North Bay Parry Sound District Health Unit

Communicable Disease Control Report

Annual report for health care providers on diseases of public health significance

July 2019

Contents

Ticks test positive for Lyme Disease

In 2018, 51 ticks submitted to the health unit by the public were sent for laboratory identification. Thirty (60.0%) were identified as blacklegged ticks, the vector for Lyme disease. Seven of the thirty blacklegged ticks (23.3%) tested positive for *B. burgdorferi*, the bacteria that causes Lyme disease.

A new clinical guidance document, *Management of Tick Bites and Investigation of Early Localized Lyme Disease,* addressing post-exposure prophylaxis and the diagnosis and treatment of early localized Lyme disease is available from the Health Quality Ontario website.[1] For pediatric patients, updated recommendations for post-exposure prophylaxis and treatment of Lyme disease are available on the Canadian Pediatric Society website.[2]

Invasive Bacterial Infections

Invasive Pneumococcal Infections

Introduction of the pneumococcal vaccination program, as well as herd effects related to the conjugate vaccine's impact on *S. pneumoniae* bacterial colonization has resulted in a decreased incidence of invasive pneumococcal disease in certain age groups in Ontario; children under 10 years of age and adults aged 65 and older.[3]

The incidence of invasive pneumococcal disease increased from 2017 to 2018 in the North Bay Parry Sound District Health Unit (NBPSDHU) area and was the highest incidence rate reported since 2009 (Figure 1). Over one-third of all cases (38.9%) reported in 2018 were aged 50 to 59 years and the count (n=7) was above the five year average for this age group. The majority of the cases in this age group (85.7%) met the high-risk eligibility criteria for the publicly funded pneumococcal 23-valent polysaccharide vaccine.[4]

Figure 1. Number and Crude Rate per 100,000 Population of Confirmed and Probable Invasive Pneumococcal Disease Cases, by Region, 2009-2018

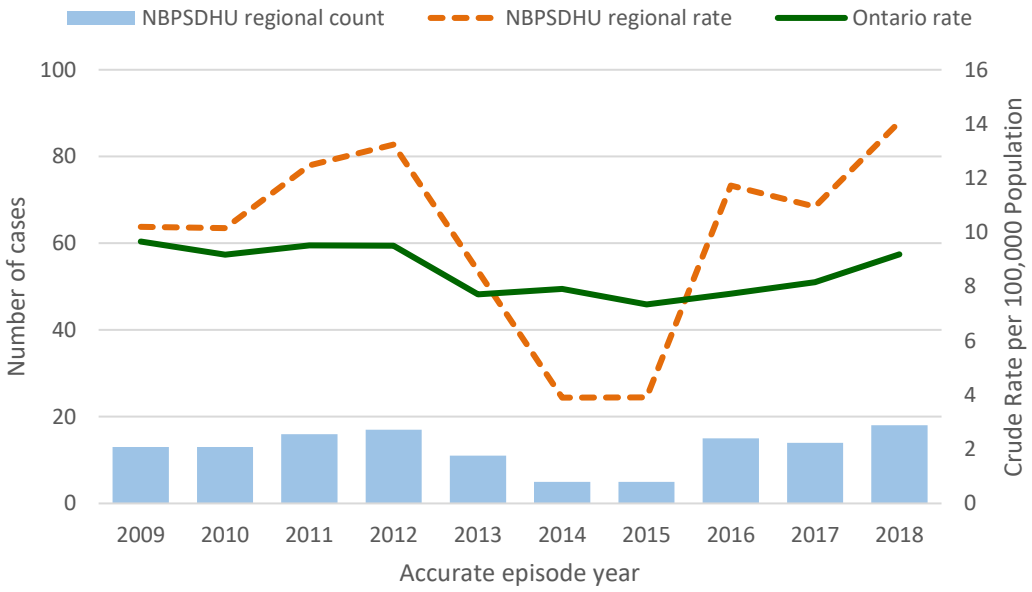
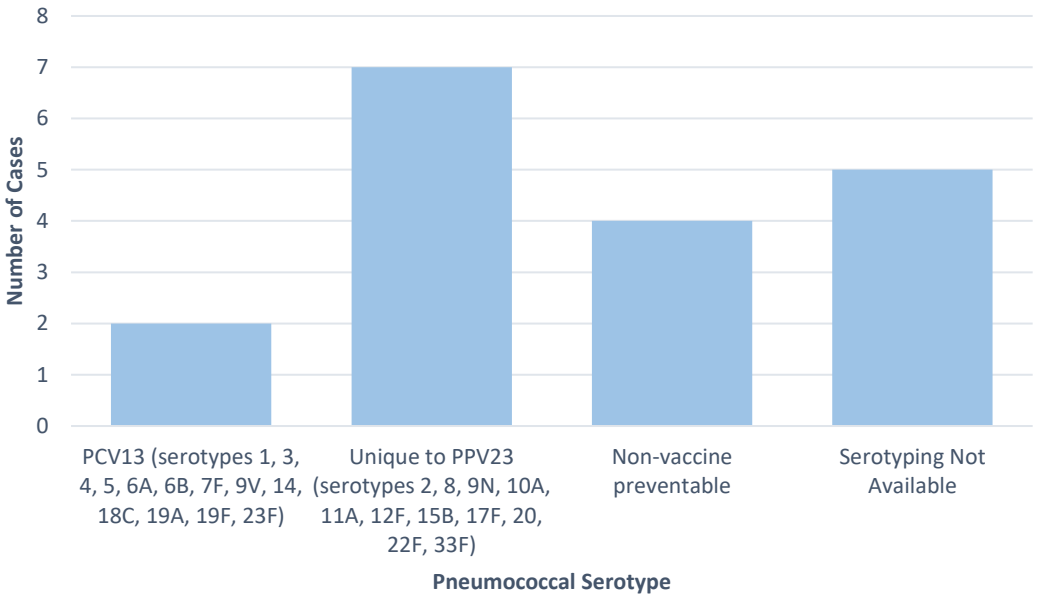


