

# Invasive Pneumococcal Disease Quarterly Report

January–March 2014

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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 (PCV7), Prevenar<sup>®</sup>, was added to the New Zealand childhood immunisation schedule. From approximately October 2011, the 10-valent pneumococcal conjugate vaccine (PCV10), Synflorix<sup>®</sup>, replaced PCV7 as supplies of the latter were depleted.

PCV10 includes the seven serotypes in PCV7 (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 PCV7 to PCV10, 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 14 April 2014. 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 2013 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 less than or equal to 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

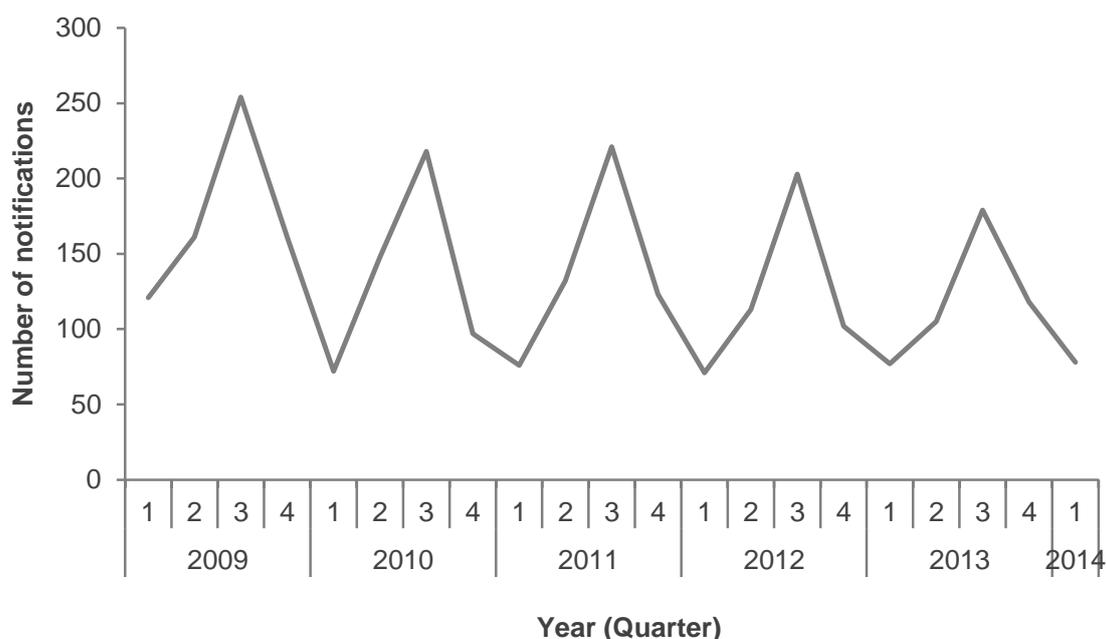
A case of invasive pneumococcal disease is defined as:

- 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 78 IPD cases notified in the January–March 2014 quarter (77 cases in January–March 2013). There is a distinct seasonal pattern with a winter peak and summer trough (Figure 1). The notification rate for the latest 12-month period ending March 2014 (10.7 per 100 000 population, 480 cases) was a non-significant decrease from the rate for the previous 12-month period ending March 2013 (11.2 per 100 000, 495 cases).

**Figure 1. Number of cases of invasive pneumococcal disease by quarter reported, January 2009–March 2014**



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 (29.4 per 100 000 population, 187 cases) and  $< 2$  years (20.0 per 100 000, 24 cases) age groups. Comparing the latest 12-month period with the previous 12-month period, there was a significant decrease in the rate for the  $< 2$  years age group (33.4 to 20.0 per 100 000).

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

Age group	Jan–Mar 2014	12 months ending Mar 2014		12 months ending Mar 2013	
	Cases	Cases	Rate <sup>a</sup>	Cases	Rate <sup>a</sup>
<2 years	7	24	20.0	41	33.4
2–4 years	5	18	9.6	15	7.9
5–64 years	35	251	7.1	225	6.4
$\geq 65$ years	31	187	29.4	214	35.0
<b>Total</b>	<b>78</b>	<b>480</b>	<b>10.7</b>	<b>495</b>	<b>11.2</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. The highest rate for the latest 12-month period was in the Midland region (14.2 per 100 000 population, 120 cases). Comparing the latest 12-month period to the previous 12-month period, there were no significant changes in any region or DHB.

