

Vaccine Preventable and Invasive Bacterial Diseases Quarterly Report 2018 Quarter 3: July 1 – September 30, 2018

Highlights

- Year-to-date incidence of invasive pneumococcal disease remains high, with increase since 2015
- Year-to-date incidence of invasive group A streptococcal disease similar to high rate seen in 2017
- Continued increase in serogroup W invasive meningococcal disease with ST-11 clonal complex

Invasive Pneumococcal Disease

In the third quarter of 2018, 67 confirmed cases of invasive pneumococcal disease (IPD) were reported in BC. Unlike the first two quarters of 2018, the number of cases reported during the third quarter was below the maximum, but above the median, number of cases observed for the same quarter in 2013-2017 (Figure 1). To-date, 399 IPD cases have been reported in 2018. Without adjustment for seasonality, the year-to-date (YTD) incidence rate* of IPD for 2018 is similar to the annual incidence rate observed in 2017 (2018: 10.9 per 100,000 population per year; 2017: 11.0 per 100,000 population per year) (Figure 2). The number and rate of IPD cases in 2017 was the highest reported in BC since 2008 (data not shown).

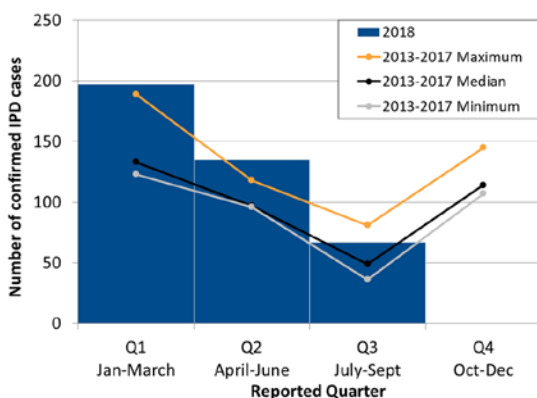


Figure 1. Number of IPD cases by quarter, BC, 2013-2017 and 2018

Two pneumococcal vaccines are available in the BC immunization program: a 13-valent pneumococcal conjugate vaccine (PCV13) and a 23-valent pneumococcal polysaccharide vaccine (PPV23) which

protect against 13 and 23 serotypes, respectively. Eligibility varies by age and medical risk factors for invasive disease.¹

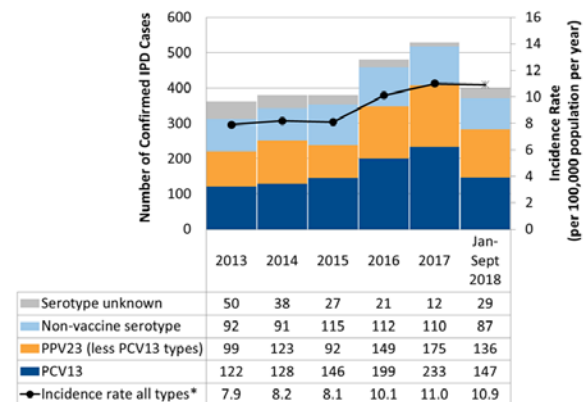


Figure 2. Number of IPD cases by year and vaccine serotype group, BC, 2013-Sept 2018

The BCCDC Public Health Laboratory provided National Microbiology Laboratory serotype results for cases. To date, 71% of the 2018 IPD cases were due to serotypes contained in one or both of the pneumococcal vaccines offered in BC and 22% were due to non-vaccine preventable serotypes (Figure 2). Serotype 4 continues to be the most common serotype in BC, with all cases of serotype 4 IPD occurring in adults 17 years of age and older (Table 1).

¹ <http://www.bccdc.ca/health-professionals/clinical-resources/communicable-disease-control-manual/immunization>

* 2018 incidence rates have been annualized based on the first 3 quarters of the year without adjustment for seasonality.

