

Vaccine preventable and invasive diseases in Queensland

1 Jan – 31 Dec 2017

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 2017. Data for this report were extracted from the Notifiable Diseases System on 1 February 2018 by onset date.

For current year to date totals, please refer to the Queensland Health Weekly Notifiable Conditions Report available [here](#). 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, 2017 and 2016-2017

Disease	2017					2016
	Q1	Q2	Q3	Q4	Total	Total
Diphtheria	1	2	0	1	4	8
Group A Streptococcal Infection (invasive)	77	72	130	102	381	289
<i>Haemophilus influenzae</i> type b (invasive)	1	0	1	1	3	5
Measles	7	1	0	0	8	15
Meningococcal (invasive)	22	13	17	16	68	45
Mumps	69	90	103	138	400	62
Pertussis	301	262	399	336	1,298	2,153
Pneumococcal (invasive)	41	71	139	59	310	265
Rotavirus	300	581	927	527	2,335	1,277
Rubella	3	0	0	0	3	2
Tetanus	0	0	0	1	1	4
Varicella	2,030	1,964	2,195	2,100	8,289	7,846

(Q1: 1 January – 31 March, Q2: 1 April – 30 June, Q3: 1 July – 30 September, Q4: 1 October-31 December)

Diphtheria – There was one notification of cutaneous toxigenic *C. diphtheriae* from the West Moreton area in quarter 4 in a 25 year old male. In 2017, there were four cases of cutaneous toxigenic *C. diphtheriae* notified in Queensland, of which three were acquired in Queensland and the other in the Solomon Islands.

Invasive *Haemophilus influenzae* type b (Hib) – There was one notification of Hib from Metro South HHS in quarter 4: a one year old child. The three notifications of Hib in 2017 were aged 1, 2, and 31 years. Of these two children, one was fully vaccinated for age.

Measles – There were no notifications in quarter 4. In 2017 there were a total of eight notifications, with cases aged from 9 months to 43 years. Two of these cases were epidemiologically linked (siblings); both cases were unvaccinated and the other six cases had no documentation of measles vaccination. All were acquired overseas: six acquired their infection in Indonesia and one case each was acquired in Japan and India.

Mumps – There were 138 notifications of mumps received in quarter 4, with cases aged from 1 month to 67 years. Of the 138 notifications, 92 (66%) are related to an ongoing outbreak in Indigenous communities in North West, Central Queensland, and Townsville HHS. In 2017, the outbreak in North West, Cairns and Hinterland, Central Queensland, and Townsville HHS areas includes 270 notifications. 87% of outbreak cases are aged between 5 - 39 years and 72% had been partially or fully vaccinated with mumps containing vaccines. In total, 400 notifications were reported in Queensland during 2017 compared to an average of 45 notifications per year for the previous five years.

Rubella – No notifications were reported in quarter 4. In 2017, three notifications of rubella were reported, with cases aged from 4 years to 36 years. Two infections were acquired overseas in the Philippines and India. None of the notifications had documentation of rubella vaccination.

Tetanus – There was one notification of tetanus from the Sunshine Coast area in quarter 4 in a 34 year old male. This case was vaccinated and fully recovered following infection.

Invasive group A streptococcal infection

There were 102 notifications of invasive group A streptococcal (iGAS) infection in quarter 4 and four deaths reported. From 1 January to 31 December 2017, there were 381 notifications of iGAS infection in Queensland, including 15 reported deaths (Table 2). The majority of cases (84%) are adults aged older than 20 years and all deaths occurred in adults aged older than 40 years. Indigenous status was available for 357 (94%) cases, of these 73 (20%) were Aboriginal and Torres Strait Islander people.

