

Vaccine preventable and invasive diseases in Queensland

1 Jan – 31 Dec 2018

Quarterly surveillance report

This report, by quarter, provides additional data on vaccine preventable diseases notified in Queensland. This report covers the period 1 January to 31 December 2018. Data for this report were extracted from the Queensland Health notifiable conditions register on 22 February 2019 by onset date.

For current year to date totals, please refer to the Queensland Health Weekly Notifiable Conditions Report available [here](#). Recent changes were made to the Queensland immunisation schedule, in line with changes to the national program, from 1 July 2018, at the end of the period covered in this report.

The current [Queensland immunisation schedule](#) is available for any questions regarding vaccine recommendations.

Summary

Table 1: Notifications of vaccine preventable diseases in Queensland by quarter 2018, and 2017-2018

Disease	2018					2017
	Q1	Q2	Q3	Q4	Total	Total
Diphtheria	3	0	0	3	6	4
Group A Streptococcal infection (invasive)	75	87	107	86	355	381
<i>Haemophilus influenzae</i> type b (invasive)	1	3	2	1	7	3
Measles	8	3	1	2	14	8
Meningococcal disease (invasive)	9	18	16	15	58	69
Mumps	179	165	78	53	475	400
Pertussis	408	237	456	658	1,759	1,342
Pneumococcal disease (invasive)	53	97	148	71	369	311
Rotavirus	284	249	289	216	1,038	2,603
Rubella	0	1	2	2	5	3
Tetanus	1	0	0	0	1	1
Varicella	2,190	2,250	2,741	2,369	9,550	8,289

Diphtheria – There were three notifications of cutaneous toxigenic *C. diphtheriae* from West Moreton (2) and Metro South (1) HHS areas in quarter 4 2018 (Q4 2018). Five of the six notifications in 2018 were cutaneous (non-respiratory) presentations of toxigenic *C. diphtheriae* (44–73 years), and one was a fatal case of respiratory toxigenic *C. diphtheriae* in a 26-year-old. Two of the five cutaneous cases were overseas acquired from Papua New Guinea and Solomon Islands.

Invasive *Haemophilus influenzae* type b (Hib) – There was one notification of Hib from the Cairns and Hinterland area in Q4 2018 in a one-year-old child. In 2018, there were seven cases of Hib notified in Queensland, of which four were children (aged 1 month, 5 months (2 cases), and 1 year) and three were

adults (aged 18, 33, and 63 years). Of the four children, three were fully vaccinated for age, and one adult was fully vaccinated for age.

Measles – There were two notifications in Q4 2018, with cases aged 36 and 37 years; these two infections were acquired overseas. In 2018, there were a total of 14 notifications in Queensland, with cases aged from 8 months to 62 years old. Of these, eight acquired their infection overseas in India (4), Brazil (1), Indonesia (1), Philippines (1), and Viet Nam (1); five cases were acquired in Queensland and one case was acquired in Victoria. Of these 14 cases, two were too young for vaccination, one was partially vaccinated, one was fully vaccinated, four were unvaccinated, and six had no documentation of measles vaccination.

Mumps – There were 53 notifications of mumps received in Q4 2018, with cases aged from 9 months to 73 years. In 2018, there were a total of 475 notifications in Queensland, with cases aged from 9 months to 91 years. Of these 475 notifications, 421 (89%) were related to an ongoing outbreak in Cairns and Hinterland, Central Queensland, Darling Downs, North West, Torres and Cape, and Townsville HHSs. In the outbreak regions, 88% of cases were in Aboriginal and/or Torres Strait Islander people; cases were aged between 1 and 72 years, and 72% had been partially or fully vaccinated with mumps containing vaccines.

Rubella – There were two notifications of rubella in Q4 2018, with cases aged 28 and 45 years. In 2018, five notifications of rubella were reported, with cases aged from 1 year to 45 years. Of the five cases, PCR testing was done for four cases and none of them were positive; the fifth case was identified through the serology results (IgM and IgG) and did not have PCR testing performed. One infection was acquired overseas in Colombia. Of these five notifications, three had received a single dose of rubella containing vaccine and two had no documentation of rubella vaccination.

Tetanus – There was one notification of tetanus from Townsville HHS in 2018 in a non-Indigenous person aged 90 years, who died during the hospital admission.

Invasive group A streptococcal infection

There were 86 notifications of invasive group A streptococcal (iGAS) infection in Q4 2018, with one death reported. From 1 January to 31 December 2018, there were 355 notifications of iGAS infection in Queensland, including nine reported deaths. The majority of cases (79%) were adults aged 25 years or older and all deaths occurred in adults aged 40 years or older. Indigenous status was available for 337 (95%) cases, of these 62 (18%) were Aboriginal and/or Torres Strait Islander people.

