Invasive pneumococcal disease surveillance Australia, 1 April to 30 June 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 and IPD has been a nationally notifiable disease in Australia 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 2nd 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 14 August 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 polysaccharide 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 437 cases of IPD reported to the NNDSS in the 2nd quarter of 2013, bringing the year to date total to 651 cases (Table). While the number of cases notified in the reporting period is more than twice the number in the 1st quarter of 2013 (n=214), it was a 13% reduction on the number of cases reported during the same period in 2012 (n=505), and a seasonal increase is not unexpected.

Overall, Aboriginal and Torres Strait Islander status was reported for 84% (n=365) of cases, ranging from 58% 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 and under and 50 years and older 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 16% (n=58) of all cases notified in the quarter (Table).

Serotype information was available for 95% (n=417) of all cases reported in the quarter (Table). There were 5 cases reported in the quarter that were deemed by the reference laboratory as non-typable; these cases are included in the vaccine serotype group in figures of this report as serotype not specified.

In the 2nd quarter of 2013, notified cases were highest in the under 5 years age group (n=59), followed by the 65–69 years age group (n=41) and the 85 years or older age group (n=38). 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=8) and the 35–39 years age group (n=8). Three groups have been selected for focused analyses in this quarterly report. These groups carry the greatest burden of disease and are those at which the NIP is targeted.

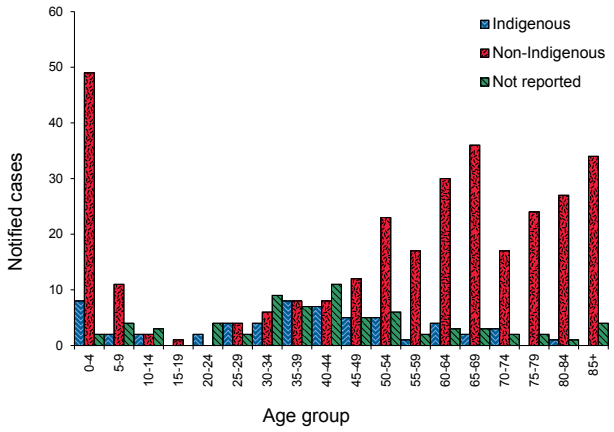
Table: Notified cases of invasive pneumococcal disease, Australia, 1 April to 30 June 2013, by Indigenous status, serotype and state or territory

Indigenous status	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Total qtr 2 2013	Total qtr 1 2013	Total qtr 2 2012	Year to date 2013
Indigenous	0	6	10	17	3	0	1	21	58			
Non-Indigenous	5	107	2	65	31	7	59	33	309			
Not stated/ unknown	0	22	0	4	1	0	43	0	70			
Total	5	135	12	86	35	7	103	54	437	214	505	651
Indigenous status completeness* (%)	100	84	100	95	97	100	58	100	84			
Serotype completeness† (%)	100	90	100	100	91	100	98	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 IPD that were reported with a serotype or 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. Figures in this report present the category 'Serotype not specified', this includes notified cases reported with an incomplete serotype or non-typable.

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



Invasive pneumococcal disease in children aged less than 5 years

In the 2nd quarter of 2013, 14% (n=59) of notified cases were aged less than 5 years. This was more than twice the number of cases reported in the previous quarter (n=21) but similar to the number reported during the same period of 2012 (n=51) (Figure 2).

The majority (88%, n=52) of cases aged less than 5 years were reported with serotype information. Of these, 40% (n=21) 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 2nd quarter of 2013, there were 10 cases aged less than 5 years with disease due to serotype 19A, 4 cases due to serotype 3 and 1 case each due to serotypes 1 and 7F. No cases in this age group were reported with disease caused by serotypes 5 or 6A.

Invasive pneumococcal disease in Indigenous Australians aged 50 years or older

In the 2nd quarter of 2013, 4% (n=16) of notified cases were reported in Indigenous Australians aged 50 years or over. This was twice the number of cases reported in the previous quarter (n=8), but a 38% decrease on the number reported during the same period in 2012 (n=26) (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.[1]

All but one of the cases were reported with serotype information. Of these, 87% (n=13) were reported with disease due to serotypes targeted by the 23vPPV; the remaining reported disease due to a non-vaccine serotype (n=2).

