

# Vaccine preventable and invasive diseases

1 Jan – 31 Dec 2016

## Quarterly surveillance report

This report, by quarter, provides additional data on vaccine preventable diseases notified in Queensland. It covers the period 1 January to 31 December 2016. Data for this report were extracted from the Notifiable Diseases System on 27 March 2017 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, 1 January 2016 to 31 December 2016

Disease	Q1	Q2	Q3	Q4	Total
Diphtheria	1	3	1	3	8
Group A Streptococcal Infection (invasive)	62	46	82	98	288
<i>Haemophilus influenzae</i> type b (invasive)	1	1	1	2	5
Measles	4	2	1	8	15
Meningococcal (invasive)	11	8	11	15	45
Mumps	11	11	21	19	62
Pertussis	788	466	418	481	2,153
Pneumococcal (invasive)	28	76	105	56	265
Rotavirus	453	291	234	299	1,277
Rubella	1	1	0	0	2
Tetanus	1	1	1	1	4
Varicella	1,899	1,946	2,049	1,951	7,845

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

**Diphtheria** - There were three notifications of diphtheria in quarter 4; one linked to a previous overseas case and two overseas acquired. Six of the eight notifications in 2016 were cutaneous (non-respiratory) presentations of toxigenic *C.diphtheriae* and two involved both respiratory and cutaneous symptoms. In 2016 the overseas countries of acquisition included Indonesia, Papua New Guinea, the Philippines, the Solomon Islands, and Vanuatu.

The case definition for diphtheria in Queensland requires the notification of all detections of toxigenic *C.diphtheriae* and *C.ulcerans*, regardless of clinical presentation. In contrast, the national case definition requires a specific clinical presentation, with cutaneous cases excluded. For this reason there may be differences between state and national reporting.

**Invasive *Haemophilus influenzae* type b (Hib)** – The five notifications of Hib in 2016 were aged 7 months, 4, 7, 51, and 55 years. All of the three children were fully vaccinated for age.

**Measles** – There were eight notifications in quarter 4, with cases aged from 11 years to 45 years. Two infections were acquired overseas, five cases were linked to these overseas acquired cases, and one case with unknown place of acquisition. In 2016 there were a total of 15 notifications. Of these, six acquired their infection overseas in India, Pakistan, Indonesia, Asia (either Indonesia or Malaysia), and on board a cruise ship – the specific country was not identified. Six locally acquired infections were linked to overseas acquired cases and there were three notifications where the acquisition of infection could not be determined. Of the 15 cases, 10 were unvaccinated and 5 had no documentation of measles vaccination.

**Mumps** – There were nineteen notifications of mumps received in quarter 4, with cases aged from 2 years to 68 years. This included five cases (aged 2 to 12 years) in people who had received two doses of MMR vaccine. Indigenous status was available for 18 cases – all were non-Aboriginal and Torres Strait Islander peoples. In total 62 cases were reported during 2016 compared to an average of 40 cases per year for the previous 5 years.

**Rubella** – No notifications were received in quarter 4. The two notifications received during 2016 were in males, aged 19 and 25 years. One case was unvaccinated, while the other self-reported as being vaccinated, but without documentation of their rubella vaccine administration.

**Tetanus** – There was one notification in quarter 4 in an 87 year old person who died. There were a total of four notifications in 2016 –three related to a recent injury/wound and the other a dog bite. Two of these were in young people with a history of recent vaccination and both recovered fully.

## Invasive group A streptococcal infection

There were 98 notifications of invasive group A streptococcal (iGAS) infection in quarter 4 and two deaths reported. From 1 January to 31 December 2016, there were 288 notifications of iGAS infection in Queensland, including nine reported deaths (Table 2). Seven of the nine deaths occurred in adults and two deaths were in children aged younger than 5 years. Indigenous status was available for 257 (90%) cases, of these 62 (24%) were Aboriginal and Torres Strait Islander people.