Table 1. Number and Crude Rate per 100,000 Population of Confirmed and Probable Invasive Pneumococcal Disease Cases, by Region, 2009-2018

Accurate episode year	NBPSDHU Region: Number of Cases	NBPSDHU Region: Rate per 100,000 Population	Ontario: Rate per 100,000 Population
2009	13	10.2	9.7
2010	13	10.2	9.2
2011	16	12.5	9.5
2012	17	13.2	9.5
2013	11	8.6	7.7
2014	5	3.9	7.9
2015	5	3.9	7.3
2016	15	11.7	7.7
2017	14	10.9	8.2
2018	18	14.1	9.2

Half of all cases (50.0%) reported in 2018 had infections caused by a strain of *S. pneumoniae* that is included in the 13-valent conjugate and/or 23-valent polysaccharide pneumococcal vaccines. Twenty-two percent of cases had infections caused by strains that were not vaccine preventable (Figure 2).

Figure 2. Number of Confirmed and Probable Invasive Pneumococcal Disease Cases in the NBPSDHU Area by Serotype, 2018.



PCV13=13-valent pneumococcal conjugate vaccine
PPV23=23-valent pneumococcal polysaccharide vaccine

Table 2. Number of Confirmed and Probable Invasive Pneumococcal Disease Cases in the NBPSDHU Area by Serotype, 2018

Serotype	**Number of Cases**
PCV13 (serotypes 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, 23F)	2
Unique to PPV23 (serotypes 2, 8, 9N, 10A, 11A, 12F, 15B, 17F, 20, 22F, 33F)	7
Non-vaccine preventable	4
Serotyping Not Available	5

Invasive Group A Streptococcal Infections

The incidence of invasive group A streptococcal (iGAS) infections has been rising in Ontario over the last few years.[5] In the NBPSDHU area the highest incidence rate was also reported in 2018 (Figure 3). In the winter of 2018, an outbreak occurred in the NBPSDHU area, which accounted for one-third of all cases reported that year. The majority of outbreak cases had an emm76 serotype of *S. pyogenes*. This serotype was not reported in the district in the previous 10 years and was not a common cause of iGAS infections in Ontario.[6] The most commonly reported risk factors for infection for were: hepatitis C infection, dermatological conditions, injection drug use and other illicit drug use.

