

Prevention is the new Treatment - Vaccine Updates

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Disclosures

- Presenter Disclosure

- I have no current or past relationships with commercial entities
- I have received no speaker's fee for this learning activity

- Commercial Support Disclosure

- This program has received no financial or in-kind support from any commercial or other organization

Learning Objectives

- To describe the epidemiology of influenza and invasive meningococcal disease (IMD)
- To review select vaccines for influenza and IMD available
- To discuss updates in vaccine related guidelines and resources

Influenza - Background

- Respiratory infection caused by influenza A or B viruses
- Influenza A viruses:
 - Classified into subtypes based on two surface proteins – haemagglutinin (HA) and neuraminidase (NA)
 - 3 subtypes of HA (H1, H2, H3) and 2 of NA (N1, N2) cause widespread disease
- Influenza B viruses:
 - 2 lineages – B/Yamagata and B/Victoria

Influenza - Background

- Individuals at high risk of complications or hospitalizations:
 - Those with chronic medical conditions
 - Residents of nursing home or chronic care facilities
 - Adults \geq 65 years old
 - Children 6 to 59 months of age
 - All pregnant women

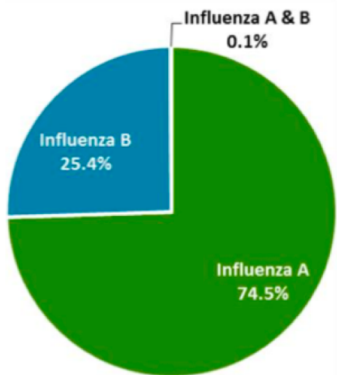
- Serious influenza-related complications:
 - Pneumonia (viral or secondary bacterial)
 - Worsening of underlying medical conditions

Influenza - Epidemiology

- 10-20% of Canadian population contract influenza annually
 - Highest infection rates in children aged 5-9 years
- Morbidity and mortality highest in children <2 years, adults >65 years, and patients with underlying medical conditions
 - Canada: ~3,500 deaths annually
 - Ontario: annual averages of 272 deaths and over 620,000 health care utilization episodes

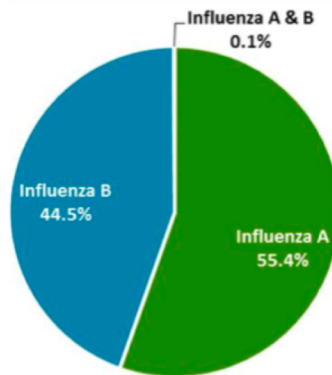
Influenza - Epidemiology

< 5 years



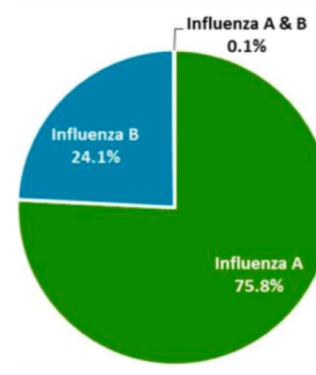
Influenza A
A/H3N2 – 60.2%
A/H1N1 – 39.8%

5-19 years



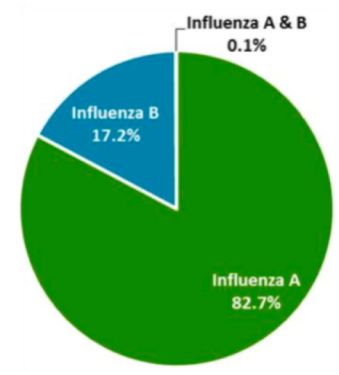
Influenza A
A/H3N2 – 71.3%
A/H1N1 – 28.7%

20-64 years



Influenza A
A/H3N2 – 59.5%
A/H1N1 – 40.5%

65+ years



Influenza A
A/H3N2 – 91.5%
A/H1N1 – 8.5%

Influenza - Epidemiology

- 2012 Public Health Agency of Canada Survey Report:
 - Influenza immunization rate remained unchanged since 2001
 - General population: ~37%
 - Adults >65 years: ~65%
 - Adults 18-64 years with chronic medical conditions: ~38%
- 2017 Public Health Agency of Canada Impact Study:
 - Pharmacist expanded scope resulted in 5% vaccine uptake (95% CI 1.02-1.08)

