

Vaccine Preventable Diseases in Tasmania

2016 Annual Report

Vaccine Preventable Diseases in Tasmania

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Notes

Data from previous reports should not be relied upon. Use the most up to date report when citing data.

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Summary and Key Issues

This report is the 2016 Annual report of notifiable vaccine preventable diseases (VPDs), and is focused on trends and issues identified during this year. Data from previous years are provided to show trends over time.

Table 1: Notifications of vaccine preventable diseases in Tasmania by year, 1 January 2012 to 31 December 2016

Disease	2012	2013	2014	2015	2016
Diphtheria	0	0	0	0	0
<i>Haemophilus influenzae</i> Type B (invasive)	1	0	0	0	0
Measles	0	0	5	0	3
Meningococcal Disease (invasive)	7	3	2	2	5
Mumps	1	5	5	8	4
Pertussis	1276	522	68	31	30
Pneumococcal Disease (invasive)	45	37	39	43	50
Poliovirus	0	0	0	0	0
Rotavirus	97	110	76	54	31
Rubella	1	0	0	1	1
Varicella	375	365	456	462	518
Tetanus	0	0	0	0	0
Total	1803	1042	651	601	642

- In 2016, varicella notifications accounted for more than 80 per cent of all vaccine preventable diseases notified. Varicella notifications include chicken pox, shingles and unspecified varicella infections. This was followed by invasive pneumococcal infection (eight per cent), rotavirus (five per cent) and pertussis (whooping cough) (five per cent).
- Notifications of pertussis (whooping cough) in 2016 were significantly lower than in 2012, when Australia was experiencing a large outbreak.
- Notifications of rotavirus decreased from 97 in 2012 to 31 in 2016. The majority of this decrease was accounted for by a fall in rotavirus notifications in children aged <5 years.
- Cases of invasive pneumococcal disease have remained steady in Tasmania over the previous five years with an average of 43 notifications per year.
- In 2016, there was an increase in notifications of invasive meningococcal disease caused by serogroup W infection, from none in 2012 to four in 2016. Nationally there has also been an increase in meningococcal W infections.
- From 2012 to 2016 there were no notifications of diphtheria, poliovirus or tetanus in Tasmania.

Introduction

This report provides an overview of the epidemiology of notifiable vaccine preventable diseases (VPDs) in Tasmania that are included in the [National Immunisation Program \(NIP\)](#). This report is based on data collected through the Tasmanian Notifiable Diseases Database (TNDD). This database is for surveillance purposes and is not designed to collect data for analysis in relation to vaccine effectiveness. Cases included in this report are classified based on national surveillance case definitions, available at the [Australian Department of Health website](#). These definitions are used nationally for consistency in reporting and may sometimes differ from case classification decisions made in a clinical context.

Tasmania follows the NIP schedule. Information on vaccines and the schedule is available at the [Immunise Australia Program](#) and [Australian Immunisation Handbook](#) website.

Data on influenza are reported monthly during the influenza season, and are not included in this report but are available on the [Communicable Diseases Prevention Unit \(CDPU\) website](#). For the purposes of reporting, hepatitis B is considered a blood borne virus, even though a vaccine is included on the NIP. These reports are available on the [Department of Health and Human Services website](#).

Invasive meningococcal disease

In 2016 there were five notifications of invasive meningococcal disease (IMD) in Tasmanian residents; four were serogroup W and one serogroup Y (Figure 1). No deaths were reported in 2016.

In 2016, there was an increase in the number of notifications of serogroup W infection, from none in 2012 and 2013, to four in 2016. The four cases of serogroup W infection in 2016 were aged between 3 and 79 years. Nationally there has also been an increase in notifications of IMD caused by serogroup W, from 17 in 2014 to 110 in 2016 (1).

In 2016 the notification rate of IMD in Tasmania was 1.2 per 100 000 population, slightly higher than the Australian notification rate of 1.0 per 100 000. Notification rates in other jurisdictions ranged from 0.5 to 1.6 per 100 000 (2).

