# Linking Public Health and Health Care: Infectious Disease and Immunization

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Thunder Bay Medical Society – Winter school
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# Conflict of Interest Declaration: Nothing to Disclose

**Presenter:** Dr. Janet DeMille

**Title of Presentation:**

Linking Public Health and Health Care - Infectious Disease and Immunization

**I have no financial or personal relationship related to this presentation to disclose.**

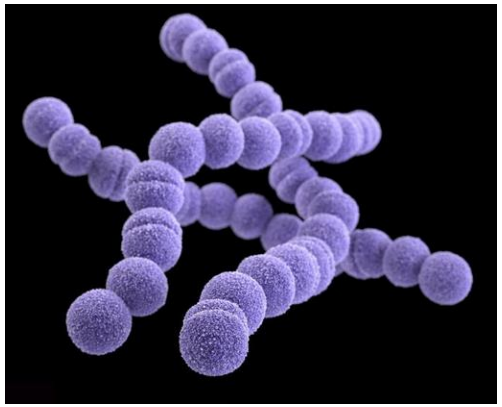
# Objectives:

- List emerging issues in infectious diseases to their practice;
- Apply updates in immunization to their practice
- Demonstrate communication/collaboration between public health and health care providers for the benefit of patients and the population.

# Outline:

- Group A strep
  - Invasive GAS
  - Rheumatic fever, Post-strep GN
  - TBDHU/NWO/provincial context
- Gonorrhea
- Childhood Immunization

# Group A strep (GAS):



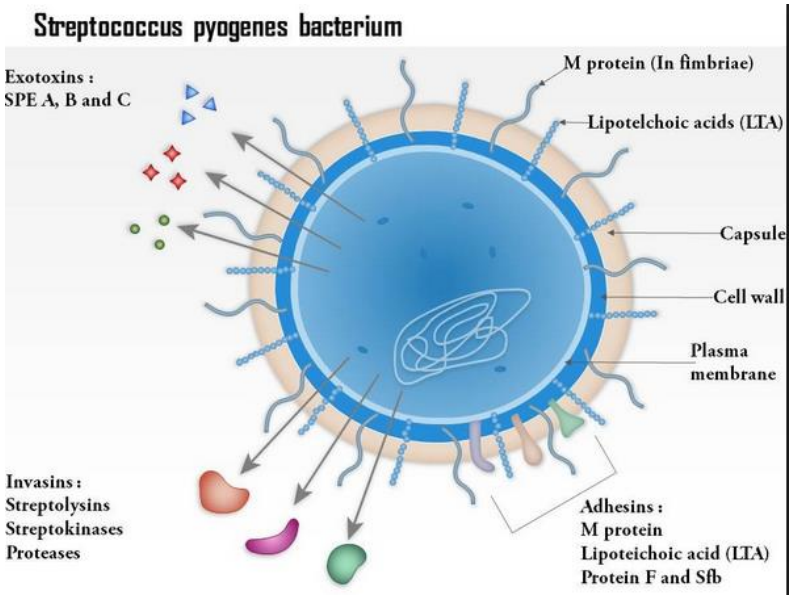
- *Streptococcus pyogenes*
- Gram positive bacterium
- Range of diseases-
  - Pharyngotonsillitis
  - Skin and soft tissue infections
  - Hematogenous
  - Non-suppurative:  Acute rheumatic fever, post-strep glomerulonephritis
  - Scarlet fever, Streptococcal toxic-shock, post-partum sepsis, endocarditis, …..
- Transmission – respiratory droplets, direct contact with respiratory secretions or lesions; needle sharing
- Incubation period 1-3 days; period of communicability 10-21 days
- Asymptomatic carriers

  15-20% school aged children

  <5% adults

# GAS serotypes:

- M protein
- *emm* gene - serotype often referred to as the “emm type”
- Important virulence factor
  - M protein prevents phagocytosis; inhibits activation of complement pathway…
- Over 200 *emm* types



# Invasive GAS (iGAS):

**Confirmed case:**

- Isolation of Group A Streptococcus or DNA detection by nucleic acid amplification test (NAAT) from a normally sterile site (e.g., blood, cerebrospinal fluid, joint, pleural, pericardial fluid) with or without evidence of clinical severity, OR,

- Isolation of Group A Streptococcus from a non-sterile site (e.g., skin) with evidence of severity.