Publicly Funded Influenza Vaccines – 2018/19

Vaccine Products	Quadrivalent Inactivated Vaccines (QIVs)		Quadrivalent Live Attenuated Influenza Vaccine (Q-LAIV)	High-Dose Trivalent Inactivated Vaccines (High-Dose TIV)
Viral Strains Contained	A/H3N2, A/H1N1 B/Yamagata, B/Victoria (15 mcg per antigen for QIVs) (10 fluorescent focus units of each strain for Q-LAIV)			A/H3N2, A/H1N1 B/Victoria (60 mcg per antigen)
Brand Name	FluLaval® Tetra	Fluzone® Quadrivalent	FluMist® Quadrivalent	Fluzone® High-Dose
Dosage	1 dose (0.5 mL)*	1 dose (0.5 mL)*	1 dose (0.2 mL total, 0.1 mL in each nostril)*	1 dose (0.5 mL)
Administration	Intramuscular	Intramuscular	Intranasal spray	Intramuscular
Age Indications	≥6 months	≥6 months	2 to 59 years	≥65 years
Formats	Multi-dose vials	Multi-dose vials Prefilled syringes	Prefilled sprayers	Prefilled syringes

*2 doses required in the current season, given 4 weeks apart in children less than 9 years old receiving influenza vaccine for the very first time.

Publicly Funded Influenza Vaccines – 2018/19

Funding Eligibility by Age Group			
Age Group	Quadrivalent Inactivated Vaccines (QIVs)	Quadrivalent Live Attenuated Influenza Vaccine (Q-LAIV)	High-Dose Trivalent Inactivated Vaccines (High-Dose TIV)
6 to 23 months	✓		
2 to 17 years	✓	✓	
17 to 64 years	✓		
65 years and older	✓		✓

MF59-Adjuvanted Trivalent Inactivated Influenza (TIV) Vaccine – Flud[®]/ Flud Pediatric[®]

- Not publicly funded for the 2018/19 influenza season
- MF59: oil-in-water emulsion to help stimulate immune response

Viral Strains Contained	A/H3N2, A/H1N1 B/Victoria (15 mcg per antigen)	
Brand Name	Flud [®]	Flud Pediatric [®]
Dosage	1 dose (0.5 mL)	1 dose (0.25 mL)*
Administration	Intramuscular	Intramuscular
Age Indications	≥65 years	6 months to 2 years
Formats	Prefilled syringe	Prefilled syringe

*2 doses required in the current season, given 4 weeks apart in children less than 9 years old receiving influenza vaccine for the very first time.

National Advisory Committee on Immunization (NACI) Guideline Update

- Fluzone[®] High-Dose (High-Dose TIV):
 - Provides superior protection compared to standard-dose TIV in adults ≥ 65 years
 - No evidence identified comparing high-dose vaccines to the MF59-adjuvanted standard-dose TIV vaccine
- Flud[®] (MF59-Adjuvanted standard-dose TIV vaccine):
 - May be effective at reducing hospitalization and influenza complications in adults ≥ 65 years compared to those unvaccinated
 - Insufficient evidence comparing to unadjuvanted TIV subunit vaccines

National Advisory Committee on Immunization (NACI) Guideline Update

- Insufficient evidence comparing subunit to split virus standard-dose vaccines in terms of vaccine effectiveness and immunogenicity in older adults

Brand Name	Influvac®	Fluviral®	Agriflu®	Fluad® (Adult and Peds)	Fluzone® High-Dose	FluMist® Quadrivalent	FluLaval® Tetra	Fluzone® Quadrivalent
Vaccine Product	TIV	TIV	TIV	TIV	TIV	Live attenuated	QIV	QIV
Vaccine Type	Subunit	Split	Subunit	Subunit	Split	Live attenuated	Split	Split