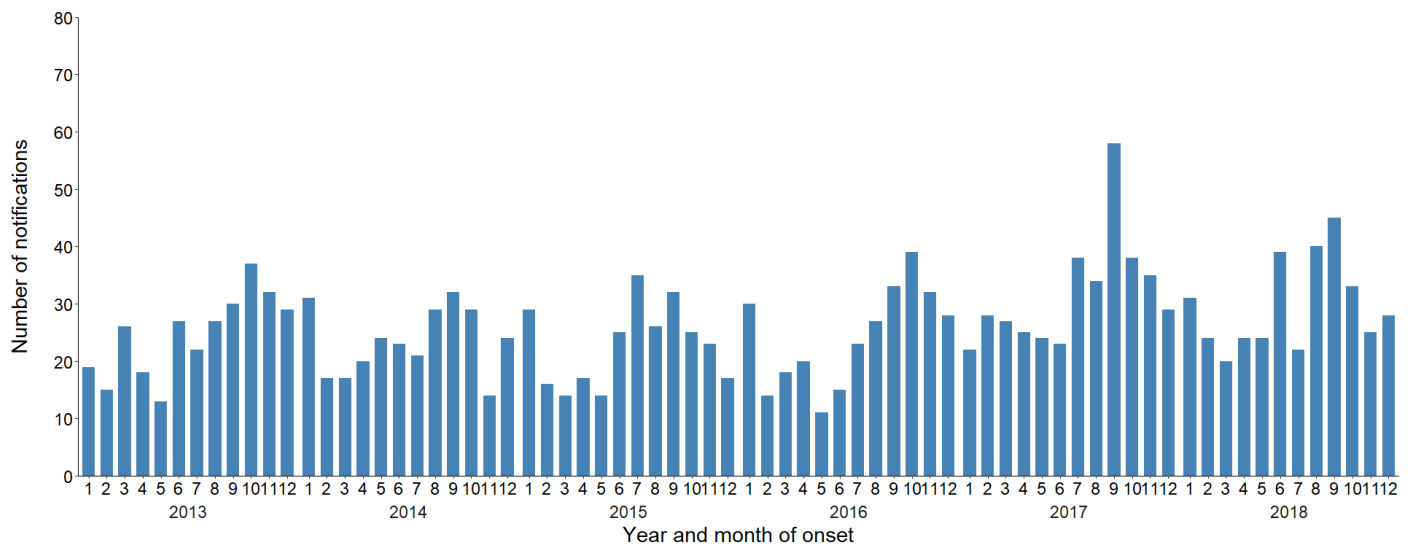


Figure 1: Notifications of invasive group A streptococcal infection in Queensland by year and month of onset, 1 January 2013 to 31 December 2018

Table 2: Notifications of invasive group A streptococcal infection in Queensland by age group and quarter, 2018 and 2017-2018

Age Group	2018					2017
	Q1	Q2	Q3	Q4	Total	Total
0–4	3	8	13	8	32	30
5–9	4	6	5	2	17	20
10–14	1	0	3	3	7	6
15–19	2	2	0	0	4	3
20–24	3	2	2	6	13	17
25–44	11	20	25	15	71	80
45–64	16	29	18	28	91	91
65+	35	20	41	24	120	134
Total	75	87	107	86	355	381

Invasive meningococcal disease

There were 15 notifications of invasive meningococcal disease (IMD) in Q4 2018, with one death reported. Of these, eight cases were serogroup B, four cases were serogroup W, two cases were serogroup Y, and one case was serogroup C. During 2018, there were a total of 58 notifications of IMD, with three deaths reported. Serogroups W and Y remain present in Queensland cases following their emergence in 2016 (Figure 2).

Vaccination History

In Queensland:

- In response to the rise in serogroup W and serogroup Y disease in 2016, a Meningococcal ACWY vaccination program was introduced in July 2017 to provide vaccination to year 10 students through the school immunisation program, and for young people aged 15–19 years of age through their immunisation provider.
- Vaccines for serogroup C disease were introduced for children 12 months of age in 2003, with an initial catch-up period covering older ages to <20 years.
- From 1 July 2018, meningococcal ACWY vaccine replaced Menitorix (Hib-Meningococcal Serogroup C vaccine) at the 12-month time period on the national immunisation program schedule.
- Vaccines for serogroup B are available on the private market, but are not currently part of the national immunisation program.

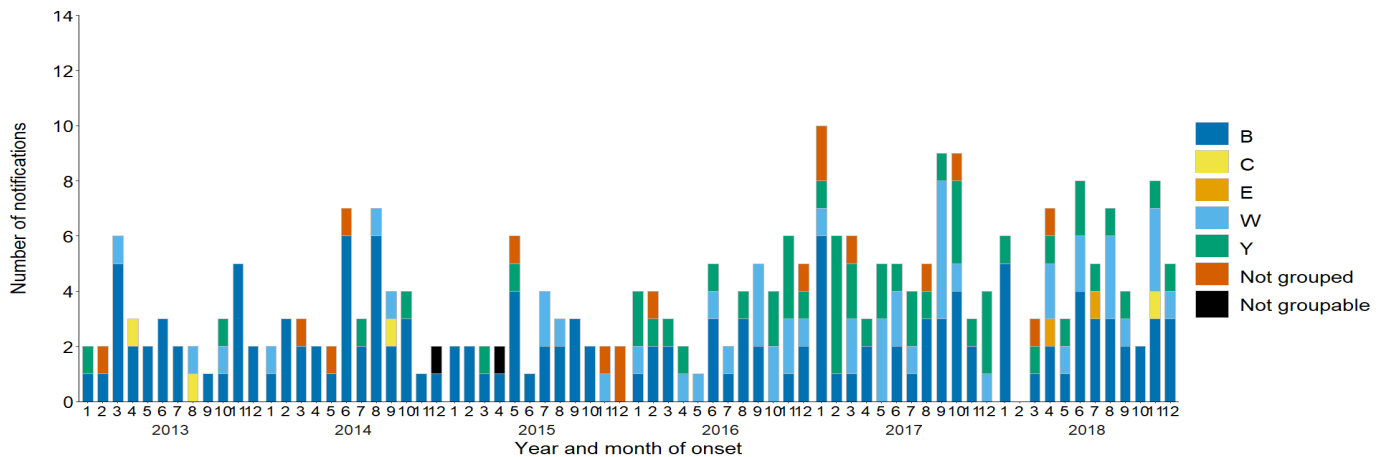


Figure 2: Notifications of invasive meningococcal disease in Queensland by year and month of onset, 1 January 2013 to 31 December 2018

