

# Invasive Pneumococcal Disease Quarterly Report

October-December 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<sup>®</sup>, was added to the New Zealand childhood immunisation schedule. From approximately October 2011, the 10-valent pneumococcal conjugate vaccine (PCV-10), Synflorix<sup>®</sup>, 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 18 January 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 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

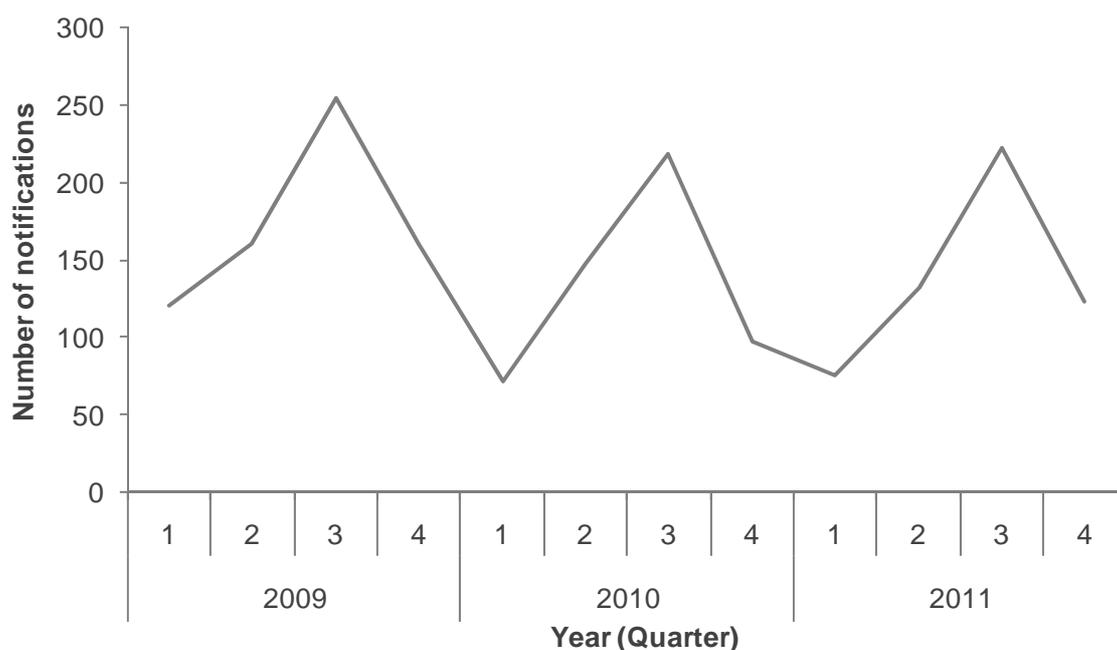
A case of invasive pneumococcal disease is defined as:

- 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 123 IPD cases notified in the October-December 2011 quarter (97 cases in October-December 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 31 December 2011, the notification rate was 12.7 per 100 000 population (553 cases), which was higher than the rate of 12.2 per 100 000 (535 cases) for the previous 12-month period ending 31 December 2010.

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



The distribution of IPD cases and rates by age group is presented in Table 1. For the 12-month period ending 31 December 2011, the highest rates were reported in the 65+ years (40.4 per 100 000 population, 230 cases) and the <2 years (23.7 per 100 000, 30 cases) age groups. The rates for the 12 months ending December 2011 were higher than the previous 12-month period for the 5-64 years and  $\geq 65$  years age groups.

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

Age group	Oct-Dec 2011	12-months ending Dec 2011		12-months ending Dec 2010	
	Cases	Cases	Rate <sup>a</sup>	Cases	Rate <sup>a</sup>
<2 years	8	30	23.7	37	29.2
2-4 years	4	18	9.7	28	15.1
5-64 years	57	274	7.9	246	7.1
65+ years	54	230	40.4	224	39.4
Unknown	0	1		0	
<b>Total</b>	<b>123</b>	<b>553</b>	<b>12.7</b>	<b>535</b>	<b>12.2</b>

<sup>a</sup> 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 December 2011, the highest rate was reported in the Midland region (14.4 per 100 000 population, 120 cases). All regions except the Northern region reported higher rates in the 12 months ending December 2011 compared to the previous 12-month period.

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

Region	Oct-Dec 2011	12-months ending Dec 2011		12-months ending Dec 2010	
	Cases	Cases	Rate <sup>a</sup>	Cases	Rate <sup>a</sup>
Northern <sup>b</sup>	46	208	12.7	229	14.0
Midland <sup>c</sup>	23	120	14.4	109	13.1
Central <sup>d</sup>	31	112	11.2	104	10.4
Southern <sup>e</sup>	23	113	12.6	93	10.3
<b>Total</b>	<b>123</b>	<b>553</b>	<b>12.7</b>	<b>535</b>	<b>12.2</b>

<sup>a</sup> Rate is expressed as cases per 100 000 population.