Notifications of IMD were variable over the five year period 2012 to 2016, with the highest number notified in 2012 (7) and the lowest in 2014 and 2015 (2 each year). From 2012 to 2016 all notifications of invasive meningococcal disease (IMD) were sporadic, with no epidemiologically linked cases.

Meningococcal C vaccination has been included in the NIP since 2003 and notifications of serogroup C disease have decreased significantly since it was introduced. The last case of serogroup C infection notified in Tasmania was in 2012. Since 2012, there has been a decrease in cases of serogroup B disease in Tasmania, from four in 2012 to one each in 2014, 2015 and none in 2016.

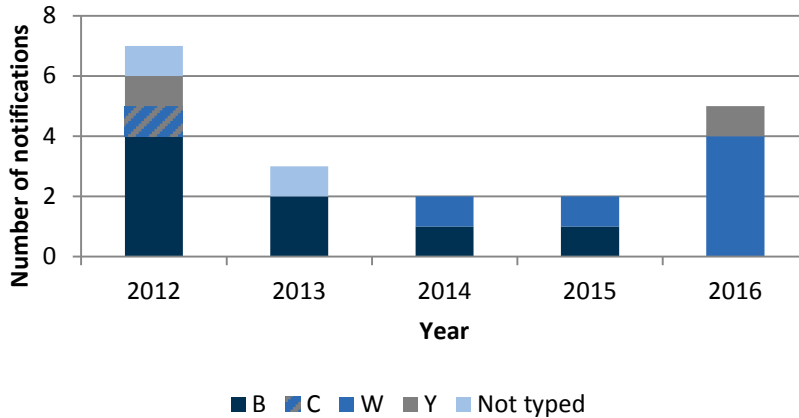


Figure 1: Notifications of invasive meningococcal disease in Tasmania by serogroup and year of onset, 1 January 2012 to 31 December 2016

Pertussis (Whooping Cough)

In 2016, there were 30 notifications of pertussis in Tasmanian residents. This was significantly lower than the 1276 notified in 2012, when Tasmania was part of a national outbreak (Figure 2). In Australia, pertussis epidemics occur every three to four years (3, 4).

Before 2012, all notifications of pertussis were actively followed up and some contacts identified as probable cases based on clinical evidence and known contact with a case. From 2012 onwards, only cases in children aged <5 years were followed up, which is likely to result in lower case numbers.

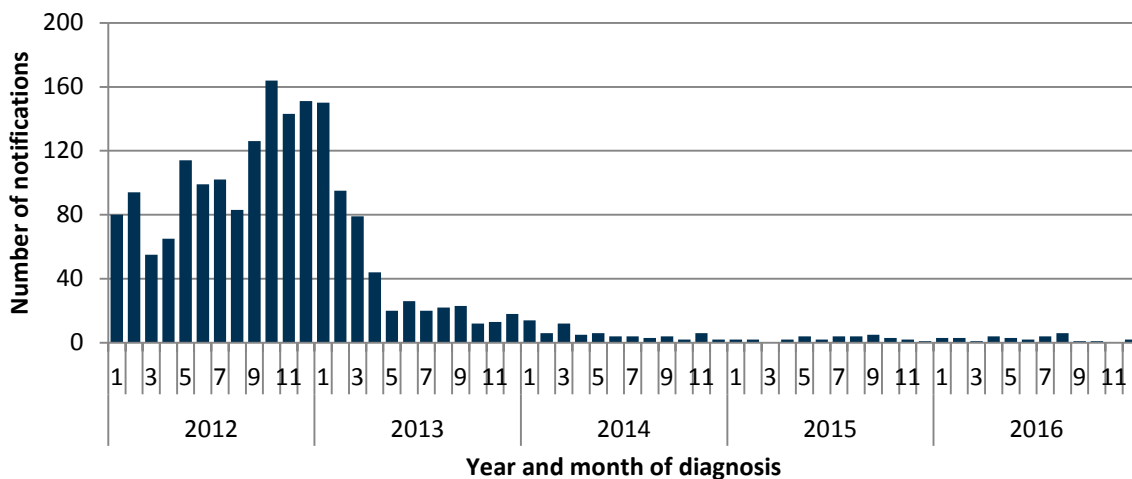


Figure 2: Notifications of pertussis in Tasmania by year and month, 1 January 2012 to 31 December 2016

In 2016, the highest proportion of notifications was in both the <5 years (23 per cent) and 5-9 years (23 per cent) age groups (Table 2). Two cases were aged less than 12 months. There were an equal number of cases in both males and females with a similar distribution across age groups.

