

# INVASIVE PNEUMOCOCCAL DISEASE SURVEILLANCE AUSTRALIA, 1 JULY TO 30 SEPTEMBER 2013

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## Introduction

Invasive pneumococcal disease (IPD) is caused by the bacterium *Streptococcus pneumoniae* and results in illnesses such as pneumonia, bacteraemia and meningitis. There are currently more than 90 serotypes recognised worldwide, approximately half of which are found in Australia where IPD has been a nationally notifiable disease since 2001. The Communicable Diseases Network Australia established the Enhanced Invasive Pneumococcal Disease Surveillance Working Group (EIPDSWG) in 2000 to assist in developing and implementing a nationally standardised approach to the enhanced surveillance of IPD in Australia. This quarterly report documents trends in notified cases of IPD occurring in Australia in the 3rd quarter of 2013.

Notification data are collected by all Australian states and territories under jurisdictional public health legislation and are forwarded to the Commonwealth under the *National Health Security Act 2007*. Notified cases are collated nationally in the National Notifiable Diseases Surveillance System (NNDSS). The data in this report are provisional and subject to change as laboratory results and additional case information become available. The data are analysed by diagnosis date, which is the onset date or where the onset date was not known, the earliest of the specimen collection date, the notification date, and the notification receive date. Data for this report were extracted on 31 October 2013. Crude rates were calculated using the Australian Bureau of Statistics estimated resident populations for Australia at 30 June of each year. Consideration of vaccination status of cases is outside the scope of this report. For more detailed reports readers are referred to the regular *Communicable Diseases Intelligence* supplements *Vaccine Preventable Diseases in Australia*.

In Australia, pneumococcal vaccination is recommended as part of routine immunisation for children, the medically at risk and older Australians. The 7-valent pneumococcal conjugate vaccine (7vPCV) was added to the National Immunisation Program (NIP) schedule for Indigenous and medically at-risk children in 2001 and for all children up to 2 years of age in 2005. The 13-valent pneumococcal conjugate vaccine (13vPCV) replaced the 7vPCV in the childhood immunisation program from July 2011. The 23-valent pneumococcal poly-

saccharide vaccine (23vPPV) was added to the NIP schedule for Aboriginal and Torres Strait Islander peoples aged 50 years or older in 1999 and for non-Indigenous Australians aged 65 years or older from January 2005.

## Results

There were 550 cases of IPD reported to the NNDSS in the 3rd quarter of 2013, bringing the year to date total to 1,202 cases (Table). While the number of cases notified in the reporting period is the highest so far this year, it was a 24% reduction on the number of cases reported in the same period in 2012 (n=726).

Overall, Aboriginal and Torres Strait Islander status was reported for 82% (n=452) of cases, ranging from 68% of cases reported by Victoria to 100% of cases reported by the Australian Capital Territory, the Northern Territory, Tasmania and Western Australia. Victoria and New South Wales only actively follow up notified cases of IPD aged 5 years or under, and 50 years or over for core and enhanced data, whereas follow up of all cases is undertaken in other states and territories. This may account for missing data among cases falling outside these age groups. Of cases with a reported Indigenous status, Aboriginal and Torres Strait peoples accounted for 14% (n=62) of all cases notified in the quarter (Table).

Serotype information was available for 92% (n=508) of all cases reported in the quarter, ranging from 85% of cases reported by South Australia to 100% of cases reported by the Australian Capital Territory and the Northern Territory. There was a single case reported in the quarter that was deemed by the reference laboratory as non-typable. Cases such as these are included in the vaccine serotype group in figures of this report as serotype not specified.

In the 3rd quarter of 2013, notified cases were highest in children aged under 5 years (n=65), followed by the 60–64 years age group (n=55) and the 65–69 years age group (n=50). This age distribution was evident in cases reported as non-Indigenous Australian (Figure 1). However in cases reported as Indigenous, the most prevalent age groups were those under 5 years (n=9) and the 45–49 years age group (n=8). Three age groups

**Table: Notified cases of invasive pneumococcal disease, Australia, 1 July to 30 September 2013, by Indigenous status, serotype and state or territory**

Indigenous status	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Total 3rd qtr 2013	Total 2nd qtr 2013	Total 3rd qtr 2012	Year to date 2013
Indigenous	0	5	18	8	2	1	3	25	62			
Non-Indigenous	1	132	2	69	30	12	96	48	390			
Not stated/unknown	0	31	0	19	2	0	46	0	98			
<b>Total</b>	<b>1</b>	<b>168</b>	<b>20</b>	<b>96</b>	<b>34</b>	<b>13</b>	<b>145</b>	<b>73</b>	<b>550</b>	<b>438</b>	<b>726</b>	<b>1,202</b>
Indigenous status completeness* (%)	100	82	100	80	94	100	68	100	82			
Serotype completeness† (%)	100	87	100	96	85	92	95	96	92			

