

CIC 2018 CCI | December 4-6
4 - 6 décembre
OTTAWA

The Emergence of Meningococcal W ST-11 Clone in BC, 2017

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Disclosure Statement

- I have no affiliation (financial or otherwise) with a pharmaceutical, medical device or communications organization.

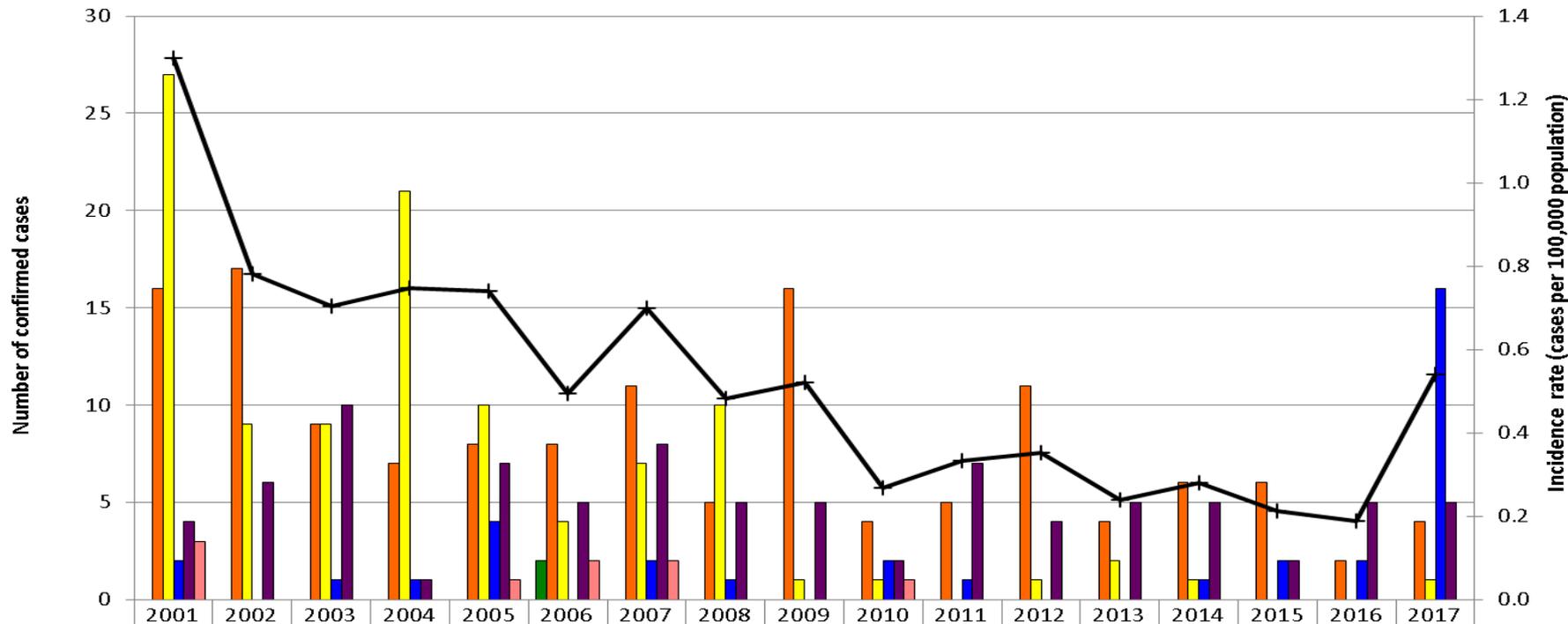
Invasive meningococcal disease in BC

- Serious infection with significant morbidity and mortality
- Public health role: surveillance, contact management, prevention through immunization
- C and quadrivalent conjugate vaccine programs