In Tasmania, enhanced data on pertussis infection is only collected for children aged <5 years, with no deaths as a result of pertussis infection in this age group reported in 2016.

Table 2: Notifications of pertussis in Tasmania by year and age group, 1 January 2012 to 31 December 2016

Age Group (years)	Years				
	2012 n (%)	2013 n (%)	2014 n (%)	2015 n (%)	2016 n (%)
<1	59 (5)	18 (3)	2 (3)	1 (3)	2 (7)
1-2	85 (7)	49 (9)	3 (4)	4 (13)	3 (10)
3-4	90 (7)	42 (8)	3 (4)	1 (3)	2 (7)
5-9	241 (19)	116 (22)	7 (10)	2 (6)	7 (23)
10-14	228 (18)	44 (8)	3 (4)	2 (6)	4 (13)
15-19	45 (4)	14 (3)	4 (6)	4 (13)	2 (7)
20-49	304 (24)	142 (27)	23 (34)	4 (13)	2 (7)
50-64	126 (10)	64 (12)	9 (13)	6 (19)	4 (13)
65+	98 (8)	33 (6)	14 (21)	7 (23)	4 (13)
Total	1276	522	68	31	30

Invasive pneumococcal disease

In 2016 there were 50 notifications of invasive pneumococcal disease (IPD) in Tasmanian residents. This was a slight increase from 45 in 2012. The majority of notifications in 2016 were reported in people aged 18 years or older (84 per cent) (Figure 3). Eight notifications were in children aged <18 years including two aged <12 months.

Information on the serotypes included in each vaccine is in Table 6 in Appendix 2.

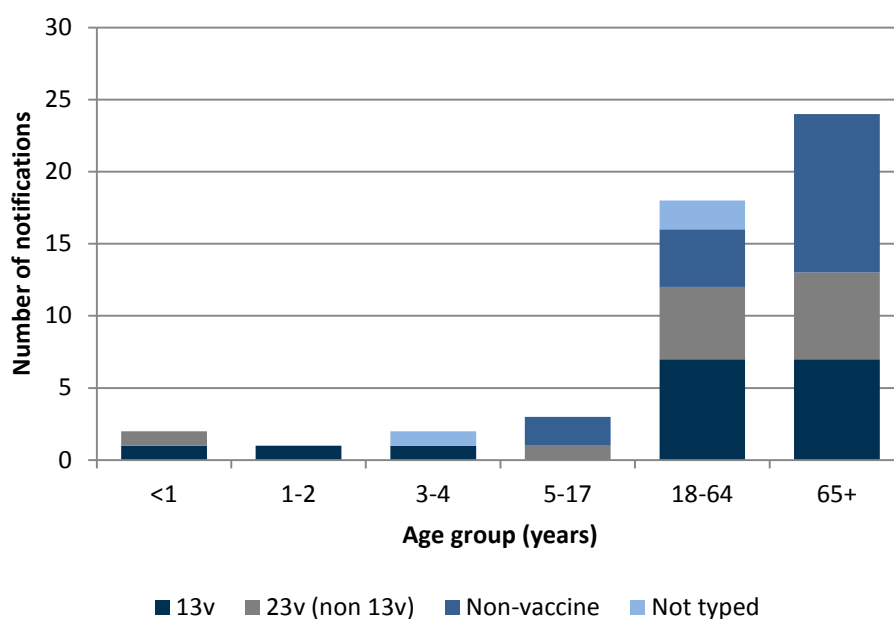


Figure 3: Notifications of invasive pneumococcal disease in Tasmania by age group and serotype (grouped by inclusion in 13v or 23v (non 13v) vaccine), 1 January to 31 December 2016

The most commonly notified serotypes in 2016 were serotype 3 (n=8, 16 per cent), 19F (n=5, 10 per cent) and 11A (n=4, 8 per cent).

