Invasive Pneumococcal Disease Quarterly Report

April–June 2016

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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 22 July 2016. 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 2015 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 ≤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, the 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

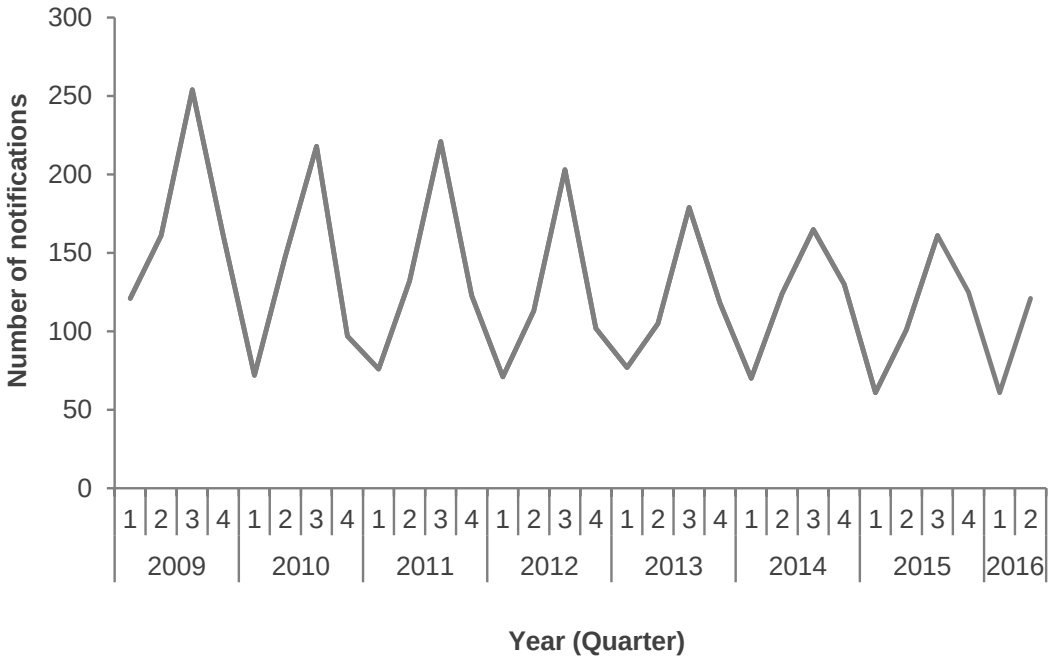
A case of invasive pneumococcal disease is defined as:

- 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 121 IPD cases notified in the April–June 2016 quarter, compared with 101 cases in the same quarter in 2015. 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 2016 (10.2 per 100,000 population, 468 cases) was similar to the rate for the previous 12-month period ending June 2015 (10.1 per 100,000, 457 cases).

Figure 1. Number of cases of invasive pneumococcal disease by quarter reported, January 2009–June 2016



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 age group (30.8 per 100,000 population, 208 cases). 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 2016	12 months ending Jun 2016		12 months ending Jun 2015	
	Cases	Cases	Rate[a]	Cases	Rate[a]
<2 years	9	19	16.0	25	20.9
2–4 years	5	15	8.0	19	10.0
5–64 years	64	226	6.3	216	6.1
≥65 years	43	208	30.8	197	30.3
Total	**121**	**468**	**10.2**	**457**	**10.1**

[a] 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 (12.3 per 100,000 population, 107 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	Apr-Jun 2016	12 months ending Jun 2016		12 months ending Jun 2015	
	Cases	Cases	Rate[a]	Cases	Rate[a]
Northern[b]	49	185	10.5	185	10.8
Midland[c]	27	107	12.3	111	12.8
Central[d]	21	91	8.9	98	9.6
Southern[e]	24	85	9.3	63	6.9
Total	**121**	**468**	**10.2**	**457**	**10.1**

[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, Tairawhiti and Taranaki DHBs.

[d] Includes Hawke's Bay, Whanganui, MidCentral, Hutt Valley, Capital & Coast, Wairarapa and Nelson Marlborough DHBs.

[e] Includes West Coast, Canterbury, South Canterbury and Southern DHBs.