\* 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 IPD that were reported with a serotype or reported as non-typable. Serotype incompleteness may include when no isolate was available as diagnosis was by polymerase chain reaction and no molecular typing was performed; 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. In this report, the category 'Serotype not specified' includes notified cases reported with an incomplete serotype or reported as non-typable.

were selected for focused analyses in this quarterly report. These age groups align with groups that carry the greatest burden of disease and against which the NIP is targeted.

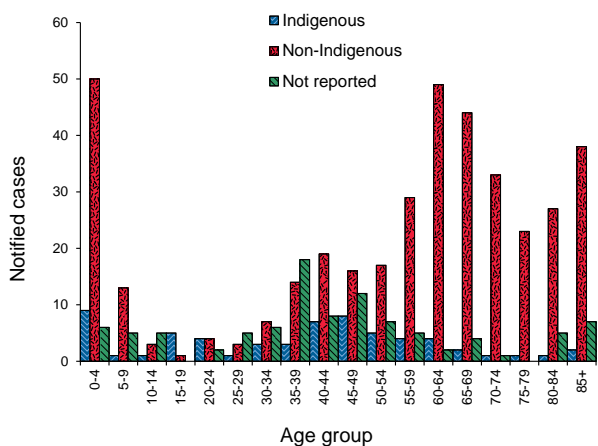
**Invasive pneumococcal disease in children aged less than 5 years**

In the 3rd quarter of 2013, 12% (n=65) of notified cases were aged less than 5 years. This was a small increase on the number of cases reported in the previous quarter (n=59) and to the number reported during the same period of 2012 (n=58) (Figure 2).

The majority (88%, n=57) of cases aged less than 5 years were reported with serotype information. Of these, 39% (n=22) were reported with a serotype included in the 7vPCV or the 13vPCV.

Notified cases aged less than 5 years with disease caused by the 6 additional serotypes targeted by the 13vPCV increased steadily over the period 2007 to 2011, particularly those caused by serotype 19A (Figure 3). However, cases of this type have decreased since the 4th quarter of 2011, reflecting the introduction of the 13vPCV on the universal childhood immunisation program in mid-2011. In the 3rd quarter of 2013, there were 9 cases aged less than 5 years with disease due to serotype 19A, 5 cases due to serotype 3, 2 cases of serotype 7F and 1 case due to serotype 1. Similar to the previous quarter, no cases in this age group were reported with disease caused by serotypes 5 or 6A.

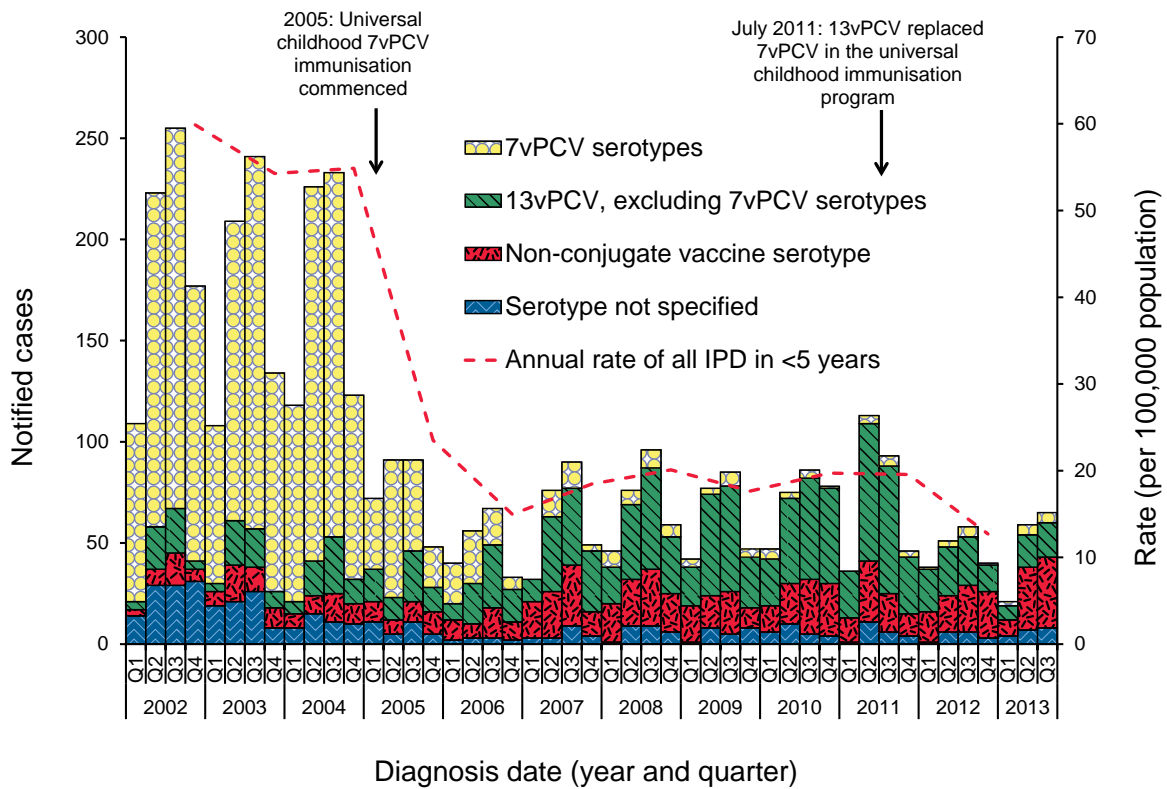
**Figure 1: Notified cases of invasive pneumococcal disease, Australia, 1 July to 30 September 2013, by Indigenous status and age group**