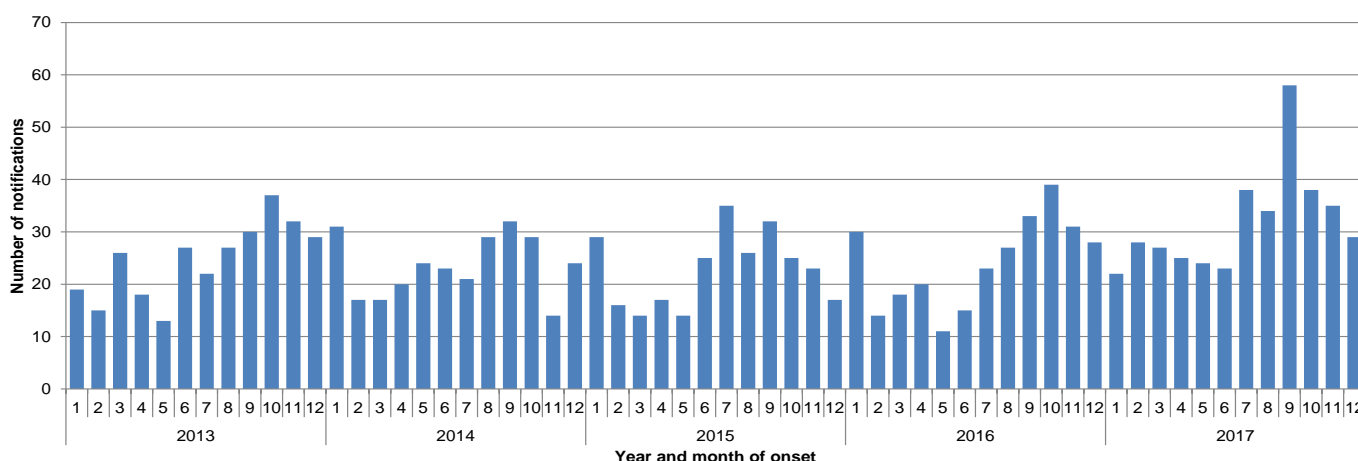


Figure 1: Notifications of invasive group A streptococcal infection in Queensland by date of onset, 1 January 2013 to 31 December 2017

Table 2: Notifications of invasive group A streptococcal infection in Queensland by quarter 2017 and age group, 2016 - 2017

Age Group	2017				2016	
	Q1	Q2	Q3	Q4	Total	Total
0-4	4	7	11	8	30	28
5-9	3	3	10	4	20	11
10-14	0	1	5	0	6	6
15-19	0	0	1	2	3	5
20+	70	61	103	88	322	239
Total	77	72	130	102	381	289

Invasive meningococcal disease

There were 16 notifications of invasive meningococcal disease (IMD) in quarter 4. Of these, two cases were serogroup W, six cases were serogroup B, seven were serogroup Y, and one was not typed. During 2017, there were a total of 68 notifications of IMD, with five deaths reported during this time. The increase in serogroup W and serogroup Y cases in Queensland that began in 2016 is continuing in 2017 (Figure 2, Figure 3).

In response to the rise in serogroup W and serogroup Y disease, Queensland introduced the Meningococcal ACWY Vaccination program 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 doctor or immunisation provider. A Meningococcal ACWY polysaccharide vaccine has been available long-term and recommended for travellers to epidemic areas. Vaccines for serogroup C disease were introduced in Queensland in 2003 initially covering many age groups as well as being on the schedule for children aged 12 months. A vaccine for serogroup B is not currently on the national immunisation program however is available on the private market for infants and adolescents.