Table 1. Serotype distribution of confirmed invasive pneumococcal disease (IPD) cases, by age group, BC, 2018

Serotype	Vaccine type†	Quarter 3 (July - Sept 2018)					Quarters 1-3 (Jan - Sept 2018)				
		<5 years	5-16 years	17-64 years	65+ years	Q3 Total	<5 years	5-16 years	17-64 years	65+ years	Q1-3 Total
4	PCV13	-	-	8	-	8	-	-	44	11	55
3	PCV13	-	-	2	4	6	2	-	18	17	37
7F	PCV13	-	-	3	1	4	-	-	24	7	31
8	PPV23	-	-	1	2	3	-	-	7	6	13
20	PPV23	-	-	3	-	3	-	-	18	3	21
22F	PPV23	-	-	1	1	2	-	-	14	8	22
33F	PPV23	1	-	1	1	3	1	1	4	3	9
15A	NVT	-	-	2	1	3	-	-	6	5	11
23A	NVT	-	-	4	1	5	-	-	6	6	12
23B	NVT	-	-	1	1	2	3	-	4	9	16
6C	NVT	-	-	1	1	2	-	-	4	3	7
7C	NVT	-	-	1	1	2	-	-	4	2	6
Other‡	-	1	-	4	7	12	6	2	79	43	130
Unknown	-	-	-	10	2	12	-	1	23	5	29

†Top serotypes of the quarter are shown; all other known serotypes are grouped as "Other". For this report "Other" includes: 10A, 11A, 11C, 12F, 13, 14, 15B, 15C, 16F, 17F, 19A, 19F, 21, 28A, 29, 31, 34, 35B, 35F, 38, 6A, 6B, 6C, 9L, 9N

‡Serotypes in both PCV13 and PPV23 (4, 6B, 9V, 14, 18C, 19F, 23F, 1, 5, 7F, 3, 19A) are denoted as PCV13. NVT = Non-vaccine serotype.

Measles

In August of 2018, a case of measles occurred in an out of country visitor. A secondary transmission resulted from the primary case. Both cases were genotype D8, with identical strains (National Microbiology Laboratory). A third case of measles was reported in early September, with no known exposures to the previous two cases. A source for this measles case was not identified. This case, while also genotype D8, was not the same strain as the two earlier cases. Public health alerts were posted for each of the cases because all attended various public venues while infectious, and all generated media attention. The out of country visitor was unimmunized. All BC cases either had one or two documented doses of MMR vaccine.

The health authorities (FHA and VCH) conducted public health investigations and contact identification and management.

Invasive Group A Streptococcal Disease

Seventy-six cases of invasive group A streptococcal disease (iGAS) were reported in the third quarter of 2018, bringing the total number of cases reported in BC this year to 322. The YTD incidence rate* is 8.8 cases per 100,000 population per year (Figure 3). This is similar to the 2017 incidence rate, which had been the highest incidence rate ever observed in BC.

The iGAS YTD incidence rates have increased in Fraser, Vancouver Island and Northern Health Authorities, and decreased slightly in Interior and Vancouver Coastal Health Authorities (Figure 4).

No unusual clustering by onset date or age group was identified in the provincial dataset.

* 2018 incidence rates have been annualized based on the first 3 quarters of the year without adjustment for seasonality.

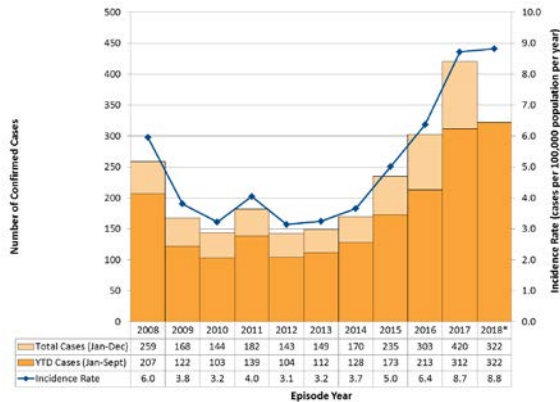


Figure 3. iGAS case counts and year-to-date (YTD) incidence rates by year, BC, 2008–2018*