Of the 50 notifications of IPD in 2016, 36 (72 per cent) were medically at risk for IPD infection (Table 3). Conditions included in this category are premature birth in children aged <5 years, congenital or chromosomal abnormality, anatomic or functional asplenia, immunocompromise or chronic illness. Two children without medical risk factors reported attendance at childcare and eight cases (16 per cent) had no risk factor identified.

Table 3: Notifications of IPD in Tasmania by age group, serotype included in a vaccine and medical risk factors, 1 January to 31 December 2016

Age group	Total notifications	Cases notified with a serotype included in a vaccine *	Medically at risk [^]	No risk factor identified
<5	5	3	1	2
5 to 64	21	7	14	3
65+	24	13	21	3
Total	50	23	36	8

*The serotype included in the vaccine is based on National Immunisation Program recommendations. For those aged <65 serotypes in the 13vPCV vaccine are included and for people aged 65+ serotypes in the 23vPPV vaccine are included.

[^]Medical risk factors include: premature birth in children aged <5 years, congenital or chromosomal abnormality, anatomic or functional asplenia, immunocompromise or chronic illness.

In 2016 there were four reported deaths as a result of IPD infection; this was equivalent to a Tasmanian mortality rate of 0.8 per 100 000. From 2012 to 2016, the majority of deaths as a result of IPD infection in Tasmania were in people aged over 50 years (79 per cent) and there were no deaths reported in children aged <18 years. All IPD related deaths in 2016 occurred in people aged over 55 years.

The Tasmanian IPD notification rate has remained relatively stable over the previous five years ranging from 7 per 100 000 in 2013 to 10 per 100 000 in 2016 and was similar across the three geographic regions of Tasmania. The Tasmanian 2016 notification rate was higher than the Australian notification rate of 7 per 100 000 (2).

Notifications of IPD caused by serotypes included in the 13-valent (13v) vaccine decreased from 25 in 2012 to 17 in 2013, and have remained steady in the years since (Figure 4). The 23-valent (non 13 valent serotypes), remained relatively stable over the previous five years, ranging from seven in 2014 to 13 in 2016.

From 2012 to 2016 there was an increase in both the number and proportion of cases notified that were non-vaccine serotypes. Proportionally this increased from 14 per cent in 2012 to 34 per cent in 2016. Of the 17 notifications that were non-vaccine serotypes in 2016, the three most commonly notified were 23B (n=4, 24 per cent), 23A (n=3, 18 per cent) and 6C (n=3, 18 per cent).

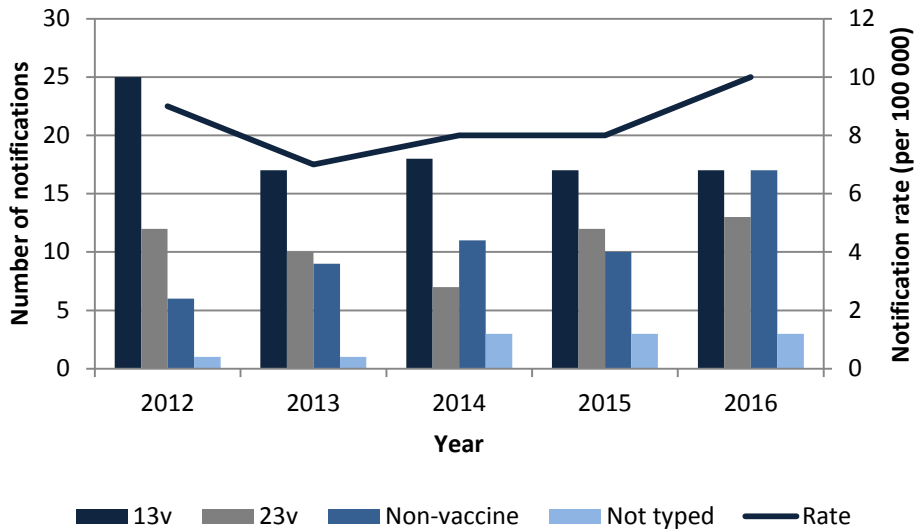


Figure 4: Notifications of IPD in Tasmania by year and vaccine serotype, 1 January 2012 to 31 December 2016

While many vaccines have undergone some changes to the schedule, pneumococcal vaccination in Australia has a complex history due to the variety of vaccines that have been available over time to different target populations. For the most up to date information on pneumococcal vaccines and further detail, please refer to the [Australian Immunisation Handbook website](#) and the [National Centre for Immunisation Research and Surveillance \(NCIRS\) website](#).

