Invasive pneumococcal disease surveillance Australia, 1 January to 31 March 2014

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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 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 1st quarter of 2014.

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 7 May 2014. Crude rates were calculated using the Australian Bureau of Statistics estimated resident populations for Australia at 30 June of each year.

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

Results

There were 209 cases of IPD reported to the NNDSS in the 1st quarter of 2014 (Table). The number of cases notified in the reporting period fell 4% from the 1st quarter of 2013 (n=217). Similar to many infectious diseases, the number of cases of IPD is highest in the cooler months. This trend was observed in all analyses included in this report.

Overall, Indigenous status was reported for 86% (n=179) of cases, ranging from 67% of cases reported by Victoria to 100% of cases reported by the Australian Capital Territory, the Northern Territory, South Australia and Tasmania. New South Wales and Victoria conduct targeted 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. Of cases reported with a valid Indigenous status, Aboriginal and Torres Strait peoples accounted for 24% (n=43) of all cases notified in the quarter (Table).

Serotype information was available for 90% (n=189) of all cases reported in the quarter, ranging from 87% of cases reported by Queensland and Victoria, to 100% of cases reported by the Australian Capital Territory, the Northern Territory and Tasmania. There was 1 case reported in the quarter that was deemed by the reference laboratory as non-typable. For figures in this report, cases deemed non-typable are included in the 'Serotype not specified' category with respect to vaccine serotype group.

During the quarter, notified case numbers were highest in the under 5 years age group (n=29), followed by the 65–69 years age group (n=18). 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 the under 5 years (n=8) followed by the 40–44 years age group (n=6). In this report, 3 age groups have been selected for focused analyses. These age groups align with groups that carry the greatest burden of disease and for which the NIP is targeted.

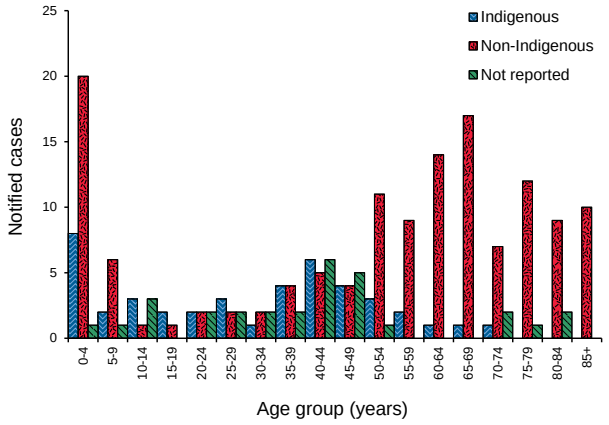
Table: Notified cases of invasive pneumococcal disease, Australia, 1 January to 31 March 2014, by Indigenous status, serotype completeness and state or territory

Indigenous status	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	1st qrt 2014	4th qrt 2013	1st qrt 2013	Year to 2014
Indigenous	0	5	10	7	3	1	0	17	43	38	33	43
Non-Indigenous	3	49	1	20	15	2	35	11	136	272	157	136
Not stated/ unknown	0	9	0	3	0	0	17	1	30	25	27	30
Total	3	63	11	30	18	3	52	29	209	335	217	209
Indigenous status completeness* (%)	100	86	100	90	100	100	67	97	86			-
Serotype completeness† (%)	100	89	100	87	94	100	87	97	90			-

* 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 when 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.

Figure 1: Notifications of invasive pneumococcal disease, Australia, 1 January to 31 March 2014, by Indigenous status and age group



Invasive pneumococcal disease in children aged less than 5 years

In the 1st quarter of 2014, 14% (n=29) of notified cases were aged less than 5 years. This was a decrease on the number of cases reported in the previous quarter (n=43) and similar to the number reported during the same period of 2013 (n=23) (Figure 2).

The majority of cases (97%, n=28) aged less than 5 years were reported with serotype information. Of these, 36% (n=10) 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 1st quarter of 2014, there were 3 cases aged less than 5 years with disease due to serotype 19A and 4 cases due to serotype 3. Similar to the 1st quarter of 2013, no cases in this age group were reported with disease caused by serotypes 1, 5 or 6A.