Meningococcus – Background

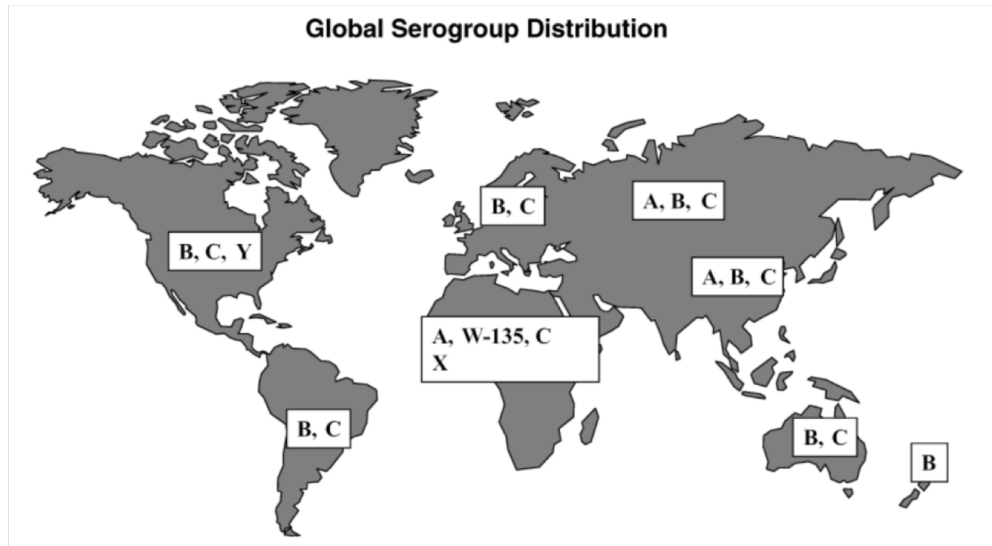
- *Neisseria meningitidis*
 - Gram-negative diplococcus
 - At least 13 different serogroups
 - 5 associated with invasive meningococcal disease (IMD): A, B, C, W-135, and Y
 - Transmitted through droplets of respiratory or throat secretions

Meningococcus – Background

- Individuals at high risk of IMD:
 - Children <5 years of age
 - Asplenia
 - Immunocompromised
 - Travelers to endemic areas
 - Certain occupations (e.g. military personnel, research or lab personnel)

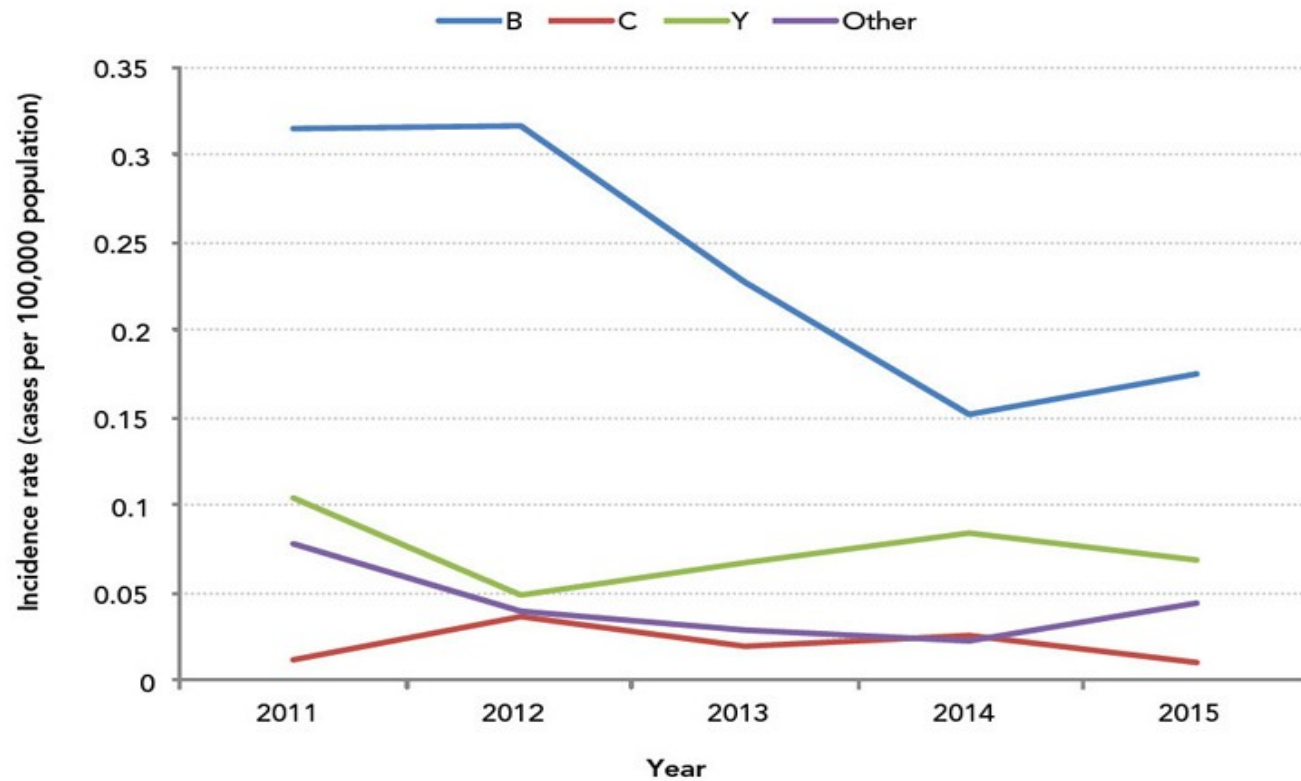
- Long-term sequelae:
 - Hearing loss
 - Neurologic disabilities

