



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:

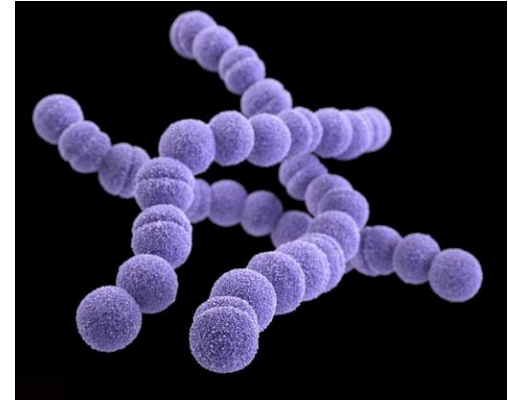
- List emerging issues in infectious diseases to their practice;
- Apply updates in immunization to their practice
- Demonstrate communication/collaboration between public health and health care providers for the benefit of patients and the population.

Outline:

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

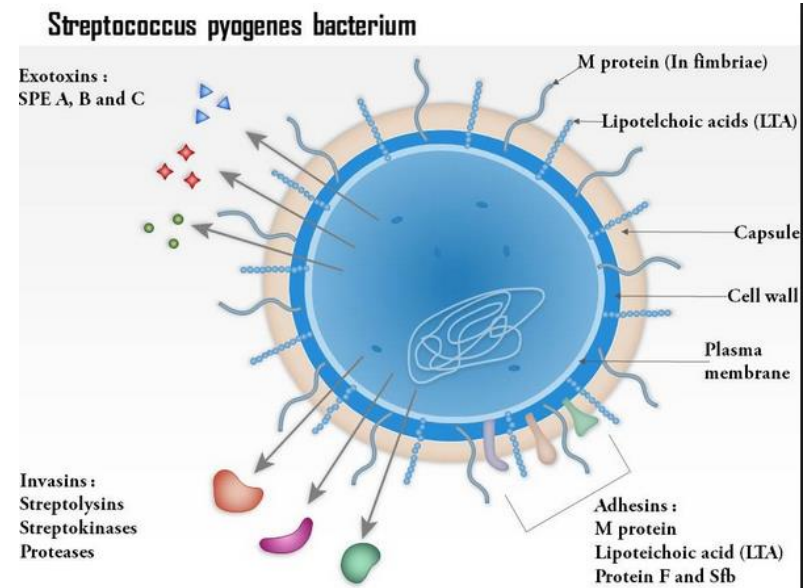
Group A strep (GAS):

- *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:

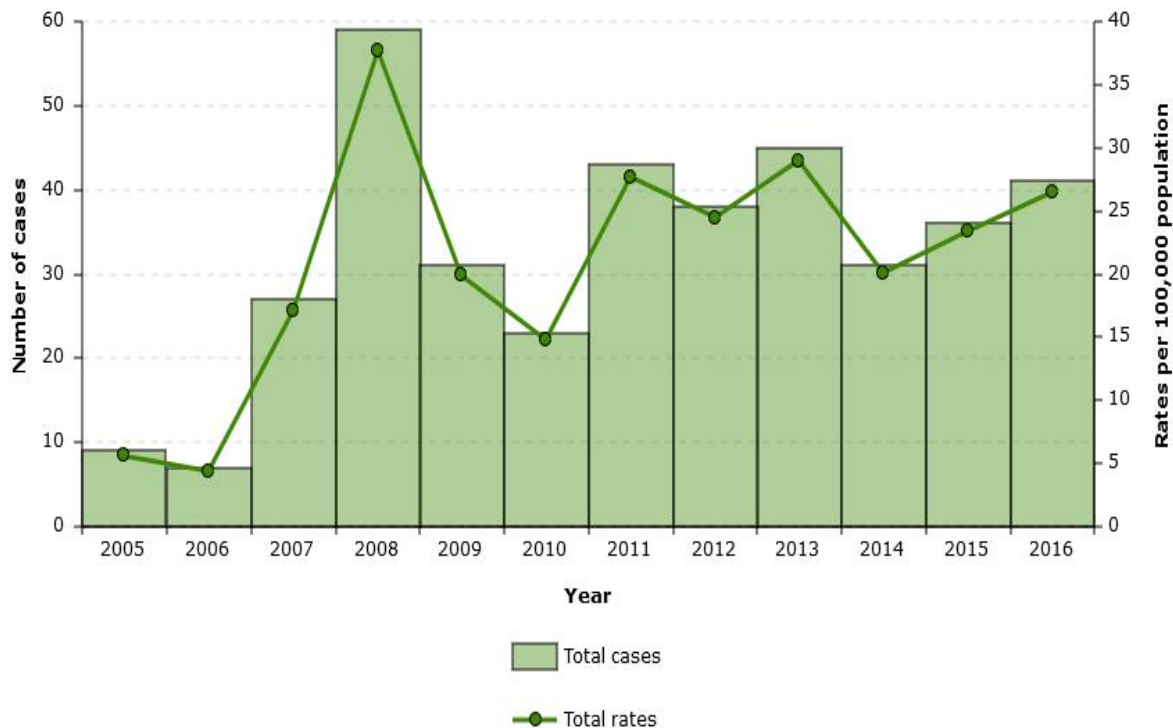
- Extremes of age
- Underlying medical conditions ex. diabetes
- Skin conditions
- Alcohol dependence
- First Nations
- Injection drug use
- Social determinant of health – housing, SES,...
- Access to health care