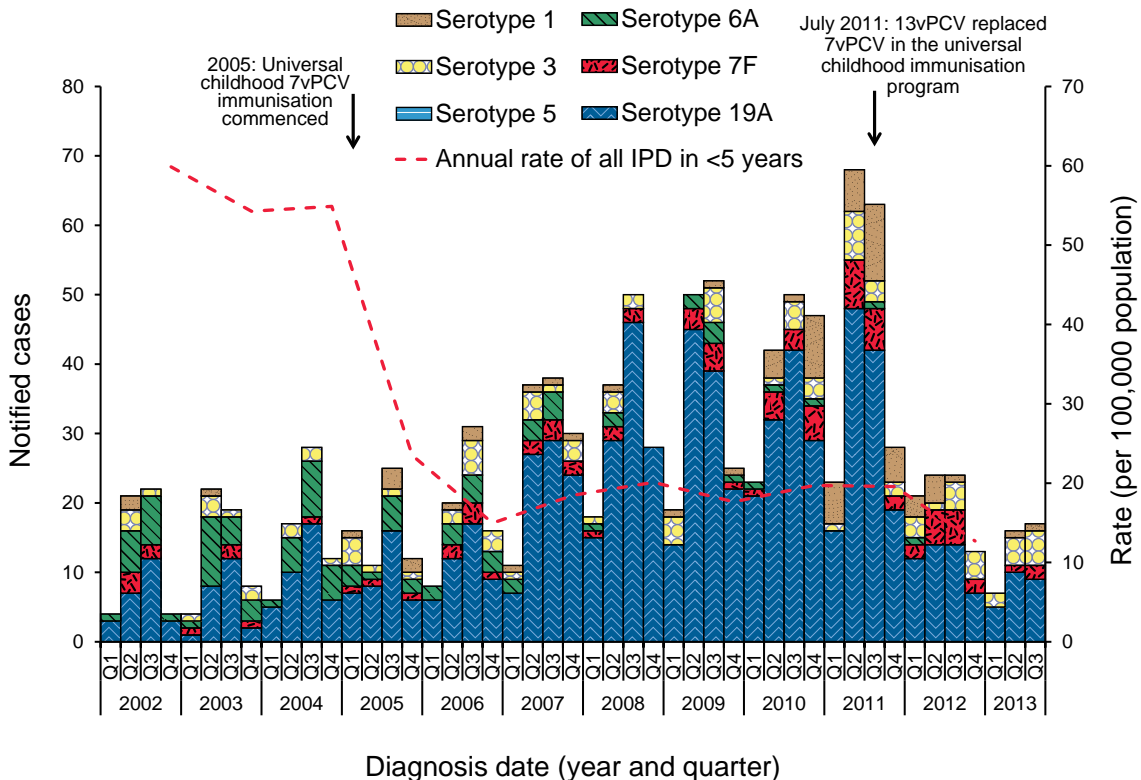
**Invasive pneumococcal disease in Indigenous Australians aged 50 years or over**

In the 2nd quarter of 2013, 4% (n=20) of notified cases were reported in Indigenous Australians aged 50 years or over. This was the highest reported so far this year (1st quarter n=8; 2nd quarter n=16) and was similar to the number reported during the same period in 2012 (n=21)(Figure 4). The annual rate of IPD in this group has tended to increase over time, with an outbreak of disease caused by serotype 1 in Central Australia that commenced in late 2010, contributing in part to this increase.