Child and adolescent immunization schedule meningococcal vaccines BC

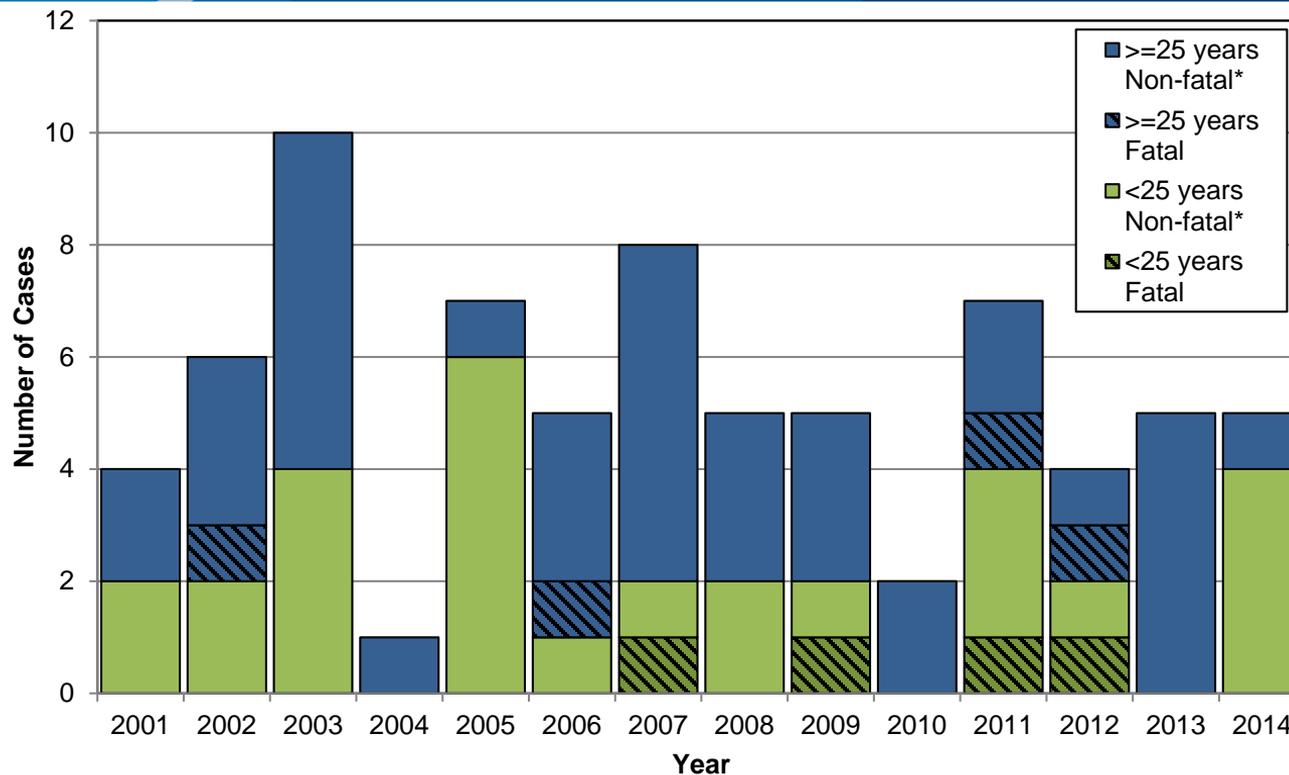
Age	Vaccine(s)
2 mo	DPT-Polio/Hepatitis B/ Hib, PCV13, MenC (2005) , rotavirus
12 mo	MMR, MenC (2001) , PCV13, Varicella
11 years/ Grade 6	HPV, MenC (2003/4 to 2015/6, with catch-up through grade 12 targeting birth cohorts 1988+)
14-16 years/ Grade 9	Tdap, Men4C (since 2016/7...now in its 3rd year)

Invasive Meningococcal Disease Cases and Incidence Rates by Year British Columbia, 2001-2017



■ A	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
■ B	16	17	9	7	8	8	11	5	16	4	5	11	4	6	6	2	4
■ C	27	9	9	21	10	4	7	10	1	1	0	1	2	1	0	0	1
■ W	2	0	1	1	4	0	2	1	0	2	1	0	0	1	2	2	16
■ Y	4	6	10	1	7	5	8	5	5	2	7	4	5	5	2	5	5
■ UNKNOWN	3	0	0	0	1	2	2	0	0	1	0	0	0	0	0	0	0
— Total Incidence	1.30	0.78	0.70	0.75	0.74	0.50	0.70	0.48	0.52	0.27	0.33	0.35	0.24	0.28	0.21	0.19	0.54

Serogroup Y IMD BC 2001-14



Vaccination with conjugate vaccines in adolescents / young adults provides indirect protection for others because peak nasopharyngeal carriage is age 19