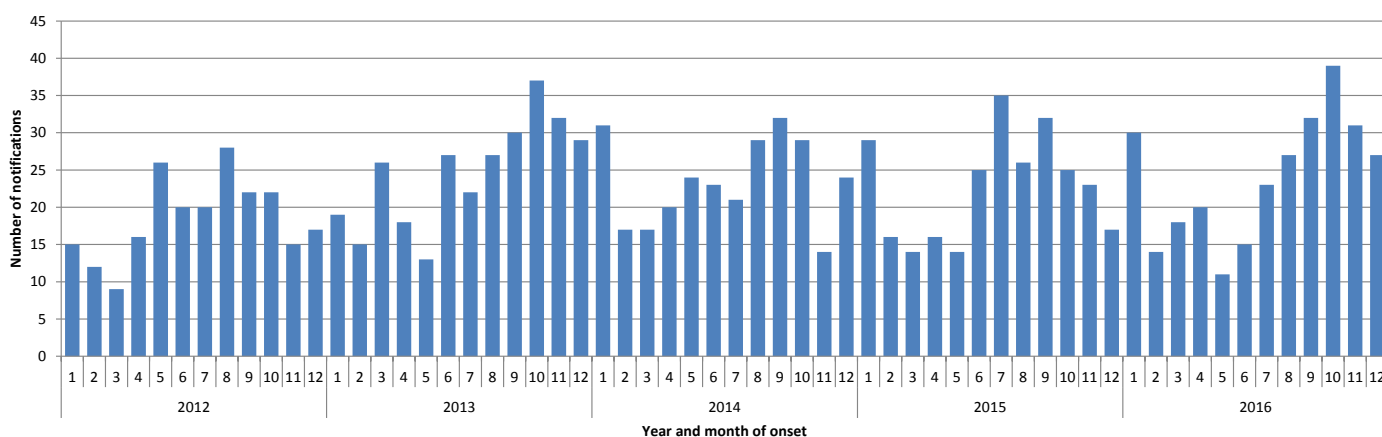


Figure 1: Notifications of invasive group A streptococcal infection in Queensland by date of onset, 1 January 2012 to 31 December 2016

Table 2: Notifications of invasive group A streptococcal infection in Queensland by quarter and age group, 1 January 2016 to 31 December 2016

Age Group	Q1	Q2	Q3	Q4	Total
0-4	2	8	8	10	<b>28</b>
5-9	4	1	3	3	<b>11</b>
10-14	2	0	0	4	<b>6</b>
15-19	2	0	3	0	<b>5</b>
20+	52	37	68	81	<b>238</b>
<b>Total</b>	<b>62</b>	<b>46</b>	<b>82</b>	<b>98</b>	<b>288</b>

## Invasive meningococcal disease

There were 15 notifications of invasive meningococcal disease (IMD) in quarter 4. Of these, six cases were serogroup Y, five cases were serogroup W, three cases were serogroup B, and one case was diagnosed clinically. During 2016, there were a total of 45 notifications of IMD, with no deaths reported during this time. Queensland has seen an increase in the number of serogroup W and serogroup Y cases in 2016 compared with previous years (Figure 2).