Figure 3. Number and Crude Rate per 100,000 Population of Confirmed and Probable Invasive Group A Streptococcal Disease Cases, by Region, 2009-2018

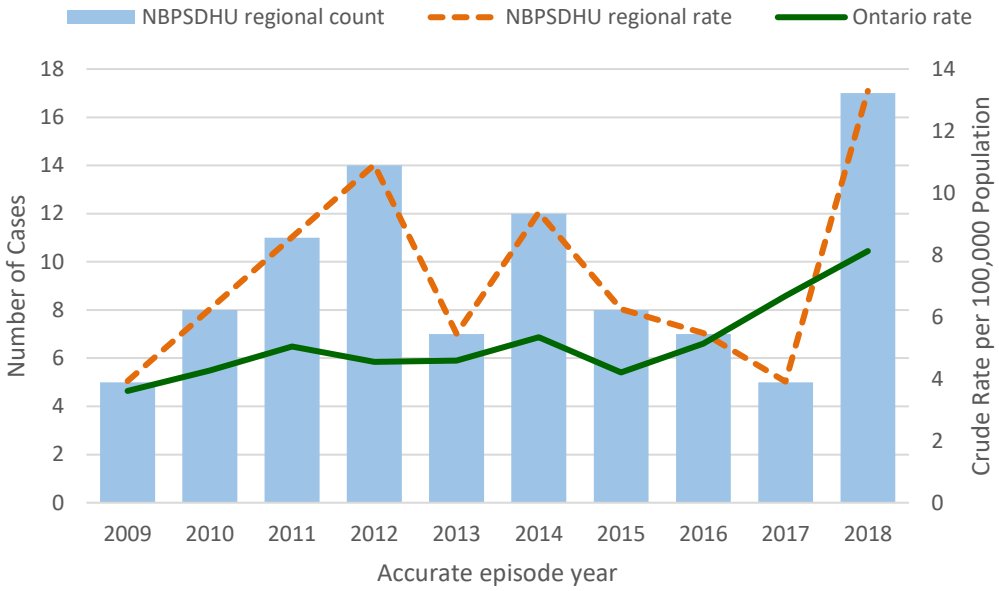


Table 3. Number and Crude Rate per 100,000 Population of Confirmed and Probable Invasive Group A Streptococcal Disease Cases, by Region, 2009-2018

Accurate episode year	NBPSDHU Region: Number of Cases	NBPSDHU Region: Rate per 100,000 Population	Ontario: Rate per 100,000 Population
2009	5	3.9	3.6
2010	8	6.2	4.3
2011	11	8.6	5.0
2012	14	10.9	4.5
2013	7	5.5	4.6
2014	12	9.4	5.3
2015	8	6.3	4.2
2016	7	5.5	5.1
2017	5	3.9	6.7
2018	17	13.3	8.1

Bacterial Meningitis

There was an increased incidence of bacterial meningitis in the NBPSDHU area in 2018, the highest incidence rate reported since 2009 (Figure 4). Causative agents identified for confirmed cases varied and included species from the *Enterobacter*, *Bacillus*, *Fusobacterium* and *Staphylococcus* genera. All of these types of organisms can be found in the environment or as part of normal flora on the skin, gastrointestinal and/or respiratory tracts.[7] They can present as opportunistic infections, infecting hosts who are immunocompromised or who received invasive medical procedures and are colonized with the bacteria.[7] They can also be spread through unwashed hands or contaminated medical devices and instruments. The median age for cases reported in 2018 was 46.3 years and the majority of cases were female. Approximately half (42.9%) of all cases had an underlying medical condition that put them at risk for an invasive bacterial infection.