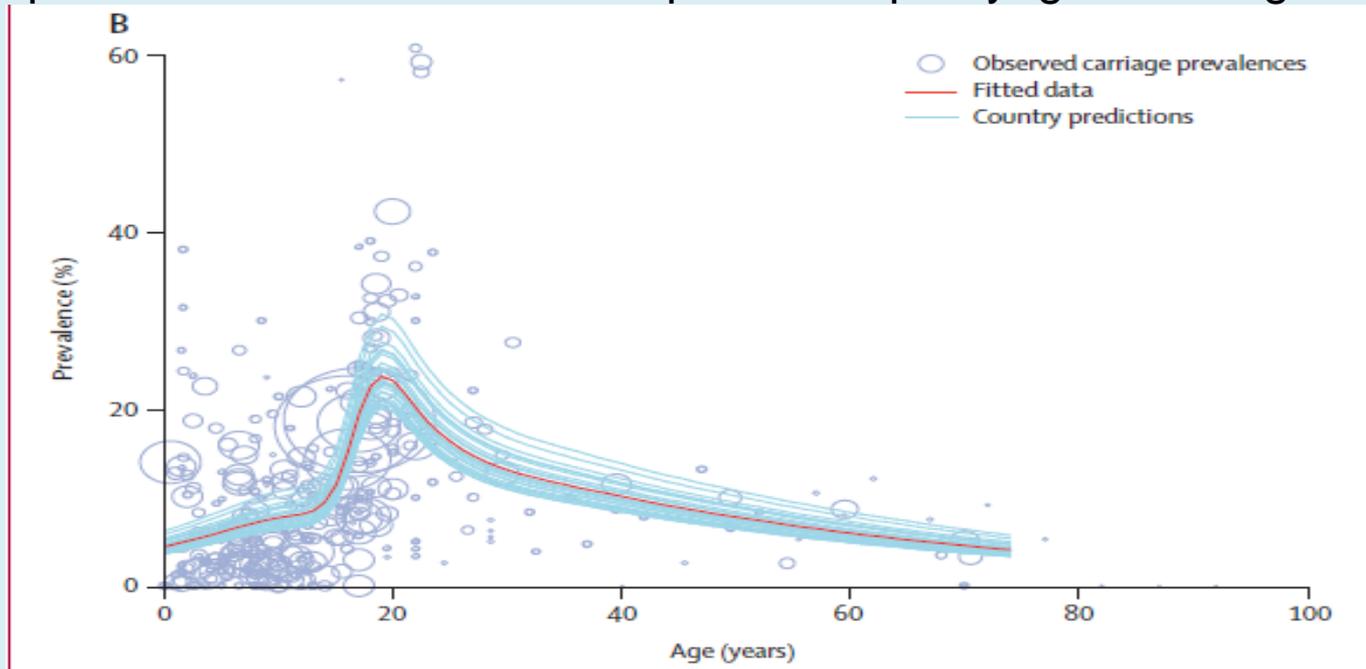


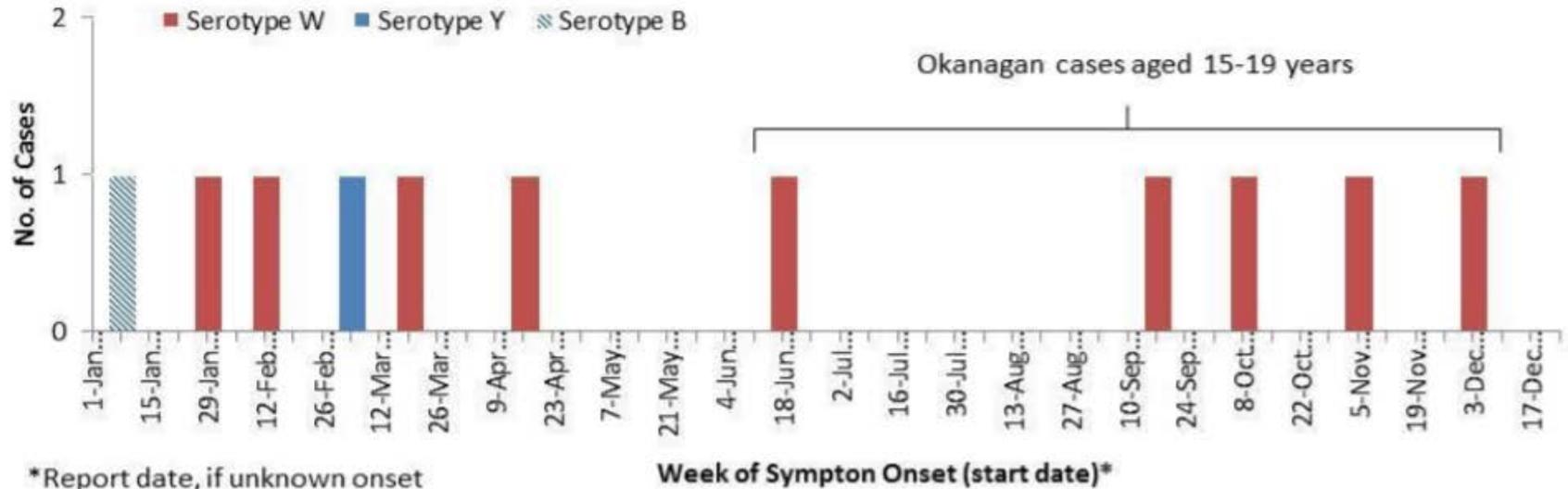
Figure 2: Estimates of meningococcal carriage by age when swabs were plated immediately after collection
Circles are the datapoints included, with the larger circles representing a larger sample size. The largest circles represent the results of the serial cross-sectional studies in teenagers aged 15–19 years old in the UK, before and after the introduction of the meningococcal serogroup C vaccine.^{105,110,113} (A) 95% bias-corrected CIs. (B) With individual country predictions.

