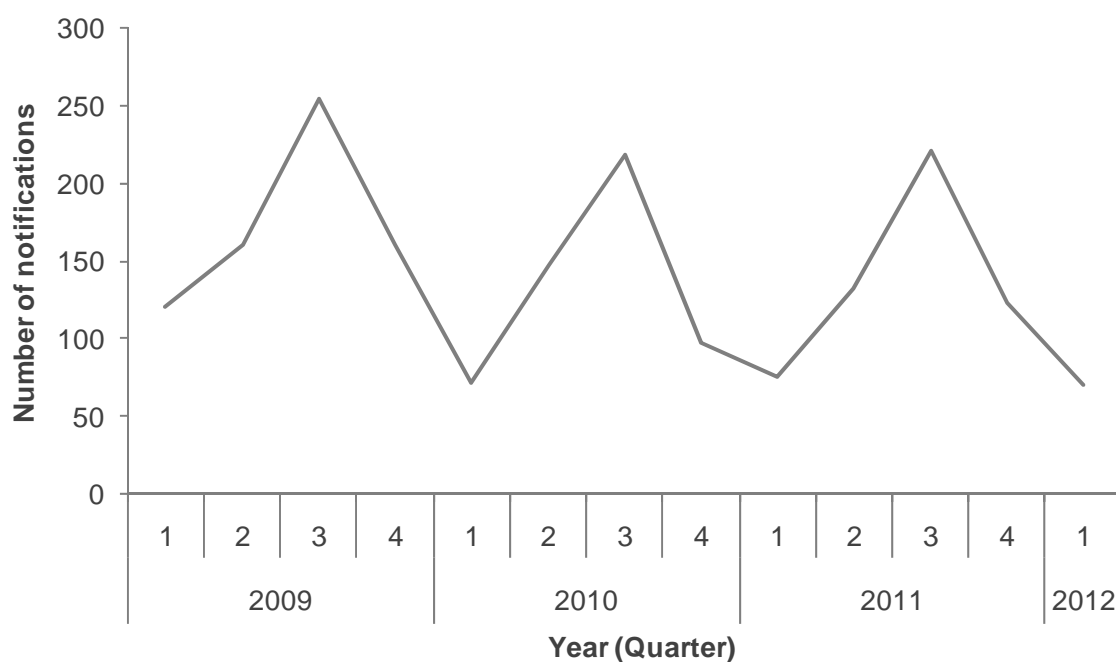
A case of invasive pneumococcal disease is defined as:

- 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 71 IPD cases notified in the January–March 2012 quarter (76 cases in January–March 2011). 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). The notification rate of 12.4 per 100 000 population (547 cases) for the latest 12-month period ending 31 March 2012 was similar to the rate for the previous 12-month period ending 31 March 2011 (12.3 per 100 000, 539 cases).

Figure 1. Number of cases of invasive pneumococcal disease by quarter reported, Jan 2009–Mar 2012



The distribution of IPD cases and rates by age group is presented in Table 1. During the latest 12-month period the highest rates were in the 65+ years (38.5 per 100 000 population, 226 cases) and <2 years (24.6 per 100 000, 31 cases) age groups. The rates for the latest 12-month-period were lower than those for the previous 12-month period in all age groups except the 5–64 years age group.

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

Age group	Jan–Mar 2012	12 months ending Mar 2012		12 months ending Mar 2011	
	Cases	Cases	Rate ^a	Cases	Rate ^a
<2 years	10	31	24.6	41	32.3
2–4 years	2	18	9.6	25	13.5
5–64 years	31	272	7.8	242	6.9
65+ years	28	226	38.5	231	40.6
Unknown	0	0		0	
Total	71	547	12.4	539	12.3

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

The distribution of IPD cases and rates by region is presented in Table 2. During the latest 12-month period, the highest rate was in the Midland region (14.2 per 100 000 population, 119 cases). The regional rates for the latest 12-month period were similar to those for the previous 12-month period except for a small increase (12.8 to 14.2 per 100 000) in the Midland region. However, between these two 12-month periods there were significant increases in the number of cases reported for Lakes (14 to 30) and Nelson Marlborough (5 to 17) DHBs.

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

Region	Jan–Mar 2012	12 months ending Mar 2012		12 months ending Mar 2011	
	Cases	Cases	Rate ^a	Cases	Rate ^a
Northern ^b	34	216	13.0	219	13.4
Midland ^c	12	119	14.2	107	12.8
Central ^d	12	110	10.9	104	10.4
Southern ^e	13	102	11.4	109	12.1
Total	71	547	12.4	539	12.3

^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 71 cases notified in the January–March 2012 quarter, 66 (93.0%) were culture positive. The predominant PCV-7 serotype reported in the quarter was type 4 (10 cases). There was only one case of IPD in the <2 years age group due to a PCV-7 serotype (type 14) during the quarter.

Comparing the latest 12-month period with the previous 12-month period, the number of cases due to each of the PCV-7 serotypes, except type 18C, either decreased or was very similar. The increase in the number of type 18C cases mostly 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 previous 12-month period, halved in the latest 12-month period (62 to 31) while cases due to serotype 7F doubled (10 to 20). The increase in type 7F cases occurred in cases aged 2+ years.

The number of cases due to non-PCV-10 serotypes increased 32% (230 to 303) in the latest 12-month period compared with the previous 12-month period, with increases of 67% in type 3 cases, 25% in type 19A cases and 60% in type 22F cases. Most of the increase in cases of these three types occurred in the 5+ years age group, with the exception of type 19A which also increased in the <2 years and 2–4 years age groups.

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

Serotypes	Age group											
	<2 years			2–4 years			5+ years			Total		
	Q1 2012 ^a	2012 ^b	2011 ^c	Q1 2012 ^a	2012 ^b	2011 ^c	Q1 2012 ^a	2012 ^b	2011 ^c	Q1 2012 ^a	2012 ^b	2011 ^c
4					1	2	10	49	47	10	50	49
6B		1	1			1	2	16	18	2	17	20
9V			1			2	2	13	28	2	13	31
14	1	1	3			4	2	24	35	3	25	42
18C		1			1		1	14	8	1	16	8
19F			6		3	3	6	31	36	6	34	45
23F					1	1		15	19		16	20
Total (PCV-7)	1	3	11	0	6	13	23	162	191	24	171	215
1	1	2	3		1	5	1	28	54	2	31	62
5									1			1
7F		2	2		2		5	16	8	5	20	10
Total (PCV-10)	2	7	16		9	18	29	206	254	31	222	288
3			1			2		35	18		35	21
6A		1	2					15	11		16	13
6C							2	7	11	2	7	11
9N		1					1	13	14	1	14	14
11A			1					11	15		11	16
19A	4	10	7	1	6	2	10	54	47	15	70	56
22F			1				4	40	24	4	40	25
33F		1	3				4	14	7	4	15	10
Other types ^d	4	9	9	1	2	2	4	84	53	9	95	64
Total (non-PCV-10)	8	22	24	2	8	6	25	273	200	35	303	230

^a Cases reported in the first quarter of 2012 (January–March 2012).

^b Cases reported in the 12 months ending 31 March 2012.

^c Cases reported in the 12 months ending 31 March 2011.

^d Other serogroups/serotypes reported in the January–March 2012 quarter include 7 (not 7A or 7F), 8, 9 (not 9N or 9V), 10A, 11, 15B, 17F and 35