Invasive pneumococcal disease surveillance, 1 January to 31 March 2016

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Summary

The number of notified cases of invasive pneumococcal disease (IPD) in the 1st quarter of 2016 was substantially fewer than the previous quarter and marginally less than the number of notified cases in the 1st quarter of 2015. Overall, the decline in disease due to the serotypes targeted by the 13-valent pneumococcal conjugate vaccine (13vPCV) has been maintained across all age groups since the 13vPCV replaced the 7-valent pneumococcal conjugate vaccine (7vPCV) in the childhood immunisation program from July 2011.

Key points

In the 1st quarter of 2016, there were 184 cases of IPD reported to the NNDSS, an almost 6% decrease compared with the same period in 2015 (n = 195) (Table 1). In 2015 the most common pneumococcal serotypes causing IPD were 3 (8.8%), 19A (8.5%) and 22F (7.1%). The trend for this quarter was similar; however serotype 19F (6.0%; n = 11) was also common and has been gradually increasing (Table 2).

In non-Indigenous Australians, the number of notified cases was highest in children aged less than 5 years and older adult age groups, especially those aged 60 years or over. In Indigenous Australians, cases were highest in the under 5 years age group and the 55–59 years age group (Table 3). The proportion of cases reported as Indigenous in this quarter (14%) was less than the proportion observed in the 1st quarter of 2015 (17%; 33/195), but was similar to the proportion overall in 2015 (14%; 208/1,500).

There were 34 cases of IPD reported in children aged less than 5 years, representing 18% of all cases reported this quarter. The number of cases notified in this age group was 9.7% more in this reporting period compared with the 1st quarter of 2015 (n = 31). Of those cases with known serotype, 32% (n = 8) were due to a serotype included in the 13vPCV compared with 42% (n = 12) of cases in the 1st quarter of 2015 (Figure 1). Serotypes 19F, 16F and 23B were the most common serotypes affecting this age group this quarter, noting that serotype 19F is included in the 13vPCV (Table 2).

In the 1st quarter of 2016, there were 6 cases reported in fully vaccinated children aged less than 5 years who were considered to be 13vPCV failures. Serotype 19F was reported as the cause of disease in 4 of these cases (Table 4).

Table 1: Notified cases of invasive pneumococcal disease, Australia, 1 January to 31 March 2016, by Indigenous status, serotype completeness and state or territory

Indigenous status	ACT	NSW	NT	Qld	SA	Tas.	Vic.	WA	Total 1st qtr 2016	Total 4th qtr 2015	Total 1st qtr 2015
Indigenous	0	1	5	6	2	0	1	11	26	52	33
Non-Indigenous	2	53	2	19	10	6	36	9	137	233	141
Not stated / Unknown	0	11	0	3	0	0	7	0	21	29	21
Total	2	65	7	28	12	6	44	20	184	314	195
Indigenous status completeness* (%)	100	83	100	89	100	100	84	100	91	91	89
Serotype completeness† (%)	100	77	100	93	75	100	95	100	96	96	95

* Indigenous status completeness is defined as the reporting of a known Indigenous status, excluding the reporting of not stated or unknown Indigenous status.

† Serotype completeness is the proportion of all cases of invasive pneumococcal disease that were reported with a serotype or reported as non-typable. Serotype incompleteness may include where no isolate was available as diagnosis was by polymerase chain reaction and no molecular typing was attempted or was not possible due to insufficient genetic material; the isolate was not referred to the reference laboratory or was not viable; typing was pending at the time of reporting, or no serotype was reported by the notifying jurisdiction to the National Notifiable Diseases Surveillance System.

Table 2: Frequently notified serotypes of invasive pneumococcal disease, Australia, 1 January to 31 March 2016, by age group

Serotype	Age group			Serotype total
	Under 5 years	5–64 years	Over 65 years	
3	1	7	8	16
19A	1	6	5	12
19F	4	4	3	11
22F	1	5	5	11
8	0	7	3	10
16F	3	1	5	9
23B	3	4	2	9
15A	1	3	4	8
9N	0	5	3	8
10A	0	4	1	5
23A	0	3	2	5
38	1	3	1	5
6C	0	3	2	5
Other*	10	27	11	48
Serotype unknown†	9	11	2	22
Total	34	93	57	184

* Serotypes that only occur in less than 5 cases per quarter are grouped as 'Other' and include 'non-typable' isolates this quarter.