<sup>b</sup> Includes Northland, Waitemata, Auckland, and Counties Manukau DHBs.

<sup>c</sup> Includes Waikato, Lakes, Bay of Plenty, Tairāwhiti, and Taranaki DHBs.

<sup>d</sup> Includes Hawke's Bay, Whanganui, MidCentral, Hutt Valley, Capital and Coast, Wairarapa, and Nelson Marlborough DHBs.

<sup>e</sup> 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 123 cases notified in the October-December 2011 quarter, 120 (97.6%) were culture positive. The predominant PCV-7 serotype reported in the quarter was type 4 (11 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 31 December 2011 with the previous 12-month period, the number of cases due to each of the PCV-7 types, except 18C and 19F, decreased. The increase in the number of serotypes 18C and 19F 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 December 2010, more than halved in the latest 12-month period (77 to 35 cases) while cases due to serotype 7F increased by 77.8%. This increase occurred in the cases aged 2+ years.

The predominant non-PCV-10 serotype reported in the October-December 2011 quarter was 19A (13 cases). There was a small increase of 14.5% in cases due to serotype 19A disease in the latest 12-month period ending 31 December 2011 compared with the previous 12-month period. Between the two 12-month periods, the largest increases in cases of non-PCV-10 serotypes were an 85.7% increase in type 3 cases and a 65.2% increase in type 22F cases. Most of the increase in cases of these two types 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 <sup>a</sup>		
	Q4 2011 <sup>b</sup>	2011 <sup>c</sup>	2010 <sup>d</sup>	Q4 2011 <sup>b</sup>	2011 <sup>c</sup>	2010 <sup>d</sup>	Q4 2011 <sup>b</sup>	2011 <sup>c</sup>	2010 <sup>d</sup>	Q4 2011 <sup>b</sup>	2011 <sup>c</sup>	2010 <sup>d</sup>
4	0	0	0	0	1	2	11	45	44	11	46	46
6B	1	1	1	0	0	1	3	17	19	4	18	21
9V	0	1	0	0	0	2	3	13	29	3	14	31
14	0	0	3	0	1	4	4	27	33	4	28	40
18C	0	1	0	0	1	0	4	14	9	4	16	9
19F	0	0	6	0	3	3	6	36	27	6	39	36
23F	0	0	0	1	1	2	3	16	23	4	17	25
<b>Total (PCV-7)</b>	<b>1</b>	<b>3</b>	<b>10</b>	<b>1</b>	<b>7</b>	<b>14</b>	<b>34</b>	<b>168</b>	<b>184</b>	<b>36</b>	<b>178</b>	<b>208</b>
1	0	2	2	0	1	7	6	32	68	6	35	77
5	0	0	0	0	0	0	0	0	1	0	0	1
7F	1	2	2	1	2	0	2	12	7	4	16	9
<b>Total (PCV-10)</b>	<b>2</b>	<b>7</b>	<b>14</b>	<b>2</b>	<b>10</b>	<b>21</b>	<b>42</b>	<b>212</b>	<b>260</b>	<b>46</b>	<b>229</b>	<b>295</b>
3	0	0	2	0	0	2	11	39	17	11	39	21
6A	0	0	0	0	0	0	0	8	10	0	8	10
6C	0	1	2	0	0	0	4	15	9	4	16	11
9N	1	1	0	0	0	0	4	14	15	5	15	15
11A	0	1	0	0	0	0	4	13	13	4	14	13
19A	3	8	7	2	5	3	8	50	45	13	63	55
22F	0	0	1	0	0	0	12	38	22	12	38	23
Other types <sup>e</sup>	2	10	10	0	2	1	23	97	60	25	110	71
<b>Total (non-PCV-10)</b>	<b>6</b>	<b>21</b>	<b>22</b>	<b>2</b>	<b>7</b>	<b>6</b>	<b>66</b>	<b>274</b>	<b>191</b>	<b>74</b>	<b>303</b>	<b>219</b>

<sup>a</sup> Total includes cases where age of case was unknown.

<sup>b</sup> Cases reported in the fourth quarter of 2011 (October-December 2011).

<sup>c</sup> Cases reported in the 12 months ending 31 December 2011.

<sup>d</sup> Cases reported in the 12 months ending 31 December 2010.

<sup>e</sup> Other serogroups/serotypes reported in the October-December 2011 quarter include 7A, 8, 10A, 15 (not 15B), 17F, 20, 23B, 33F, 34, 35, and 38.