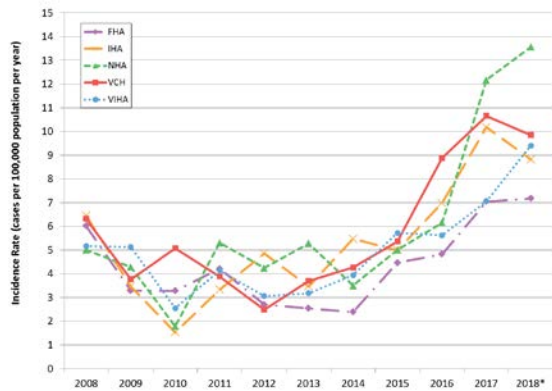


Figure 4. iGAS incidence by health authority and year, BC, 2008–2018*

The BCCDC Public Health Laboratory provided National Microbiology Laboratory *emm* typing results for 243 of the cases reported to date in 2018. The three most common *emm* types were *emm1* (23% of known *emm* types), *emm76* (21%) and *emm81* (11%). The *emm* distribution varied by health authority (Figure 5) and month (data not shown). No single *emm* type explains the increased incidence.

Case characteristics varied by *emm* type. *Emm76* and *emm81* cases were more likely to report homelessness/under-housing (36% and 63%, respectively) and injection drug use (42% and 59%, respectively). *Emm1* cases were more likely to have severe presentations, including toxic shock syndrome and death, with a case fatality rate of 18%.

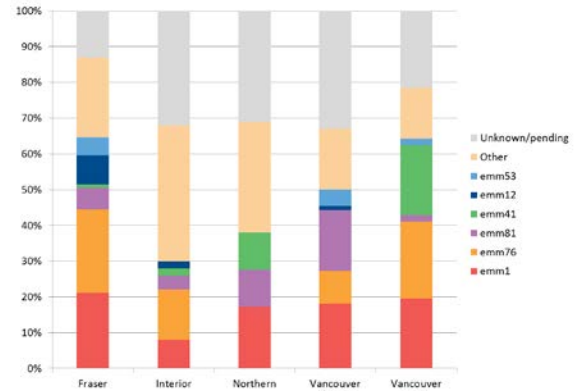


Figure 5. iGAS *emm* type distribution by health authority BC, January–September 2018

For a more detailed analysis of the BC iGAS surveillance data for 2018, please refer to the iGAS quarterly summaries available at: <http://www.bccdc.ca/health-professionals/data-reports/communicable-diseases> under Respiratory Diseases.

Of note, similar increases in invasive group A streptococcal disease and invasive pneumococcal disease incidence have been observed beginning in 2015 and 2016, respectively (Figure 6).

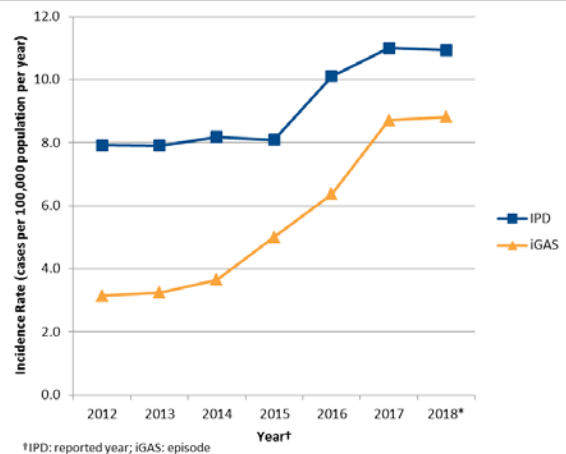


Figure 6. IPD and iGAS incidence by year, BC, 2012–2018

* 2018 incidence rates have been annualized based on the first 3 quarters of the year without adjustment for seasonality.