† 'Serotype unknown' includes those serotypes reported as 'no isolate', 'not referred', 'not viable', 'typing pending' and 'untyped'.

Table 3: Notified cases of invasive pneumococcal disease, Australia, 1 January to 31 March 2016, by Indigenous status and age group

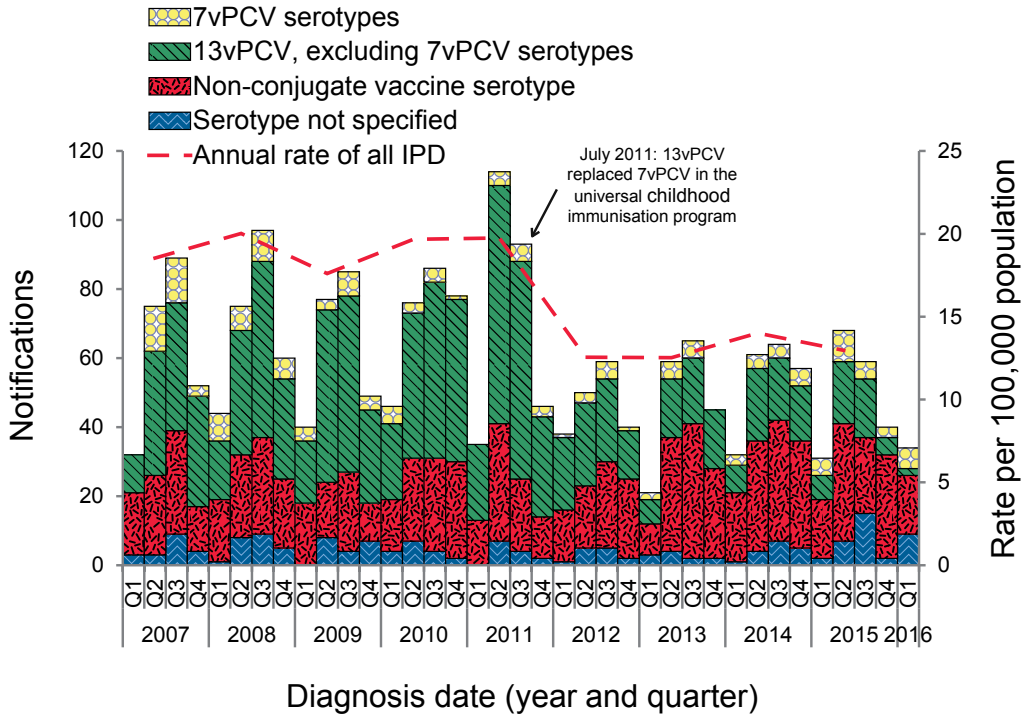
Age group	Indigenous	Non-Indigenous	Not reported*	Total
0-4	4	28	2	34
5-9	0	1	3	4
10-14	0	5	0	5
15-19	0	0	0	0
20-24	2	2	0	4
25-29	2	5	3	10
30-34	1	2	1	4
35-39	2	3	3	8
40-44	2	3	2	7
45-49	1	3	3	7
50-54	4	5	1	10
55-59	5	9	0	14
60-64	1	17	2	20
65-69	1	12	0	13
70-74	0	9	1	10
75-79	0	7	0	7
80-84	0	13	0	13
85+	1	13	0	14
Total	26 (14%)	137 (74%)	21 (11%)	184

* Not reported is defined as not stated or unknown Indigenous status.

There were 12 cases of IPD reported among Indigenous Australians aged 50 years or over in the 1st quarter of 2016. Of those cases with a reported serotype, half (n = 6) were due to a serotype included in the 23vPPV (Figure 2). The number of notified cases of IPD among Indigenous Australians aged 50 years or over was just over half (55%) the number reported in the previous quarter (n = 22) and similar to the 1st quarter of 2015 (n = 10). Compared with the previous quarter, the proportion of cases due to serotypes included in the 23vPPV decreased from 75% to 50% among cases with a known serotype. Additionally, there was no apparent predominance of any serotype reported among this population group this quarter.

There were 54 cases of IPD among non-Indigenous Australians aged 65 years or over reported in the 1st quarter of 2016. The number of notified cases of IPD among non-Indigenous Australians aged 65 years or over was around half the number reported in the previous quarter (n = 111) and 11% lower than the 1st quarter of 2015 (n = 61). Of those cases with a reported serotype, 62% (n = 32) were due to a serotype included in the 23vPPV (Figure 3). Compared with the previous quarter, the proportion of IPD due to 23vPPV serotypes among cases with a reported serotype were relatively similar.