Seasonal trend:

- Worse in late fall and winter

iGAS Epidemiology – local/regional:

Group A Streptococcal disease, invasive rates and cases for all ages, for all sexes,
in Thunder Bay District



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

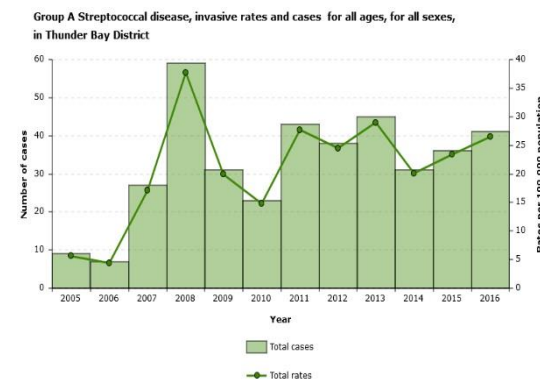
~40% of cases are *emm*81

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/emmm59 Causing Invasive Disease in Canada

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Background. The incidence of invasive group A *Streptococcus* (iGAS) disease can vary over time and geographic region, possibly reflecting the population's susceptibility to particular strains but also variation in the predominant M/emmm types. Canadian surveillance documented an epidemic of an uncommon M/emmm59 type from 2006 to 2010.



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

Natalie Bocking,¹ Cai-lei Matsumoto,² Kassandra Loewen,³ Sarah Teatero,⁴ Alex Marchand-Austin,⁵ Janet Gordon,⁶ Nahuel Fittipaldi,^{7,8} and Allison McGeer¹

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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 threat
- 3 You're either with Trump or you're a reasonable person
- 4 Canadian researchers test new cell therapy for diabetes

CBC London

9 dead in London area in bacterial outbreak, says Health Unit

Symptoms include: fever, chills, sore throat, dizziness, confusion, severe pain, redness and swelling

9:45 AM - Posted Nov 27, 2017 3:19 PM ET - Last updated Nov 27, 2017 3:19 PM ET



Health officials have issued an alert, saying nine people have died in an ongoing invasive group A streptococcus outbreak in the London area. The outbreak was declared more than 18 months ago and the

London Weather

Humidity	Today	Friday	Saturday	Sunday
90%	10°C	10°C	10°C	10°C



Acute rheumatic fever:

Clinical Discovery | Research ▾

Acute rheumatic fever in First Nations communities in northwestern Ontario

Social determinants of health "bite the heart"

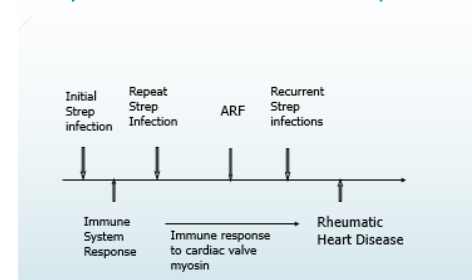
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Natalie Bocking MD MPH CCFP Brittany Blakelock Michelle Haavalsrud RN MPH Christine Kennedy MD DPhil CCFP FRCP C
Terri Farrell MBChB DCH CCFP Lloyd Douglas MBBS Len Kelly MD MSc CCFP FRBM

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 18 months), 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

