

MANITOBA ANNUAL SUMMARY OF COMMUNICABLE DISEASES 2016



HEALTHY MANITOBANS THROUGH AN APPROPRIATE BALANCE OF PREVENTION AND CARE.

TO MEET THE HEALTH NEEDS OF INDIVIDUALS, FAMILIES AND THEIR COMMUNITIES BY LEADING A SUSTAINABLE, PUBLICLY ADMINISTERED HEALTH SYSTEM THAT PROMOTES WELL-BEING AND PROVIDES THE RIGHT CARE, IN THE RIGHT PLACE, AT THE RIGHT TIME.

MANITOBA HEALTH, SENIORS AND ACTIVE LIVING

Epidemiology & Surveillance

Information Management & Analytics, Resources and Performances, Manitoba Health, Seniors and Active Living

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ABBREVIATIONS & REGIONAL HEALTH AUTHORITIES

ABBREVIATIONS

CDI	<i>Clostridioides Difficile</i> Infection previously known as <i>Clostridium Difficile</i> Infection
CI	Confidence Interval
CJD	Creutzfeldt-Jakob Disease
IMD	Invasive Meningococcal Disease
IPD	Invasive Pneumococcal Disease
IQR	Interquartile Range
MHSAL	Manitoba Health, Seniors and Active Living
RHA	Regional Health Authority
VTEC	Verotoxigenic <i>Escherichia Coli</i>

REGIONAL HEALTH AUTHORITIES

Winnipeg RHA	Winnipeg Regional Health Authority (includes Churchill)
Southern Health-Santé Sud	Southern Health – Santé Sud
Interlake-Eastern RHA	Interlake-Eastern Regional Health Authority
Prairie Mountain Health	Prairie Mountain Health
Northern Health Region	Northern Regional Health Authority

ACKNOWLEDGMENTS

Manitoba Annual Summary of Communicable Diseases (2016) is the result of the efforts of a dedicated team of individuals throughout the province of Manitoba including healthcare providers, laboratory personnel, and regional public health employees. The surveillance data entered and housed in the Surveillance Unit at Manitoba Health, Seniors and Active Living (MHSAL) was necessary for the production of this report.

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EXECUTIVE SUMMARY

In October 2016, routine public health surveillance detected a cluster of six mumps cases in the Winnipeg Regional Health Authority. All cases were students aged around 20 years from the University of Manitoba with symptom onset between late September and early October 2016. The infection soon spread to other universities and communities. By November 2016, mumps had spread to three rural health regions triggering an outbreak to be declared.

NOSOCOMIAL INFECTIONS

- *Clostridioides difficile* is a bacteria that is often associated with infections and outbreaks seen in healthcare facilities, but can also be community acquired. *Clostridioides difficile* infection is a lab surveillance only bacteria. The incidence rate of *Clostridioides difficile* infection in 2016 (73.1 per 100,000 population) was higher than the 5-year average (61.7 per 100,000 population) incidence rate. Over half of the cases reported in 2016 were in females (n=558) as compared to males (n = 421).

ENTERIC DISEASES

- Salmonellosis had 280 laboratory-confirmed cases in 2016 which was also the most reported cases of all the enteric diseases. This was higher than 5-year average of 204 cases.
- Verotoxigenic *Escherichia coli* (VTEC) had lower than expected case counts in three of the regional health authorities (Northern Health Region had 0 cases compared to the previous 5-year average of 0.4 cases, Prairie Mountain Health had 4 cases compared to the previous 5-year average of 5.8 cases and Interlake-Eastern RHA had 1 case compared to the previous 5-year average of 4.6 cases), and higher than expected case counts in Southern Health-Santé Sud, (15 cases compared to the previous 5-year average of 13.2 cases) and Winnipeg RHA (19 cases compared to the previous 5-year average of 15.2 cases).

NON-VACCINE PREVENTABLE DISEASES

- Streptococcal invasive disease (Group A), accounted for the majority of cases (n = 195) in this category for 2016, which was lower than the laboratory-confirmed cases in 2015 (n = 208). Due to changes in the ICD9 coding practices, we were not able to generate an expected count of this disease (see Changes in ICD9 Coding Practices, Appendix C). Trends for this disease will be addressed in future reports.

VACCINE PREVENTABLE DISEASES

- A mumps outbreak was declared in 2016 and resulted in 111 laboratory-confirmed cases; this was higher than the 5-year average of 4.4 cases. Winnipeg RHA had the highest number of cases with 88, followed by Southern Health-Santé Sud with 10 cases. The 20-24 years age group was the most affected with 45 confirmed cases.

- Pertussis had 116 laboratory-confirmed cases in 2016 which was higher than 5-year average of 44.6 cases. The age group of 4 years and under were the most affected with 61 laboratory-confirmed cases.

ZOONOTIC AND ENVIRONMENTAL DISEASES

- All zoonotic and environmental diseases were within expected ranges.

INTRODUCTION

The *Manitoba Annual Summary of Communicable Diseases (2016)* provides a summary of laboratory-confirmed, communicable diseases in Manitoba for the year 2016. It focuses specifically on those infectious diseases listed as “reportable” under *The Public Health Act* with the exception of influenza, tuberculosis, West Nile virus, tick-borne diseases, and the sexually transmitted and blood-borne infections - these diseases appear in other annual reports produced by Manitoba Health, Seniors and Active Living (MHSAL). For a list of all diseases that were reportable in Manitoba, in 2016, see Appendix A.

The information in this report can be used to identify potential emerging issues and evaluate the effect of policies and programs. It can also be used by the regional health authorities (RHAs) to better understand the burden of disease in their jurisdictions.

It is important to note the data in this report is *surveillance data*, which has certain limitations. These limitations are covered in more detail in the Methods section.

The diseases in this report are divided into five main categories:

1. nosocomial infection
2. enteric diseases
3. non-vaccine preventable diseases
4. vaccine preventable diseases
5. zoonotic and environmental diseases

Case counts and incidence rates for each disease with **more than 5** cases in 2016 are presented in tables by:

- sex, with age analysis (2016 and the 5-year average [2011-2015]),
- age group and sex (2016), and
- RHA (2016 and the 5-year average [2011-2015])

Diseases with case counts **greater than 15** also had the above information presented with graphs.

METHODS

Only those laboratory-confirmed communicable diseases which occurred in individuals between January 1, 2011 and December 31, 2016, and were reported to MHSAL before the date of data extraction (June 14, 2019), were included in this report. Throughout the report, the 2016 data were compared to the data of the previous 5 years (in the form of the 5-year average [2011-2015] or year-by-year from 2011 to 2016), when the comparison was deemed valuable.

Incidence rates were calculated using the MHSAL population files which provide the mid-year population count as of June 1 of that year. All rates are crude incidence rates calculated as

$$\text{Incidence rate} = \frac{\text{Number of cases}}{\text{Mid-year population of specified group}} \times 100,000,$$

In order to produce the number of reported cases per 100,000 population. That is, the number of cases per 100,000 individuals in that population in the specified year.

Average incidence rates were calculated with a numerator of the *average* number of cases from 2011-2015, and a denominator of the *average* population of the specified group, from 2011-2015

For example, the incidence rate for males in the 15-19 years age group in 2016 would be calculated with a numerator being the number of males aged 15-19 years who had laboratory-confirmed cases of the specific disease, and a denominator of the total number of males in Manitoba aged 15-19 years old in June, 2016.

For the diseases that had an age analysis performed, the standard deviation, and the values that make up the interquartile range (IQR) are provided within the analysis. Standard deviation measures the amount of variation in a given set of data. A low standard deviation indicates the data values are close to the average, while a larger standard deviation indicates the data values are more spread out. The age analysis indicates the first and third quartile, respectively, associated with the median. These quartiles can be used to determine the interquartile range (IQR), which is the difference between the third and first quartile. The first quartile is the value that has 25% of the data falling below it, and the third quartile is the value that has 75% of the data falling below it. The IQR is used to identify outliers, i.e. the data points that are further away from the median than expected. It also shows how the data is distributed around the median. If the first and third quartiles are close together, this indicates the data values are falling close to the median, while quartiles that are further apart indicate the data is spread out.

When comparing incidence rates, and especially when comparing case counts between RHAs, it is important to keep in mind that the differing population counts between regions can contribute to an incidence rate that looks conspicuously large even when there are only a few cases, or an incidence rate that appears small even when there are many cases. For example, Northern RHA may experience large changes in incidence when there are small changes in the case count, due to its small population; the opposite goes for the Winnipeg RHA. The same concept applies for the age groups, a small change in case counts in the <1 and 1-4 years age groups (that have small populations) makes a larger difference than the same change in case counts in the 50-59 years and over 60 years age groups (that have large populations).

Regional comparisons were created based on the case's region of residence, not on the region in which the case was tested and/or diagnosed. Thus, data for those individuals who were tested in Manitoba, but lived outside of the province, were not included in this report.

Notes:

- Any disease with less than or equal to 5 cases in 2016 did not have a detailed analysis performed. Information for these diseases was only included in the comparison tables both at the beginning of the report and in the disease category to which the disease belongs (Appendix B).
- Any disease with less than or equal to 15 cases in 2016 did not have a graphical analysis performed. Graphical analysis of such small numbers can be misleading and therefore was not included.
- The surveillance data used in this report were extracted on June 14, 2019 from the Communicable Disease Control Surveillance Database housed by MHSAL.

In some instances throughout this report, rates for case counts less than and equal to five are presented. It is important to remember that these rates are not statistically robust due to the unpredictable nature of small numbers. For example, all it takes to go from usually having 0 cases of a disease in one year to having 4 cases the next year is one family coming home from a holiday outside of Manitoba having contracted the disease. For this reason, case counts equal to and less than five are reported for informational purposes but they should be interpreted with caution.

ABOUT SURVEILLANCE DATA

Surveillance data in Manitoba are routinely collected under *The Public Health Act* and are subject to certain limitations. It can often be the case that the number of reported cases of any disease is a fraction of the actual count. Individuals may not seek medical care for “mild” symptoms; if they do, the doctor may not order a laboratory test to confirm the disease. In addition, surveillance data results can be skewed as doctors may be more likely to order tests for severe diseases or those diseases which pose a danger to public health. The amount of testing and reporting performed can be influenced by many factors including outbreaks and policy changes. Increased reporting can make it appear as though there has been an increase in the number of cases in a community, while the actual number of cases remains constant (and vice versa).

Surveillance data are also influenced by changes in testing practices (e.g., universal screening for an organism upon admission to health facilities), laboratory capacity (e.g., only testing a certain proportion of influenza cases during a known outbreak), and changes in lab technology (e.g., more sensitive diagnoses). All of these factors must be considered when drawing conclusions about surveillance data.

It is especially important to consider these limitations in two situations:

- When comparing RHA incidence rates and case counts. It is not uncommon for there to be variation in the number of cases tested and sent for laboratory confirmation between the RHAs; and/or
- When identifying increasing or decreasing trends in a disease. It is important to remember this may not be a true reflection of increasing or decreasing case counts and incidence rates. Further investigation and evidence collection is required to determine whether the increase or decrease is caused by a “true” change in disease incidence, or by a change in reporting practices.

TECHNICAL NOTES AND LIMITATIONS

Data sources for this report are Manitoba's surveillance databases. It should be noted that provincial databases are continually updated as new case information is received from public health units, and as data cleaning and verification occur. Case counts depend on the timely reporting of cases by laboratories and physicians, by local Medical Officers of Health, and timely entry of case information into the surveillance databases. Surveillance case definitions, database records, and statistical programs used to generate this report are also constantly reviewed and revised. This report may also include unconfirmed cases of diseases and conditions. Therefore, slight differences between this report and any previous or future reports are expected.

Surveillance data are in the process of being transitioned to a new Public Health Information Management System (PHIMS). In the legacy databases, in use in 2016, it is difficult to determine repeat infections. For the purposes of this report, all laboratory reports within 30 days of the original specimen are considered one case, whereas results occurring more than 30 days apart are considered separate cases.

Please interpret this report with caution.

REPORTABLE DISEASES IN MANITOBA

TABLE 1: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed cases in Manitoba, by disease, 2016 and 5-year average (2011-2015).

Disease name	Count		Incidence Rate (95% CI)	
	2016	2011-2015 Average	2016	2011-2015 Average
NOSOCOMIAL INFECTIONS				
<i>Clostridioides difficile</i> infection	979	794.4	73.1 (68.6, 77.8)	61.7 (57.5, 66.1)
ENTERIC DISEASES				
Amebiasis	26	27.8	1.9 (1.3, 2.8)	2.2 (1.4, 3.1)
Campylobacteriosis	199	212.4	14.9 (12.9, 17.1)	16.5 (14.4, 18.9)
Cholera	0	0.2	0.0 (0.0, 0.3)	0.0 (0.0, 0.3)
Cryptosporidiosis	33	49.4	2.5 (1.7, 3.5)	3.8 (2.8, 5.1)
Cyclosporiasis	1	2.6	0.1 (0.0, 0.4)	0.2 (0.0, 0.6)
Giardiasis	138	98.6	10.3 (8.7, 12.2)	7.7 (6.2, 9.3)
Hepatitis A	1	6.8	0.1 (0.0, 0.4)	0.5 (0.2, 1.1)
Listeriosis	4	3.2	0.3 (0.1, 0.8)	0.2 (0.1, 0.7)
Paratyphoid fever	0	4.8	0 (0.0, 0.3)	0.4 (0.1, 0.9)
Salmonellosis	280	204.0	20.9 (18.5, 23.5)	15.8 (13.7, 18.2)
Shigellosis	13	36.2	1.0 (0.5, 1.7)	2.8 (2.0, 3.9)
Typhoid fever	5	4.4	0.4 (0.1, 0.9)	0.3 (0.1, 0.8)
Verotoxigenic <i>Escherichia coli</i> (VTEC)	39	39.2	2.9 (2.1, 4)	3.0 (2.2, 4.2)
NON-VACCINE PREVENTABLE DISEASES				
Leprosy	0	0.2	0.0 (0.0, 0.3)	0.0 (0.0, 0.3)
Streptococcal invasive disease (Group A)	195	-	14.6 (12.6, 16.8)	-
Streptococcal invasive disease of the newborn (Group B)	10	-	0.7 (0.4, 1.4)	-
VACCINE PREVENTABLE DISEASES				
Congenital rubella syndrome	0	0.2	0.0 (0.0, 0.3)	0.0 (0.0, 0.3)
Diphtheria	1	0.2	0.1 (0.0, 0.4)	0.0 (0.0, 0.3)
<i>Haemophilus influenzae</i> (non-serotype B, invasive)	33	-	2.5 (1.7, 3.5)	-
<i>Haemophilus influenzae</i> (serotype B invasive)	0	-	0.0 (0.0, 0.3)	-
Invasive meningococcal disease	8	3.8	0.6 (0.3, 1.2)	0.3 (0.1, 0.8)
Invasive pneumococcal disease	120	133.6	9.0 (7.4, 10.7)	10.4 (8.7, 12.3)
Measles	0	2.2	0.0 (0.0, 0.3)	0.2 (0.0, 0.6)
Mumps	111	4.4	8.3 (6.8, 10)	0.3 (0.1, 0.8)
Pertussis	116	44.6	8.7 (7.2, 10.4)	3.5 (2.5, 4.6)
Rubella	0	0.2	0.0 (0.0, 0.3)	0.0 (0.0, 0.3)
Yellow fever	1	0.0	0.1 (0, 0.4)	0.0 (0.0, 0.3)

* The dash indicates that the comparison to previous years is not possible due to changes in disease coding (See Appendix C).

TABLE 1 (cont.): Case count and incidence (per 100,000 population) of laboratory-confirmed cases in Manitoba, by disease, 2016 and 5-year average (2011-2015).