Invasive pneumococcal disease in Indigenous Australians aged 50 years or over

In the 1st quarter of 2014, 4% (n=8) of notified cases were reported as Indigenous Australians aged 50 years or over (Figure 4). This was consistent with the same period in previous years having the lowest number of notifications overall and was equal to the number reported during the same period in 2013 (n=8). For 2010 to 2012, the annual rate of IPD in this group has tended to increase. An outbreak of disease caused by serotype 1 in Central Australia that commenced in late 2010 contributed, in part, to this increase.[1] During 2013, the annual rate fell to 63 per 100,000 population, a 23% decrease from the peak rate in 2012 (82 per 100,000 population).

All but one of the cases notified in the 1st quarter of 2014 was reported with serotype information. Of cases with serotype, three were reported with disease due to serotypes targeted by the 23vPPV; the remaining reported disease due to a non-vaccine serotype (n=4).

Figure 2: Notifications and rates of invasive pneumococcal disease in those aged less than 5 years, Australia, 2003 to 31 March 2014, by vaccine serotype group

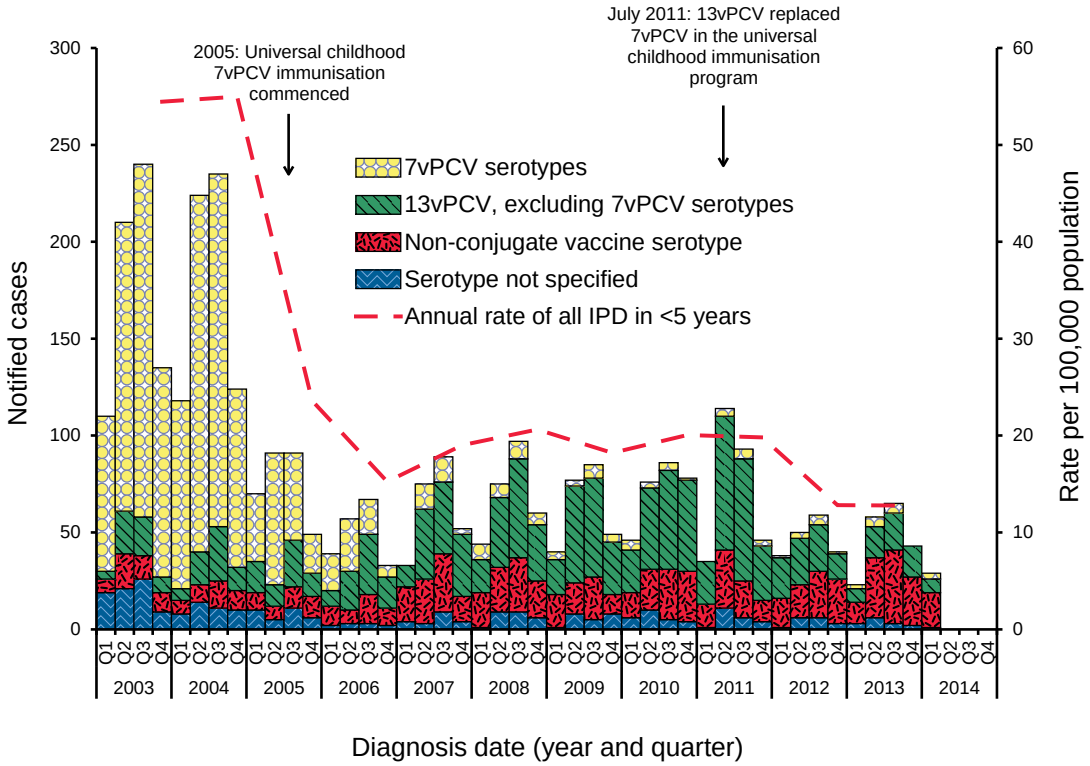


Figure 3: Notifications of invasive pneumococcal disease caused by serotypes targeted by the 13-valent pneumococcal conjugate vaccine (excluding those targeted by 7-valent pneumococcal conjugate vaccine) and rates of all invasive pneumococcal disease, aged less than 5 years, Australia, 2003 to 31 March 2014