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

Region	Jan–Mar 2014	12 months ending Mar 2014		12 months ending Mar 2013	
	Cases	Cases	Rate <sup>a</sup>	Cases	Rate <sup>a</sup>
Northern <sup>b</sup>	33	176	10.3	180	10.7
Midland <sup>c</sup>	19	120	14.2	112	13.3
Central <sup>d</sup>	17	108	10.7	116	11.5
Southern <sup>e</sup>	9	76	8.4	87	9.7
<b>Total</b>	<b>78</b>	<b>480</b>	<b>10.7</b>	<b>495</b>	<b>11.2</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 IPD cases due to each of the serotypes included in PCV7 and PCV10, and due to non-PCV10 serotypes. Of the 78 cases notified in the January–March 2014 quarter, 60 (76.9%) were culture positive.

The number of IPD cases due to PCV7 serotypes decreased 28% between the last two 12-month periods (120 to 87 cases), with a decrease in the number of cases due to each of the PCV7 types except 18C. Notably during the last 12 months, there were only two cases due to a PVC7 type in the <5 years age group.

The most notable change in serotypes over the last two 12-month periods was a 72% increase (39 to 67 cases) in IPD cases due to serotype 7F, despite 7F being one of the three additional serotypes covered by PCV10 used in the childhood immunisation schedule since late 2011. However, the increase in type 7F cases has occurred wholly in the ≥5 years age group. This recent increase in serotype 7F disease has resulted in this type now being the second most common serotype after 19A among IPD cases in New Zealand. In fact during the last 12 months, serotype 7F (67 cases) was almost as common as type 19A (72 cases).

**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 2014 <sup>a</sup>	2014 <sup>b</sup>	2013 <sup>c</sup>	Q1 2014 <sup>a</sup>	2014 <sup>b</sup>	2013 <sup>c</sup>	Q1 2014 <sup>a</sup>	2014 <sup>b</sup>	2013 <sup>c</sup>	Q1 2014 <sup>a</sup>	2014 <sup>b</sup>	2013 <sup>c</sup>
4	0	0	0	1	1	0	3	31	42	4	32	42
6B	0	0	0	0	0	0	0	6	7	0	6	7
9V	0	0	0	0	0	1	0	10	12	0	10	13
14	0	0	0	1	1	1	0	6	15	1	7	16
18C	0	0	0	0	0	0	1	16	9	1	16	9
19F	0	0	2	0	0	0	3	12	20	3	12	22
23F	0	0	0	0	0	0	0	4	11	0	4	11
<b>Total (PCV7)</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>7</b>	<b>85</b>	<b>116</b>	<b>9</b>	<b>87</b>	<b>120</b>
1	0	0	0	0	1	1	0	1	6	0	2	7
5	0	0	0	0	0	0	0	0	0	0	0	0
7F	0	1	2	0	0	2	5	66	35	5	67	39
<b>Total (PCV10)</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>5</b>	<b>12</b>	<b>152</b>	<b>157</b>	<b>14</b>	<b>156</b>	<b>166</b>
3	2	5	2	0	0	0	6	23	26	8	28	28
6A	0	0	3	0	0	0	0	1	6	0	1	9
6C	0	0	2	1	1	0	3	21	14	4	22	16
8	1	2	3	0	0	0	0	14	16	1	16	19
9N	0	0	0	0	0	0	3	13	9	3	13	9
10A	0	0	4	0	0	1	2	7	5	2	7	10
11A	0	2	2	0	1	0	0	8	12	0	11	14
19A	2	8	10	0	3	5	7	61	62	9	72	77
22F	0	1	0	0	0	0	5	40	41	5	41	41
33F	1	2	0	0	0	0	0	8	7	1	10	7
Other types <sup>d</sup>	0	2	6	1	6	2	12	56	61	13	64	69
<b>Total (non-PCV10)</b>	<b>6</b>	<b>22</b>	<b>32</b>	<b>2</b>	<b>11</b>	<b>8</b>	<b>38</b>	<b>252</b>	<b>259</b>	<b>46</b>	<b>285</b>	<b>299</b>

<sup>a</sup> Cases reported in the first quarter of 2014 (January–March 2014).

<sup>b</sup> Cases reported in the 12 months ending 31 March 2014.

<sup>c</sup> Cases reported in the 12 months ending 31 March 2013.

<sup>d</sup> Other serogroups/serotypes reported in the January–March 2014 quarter include 12F, 15B, 16, 17F, 23A, 23B, 34, 35, and 24.