Disease name	Count		Incidence Rate (95% CI)	
	2016	2011-2015	2016	2011-2015
ZOONOTIC AND ENVIRONMENTAL DISEASES				
Blastomycosis	14	14.6	1.0 (0.6, 1.8)	1.1 (0.6, 1.9)
Brucellosis	1	1.4	0.1 (0.0, 0.4)	0.1 (0.0, 0.5)
Creutzfeldt-Jakob Disease (CJD)	0	1.2	0.0 (0.0, 0.7)	0.1 (0.0, 0.5)
Hantavirus infection	1	0.4	0.1 (0.0, 0.4)	0.0 (0.0, 0.3)
Legionellosis	1	2.8	0.1 (0.0, 0.4)	0.2 (0.0, 0.7)
Malaria	20	20.0	1.5 (0.9, 2.3)	1.6 (0.9, 2.4)
Tularemia	3	1.8	0.2 (0.0, 0.7)	0.1 (0.0, 0.5)

* The dash indicates that the comparison to previous years is not possible due to changes in disease coding (See Appendix C).

NOSOCOMIAL INFECTIONS

CLOSTRIDIOIDES DIFFICILE INFECTION (CDI)

The average age in 2016 was 61.5 years (with a standard deviation of 21.3 years). The average age in 2011 - 2015 was 62.0 years (with a standard deviation of 21.8 years). The median age in 2016 was 66 years (IQR: 50 - 77 years). The median age in 2011 - 2015 was 65 years (IQR: 49 - 79 years).

TABLE 2: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed *Clostridioides difficile* infection cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	979	794.4	73.1	61.7
Female	558	464.8	82.8	71.6
Male	421	329.6	63.3	51.7

FIGURE 1: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed *Clostridioides difficile* infection cases in Manitoba, by age group and sex, 2016.

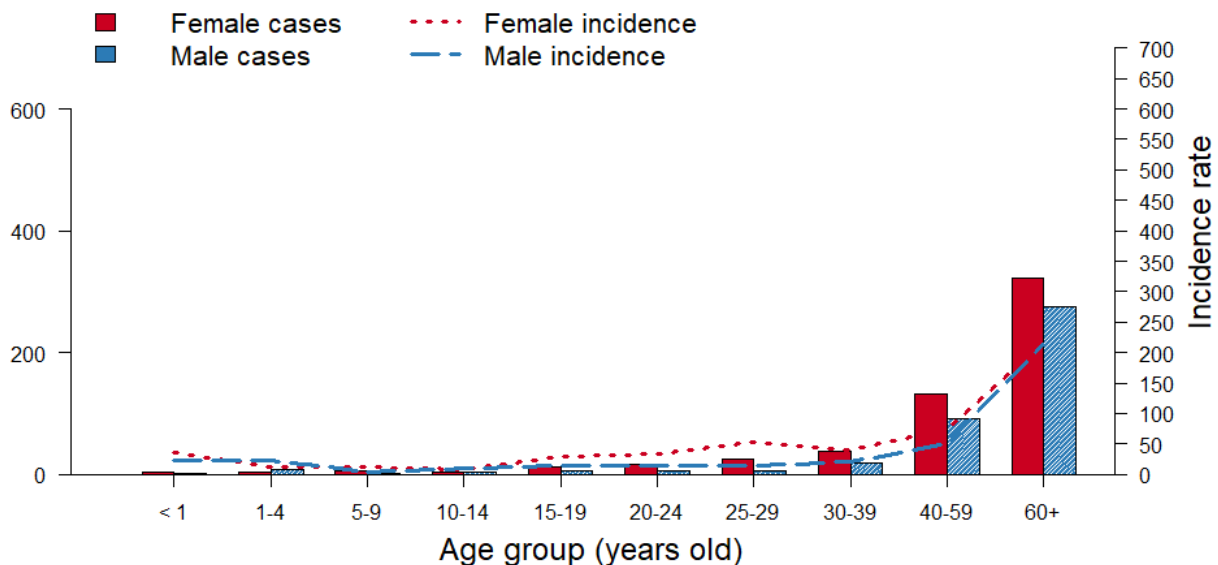


TABLE 3: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed *Clostridioides difficile* infection cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	5	3	2	29.6	36.6	23.1
1-4	12	4	8	17.6	12.1	22.7
5-9	7	5	2	8.1	11.8	4.5
10-14	7	3	4	8.7	7.7	9.7
15-19	18	12	6	21.0	28.9	13.5
20-24	23	16	7	23.6	33.9	14.0
25-29	32	25	7	33.4	52.3	14.6
30-39	56	37	19	31.1	40.9	21.3
40-59	222	131	91	63.3	75.0	51.7
60+	597	322	275	214.9	215.5	214.2

FIGURE 2: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed *Clostridioides difficile* infection cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

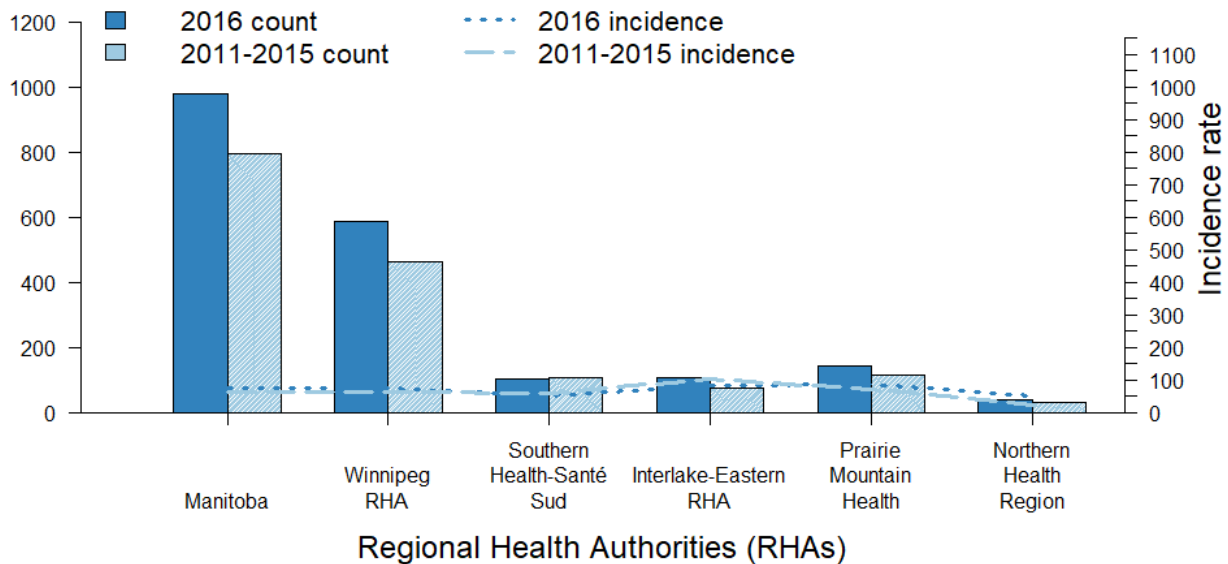
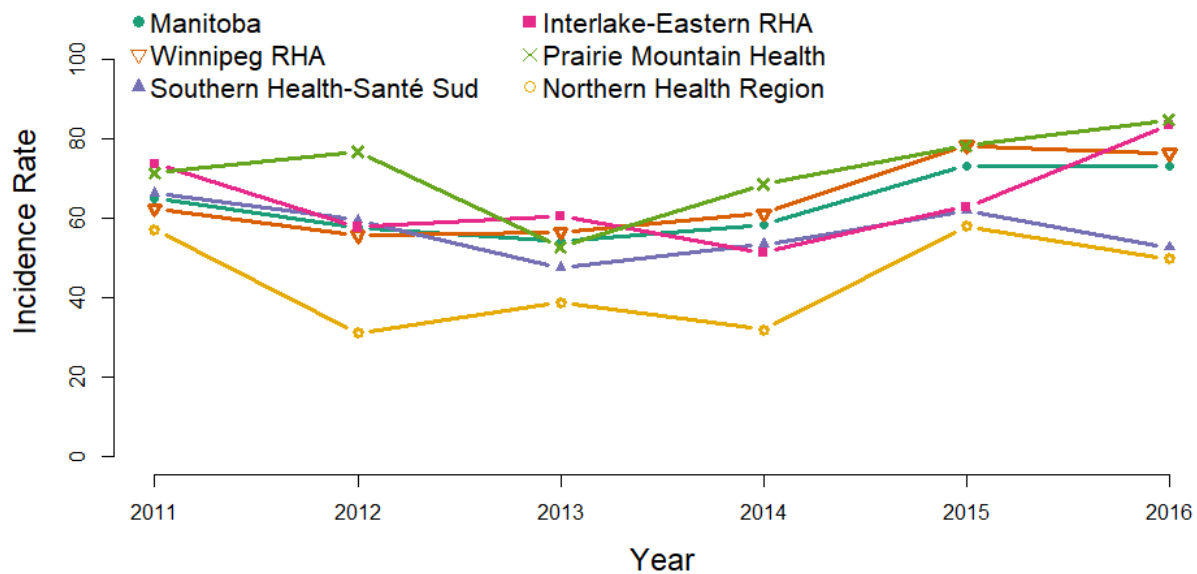


TABLE 4: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed *Clostridioides difficile* infection cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	586	461.8	76.3	62.9
Southern Health-Santé Sud	104	107.8	52.7	57.6
Interlake-Eastern RHA	107	76.6	83.5	102.4
Prairie Mountain Health	144	115.8	84.8	69.5
Northern Health Region	38	32.4	49.7	21.5
Manitoba	979	794.4	73.1	61.7

FIGURE 3: Annual crude incidence rate (per 100,000 population) of laboratory-confirmed *Clostridioides difficile* infection cases in Manitoba, by regional health authority (RHA), 2011-2016.



ENTERIC DISEASES

AMEBIASIS

The average age in 2016 was 30.7 years (with a standard deviation of 18.6 years). The average age in 2011 - 2015 was 30.1 years (with a standard deviation of 17.0 years). The median age in 2016 was 30.0 years (IQR: 22.5 – 38.0 years). The median age in 2011 - 2015 was 30.0 years (IQR: 17.5 – 40.0 years).

TABLE 5: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Amebiasis cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	26	27.8	1.9	2.2
Female	10	11.4	1.5	1.8
Male	16	16.4	2.4	2.6

FIGURE 4: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Amebiasis cases in Manitoba, by age group and sex, 2016.

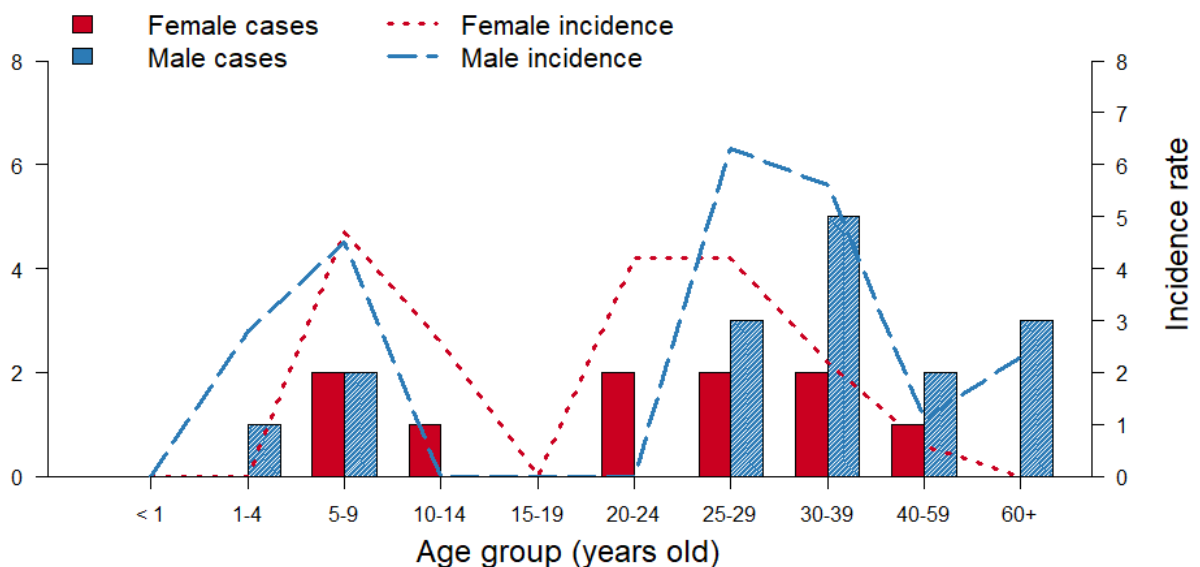


TABLE 6: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Amebiasis cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	0	0	0	0.0	0.0	0.0
1-4	1	0	1	1.5	0.0	2.8
5-9	4	2	2	4.6	4.7	4.5
10-14	1	1	0	1.2	2.6	0.0
15-19	0	0	0	0.0	0.0	0.0
20-24	2	2	0	2.1	4.2	0.0
25-29	5	2	3	5.2	4.2	6.3
30-39	7	2	5	3.9	2.2	5.6
40-59	3	1	2	0.9	0.6	1.1
60+	3	0	3	1.1	0.0	2.3

FIGURE 5: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Amebiasis cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

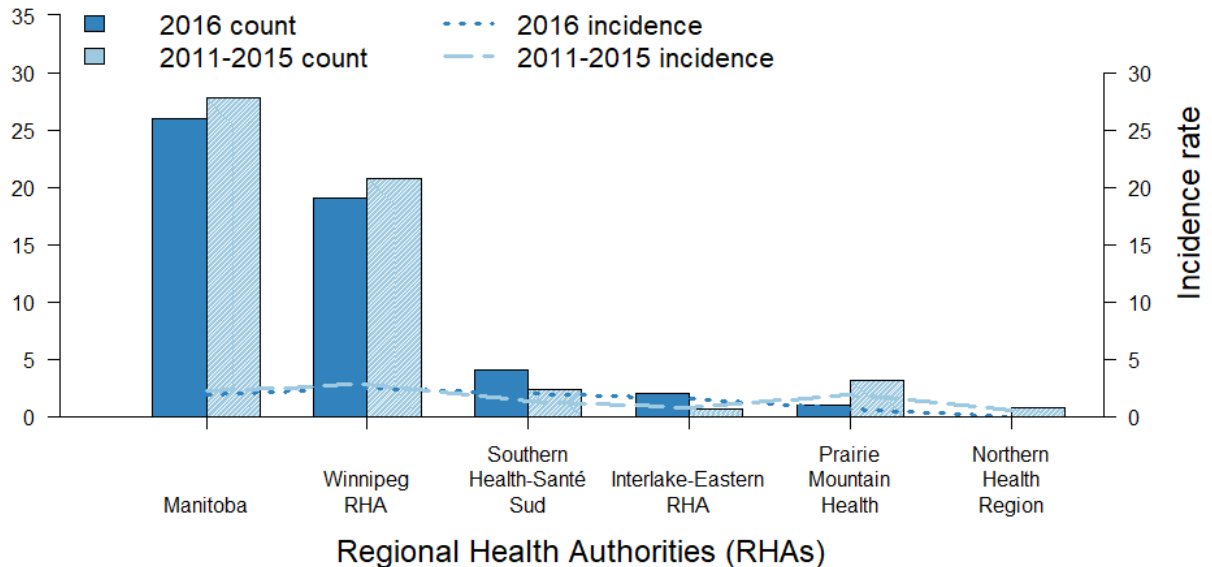
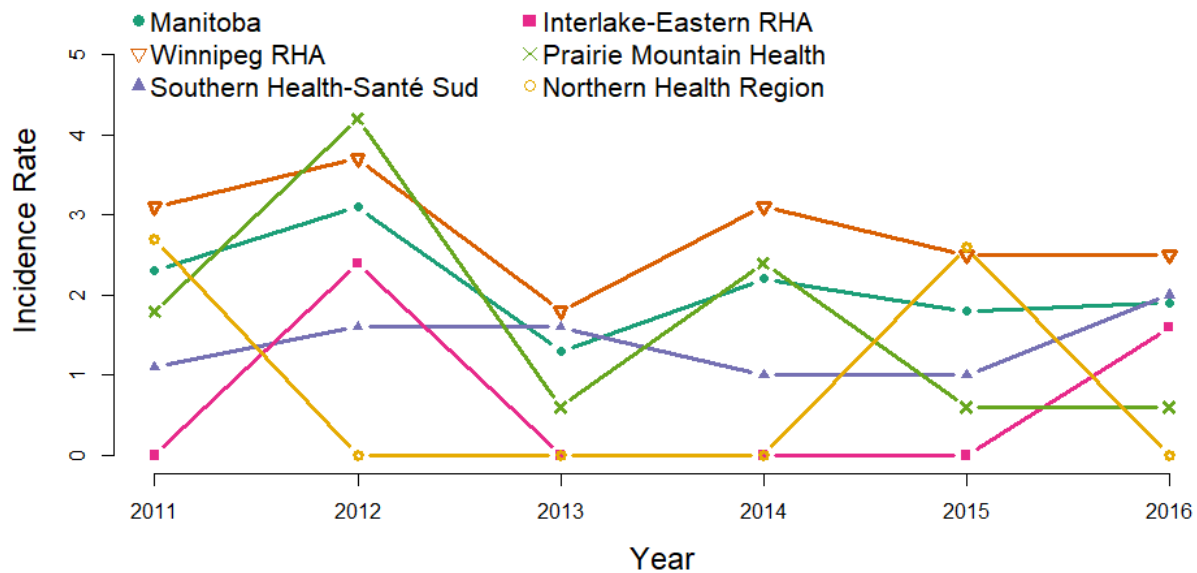


TABLE 7: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Amebiasis cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	19	20.8	2.5	2.8
Southern Health-Santé Sud	4	2.4	2.0	1.3
Interlake-Eastern RHA	2	0.6	1.6	0.8
Prairie Mountain Health	1	3.2	0.6	1.9
Northern Health Region	0	0.8	0.0	0.5
Manitoba	26	27.8	1.9	2.2

FIGURE 6: Annual crude incidence rate (per 100,000 population) of laboratory-confirmed Amebiasis cases in Manitoba, by regional health authority (RHA), 2011-2016.