Figure 1: Notifications and annual rates* of invasive pneumococcal disease in children aged less than 5 years, Australia, 2007 to 31 March 2016, by vaccine serotype group



* Annual rates are shown on Q2, excluding 2016.

Table 4: Characteristics of 13vPCV failures in children aged less than 5 years, Australia, 1 January to 31 March 2016

Age	Indigenous status	Serotype	Clinical category	Risk factor/s
11 months	Non-Indigenous	19F	Pneumonia	No data available
1 year	Non-Indigenous	19A	Pneumonia and other (pleural empyema)	Childcare attendee and other
2 years	Non-Indigenous	19F	Bacteraemia	Chronic illness
2 years	Non-Indigenous	19F	Pneumonia	Congenital or chromosomal abnormality
4 years	Indigenous	23F	Pneumonia	Previous episode of IPD
4 years	Non-Indigenous	19F	Pneumonia	Childcare attendee

In the 1st quarter of 2016 there were 9 deaths attributed to a variety of IPD serotypes. All of these deaths occurred in non-Indigenous Australians with a median age of 61 years (range 48–83).

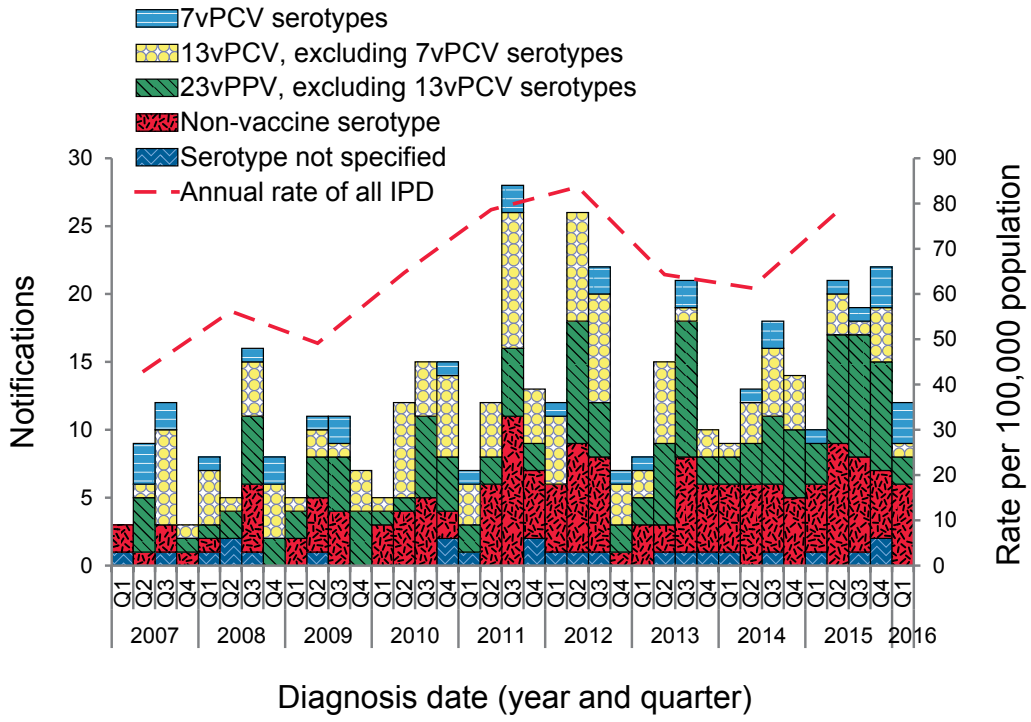
Notes

The data in this report are provisional and subject to change as laboratory results and additional case information become available. More detailed data analysis of IPD in Australia and surveillance methodology are described in the IPD annual report series published in *Communicable Diseases Intelligence*.

In Australia, pneumococcal vaccination is recommended as part of routine immunisation for children, individuals with specific underlying conditions associated with increased risk of IPD and older Australians. More information on the scheduling of the pneumococcal vaccination can be found on the Immunise Australia Program website (www.immunise.health.gov.au).