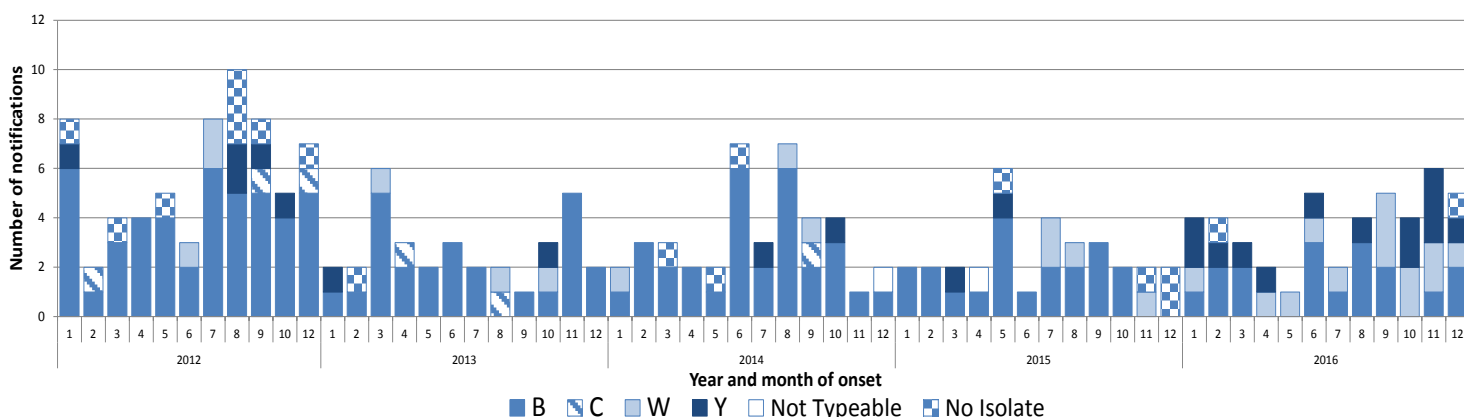


Figure 2: Notifications of invasive meningococcal disease in Queensland, by date of onset, 1 January 2012 to 31 December 2016

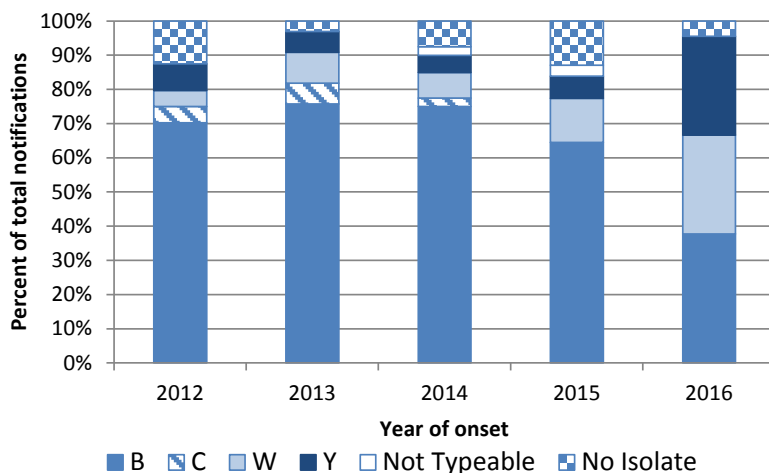


Figure 3: Notifications of invasive meningococcal disease in Queensland by year and serogroup

Although the highest number of IMD notifications is seen in adults, the increase in serogroup W & Y notifications is being seen in children aged younger than 5 years as well as adults (Table 3).

Table 3: Notifications of invasive meningococcal infection in Queensland by serogroup and age group, 1 January 2016 to 31 December 2016

Age Group	Group B	Group W	Group Y	No Isolate	Total
0-4	6	2	2	0	10
5-9	1	0	1	1	3
10-14	0	0	0	0	0
15-19	1	0	2	0	3
20-24	6	2	1	0	9
25+	3	9	7	1	20
<b>Total</b>	<b>17</b>	<b>13</b>	<b>13</b>	<b>2</b>	<b>45</b>

## Invasive pneumococcal disease

There was an increase in cases in quarters 2 and 3, in line with the seasonal trend of invasive pneumococcal disease (IPD), which generally peaks in the winter months. There were 56 notifications in quarter 4 and one death reported. During 2016 there were a total of 262 notifications and seven deaths reported. One death was recorded in a child aged younger than 1 year; two deaths were recorded in each of the adult age groups: 20-49 years, 50-64 years, and 65 years and older.

Figure 2 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.