CAMPYLOBACTERIOSIS

The average age in 2016 was 36.7 years (with a standard deviation of 23.4 years). The average age in 2011 - 2015 was 34.8 years (with a standard deviation of 23.7 years). The median age in 2016 was 35 years (IQR: 18.5 - 55 years). The median age in 2011 - 2015 was 31 years (IQR: 17 - 55 years).

TABLE 8: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Campylobacteriosis cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	199	212.4	14.9	16.5
Female	89	99.2	13.2	15.3
Male	110	113.2	16.5	17.7

FIGURE 7: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Campylobacteriosis cases in Manitoba, by age group and sex, 2016.

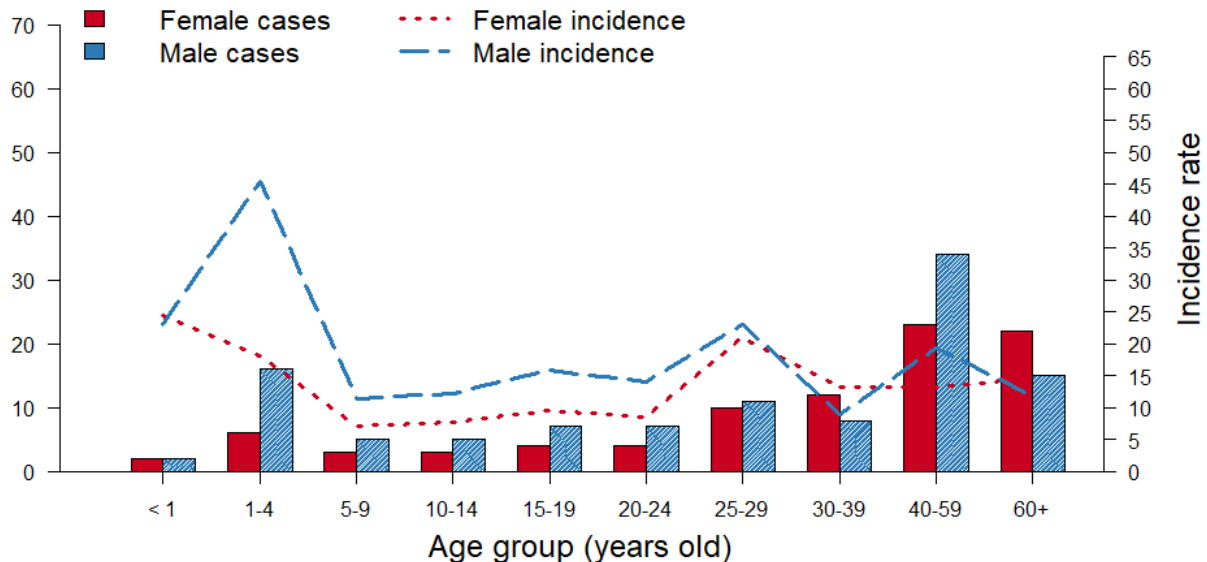


TABLE 9: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Campylobacteriosis cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	4	2	2	23.7	24.4	23.1
1-4	22	6	16	32.2	18.1	45.4
5-9	8	3	5	9.3	7.1	11.4
10-14	8	3	5	9.9	7.7	12.1
15-19	11	4	7	12.8	9.6	15.8
20-24	11	4	7	11.3	8.5	14.0
25-29	21	10	11	21.9	20.9	23.0
30-39	20	12	8	11.1	13.2	9.0
40-59	57	23	34	16.3	13.2	19.3
60+	37	22	15	13.3	14.7	11.7

FIGURE 8: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Campylobacteriosis cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

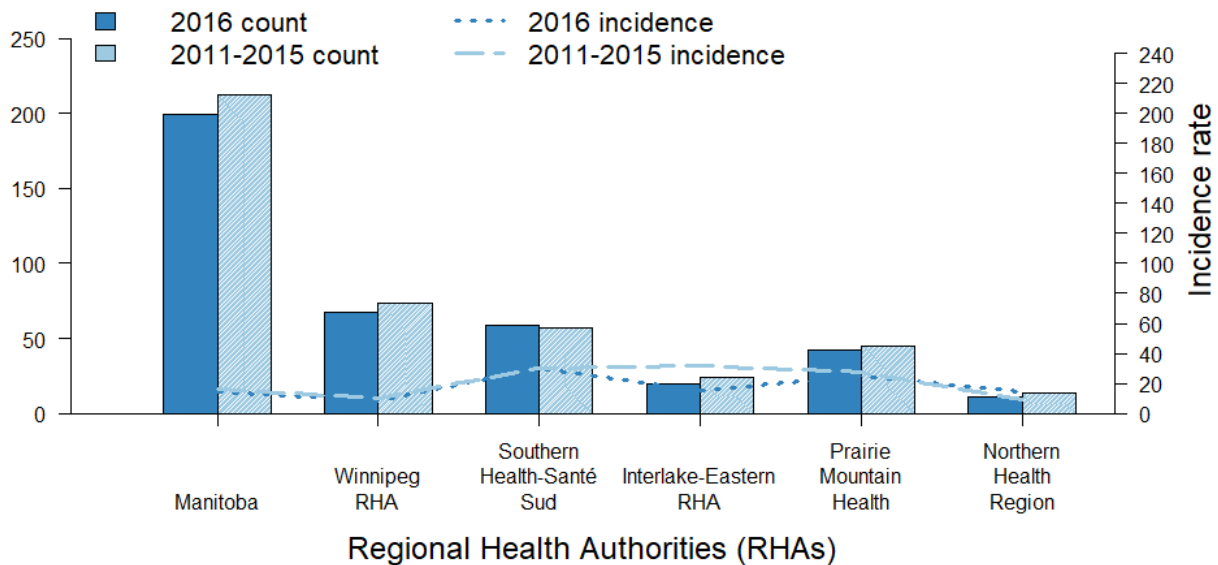
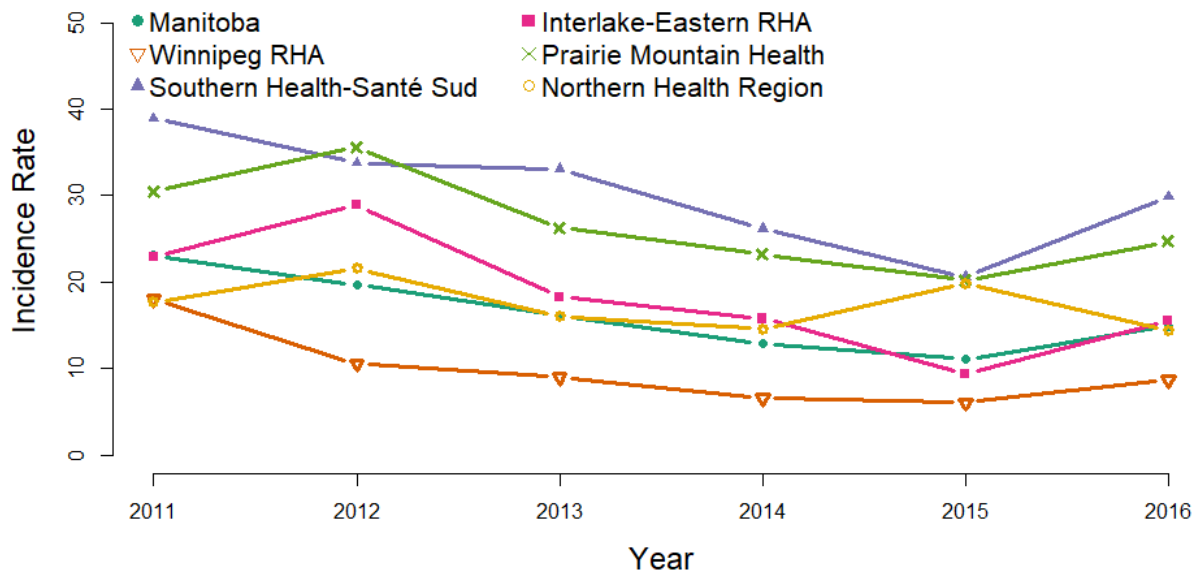


TABLE 10: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Campylobacteriosis cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	67	73.2	8.7	10.0
Southern Health-Santé Sud	59	56.8	29.9	30.4
Interlake-Eastern RHA	20	23.8	15.6	31.8
Prairie Mountain Health	42	45.2	24.7	27.1
Northern Health Region	11	13.4	14.4	8.9
Manitoba	199	212.4	14.9	16.5

FIGURE 9: Annual crude incidence rate (per 100,000 population) of laboratory-confirmed Campylobacteriosis cases in Manitoba, by regional health authority (RHA), 2011-2016.



CRYPTOSPORIDIOSIS

The average age in 2016 was 19.2 years (with a standard deviation of 14.5 years). The average age in 2011 - 2015 was 20.9 years (with a standard deviation of 17.2 years). The median age in 2016 was 16 years (IQR: 7 - 29 years). The median age in 2011 - 2015 was 19 years (IQR: 6 - 32 years).

TABLE 11: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Cryptosporidiosis cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	33	49.4	2.5	3.8
Female	13	28.4	1.9	4.4
Male	20	21.0	3.0	3.3

FIGURE 10: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Cryptosporidiosis cases in Manitoba, by age group and sex, 2016.

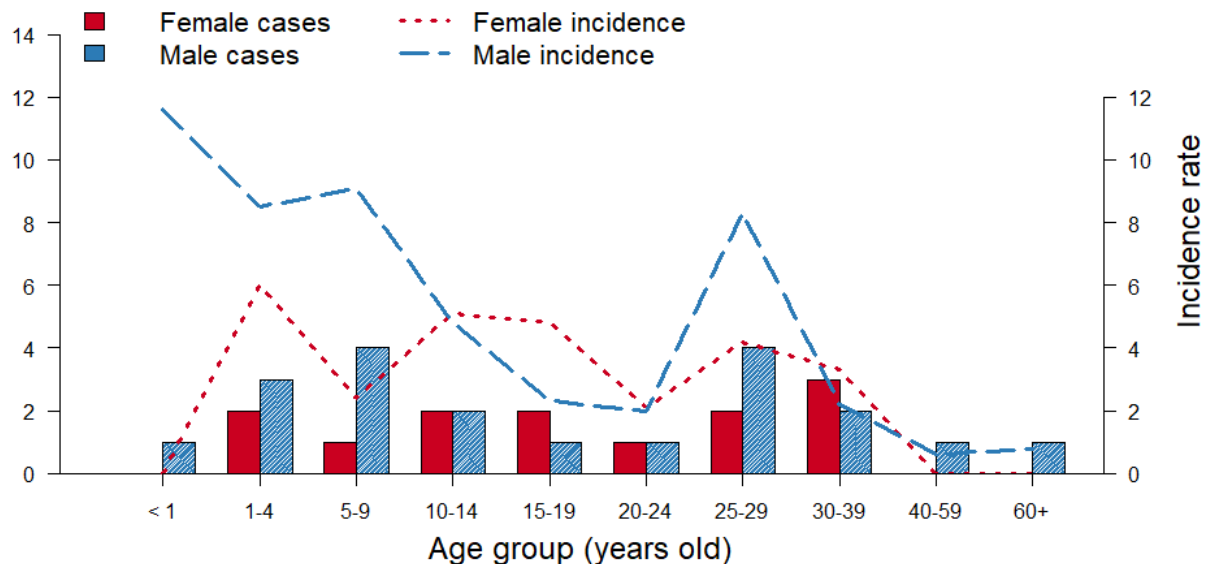


TABLE 12: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Cryptosporidiosis cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	1	0	1	5.9	0.0	11.6
1-4	5	2	3	7.3	6.0	8.5
5-9	5	1	4	5.8	2.4	9.1
10-14	4	2	2	5.0	5.1	4.8
15-19	3	2	1	3.5	4.8	2.3
20-24	2	1	1	2.1	2.1	2.0
25-29	6	2	4	6.3	4.2	8.3
30-39	5	3	2	2.8	3.3	2.2
40-59	1	0	1	0.3	0.0	0.6
60+	1	0	1	0.4	0.0	0.8

FIGURE 11: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Cryptosporidiosis cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

