

Vaccine Preventable Diseases and Invasive Group A Streptococcal Disease 2019 Quarter 2: April 1 – June 30, 2019

Highlights

- Serogroup W continues to predominate among invasive meningococcal disease cases
- Three new measles cases were reported in the second quarter of 2019
- Invasive pneumococcal disease incidence remains lower than observed in 2018
- Non-endemic mumps genotypes were identified in locally-acquired cases
- Fewer invasive group A streptococcal disease cases have been reported than in the first half of 2018
- Two cases of *Haemophilus influenzae* type b were reported in unimmunized children

Invasive Meningococcal Disease

Six confirmed cases of invasive meningococcal disease (IMD) were reported in the second quarter of 2019; five were serogroup W and one was non-typeable. These brought the total number of IMD cases reported in the first two quarters of 2019 to 15; 11 were serogroup W, two serogroup Y, one serogroup B and one non-typeable (Figure 1).

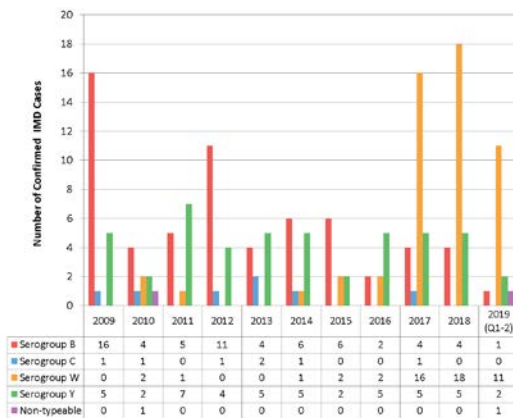


Figure 1. IMD case counts by serogroup, BC, 2009-2019 June 30

In the previous ten years, 2-18 (median=8.5) cases were reported between January 1 and June 30.

Five of the fifteen cases resided in Vancouver Coastal Health Authority (four serogroup W, one non-typeable), four in Interior Health Authority (all serogroup W), four in Fraser Health Authority (two serogroup W, two serogroup Y), and two in Vancouver Island Health Authority (one serogroup B, one serogroup W).

All 2019 cases were 20 years of age or older (Figure 2).

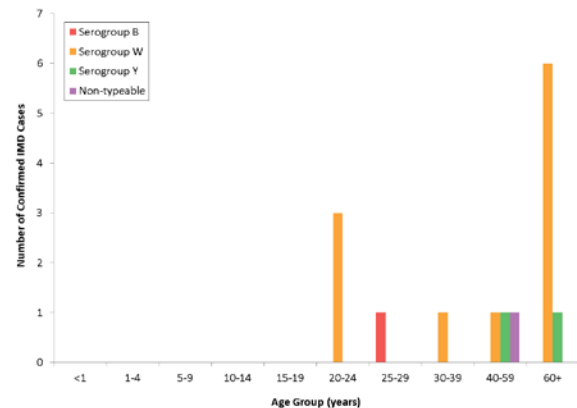


Figure 2. IMD cases by serogroup and age group, BC, January-June 2019

None of the cases in 2019 reported risk factors for invasive meningococcal disease that warranted consideration of meningococcal immunization.

Three of the fifteen cases (one each of serogroup B, serogroup W and non-typeable) reported travel outside of Canada during their exposure periods. The travel locations were in the United States, Europe and Asia.

Two cases (serogroup W) were household contacts; none of the other cases were epidemiologically linked.

Measles

Three confirmed measles cases were reported in the second quarter of 2019, all in the month of April (Figure 3). These brought the total number of cases in the first half of this year to 29 with a year-to-date (YTD) incidence rate of 1.2 cases per 100,000 population*. This has been the highest number of measles cases reported in a year since 2014, when over 340 individuals were infected during an outbreak in the Fraser Valley.