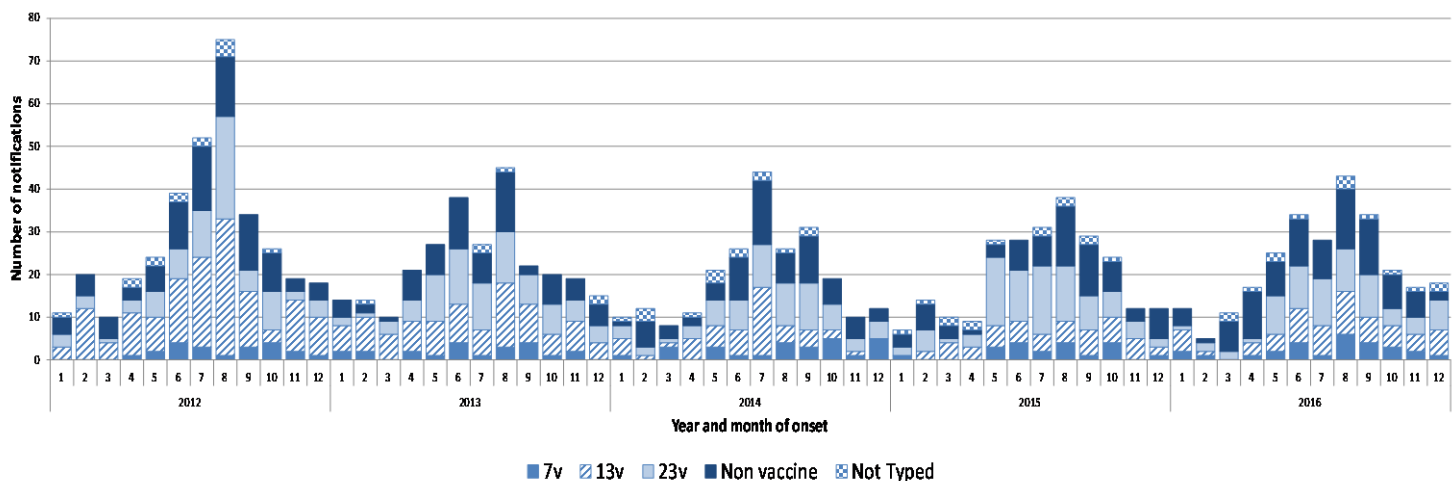


Figure 4: Notifications of invasive pneumococcal disease in Queensland by date of onset, 1 January 2012 to 31 December 2016

In quarter 4, the most commonly notified IPD serotypes were 3, 19A, and 23B, which accounted for 36% of all IPD notifications.

Table 4: Ten common serotypes of invasive pneumococcal disease notified in Queensland by number of notifications and quarter, 1 January 2016 to 31 December 2016

Serotype	Vaccine	Q1	Q2	Q3	Q4	Total
	inclusion					
3	13v	4	5	12	7	<b>28</b>
22F	23v	0	8	11	3	<b>22</b>
19A	13v	0	8	7	7	<b>22</b>
23B	Non vaccine	2	8	4	6	<b>20</b>
15A	Non vaccine	2	6	3	4	<b>15</b>
9N	23v	2	0	8	5	<b>15</b>
19F	7v	2	3	5	5	<b>15</b>
6C	Non vaccine	2	3	4	1	<b>10</b>
11A	23v	0	2	3	5	<b>10</b>
8	23v	1	5	3	1	<b>10</b>
23A	Non vaccine	0	2	6	2	<b>10</b>

Table 5: Notifications of invasive pneumococcal disease in Queensland by quarter and age group, 1 January 2016 to 31 December 2016

Age Group	Q1	Q2	Q3	Q4	Total	Rate <sup>#</sup>
<1	0	3	3	3	<b>9</b>	<b>14.4</b>
1-2	1	8	6	5	<b>20</b>	<b>15.6</b>
3-4	0	8	1	2	<b>11</b>	<b>8.6</b>
5-9	1	2	3	3	<b>9</b>	<b>2.8</b>
10-14	4	5	3	0	<b>12</b>	<b>3.9</b>
15-19	0	0	3	1	<b>4</b>	<b>1.3</b>
20-49	5	13	27	7	<b>52</b>	<b>2.6</b>
50-64	10	16	24	14	<b>64</b>	<b>7.5</b>
65+	7	21	35	21	<b>84</b>	<b>12.2</b>
<b>Total</b>	<b>28</b>	<b>76</b>	<b>105</b>	<b>56</b>	<b>265</b>	<b>5.5</b>

# Annual age specific rate per 100,000 per year population using ERP for 2015 (ABS Catalogue no. 3235.0)

## Pertussis

There were 481 notifications of pertussis in quarter 4 and a total of 2,153 notifications of pertussis with onset in 2016 with no deaths reported. The highest number of notifications was seen in the 20-49 year age group however the highest rate of notifications was seen in the 10-14 years age group. The notification rate decreased with each younger age group from 10-14 years to infants aged younger than 1 year (Table 6).