**Evidence of Clinical severity:**

- Streptococcal toxic-shock syndrome, OR
- Soft-tissue necrosis, including necrotizing fasciitis or myositis or gangrene, OR
- Meningitis, OR
- Death, OR
- A combination of any of these conditions.

# Invasive GAS (iGAS):

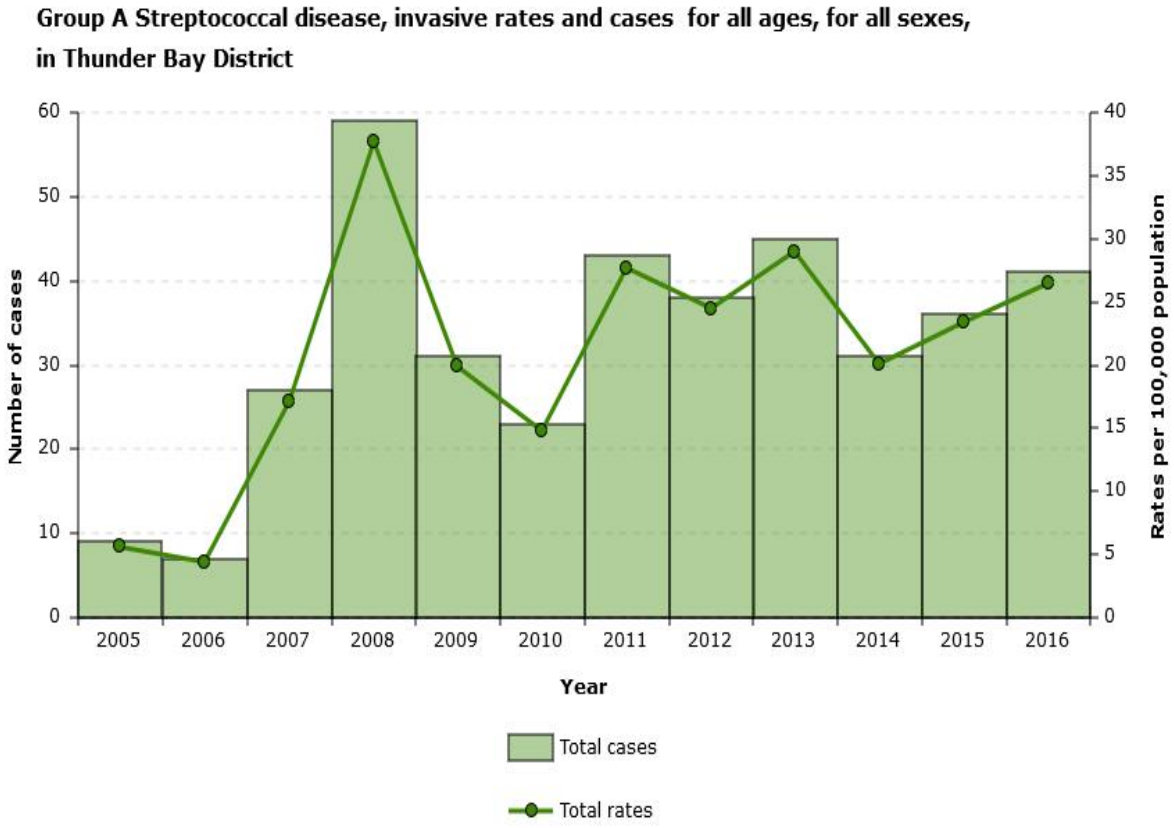
**Risk factors**:

- Extremes of age
- Underlying medical conditions ex. diabetes
- Skin conditions
- Alcohol dependence
- First Nations
- Injection drug use
- Social determinant of health – housing, SES,…
- Access to health care

**Seasonal trend:**

- Worse in late fall and winter

# iGAS Epidemiology – local/regional:




2008
59 cases
37.7 per 100,000

2016
41 cases in total
26.5 per 100,000

**2017:**
**71 cases in total**
**47.5 per 100,000**

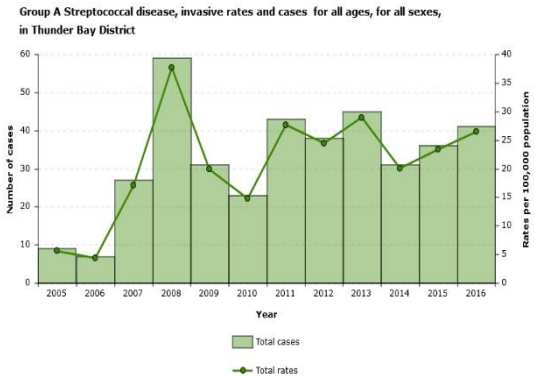
# iGAS Epidemiology – local/regional:

