British Columbia Provincial Pertussis Summary

December 6, 2024

This bulletin provides updated information on pertussis activity in British Columbia (BC) and elsewhere, including recent trends since the last BC Provincial Pertussis Summary (September 2024).

Summary findings and messages

1) Recently, pertussis activity has shown a delayed increase compared to the usual summer peak in BC. Whereas ≤10 cases were reported per month between May and July of 2024 (N=25), reports increased to ≥45 cases per month between August and October (N=155), lower in November (N=24) but subject to change as data become more complete. Localized clusters in several health authorities contribute to recent increase. Regardless, each of these 2024 tallies by month remains within historical pre-pandemic ranges between 2014 and 2019.

2) As of November 30, 2024, year-to-date (YTD) pertussis incidence in BC is ~5 per 100,000 which remains lower than the same YTD period between 2014 and 2019 (ranging ~6-20 per 100,000) although higher than 2020-2022 (ranging <1-2 per 100,000) when COVID-19 pandemic mitigation measures likely also disrupted *Bordetella pertussis* circulation.

3) As observed each year since 2014 (excl. 2021 and 2022), in 2024 infants <1 year have the highest YTD incidence per 100,000 (~50) followed by pre-school children 1-4 years (~25). YTD incidence in 2024 also approaches 20 per 100,000 among school-aged children 5-9 years (18) and 10-14 years (19), dropping substantially to <10 per 100,000 among teens 15-19 years (7) and consistently <5 per 100,000 in all adult age groups. Age-specific incidences also remain within historic levels. Milder presentations beyond infancy may contribute to undiagnosed cases, unrecognized community transmission and surveillance under-ascertainment in older children and adults.

4) Proactive measures to mitigate the pertussis risk include reinforcing up-to-date vaccination, notably for the very young and for pregnant people to reduce the risk of severe outcomes in infants and especially newborns. Proactive regional outreach to communities where vaccination coverage may be suboptimal is warranted.

Updated BC observations as of November 30, 2024

As of November 30, 2024 (epi-week 48), the YTD tally of laboratory-confirmed or epidemiologically-linked pertussis cases reported in BC is 268, more than double the tally from our last bulletin in September 2024 (N=122) and exceeding full year tallies in 2023 (N=46), 2022 (N=1), 2021 (N=2), and 2020 (N=113) (**Figure 1A; Figure 1B**). Recently, pertussis activity has shown a delayed increase compared to the usual summer peak in BC. Whereas ≤10 cases were reported per month between May and July of 2024 (N=25), tallies increased to ≥45 cases per month between August and October (N=155), lower in November (N=24) but subject to change as data become more complete (**Figure 2**). Further monitoring is required to know when pertussis activity may yet peak. Localized clusters in several health authorities contribute to recent increase. Regardless, each of these 2024 tallies by month remains within historical ranges between 2014 and 2019. Overall, the 2024 YTD incidence of 4.7 cases per 100,000 remains lower than incidences during the same YTD period of 2014 to 2019, ranging from 5.8 to 19.9 per 100,000 (**Figure 1B**). Regional incidence continues to be highest in Northern and Interior Health Authorities (**Figure 1B**), with increased cases in Fraser Health and Island Health in recent months (**Figure 3**). Age-specific incidences also remain within the YTD historic range observed between 2014 and 2019 (**Figure 4A; Figure 4B**). As observed each year since 2014 (excl. 2021 and 2022), in 2024 infants <1 year have the highest YTD incidence per 100,000 (~50) followed by pre-school children 1-4 years (~25). YTD incidence in 2024 also approaches 20 per 100,000 among school-aged children 5-9 years (18) and 10-14 years (19), dropping substantially to <10 per 100,000 among teens 15-19 years (7) and consistently <5 per 100,000 in all adult age groups. Milder presentations beyond infancy may contribute to undiagnosed cases, unrecognized community transmission and surveillance under-ascertainment in older children and adults.