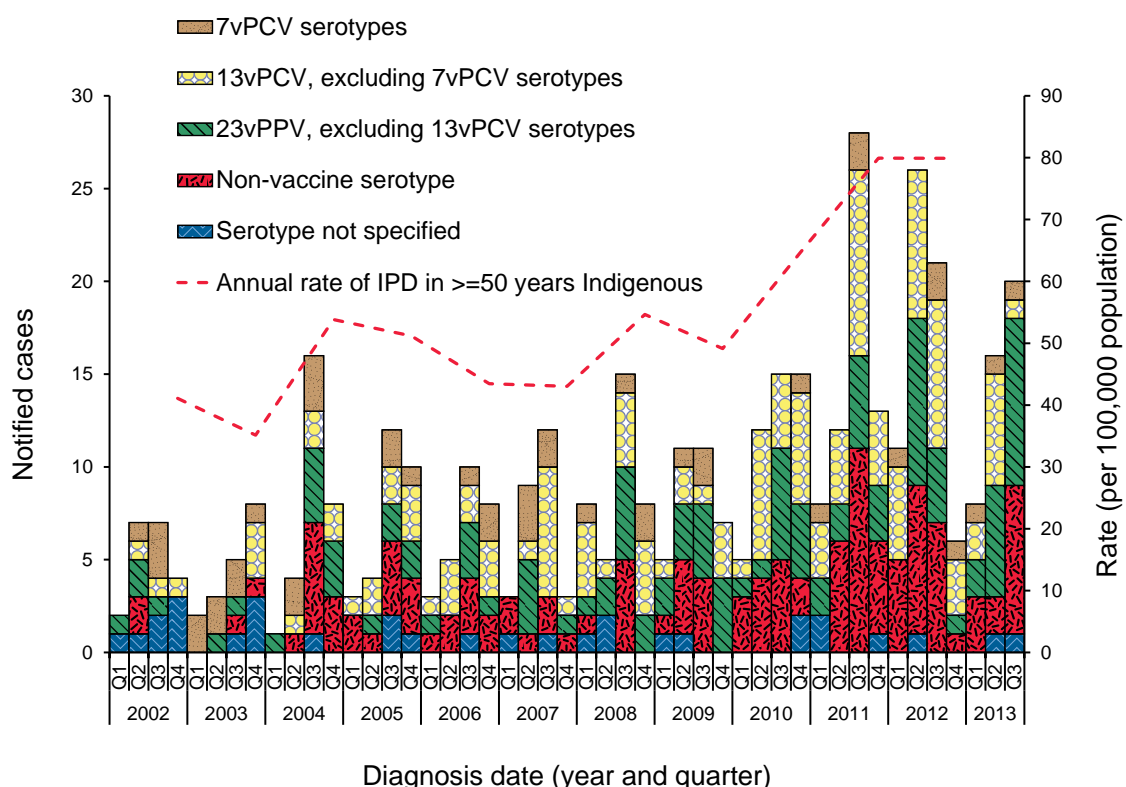
**Figure 2: Notified cases and rates of invasive pneumococcal disease in those aged less than 5 years, Australia, 2002 to 30 September 2013, by vaccine serotype group**



**Figure 3: Notified cases of invasive pneumococcal disease caused by serotypes targeted by the 13-valent pneumococcal conjugate vaccine (excluding those targeted by 7-valent pneumococcal conjugate vaccine) and rates of all invasive pneumococcal disease, aged less than 5 years, Australia, 2002 to 30 September 2013**



**Figure 4: Notified cases and rates of invasive pneumococcal disease in Indigenous Australians aged 50 years or over, Australia, 2002 to 30 September 2013, by vaccine serotype group**



In 1999 23vPPV immunisation commenced for Indigenous Australians aged 50 years or over.

All but one of the cases were reported with serotype information. Of these, 58% (n=11) were reported with disease due to serotypes targeted by the 23vPPV; the remaining reported disease due to a non-vaccine serotype (n=8).