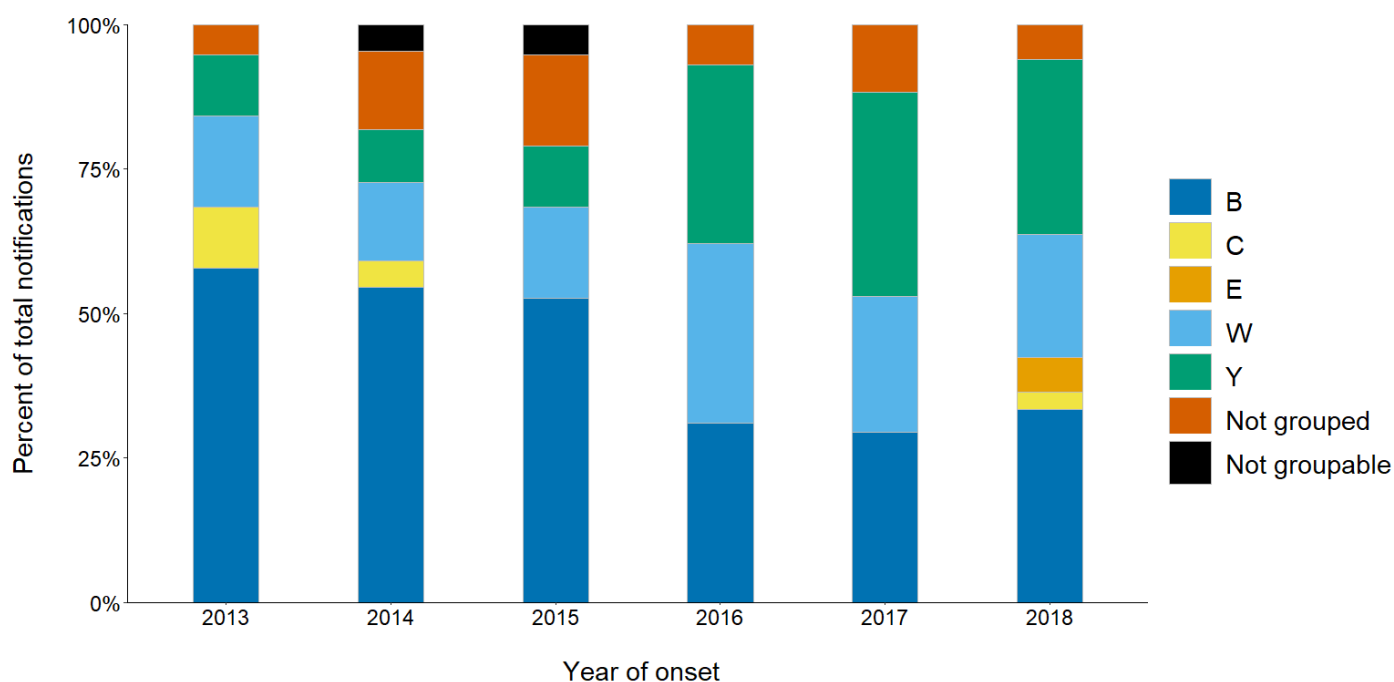


Figure 3: Notifications of invasive meningococcal disease in Queensland by year and serogroup, 1 January 2013 to 31 December 2018

Table 3: Notifications of invasive meningococcal infection in Queensland by serogroup, 1 January to 31 December 2018, and age group, 2017-2018

Age Group	2018							2017	
	Group B	Group C	Group E	Group W	Group Y	Not groupable	Not grouped	Total	
0–4	8	0	0	1	2	0	0	11	10
5–9	0	0	1	0	0	0	0	1	4
10–14	1	0	0	0	0	0	0	1	2
15–19	6	0	1	1	2	0	1	11	10
20–24	5	0	0	0	2	0	0	7	10
25+	9	1	0	11	5	0	1	27	33
Total	29	1	2	13	11	0	2	58	69

Invasive pneumococcal disease

There were 71 invasive pneumococcal disease (IPD) notifications in Q4 2018, with one death reported in an adult 80-years-old. During 2018 there were a total of 369 notifications of IPD and 20 deaths reported. Of these 20 deaths, 13 were in adults aged 65 years or older, six in adults aged 40–64 years, and one was in child aged 7 months. Figure 4 shows the number of notifications of IPD by year and month of onset. The serotype of each notification is categorised according to vaccine type. For example, all serotypes included in the 7-valent vaccine (Prevenar) are categorised as 7v, those included exclusively in the 13-valent vaccine (Prevenar 13) are categorised as 13v-7v.

Figure 5 shows the number of notifications of 13v-7v serotypes of IPD in Queensland by year and quarter of onset, 1 January 2013 to 31 December 2018.

Vaccination History

Queensland has been using

- Prevenar 13® (13vPCV) vaccine in a 3-dose primary course schedule for infants not in a high-risk category at 6 weeks, 4, and 6 months of age for since 1 July 2011. From 1 July 2018, a new schedule for 13vPCV was introduced, with doses at 6 weeks, 4 months, and 12 months of age
- From 1 July 2018, Aboriginal and Torres Strait Islander children and medically at-risk children are scheduled to receive Prevenar 13 at 6 weeks, 4 months, 6 months, and 12 months of age.