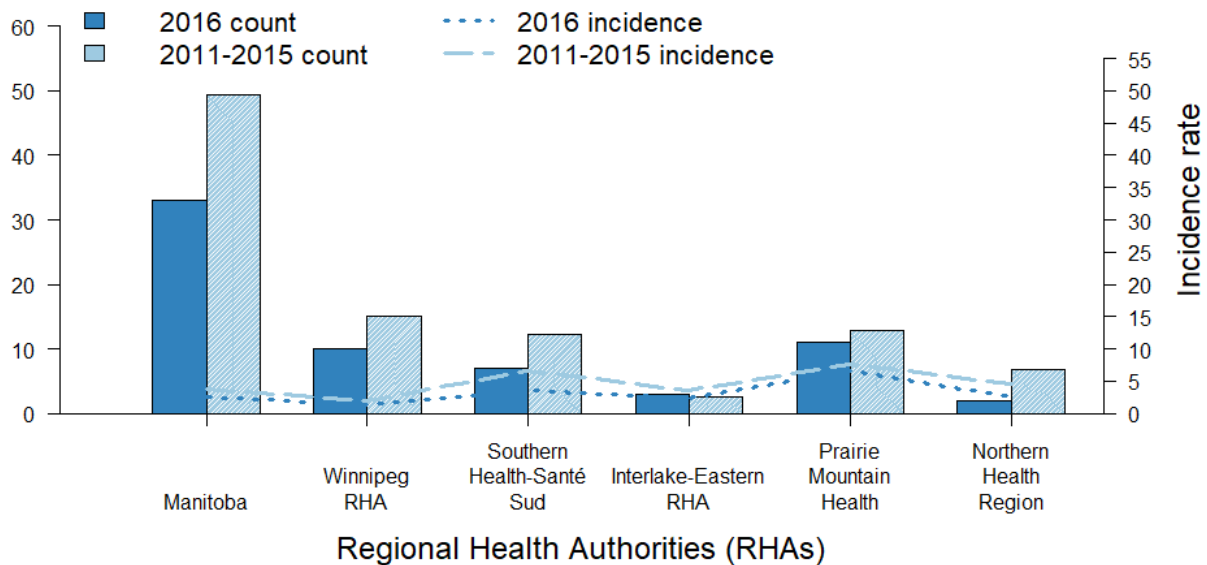
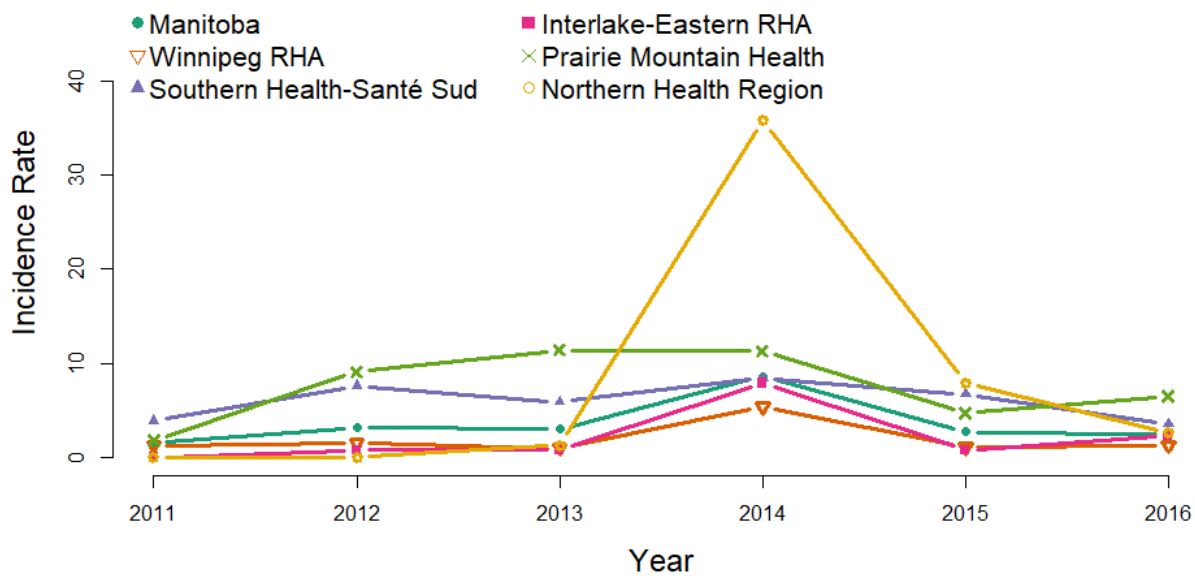


TABLE 13: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Cryptosporidiosis cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	10	15.0	1.3	2.0
Southern Health-Santé Sud	7	12.2	3.5	6.5
Interlake-Eastern RHA	3	2.6	2.3	3.5
Prairie Mountain Health	11	12.8	6.5	7.7
Northern Health Region	2	6.8	2.6	4.5
Manitoba	33	49.4	2.5	3.8

FIGURE 12: Annual crude incidence rate (per 100,000 population) of laboratory-confirmed Cryptosporidiosis cases in Manitoba, by regional health authority (RHA), 2011-2016.



GIARDIASIS

The average age in 2016 was 32.5 years (with a standard deviation of 22.6 years). The average age in 2011 - 2015 was 23.3 years (with a standard deviation of 21.6 years). The median age in 2016 was 30 years (IQR: 10 - 51.75 years). The median age in 2011 - 2015 was 16 years (IQR: 4 - 38 years).

TABLE 14: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Giardiasis cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	138	98.6	10.3	7.7
Female	56	40.4	8.3	6.2
Male	82	58.2	12.3	9.1

FIGURE 13: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Giardiasis cases in Manitoba, by age group and sex, 2016.

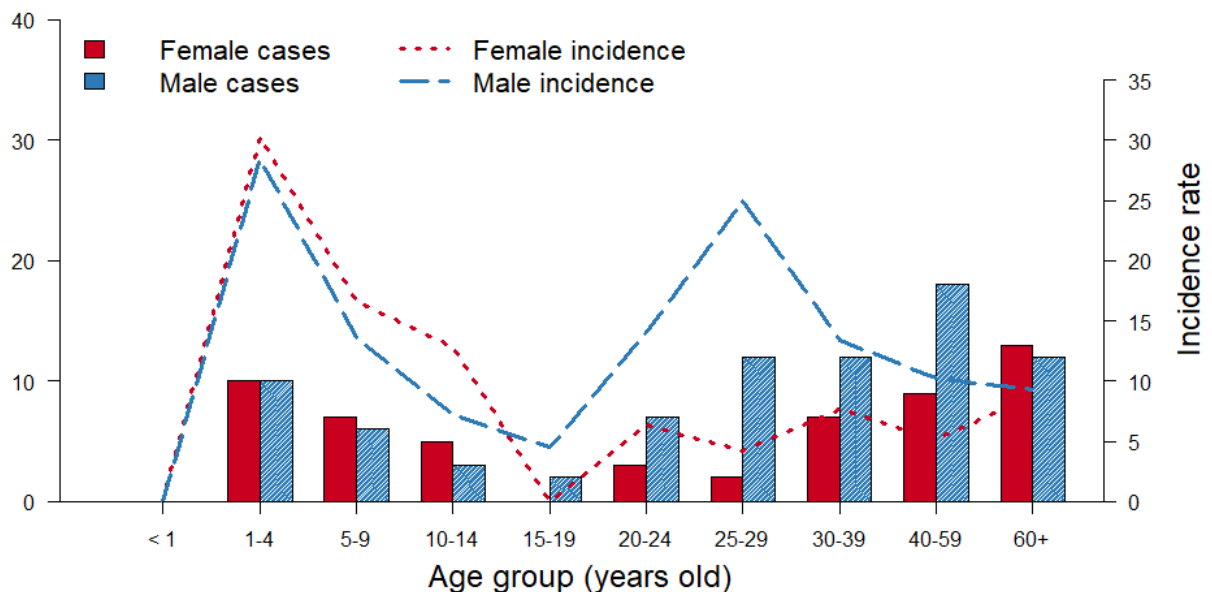


TABLE 15: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Giardiasis cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	0	0	0	0.0	0.0	0.0
1-4	20	10	10	29.3	30.2	28.4
5-9	13	7	6	15.1	16.6	13.6
10-14	8	5	3	9.9	12.8	7.2
15-19	2	0	2	2.3	0.0	4.5
20-24	10	3	7	10.3	6.4	14.0
25-29	14	2	12	14.6	4.2	25.0
30-39	19	7	12	10.6	7.7	13.4
40-59	27	9	18	7.7	5.2	10.2
60+	25	13	12	9.0	8.7	9.3

FIGURE 14: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Giardiasis cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

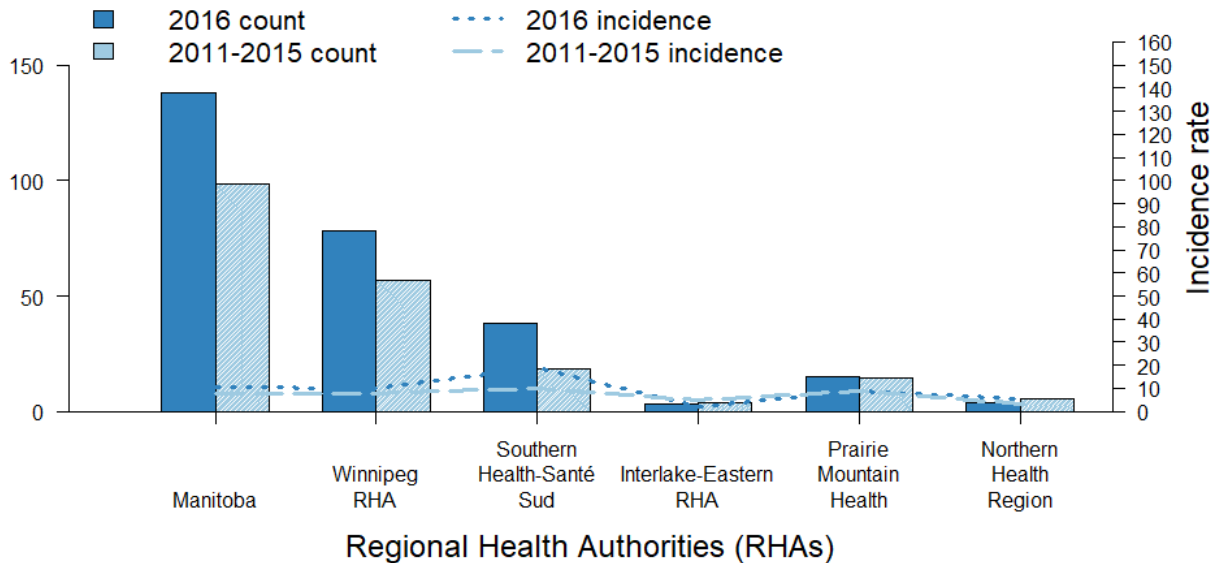
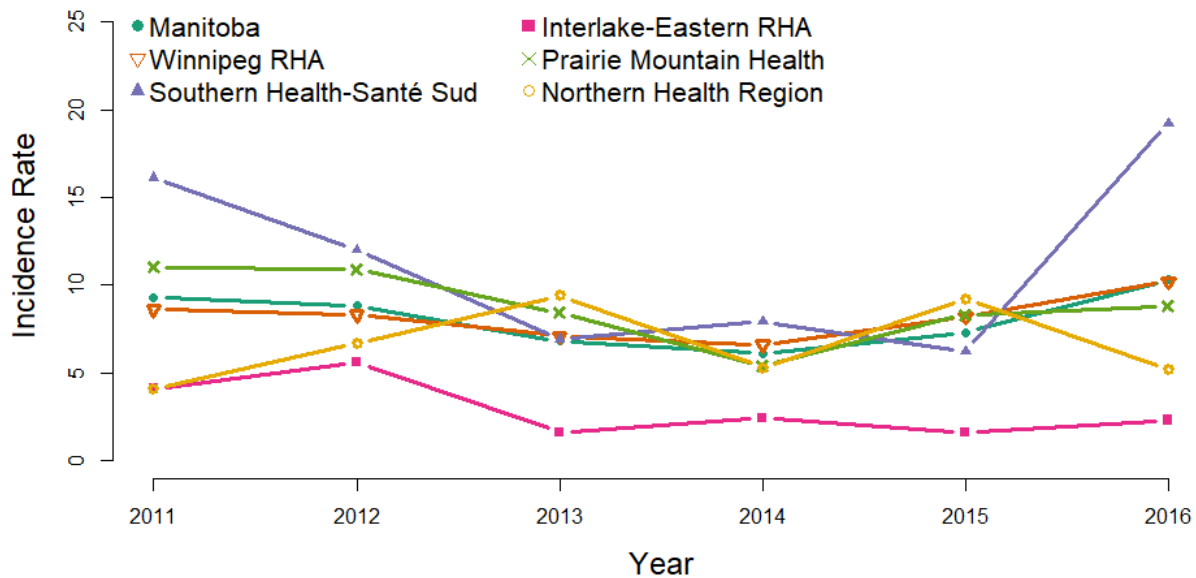


TABLE 16: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Giardiasis cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	78	56.8	10.2	7.7
Southern Health-Santé Sud	38	18.2	19.2	9.7
Interlake-Eastern RHA	3	3.8	2.3	5.1
Prairie Mountain Health	15	14.6	8.8	8.8
Northern Health Region	4	5.2	5.2	3.4
Manitoba	138	98.6	10.3	7.7

FIGURE 15: Annual crude incidence rate (per 100,000 population) of laboratory-confirmed Giardiasis cases in Manitoba, by regional health authority (RHA), 2011-2016.



SALMONELLOSIS

The average age in 2016 was 40.2 years (with a standard deviation of 24.5 years). The average age in 2011 - 2015 was 36.9 years (with a standard deviation of 24.6 years). The median age in 2016 was 40.5 years (IQR: 22 - 59 years). The median age in 2011 - 2015 was 34 years (IQR: 17 - 55.25 years).

TABLE 17: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Salmonellosis cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	280	204.0	20.9	15.8
Female	161	108.8	23.9	16.7
Male	119	95.2	17.9	14.9

FIGURE 16: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Salmonellosis cases in Manitoba, by age group and sex, 2016.

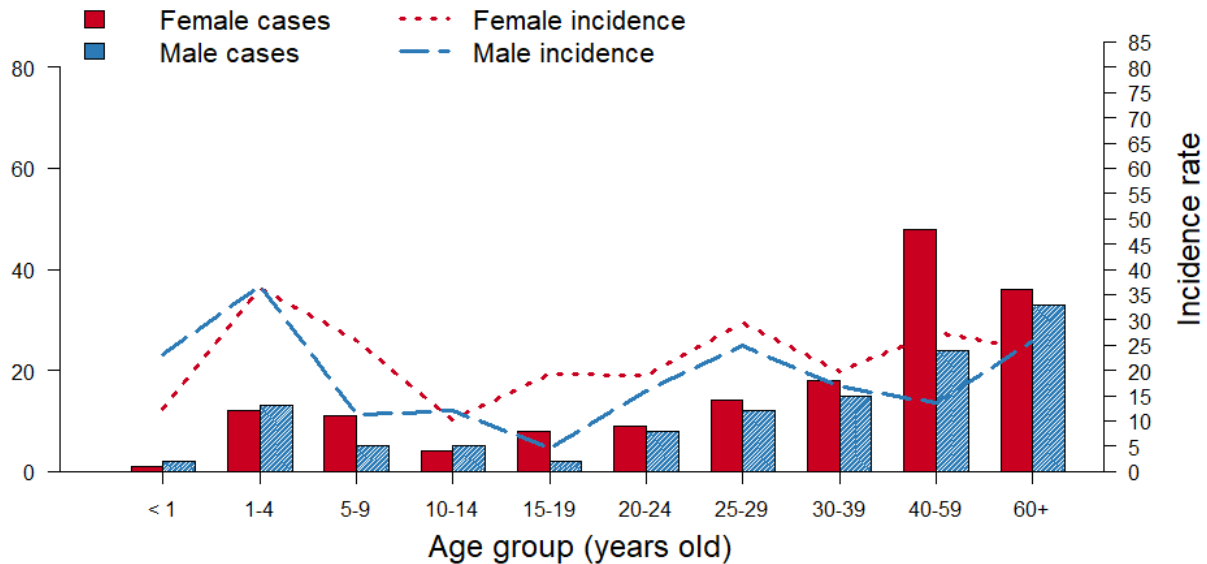


TABLE 18: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Salmonellosis cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	3	1	2	17.8	12.2	23.1
1-4	25	12	13	36.6	36.3	36.9
5-9	16	11	5	18.6	26.1	11.4
10-14	9	4	5	11.2	10.2	12.1
15-19	10	8	2	11.6	19.3	4.5
20-24	17	9	8	17.5	19.1	16.0
25-29	26	14	12	27.2	29.3	25.0
30-39	33	18	15	18.3	19.9	16.8
40-59	72	48	24	20.5	27.5	13.6
60+	69	36	33	24.8	24.1	25.7

FIGURE 17: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Salmonellosis cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