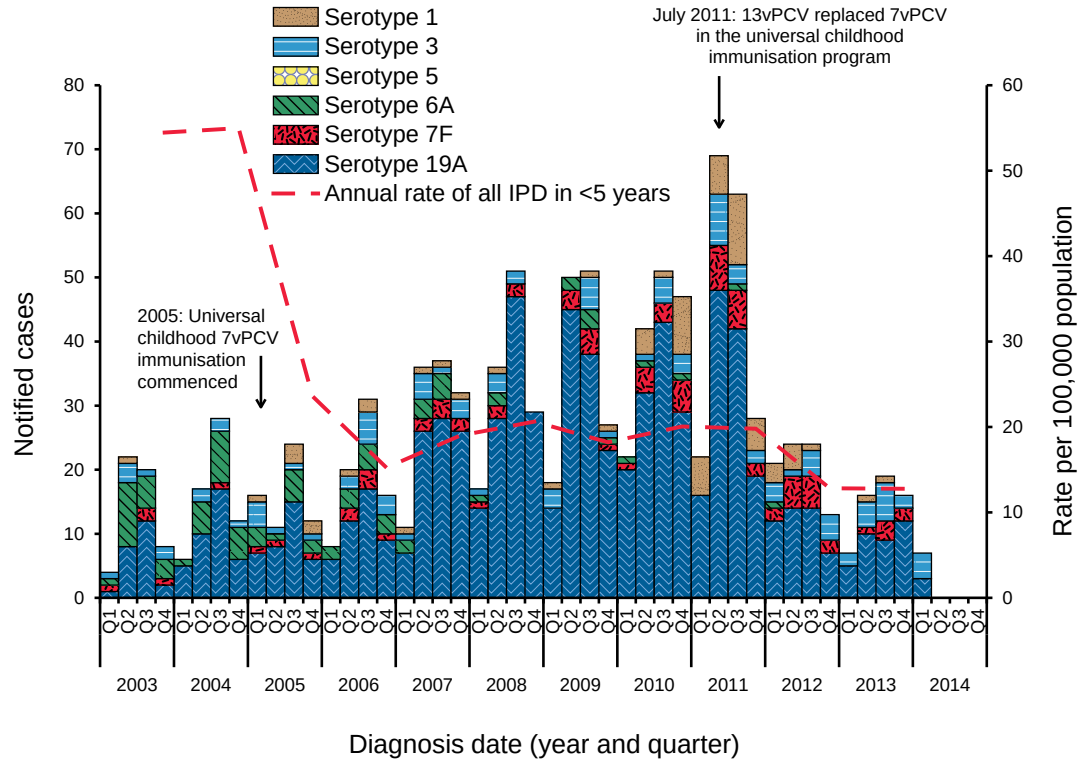
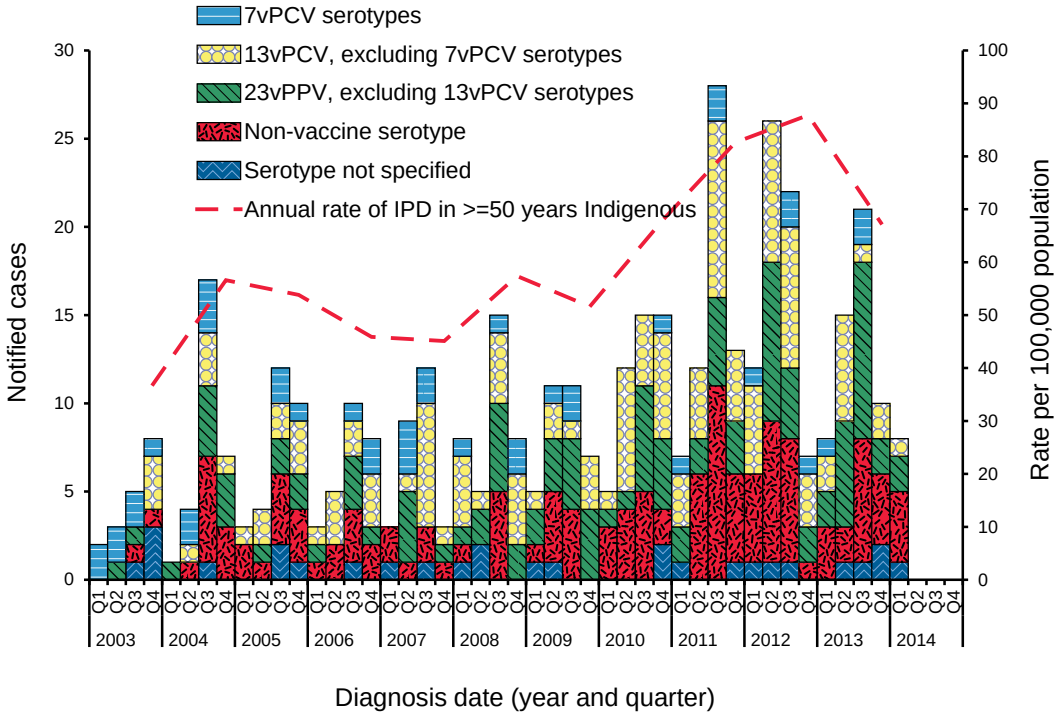