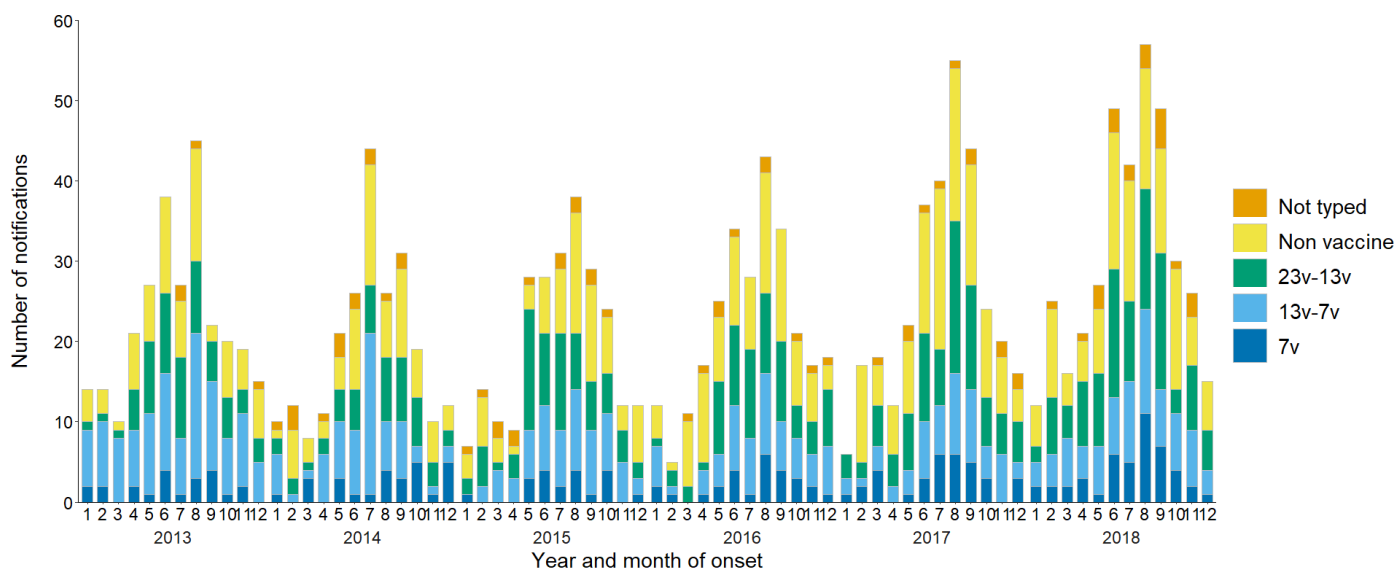


Figure 4: Notifications of invasive pneumococcal disease in Queensland by year and month of onset, 1 January 2013 to 31 December 2018

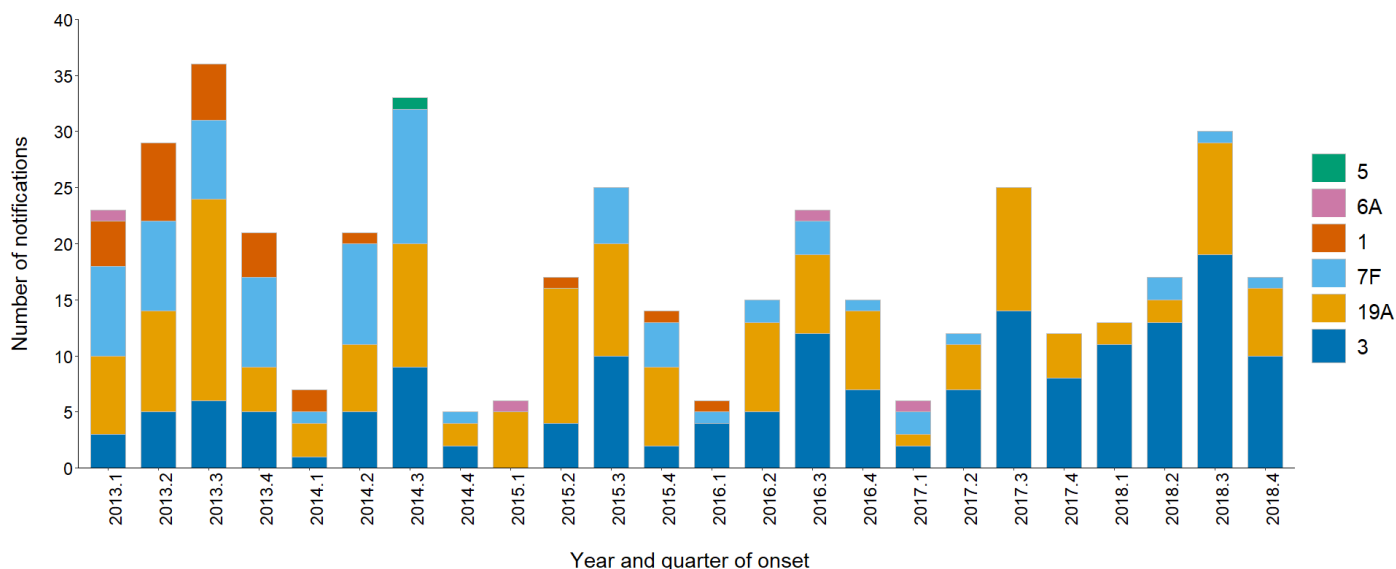


Figure 5: Notifications of 13v-7v serotypes of invasive pneumococcal disease in Queensland by year and quarter of onset, 1 January 2013 to 31 December 2018

In 2018, the most commonly notified IPD serotypes were 3, 19F, 22F, 9N, 23B, 19A, 23A, 11A, 16F, 15A, 33F, and 6C accounting for 69% of all IPD notifications in the time period.

