

# Invasive Pneumococcal Disease Quarterly Report

April–June 2015

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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. On 1 June 2008, pneumococcal conjugate vaccine (PCV) was added to the New Zealand childhood immunisation schedule. Initially the 7-valent conjugate vaccine (PCV7), Prevenar®, was used. In July 2011, Prevenar® was replaced on the schedule with the 10-valent conjugate vaccine (PCV10), Synflorix®. In July 2014, Synflorix® was replaced by the 13-valent conjugate vaccine (PCV13), Prevenar13®.

PCV10 covers the seven serotypes in PCV7 (4, 6B, 9V, 14, 18C, 19F and 23F) as well as serotypes 1, 5 and 7F. PCV13 covers the 10 serotypes in PCV10 as well as serotypes 3, 6A and 19A. 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 changes in vaccine valency, 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 August 2015. 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 2014 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. Results are considered statistically significant when the *P* value is  $\leq 0.05$ .

*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

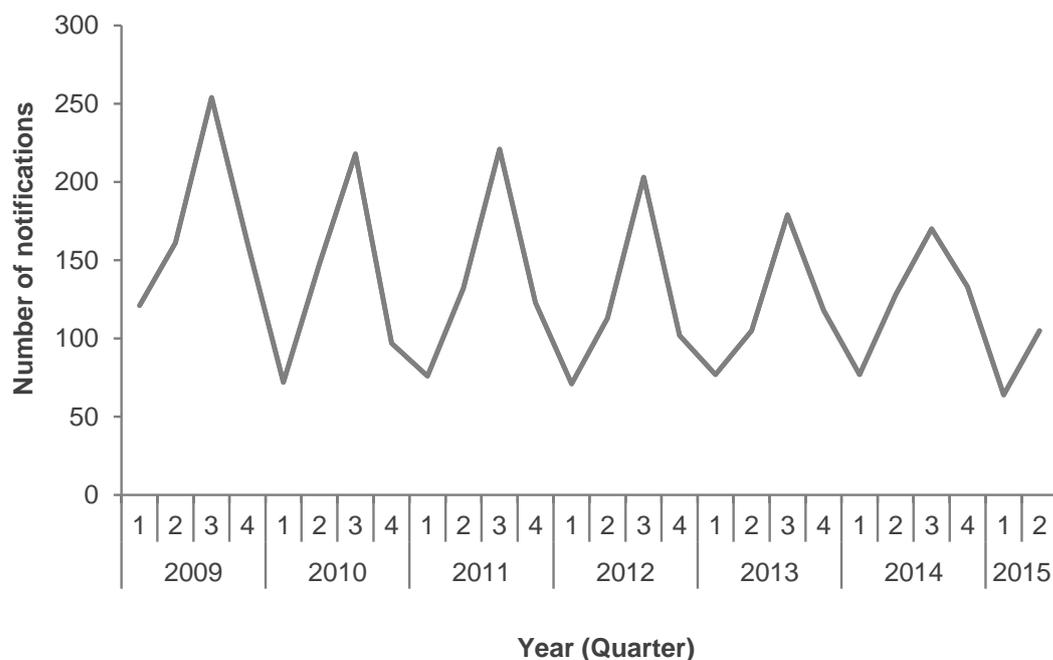
A case of invasive pneumococcal disease is defined as:

- 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 on CSF in individuals from whom samples were obtained after antibiotic treatment.

## Results

There were 105 IPD cases notified in the April–June 2015 quarter, compared with 128 cases in same quarter in 2014. IPD displays a distinct seasonal pattern with a winter peak and summer trough (Figure 1). The notification rate for the latest 12-month period ending June 2015 (10.5 per 100 000 population, 472 cases) was less than the rate for the previous 12-month period ending June 2014 (11.3 per 100 000, 502 cases).

**Figure 1. Number of cases of invasive pneumococcal disease by quarter reported, January 2009–June 2015**



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  $\geq 65$  years (30.8 per 100 000 population, 200 cases) and  $< 2$  years (25.1 per 100,000, 30 cases) age groups. Comparing the latest 12-month period with the previous 12-month period, there were no significant changes in the age-specific rates.

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

Age group	Apr-Jun 2015	12 months ending Jun 2015		12 months ending Jun 2014	
	Cases	Cases	Rate <sup>a</sup>	Cases	Rate <sup>a</sup>
<2 years	5	30	25.1	27	22.2
2–4 years	2	22	11.6	17	8.9
5–64 years	49	220	6.2	246	7.0
$\geq 65$ years	49	200	30.8	212	33.9
<b>Total</b>	<b>105</b>	<b>472</b>	<b>10.5</b>	<b>502</b>	<b>11.3</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. The highest rate for the latest 12-month period was in the Midland region (13.2 per 100 000 population, 114 cases). Comparing the latest 12-month period to the previous 12-month period, there was a significant decrease in Canterbury DHB (49 to 29 cases).