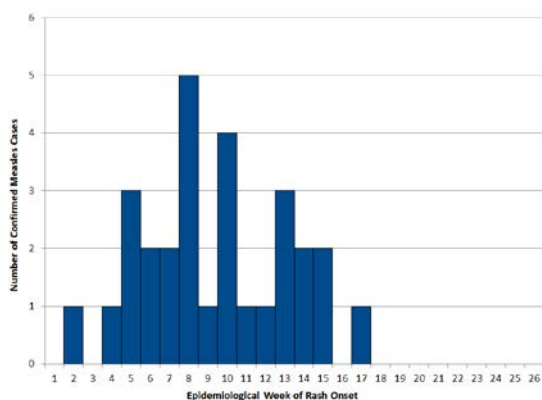


Figure 3. Measles case counts per epidemiological week, BC, January-June 2019

Each of the three new cases acquired measles during travel outside of Canada, and none were related to any of the previous BC cases this year.

The first case with rash onset in epidemiological week 15 was an individual from Vancouver Island who travelled to various countries in Asia. Genotype B3 was identified by the National Microbiology Laboratory. The second case in week 15 was a Fraser Health resident who acquired measles while in Vietnam, and genotype D8 was isolated. The third case with illness onset in week 17 was a Vancouver Island resident with travel to Japan and the United States. Genotype D8 was also identified in this individual. No secondary transmission occurred from any of these cases.

All BC measles cases with genotype results this year have been either B3 or D8, the predominant measles strains circulating globally.

Slightly more than one in four cases (27%) reported so far in 2019 were between 10 and 14 years of age.

This age group also had the highest YTD incidence* at 6.6 cases per 100,000 population (Figure 4).

Of the 29 cases, 10 (34%) reported never receiving a measles-containing vaccine (Table 1). Nine cases (31%) reported being fully immunized with two or more documented doses of measles-containing vaccine, an expected finding in a population with high vaccine coverage.¹

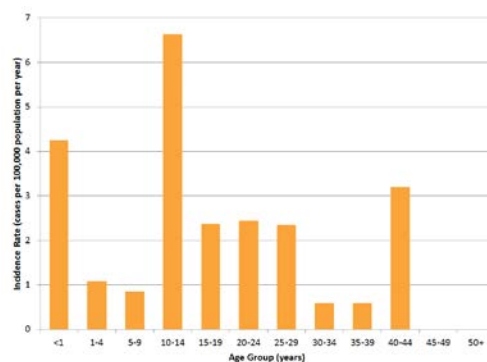


Figure 4. Measles incidence rates* by age group, BC, January-June 2019

Table 1. Measles vaccination history for confirmed measles cases, BC, January-June 2019

Measles Vaccination History	Confirmed Cases	
	N	(%)
0 doses	10	(34)
1 dose undocumented	2	(7)
2 dose undocumented	5	(17)
1 dose documented	3	(10)
2+ doses documented	9	(31)

Invasive Pneumococcal Disease

There were 131 cases of invasive pneumococcal disease (IPD) in the second quarter of 2019. As of June 30th, 311 cases of IPD have been reported in BC this year, giving a YTD incidence rate* of 12.6 cases per 100,000 population (Figure 5). This was a decrease from 2018, when the highest IPD rates were observed in the province.

¹ WHO. Six common misconceptions about immunization: https://www.who.int/vaccine_safety/initiative/detection/immunization_misconceptions/en/index2.html

* 2019 incidence rates marked with an asterisk have been annualized based on the first half of the year without adjustment for seasonality.

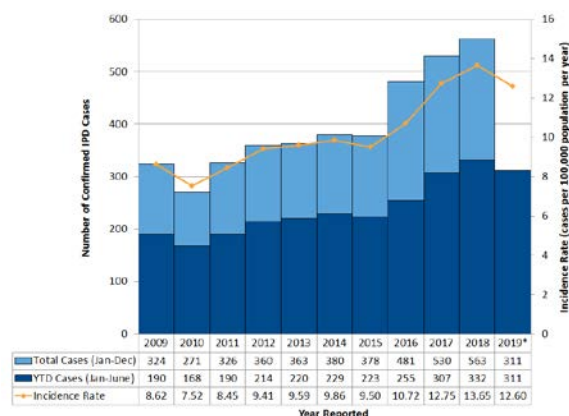


Figure 5. IPD case counts and incidence rates per year, BC, 2009-2019 June 30*

Fourteen (11%) of the cases in the second quarter were pediatric (aged 16 and younger). This is a slightly higher percentage than observed in quarter 1 (6.7%). Compared to the previous ten years, similar proportions of pediatric cases were reported in 2019, but a higher proportion was between 17 and 64 years of age (Figure 6).