Table 4: Most common serotypes of invasive pneumococcal disease notified in Queensland by quarter, 2018 and 2017-2018

Serotype	Vaccine inclusion	2018					2017
		Q1	Q2	Q3	Q4	Total	Total
3	13v-7v	11	13	19	10	53	31
19F	7v	5	8	14	5	32	23
22F	23v-13v	1	8	11	4	24	19
9N	23v-13v	6	6	8	4	24	16
23B	Non-vaccine	5	6	9	3	23	18
19A	13v-7v	2	2	10	6	20	20
23A	Non- vaccine	3	7	6	3	19	19
11A	23v-13v	3	2	6	4	15	11
16F	Non- vaccine	0	5	6	2	13	13
15A	Non- vaccine	7	0	1	3	11	21
33F	23v-13v	0	5	4	2	11	9
6C	Non- vaccine	0	2	6	3	11	10

Table 5: Notifications and rates of invasive pneumococcal disease in Queensland by age group and quarter, 2018 and 2017-2018

Age Group	2018						2017	
	Q1	Q2	Q3	Q4	Total	Rate#	Total	Rate#
<1	2	4	8	5	19	30.8	10	16.2
1-4	7	22	9	9	47	18.3	30	11.7
5-14	2	1	7	5	15	2.3	14	2.2
15-24	1	3	12	2	18	2.8	12	1.8
25-44	11	15	18	11	55	4.1	50	3.7
45-64	15	22	47	18	102	8.4	96	7.9
65+	15	30	47	21	113	15.2	99	13.4
Total	53	97	148	71	369	7.5	311	6.3

Annual age specific rate per 100,000 population using ERP for 2017 and 2018 (ABS Catalogue no. 3218.0)

Pertussis

There were 658 notifications of pertussis in Q4 2018 and a total of 1,759 notifications of pertussis with onset in 2018. There were no deaths reported. The highest number and rate of notifications for 2018 was in the 5-9 year age group (Table 6).

Vaccination History

- Acellular vaccines were first used on the NIP for all Australian children in the late 1990s.
- Queensland has offered children Infanrix hexa in a 3-dose schedule for infants at 6 weeks, 4 months, and 6 months of age from 1 March 2008.

- A booster dose of pertussis-containing vaccine is scheduled for children at 18 months, and 4 years of age.
- A pertussis-containing vaccine is offered in a year 7 school program.
- A dose of pertussis-containing vaccine is recommended during the third trimester (preferably between 28 and 32 weeks) of every pregnancy.

Table 6: Number and rate of pertussis notifications in Queensland by age group and quarter, 2018 and 2017–2018

Age Group	2018						2017	
	Q1	Q2	Q3	Q4	Total	Rate [#]	Total	Rate [#]
<1	8	6	9	15	38	61.6	42	68.1
1–2	24	10	14	30	78	61.6	68	53.7
3–4	37	9	19	22	87	67.1	86	66.3
5–9	141	64	139	214	558	167.3	299	89.7
10–14	46	32	95	182	355	112.5	231	73.2
15–19	14	22	24	32	92	29.6	78	25.1
20–49	92	58	102	97	349	17.2	313	15.4
50–64	28	21	40	39	128	14.6	110	12.5
65+	18	15	14	27	74	10	115	15.5
Total	408	237	456	658	1,759	35.7	1,342	27.2

Annual age specific rate per 100,000 population per year using ERP for 2017 and 2018 (ABS Catalogue no. 3218.0)

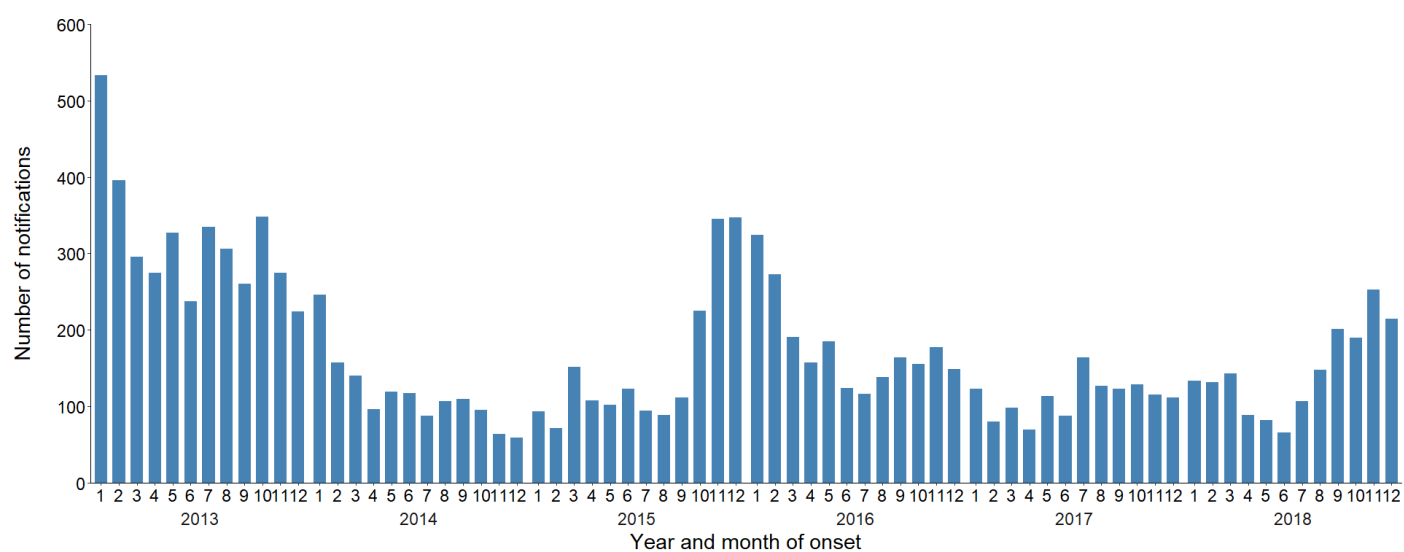


Figure 6: Notifications of pertussis in Queensland by month and year of onset, 1 January 2013 to 31 December 2018