Table 6: Notifications of pertussis in Queensland by age group, 1 January 2016 to 31 December 2016

Age Group	Q1	Q2	Q3	Q4	Total	Rate <sup>#</sup>
< 1	29	13	12	14	<b>68</b>	<b>108.6</b>
1-2	78	25	14	24	<b>141</b>	<b>110.3</b>
3-4	78	29	21	28	<b>156</b>	<b>122.1</b>
5-9	176	103	80	110	<b>469</b>	<b>146.1</b>
10-14	142	104	96	106	<b>448</b>	<b>147.1</b>
15-19	26	42	32	21	<b>121</b>	<b>39.1</b>
20-49	176	93	112	121	<b>502</b>	<b>25.3</b>
50-64	56	36	38	34	<b>164</b>	<b>19.1</b>
65+	27	21	13	23	<b>84</b>	<b>12.2</b>
<b>Total</b>	<b>788</b>	<b>466</b>	<b>418</b>	<b>481</b>	<b>2,153</b>	<b>45.1</b>

# Annual age specific rate per 100,000 per year population using ERP for 2015 (ABS Catalogue no. 3235.0)

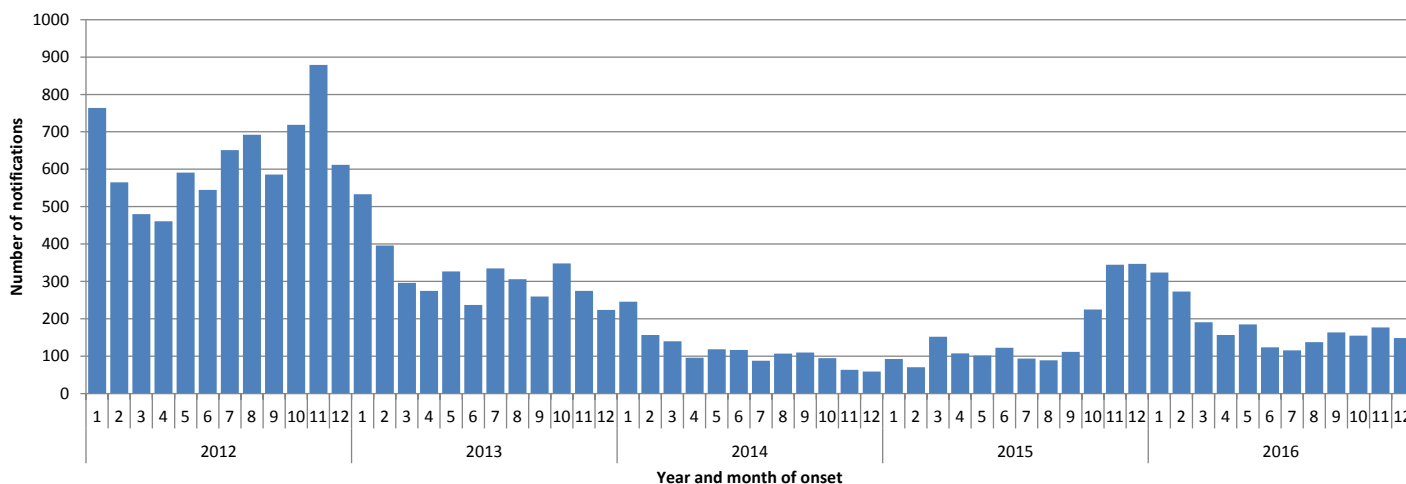


Figure 5: Notifications of pertussis in Queensland by year and month of onset, 1 January 2012 to 31 December 2016

Table 7: Notifications of pertussis in Queensland in children aged younger than 1 year, by quarter and age group, 1 January 2016 to 31 December 2016

Age Group	Q1	Q2	Q3	Q4	Total
< 1 month	2	2	2	0	<b>6</b>
1 month	3	0	1	1	<b>5</b>
2 months	1	1	1	3	<b>6</b>
3 months	2	2	0	1	<b>5</b>
4 months	3	0	0	1	<b>4</b>
5 months	3	1	0	1	<b>5</b>
6 months	0	0	1	0	<b>1</b>
7 months	7	1	3	1	<b>12</b>
8 months	2	2	1	0	<b>5</b>
9 months	2	1	1	1	<b>5</b>
10 months	0	1	0	2	<b>3</b>
11 months	4	2	2	3	<b>11</b>
<b>Total</b>	<b>29</b>	<b>13</b>	<b>12</b>	<b>14</b>	<b>68</b>

## Rotavirus

There were 299 notifications of rotavirus in quarter 4 and a total of 1,277 notifications in 2016. The highest number and rate of notification 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 has continued into 2016. At the end of 2015, private laboratories in Queensland introduced PCR testing for rotavirus infection. Rotavirus is included on the viral enteric pathogen panel, and the generic assay does not distinguish between wild type rotavirus and the vaccine strains. Many of the notified cases in this age group are unlikely to be wild type infections. Further work to investigate these cases is still ongoing.