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

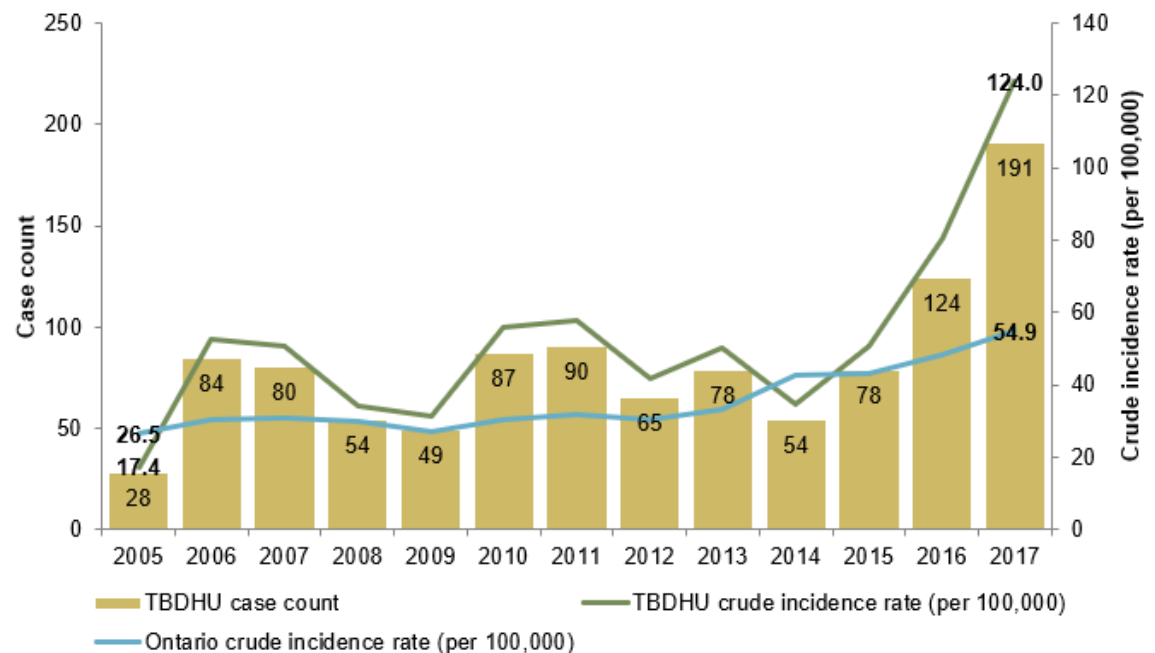
1. Rates are going up.

2017 data:

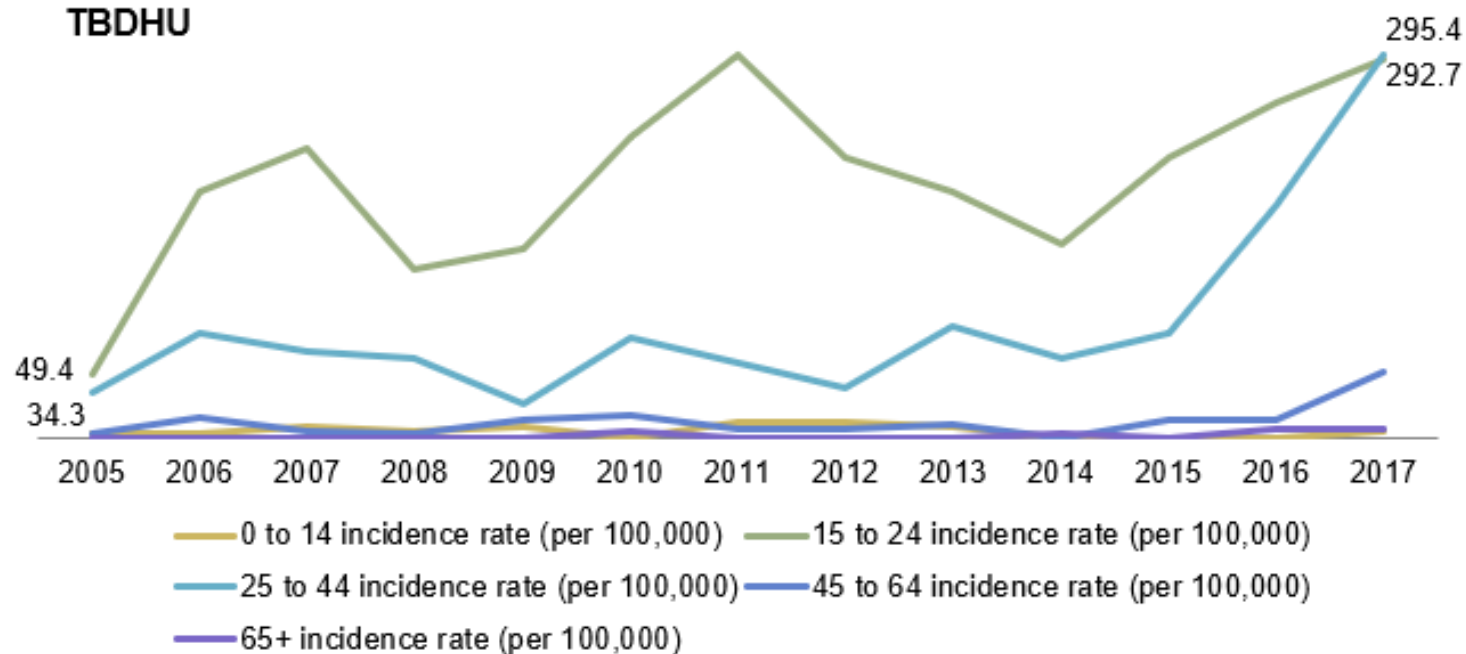
Males (50.8%) Females (49.2%)

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

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



TBDHU



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

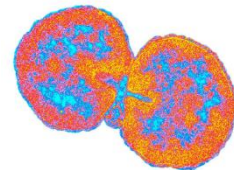
3. Provincial testing and treatment guidelines for gonorrhea (PHO):
Drug resistant Gonorrhea is a significant threat to public health.