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

In the 2nd quarter of 2013, 32% (n=138) of notified cases were reported as non-Indigenous Australians aged 65 years or over. This was more than twice

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

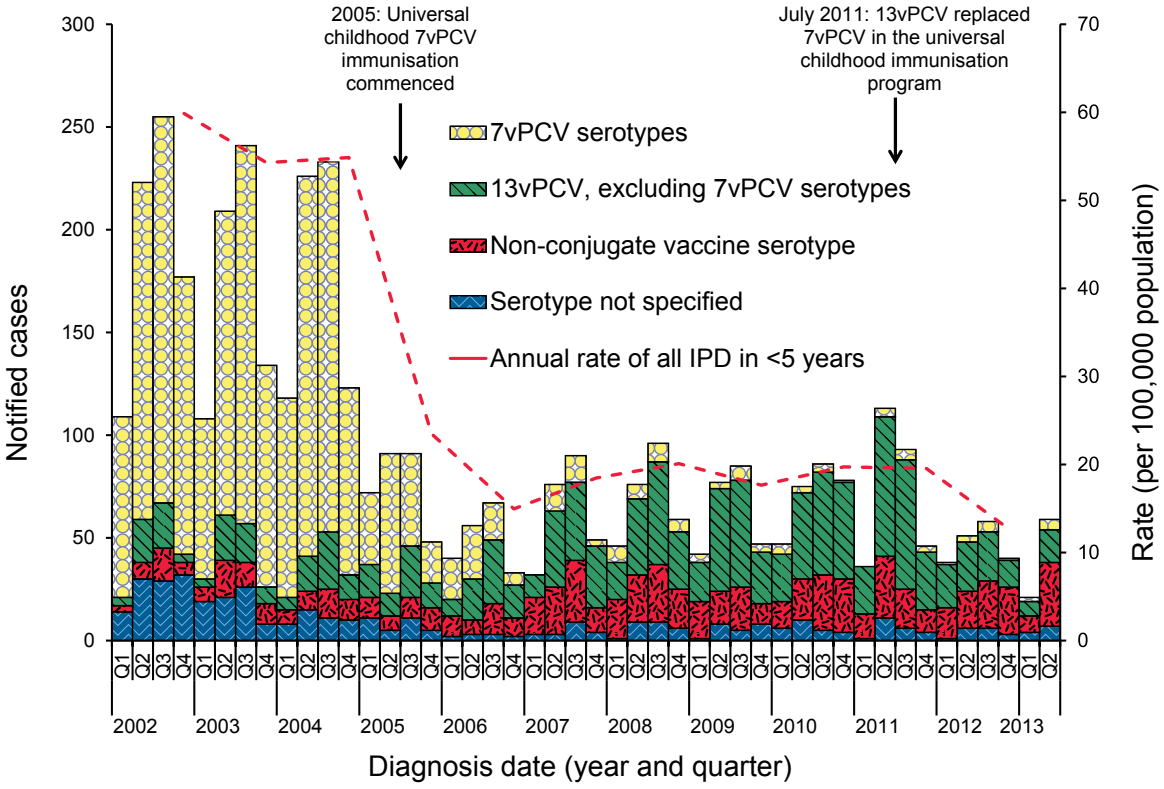
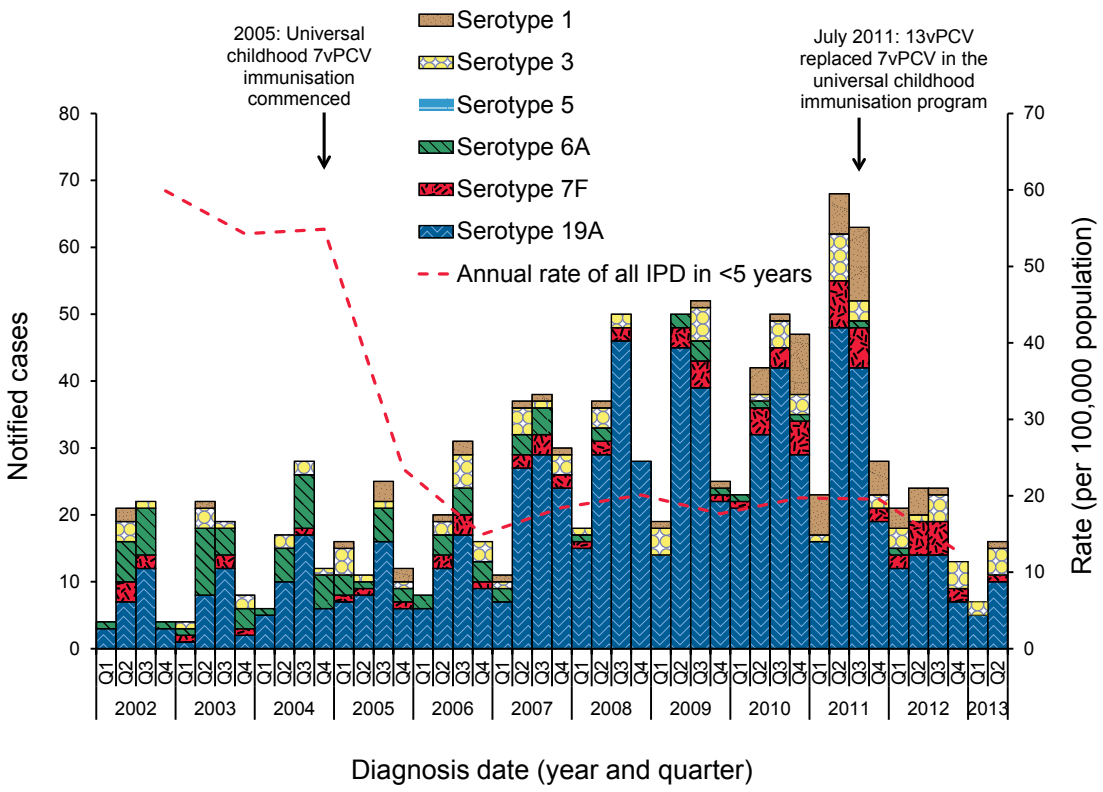


