

Vaccine preventable and invasive diseases in Queensland

1 January 2023–31 December 2023



Queensland
Government

Vaccine preventable and invasive diseases in Queensland - 1 January 2023–31 December 2023

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Quarterly Surveillance Report

This report provides additional data on vaccine preventable diseases notified in Queensland. This is the final report for 2023 data and covers the period 1 January 2023 to 31 December 2023. Data for this report were extracted from the Queensland Health notifiable conditions register on 15 February 2024 by episode date, which is the earliest of date of onset, specimen collection and date of notification.

For current year to date totals, please refer to the Queensland Health Weekly Notifiable Conditions Report available from the [Queensland Health website](#).

The current immunisation schedule is available from the [Immunisation Schedule Queensland](#) website.

Summary

Table 1: Notification of vaccine preventable diseases in Queensland by quarter, 2023, and 2022-2023

Disease	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Total 2023	Total 2022
Diphtheria	2	1	3	0	6	25
Group A Streptococcal infection (invasive)	138	129	202	161	630	398
<i>Haemophilus influenzae</i> type b (invasive) disease	2	1	0	1	4	1
Measles	2	1	1	1	5	0
Meningococcal (invasive) disease	5	14	10	12	41	36
Mumps	6	9	8	10	33	12
Pertussis	19	49	179	682	929	55
Pneumococcal (invasive) disease	49	119	151	84	403	352
Rotavirus	328	230	412	558	1,528	2,522
Rubella	0	0	0	0	0	0
Tetanus	0	0	0	1	1	0
Varicella	2,717	2,541	2,716	2,721	10,695	9,625

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

Diphtheria

Three cases of cutaneous toxigenic *C. diphtheriae* were reported in the Townsville, Torres and Cape, and Sunshine Coast HHS areas in quarter 3 2023 (Q3 2023) and no notifications of diphtheria in Q4 2023.

In 2023, there were 4 cases of cutaneous toxigenic *C. diphtheriae* and 2 cutaneous toxigenic *C. ulcerans* notified in Queensland, with cases aged from 10 months to 69 years. Of the 6 cases, 4 cases were vaccinated, and 2 cases had no documentation of diphtheria vaccination.

Invasive *Haemophilus influenzae* type b (Hib) disease

There was one notification of invasive Hib disease from the Townsville HHS in Q4 2023 in a fully vaccinated (3 doses) 18-month-old child.

The four notifications of Hib in 2023 were aged 18 months, 37, 45, and 55 years. The 3 notified adults were unvaccinated.

Measles

During the third and fourth quarters of 2023, there was a single notification of measles in each quarter, with cases aged 19 and 28 years.

In 2023, there were a total of 5 notifications in Queensland, with cases aged from 2 years to 28 years old. Of these, 3 cases acquired their infection overseas in Pakistan (1), Thailand (1), Indonesia (1), and one case was a household contact (sibling) and another case was linked to the overseas acquired case. Of these 5 cases, one was fully vaccinated (21 year old), and 4 were unvaccinated.

Mumps

In the third and fourth quarters of 2023, there were 8 and 10 notifications of mumps, respectively, with cases aged from 3 years to 66 years.

In 2023, there were 33 mumps cases notified in Queensland, with cases aged from 1 year to 66 years. Of these 33 notifications, 13 children and 4 adults were partially or fully vaccinated with mumps containing vaccines. Indigenous status was available for 29 (88%) cases, and 28 cases were in non-Indigenous people and one case was a First Nations person.

Rubella

There were no notifications of rubella in 2023.

Tetanus

There was one notification of tetanus from the Gold Coast HHS in Q4 2023 in a 20-year-old who had received a vaccination in 2016. The case acquired a foot injury from rusty metal while on a farm.

Invasive group A streptococcal infection

In the third and fourth quarters of 2023, there were 202 and 161 notifications of invasive group A streptococcal (iGAS) infection, respectively, with 23 deaths reported.

From 1 January to 31 December 2023, there were 630 notifications of iGAS infection in Queensland, including 43 reported as a cause or contributing factor to death. The 2023 notifications of iGAS were 58% higher than the notifications of 2022 (398 cases). The majority of cases (80 percent) were adults aged 20 years or older. Of the 43 deaths, 38 occurred in adults aged 29 years or older and 5 deaths in children younger than 12 years of age. Indigenous status was available for 626 (99.4 percent) reported cases. Of these, 90 (14 percent) cases occurred in First Nations people.