2008:
59 cases in total
*emm* 59 cases spiked over a two month period in the spring
- first appearance of *emm* 59 in Ontario
- associated with broader pan-Canadian outbreak (largely in the west)

2017:
71 cases
~40% of cases are *emm*81
14 cases are *emm*74 – 13 of these occurred in the last three months of 2017
~50% of cases from Oct-Dec were *emm*74

*emm* 74 associated with outbreak in London and Toronto.

In general, *emm* types for cases in TBDHU tend to vary through month and years.



# Epidemic of Group A *Streptococcus* M/*emm*59 Causing Invasive Disease in Canada

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***Background.*** The incidence of invasive group A *Streptococcus* (GAS) disease can vary over time and geographic region, possibly reflecting the population's susceptibility to particular strains but also variation in the predominant M/*emm* types. Canadian surveillance documented an epidemic of an uncommon M/*emm*59 type from 2006 to

AMERICAN SOCIETY FOR MICROBIOLOGY | Journal of Clinical Microbiology

# High Incidence of Invasive Group A *Streptococcus* Disease Caused by Strains of Uncommon *emm* Types in Thunder Bay, Ontario, Canada

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**An outbreak of type *emm*59 invasive group A *Streptococcus* (iGAS) disease was declared in 2008 in Thunder Bay District, Northwestern Ontario, 2 years after a countrywide *emm*59 epidemic was recognized in Canada. Despite a declining number of *emm*59 infections since 2010, numerous cases of iGAS disease continue to be reported in the area. We collected clinical information on**


Open Forum Infectious Diseases
MAJOR ARTICLE

# High Incidence of Invasive Group A Streptococcal Infections in Remote Indigenous Communities in Northwestern Ontario, Canada

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***Background.*** Worldwide, indigenous populations appear to be at increased risk for invasive group A streptococcal (iGAS) infections. Although there is empirical evidence that the burden of iGAS disease is significant among remote First Nations communities

OPINION

# Streptococcus outbreak in Canada is part of a larger story

ANDRÉ PICARD ›
PUBLIC HEALTH REPORTER
PUBLISHED NOVEMBER 28, 2017

The Middlesex-London Health Unit has issued an alert about a continuing outbreak of invasive group A streptococcus (iGAS).

There have been 132 reported cases of the bacterial infection since April, 2016.

To date, there have been nine deaths, 20 cases of necrotizing fasciitis (flesh-eating disease), 20 cases of toxic shock and 29 others have ended up in intensive care with other grave symptoms.

TRENDING

1 Why Trump continues to dodge impeachment

2 U.S. withholds $65-million in Palestinian aid after Trump thre

3 You're either with Trump or yo reasonable person

4 Canadian researchers test new s cell therapy for diabetes

# Acute rheumatic fever:

Clinical Discovery | Research

## Acute rheumatic fever in First Nations communities in northwestern Ontario

*Social determinants of health "bite the heart"*

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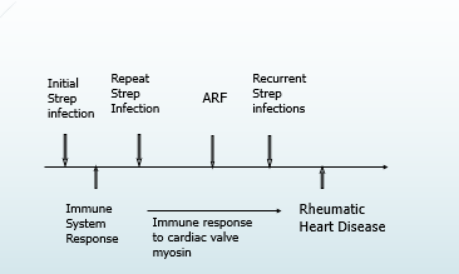
Abstract

***Objective*** To document a case series of 8 young First Nations patients diagnosed with acute rheumatic fever (ARF), a preventable disease that resulted in the death of 2 patients, in northwestern Ontario in the context of late diagnosis, overcrowded housing, and inadequate public health response.

