

Invasive Pneumococcal Disease Quarterly Report

July–September 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 5 October 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 Fisher's exact test was 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 IPD cases. Serotype data for invasive isolates of *S. pneumoniae* was matched with the relevant IPD case notification.

Case definition

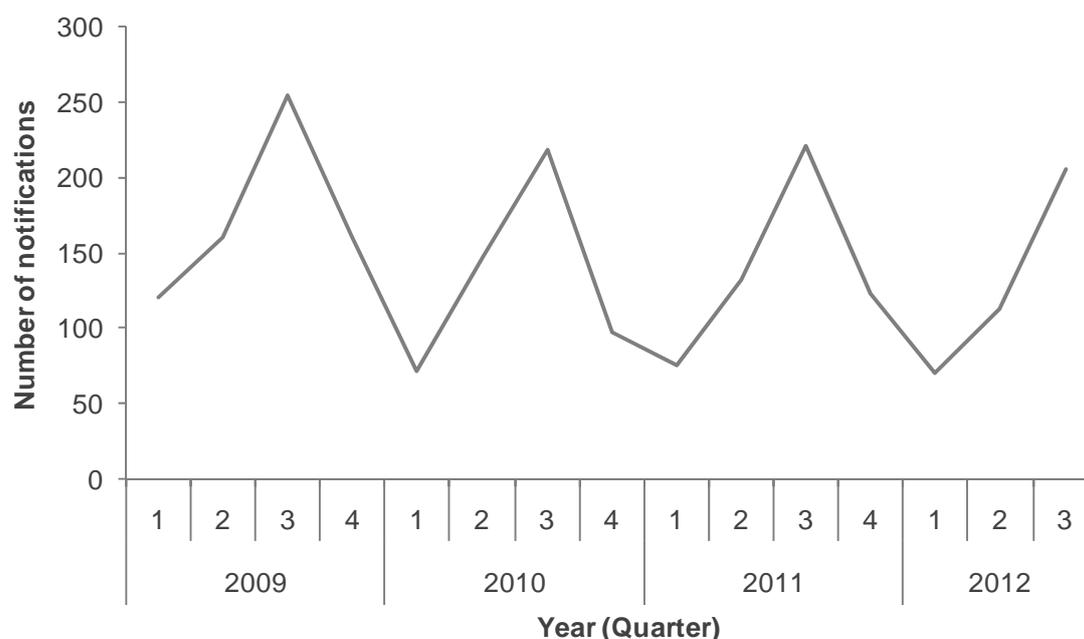
A case of invasive pneumococcal disease is defined as:

- 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 206 IPD cases notified in the July–September 2012 quarter (221 cases in July–September 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 11.6 per 100 000 population (513 cases) for the latest 12-month period ending 30 September 2012 was similar to the rate for the previous 12-month period ending 30 September 2011 (11.9 per 100 000, 526 cases).

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



The distribution of IPD cases and rates by age group is presented in Table 1. During the latest 12-month period the highest rate was in the 65+ years (37.3 per 100 000 population, 219 cases) age group. There was a non-significant increase in the rate for the <2 years age group from the previous 12-month period (23.8 per 100 000, 30 cases) to the latest 12-month period (35.8 per 100 000, 45 cases).

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

Age group	Jul-Sep 2012	12 months ending Sep 2012		12 months ending Sep 2011	
	Cases	Cases	Rate ^a	Cases	Rate ^a
<2 years	20	45	35.8	30	23.8
2-4 years	4	15	8.0	17	9.0
5-64 years	91	234	6.7	257	7.3
65+ years	91	219	37.3	222	37.8
Total	206	513	11.6	526	11.9

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

The distribution of IPD cases and rates by region is presented in Table 2. Over the last two 12-month periods, IPD rates were similar across all regions, ranging between 9.8 and 13.6 per 100 000 population. However, there was a significant increase in the rate in Capital and Coast DHB between the 12-month period ending September 2011 (3.7 per 100 000, 11 cases) and the latest 12-month period ending September 2012 (11.2 per 100 000, 33 cases).