Rotavirus

Rotavirus is a notifiable condition in Tasmania but was not nationally notifiable in 2016.

In 2016 there were 31 notifications of rotavirus in Tasmanian residents. The majority of notifications were in children aged <5 years (26 per cent), followed by the 20-49 year age group (23 per cent).

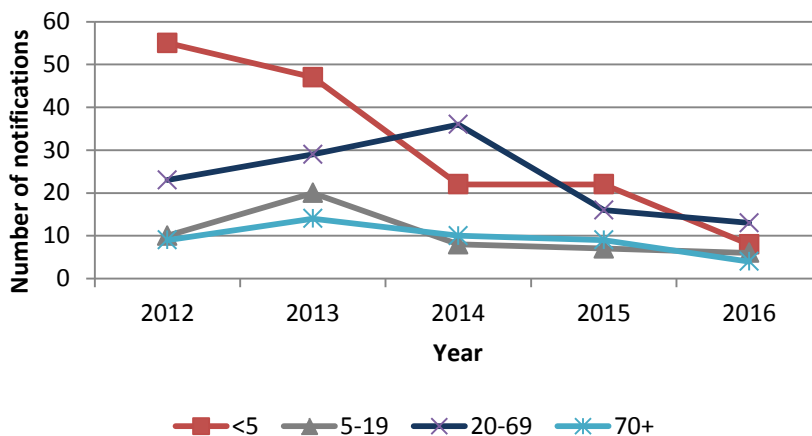


Figure 5: Number of rotavirus notifications in Tasmania by year of notification and age group, 1 January 2012 to 31 December 2016.

Notifications of rotavirus have decreased over the previous five years, with the peak number of notifications in this period (110) in 2013. This decrease was mostly attributable to a significant reduction in notifications in children aged <5 years (Figure 5).

In children aged <12 months there was a decrease of 71 per cent from 35 in 2012 to 10 in 2016 (Figure 6). During this same period, in children aged between 12 months and 5 years of age, notifications decreased by 86 per cent, from 22 in 2012 to 3 in 2016, though there was a peak in 2013 (n=28).

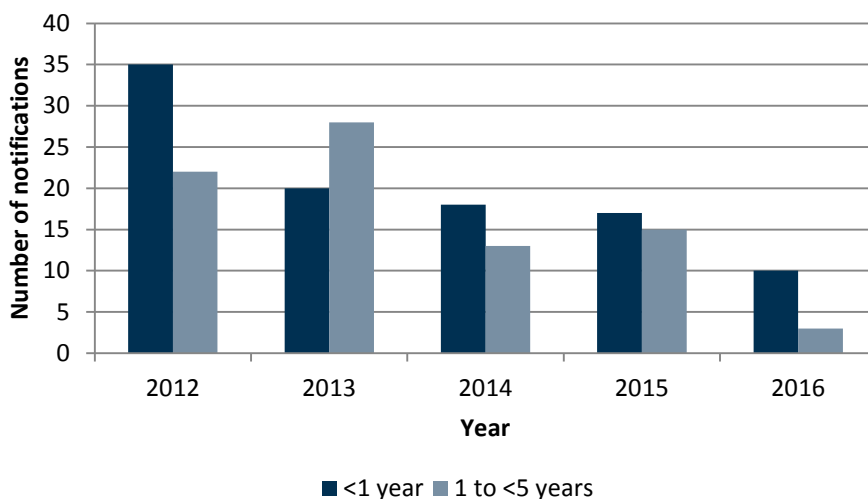


Figure 6: Notifications of rotavirus in children aged <5 years in Tasmania, by age group and year of notification, 1 January 2012 to 31 December 2016.