Figure 3: Notified cases of invasive pneumococcal disease caused by serotypes targeted by the 13-valent pneumococcal conjugate vaccine (excluding those targeted by 7-valent pneumococcal conjugate vaccine) and rates of all invasive pneumococcal disease, aged less than 5 years, Australia, 2002 to 30 June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



the number of cases reported in the previous quarter (n=60), but a 19% decrease on the number reported during the same period of 2012 (n=166) (Figure 5).

The majority (96%, n=133) of cases reported in this quarter were reported with serotype information. Of these cases, 57% (n=76) 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 effects from the childhood immunisation program.

Conclusion

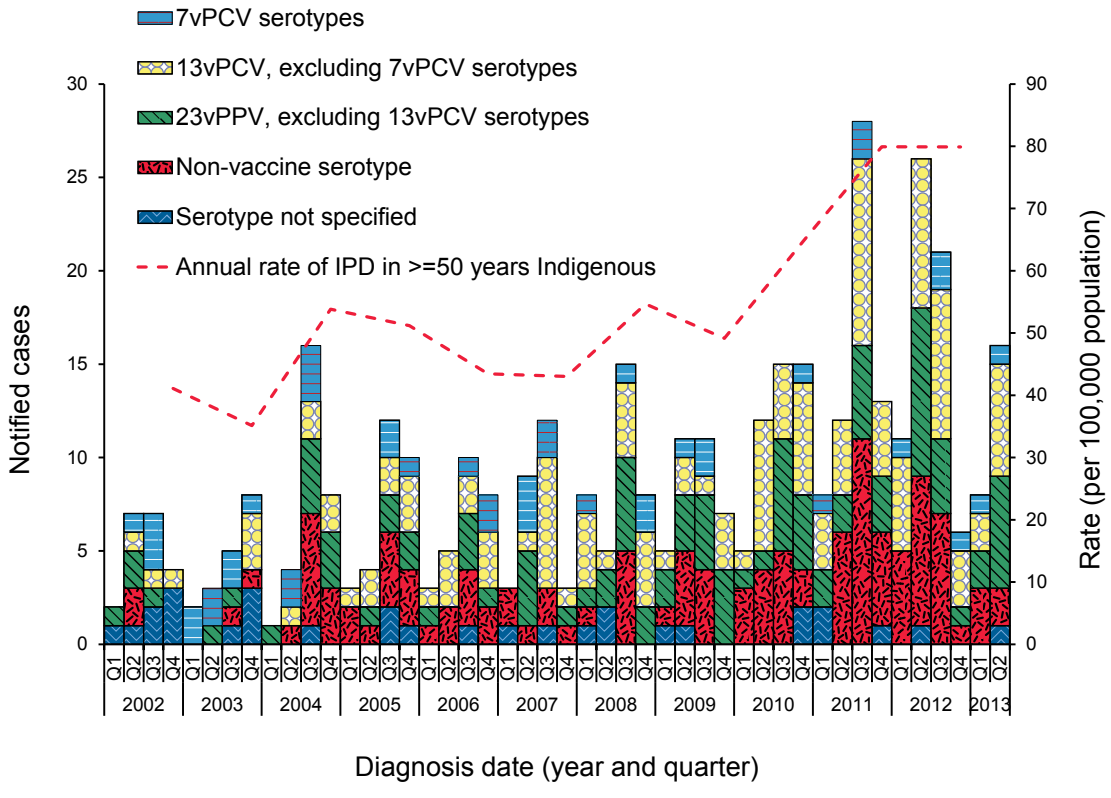
While the number of notified cases of IPD in the 2nd quarter of 2013 was more than double the number reported in the previous quarter, it represented a decline compared with the number reported during the same quarter in 2012. Disease due to the serotypes targeted by the 13vPCV has continued to decline 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 older have tended to increase over time, whereas disease in non-Indigenous Australians aged 65 years or older has remained relatively stable but the profile of serotypes causing disease has diversified.