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

Region	Apr-Jun 2015	12 months ending Jun 2015		12 months ending Jun 2014	
	Cases	Cases	Rate <sup>a</sup>	Cases	Rate <sup>a</sup>
Northern <sup>b</sup>	39	196	11.5	192	11.5
Midland <sup>c</sup>	29	114	13.2	117	13.7
Central <sup>d</sup>	22	98	9.6	114	11.3
Southern <sup>e</sup>	15	64	7.0	79	8.8
<b>Total</b>	<b>105</b>	<b>472</b>	<b>10.5</b>	<b>502</b>	<b>11.3</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.

A culture was received at ESR for serotyping from 99 (94.3%) of the 105 cases notified in the April–June 2015 quarter. Table 3 shows the number of IPD cases due to each of the serotypes included in PCV7, PCV10 and PCV13, and due to non-PCV13 serotypes.

The number of IPD cases due to PCV10 serotypes decreased by 34% between the last two 12-month periods (157 to 104 cases). During the last 12 months, there were only two cases of IPD due to a PVC10 type in the <2 years age group.

The three most prevalent serotypes during the last 12 months were 19A, 7F and 22F (Table 3). Notably IPD cases due to serotype 19A (a PCV13 type) almost doubled in the <2 years age group during the latest 12-month period (from 6 cases in the previous 12-month period to 11 cases).

There was a marked decrease in cases of serotype 7F (a PCV10 type) during the latest 12-month period (from 68 cases in the previous 12-month period to 46 cases). In recent years, most cases of serotype 7F IPD have been in the >5 years age group. The decrease in 7F cases in the last 12 months likely reflects that the switch from PCV7 to PCV10 for routine infant immunisation in late 2011 is now having an indirect effect on type 7F disease in the older 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		
	Q2 2015 <sup>a</sup>	2015 <sup>b</sup>	2014 <sup>c</sup>	Q2 2015 <sup>a</sup>	2015 <sup>b</sup>	2014 <sup>c</sup>	Q2 2015 <sup>a</sup>	2015 <sup>b</sup>	2014 <sup>c</sup>	Q2 2015 <sup>a</sup>	2015 <sup>b</sup>	2014 <sup>c</sup>
4	0	0	0	1	1	1	7	23	27	8	24	28
6B	0	1	0	0	0	0	0	1	6	0	2	6
9V	0	0	0	0	0	0	1	8	8	1	8	8
14	0	0	0	0	0	1	0	2	7	0	2	8
18C	0	0	1	0	0	0	1	6	14	1	6	15
19F	0	1	0	0	0	0	5	10	17	5	11	17
23F	0	0	0	0	0	0	2	4	4	2	4	4
<b>Total PCV7</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>16</b>	<b>54</b>	<b>83</b>	<b>17</b>	<b>57</b>	<b>86</b>
1	0	0	0	0	0	2	0	1	1	0	1	3
5	0	0	0	0	0	0	0	0	0	0	0	0
7F	0	0	1	0	1	0	8	45	67	8	46	68
<b>Total PCV10</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>4</b>	<b>24</b>	<b>100</b>	<b>151</b>	<b>25</b>	<b>104</b>	<b>157</b>
3	0	5	5	0	3	0	5	25	29	5	33	34
6A	0	0	0	0	0	0	0	1	1	0	1	1
19A	1	11	6	0	4	5	21	74	73	22	89	84
<b>Total PCV13</b>	<b>1</b>	<b>18</b>	<b>13</b>	<b>1</b>	<b>9</b>	<b>9</b>	<b>50</b>	<b>200</b>	<b>254</b>	<b>52</b>	<b>227</b>	<b>276</b>
6C	1	4	0	0	2	1	3	19	26	4	25	27
8	0	1	2	0	0	0	5	21	14	5	22	16
9N	0	0	2	0	0	0	4	12	15	4	12	17
10A	0	0	0	0	0	1	3	6	6	3	6	7
11A	0	0	1	0	0	0	0	8	8	0	8	9
15B	0	0	0	0	2	0	1	6	7	1	8	7
16 non-typable	0	0	1	0	0	1	2	12	7	2	12	9
22F	0	0	1	1	2	0	11	40	37	12	42	38
23A	1	3	0	0	0	0	3	12	5	4	15	5
23B	1	1	0	0	0	0	3	9	6	4	10	6
31	0	0	0	0	0	0	2	6	4	2	6	4
33F	0	0	2	0	0	0	0	5	10	0	5	12
35 non-typable	0	0	0	0	1	0	1	14	8	1	15	8
Other types <sup>d</sup>	0	0	2	0	2	2	5	32	22	5	34	26
<b>Total non-PCV13</b>	<b>3</b>	<b>9</b>	<b>11</b>	<b>1</b>	<b>9</b>	<b>5</b>	<b>43</b>	<b>202</b>	<b>175</b>	<b>47</b>	<b>220</b>	<b>191</b>

<sup>a</sup> Cases reported in the second quarter of 2015 (April-June 2015).

<sup>b</sup> Cases reported in the 12 months ending 30 June 2015.

<sup>c</sup> Cases reported in the 12 months ending 30 June 2014.

<sup>d</sup> Any of these other serogroups/serotypes accounted for ≤5 IPD cases during the 12 months ending 30 June 2015.