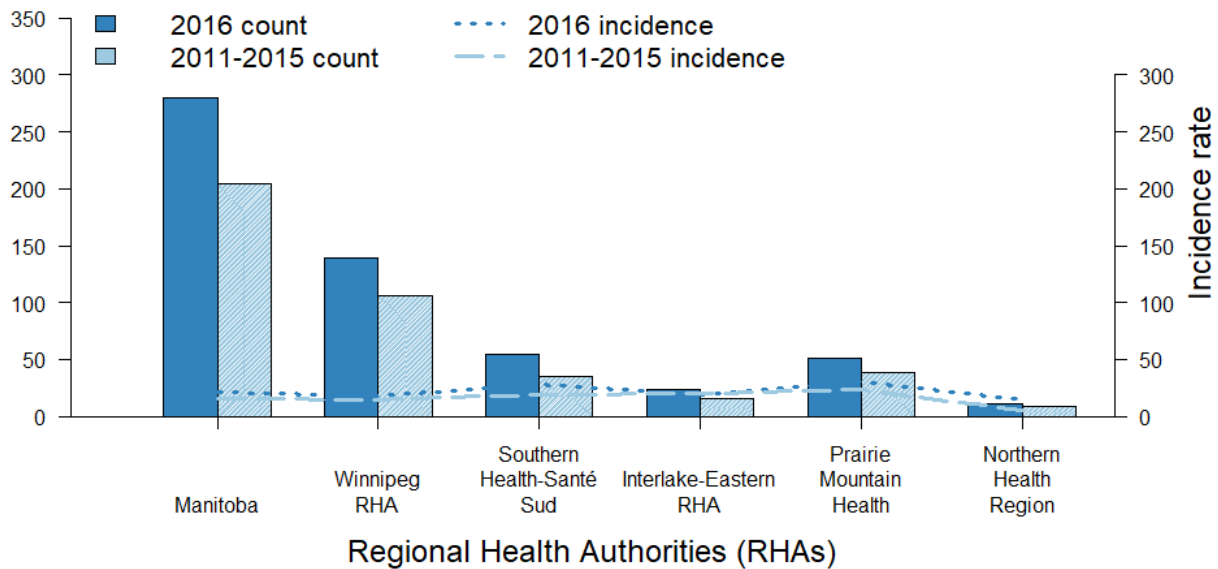
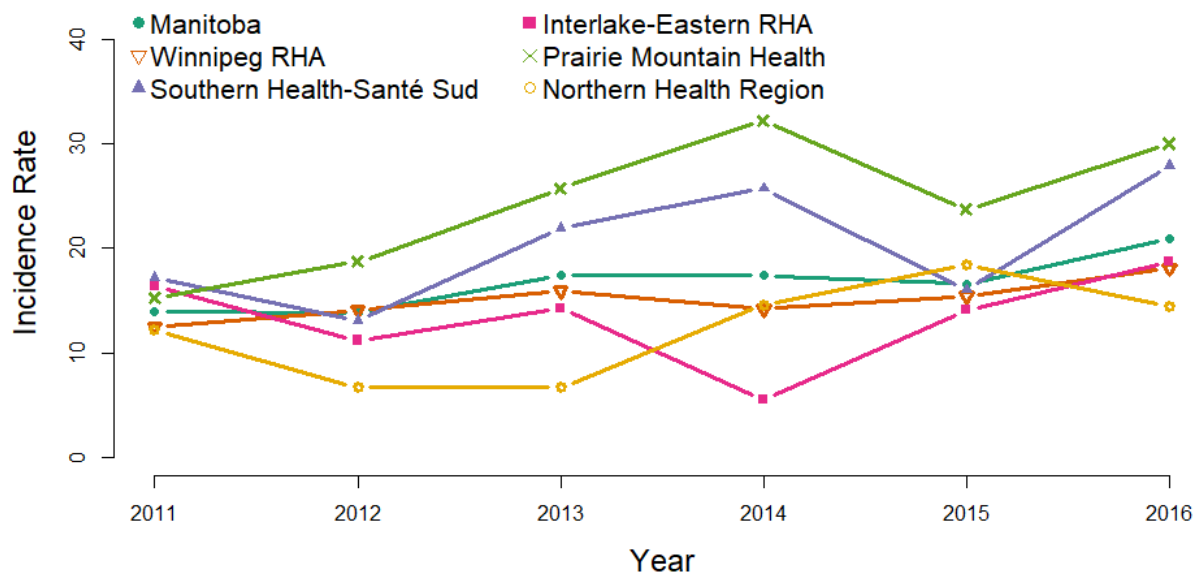


TABLE 19: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Salmonellosis cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	139	106.0	18.1	14.4
Southern Health-Santé Sud	55	35.2	27.9	18.8
Interlake-Eastern RHA	24	15.4	18.7	20.6
Prairie Mountain Health	51	38.6	30.0	23.2
Northern Health Region	11	8.8	14.4	5.8
Manitoba	280	204.0	20.9	15.8

FIGURE 18: Annual crude incidence rate (per 100,000 population) of laboratory-confirmed Salmonellosis cases in Manitoba, by regional health authority (RHA), 2011-2016.



SHIGELLOSIS

The average age in 2016 was 40.8 years (with a standard deviation of 20.7 years). The average age in 2011 - 2015 was 23.5 years (with a standard deviation of 21.5 years). The median age in 2016 was 39 years (IQR: 26 - 54 years). The median age in 2011 - 2015 was 16 years (IQR: 6 - 40 years).

TABLE 20: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Shigellosis cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	13	36.2	1.0	2.8
Female	8	17.0	1.2	2.6
Male	5	19.2	0.8	3.0

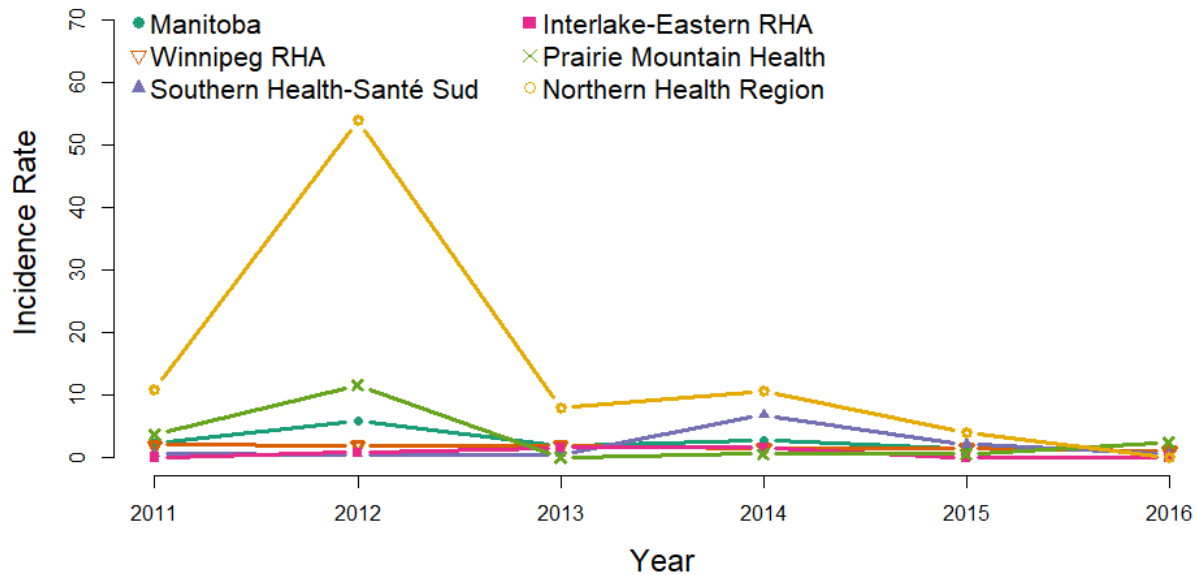
TABLE 21: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Shigellosis cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	0	0	0	0.0	0.0	0.0
1-4	0	0	0	0.0	0.0	0.0
5-9	1	0	1	1.2	0.0	2.3
10-14	0	0	0	0.0	0.0	0.0
15-19	1	0	1	1.2	0.0	2.3
20-24	1	1	0	1.0	2.1	0.0
25-29	2	0	2	2.1	0.0	4.2
30-39	2	2	0	1.1	2.2	0.0
40-59	4	3	1	1.1	1.7	0.6
60+	2	2	0	0.7	1.3	0.0

TABLE 22: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Shigellosis cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	8	12.8	1.0	1.7
Southern Health-Santé Sud	1	4.0	0.5	2.1
Interlake-Eastern RHA	0	1.0	0.0	1.3
Prairie Mountain Health	4	5.4	2.4	3.2
Northern Health Region	0	13.0	0.0	8.6
Manitoba	13	36.2	1.0	2.8

FIGURE 19: Annual crude incidence rate (per 100,000 population) of laboratory-confirmed Shigellosis cases in Manitoba, by regional health authority (RHA), 2011-2016.



VEROTOXIGENIC *ESCHERICHIA COLI* (VTEC)

The average age in 2016 was 31.1 years (with a standard deviation of 20 years). The average age in 2011 - 2015 was 28.4 years (with a standard deviation of 22.3 years). The median age in 2016 was 28 years (IQR: 17 - 41.5 years). The median age in 2011 - 2015 was 24 years (IQR: 10 - 43 years).

TABLE 23: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Verotoxigenic *Escherichia coli* (VTEC) cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	39	39.2	2.9	3.0
Female	20	20.4	3.0	3.1
Male	19	18.8	2.9	2.9

FIGURE 20: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Verotoxigenic *Escherichia coli* (VTEC) cases in Manitoba, by age group and sex, 2016.

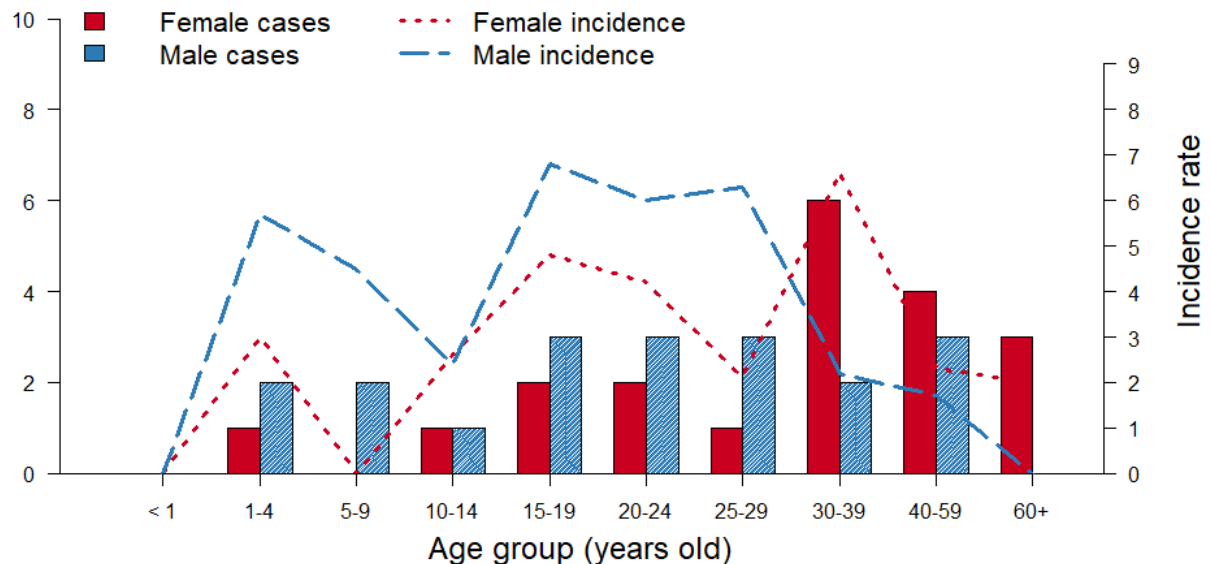


TABLE 24: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Verotoxigenic *Escherichia coli* (VTEC) cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	0	0	0	0.0	0.0	0.0
1-4	3	1	2	4.4	3.0	5.7
5-9	2	0	2	2.3	0.0	4.5
10-14	2	1	1	2.5	2.6	2.4
15-19	5	2	3	5.8	4.8	6.8
20-24	5	2	3	5.1	4.2	6.0
25-29	4	1	3	4.2	2.1	6.3
30-39	8	6	2	4.4	6.6	2.2
40-59	7	4	3	2.0	2.3	1.7
60+	3	3	0	1.1	2.0	0.0

FIGURE 21: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Verotoxigenic *Escherichia coli* (VTEC) cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

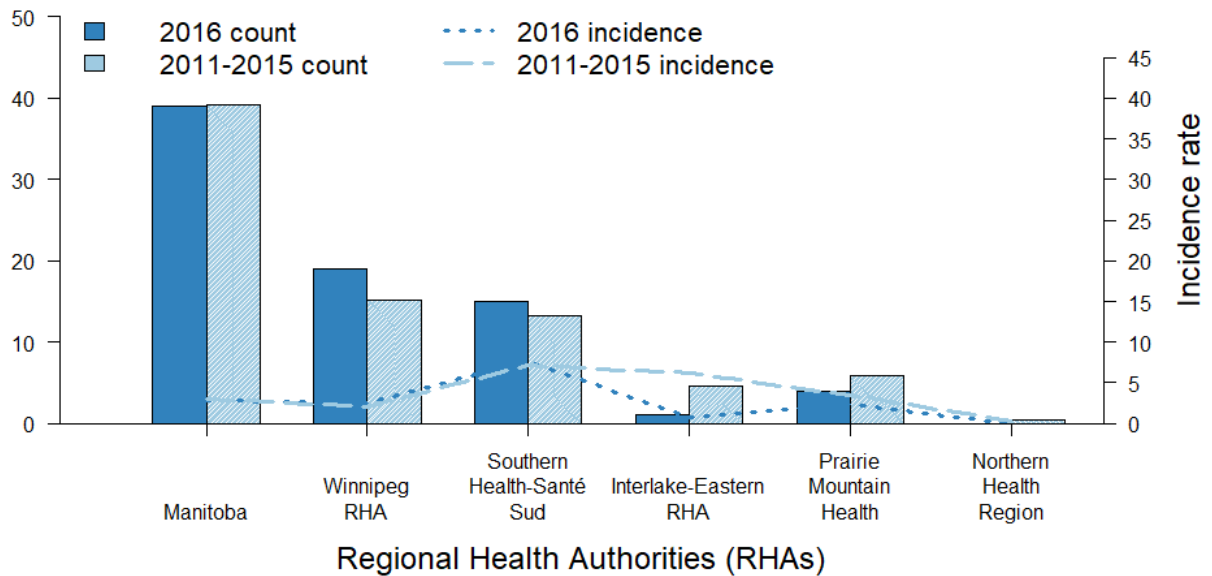
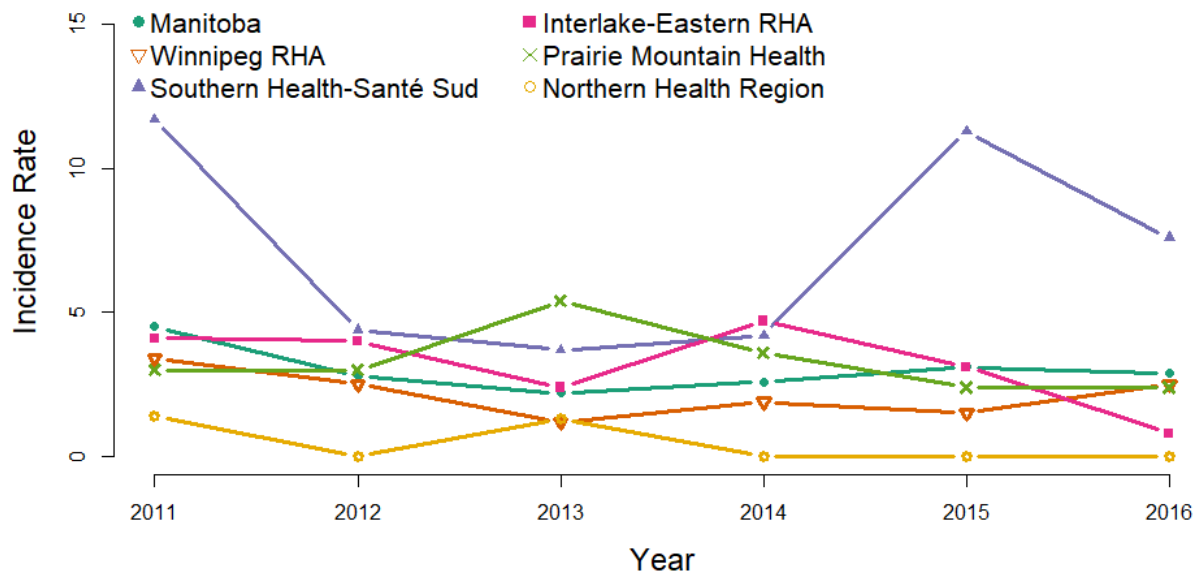


TABLE 25: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Verotoxigenic *Escherichia coli* (VTEC) cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	19	15.2	2.5	2.1
Southern Health-Santé Sud	15	13.2	7.6	7.1
Interlake-Eastern RHA	1	4.6	0.8	6.2
Prairie Mountain Health	4	5.8	2.4	3.5
Northern Health Region	0	0.4	0.0	0.3
Manitoba	39	39.2	2.9	3.0

FIGURE 22: Annual crude incidence rate (per 100,000 population) of laboratory-confirmed Verotoxigenic *Escherichia coli* (VTEC) cases in Manitoba, by regional health authority (RHA), 2011-2016.