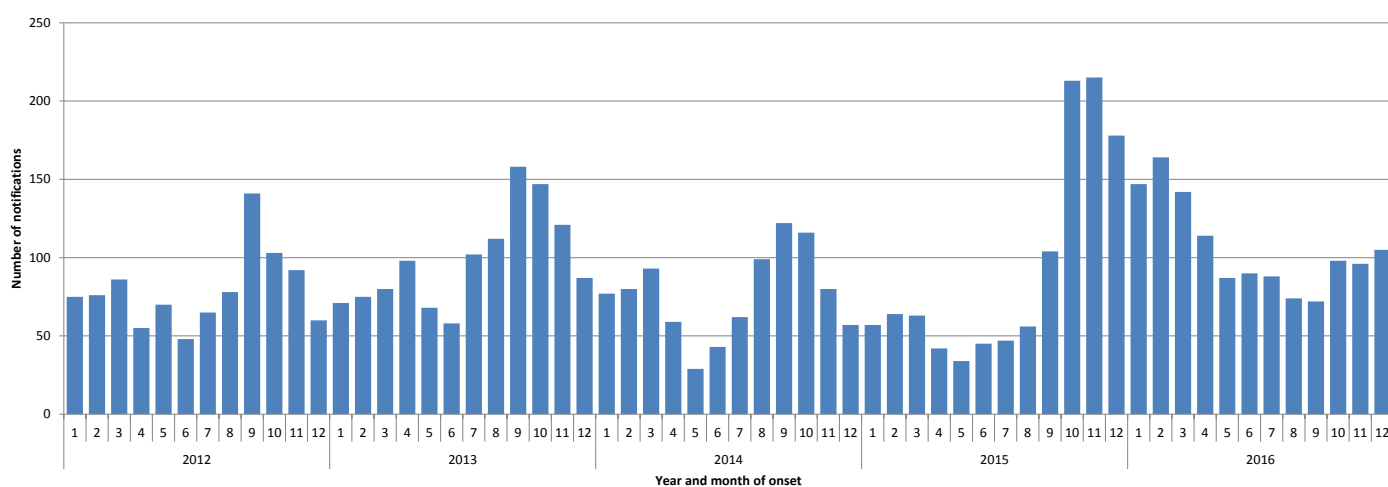


Figure 6: Notifications of rotavirus in Queensland children aged less than one year by date of onset, 1 January 2012 to 31 December 2016

Table 8: Notifications of rotavirus in Queensland in children aged less than one year, by quarter and age group, 1 January 2016 to 31 December 2016

Age Group	Q1	Q2	Q3	Q4	Total
< 1 month	18	8	2	3	<b>31</b>
1 month	25	22	16	22	<b>85</b>
2 months	23	18	20	15	<b>76</b>
3 months	9	16	3	8	<b>36</b>
4 months	9	15	11	14	<b>49</b>
5 months	4	6	7	2	<b>19</b>
6 months	13	10	6	7	<b>36</b>
7 months	6	3	4	5	<b>18</b>
8 months	8	5	1	4	<b>18</b>
9 months	5	1	1	1	<b>8</b>
10 months	2	3	4	2	<b>11</b>
11 months	7	3	1	0	<b>11</b>
<b>Total</b>	<b>129</b>	<b>110</b>	<b>76</b>	<b>83</b>	<b>398</b>

Table 9: Notifications of rotavirus in Queensland, by quarter and age group, 1 January 2016 to 31 December 2016