Varicella (Chicken pox and shingles)

Varicella zoster virus causes chicken pox and shingles infections. Some test results are notified in Tasmania that are unable to be classified as either chicken pox or shingles due to a lack of clinical information and are reported as Varicella zoster unspecified infections.

In 2016 there were a total of 518 notifications of varicella infection in Tasmanian residents. Of these, 307 (59 per cent) were shingles, 140 (27 per cent) were unspecified varicella infections and 71 (14 per cent) were chicken pox (Figure 7).

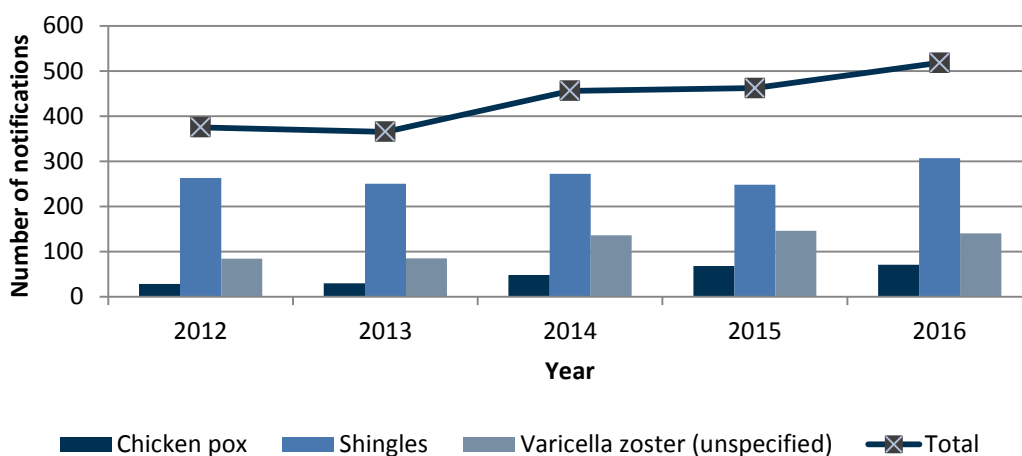


Figure 7: Notifications of varicella infection in Tasmania, by infection type and year, 1 January 2012 to 31 December 2016.

In 2016 there were 11 cases of chicken pox in children aged <5 years, which was 15 per cent of chicken pox notifications. The majority of shingles notifications (72 per cent) were in people aged >40 years (Table 4).

Table 4: Notifications of varicella in Tasmania by clinical presentation and age group, 1 January to 31 December 2016.

Age Group	Chicken pox	Shingles	Varicella zoster (unspecified)	Total
<2	7	-	-	7
3 - 5	4	3	2	9
6 - 17	39	13	8	60
18 - 39	14	70	29	113
40-69	6	138	58	202
70+	1	83	43	127
Total	71	307	140	518

There has been a 38 per cent increase in the number of notifications of varicella infection over the last five years, from 375 in 2012 to 518 in 2016. In 2016, the majority of varicella notifications were classified as shingles infection (59 per cent). In the same period, chicken pox accounted for 14 per cent of varicella infections, and the number of notifications of chicken pox peaked in the school age cohort. However, this possibly reflects changes to testing and reporting practices rather than an increase in disease in the community. Notifications of varicella include unspecified infection, where the clinical presentation is not reported. Surveillance for varicella infections are based on both laboratory testing and clinical presentation. There may be underreporting of clinically diagnosed cases.

Measles

In 2016, there were three notifications of measles in Tasmanian residents, all part of a single outbreak. Cases were aged between 21 and 34 years. The index case acquired their infection overseas and three subsequent cases were infected in Tasmania. One of these subsequent cases was an interstate resident, who was notified in their home state. All three were the D8 genotype.

Cases of measles in Tasmania are rare but most often occur in clusters around imported cases, from overseas or interstate.