Figure 4. Number and Crude Rate per 100,000 Population of Confirmed and Probable Bacterial Meningitis Cases in the NBPSDHU Area, 2009-2018

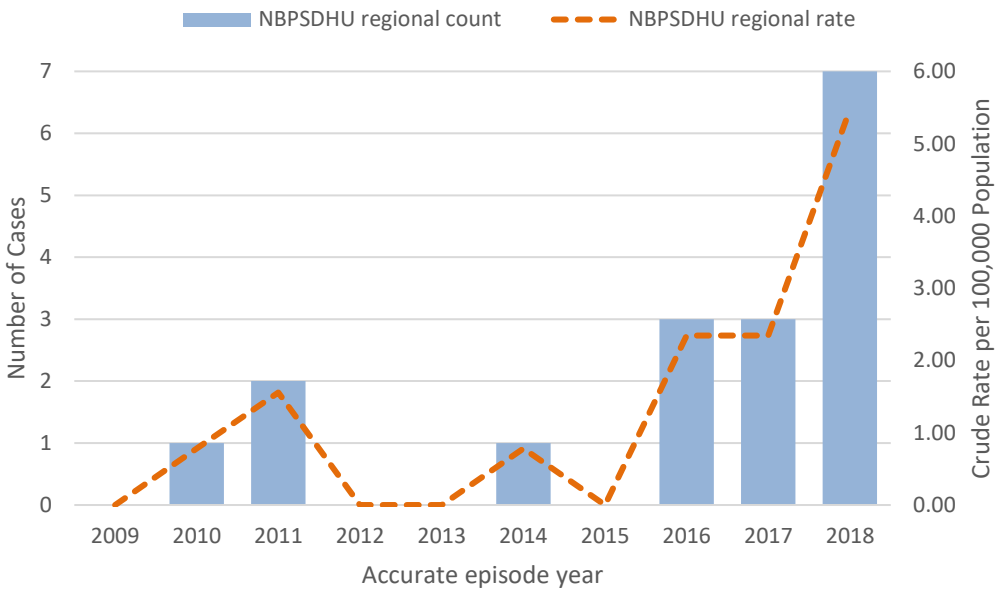


Table 4. Number and Crude Rate per 100,000 Population of Confirmed and Probable Bacterial Meningitis Cases in the NBPSDHU Area, 2009-2018

Accurate episode year	NBPSDHU Region: Number of Cases	NBPSDHU Region: Rate per 100,000 Population
2009	0	0.0
2010	1	0.8
2011	2	1.6
2012	0	0.0
2013	0	0.0
2014	1	0.8
2015	0	0.0
2016	3	2.3
2017	3	2.3
2018	7	5.5

Tuberculosis

Active Cases

There were three confirmed cases of active tuberculosis (TB) in the NBPSDHU area in 2018. This represents the highest incidence rate of tuberculosis (2.3 cases per 100,000 population) in the area since 2009 (Figure 5). Despite this, the incidence rate remains below the provincial incidence rate of 4.7 cases per 100,000 population. There have been no cases of drug resistant TB in the NBPSDHU; all cases were sensitive to first-line TB medications.

Figure 5. Number and Crude Rate per 100,000 Population of Active Tuberculosis Cases, by Region, 2009-2018