NON-VACCINE PREVENTABLE DISEASES

STREPTOCOCCAL INVASIVE DISEASE (GROUP A)

Prior to January 1, 2015, the following ICD9 codes were used to classify Streptococcus:

- 038.0 - Streptococcus Beta-hemolytic in blood (all groups A-G)
- 320.2 - Streptococcus Beta-hemolytic in CSF (all groups A-G)
- 041.1 - Streptococcus Beta-hemolytic in other sterile sites (all groups A-G).

As of January 1, 2015, the ICD9 codes 038.0, 320.2 and 041.1 were re-classified to only include Group A; Groups B-G were no longer captured in these codes. These ICD9 codes are now reported together as Streptococcal invasive disease (Group A), as they are all caused by the same infectious agent, *Streptococcus pyogenes*, but isolated from different sites. Thus, making a comparison to previous years is not possible, since the data collected prior to 2015 is different from that collected since January 2015.

The average age in 2016 was 45.9 years (with a standard deviation of 23.3 years). The average age in 2011 - 2015 was 44 years (with a standard deviation of 23.2 years). The median age in 2016 was 48 years (IQR: 32 - 62.5 years). The median age in 2011 - 2015 was 46 years (IQR: 30 - 60 years).

TABLE 26: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Streptococcal invasive disease (Group A) cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	195	-	14.6	-
Female	84	-	12.5	-
Male	111	-	16.7	-

*The dash indicates that the comparison to previous years is not possible due to changes in disease coding (See Appendix C).

FIGURE 23: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Streptococcal invasive disease (Group A) cases in Manitoba, by age group and sex, 2016.

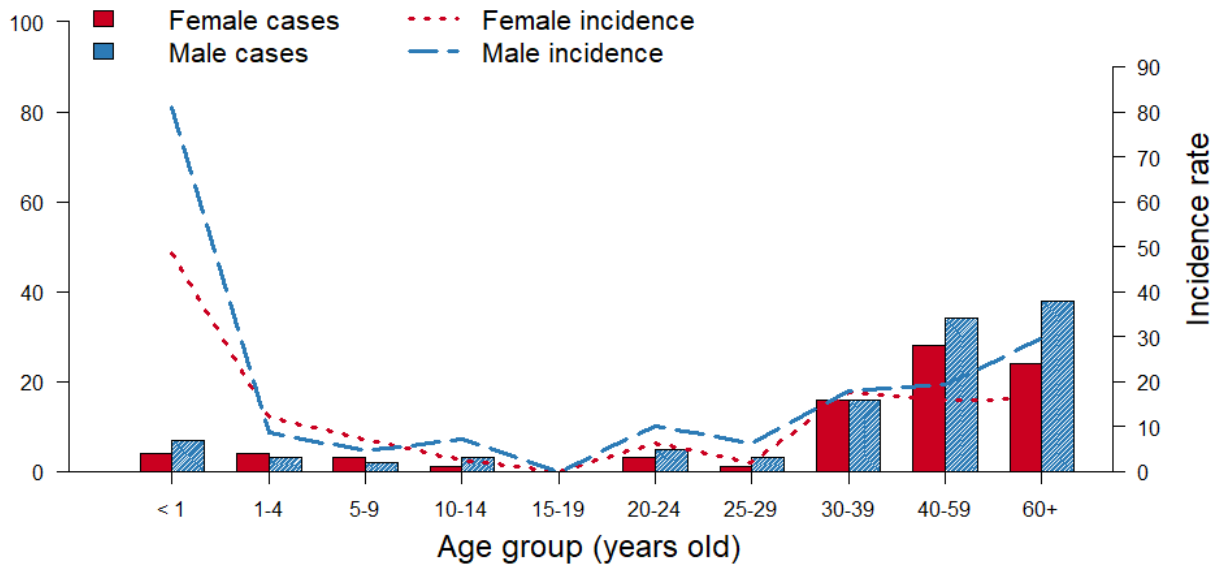


TABLE 27: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Streptococcal invasive disease (Group A) cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	11	4	7	65.2	48.7	80.9
1-4	7	4	3	10.2	12.1	8.5
5-9	5	3	2	5.8	7.1	4.5
10-14	4	1	3	5.0	2.6	7.2
15-19	0	0	0	0.0	0.0	0.0
20-24	8	3	5	8.2	6.4	10.0
25-29	4	1	3	4.2	2.1	6.3
30-39	32	16	16	17.8	17.7	17.9
40-59	62	28	34	17.7	16.0	19.3
60+	62	24	38	22.3	16.1	29.6

FIGURE 24: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Streptococcal invasive disease (Group A) cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

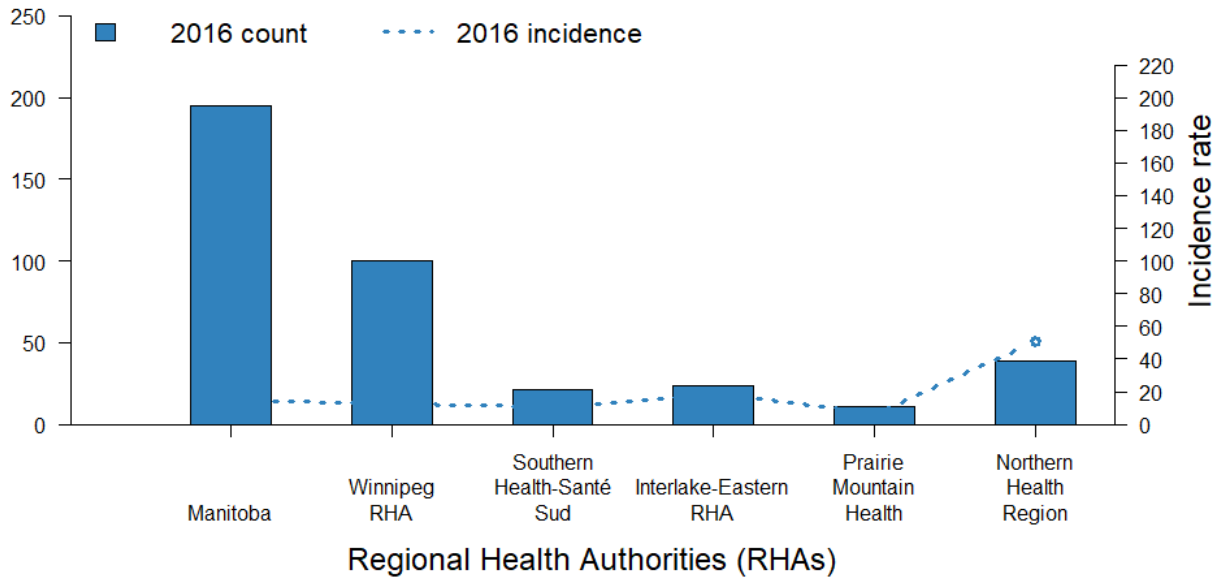


TABLE 28: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Streptococcal invasive disease (Group A) cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	100	-	13.0	-
Southern Health-Santé Sud	21	-	10.6	-
Interlake-Eastern RHA	24	-	18.7	-
Prairie Mountain Health	11	-	6.5	-
Northern Health Region	39	-	51.0	-
Manitoba	195	-	14.6	-

*The dash indicates that the comparison to previous years is not possible due to changes in disease coding (See Appendix C).

STREPTOCOCCAL INVASIVE DISEASE OF THE NEWBORN (GROUP B)

As of January 1, 2015 a new ICD9 code, 041.02, was created to capture cases where the infectious agent *Streptococcus agalactiae* infected a newborn (defined as an infant up to 28 days old). These cases are known as Streptococcal invasive disease of the newborn (group B). Making a comparison with previous years is not possible in these situations because the ICD9 code did not exist during the years we would compare the data to.

The average age in 2016 was 0 years (with a standard deviation of 0 years). The average age in 2011 - 2015 was 0 years (with a standard deviation of 0 years). The median age in 2016 was 0 years (IQR: 0 - 0 years). The median age in 2011 - 2015 was 0 years (IQR: 0 - 0 years).

TABLE 29: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Streptococcal invasive disease of the newborn (Group B) cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	10	-	0.7	-
Female	6	-	0.9	-
Male	4	-	0.6	-

*The dash indicates that the comparison to previous years is not possible due to changes in disease coding (See Appendix C).

TABLE 30: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Streptococcal invasive disease of the newborn (Group B) cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	10	6	4	59.3	73.1	46.2
1-4	0	0	0	0.0	0.0	0.0
5-9	0	0	0	0.0	0.0	0.0
10-14	0	0	0	0.0	0.0	0.0
15-19	0	0	0	0.0	0.0	0.0
20-24	0	0	0	0.0	0.0	0.0
25-29	0	0	0	0.0	0.0	0.0
30-39	0	0	0	0.0	0.0	0.0
40-59	0	0	0	0.0	0.0	0.0
60+	0	0	0	0.0	0.0	0.0

TABLE 31: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Streptococcal invasive disease of the newborn (Group B) cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	6	-	0.8	-
Southern Health-Santé Sud	0	-	0.0	-
Interlake-Eastern RHA	1	-	0.8	-
Prairie Mountain Health	0	-	0.0	-
Northern Health Region	3	-	3.9	-
Manitoba	10	-	0.7	-

*The dash indicates that the comparison to previous years is not possible due to changes in disease coding (See Appendix C).

VACCINE PREVENTABLE DISEASES

HAEMOPHILUS INFLUENZAE (NON-SEROTYPE B INVASIVE DISEASE)

Prior to January 1, 2015 the ICD9 code 041.59 captured *Haemophilus influenzae* (not typeable). As of January 1, 2015, this ICD9 code was re-classified to as *Haemophilus influenzae* (non-serotype B invasive disease) which includes all *Haemophilus influenzae* invasive cases that are non-serotype B, and those organisms that were not type-able. Making a comparison with previous years is not valuable in these situation because the meaning of the ICD9 code have changed.

The average age in 2016 was 32.4 years (with a standard deviation of 30 years). The average age in 2011 - 2015 was 37.7 years (with a standard deviation of 33.6 years). The median age in 2016 was 36 years (IQR: 2 - 56 years). The median age in 2011 - 2015 was 34 years (IQR: 1 - 70 years).

TABLE 32: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed *Haemophilus influenzae* (non-serotype B invasive disease) cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	33	-	2.5	-
Female	14	-	2.1	-
Male	19	-	2.9	-

*The dash indicates that the comparison to previous years is not possible due to changes in disease coding (See Appendix C).

FIGURE 25: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed *Haemophilus influenzae* (non-serotype B invasive disease) cases in Manitoba, by age group and sex, 2016.

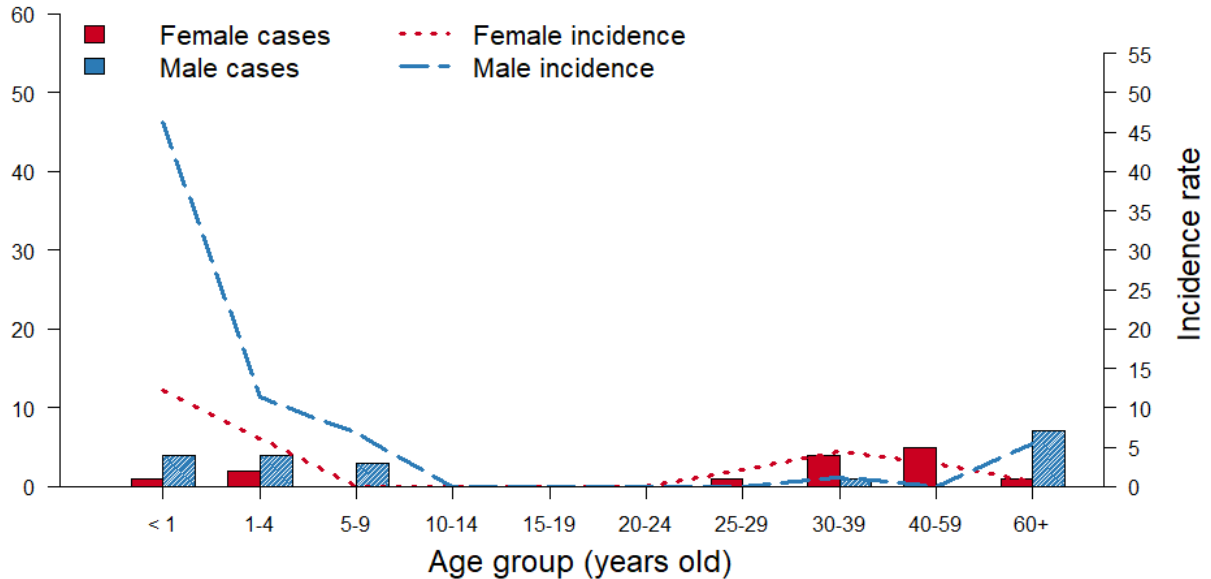


TABLE 33: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed *Haemophilus influenzae* (non-serotype B invasive disease) cases in Manitoba, by age group and sex, 2016.

Age group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	5	1	4	29.6	12.2	46.2
1-4	6	2	4	8.8	6.0	11.3
5-9	3	0	3	3.5	0.0	6.8
10-14	0	0	0	0.0	0.0	0.0
15-19	0	0	0	0.0	0.0	0.0
20-24	0	0	0	0.0	0.0	0.0
25-29	1	1	0	1.0	2.1	0.0
30-39	5	4	1	2.8	4.4	1.1
40-59	5	5	0	1.4	2.9	0.0
60+	8	1	7	2.9	0.7	5.5

FIGURE 26: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed *Haemophilus influenzae* (non-serotype B invasive disease) cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

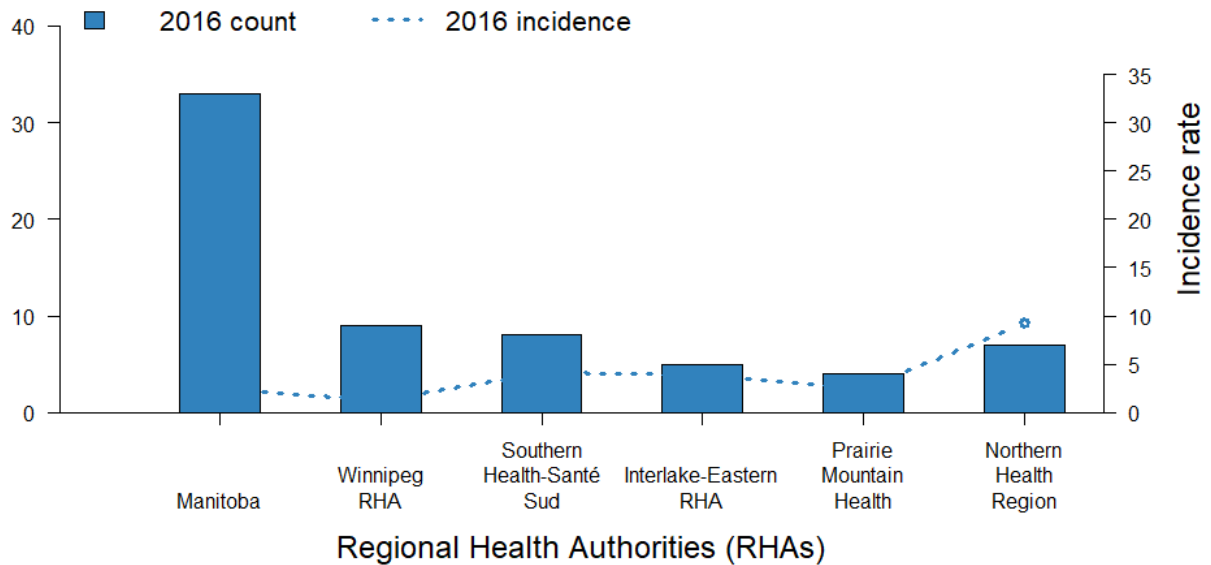


TABLE 34: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed *Haemophilus influenzae* (non-serotype B invasive disease) cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	9	-	1.2	-
Southern Health-Santé Sud	8	-	4.1	-
Interlake-Eastern RHA	5	-	3.9	-
Prairie Mountain Health	4	-	2.4	-
Northern Health Region	7	-	9.2	-
Manitoba	33	-	2.5	-

*The dash indicates that the comparison to previous years is not possible due to changes in disease coding (See Appendix C).