Table 7: Notifications of pertussis in Queensland in children aged younger than one year by quarter, 2018 and 2017-2018

Age Group	2018					2017
	Q1	Q2	Q3	Q4	Total	Total
<1 month	0	1	0	0	1	4
1 month	0	1	2	1	4	1
2 months	1	0	1	1	3	3
3 months	1	0	2	2	5	8
4 months	0	1	0	2	3	6
5 months	1	0	1	0	2	3
6 months	2	0	0	3	5	8
7 months	0	2	1	1	4	1
8 months	1	1	1	1	4	2
9 months	2	0	0	1	3	2
10 months	0	0	0	3	3	2
11 months	0	0	1	0	1	2
Total	8	6	9	15	38	42

Rotavirus

There were 216 notifications of rotavirus in Q4 2018 and a total of 1,038 notifications in 2018. The highest number and rate of notification was seen in children younger than 1 year of age. The 2018 notifications and rates of rotavirus are approximately half the notifications and rate for 2017. Figure 7 shows the notifications of rotavirus in Queensland by age group and quarter and year of onset.

Towards the end of 2015 there was an increase in notifications in children aged younger than one year, which has been sustained. At the end of 2015, two laboratories in Queensland introduced PCR testing for rotavirus infection. PCR is more sensitive for rotavirus detection than antigen detection methods. Further, with current PCR assays, discrimination between wild type rotavirus and the vaccine strains is not possible. Notified cases in this age group may reflect recent vaccination rather than infection.

During 2006–2016, only confirmed rotavirus cases were notified as per the Queensland health guidelines. Queensland introduced a case definition for probable and confirmed cases from the beginning of 2017.

Vaccination History

Vaccines for rotavirus first became available in Australia in early 2006 and were added to the National Immunisation Program from 1 July 2007. At this time, Queensland began vaccinating children with RotaTeq (Merck/Seqirus) in a 3-dose schedule administered orally at 6 weeks, 4 months, and 6 months of age.

From 1 July 2017, oral rotavirus vaccine Rotarix (GSK) given in a 2-dose schedule, replaced RotaTeq in Queensland.

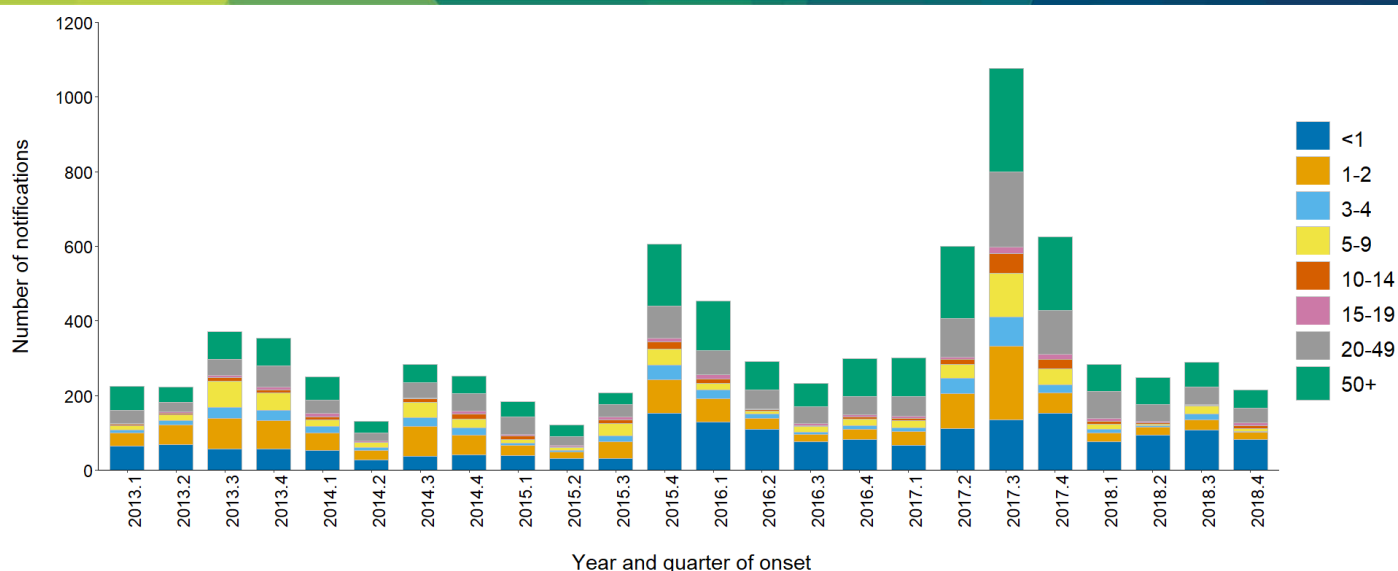


Figure 7: Notifications of rotavirus in Queensland by age group and quarter and year of onset, 1 January 2013 to 31 December 2018

Table 8: Number and rate of rotavirus notifications in Queensland by age group and quarter, 2018 and 2017–2018

Age Group	2018						2017	
	Q1	Q2	Q3	Q4	Total	Rate [#]	Total	Rate [#]
<1	77	95	107	83	362	587.1	466	755.8
1–2	24	21	29	19	93	73.5	385	304.1
3–4	9	4	15	3	31	23.9	149	114.9
5–9	13	3	21	7	44	13.2	216	64.8
10–14	9	4	2	8	23	7.3	98	31
15–19	7	4	2	8	21	6.8	46	14.8
20–49	73	45	48	39	205	10.1	472	23.2
50+	72	73	65	49	259	16	771	47.6
Total	284	249	289	216	1,038	21.1	2,603	52.8

[#] Annual age specific rate per 100,000 population using ERP for 2017 and 2018 (ABS Catalogue no. 3218.0)