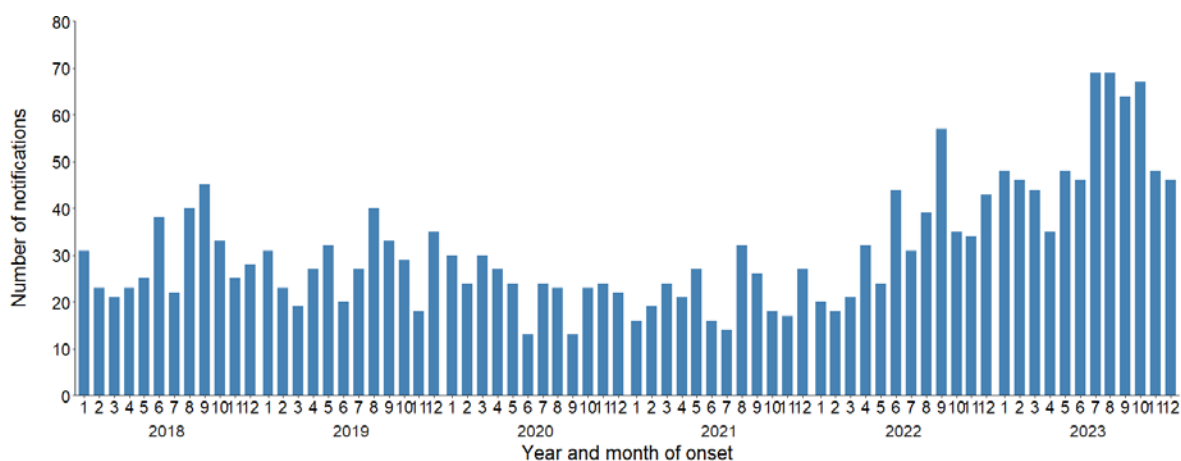


Figure 1: Notifications of invasive group A streptococcal infection in Queensland by year and month of onset, 1 January 2018 to 31 December 2023

Table 2: Notifications of invasive group A streptococcal infection in Queensland by age group and quarter, 2023, and 2022-2023

Age Group (years)	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Total 2023	Total 2022
0-4	8	11	32	15	66	37
5-9	4	8	8	9	29	14
10-14	2	6	6	5	19	10
15-19	2	4	4	0	10	11
20-24	6	2	7	1	16	4
25-44	29	27	34	33	123	94
45-64	43	24	47	40	154	98
65+	44	47	64	58	213	130
Total	138	129	202	161	630	398

Invasive meningococcal disease

During the third and fourth quarters of 2023, there were 10 and 12 notifications of invasive meningococcal disease (IMD), respectively, with one reported death.

In 2023, there were 41 notifications of IMD, with two reported deaths. Of the total 41 notifications, 36 cases were identified as serogroup B, 2 cases as serogroup Y, and 3 cases were not grouped. In 2023, there were 14% more notifications of IMD compared to 2022 (36 cases). In 2023, there was a 38% increase in serogroup B meningococcal notifications compared to the 26 cases reported in 2022.

Vaccination History

In Queensland:

- 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.
- 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.
- From 1 July 2018, conjugate meningococcal ACWY vaccine replaced Menitorix® (Hib-Meningococcal Serogroup C vaccine) at the 12-month time point on the national immunisation program schedule.

- From 1 July 2020, the meningococcal B vaccine (Bexsero®) became available and was funded for First Nations children from 6 weeks of age, with a three-year catch-up program for children younger than two years of age until 30 June 2023.
- From 1 July 2020, Bexsero and conjugate meningococcal ACWY vaccines were made available and funded for people of all ages with specified medical conditions that increase their risk of IMD.
- The Queensland Government is rolling out a free meningococcal B vaccination programme for infants, children, and adolescents that commenced in February 2024 and will be implemented in full by the end of March 2024.

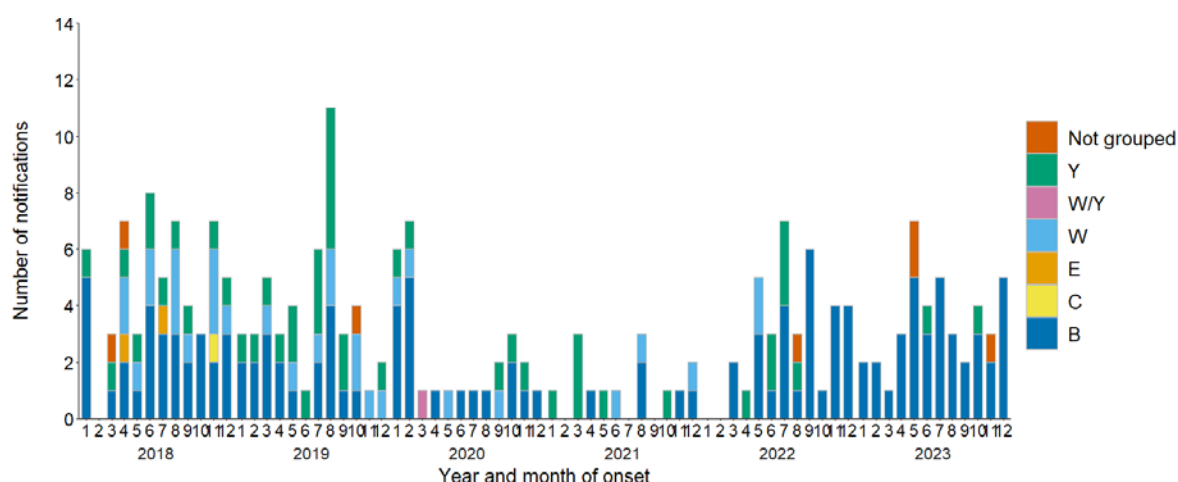


Figure 2: Notifications of invasive meningococcal disease in Queensland by year and month of onset, 1 January 2018 to 31 December 2023