INVASIVE MENINGOCOCCAL DISEASE

The average age in 2016 was 12.2 years (with a standard deviation of 26.3 years). The average age in 2011 - 2015 was 25.7 years (with a standard deviation of 27.4 years). The median age in 2016 was 1.5 years (IQR: 1 - 7.25 years). The median age in 2011 - 2015 was 19 years (IQR: 1.5 - 41 years).

TABLE 35: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Invasive meningococcal disease cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	8	3.8	0.6	0.3
Female	5	2.6	0.7	0.4
Male	3	1.2	0.5	0.2

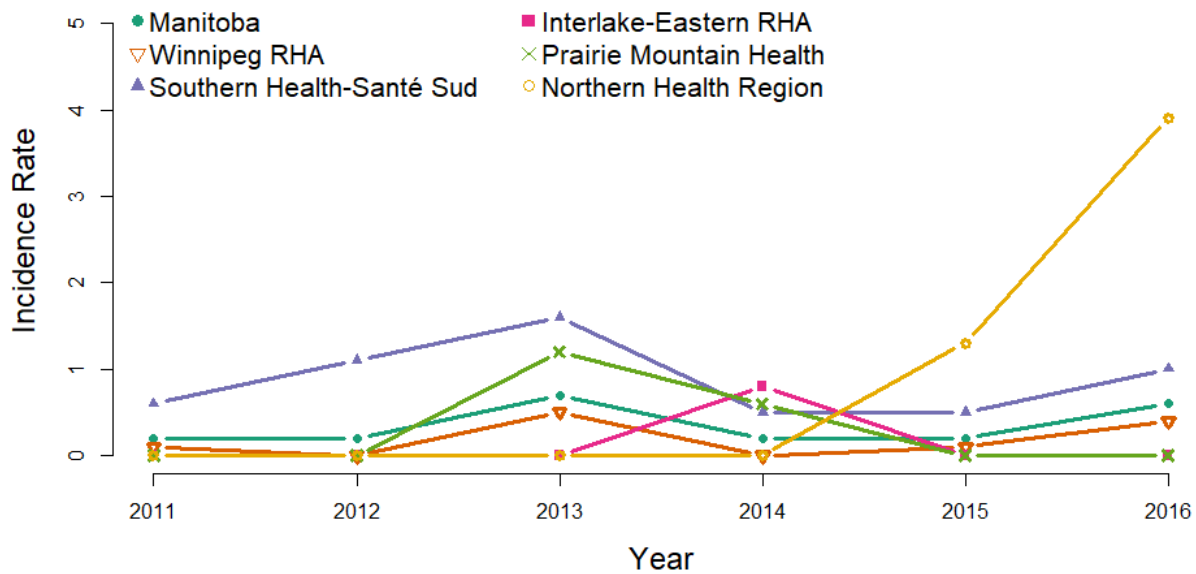
TABLE 36: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Invasive meningococcal disease cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	0	0	0	0.0	0.0	0.0
1-4	5	2	3	7.3	6.0	8.5
5-9	2	2	0	2.3	4.7	0.0
10-14	0	0	0	0.0	0.0	0.0
15-19	0	0	0	0.0	0.0	0.0
20-24	0	0	0	0.0	0.0	0.0
25-29	0	0	0	0.0	0.0	0.0
30-39	0	0	0	0.0	0.0	0.0
40-59	0	0	0	0.0	0.0	0.0
60+	1	1	0	0.4	0.7	0.0

TABLE 37: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Invasive meningococcal disease cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	3	1.2	0.4	0.2
Southern Health-Santé Sud	2	1.6	1.0	0.9
Interlake-Eastern RHA	0	0.2	0.0	0.3
Prairie Mountain Health	0	0.6	0.0	0.4
Northern Health Region	3	0.2	3.9	0.1
Manitoba	8	3.8	0.6	0.3

FIGURE 27: Annual crude incidence rate (per 100,000 population) of laboratory-confirmed Invasive meningococcal disease cases in Manitoba, by regional health authority (RHA), 2011-2016.



INVASIVE PNEUMOCOCCAL DISEASE

The average age in 2016 was 47.2 years (with a standard deviation of 27.1 years). The average age in 2011 - 2015 was 49 years (with a standard deviation of 25.7 years). The median age in 2016 was 52.5 years (IQR: 28.5 - 68 years). The median age in 2011 - 2015 was 52 years (IQR: 34 - 68 years).

TABLE 38: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Invasive pneumococcal disease cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	120	133.6	9.0	10.4
Female	58	65.8	8.6	10.1
Male	62	67.8	9.3	10.6

FIGURE 28: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Invasive pneumococcal disease cases in Manitoba, by age group and sex, 2016.

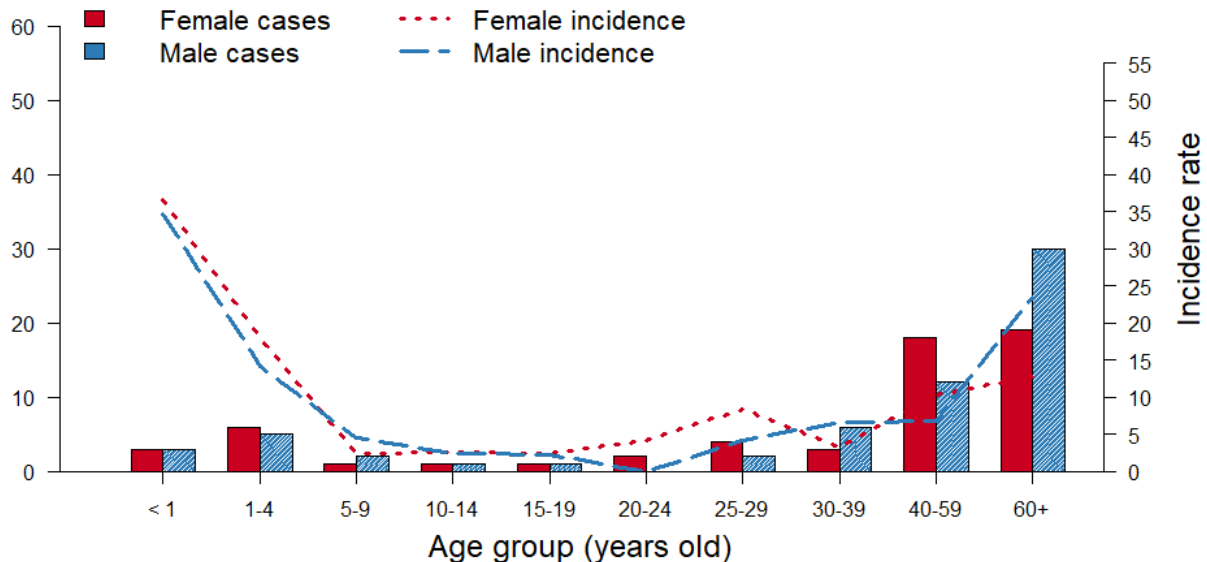


TABLE 39: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Invasive pneumococcal disease cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	6	3	3	35.6	36.6	34.7
1-4	11	6	5	16.1	18.1	14.2
5-9	3	1	2	3.5	2.4	4.5
10-14	2	1	1	2.5	2.6	2.4
15-19	2	1	1	2.3	2.4	2.3
20-24	2	2	0	2.1	4.2	0.0
25-29	6	4	2	6.3	8.4	4.2
30-39	9	3	6	5.0	3.3	6.7
40-59	30	18	12	8.6	10.3	6.8
60+	49	19	30	17.6	12.7	23.4

FIGURE 29: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Invasive pneumococcal disease cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

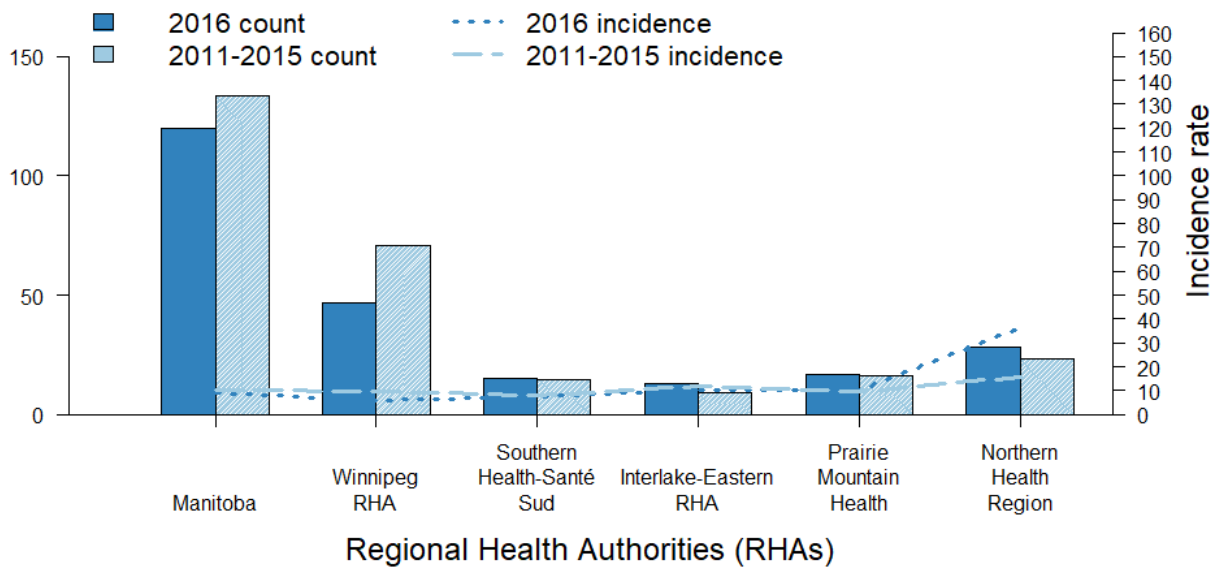
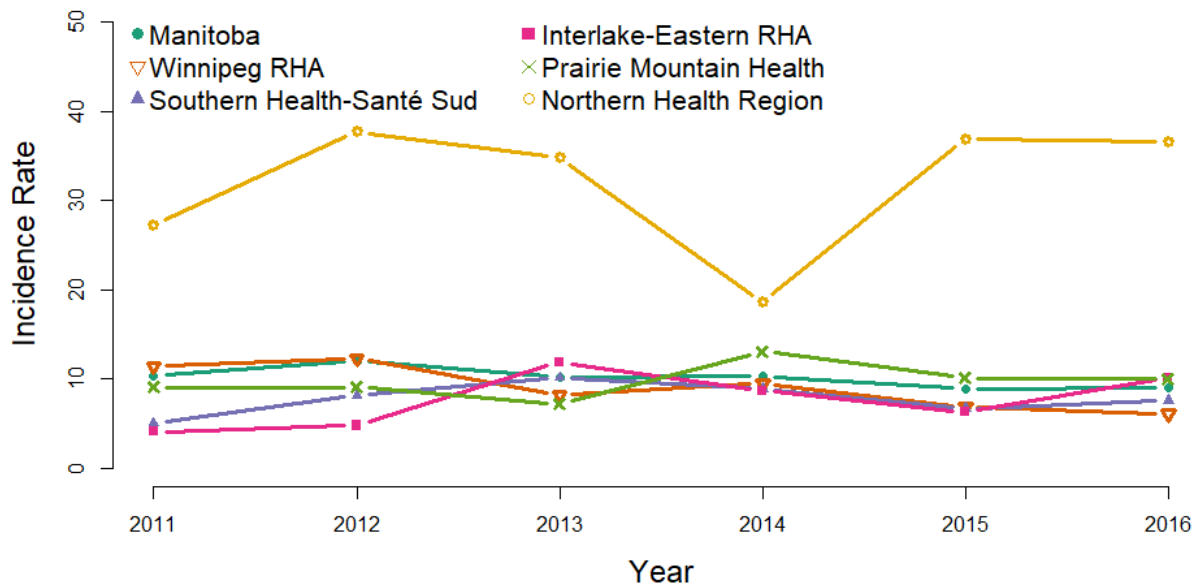


TABLE 40: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Invasive pneumococcal disease cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	47	70.6	6.1	9.6
Southern Health-Santé Sud	15	14.6	7.6	7.8
Interlake-Eastern RHA	13	9.0	10.1	12.0
Prairie Mountain Health	17	16.2	10.0	9.7
Northern Health Region	28	23.2	36.6	15.4
Manitoba	120	133.6	9.0	10.4

FIGURE 30: Annual crude incidence rate (per 100,000 population) of laboratory-confirmed Invasive pneumococcal disease cases in Manitoba, by regional health authority (RHA), 2011-2016.



MUMPS

In October 2016, routine public health surveillance detected a cluster of six mumps cases in the Winnipeg Regional Health Authority. All cases were students aged around 20 years from the University of Manitoba with symptoms onset between late September and early October 2016. The infection soon spread to other universities and communities. By November 2016, mumps had spread to three rural health regions, which resulted in an outbreak being declared.

The average age in 2016 was 24.3 years (with a standard deviation of 9.3 years). The average age in 2011 - 2015 was 35.6 years (with a standard deviation of 20.5 years). The median age in 2016 was 22 years (IQR: 19 - 28 years). The median age in 2011 - 2015 was 37 years (IQR: 14.5 - 51 years).

TABLE 41: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Mumps cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	111	4.4	8.3	0.3
Female	41	2.0	6.1	0.3
Male	70	2.4	10.5	0.4

FIGURE 31: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Mumps cases in Manitoba, by age group and sex, 2016.