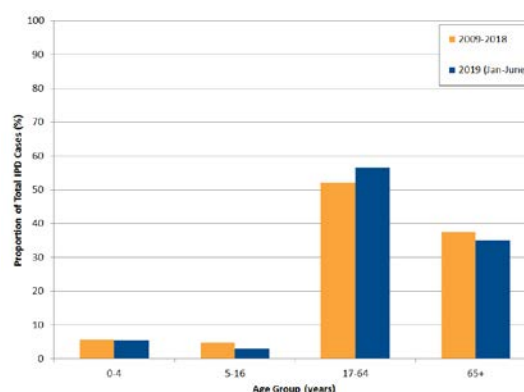


Figure 6. Age distribution of IPD cases, BC 2009-2018 and 2019 (Jan-Jun)

The BCCDC Public Health Laboratory provided National Microbiology Laboratory serotype results for 291 (94%) of the cases from 2019. Of cases with known serotype information, serotype 3 was the most commonly identified in quarter 2 (16%) with two cases in children under age five (Table 2). For all of 2019 to date, serotype 4 was the most common (17%), and all serotype 4 cases were in individuals aged 17 years and older. This is consistent with what was observed in 2018.

Table 2. Serotype distribution of confirmed invasive pneumococcal disease cases, by age group, BC, 2019

Serotype	Vaccine type†	Quarter 2 (April - June 2019)					2019 YTD (Jan - June 2019)				
		<5 years	5-16 years	17-64 years	65+ years	Q2 Total	<5 years	5-16 years	17-64 years	65+ years	YTD Total
4	PCV13	-	-	13	4	17	-	-	41	9	50
3	PCV13	2	-	9	8	19	2	-	15	16	33
7F	PCV13	-	-	8	2	10	1	-	22	3	26
22F	PPV23	2	-	6	3	11	3	-	10	7	20
12F	PPV23	-	-	7	2	9	-	-	14	4	18
20	PPV23	-	-	3	2	5	-	-	13	4	17
19A	PCV13	-	-	5	2	7	-	1	8	7	16
9N	PPV23	-	-	3	2	5	-	-	7	6	13
23B	NVT	3	-	4	-	7	4	-	6	1	11
11A	PPV23	-	1	1	-	2	3	1	2	4	10
Other‡	-	1	2	10	17	30	1	3	32	41	77
Unknown	-	2	1	3	3	9	3	4	6	7	20

Abbreviations: PCV13, 13-valent pneumococcal conjugate vaccine; PPV23, 23-valent pneumococcal polysaccharide vaccine; NVT, non-vaccine type

‡The top 10 serotypes of 2019 are shown. All other serotypes (n=21) are grouped as “Other”.

†Serotypes in both PCV13 and PPV23 are denoted as PCV13

* 2019 incidence rates marked with an asterisk have been annualized based on the first half of the year without adjustment for seasonality.

Mumps

Seven confirmed and five probable cases of mumps were reported in the second quarter of 2019, bringing the YTD total case counts to 15 confirmed and eight probable. This was a similar number of confirmed cases to the same time last year, when 16 cases had been reported (Figure 7). The YTD incidence rate* for confirmed mumps was 0.6 cases per 100,000 population.