- Previously (2009) – 5 cases in preceding 36 months
- 2010-2015 – 8 cases (all in preceding 18months), at least 2-3 more since

- Incidence rate of 21.3 cases per 100,000 – 75x higher than CPS reported rate 2004-2007
- Similar to Australia (now comprehensive ARF guidelines, reportable disease)

Sequence of infection/response



# Post-strep glomerulonephritis (PSGN):

- Disease characterized by the sudden appearance of edema, hematuria, proteinuria, and hypertension.
- A "nephritic syndrome" induced by immune-complex glomerulonephritis (GN) – DDX idiopathic, post-infectious, multisystem diseases e.g. HSP, SLE
- Triggered by an infection – occurs ~10d after pharyngitis and ~14 days after impetigo – nephritogenic strain of GAS
- Most commonly children aged 2-6 years in winter months, can be adult

**ASPGN in NW Ontario**

- January 1, 2010 to December 31, 2015
- 235 patient charts reviewed
- 15 cases: 6 confirmed, 8 probable, 1 possible
- 10 pediatric, 5 adults

- 7 pediatric cases in one community - Sept-Nov, 2017

- Likely many cases missed – never referred out or worked up

Credit: Dr. Y. Schreiber

# Public health:

- Reportable disease (iGAS)
  - Surveillance
- Case and contact management
  - prophylaxis according guidelines.
- Mobile Outreach – Thunder Bay
- Connection with community partners – ex. Shelter, organizations that work with disadvantaged populations, etc
- Connecting regionally and provincially with partners to share information, manage situations, and discuss options for more comprehensive approach