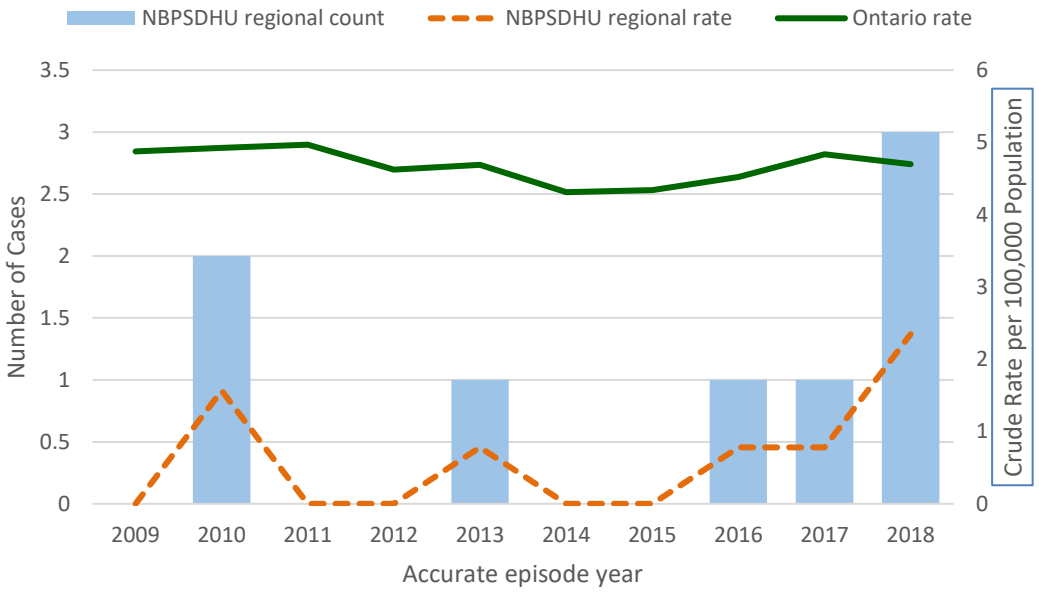


Table 5. Number and Crude Rate per 100,000 Population of Active Tuberculosis Cases, by Region, 2009-2018

Accurate episode year	NBPSDHU Region: Number of Cases	NBPSDHU Region: Rate per 100,000 Population	Ontario: Rate per 100,000 Population
2009	0	0.0	4.9
2010	2	1.6	4.9
2011	0	0.0	5.0
2012	0	0.0	4.6
2013	1	0.8	4.7
2014	0	0.0	4.3
2015	0	0.0	4.3
2016	1	0.8	4.5
2017	1	0.8	4.8
2018	3	2.3	4.7

Latent Tuberculosis Infections

The World Health Organization's (WHO) goal is for global eradication of TB, but they have identified that the number of untreated latent tuberculosis infections (LTBI) hinders this goal.[8] "*In Canada, most TB is understood to be "reactivation" TB, i.e. occurring 18-24 months or more after the initial infection."*[9] Approximately 10% of

those with LTBI will progress to active TB in their lifetime. LTBI treatment can significantly reduce the risk of development into active TB disease and is recommended for those who are at high-risk for activation.[9] To improve the number of persons treated for LTBI, shorter drug regimens with fewer side effects are needed.[8]

In 2018, there were 46 latent tuberculosis infections reported in the NBPSDHU area and almost half of those cases reported having lived in an endemic country (Figure 6). Only 6.5% of all LTBI cases reported in 2018 initiated treatment.

Figure 6. Percentage of Latent Tuberculosis Infection Cases by Top Risk Factors for Infection in the NBPSDHU Area, 2018.