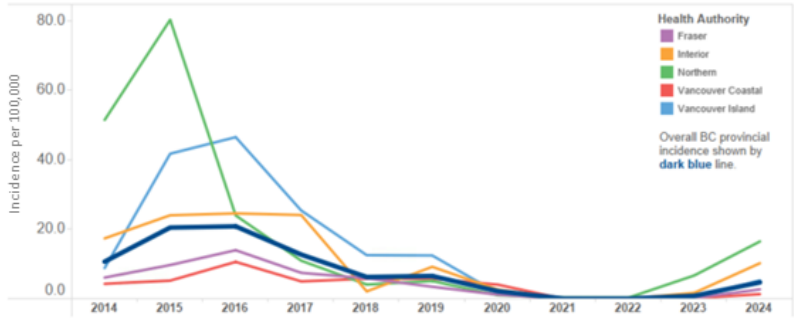
Background context

In BC, as elsewhere, pertussis is an endemic disease with cyclical peaks occurring every 2-5 years[1]. Infants <1 year are at highest risk of severe disease, including hospitalization, intensive care unit admission and death, with the highest risk occurring among infants <3 months of age[1]. Because of their more severe presentation, pertussis in infants, compared to other age groups, may be more readily detectable and indicative of community trends overall. In 1997, most Canadian provinces (including BC) replaced the whole cell pertussis vaccine with a more efficacious (and less reactogenic) acellular pertussis vaccine, and in 2004 added a Grade 9 Tdap (tetanus, diphtheria, acellular pertussis) booster dose[1]. In 2020, BC joined other provinces in publicly-funding an additional Tdap dose for pregnant people each pregnancy, ideally between 27-32 weeks of gestation in order to protect newborns before they can receive a first dose directly[2]. Between 2004 and 2011, BC experienced trough pertussis levels, followed by cyclical peaks in 2012, 2015, and 2016, which subsequently subsided between 2017 and 2019 (**Figure 1A**)[1]. As elsewhere, BC may have been spared an expected cyclical peak during the period that COVID-19 pandemic mitigation measures were in place beginning in March 2020[3–5], with much reduced *B. pertussis* detections thereafter (**Figure 1A**). Following the relaxation of pandemic mitigation measures, other areas in Canada and internationally continue to experience resurgent activity, with some areas indicating pertussis activity surpassing levels from prior peak seasons. Some reports have also highlighted lower vaccine coverage as potentially contributing to increased activity[6–8]. Updated national pertussis surveillance data for Canada remain pending[9].

References

1. Chambers, C. *et al.* Pertussis Surveillance Trends in British Columbia, Canada, over a 20-year Period: 1993-2013. *CCDR* **40**, 31–41 (2014).
2. BC Centre for Disease Control. Communicable Disease Control Manual, Chapter 2: Immunization. (2024).
3. Matczak, S. *et al.* Association between the COVID-19 pandemic and pertussis derived from multiple nationwide data sources, France, 2013 to 2020. *Eurosurveillance* **27**, (2022).
4. Sandoval, T., Bisht, A. & Maurice, A. de S. The impact of COVID-19 and masking practices on pertussis cases at a large academic medical center (2019-2021). *American Journal of Infection Control* **51**, 844–846 (2023).
5. Tessier, E. *et al.* Impact of the COVID-19 pandemic on Bordetella pertussis infections in England. *BMC Public Health* **22**, 405 (2022).
6. Kury de Castillo, C. Whooping cough warnings continue amid low vaccination rates in rural Alberta. *Global News* (2024).
7. UK Health Security Agency. *Confirmed cases of pertussis in England by month*. https://www.gov.uk/government/publications/pertussis-epidemiology-in-england-2024/confirmed-cases-of-pertussis-in-england-by-month (2024).
8. Poeta, M. *et al.* Pertussis outbreak in neonates and young infants across Italy, January to May 2024: implications for vaccination strategies. *Eurosurveillance* **29**, (2024).
9. Public Health Agency of Canada. Reported cases from 1924 to 2022 in Canada - Notifiable diseases on-line. https://diseases.canada.ca/notifiable/charts?c=pl.

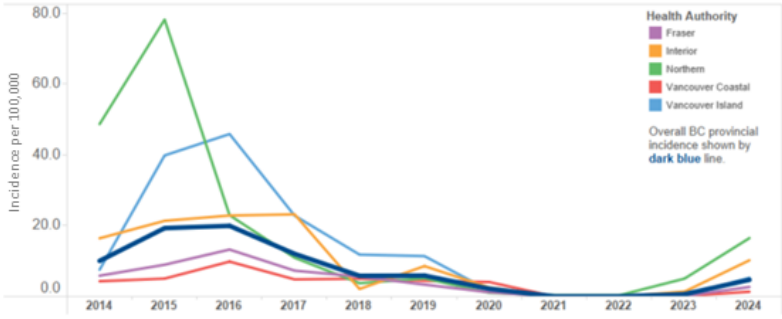
Figure 1A. Annual incidence (per 100,000)
BC overall and by Health Authority