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

Guidelines for Testing and Treatment of Gonorrhea in Ontario

APRIL 2013



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Gonorrhea

Abstract: *Neisseria gonorrhoeae* (the bacteria that cause gonorrhea infections), can infect any mucous membrane in the body, including the urethra, cervix, vagina, proctodermis, rectum and conjunctiva. Gonorrhea can be transmitted via oral, anal and vaginal intercourse as well as from mother to child during birth.

Gonorrhea can be prevented through condom use and can be treated with antibiotics. Over the last several decades Gonorrhea has become resistant to an increasing number of antibiotics. Including oral cephalosporins that has been the mainstay of treatment over the last number of years. In an effort to address the growing problem of multi-drug resistant gonorrhea and reduce the risk of long-term consequences associated with gonorrhea, Public Health Ontario released Ontario-specific Guidelines for Testing and Treatment of Gonorrhea in Ontario in 2013.

Contact Us: Communicable Disease, Emergency Preparedness and Response (CDERP)

Laboratory

Resources

Online Learning

TESTING INFORMATION

- Neisseria gonorrhoeae - "NAAT" tests
- Neisseria gonorrhoeae - "NAAT" - urine
- Neisseria gonorrhoeae - Culture

GUIDELINES

Guidelines for Testing and Treatment of Gonorrhea in Ontario, 2013

- Full Test Version
- Quick Reference Guide
- Frequently Asked Questions
- Treatment patterns among gonorrhea cases in Ontario, 2008 to 2016

PRESENTATIONS

RESOURCES FOR PUBLIC HEALTH TEAMS

Sexually Transmitted Infections Case Management and Contact Tracing Best Practice Recommendations

Related Links

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.

Immunization Connect (ICON)

Welcome to ICON (Immunization Connect Ontario), a new secure online system for submitting student immunization information to the Thunder Bay District Health Unit.

[Report or Access Your Immunization Records Here](#)

Under the *Immunization of School Pupils Act* all children attending school in Ontario need to be vaccinated against the following diseases:

- measles
- mumps
- rubella
- diphtheria
- tetanus
- polio
- meningococcal
- whooping cough (pertussis)
- chickenpox (only applies to students born on or after 2010)

All the vaccines needed for school are free. For other recommended vaccines

Immunizations Keep Ontarians Healthy!

View Immunizations
You can view current, overdue and upcoming immunizations. Like your Yellow Card, only better.

Submit Immunizations
Keep track of immunizations by reporting them to your Public Health Unit.

Why should I use this site?

- It's an online alternative to paper immunization records.
- It allows Ontarians to securely keep track of their families' immunization records.
- It allows families to report their child's immunization records to their local public health unit, as required by the *Immunization of School Pupils Act, 1990 (ISPA)* and the *Child Care and Early Years Act, 2014 (CCEYA)*.
- Public health units review immunization records to ensure school children are up to date with their immunizations.
- Reporting immunizations helps to keep everyone protected from serious diseases that can be easily spread in schools and throughout our communities.

You may also need your immunization record for:

- Medical treatment

Your Immunization Record

NAME: [REDACTED]

SEX: Male

DATE OF BIRTH: [REDACTED]

HEALTH CARD NUMBER: [REDACTED]

ONTARIO IMMUNIZATION ID: [REDACTED]

	Diphtheria	Tetanus	Pertussis	Polio	HB	Pneumococcal	Rotavirus	Measles	Mumps	Rubella	Varicella	Meningococcal	Hepatitis B	HPV	Influenza	Hepatitis A	Other	Additional Info
00																		
0	✓	✓	✓	✓	✓	✓												Show Info
3	✓	✓	✓	✓	✓	✓												Show Info
5	✓	✓	✓	✓	✓	✓												Show Info
9	✓	✓	✓	✓	✓	✓												Show Info
6								✓	✓	✓	✓							Show Info
6								✓	✓	✓								Show Info
9	✓	✓	✓	✓	✓						✓							Show Info
7												✓						Show Info

The information in the record above comes from the Ontario Immunization Repository.

Immunizations Needed

Thank you!



I would like to acknowledge the following people for their contributions to this topics presented here:

- Dr. Emily Groot (Associate MOH at TBDHU)
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- TBDHU staff – Infectious Disease, Sexual Health, Vaccine Preventable Diseases programs