Age Group	Q1	Q2	Q3	Q4	Total	Rate <sup>#</sup>
< 1	129	110	76	83	<b>398</b>	<b>635.6</b>
1-2	63	30	20	26	<b>139</b>	<b>108.7</b>
3-4	23	10	8	10	<b>51</b>	<b>39.9</b>
5-9	17	9	14	18	<b>58</b>	<b>18.1</b>
10-14	13	4	3	6	<b>26</b>	<b>8.5</b>
15-19	12	2	5	5	<b>24</b>	<b>7.8</b>
20-49	64	50	46	49	<b>209</b>	<b>10.5</b>
50+	132	76	62	102	<b>372</b>	<b>24.1</b>
<b>Total</b>	<b>453</b>	<b>291</b>	<b>234</b>	<b>299</b>	<b>1,277</b>	<b>26.7</b>

# Annual age specific rate per 100,000 per year population using ERP for 2015 (ABS Catalogue no. 3235.0)

## Varicella-zoster virus infection

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 and the vast majority are 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 (whichever is appropriate).

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

Age group	Chickenpox	Varicella zoster	Unspecified	Total
<1	33	0	0	<b>33</b>
1	38	7	0	<b>45</b>
2	14	5	0	<b>19</b>
3	31	6	0	<b>37</b>
4	50	5	1	<b>56</b>
5	54	7	0	<b>61</b>
6	67	11	0	<b>78</b>
7	81	8	0	<b>89</b>
8+	8	24	7,395	<b>7,427</b>
<b>Total</b>	<b>376</b>	<b>73</b>	<b>7,396</b>	<b>7,845</b>



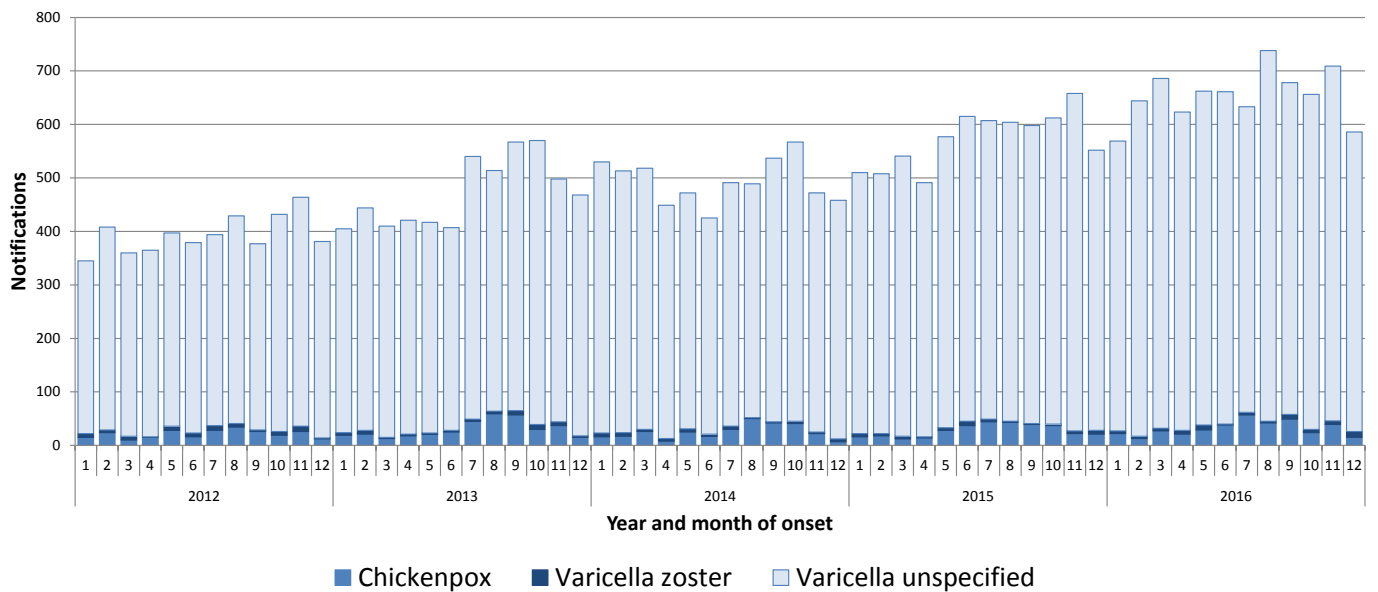


Figure 7: Notifications of varicella in Queensland by clinical presentation, 1 January 2012 to 31 December 2016

### 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/>