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

Region	Jul-Sep 2012	12 months ending Sep 2012		12 months ending Sep 2011	
	Cases	Cases	Rate ^a	Cases	Rate ^a
Northern ^b	78	201	12.1	203	12.2
Midland ^c	45	110	13.1	114	13.6
Central ^d	47	114	11.3	100	9.9
Southern ^e	36	88	9.8	109	12.1
Total	206	513	11.6	526	11.9

^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 206 cases notified in the July–September 2012 quarter, 188 (91.3%) were culture-positive. The predominant PCV-7 serotype reported in the quarter was type 4 (17 cases), all in the 5+ years age group. During the quarter there were no cases of IPD due to a PCV-7 serotype in the <5 years age group.

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 4, has decreased. The increase in the number of cases due to type 4 was all in the 5+ years age group.

The number of cases due to serotype 1 (PCV-10, but not PCV-7, type) continued to decrease in the latest 12-month period (42 to 12), while cases of another PCV-10 serotype, 7F, increased 162% between the two 12-month periods (13 to 34). This increase in type 7F cases was mostly in the 5+ years age group.

The number of cases due to non-PCV-10 serotypes increased by 11% (268 to 298) in the latest 12-month period compared with the previous 12-month period, with the highest increases in type 8 (64%) and type 22F (52%) cases. These increases in type 8 and 22F cases were in the 5+ years age group. Serotype 19A cases are also increasing and this increase is across all age groups. Notably, type 19A was the most common serotype among IPD cases in the latest quarter and last two 12-month 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		
	Q3 2012 ^a	2012 ^b	2011 ^c	Q3 2012 ^a	2012 ^b	2011 ^c	Q3 2012 ^a	2012 ^b	2011 ^c	Q3 2012 ^a	2012 ^b	2011 ^c
4	0	0	0	0	0	1	17	48	39	17	48	40
6B	0	1	0	0	0	0	4	10	19	4	11	19
9V	0	0	1	0	1	0	4	12	19	4	13	20
14	0	1	2	0	0	2	9	17	29	9	18	33
18C	0	0	1	0	0	1	6	12	13	6	12	15
19F	0	0	2	0	0	3	9	25	32	9	25	37
23F	0	0	0	0	1	0	1	9	18	1	10	18
Total (PCV-7)	0	2	6	0	2	7	50	133	169	50	137	182
1	0	1	2	0	0	3	1	11	37	1	12	42
5	0	0	0	0	0	0	0	0	0	0	0	0
7F	0	2	1	1	3	1	19	29	11	20	34	13
Total (PCV-10)	0	5	9	1	5	11	70	173	217	71	183	237
3	0	1	1	0	0	0	10	26	31	10	27	32
6A	2	2	0	0	0	0	1	2	9	3	4	9
6C	2	2	1	0	0	0	6	14	14	8	16	15
8	1	1	2	0	0	0	6	17	9	7	18	11
9N	0	1	0	0	0	0	3	9	14	3	10	14
11A	2	2	1	0	0	0	3	12	13	5	14	14
19A	6	15	6	1	6	3	24	56	49	31	77	58
22F	0	0	1	0	0	0	17	47	30	17	47	31
33F	0	0	1	0	0	0	2	11	8	2	11	9
Other types ^d	5	13	6	0	1	2	26	60	67	31	74	75
Total (non-PCV-10)	18	37	19	1	7	5	98	254	244	117	298	268

^a Cases reported in the third quarter of 2012 (July–September 2012).

^b Cases reported in the 12 months ending 30 September 2012.

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

^d Other serogroups/serotypes reported in the July–September 2012 quarter include 7A, 10A, 10 (not 10A), 13, 15B, 15 (not 15B), 17F, 17 non-typable, 20, 22A, 22 non-typable, 23A, 23B, 31, and 35