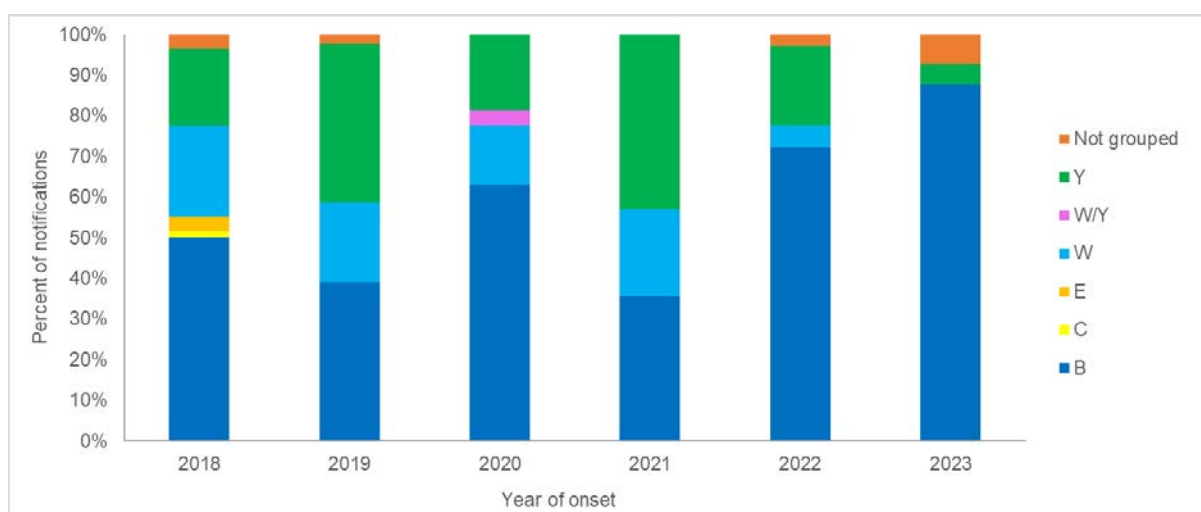


Figure 3: Notifications of invasive meningococcal disease in Queensland by year and serogroup, 1 January 2018 to 31 December 2023

Table 3: Notifications of invasive meningococcal infection in Queensland by serogroup and age group in years, 1 January to 31 December 2023

Age Group (years)	Group B	Group W	Group Y	Not groupable	Not grouped	Total
0–4	10	0	0	0	1	11
5–9	0	0	0	0	0	0
10–14	3	0	0	0	1	4
15–19	11	0	0	0	0	11
20–24	4	0	0	0	0	4
25+	8	0	2	0	1	11
Total	36	0	2	0	3	41

Invasive pneumococcal disease

In the third and fourth quarters of 2023, there were 151 and 84 notifications of invasive pneumococcal disease (IPD), respectively, with 12 deaths reported, one in a child aged 4 years and the remainder in adults aged 45 years or older.

During 2023, there were 403 notifications of IPD, and 21 deaths reported. Of these 21 deaths, 19 were in adults aged 36 years or older and 2 were in children aged 3 and 4 years of age. The 2023 notifications of IPD were 15% higher than the notifications for 2022 (352 cases).

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: 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, and those included exclusively in the 23-valent vaccine (Pneumovax 23) are categorise as 23v-13v.

Vaccination History

In Queensland:

- Since 1 July 2011, 13vPCV vaccine was provided in a 3-dose primary course schedule for infants not in a high-risk category at 6 weeks, 4, and 6 months.
- 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/or 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.

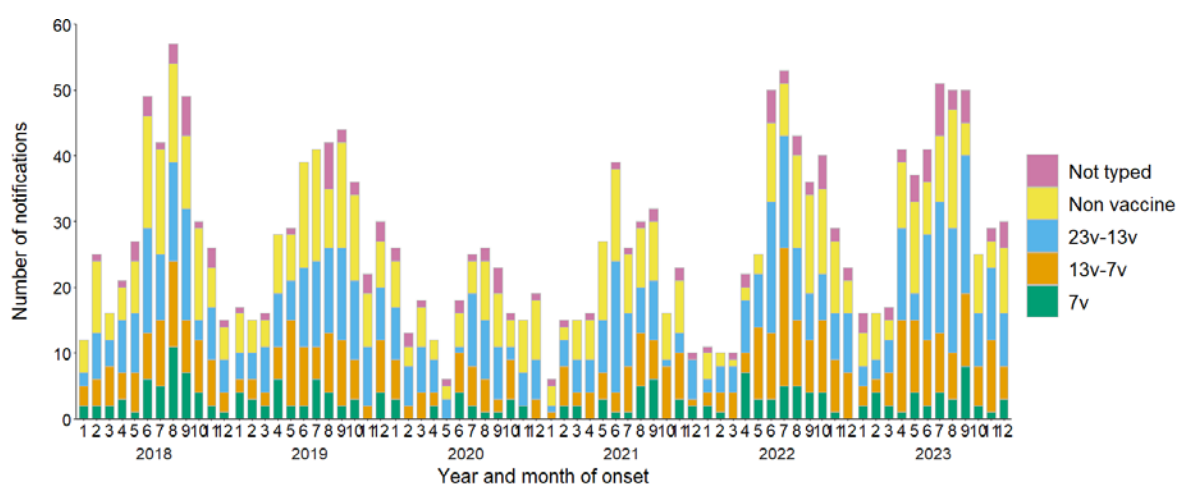


Figure 4: Notifications of invasive pneumococcal disease in Queensland by year and month of onset, 1 January 2018 to 31 December 2023