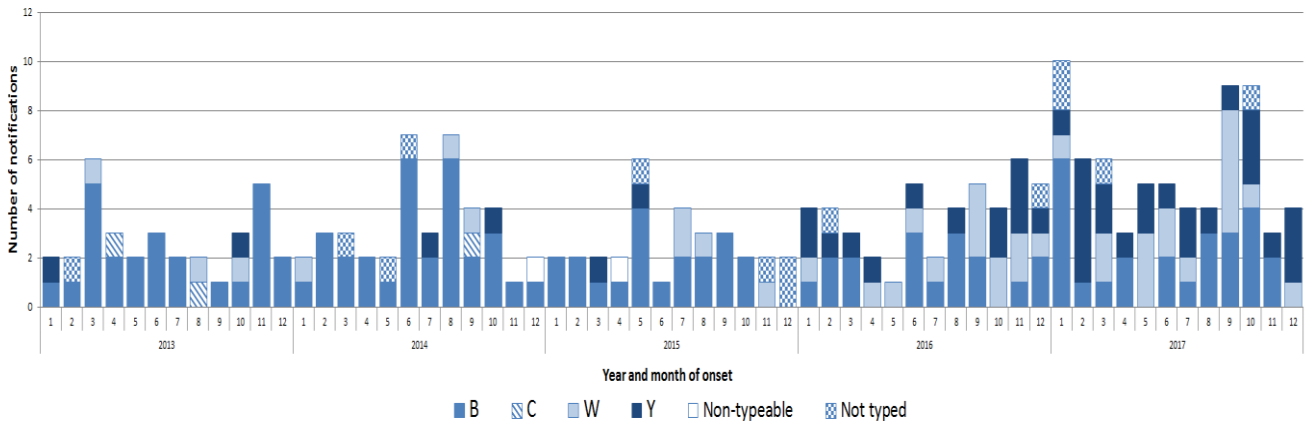


Figure 2: Notifications of invasive meningococcal disease in Queensland, by date of onset, 1 January 2013 to 31 December 2017

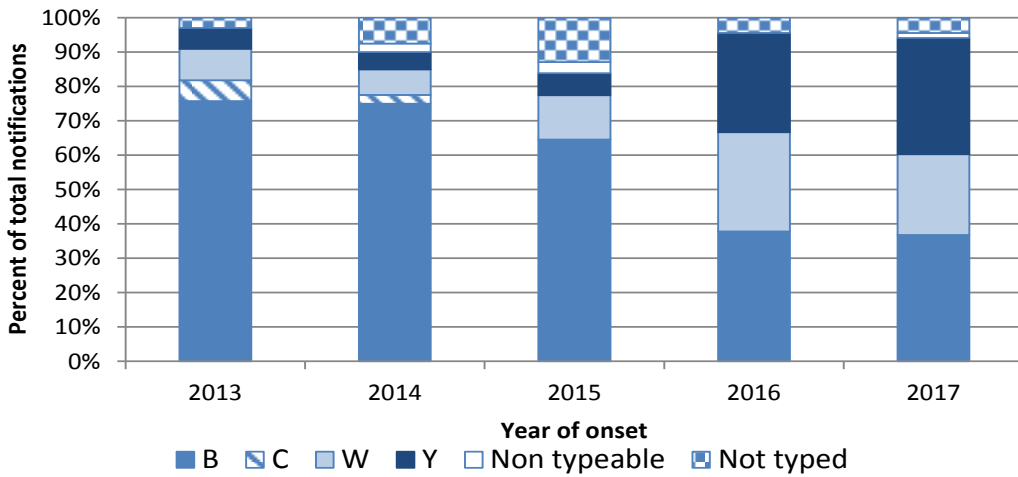


Figure 3: Notifications of invasive meningococcal disease in Queensland by year and serogroup

Table 3: Notifications of invasive meningococcal infection in Queensland by serogroup, 2017 and age group, 2016 – 2017

Age Group	2017						2016
	Group B	Group C	Group W	Group Y	Not typeable	Not typed	Total
0-4	5	0	2	1	1	1	10
5-9	3	0	1	0	0	0	4
10-14	2	0	0	0	0	0	2
15-19	6	0	2	1	0	0	9
20-24	2	0	3	5	0	0	10
25+	7	0	8	16	0	2	33
2017 Total	25	0	16	23	1	3	68
2016 Total	17	0	13	13	0	2	45

Invasive pneumococcal disease

There were 59 invasive pneumococcal disease (IPD) notifications in quarter 4 with four deaths reported in adults aged older than 37 years. During 2017 there were a total of 310 notifications and 19 deaths reported. Ten deaths were recorded in adults aged older than 65 years, eight in adults aged 30-49 years, and one death was in an adult aged 50-64 years.

Figure 4 shows the number of notifications of IPD by year and month of onset. The serogroup of each notification is categorised according to the vaccine that it is included in. For example, all serogroups included in the 7 valent vaccine (Prevenar) are categorised as 7v, those included in the 13 valent vaccine (Prevenar 13) but not in the 7v are categorised as 13v.