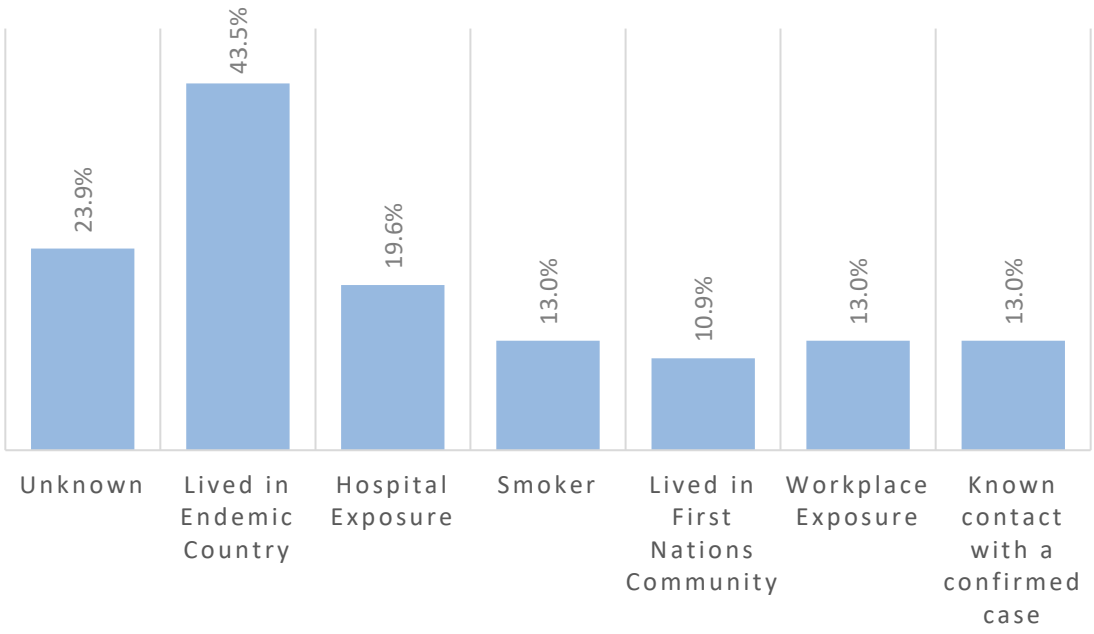


Table 6. Percentage of Latent Tuberculosis Infection Cases by Top Risk Factors for Infection in the NBPSDHU Area, 2018.

Risk Factor	**Percentage (%)**
Lived in endemic area	43.5%
Hospital exposure	19.6%
Smoker	13.0%
Workplace exposure	13.0%
Known contact with confirmed case	13.0%
Lived in First Nations community	10.9%
Unknown	23.9%

Campylobacter – Risk of Contact With Poultry

There were 18 confirmed cases of *Campylobacter* enteritis reported in 2018, this was a decrease in the number of cases from 2017. The incidence rate in the NBPSDHU area remained statistically significantly lower than the provincial rate. However, it was noted that reported risk factors for infection among cases in the NBPDSHU area has changed over time. In 2018, half of all cases reported contact with poultry and/or consumption of farm fresh eggs, whereas, less than one-quarter of cases reported this risk factor in the four years prior (Figure 7).

Chickens are found in both rural and urban areas in Ontario.[10] Salmonellosis and campylobacteriosis are the most frequent infections reported in relation to live poultry exposure as these bacteria are carried in the intestines and eggs of poultry and can be spread to their feathers and environment.[10] Owners often have limited awareness of the risk of illness and prevention measures.[10]

Figure 7. Percentage of Confirmed *Campylobacter* Cases in the NBPSDHU Area Reporting Contact With Chickens and/or Consumption of Farm Fresh Eggs by Accurate Episode Year, 2014-2018.

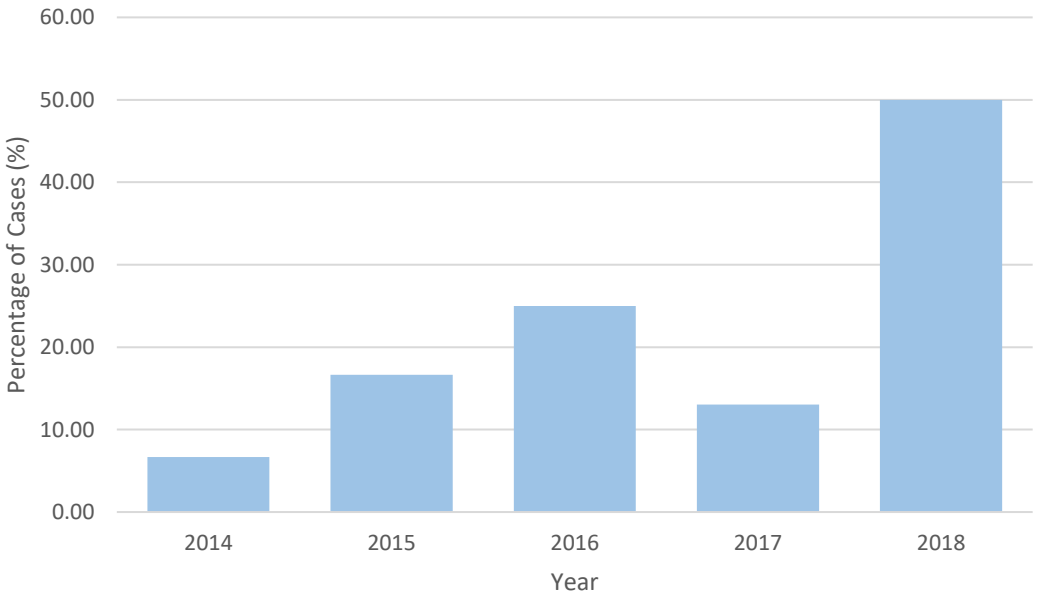


Table 7. Percentage of Confirmed *Campylobacter* Cases in the NBPSDHU Area Reporting Contact With Chickens and/or Consumption of Farm Fresh Eggs by Accurate Episode Year, 2014-2018.