From: Christensen. *Lancet Infect Dis* 2010; 10: 853–61

Outbreak in the Interior Health Region

Okanagan HSDA - 3 community

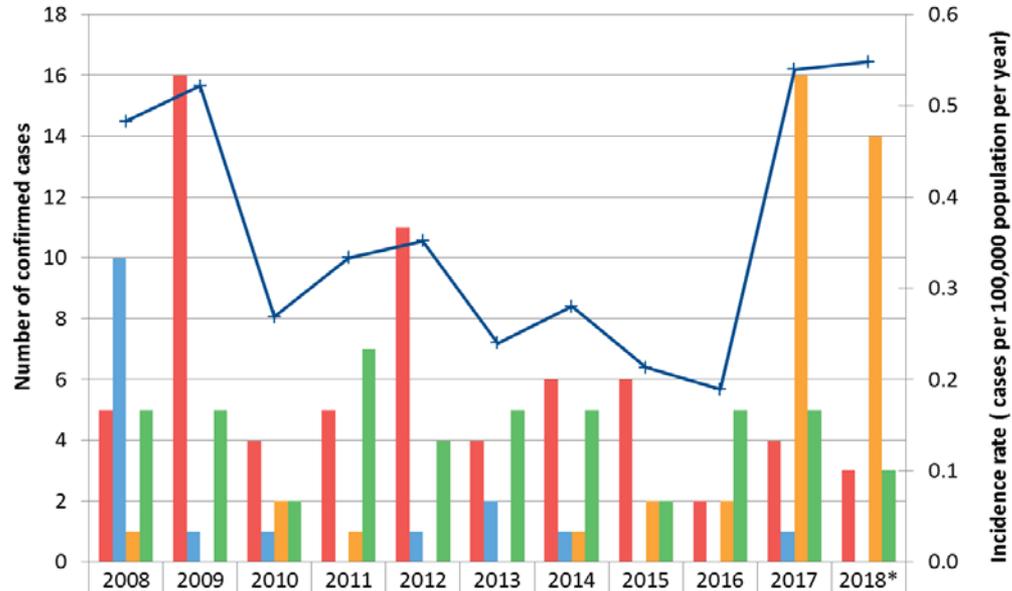
Figure 1. Cases of IMD by week of symptom onset and serogroup, Jan 1-Dec 11, 2017



Clonal complex 11, Serogroup W

- First large W outbreak in 2000: >400 cases, Hajj, pilgrims from 16 countries
 - global dissemination with outbreaks in sub-Saharan Africa, South America, UK, Australia
- UK atypical presentations, and GI symptoms assoc. with fatal outcome
- 2016 Canada: menW 19% of IMD, previously 7%; and 75% of isolates in ST-11 cc (53.5 yo) compared to ST-22 (23.5 yo) previously
- BC:
 - up to 2016: 5 ST11 cc
 - 2017: 16W; 15 were ST11/ET37: 10 IHA 3 FHA 1 VCH 1 VIHA
 - ST11: age range 6 months to 97 yo; median 23 yo; 2/15 fatal