# Three things to know:

## Gonorrhea

# Three things to know:

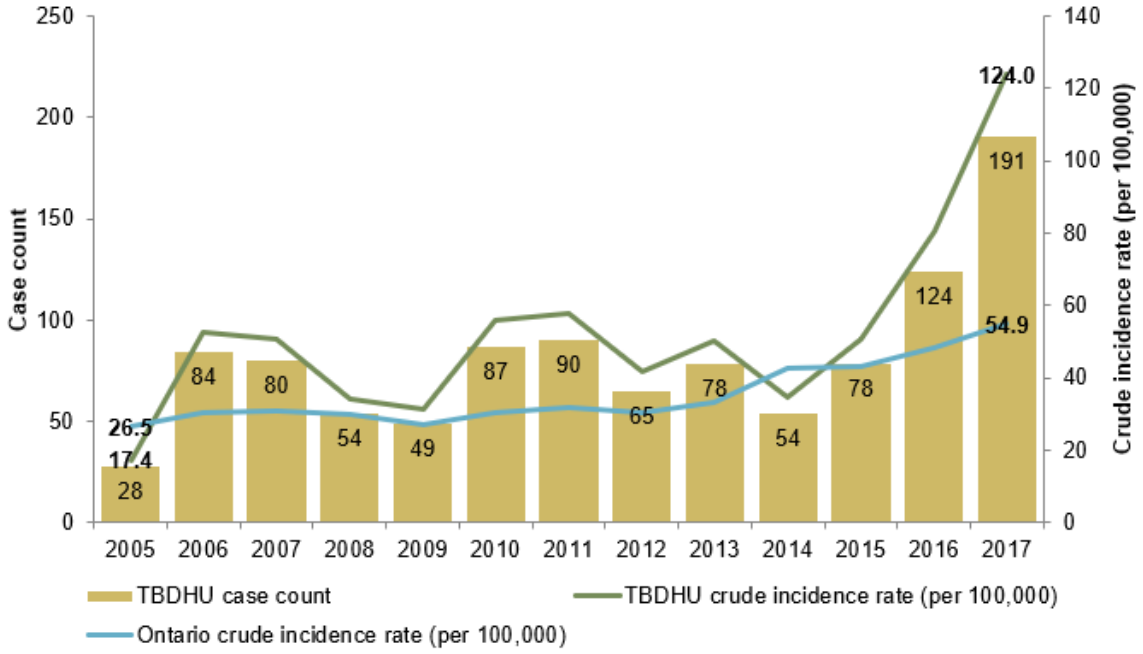
## Gonorrhea

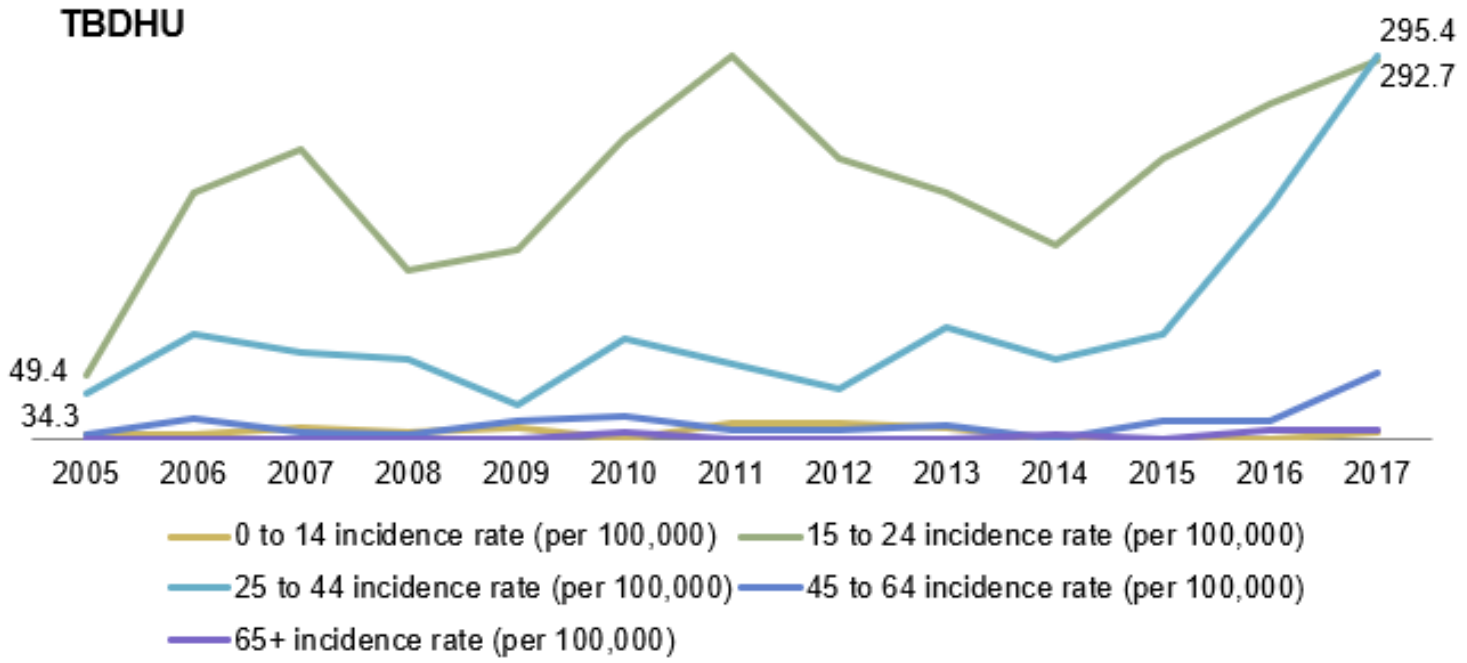
1. **Rates are going up.**

<u>2017 data:</u>

Males (50.8%)  Females (49.2%)

~60% of cases are in 25-44 y.o
~28% of cases are in 15-24 y.o.




TBDHU
295.4
292.7
49.4
34.3
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
0 to 14 incidence rate (per 100,000)
15 to 24 incidence rate (per 100,000)
25 to 44 incidence rate (per 100,000)
45 to 64 incidence rate (per 100,000)
65+ incidence rate (per 100,000)

# Three things to know:

# Gonorrhea

2. **Co-infection with Chlamydia is common.**
   33% of gonorrhea cases in 2017 (TBDHU) also had chlamydia.

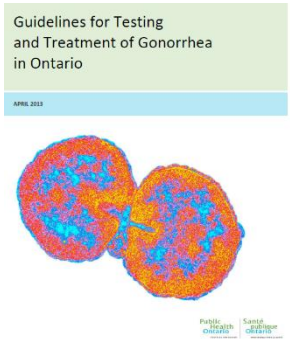
# Three things to know:

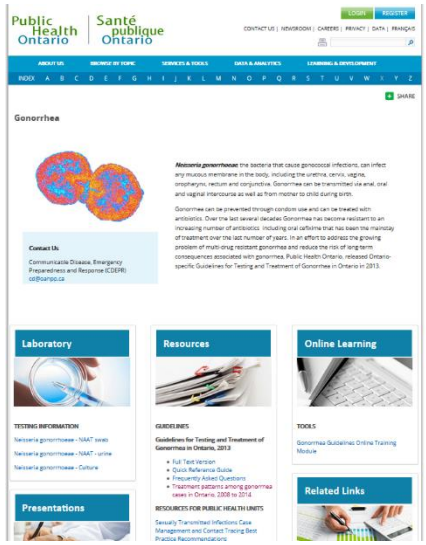
# Gonorrhea

3. **Provincial testing and treatment guidelines for gonorrhea (PHO):**
   Drug resistant Gonorrhea is a significant threat to public health.