**Invasive pneumococcal disease in non-Indigenous Australians aged 65 years or over**

In the 3rd quarter of 2013, 30% (n=165) of notified cases were reported as non-Indigenous Australians aged 65 years or over. This was a moderate increase in the number of cases reported in the previous quarter (n=138), but a 24% decrease on the number reported during the same period of 2012 (n=218) (Figure 5).

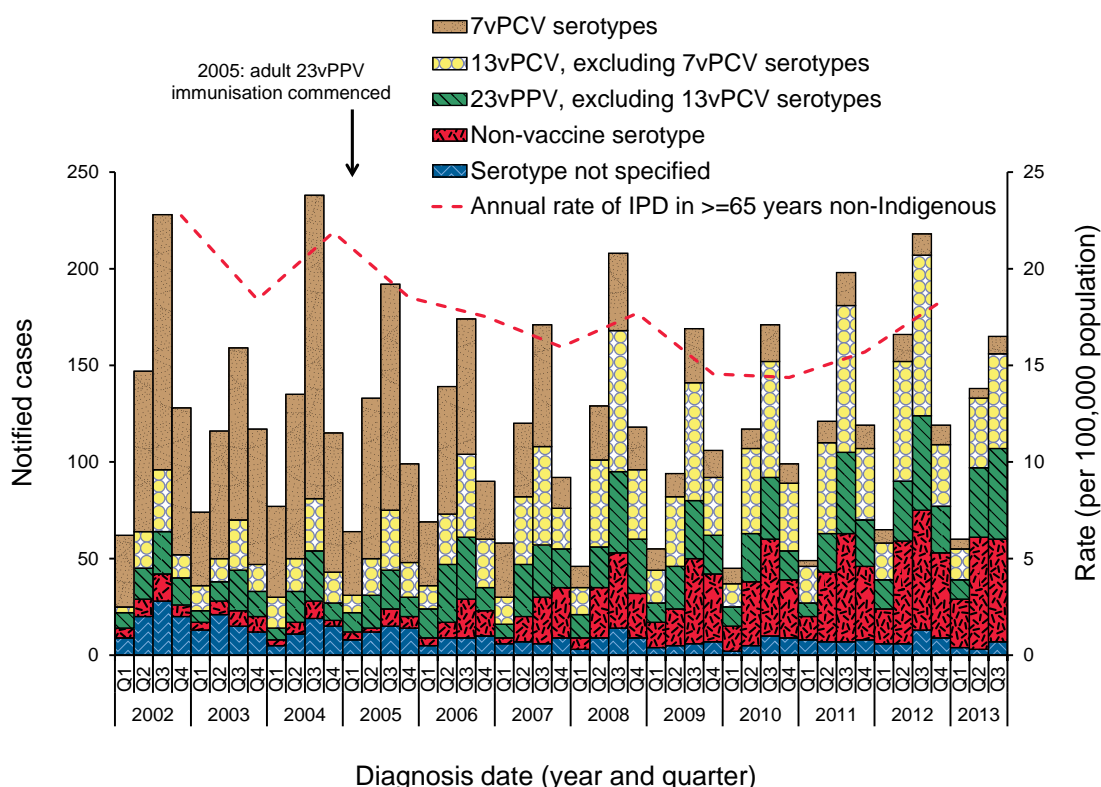
The majority (96%, n=158) of cases reported in this quarter were reported with serotype information. Of these cases, 66% (n=105) were reported with a serotype targeted by the 23vPPV. While the burden of disease in this age group has remained relatively stable, the profile of serotypes causing disease has changed over time. Disease due to serotypes targeted by the 7vPCV has reduced sub-

stantially in this age group, which is likely to be due to herd immunity impacts from the childhood immunisation program.

**Conclusion**

While the number of notified cases of IPD in the 3rd quarter of 2013 was the highest so far this year and a 26% increase on the previous quarter, it represented a decline on the incidence reported in the same quarter in 2012. Elevated numbers of IPD notifications during the 2nd and 3rd quarters are consistent with annual winter seasonality observed for many infectious diseases. Nationally, the pattern of disease has not changed from the 2nd quarter this year. Specifically, disease due to the serotypes targeted by the 13vPCV has continued to decline since the 13vPCV replaced the 7vPCV in the childhood immunisation program from July 2011. Notified cases of IPD in Indigenous Australians aged 50 years or over have tended to increase over time, whereas disease in non-Indigenous Australians aged 65 years or over has remained relatively stable but the profile of serotypes causing disease has diversified.

**Figure 5: Notified cases and rates of invasive pneumococcal disease in non-Indigenous Australians aged 65 years or over, Australia, 2002 to 30 September 2013, by vaccine serotype group**



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