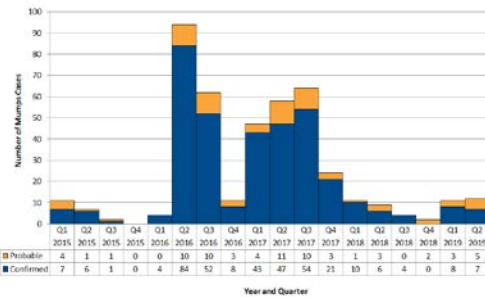


Figure 7. Mumps cases by classification per year and quarter, BC, 2015 to 2019 June 30

Twelve cases from 2019 had genotype results from the National Microbiology Laboratory. Two were genotype H, five genotype C, and five genotype G. Genotype G is considered the endemic mumps strain circulating in Canada, and the most likely strain to be isolated in locally-acquired cases. Interestingly, two of the genotype C cases and one of the genotype H cases reported no history of travel outside of Canada during their exposure period and no epidemiological link to a known mumps case (Table 3).

Table 3. Confirmed mumps cases by genotype and travel history, BC, January-June 2019

Mumps Genotype	Travel During Exposure Period		
	Yes	No	Unknown
G	4	1	-
H	1	1	-
C	2	2	1
Not identified	1	2	-

Possible explanations for this include that these cases were unknowingly exposed in Canada to individuals with mumps acquired outside of Canada, or that new mumps strains are beginning to circulate in BC. More time is needed to confirm or refute the latter explanation.

Invasive Group A Streptococcal Disease

Eighty cases of invasive group A streptococcal disease (iGAS) were reported in the second quarter of 2019, bringing the total number of cases reported in the first half of 2019 to 174. The YTD incidence rate* was 7.1 cases per 100,000 population (Figure 8). This was lower than the 2017 and 2018 annual incidence rates, which were the highest incidence rates ever observed in BC.

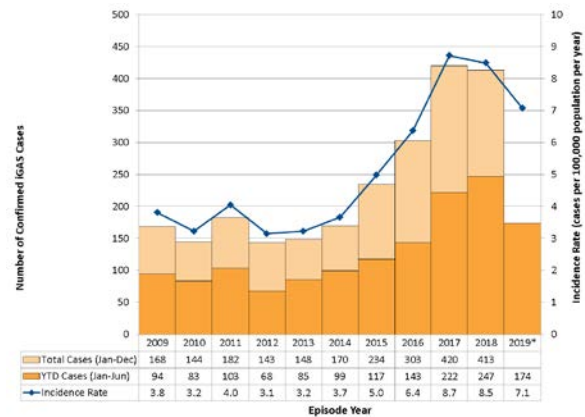


Figure 8. iGAS case counts and incidence rates by year, BC, 2009–2019 June 30*

The highest YTD age-specific incidence rate* was in the 30-39 years age group (Figure 9).

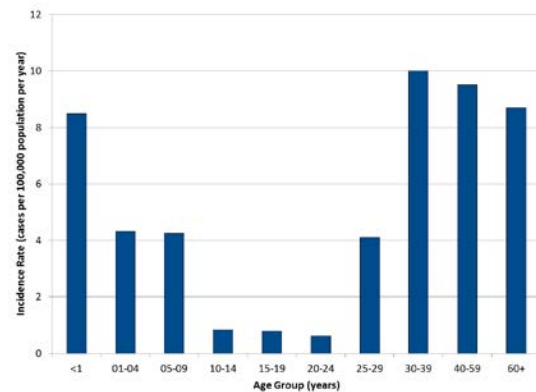


Figure 9. iGAS incidence rates* by age group, BC, January-June 2019

Forty-eight cases (29%) were classified as severe (involving streptococcal toxic shock syndrome, soft tissue necrosis, meningitis, pneumonia, and/or death); eight (5%) were fatal. In the previous ten

* 2019 incidence rates marked with an asterisk have been annualized based on the first half of the year without adjustment for seasonality.

years, 28% of cases (annual range 19-35%) were severe and 7% (annual range 4-14%) were fatal. No new cases of puerperal fever due to group A streptococcus were reported in the second quarter of 2019; two had been reported in the first quarter.

The most commonly reported risk factors or predisposing conditions to date in 2019 were wounds, skin infections, and homelessness/under-housing (Table 4).