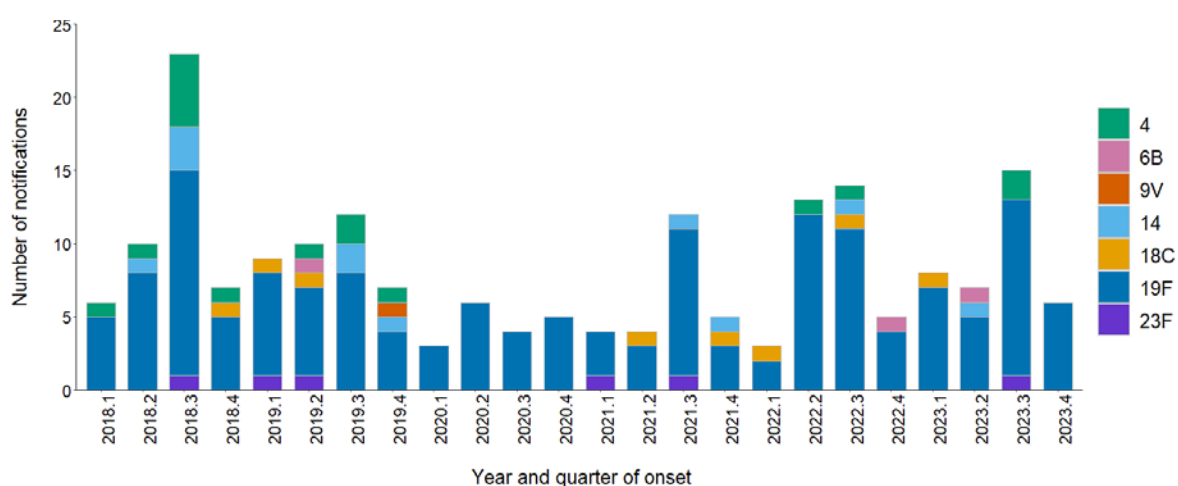


Figure 5: Notifications of 7vPCV serotypes of invasive pneumococcal disease in Queensland by year and quarter of onset, 1 January 2018 to 31 December 2023

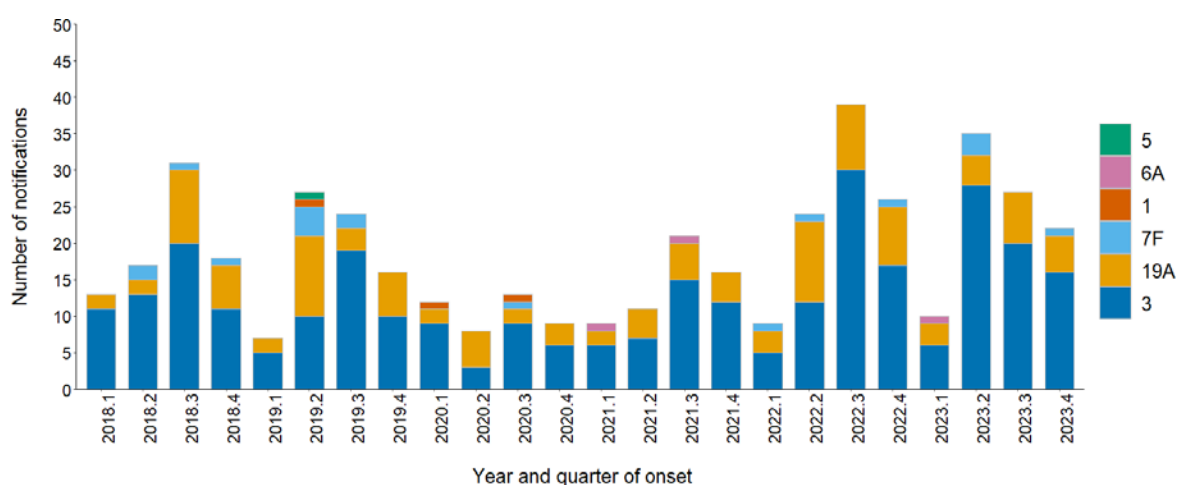


Figure 6: Notifications of 13v-7v serotypes of invasive pneumococcal disease in Queensland by year and quarter of onset, 1 January 2018 to 31 December 2023