   61% of gonorrhea cases in TBDHU were treated with the first line option
   (April 30, 2013 to Dec 31, 2014)

   *Ceftriaxone 250 mg IM plus azithromycin 1 g orally*




https://www.publichealthontario.ca/en/BrowseByTopic/InfectiousDiseases/Pages/IDLandingPages/Gonorrhea.aspx

# Three things to know:

## Childhood Immunization

# Three things to know:
# Childhood Immunization

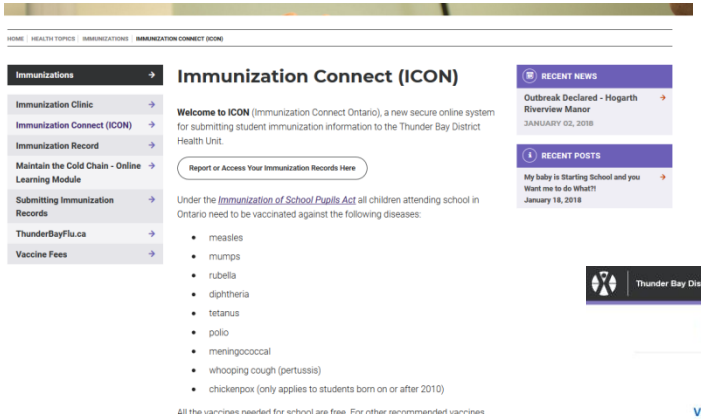
1. ***Immunization of School Pupils Act* process*:***
   a) Parents/Guardians get two notices:
      - Request for Immunization Information (6 weeks before)
      - Order for Suspension from Attendance at School (2 weeks before)

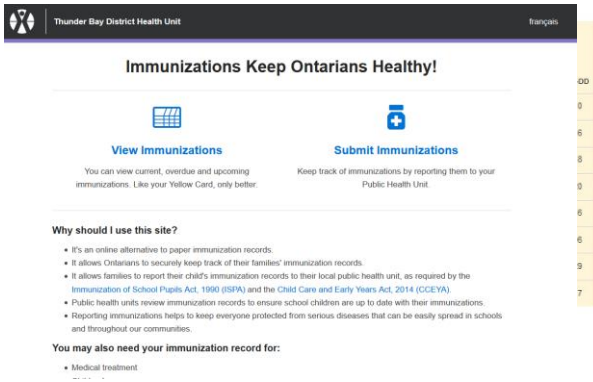
   b) Notices and Suspension Orders are produced based on the info the HU has. Two issues:
      - HU doesn't have a record; it's incomplete; a date is missing, etc.
      - The child has not received one (or more) immunization(s).

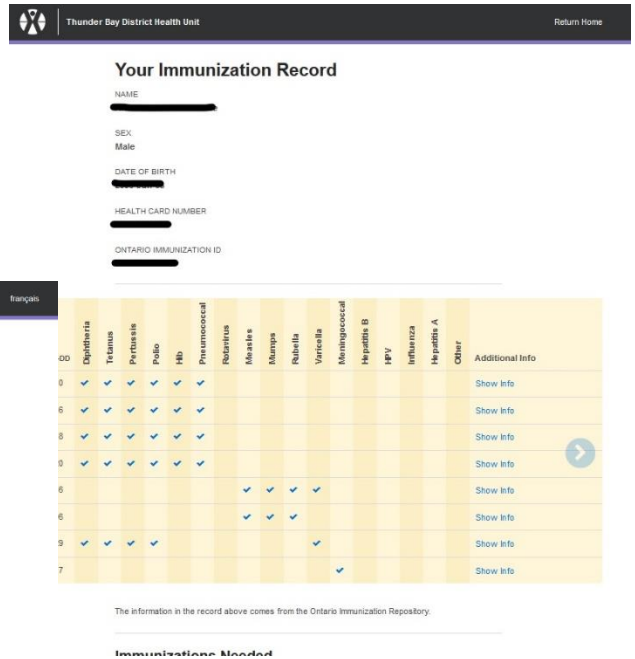
2. **12 month immunizations** must be given ON or AFTER THE FIRST BIRTHDAY for the child's record not to show as incomplete or not up to date.

# Three things to know:
# Childhood Immunization

3. **Immunization Connect Ontario (ICON)**
   - Parents/Guardians can review immunization records; can get pdf copy.
   - Parents/Guardians can submit immunization records.



# Thank you!

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