Table 4. Risk factors and predisposing conditions reported by iGAS cases, BC, 2009-2018 and January-June 2019

Risk Factor / Predisposing Condition	2009-2018	2019 YTD (Jan-Jun)
Wound	32.3%	40.2%
Skin Infection	24.3%	39.1%
Homeless/under-housed	14.4%	31.6%
Injection Drug Use	20.3%	28.7%
Chronic Cardiac Condition	16.4%	19.5%
Chronic respiratory/pulmonary condition	7.8%	17.2%
Diabetes	14.2%	16.7%
Alcoholism	12.3%	10.9%
Immunocompromised	13.6%	9.2%

No clustering by onset date or age group was identified in the provincial dataset in the second quarter of 2019. Interior Health Authority identified a cluster of three invasive and two non-invasive *emm81* cases in the same long term care facility in July 2019.

The BCCDC Public Health Laboratory provided National Microbiology Laboratory *emm* typing results for 134 (77%) of the cases reported in the first two quarters of 2019. Twenty-three different *emm* types were identified. The most common *emm* types were *emm81* (22 cases), *emm41* (18 cases) and *emm76* (14 cases).

Haemophilus influenzae type b

One case of *Haemophilus influenzae* type b (Hib) was reported in an unimmunized 9-month old from Fraser East Health Service Delivery Area in the second quarter of 2019. A second Hib case was reported in an unimmunized 2-year old from the Okanagan Health Service Delivery Area in July (third quarter). Since the introduction of Hib vaccine in the early 1990s, Hib incidence has declined dramatically, with a small residual burden of illness almost exclusively in adults and unimmunized children.

Data Notes

Data for invasive meningococcal disease, invasive group A streptococcal disease, measles, and mumps are sourced from reporting by BC health authorities using forms specifically designed for each disease, and sometimes reconciliation with laboratory data. Data for all other diseases are sourced from the health authorities' investigation reports in the provincial public health information system (Panorama).

For incidence rate calculations, population numbers for years prior to 2018 were from the BC Stats Population Estimates and populations numbers for 2018 and 2019 were from the BC Stats P.E.O.P.L.E. (Population Extrapolation for Organizational Planning with Less Error) Projection (<https://www2.gov.bc.ca/gov/content/data/about-data-management/bc-stats>). The Population Estimates were updated April 2018 and the P.E.O.P.L.E. Projections were updated September 2018.

Numbers in this report were generated July 12-25, 2019 and are subject to change due to possible late reporting and/or data clean up.

* 2019 incidence rates marked with an asterisk have been annualized based on the first half of the year without adjustment for seasonality.

Additional BCCDC Reports

Influenza Surveillance Reports:

<http://www.bccdc.ca/health-professionals/data-reports/communicable-diseases/influenza-surveillance-reports>

Invasive Group A Streptococcal Disease (iGAS) in British Columbia, 2018 Quarterly reports:

<http://www.bccdc.ca/health-professionals/data-reports/communicable-diseases> see Respiratory Diseases

Measles and Mumps Epidemiological Summaries:

<http://www.bccdc.ca/health-professionals/data-reports/communicable-diseases> see Vaccine Preventable Diseases

Reportable Diseases Dashboard:

<http://www.bccdc.ca/health-professionals/data-reports/reportable-diseases-data-dashboard>

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Summary Table of Select Reportable Diseases