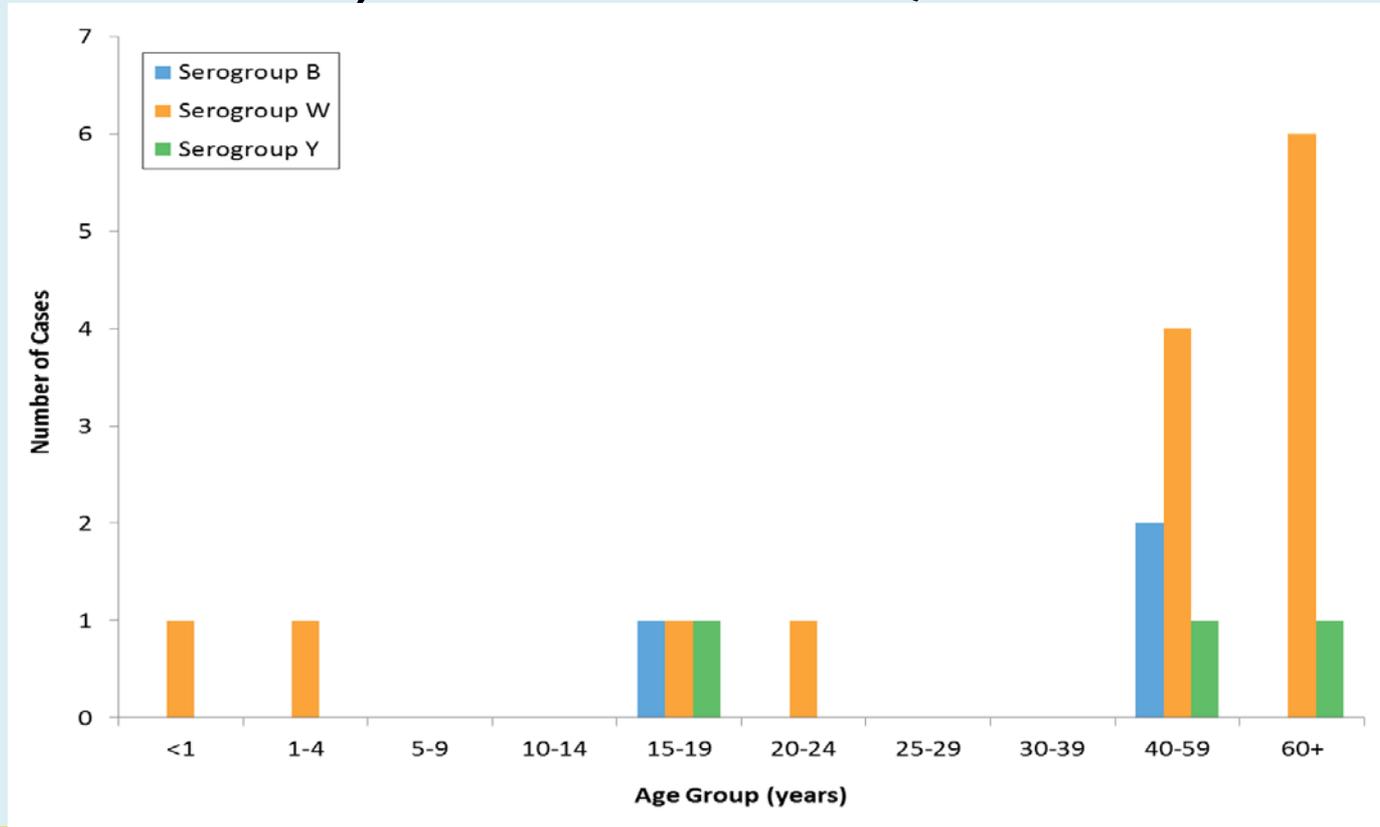
IMD cases and rate by serogroup BC, 2008- end of Q3 2018



■ Serogroup B	5	16	4	5	11	4	6	6	2	4	3
■ Serogroup C	10	1	1	0	1	2	1	0	0	1	0
■ Serogroup W	1	0	2	1	0	0	1	2	2	16	14
■ Serogroup Y	5	5	2	7	4	5	5	2	5	5	3
— Total Incidence	0.48	0.52	0.27	0.33	0.35	0.24	0.28	0.21	0.19	0.54	0.55

IMD cases by age and serogroup

BC, 2008- end of Q3 2018



Conclusions

- MenW is now the dominant serogroup in BC, doubling incidence of IMD
- Preponderance in adolescents and clustering was not observed in 2018, the 3rd year of the grade 9 quadrivalent vaccine program
- Ongoing vigilance of W is warranted

Acknowledgements

- BCCDC Samara David, PHL Linda Hoang, Inna Sekirov, Will Hsiao
- NML Raymond Tsang
- IHA Drs. Karin Goodison & Sue Pollock, Gillian Frosst, Yuhui Xu, Outbreak management team