Invasive Meningococcal Disease

Five confirmed cases of invasive meningococcal disease (IMD) were reported in the third quarter of 2018: four serogroup W and one serogroup B. As of September 30th, a total of 20 IMD cases have been reported in British Columbia (BC) in 2018: 14 serogroup W, three serogroup Y, and three serogroup B. The YTD incidence rate* was 0.55 cases per 100,000 population per year (Figure 7). One serogroup W case (in the 60+ year age group) was fatal.

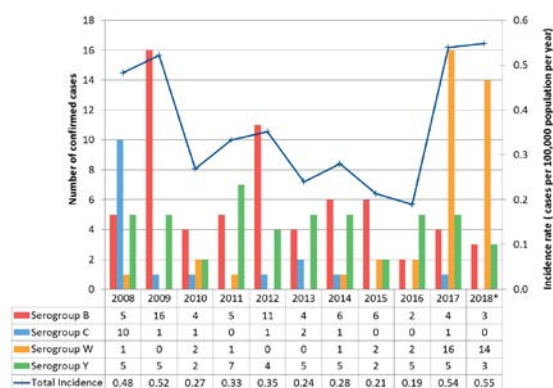


Figure 7. IMD case counts by serogroup and incidence rates, BC, 2008-2018 September 30^{*}

The majority of the 2018 IMD cases were over 40 years of age (Figure 8).

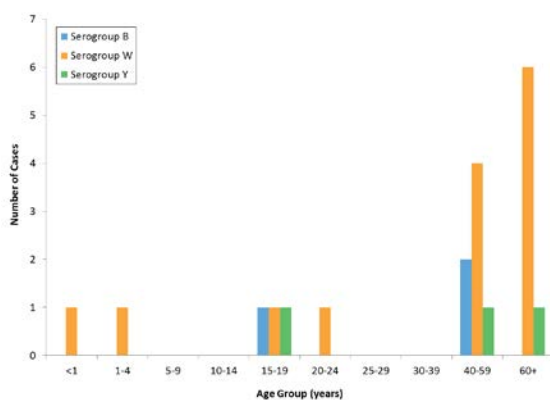


Figure 8. IMD cases by serogroup and age group, BC, January-September 2018

In late 2017, BC experienced an increase in serogroup W invasive meningococcal disease, with an outbreak among adolescents in the Interior Health Authority.² The outbreak strain was the ST-11 clonal complex (ST-11cc). In addition to the five outbreak cases, there were ten ST-11cc cases in three Health Authorities in 2017.

High rates of serogroup W disease have continued in 2018; however no epidemiologic links have been identified between cases. Seven of the 2018 serogroup W cases were the ST-11cc and one was ST-22cc. Typing for the remaining six serogroup W cases from 2018 is not yet available. The ST-11cc cases were from Fraser (3), Vancouver Island (2), Interior (1), and Vancouver Coastal (1) Health Authorities. Four of these cases were aged 40-59 years and there was one case in each of the following age groups: 1-4 years, 20-24 years and 60+ years.

Of the four new serogroup W cases in the third quarter of 2018, two were from Fraser Health Authority (60+ years age group), one was from the Interior Health Authority (40-59 years age group) and one was from Vancouver Island (20-24 years age group).

² BC Centre for Disease Control. Three cases of meningococcal disease among adolescents in Interior Health. Available online at: <http://www.bccdc.ca/about/news-stories/news-releases/2017/meningococcal-disease> [Accessed: October 19, 2018].

* 2018 incidence rates have been annualized based on the first 3 quarters of the year without adjustment for seasonality.

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 Panorama.

Numbers in this report were generated October 15-19, 2018 and are subject to change due to possible late reporting and/or data clean up.