Disease	Quarter 1 (January 1-March 31, 2019)						Quarter 2 (April 1-June 30, 2019)						2019 Year to Date (January 1-June 30, 2019)						
	FHA	IHA	NHA	VCHA	VIHA	BC	FHA	IHA	NHA	VCHA	VIHA	BC	FHA	IHA	NHA	VCHA	VIHA	BC	
Diphtheria - carrier	Count	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
	Incidence*	0.2	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	0.0
<i>Haemophilus influenzae</i> , type a	Count	1	-	-	-	-	1	1	-	-	-	-	1	2	-	-	-	-	2
	Incidence*	0.2	-	-	-	-	0.1	0.2	-	-	-	-	0.1	0.2	-	-	-	-	0.1
<i>Haemophilus influenzae</i> , type b	Count	-	-	-	-	-	-	1	-	-	-	-	1	1	-	-	-	-	1
	Incidence*	-	-	-	-	-	-	0.2	-	-	-	-	0.1	0.1	-	-	-	-	0.0
<i>Haemophilus influenzae</i> , type d	Count	-	-	-	-	-	-	-	1	-	-	-	1	-	1	-	-	-	1
	Incidence*	-	-	-	-	-	-	-	0.5	-	-	-	0.1	-	0.3	-	-	-	0.0
<i>Haemophilus influenzae</i> , type e	Count	-	-	-	-	-	-	-	1	-	-	-	1	-	1	-	-	-	1
	Incidence*	-	-	-	-	-	-	-	0.5	-	-	-	0.1	-	0.3	-	-	-	0.0
<i>Haemophilus influenzae</i> , type f	Count	-	1	1	-	-	2	1	1	-	-	-	2	1	2	1	-	-	4
	Incidence*	-	0.5	1.4	-	-	0.2	0.2	0.5	-	-	-	0.2	0.1	0.5	0.7	-	-	0.2
<i>Haemophilus influenzae</i> , non-typeable	Count	4	3	1	4	1	13	5	4	-	3	4	16	9	7	1	7	5	29
	Incidence*	0.9	1.6	1.4	1.3	0.5	1.1	1.1	2.1	-	1.0	2.0	1.3	1.0	1.8	0.7	1.2	1.2	1.2
<i>Haemophilus influenzae</i> , type unknown	Count	1	-	-	-	-	1	-	-	1	-	-	1	1	-	1	-	-	2
	Incidence*	0.2	-	-	-	-	0.1	-	-	1.4	-	-	0.1	0.1	-	0.7	-	-	0.1
Invasive group A streptococcal disease	Count	22	22	3	33	14	94	25	17	5	21	12	80	47	39	8	54	26	174
	Incidence*	4.7	11.5	4.2	11.0	6.9	7.6	5.4	8.8	7.1	7.0	5.9	6.5	5.1	10.2	5.7	9.0	6.4	7.1
Invasive pneumococcal disease	Count	47	22	24	44	43	180	27	28	19	24	32	130	74	50	43	68	75	310
	Incidence*	10.1	11.5	33.9	14.6	21.3	14.6	5.8	14.6	26.9	8.0	15.8	10.6	8.0	13.0	30.4	11.3	18.6	12.6
Invasive meningococcal disease	Count	2	4	-	2	1	9	2	-	-	3	1	6	4	4	-	5	2	15
	Incidence*	0.4	2.1	-	0.7	0.5	0.7	0.4	-	-	1.0	0.5	0.5	0.4	1.0	-	0.8	0.5	0.6
Measles	Count	8	2	-	10	6	26	1	-	-	-	2	3	9	2	-	10	8	29
	Incidence*	1.7	1.0	-	3.3	3.0	2.1	0.2	-	-	-	1.0	0.2	1.0	0.5	-	1.7	2.0	1.2
Mumps	Count	2	-	-	5	1	8	5	-	-	1	1	7	7	-	-	6	2	15
	Incidence*	0.4	-	-	1.7	0.5	0.7	1.1	-	-	0.3	0.5	0.6	0.8	-	-	1.0	0.5	0.6
Pertussis	Count	23	17	4	10	31	85	14	38	-	8	29	89	37	55	4	18	60	174
	Incidence*	5.0	8.8	5.7	3.3	15.3	6.9	3.0	19.8	-	2.7	14.4	7.2	4.0	14.3	2.8	3.0	14.8	7.1

* Quarterly and year-to-date incidence rates are calculated as annual incidence rates (cases per 100,000 population per year), without adjusting for seasonality.

Note: No cases were reported for the following diseases: diphtheria - acute case, tetanus, poliomyelitis, rubella, and *Haemophilus influenzae* type c. Influenza surveillance data are provided in the British Columbia [Influenza Surveillance Reports](#).