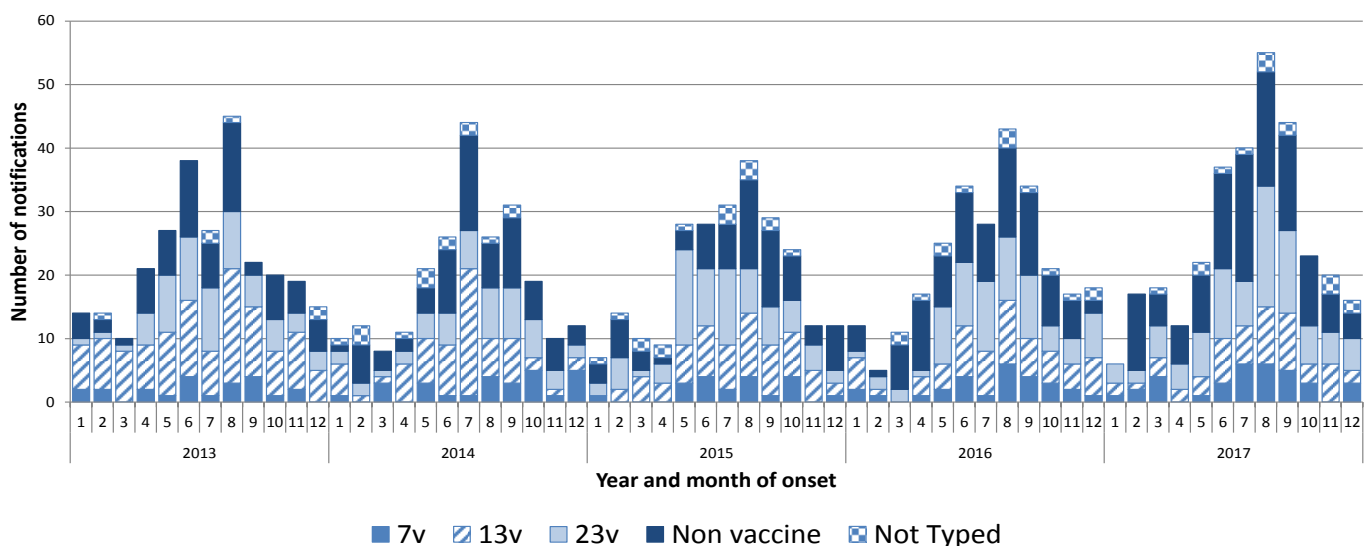


Figure 4: Notifications of invasive pneumococcal disease in Queensland by date of onset, 1 January 2013 to 31 December 2017

In 2017, the most commonly notified IPD serotypes were 3, 19F, 15A, 19A, 23A, and 22F which accounted for 42% of all IPD notifications in the time period.

Table 4: Common serotypes of invasive pneumococcal disease notified in Queensland by quarter, 2017 and 2016-2017

Serotype	Vaccine inclusion	2017					2016
		Q1	Q2	Q3	Q4	Total	Total
3	13v	2	7	13	8	30	28
19F	7v	5	3	11	4	23	15
15A	Non vaccine	1	5	11	4	21	15
19A	13v	1	4	11	3	19	22
22F	23v	3	3	11	2	19	22
23A	Non vaccine	3	7	5	4	19	10
23B	Non vaccine	5	5	4	4	18	20
9N	23v	1	4	6	5	16	15
16F	Non vaccine	1	4	4	4	13	8
8	23v	0	2	5	4	11	10
11A	23v	1	3	6	1	11	10
6C	Non vaccine	3	3	4	0	10	10

Table 5: Notifications and rates of invasive pneumococcal disease in Queensland by quarter 2017 and age group, 2016-2017

Age Group	2017						2016	
	Q1	Q2	Q3	Q4	Total	Rate#	Total	Rate#
<1	2	1	4	3	10	16.0	9	14.4
1-2	2	3	9	3	17	13.5	20	15.9
3-4	4	4	0	5	13	10.0	11	8.5
5-9	2	0	7	1	10	3.0	9	2.7
10-14	0	0	3	1	4	1.3	12	3.9
15-19	0	2	4	0	6	2.0	4	1.3
20-49	12	12	34	17	75	3.7	52	2.6
50-64	9	24	31	13	77	8.9	64	7.4
65+	10	25	47	16	98	13.9	84	11.8
Total	41	71	139	59	310	6.4	265	5.5

Annual age specific notification rate per 100,000 population using ERP for 2016 (ABS Catalogue no. 3235.0)

Pertussis

There were 336 notifications of pertussis in quarter 4 and a total of 1,298 notifications of pertussis with onset in 2017. There were no deaths reported. The highest number of notifications was seen in the 20-49 year age group however the highest rate of notification was seen in the 5-9 years age group. The 2017 notification rates of pertussis in children younger than 15 years of age are approximately half the notification rate for 2016 (Table 6).