Annual incidence (per 100,000)											
BC	10.7	20.5	20.8	12.7	6.3	6.5	2.2	0.0	0.0	0.8	4.7
Fraser	6.1	9.7	14.0	7.5	5.9	3.5	1.2			0.2	2.7
Interior	17.4	24.0	24.6	24.1	2.1	9.2	2.7			1.7	10.2
Northern	51.5	80.3	24.0	11.0	4.1	5.1	1.0	0.3	0.3	6.7	16.5
Vancouver Coastal	4.3	5.2	10.6	5.0	5.8	5.8	4.1			0.2	1.3
Vancouver Island	8.8	41.7	46.5	25.4	12.5	12.5	1.6	0.1		0.4	5.3
Annual case counts											
BC	503	976	1,013	627	314	334	113	2	1	46	268
Fraser	106	171	252	137	110	66	23			5	59
Interior	129	181	189	189	17	75	22			15	92
Northern	149	233	70	32	12	15	3	1	1	20	50
Vancouver Coastal	50	61	126	60	70	72	51			2	18
Vancouver Island	69	330	376	209	105	106	14	1		4	49

Data Source: VPD Data Mart; current to November 30, 2024

Figure 1B. YTD (Jan 1 – Nov 30) incidence (per 100,000)
BC overall and by Health Authority

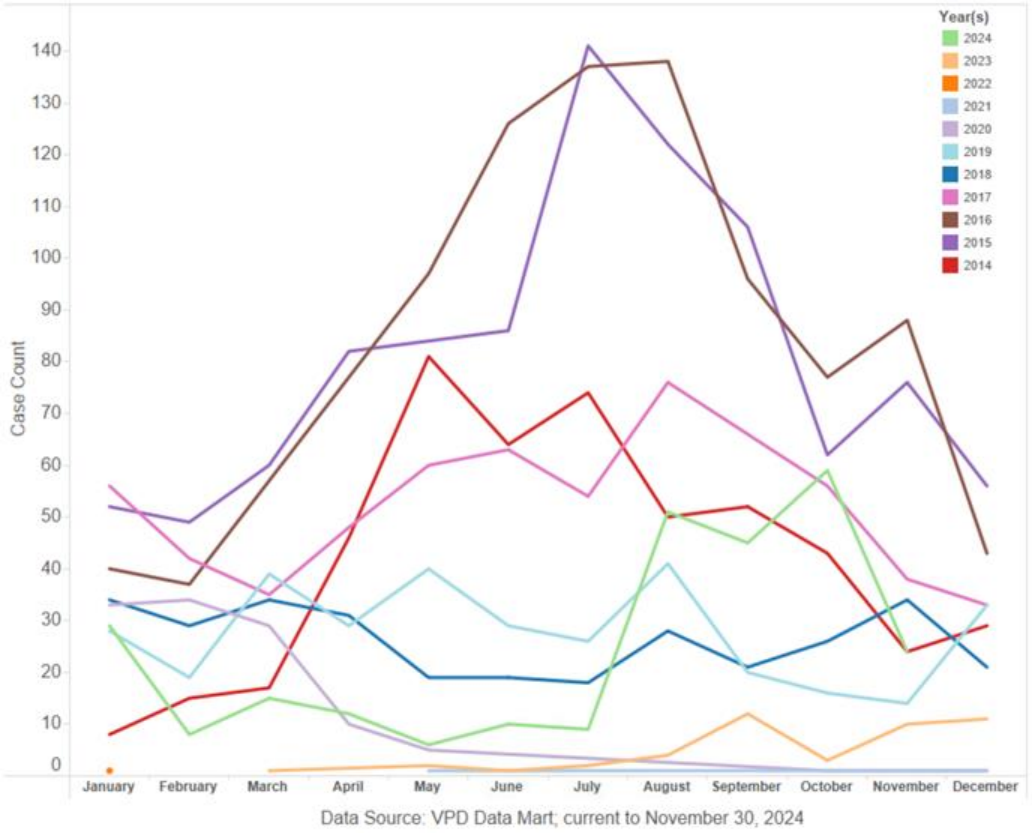


YTD incidence (per 100,000)											
BC	10.1	19.2	19.9	12.0	5.8	5.9	2.2	0.0	0.0	0.6	4.7
Fraser	5.9	9.0	13.3	7.3	5.6	3.4	1.2			0.1	2.7
Interior	16.4	20.8	22.6	23.2	2.1	8.6	2.5			1.4	10.2
Northern	48.7	78.2	22.9	11.0	3.8	5.1	1.0	0.3	0.3	5.0	16.5
Vancouver Coastal	4.3	5.0	9.9	4.8	5.0	4.4	4.1			0.2	1.3
Vancouver Island	7.6	39.7	45.8	22.8	11.8	11.4	1.6			0.3	5.3
YTD case counts											
BC	474	915	967	594	293	301	112	1	1	35	268
Fraser	102	158	239	134	105	64	23			3	59
Interior	122	157	174	182	17	70	21			12	92
Northern	141	227	67	32	11	15	3	1	1	15	50
Vancouver Coastal	50	59	117	58	61	55	51			2	18
Vancouver Island	59	314	370	188	99	97	14			3	49