A culture was received at ESR for serotyping from 116 (95.9%) of the 121 cases notified in the April−June 2016 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 15.4% between the last two 12-month periods (104 to 88 cases). In the <2 years age group during the last 12 months there were no cases of IPD due to a PCV10 type and only two cases of PCV13 types.

The four most prevalent serotypes during the last 12 months were 19A, 7F, 22F and 3 (Table 3). However, between the last two 12-month periods there were notable decreases in IPD due to serotypes 19A and 3 (both PCV13 types) in the <2 years age group: 10 to 1 type 19A cases and 5 to 1 type 3 cases. These decreases are likely to be due to the direct effect of the change from PCV10 to PCV13 for routine infant immunisation in mid-late 2014.

There has been a recent increase in IPD cases due to serotype 33F (a non-PCV13 type), with 22 cases in the latest 12-month period compared to 5 cases in the previous 12-month period. Cases of this type have increased in both infants <2 years old and the ≥5 years age group (Table 3).

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 2016[a]	2016[b]	2015[c]	Q2 2016[a]	2016[b]	2015[c]	Q2 2016[a]	2016[b]	2015[c]	Q2 2016[a]	2016[b]	2015[c]
4	0	0	0	0	1	1	3	19	23	3	20	24
6B	0	0	1	0	0	0	0	1	1	0	1	2
9V	0	0	0	0	0	0	0	2	8	0	2	8
14	0	0	0	0	0	0	2	5	2	2	5	2
18C	0	0	0	0	0	0	0	1	6	0	1	6
19F	0	0	1	0	0	0	3	15	10	3	15	11
23F	0	0	0	0	0	0	1	4	4	1	4	4
Total PCV7	**0**	**0**	**2**	**0**	**1**	**1**	**9**	**47**	**54**	**9**	**48**	**57**
1	0	0	0	0	0	0	1	1	1	1	1	1
5	0	0	0	0	0	0	1	1	0	1	1	0
7F	0	0	0	0	0	1	13	38	45	13	38	46
Total PCV10	**0**	**0**	**2**	**0**	**1**	**2**	**24**	**87**	**100**	**24**	**88**	**104**
3	0	1	5	0	1	3	4	31	23	4	33	31
6A	0	0	0	0	0	0	0	1	1	0	1	1
19A	1	1	10	3	6	4	17	77	73	21	84	87
Total PCV13	**1**	**2**	**17**	**3**	**8**	**9**	**45**	**196**	**197**	**49**	**206**	**223**
6C	0	0	4	0	1	2	4	22	19	4	23	25
8	0	1	1	0	0	0	6	23	22	6	24	23
9N	0	0	0	0	0	0	1	9	12	1	9	12
11A	0	0	0	0	0	0	3	9	8	3	9	8
15A	0	0	0	0	1	0	4	10	2	4	11	2
15B	2	3	0	0	1	2	2	9	6	4	13	8
16F	0	0	0	0	0	0	1	6	2	1	6	2
17F	0	0	0	0	0	0	4	7	2	4	7	2
22F	0	1	0	0	1	2	8	33	40	8	35	42
23A	0	1	2	0	0	0	3	14	12	3	15	14
23B	0	0	0	0	1	0	4	14	9	4	15	9
31	0	0	0	0	0	0	3	5	6	3	5	6
33F	2	4	0	0	0	0	3	18	5	5	22	5
35	0	0	0	1	1	1	1	3	13	2	4	14
35F	0	1	0	0	0	0	0	4	1	0	5	1
38	0	0	0	1	1	0	1	4	4	2	5	4
Other types[d]	2	4	0	0	0	2	11	32	39	13	36	41
Total non-PCV13	**6**	**15**	**7**	**2**	**7**	**9**	**59**	**222**	**202**	**67**	**244**	**218**

[a] Cases reported in the second quarter of 2016 (April-June 2016).

[b] Cases reported in the 12 months ending 30 June 2016.

[c] Cases reported in the 12 months ending 30 June 2015.

[d] Any of these other serogroups/serotypes accounted for ≤5 IPD cases during the 12 months ending 30 June 2016.