Table 6: Number and rate of notifications of pertussis in Queensland by age group, 2016 -2017

Age Group	2017					Rate#	2016	
	Q1	Q2	Q3	Q4	Total		Total	Rate#
< 1	9	9	13	10	41	65.6	68	108.9
1-2	26	10	11	19	66	52.5	141	112.3
3-4	19	17	27	20	83	64.1	156	120.5
5-9	62	68	96	70	296	89.5	469	141.9
10-14	41	45	75	67	228	74.4	448	146.2
15-19	23	11	18	26	78	25.4	121	39.4
20-49	82	63	83	71	299	14.9	502	25.0
50-64	21	21	36	25	103	11.9	164	18.9
65+	18	18	40	28	104	14.6	84	11.8
Total	301	262	399	336	1,298	26.7	2,153	44.4

Annual age specific notification rate per 100,000 population using ERP for 2016 (ABS Catalogue no. 3235.0)

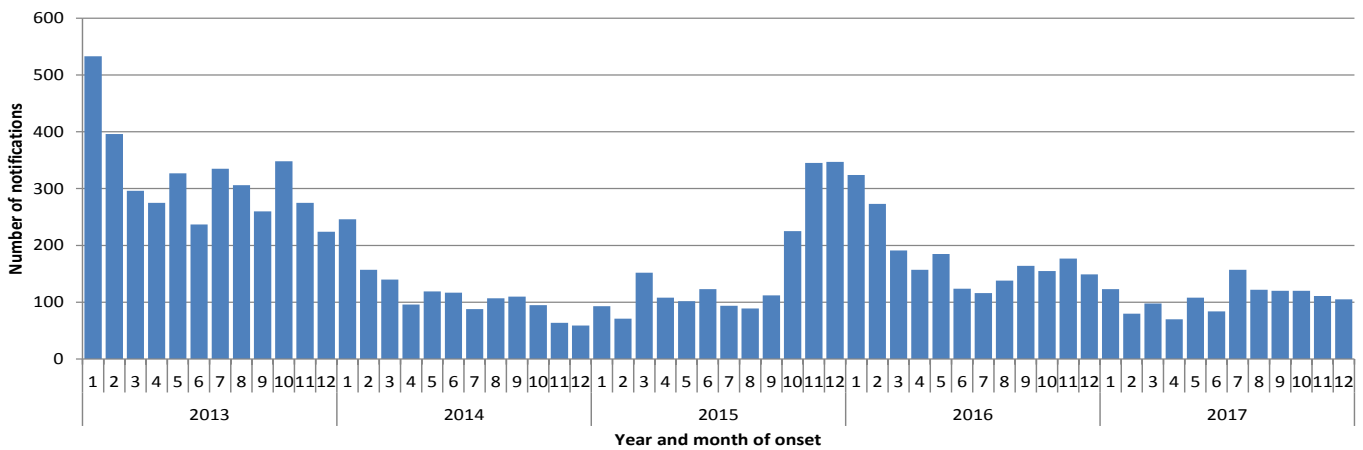


Figure 5: Notifications of pertussis in Queensland by year and month of onset, 1 January 2013 to 31 December 2017

Table 7: Notifications of pertussis in Queensland in children aged younger than one year by quarter, 2017 and age group, 2016-2017

Age Group	2017					2016
	Q1	Q2	Q3	Q4	Total	Total
< 1 month	1	1	0	1	3	6
1 month	1	0	0	0	1	5
2 months	1	1	1	0	3	6
3 months	1	1	5	1	8	5
4 months	0	1	3	2	6	4
5 months	0	0	1	2	3	5
6 months	0	4	2	2	8	1
7 months	1	0	0	0	1	12
8 months	0	1	1	0	2	5
9 months	1	0	0	1	2	5
10 months	1	0	0	1	2	3
11 months	2	0	0	0	2	11
Total	9	9	13	10	41	68

Rotavirus

There has been an increase in notifications of rotavirus in 2017 including 527 notifications in quarter 4. This increase represents a doubling of the 2017 notifications (2,335) compared to an average of 1,087 notifications per year for the previous 5 years. The highest rate of notification in 2017 was seen in children aged younger than 1 year.