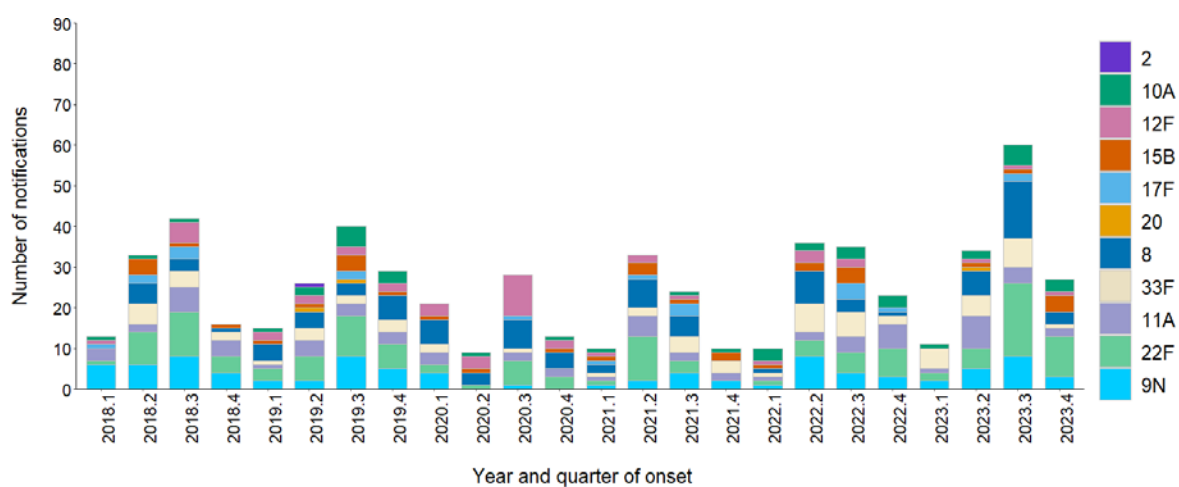


Figure 7: Notifications of 23vPPV-13vPCV serotypes of invasive pneumococcal disease in Queensland by year and quarter of onset, 1 January 2018 to 31 December 2023

In 2023, the most commonly notified IPD serotypes were 3, 22F, 19F, 8, 23B, 19A, 33F, 9N, 11A, 16F, 23A, and 10A accounting for 72% of all IPD notifications in the time period.

Table 4: Most common serotypes of invasive pneumococcal disease in Queensland by quarter, 2023, and 2022-2023

Serotype	Vaccine inclusion	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Total 2023	Total 2022
3	13v-7v	6	28	20	16	70	64
22F	23v-13v	2	5	18	10	35	17
19F	7v	7	5	12	6	30	29
NA	Not typed	1	8	12	6	27	0
8	23v-13v	0	6	14	3	23	13
23B	Non vaccine	3	8	6	5	22	13
19A	13v-7v	3	4	7	5	19	31
33F	23v-13v	5	5	7	1	18	16
9N	23v-13v	2	5	8	3	18	16
11A	23v-13v	1	8	4	2	15	13
16F	Non vaccine	1	6	6	2	15	6
23A	Non vaccine	2	4	4	4	14	17
10A	23v-13v	1	2	5	3	11	11

Table 5: Notifications and rates of invasive pneumococcal disease in Queensland by age group in years and quarter, 2023, and 2022-2023

Pneumococcal	Number of notifications						Notification rate#	
Age Group	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Total 2023	Total 2022	Total 2023	Total 2022
<1	4	2	5	2	13	14	20.4	22
1-4	10	15	15	13	53	44	21.8	18.1
5-14	4	17	12	2	35	29	5.1	4.2
15-24	1	3	4	2	10	14	1.5	2.1
25-44	7	14	25	16	62	49	4.3	3.4
45-64	11	35	43	22	111	90	8.5	6.9
65+	12	33	47	27	119	112	13.3	12.5
Total	49	119	151	84	403	352	7.6	6.6

Annual age specific rate per 100,000 population per year using ERP for 2022 and 2023 (ABS Catalogue no. 3235.0)

Pertussis

In the fourth quarter of 2023, there were 682 notifications for pertussis, which is a 3.8-fold increase from the 179 cases reported in the third quarter of 2023.

In 2023, a total of 929 pertussis cases were reported, and no deaths were reported. The 10–14 year age group had the highest number and rate of notifications, followed by children younger than 1 year of age and the 5–9 year age group (Table 6). The number of pertussis notifications in 2023 has seen a significant rise when compared to the cases reported in 2022 (55 cases).

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 since 1 March 2008.
- Booster doses of pertussis-containing vaccine (dTpa) are scheduled for children at 18 months and 4 years of age.
- A pertussis-containing booster (dTpa) is offered in the year 7 school vaccination program.
- A dose of pertussis-containing vaccine (dTpa) is recommended during every pregnancy (ideally between 20 and 32 weeks).