This quarter the EIPDSWG noted a localised increase in the number and severity of IPD cases due to serotype 3 and will continue to monitor the occurrence of such cases in future reporting periods. The group is also actively monitoring the occurrence of vaccine failures following a full course of 13vPCV.

Acknowledgements

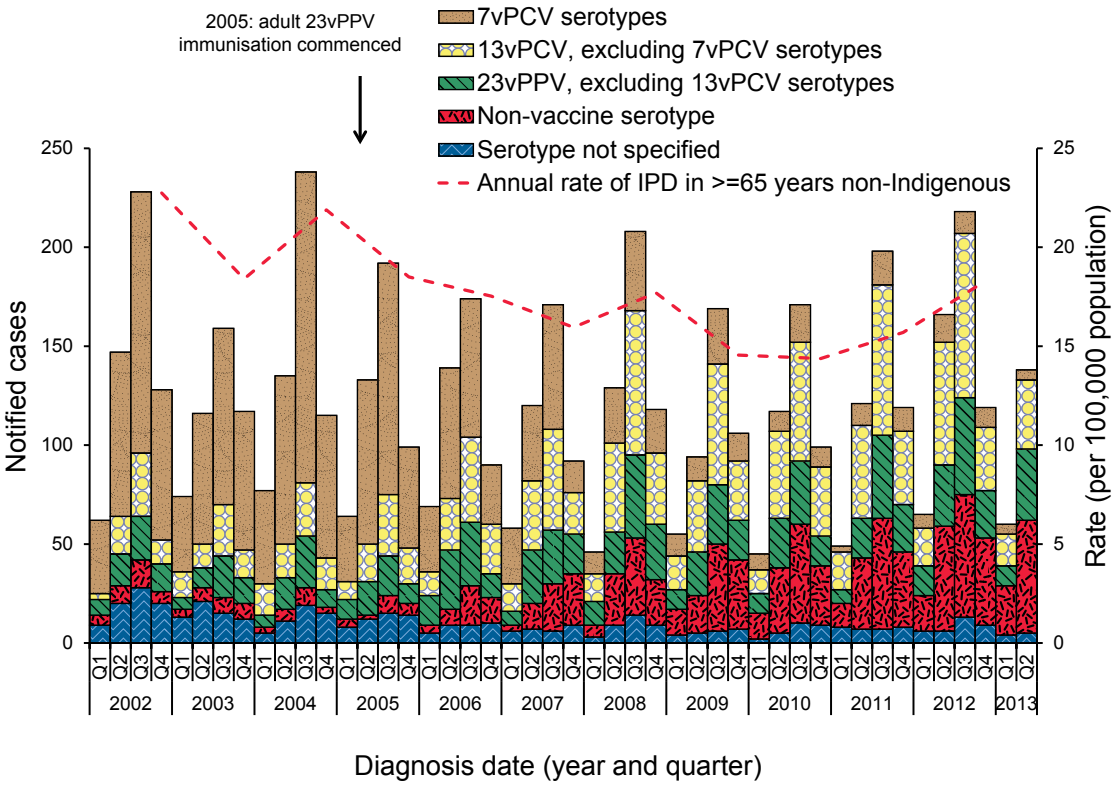
EIPDSWG contributors to this report include (in alphabetical order): Christina Bareja (Health), David Coleman (Tas), Heather Cook (NT), Lucinda Franklin (Vic), Carolien Giele (WA), Robin Gilmour (NSW), Michelle Green (Tas), Geoff Hogg (Microbiological Diagnostic Unit, University of Melbourne), Vicki Krause (NT), Rob Menzies (NCIRS), Shahin Oftadeh (Centre for Infectious Diseases and Microbiology, Public Health, Westmead Hospital), Sue Reid (ACT), Stacey Rowe (Vic), Vitali Sintchenko (Centre for Infectious Diseases and Microbiology, Public

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



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

Figure 5: Notified cases and rates of invasive pneumococcal disease in non-Indigenous Australians aged 65 years or older, Australia, 2002 to 30 June 2013, 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.