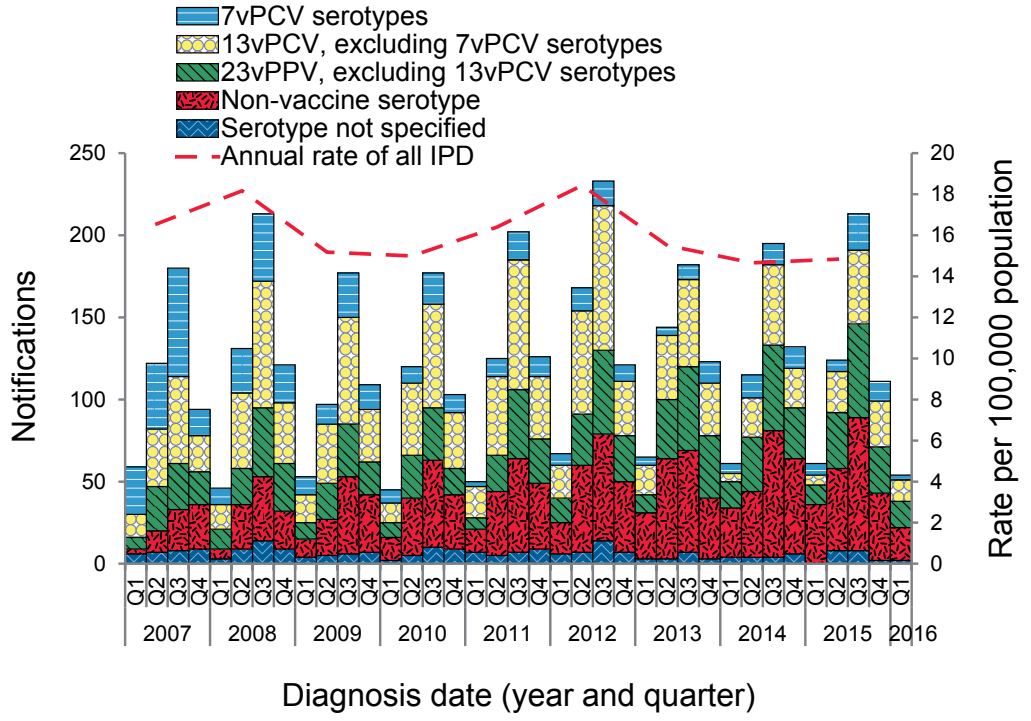
In this report, a 'vaccine failure' is where a fully vaccinated child is diagnosed with IPD due to a serotype covered by the administered vaccine. 'Fully vaccinated' describes cases that have completed the primary course of the relevant vaccine(s) required for their age according to the most recent edition of *The Australian Immunisation Handbook*,

Figure 2: Notifications and annual rates* of all invasive pneumococcal disease in Indigenous Australians aged 50 years or over, Australia, 2007 to 31 March 2016, by vaccine serotype group



* Annual rates are shown on Q2, excluding 2016.

Figure 3: Notifications and annual rates* of all invasive pneumococcal disease in non-Indigenous Australians aged 65 years or over, Australia, 2007 to 31 March 2016, by vaccine serotype group



* Annual rates are shown on Q2, excluding 2016.

at least 2 weeks prior to disease onset with at least 28 days between doses of vaccine. NB: A young child who has had all the required doses for their age but is not old enough to have completed the primary course would not be classified as fully vaccinated.

There are 4 pneumococcal vaccines available in Australia, each targeting multiple serotypes (Table 5). Note that in this report serotype analysis is generally grouped according to vaccine composition.

Follow-up of all notified cases of IPD is undertaken in all states and territories except New South Wales and Victoria who conduct targeted follow-up of notified cases aged under 5 years, and 50 years or over for enhanced data.

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Table 5: *Streptococcus pneumoniae* serotypes targeted by pneumococcal vaccines

Serotypes	7-valent pneumococcal conjugate vaccine	10-valent pneumococcal conjugate vaccine	13-valent pneumococcal conjugate vaccine	23-valent pneumococcal conjugate vaccine
1		✓	✓	✓
2				✓
3			✓	✓
4	✓	✓	✓	✓
5		✓	✓	✓
6A			✓	
6B	✓	✓	✓	✓
7F		✓	✓	✓
8				✓
9N				✓
9V	✓	✓	✓	✓
10A				✓
11A				✓
12F				✓
14	✓	✓	✓	✓
15B				✓
17F				✓
18C	✓	✓	✓	✓
19A			✓	✓
19F	✓	✓	✓	✓
20				✓
22F				✓
23F	✓	✓	✓	✓
33F				✓