Meningococcus – Epidemiology



- Estimated 500,000 cases of IMD annually worldwide
- Highest rates in infants and adolescents

Meningococcus – Epidemiology



Multicomponent Meningococcal B Vaccine – Bexsero[®] (4CMenB)

Bacterial Components	NadA (Neisserial adhesion A) NHBA (Neisseria Heparin Binding Antigen) fHbp (factor H Binding Protein) PorA P1.4 (main antigen of Outer Membrane Vesicles)
Dosage	0.5 mL per dose *Number of doses and intervals are age specific
Administration	Intramuscular
Age Indications	2 months to 25 years
Formats	Prefilled syringes
Publicly Funding Eligibility (High Risk Vaccine Program) • 2 months to 17 years of age • Eligible for 2 to 4 doses	<ul style="list-style-type: none"> • Acquired complement deficiencies (e.g., receiving eculizumab) • Asplenia (functional or anatomic) • Cochlear implant recipients (pre/post implant) • Complement, properdin, factor D or primary antibody deficiencies • HIV

Canadian Immunization Guide Update

- Bexsero® age indication for children aged 2 months to 11 months updated
- Pending updates:
 - Bexsero® dosage for children aged 2 months to 11 months
 - NACI statement on another meningococcal group B vaccine - Trumenba™
- Bexsero® Product Monograph:
 - 2 to 5 months: 4 doses total
 - 2, 4, and 6 months of age, followed by the fourth dose (booster) between 12 and 23 months of age
 - 2, 3, and 4 months of age, followed by the fourth dose (booster) between 12 and 23 months of age
 - 6 to 11 months: 3 doses total, at least 2 months between doses
 - Third dose is given between 12 and 23 months of age (at least 2 months after second dose)

Canadian Immunization Guide Update

- Immunization Guide:
 - Travelers 2 to 11 months of age: 2 or 3 doses given 8 weeks apart (with another dose between 12-23 months of age at least 8 weeks from previous dose)
 - Post-exposure and outbreak control:
 - 2 to less than 6 months:
 - Unvaccinated: 1 dose immediately exposure, then 2 more doses with at least a 4 week interval
 - Previously vaccinated: 1 dose immediately exposure
 - 6 months to less than 11 years:
 - Unvaccinated: 1 dose immediately exposure, then 1 more dose with at least a 8 week interval
 - Previously vaccinated: 1 dose immediately exposure
 - High risk individuals from medical conditions 2 to 11 months of age: 2 or 3 doses given 8 weeks apart (with another dose between 12-23 months of age)

Meningococcal group B vaccine – Trumenba™

Bacterial Components	Bivalent: two recombinant lipoprotein (rLP2086) antigens from fHbp (factor H Binding Protein) subfamilies A and B fHBP variants A05 (subfamily A) and B01 (subfamily B).
Dosage	0.5 mL per dose Routine immunization: 2 doses total, administered 6 months apart Individuals at increased risk of invasive meningococcal disease: 3 doses total; 2 doses, administered at least 1 month apart, followed by a third dose at least 4 months after the second dose
Administration	Intramuscular
Age Indications	10 to 25 years
Formats	Prefilled syringes
Publicly Funding Eligibility	Not publicly funded in Ontario

Not interchangeable with Bexsero®. Need to complete the series with the same vaccine.

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