Towards the end of 2015 there was an increase in notifications in children aged younger than one year, which continued into 2017. At the end of 2015, two laboratories in Queensland introduced PCR testing for rotavirus infection. PCR is more sensitive for rotavirus detection than previously used antigen detection methods. Further with current assays, discrimination between wild type rotavirus and the vaccine strains is not possible. Many of the notified cases in this age group are unlikely to be wild type infections. Further work to investigate these cases is ongoing.

During 2006-2016, confirmed rotavirus cases notified as per the Queensland case definition. It has been proposed that Rotavirus become a nationally notifiable condition in 2017. In preparation for this Queensland introduced a case definition for probable and confirmed cases from the beginning of 2017. The probable case definition will capture those cases with laboratory suggestive evidence including PCR testing that does not distinguish between wild-type and vaccine-related virus.

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 2, 4, and 6 months of age.

From 1 July 2017, oral rotavirus vaccine Rotarix® (given in a 2 dose schedule) replaced RotaTeq® in Queensland for children younger than 6 months of age.

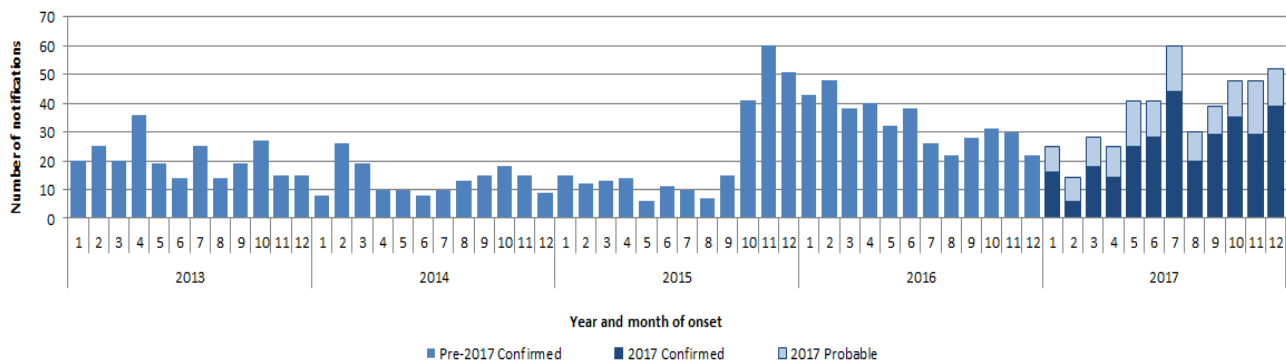


Figure 6: Notifications of rotavirus in Queensland children aged younger than one year by date of onset, 1 January 2013 to 31 December 2017

Table 8: Notifications of rotavirus in Queensland in children aged younger than one year by quarter 2017 and age group, 2016-2017

Age Group	2017					2016
	Q1	Q2	Q3	Q4	Total	Total
< 1 month	3	7	10	12	32	31
1 month	18	21	27	33	99	85
2 months	14	21	17	29	81	76
3 months	9	8	14	20	51	36
4 months	4	8	9	14	35	49
5 months	3	9	6	7	25	19
6 months	4	9	10	7	30	36
7 months	4	8	6	7	25	18
8 months	3	3	6	8	20	18
9 months	0	5	6	2	13	8
10 months	3	5	12	6	26	11
11 months	2	3	6	3	14	11
Total	67	107	129	148	451	398

Table 9: Number and rate of rotavirus notifications in Queensland by age group, 2017 and 2016

Age Group	2017						2016	
	Q1	Q2	Q3	Q4	Total	Rate#	Total	Rate#
< 1	67	107	129	148	451	722.1	398	637.2
1-2	37	94	186	49	366	291.4	139	110.7
3-4	8	40	72	18	138	106.6	51	39.4
5-9	20	34	99	35	188	56.9	58	17.5
10-14	7	14	48	19	88	28.7	26	8.5
15-19	6	7	14	12	39	12.7	24	7.8
20-49	51	96	146	88	381	19.0	209	10.4
50+	104	189	233	158	684	43.2	372	23.5
Total	300	581	927	527	2,335	48.2	1,277	26.3

Annual age notification specific rate per 100,000 population per year using ERP for 2016 (ABS Catalogue no. 3235.0). The 2017 notification rate had been annualised.