Table 6: Number and rates of pertussis notifications in Queensland by age group and quarter, 2023, and 2022–2023

Pertussis	Number of notifications						Notification rate#	
Age Group	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Total 2023	Total 2022	Total 2023	Total 2022
<1	1	5	8	27	41	3	64.5	4.7
1–2	1	2	7	29	39	1	32.6	0.8
3–4	1	1	0	29	31	0	25	0
5–9	3	5	58	116	182	4	54.1	1.2
10–14	8	11	47	239	305	10	85.8	2.8
15–19	1	4	19	65	89	3	26.9	0.9
20–49	2	12	24	122	160	13	7.5	0.6
50–64	2	5	10	34	51	9	5.2	0.9
65+	0	4	6	21	31	12	3.5	1.3
Total	19	49	179	682	929	55	17.5	1.0

Annual age specific rate per 100,000 population per year using ERP for 2022 and 2023 (ABS Catalogue no. 3235.0)

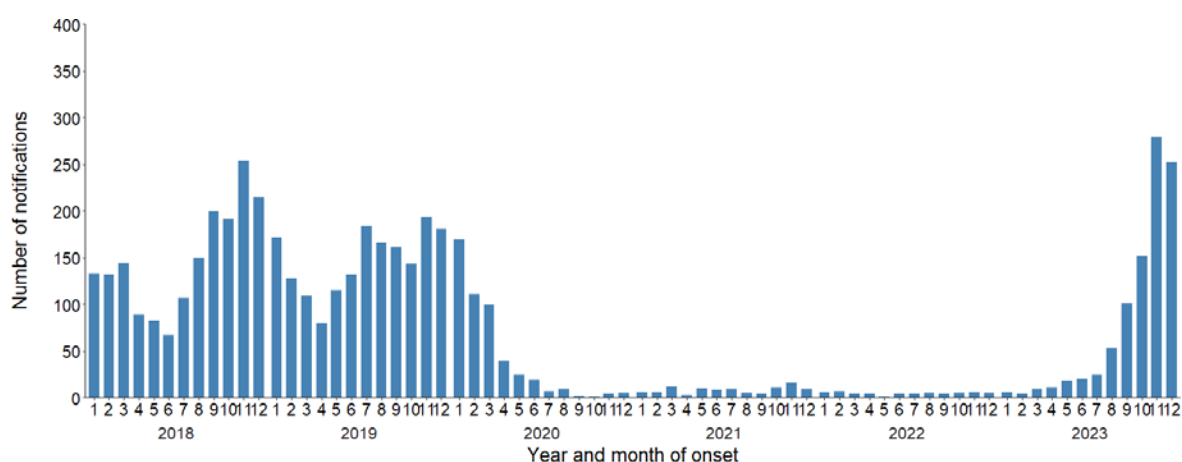


Figure 8: Notifications of pertussis in Queensland by month and year of onset, 1 January 2018 to 31 December 2023

Table 7: Notifications of pertussis in Queensland in children aged younger than one year by quarter, 2023, and 2022-2023

Age Group	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Total 2023	Total 2022
<1 month	0	0	0	0	0	0
1 month	0	0	3	2	5	0
2 months	0	1	1	6	8	0
3 months	0	1	0	2	3	2
4 months	0	0	1	2	3	0
5 months	0	0	1	5	6	0
6 months	0	0	0	3	3	1
7 months	0	0	0	1	1	0
8 months	1	3	1	2	7	0
9 months	0	0	0	0	0	0
10 months	0	0	0	3	3	0
11 months	0	0	1	1	2	0
Total	1	5	8	27	41	3

Table 8: Maternal vaccination status for mother of pertussis cases reported in Queensland in children aged younger than one year by quarter, 2023, and 2022-2023

Maternal vaccination status	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Total 2023	Total 2022
Vaccinated	-	1	3	7	11	1
Not Vaccinated	-	4	2	7	13	2
Unknown	1	-	3	13	17	-
Total	1	5	8	27	41	3

Rotavirus

In the third and fourth quarters of 2023, there were 412 and 558 notifications of rotavirus, respectively, and a total of 1,528 notifications in 2023.

The highest rate of notification was seen in children younger than one year of age. The 2023 notifications and rates of rotavirus were 39% lower than the notifications and rates of 2022. Figure 9 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.

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 (6 weeks, 4 months), replaced RotaTeq in Queensland.