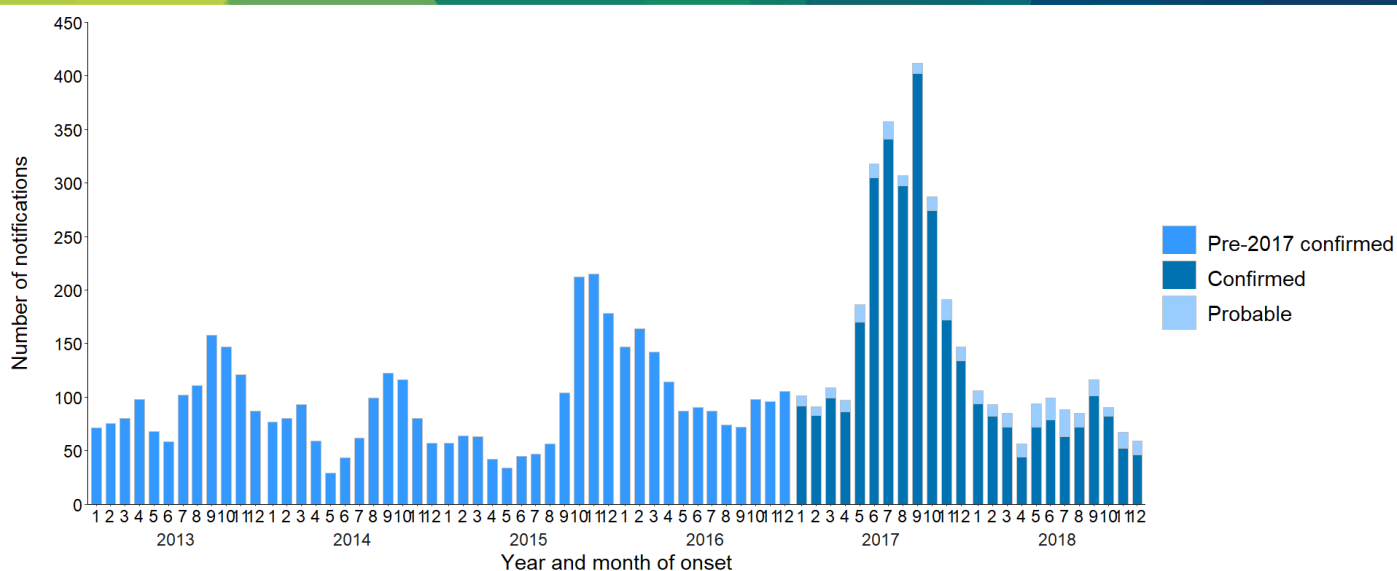


Figure 8: Notifications of rotavirus in Queensland by month and year of onset, 1 January 2013 to 31 December 2018

Table 9: Notifications of rotavirus in Queensland in children aged younger than one year by quarter, 2018 and 2017-2018

Age Group	2018					2017
	Q1	Q2	Q3	Q4	Total	Total
<1 month	2	3	1	0	6	32
1 month	20	15	36	26	97	100
2 months	17	30	30	25	102	82
3 months	6	14	10	12	42	52
4 months	9	19	7	9	44	37
5 months	6	3	6	6	21	26
6 months	3	3	1	0	7	31
7 months	4	2	2	3	11	27
8 months	2	2	5	1	10	21
9 months	5	0	5	0	10	14
10 months	3	3	1	0	7	28
11 months	0	1	3	1	5	16
Total	77	95	107	83	362	466

Varicella-zoster virus infection

There were 2,369 notifications of varicella-zoster infection in Q4 2018. From 1 January 2018, all notifications of varicella-zoster virus infection in children aged younger than 10 years, and adults aged 60 years or older have been followed up to determine if the clinical presentation is consistent with chickenpox or shingles. Prior to this time, only children younger than eight years of age were followed up. A time limited (1 Dec 2017–30 Sep 2018) intermittent enhanced surveillance (all notifications followed up for one month in each quarter) of all varicella notifications also commenced in December 2017.

Vaccination History

The National Shingles Vaccination Program commenced in November 2016 for adults 70 years of age, with a single catch-up dose funded for adults aged 71 to 79 years until 2021. The National Immunisation Program Schedule provides a combined measles, mumps, rubella, and varicella (MMRV) vaccine for children aged 18 months.

Table 10: Notifications of varicella in Queensland by age group, clinical presentation and quarter, 2018

Age Group	Q1 2018				Q2 2018				Q3 2018				Q4 2018			
	Chickenpox	Shingles	Unspecified	Total	Chickenpox	Shingles	Unspecified	Total	Chickenpox	Shingles	Unspecified	Total	Chickenpox	Shingles	Unspecified	Total
<1	8	0	1	9	18	0	1	19	17	0	1	18	16	1	0	17
1-2	11	4	0	15	19	3	0	22	27	3	1	31	21	8	2	31
3-4	12	5	1	18	21	5	0	26	35	5	1	41	23	3	0	26
5-7	40	13	2	55	45	3	1	49	219	10	4	233	85	4	5	94
8-9	38	8	0	46	20	5	2	27	134	5	6	145	51	11	2	64
10-69	52	778	847	1,677	83	737	929	1,749	143	720	1,038	1,901	60	679	1008	1,747
70+	5	336	29	370	6	319	33	358	15	337	20	372	9	355	26	390
Total	166	1,144	880	2,190	212	1,072	966	2,250	590	1,080	1,071	2,741	265	1,061	1,043	2,369