Varicella-zoster virus infection

There were 2,100 notifications of varicella-zoster infection in quarter 4 2017. All notifications of varicella-zoster virus infection in children aged younger than 8 years are followed up to determine if the clinical presentation is consistent with chickenpox or shingles. Cases aged 8 years and older are not routinely followed up with most classified as unspecified infections. Occasionally, notifications from older children or adults will have information about clinical presentation. When this occurs, the notification record for that person is re-coded from unspecified to chickenpox or shingles as appropriate.

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 free of charge to all children aged 18 months.

There are changes being made to varicella-zoster surveillance methods:

- Commencement of time limited (01 Dec 2017 – 30 Sep 2018) intermittent surveillance (all notifications followed up for one month in each quarter) of all varicella notifications from 01 Dec 2017
- Routine follow up extended to include children aged 8 and 9 years and adults aged 60 years and older from 1 January 2018

Table 10: Notifications of varicella in Queensland, by age group and clinical presentation, 1 January 2016 to 31 December 2017

Age Group	2017				2016			
	Chickenpox	Varicella zoster	Unspecified	Total	Chickenpox	Varicella zoster	Unspecified	Total
<1	40	0	5	45	33	0	0	33
1-2	80	13	4	97	52	12	0	64
3-4	71	7	5	83	81	11	1	93
5-7	204	32	5	241	202	26	0	228
8+	62	494	7,267	7,823	8	25	7,395	7,428
Total	457	546	7,286	8,289	376	74	7,396	7,846

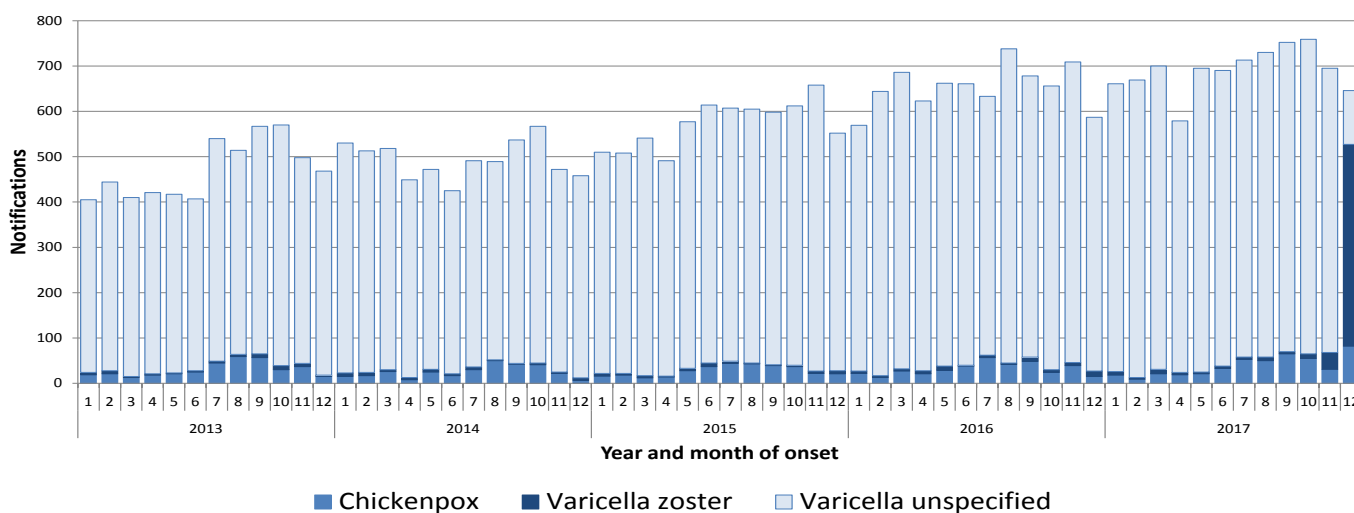


Figure 7: Notifications of varicella in Queensland by clinical presentation, 1 January 2013 to 31 December 2017

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/>