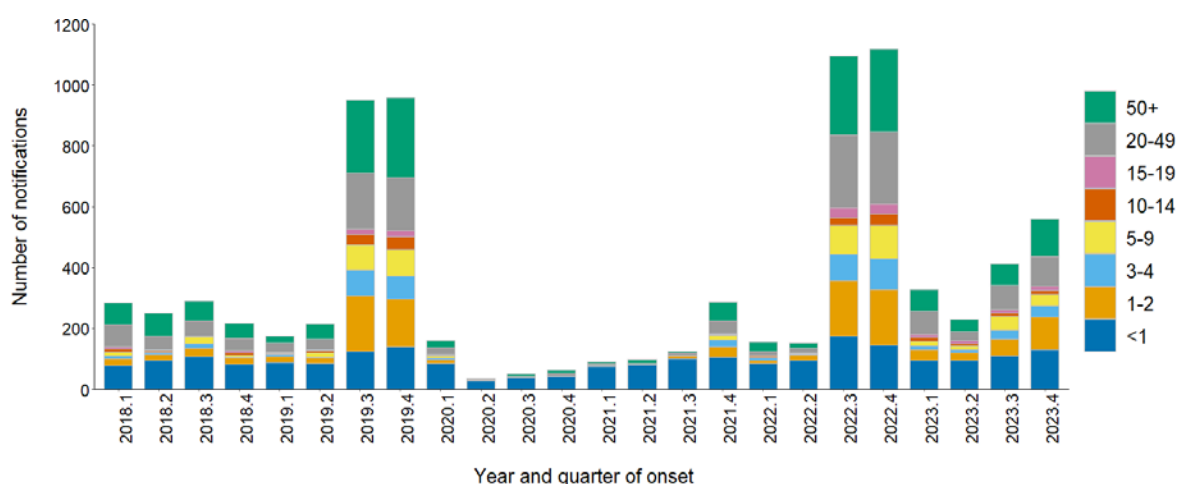


Figure 9: Notifications of rotavirus in Queensland by age group and quarter and year of onset, 1 January 2018 to 31 December 2023

Table 9: Number and rate of rotavirus notifications in Queensland by age group in years and quarter, 2023, and 2022-2023

Rotavirus	Number of notifications						Notification rate#	
Age Group	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Total 2023	Total 2022	Total 2023	Total 2022
<1	94	94	111	131	430	500	676.3	786.4
1-2	36	25	53	106	220	392	184	327.9
3-4	12	12	30	38	92	198	74.2	159.6
5-9	15	12	46	38	111	208	33	61.8
10-14	14	8	10	12	44	70	12.4	19.7
15-19	8	9	11	14	42	70	12.7	21.2
20-49	79	30	80	98	287	505	13.5	23.8
50+	70	40	71	121	302	579	16.2	31
Total	328	230	412	558	1,528	2,522	28.7	47.4

Annual age specific rate per 100,000 population per year using ERP for 2021 and 2022 (ABS Catalogue no. 3235.0)

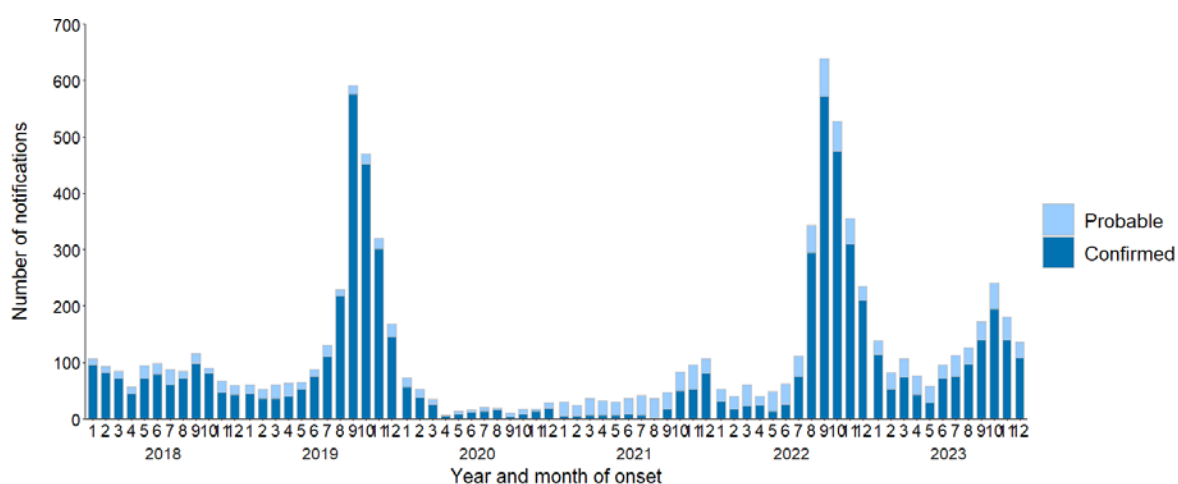


Figure 10: Notifications of rotavirus in Queensland by month and year of onset, 1 January 2018 to 31 December 2023

Table 10: Notifications of rotavirus in Queensland in children aged younger than one year by quarter, 2023, and 2022-2023

Age Group	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Total 2023	Total 2022
<1 month	0	0	0	3	3	11
1 month	16	26	18	36	96	130
2 months	29	23	35	38	125	134
3 months	14	15	14	17	60	57
4 months	15	13	15	13	56	58
5 months	6	7	9	5	27	16
6 months	5	2	5	3	15	15
7 months	3	1	4	1	9	18
8 months	0	1	2	5	8	14
9 months	0	2	2	1	5	14
10 months	3	1	3	5	12	19
11 months	3	3	4	4	14	14
Total	94	94	111	131	430	500

Varicella-zoster virus infection

During the third and fourth quarters of 2023, there were 2,716 and 2,721 notifications of varicella-zoster infection, respectively and a total of 10,695 varicella-zoster infection in 2023.

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 8 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. During the specified time periods (1 August 2019 to 31 December 2020 and from 1 January 2023), all notifications of varicella-zoster virus infection were followed up to determine the clinical presentation is consistent with chickenpox or shingles (Figures 11, 12).