Data Source: VPD Data Mart; current to November 30, 2024

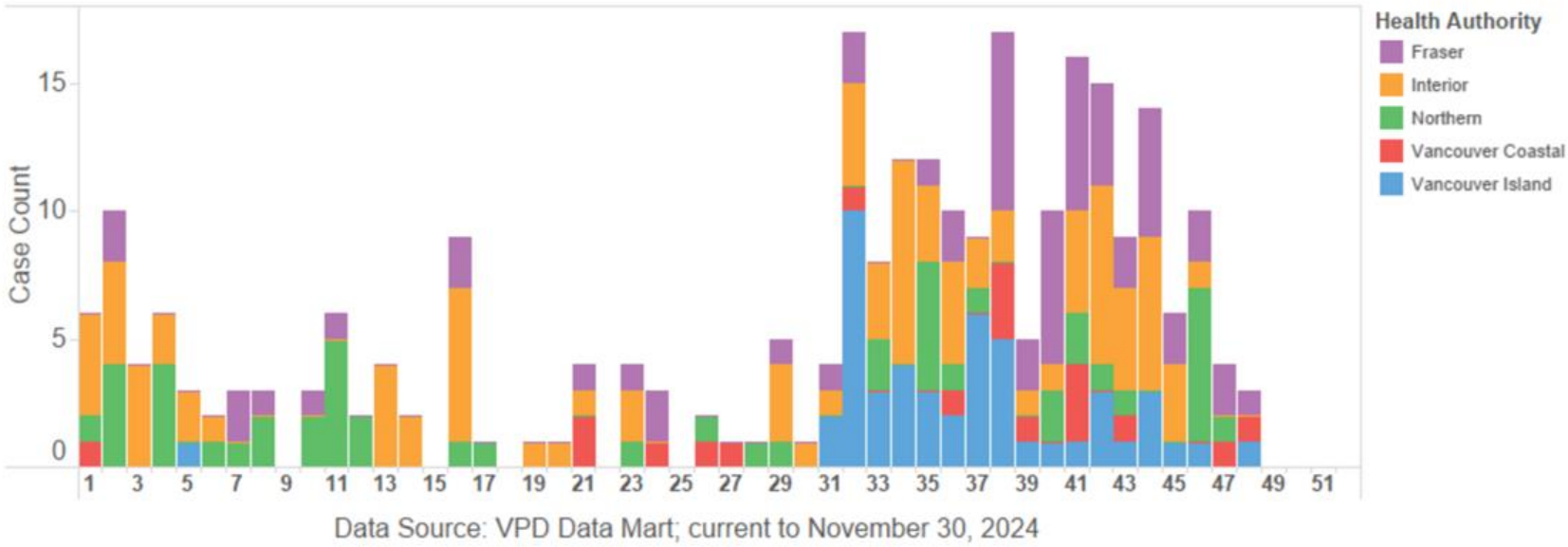
Tallies reflect confirmed cases, including laboratory-confirmed or epidemiologically-linked events.
For 2024, data are for the period between January 1 and November 30, 2024.

Figure 2. Case counts by month and year, BC



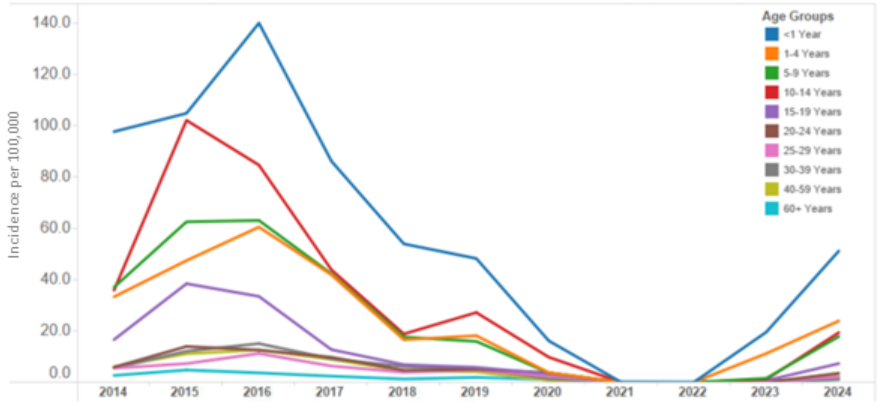
Tallies reflect confirmed cases, including laboratory-confirmed or epidemiologically-linked events.
For 2024, data are for the period between January 1 and November 30, 2024.