Year	Percentage of Cases (%)
2014	6.7
2015	16.7
2016	25.0
2017	13.0
2018	50.0

Pertussis (Whooping Cough)

Typically, pertussis is cyclical in nature, with outbreaks occurring every 4-6 years.[11] The NBPSDHU area experienced pertussis outbreaks three years in a row; the summers of 2016, 2017, and 2018, which accounted for the majority of cases reported in each of those years (Figure 8).

Figure 8. Number and Crude Rate per 100,000 Population of Confirmed and Probable Pertussis Cases, by Region, 2009-2018

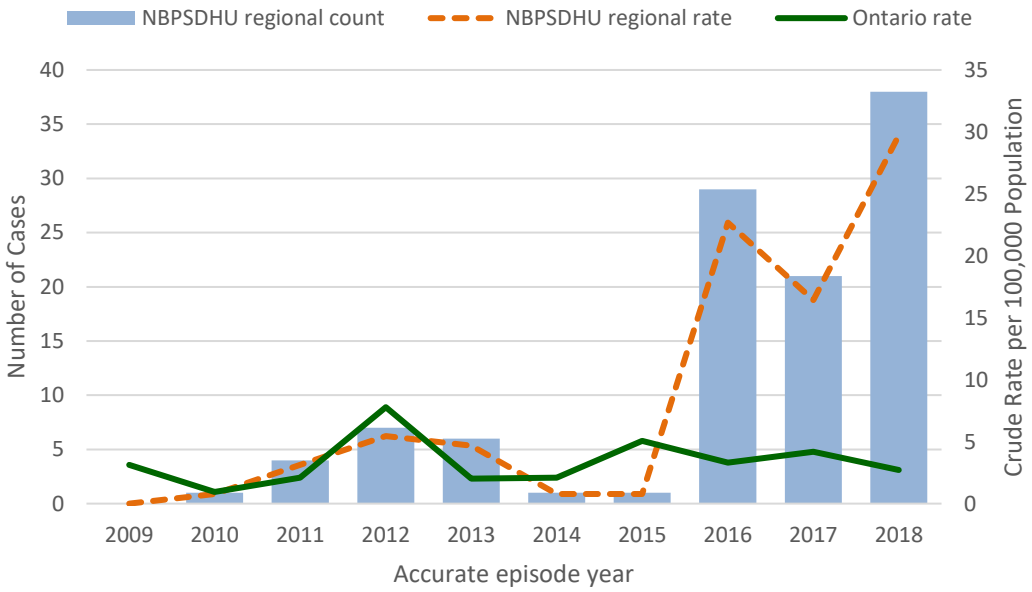


Table 8. Number and Crude Rate per 100,000 Population of Confirmed and Probable Pertussis Cases, by Region, 2009-2018

Accurate episode year	NBPSDHU Region: Number of Cases	NBPSDHU Region: Rate per 100,000 Population	Ontario: Rate per 100,000 Population
2009	0	0.0	3.1
2010	1	0.8	0.9
2011	4	3.1	2.1
2012	7	5.5	7.8
2013	6	4.7	2.0
2014	1	0.8	2.1
2015	1	0.8	5.1
2016	29	22.7	3.3
2017	21	16.4	4.2
2018	38	29.7	2.7

The 2016 outbreak occurred in the West Nipissing area of the district, mainly involving school aged children in that area (median age of cases= 13 years). All cases in the outbreak were partially or fully vaccinated, however, waning immunity following immunization may have also contributed to the outbreak as this can occur as early as 4 to 12 years after immunization.[11,12] Low immunization rates, rather than waning immunity were contributing factors to the 2017 and 2018 outbreaks (Table 9).