Vaccination History

- The National Immunisation Program Schedule provides a combined measles, mumps, rubella, and varicella (MMRV) vaccine for children aged 18 months.
- 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 old and concluded on 30 October 2023.
- From 1 November 2023, Shingrix replaced Zostavax under the National Immunisation Program (NIP) for all adults aged ≥ 65 years, Aboriginal and Torres Strait Islander people aged ≥ 50 years and selected groups aged ≥ 18 years with severe immunocompromise.

Table 11: Notifications of varicella-zoster virus in Queensland by age group by quarter, 2023, and 2022-2023

Age Group	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Total 2023	Total 2022
<1	14	10	11	9	44	49
1-2	31	15	25	30	101	97
3-4	12	8	15	11	46	42
5-7	31	27	26	28	112	137
8-9	26	30	31	28	115	137
10-19	187	144	194	166	691	591
20-59	1,335	1,278	1,390	1,305	5,308	4,851
60-69	564	501	505	554	2,124	1,802
70+	517	528	519	590	2,154	1,919
Total	2,717	2,541	2,716	2,721	10,695	9,625

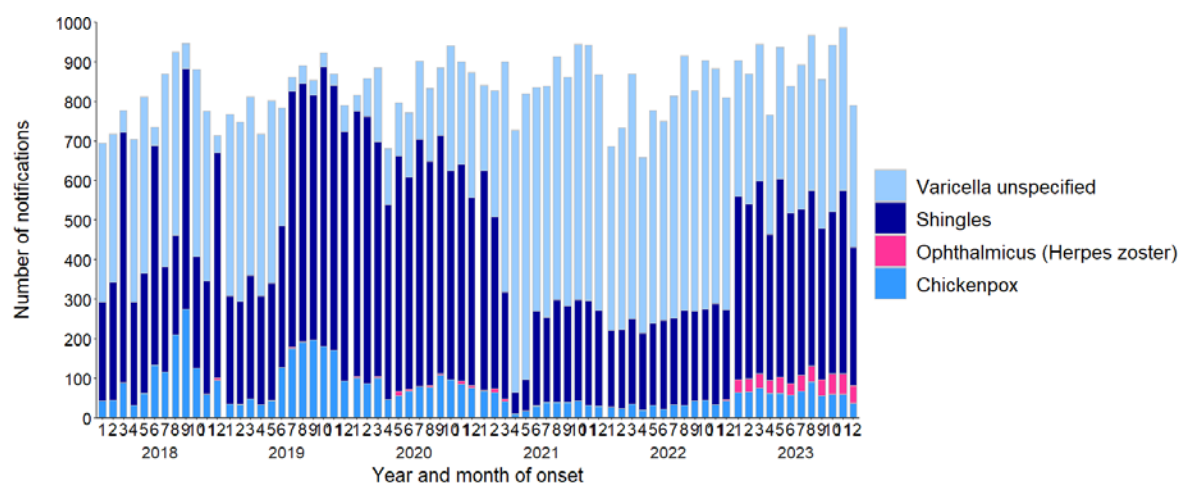


Figure 11: Notifications of varicella in Queensland by clinical presentation, 1 January 2018 to 31 December 2023

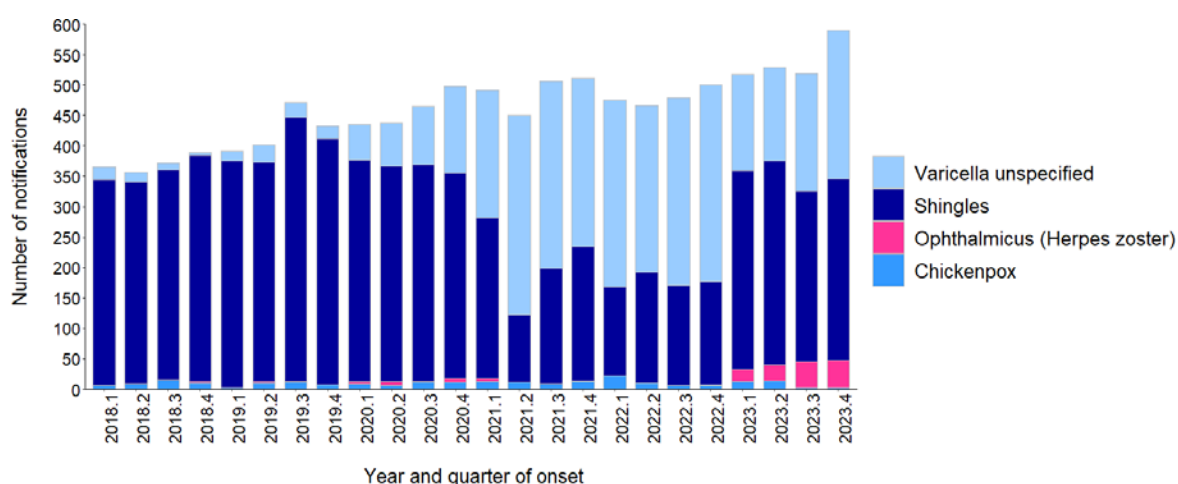


Figure 12: Notifications of varicella in Queensland by clinical presentation for people 70 years of age or older, 1 January 2018 to 31 December 2023

Technical notes

1. Notifications recorded in NOCS may change over time as it 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/>