Figure 4: Notifications and rates of invasive pneumococcal disease in Indigenous Australians aged 50 years or over, Australia, 2003 to 31 March 2014, by vaccine serotype group



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

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

In the 1st quarter of 2014, 26% (n=55) of notified cases were reported as non-Indigenous Australians aged 65 years or over. This was a large decrease in the number of cases reported in the previous quarter (n=122) and was less than the number reported during the same period of 2013 (n=64) (Figure 5). During 2013, the annual rate fell to 16 per 100,000 population, an 11% decrease from the rate in 2012 (18 per 100,000 population).

The majority of cases (89%, n=49) reported in this quarter were reported with serotype information. Of these cases, 49% (n=24) 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 substantially in this age group, which is likely to be due to herd immunity impacts from the childhood immunisation program.

Conclusion

The number of notified cases of IPD in the 1st quarter of 2014 was a 38% decrease on the previous quarter. The total number of cases for the quarter was a 30% increase on the number of cases reported for the same period in 2013. Nationally, the pattern of disease has not changed from the 4th quarter of 2013. 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. Compared with the previous quarter, IPD associated with non-vaccine serotypes has remained stable in all groups targeted for IPD vaccination. The rising trend in notified cases of IPD in Indigenous Australians aged 50 years or over reversed considerably, whereas disease in non-Indigenous Australians aged 65 years or over has remained relatively stable but the profile of serotypes causing disease has diversified.

Acknowledgements

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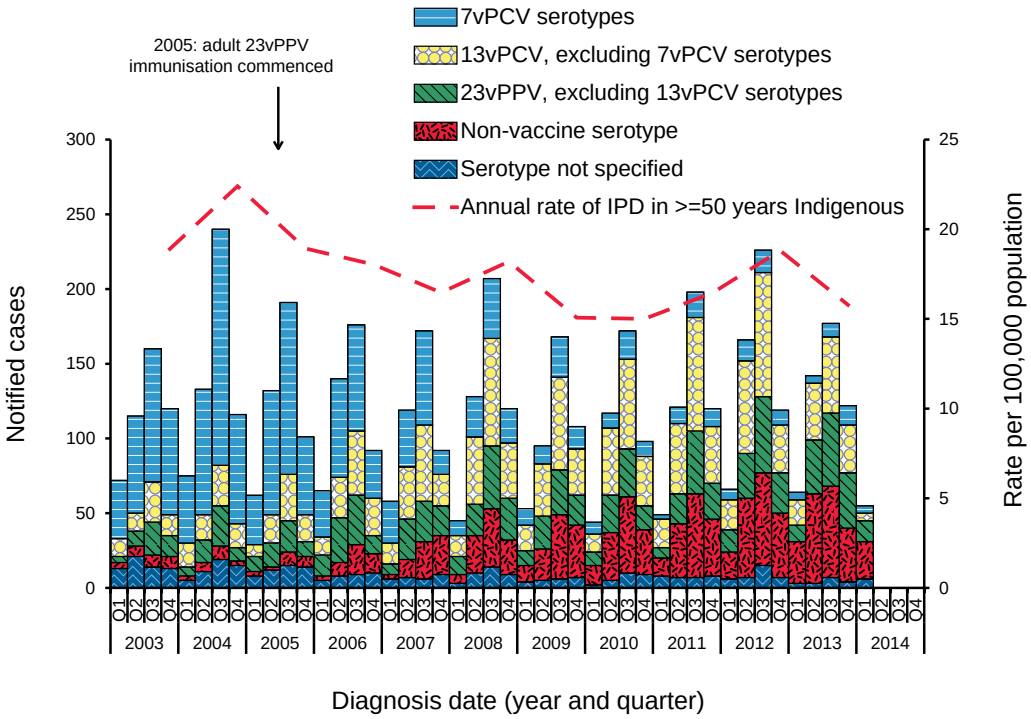
Figure 5: Notifications and rates of invasive pneumococcal disease in non-Indigenous Australians aged 65 years or over, Australia, 2003 to 31 March 2014, by vaccine serotype group



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Reference

1. Centre for Disease Control Northern Territory. Comments on notifications. *Northern Territory Disease Control Bulletin*. 2012;19(1):29.