Table 9. Summary of Pertussis Outbreaks in the NBPSDHU Area, 2016-2018.

Year	Location	Number of Cases	Percentage of Cases Unimmunized (%)	Contact follow-up
2016	West Nipissing	24	0.0%	273 individuals were immunized at community clinics
2017	North Bay and North East Parry Sound areas	16	43.8%	20 contacts received chemoprophylaxis or vaccination
2018	Powassan and surrounding areas	36	80.6%	54 contacts received chemoprophylaxis or vaccination

Non-immunized, partially immunized individuals and individuals with waning immunity may be susceptible to pertussis. The current schedule for acellular pertussis vaccine is 2, 4, 6, and 18 months, and booster doses at 4-6 years, and 14-16 years.[4,11] Adults should receive one dose of Tetanus, diptheria and pertussis (Tdap) vaccine in adulthood. All pregnant women should receive a dose of a pertussis containing vaccine, ideally between 27 and 32 weeks of gestation, irrespective of previous Tdap immunization history.[12]

Counts and Incidence Rates of Diseases of Public Health Significance

Table 5. Number of Cases and Incidence Rates of Diseases of Public Health Significance†, NBPSDHU Region and Ontario, 2018

Disease	NBPSDHU Region: Number of Cases	NBPSDHU Region: Rate per 100,000 Population	Ontario: Number of Cases	Ontario Region: Rate per 100,000 Population
AIDS	2	1.6	77	0.6
CampylobacterΔ	18	14.1(↓)	3411	24.4
Carbapenemase-producing enterobacteriaceae	1	0.8	198	1.4
Chlamydia	446	348.8	47798	341.8
CryptosporidiosisΔ	5	3.9	754	5.4
CyclosporiasisΔ	2	1.6	272	1.9
EncephalitisΔ	1	0.8	65	0.5
GiardiasisΔ	13	10.2	1,546	11.1
Gonorrhea	42	32.8(↓)	10,403	74.4
Group a streptococcal disease, invasiveΔ	17	13.3	1,136	8.1
HIV	2	1.6(↓)	875	6.3
Haemophilus Influenzae DiseaseΔ	2	1.6	196	1.4
Hepatitis C	89	69.6(↑)	5,039	36.0
Influenza	260	203.3(↑)	19,123	136.8
LegionellosisΔ	3	2.3	347	2.5
ListeriosisΔ	1	0.8	76	0.5
MalariaΔ	1	0.8	44	0.3
Meningitis, bacterial, viral, otherΔ	15	11.7(↑)	326	2.3
PertussisΔ	38	29.7(↑)	381	2.7
SalmonellosisΔ	24	18.8	2,655	19.0
ShigellosisΔ	1	0.8	321	2.3
Pneumococcal disease, invasive	18	14.1	1,285	9.2
Syphilis, infectious	2	1.6(↓)	1,754	12.5
Syphilis, other	1	0.8(↓)	901	6.4
Tuberculosis	3	2.3	657	4.7
Tuberculosis, Latent Infection (LTBI)*	46	40.0		
Typhoid FeverΔ	1	0.8	108	0.8
West Nile Virus IllnessΔ	1	0.8	138	1.0
YersiniosisΔ	1	0.8	297	2.1

† Counts and rates for diseases of public health significance were excluded from the table if there were no confirmed cases reported in 2018

Δ Counts include confirmed and probable cases to facilitate analyses of trends over time due to changes in provincial case definitions

* Counts based on reported date, rather than accurate episode (symptom onset) date

(↑) Rate is significantly higher compared to the Ontario rate

(↓) Rate is significantly lower compared to the Ontario rate

Data Sources

1) NBPSDHU LTBI counts: Integrated Public Information System (iPHIS), extracted on February 26, 2019.
2) NBPSDHU & Ontario counts: Public Health Ontario. Query: Case counts and Crude rates of reportable disease by disease, year, age group, and gender. Toronto, ON: Ontario Agency for Health Protection and Promotion; extracted on February 7, 2019.
3) Population estimates: Statistics Canada 2005-2016, IntelliHEALTH Ontario, Ministry of Health and Long-term Care, extracted November 3, 2016.

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