Mumps

There were four notifications of mumps in Tasmanian residents in 2016. All were sporadic cases and not linked. Cases were aged between 34 to 56 years. Travel history was only available for one case, who did not report any interstate or overseas travel. The five year average was 4.6 cases per year.

Rubella

There was one notification of rubella in 2016 in a Tasmanian resident. No source of infection was identified and the case was considered sporadic.

Appendix 1: Summary of Tasmanian VPD notifications against Australian national data.

Table 5: Notifications and rates of notifiable vaccine preventable and invasive diseases in Tasmania and Australia, 1 January to 31 December 2016

Disease	Tasmania		Australia	
	2016 notifications	2016 rate	2016 notifications	2016 rate
Diphtheria	0	-	8	<0.1*
Measles	3	0.6	99	0.4
Meningococcal Disease (invasive)	5	1.2	252	1.0
Mumps	4	0.8	805	3.3
Pertussis	30	5.8	20095	83.0
Poliovirus	0	-	0	0
Pneumococcal Disease (invasive)	50	9.6	1664	6.9
Rotavirus [#]	31	6.0	- [#]	-
Rubella	1	0.2	17	0.1
Varicella [^]	518	99.8	18228	112.7 [^]
Tetanus	0	-	7	<0.1*

[#]Rotavirus is not nationally notifiable.

*Notifications were low and rounding to one decimal place resulted in rates of 0.0 reported in the national dataset.

[^]Varicella is not notifiable in NSW. To calculate the national notification rate, the NSW population was excluded from the Australian population.

Appendix 2: Pneumococcal serotypes by covered by vaccine types included on the NIP in 2016

Table 6: Pneumococcal serotypes covered by vaccine type

Vaccine type	Serotypes targeted by the vaccine
13vPCV (13-valent pneumococcal conjugate vaccine)	1, 3, 4, 5, 6B, 7F, 9V, 14, 18C, 19A, 19F and 23F
23vPPV (23-valent pneumococcal polysaccharide vaccine)	1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19A, 19F, 20, 22F, 23F and 33F

Explanatory notes

Rate – A rate is a measure of the number of times an event occurs in a specific population over a certain period of time.

The number of notifications tells us how many people were reported with a certain disease, without any information on the number of people that were in the group at risk of getting that disease. Rates allow for a comparison between groups where the numbers of people in different groups varies, such as between age groups. In this report, notification rates were calculated by dividing the number of notifications in a group by the total number of people in that group then multiplying by 100 000 to provide the rate of notifications per 100 000 people in that defined group.

Tasmanian regions – For the purpose of reporting Tasmania is divided into three regions, the Southern, Northern and North-West regions.

National Immunisation Program (NIP) - Tasmania participates in the National Immunisation Program (NIP) which provides for a funded schedule of vaccinations for Australians. For information on the NIP please visit the [Immunise Australia website](#).

Methodology

For this report, notifications of vaccine preventable and invasive diseases were extracted from the Tasmanian Notifiable Diseases Database (TNDD) on 31 March 2017 by diagnosis date. Only confirmed and probable cases that meet the national reporting requirements were included, with the exception of rotavirus which is currently notifiable in Tasmania but not nationally. Case definitions for these diseases are available on the [Australian national notifiable diseases and case definitions webpage](#). Notification numbers may differ from those reported nationally as a different method is used to derive the diagnosis date. The TNDD is a live database and these data are subject to change.

In Tasmania, legislation requires laboratories and clinicians to notify Public Health Services (PHS) of cases of certain diseases, including some vaccine preventable and invasive diseases. Cases are most commonly notified through laboratories, following a positive test result. PHS then follows up certain cases of notified VPDs, to collect data on exposures and risk factors. This is most commonly collected through clinicians.

There are a number of vaccine preventable diseases that are not notifiable, such as human papillomavirus (HPV). These diseases are not included in this report as they are not reported to the Tasmanian notifiable disease database (TNDD).

Australian Bureau of Statistics population data cubes were used to calculate Tasmanian and Australian rates of disease.

References

1. [Communicable Diseases Information - Meningococcal W Disease](#). Department of Health 2017.
2. [National Notifiable Diseases Surveillance System](#). Department of Health; 2017.
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