Prepared by:

Communicable Diseases and Immunization Service
BC Centre for Disease Control, 655 West 12th Avenue, Vancouver,
BC Canada V5Z 4R4
vpd.epi@bccdc.ca | Phone: 604-707-251

Additional BCCDC Reports

Influenza Surveillance Reports:

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

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

Invasive Group A Streptococcal Disease (iGAS) in British Columbia, 2017 Annual Summary and 2018 Quarterly reports: <http://www.bccdc.ca/health-professionals/data-reports/communicable-diseases> see Respiratory Diseases

Mumps Epidemiological Summary, 2017:

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

Reportable Diseases Dashboard:

<http://www.bccdc.ca/health-info/disease-system-statistics/reportable-disease-dashboard>

Additional data and reports:

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

Summary Table of Select Reportable Diseases

Disease		Quarter 3 (July 1-September 30, 2018)						Year to Date (January 1-June 30, 2018)					
		FHA	IHA	NHA	VCHA	VIHA	BC	FHA	IHA	NHA	VCHA	VIHA	BC
<i>Haemophilus influenzae</i> , type a	Count	-	-	-	-	-	-	-	-	2	1	1	4
	Incidence*	-	-	-	-	-	-	-	-	0.9	0.1	0.2	0.1
<i>Haemophilus influenzae</i> , type b	Count	-	-	-	1	-	-	-	-	-	3	-	3
	Incidence*	-	-	-	0.3	-	-	-	-	-	0.3	-	0.1
<i>Haemophilus influenzae</i> , type c	Count	-	-	-	-	-	-	-	-	-	-	1	1
	Incidence*	-	-	-	-	-	-	-	-	-	-	0.2	0.0
<i>Haemophilus influenzae</i> , type d	Count	-	-	-	-	-	-	-	1	-	-	-	1
	Incidence*	-	-	-	-	-	-	-	0.2	-	-	-	0.0
<i>Haemophilus influenzae</i> , type e	Count	-	-	-	-	-	-	2	-	1	2	-	5
	Incidence*	-	-	-	-	-	-	0.1	-	0.5	0.2	-	0.1
<i>Haemophilus influenzae</i> , type f	Count	-	-	-	-	-	-	5	2	1	1	-	9
	Incidence*	-	-	-	-	-	-	0.4	0.4	0.5	0.1	-	0.2
<i>Haemophilus influenzae</i> , non-typeable	Count	5	3	-	-	-	8	14	7	2	4	4	31
	Incidence*	1.1	1.6	-	-	-	0.7	1.0	1.2	0.9	0.4	0.7	0.8
<i>Haemophilus influenzae</i> , type unknown	Count	1	-	-	1	-	2	1	-	-	1	-	2
	Incidence*	0.2	-	-	0.3	-	0.2	0.1	-	-	0.1	-	0.1
Invasive group A streptococcal disease	Count	21	12	16	17	10	76	99	50	29	88	56	322
	Incidence*	4.6	6.3	22.4	5.7	5.0	6.2	7.2	8.8	13.6	9.8	9.4	8.8
Invasive pneumococcal disease	Count	24	11	4	18	10	67	118	70	26	105	80	399
	Incidence*	5.2	5.8	5.6	6.0	5.0	5.5	8.6	12.3	12.2	11.7	13.4	10.9
Invasive meningococcal disease	Count	3	1	0	0	1	5	13	2	0	1	4	20
	Incidence*	0.7	0.5	0.0	0.0	0.5	0.4	0.9	0.4	0.0	0.1	0.7	0.5
Measles	Count	2	0	0	1	0	3	4	0	0	1	0	5
	Incidence*	0.4	0.0	0.0	0.3	0.0	0.2	0.3	0.0	0.0	0.1	0.0	0.1
Mumps	Count	1	0	2	2	0	5	6	2	3	8	1	20
	Incidence*	0.2	0.0	2.8	0.7	0.0	0.4	0.4	0.4	1.4	0.9	0.2	0.5
Pertussis	Count	26	5	3	9	18	61	82	19	9	36	80	226
	Incidence*	5.7	2.6	4.2	3.0	9.1	5.0	5.9	3.3	4.2	4.0	13.4	6.2

* 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, tetanus, poliomyelitis, and rubella. Influenza surveillance data are provided in the [British Columbia Influenza Surveillance Reports](#).