Figure 3. Case counts by epi-week and Health Authority



Tallies reflect confirmed cases, including laboratory-confirmed or epidemiologically-linked events.
For 2024, data are for the period between January 1 and November 30, 2024.

Figure 4A. Annual incidence (per 100,000)
BC overall and by Age Group

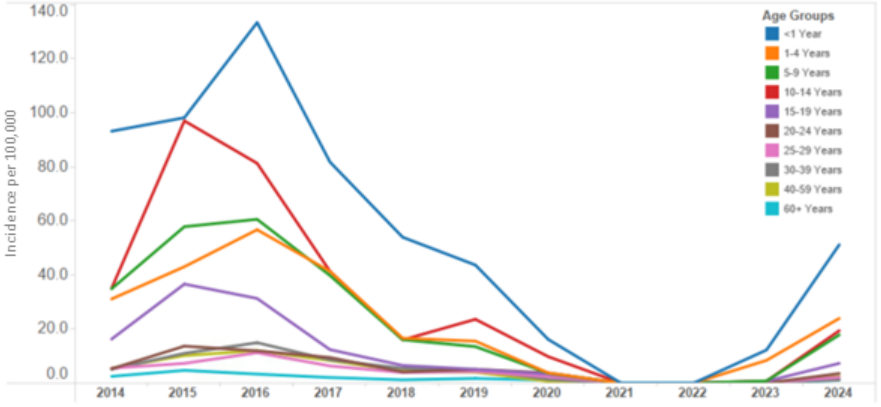


Annual incidence (per 100,000)

BC	10.7	20.5	20.8	12.7	6.3	6.5	2.2	0.0	0.0	0.8	4.7
<1 Year	97.7	104.9	140.1	86.2	54.0	48.3	16.2			19.6	51.2
1-4 Years	33.3	47.5	60.5	41.9	16.6	18.2	3.8			11.2	23.9
5-9 Years	37.1	62.6	63.1	42.3	17.7	15.9	3.6			1.5	17.8
10-14 Years	35.9	102.1	84.7	43.9	18.8	27.2	9.8			1.1	19.4
15-19 Years	16.6	38.4	33.5	12.7	6.9	5.8	3.3			0.7	7.3
20-24 Years	5.9	14.0	12.6	9.8	4.7	5.1	3.7				3.5
25-29 Years	5.5	7.3	11.2	6.3	3.9	4.8	2.4			0.2	2.1
30-39 Years	5.6	12.1	15.1	9.2	6.2	5.4	1.3	0.1		0.4	1.1
40-59 Years	6.1	11.1	12.6	8.9	4.5	4.1	0.7			0.1	2.4
60+ Years	2.7	4.8	3.7	2.4	1.3	1.9	1.0	0.1	0.1	0.2	1.1

Data Source: VPD Data Mart, current to November 30, 2024

Figure 4B. YTD (Jan 1 – Nov 30) incidence (per 100,000)
BC overall and by Age Group



YTD incidence (per 100,000)

BC	10.1	19.2	19.9	12.0	5.8	5.9	2.2	0.0	0.0	0.6	4.7
<1 Year	93.2	98.2	133.4	81.8	54.0	43.7	16.2			12.2	51.2
1-4 Years	31.1	43.0	56.7	41.4	16.6	15.5	3.8			8.4	23.9
5-9 Years	34.9	57.9	60.6	39.8	16.0	13.5	3.6			0.8	17.8
10-14 Years	35.1	97.0	81.3	41.4	16.0	23.6	9.8			0.7	19.4
15-19 Years	16.3	36.6	31.3	12.4	6.5	5.1	3.3			0.7	7.3
20-24 Years	5.3	13.7	11.9	9.5	4.1	5.1	3.7				3.5
25-29 Years	5.5	7.3	11.2	6.3	3.9	4.3	2.4			0.2	2.1
30-39 Years	5.1	11.0	14.9	8.6	5.4	5.0	1.3			0.4	1.1
40-59 Years	5.5	10.2	12.0	8.3	4.5	4.0	0.7			0.1	2.4
60+ Years	2.5	4.7	3.3	2.1	1.2	1.7	1.0	0.1	0.1	0.2	1.1

Data Source: VPD Data Mart; current to November 30, 2024

Tallies reflect confirmed cases, including laboratory-confirmed or epidemiologically-linked events.
For 2024, data are for the period between January 1 and November 30, 2024.