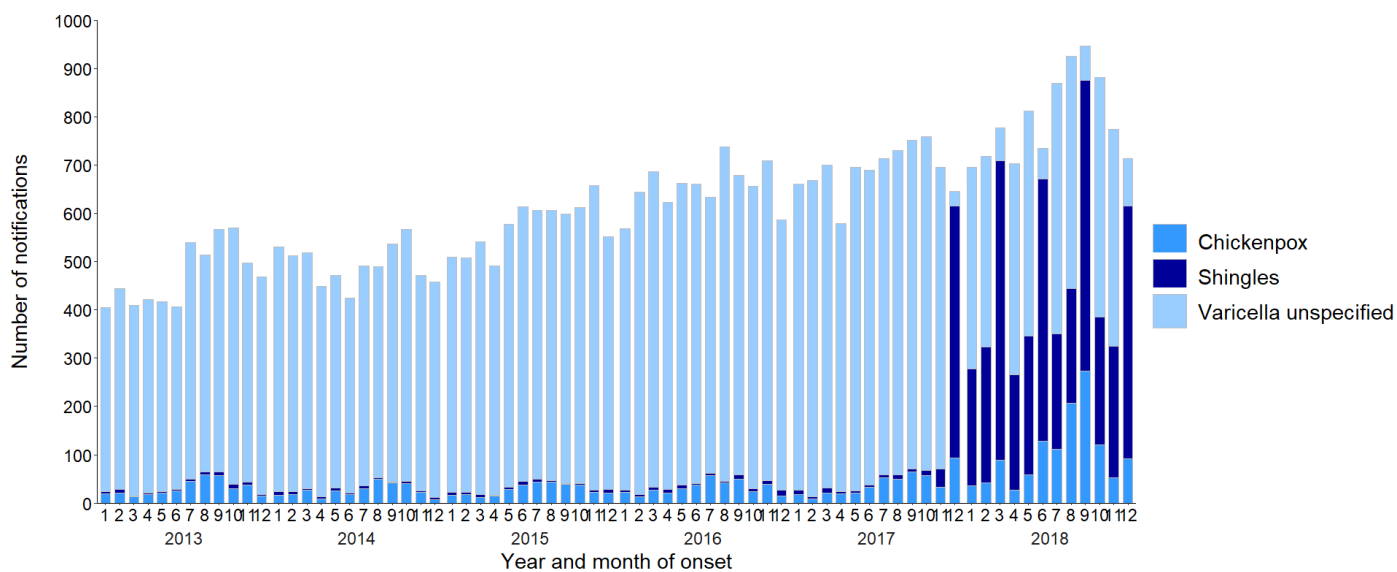


Figure 9: Notifications of varicella in Queensland by clinical presentation, 1 January 2013 to 31 December 2018

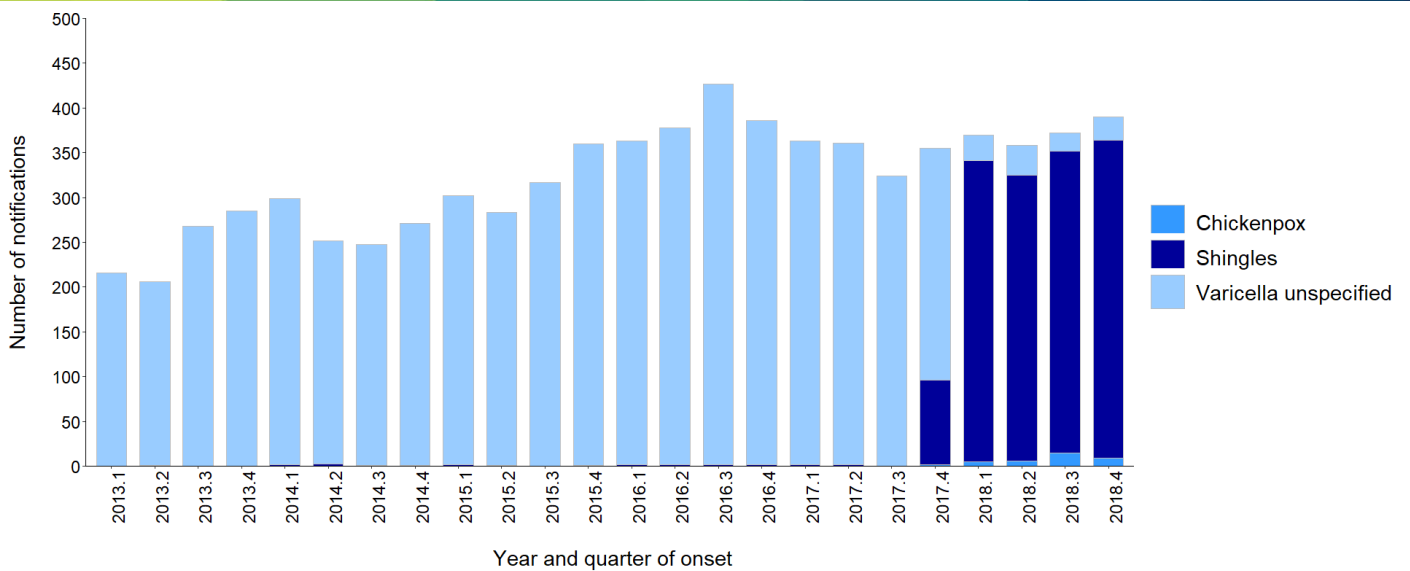


Figure 10: Notifications of varicella in Queensland by clinical presentation for older than 70 years age group, 1 January 2013 to 31 December 2018

Technical notes

1. Notifications may change over time as NOCS is a live database.
2. Case definitions for the reported diseases are available at: <http://disease-control.health.qld.gov.au/>
3. Historical vaccination data and immunisation policies are available from the National Centre for Immunisation Research and Surveillance (NCIRS) at: <http://www.ncirs.edu.au/provider-resources/vaccination-history/>