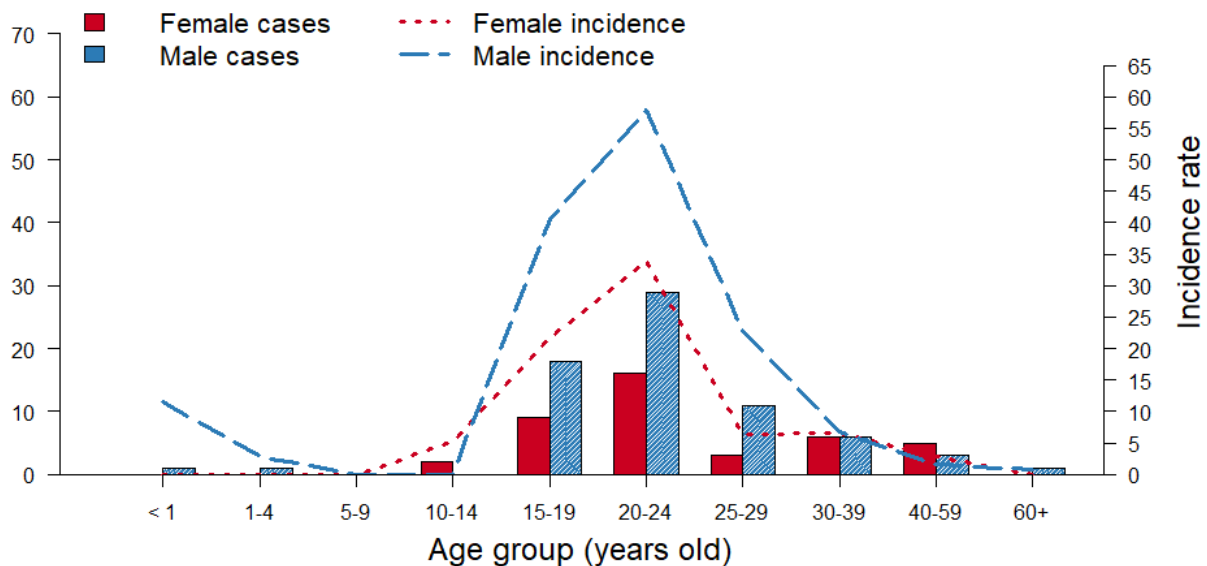


TABLE 42: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Mumps cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	1	0	1	5.9	0.0	11.6
1-4	1	0	1	1.5	0.0	2.8
5-9	0	0	0	0.0	0.0	0.0
10-14	2	2	0	2.5	5.1	0.0
15-19	27	9	18	31.4	21.7	40.5
20-24	45	16	29	46.2	33.9	57.8
25-29	14	3	11	14.6	6.3	23.0
30-39	12	6	6	6.7	6.6	6.7
40-59	8	5	3	2.3	2.9	1.7
60+	1	0	1	0.4	0.0	0.8

FIGURE 32: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Mumps cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

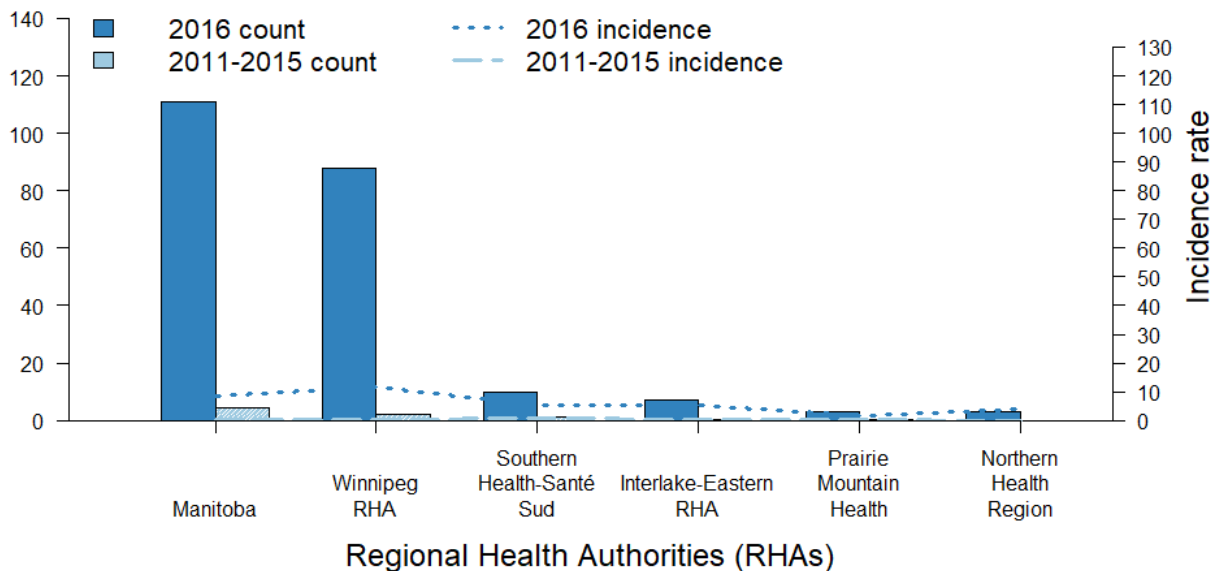
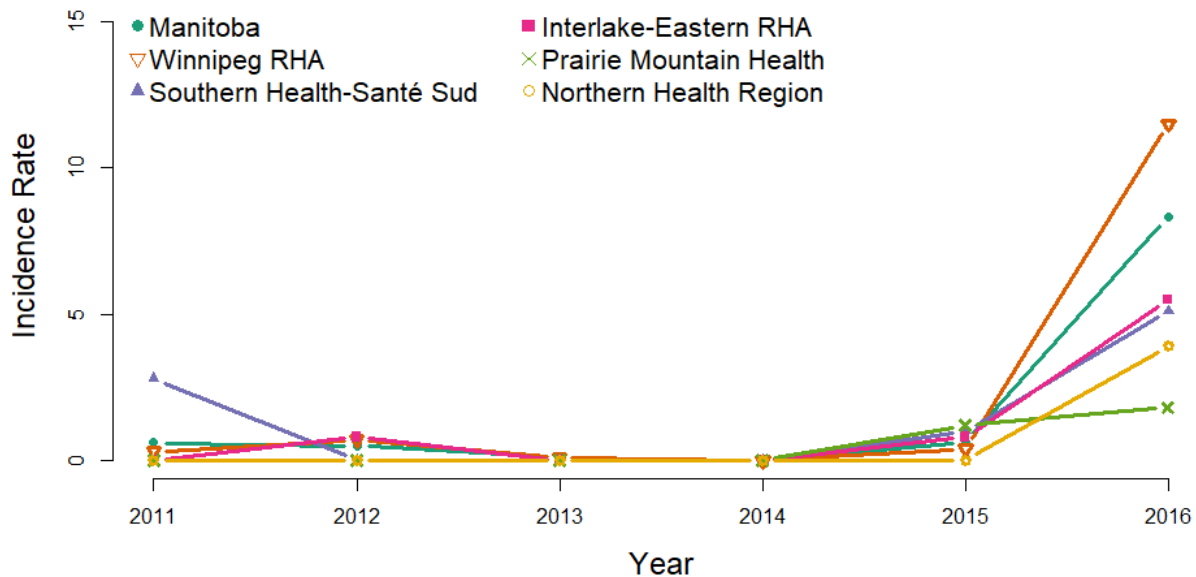


TABLE 43: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Mumps cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	88	2.2	11.5	0.3
Southern Health-Santé Sud	10	1.4	5.1	0.7
Interlake-Eastern RHA	7	0.4	5.5	0.5
Prairie Mountain Health	3	0.4	1.8	0.2
Northern Health Region	3	0.0	3.9	0.0
Manitoba	111	4.4	8.3	0.3

FIGURE 33: Annual crude incidence rate (per 100,000 population) of laboratory-confirmed Mumps cases in Manitoba, by regional health authority (RHA), 2011-2016.



PERTUSSIS

The average age in 2016 was 10.7 years (with a standard deviation of 16.8 years). The average age in 2011 - 2015 was 8.9 years (with a standard deviation of 14.8 years). The median age in 2016 was 4 years (IQR: 0 - 12 years). The median age in 2011 - 2015 was 2 years (IQR: 0 - 11.5 years).

TABLE 44: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Pertussis cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	116	44.6	8.7	3.5
Female	60	24.4	8.9	3.8
Male	56	20.2	8.4	3.2

FIGURE 34: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Pertussis cases in Manitoba, by age group and sex, 2016.

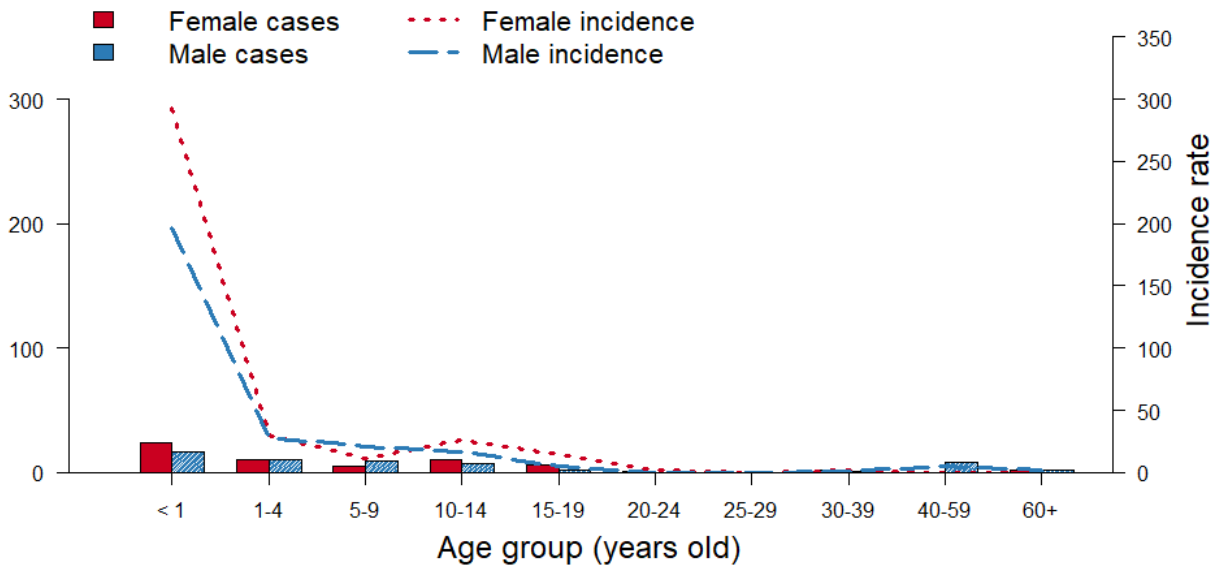


TABLE 45: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Pertussis cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	41	24	17	243.1	292.4	196.4
1-4	20	10	10	29.3	30.2	28.4
5-9	14	5	9	16.2	11.8	20.5
10-14	17	10	7	21.1	25.5	16.9
15-19	8	6	2	9.3	14.5	4.5
20-24	1	1	0	1.0	2.1	0.0
25-29	0	0	0	0.0	0.0	0.0
30-39	3	2	1	1.7	2.2	1.1
40-59	8	0	8	2.3	0.0	4.5
60+	4	2	2	1.4	1.3	1.6

FIGURE 35: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Pertussis cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

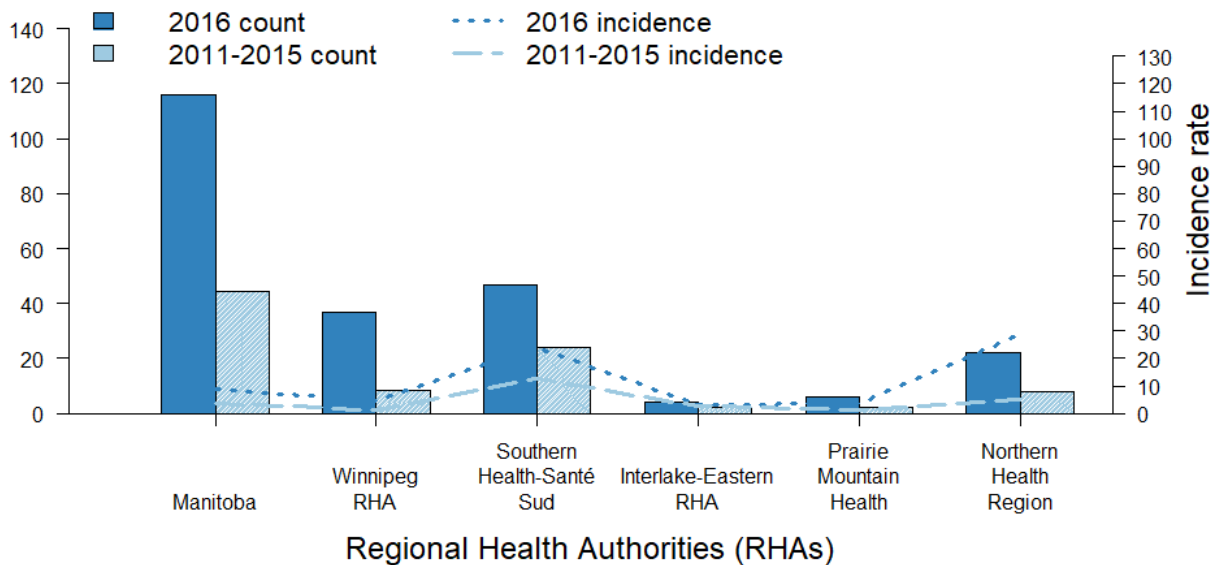
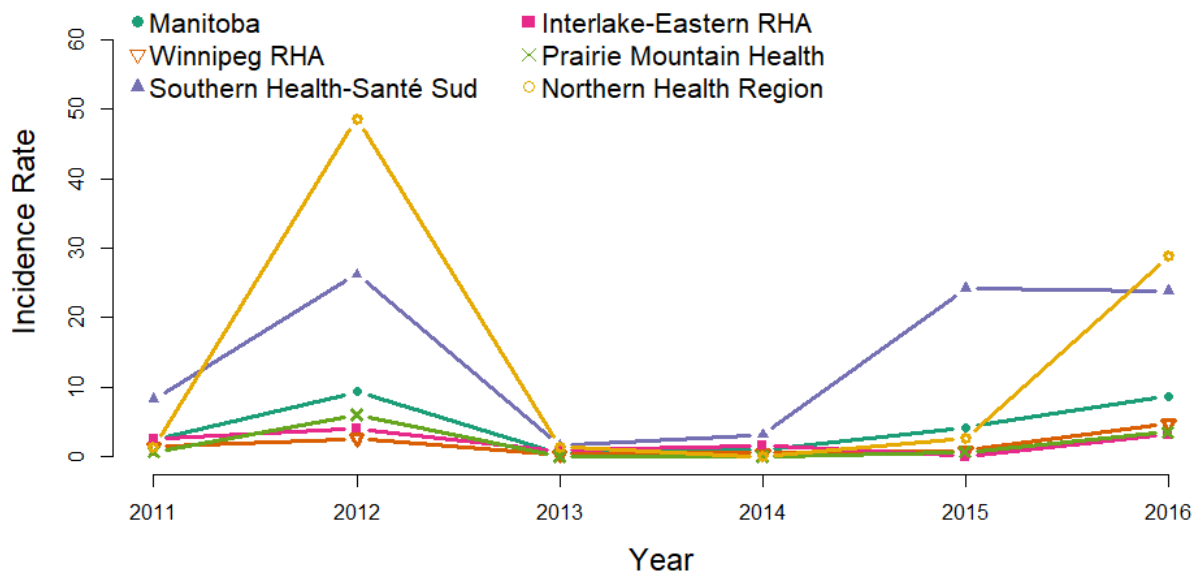


TABLE 46: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Pertussis cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	37	8.2	4.8	1.1
Southern Health-Santé Sud	47	23.8	23.8	12.7
Interlake-Eastern RHA	4	2.2	3.1	2.9
Prairie Mountain Health	6	2.4	3.5	1.4
Northern Health Region	22	8.0	28.8	5.3
Manitoba	116	44.6	8.7	3.5

FIGURE 36: Annual crude incidence rate (per 100,000 population) of laboratory-confirmed Pertussis cases in Manitoba, by regional health authority (RHA), 2011-2016.



ZOONOTIC AND ENVIRONMENTAL DISEASES

BLASTOMYCOSIS

The average age in 2016 was 42.4 years (with a standard deviation of 21.5 years). The average age in 2011 - 2015 was 38.6 years (with a standard deviation of 23.6 years). The median age in 2016 was 35 years (IQR: 25.75 - 62.75 years). The median age in 2011 - 2015 was 38 years (IQR: 20 - 55 years).

TABLE 47: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Blastomycosis cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	14	14.6	1	1.1
Female	4	5.2	0.6	0.8
Male	10	9.4	1.5	1.5

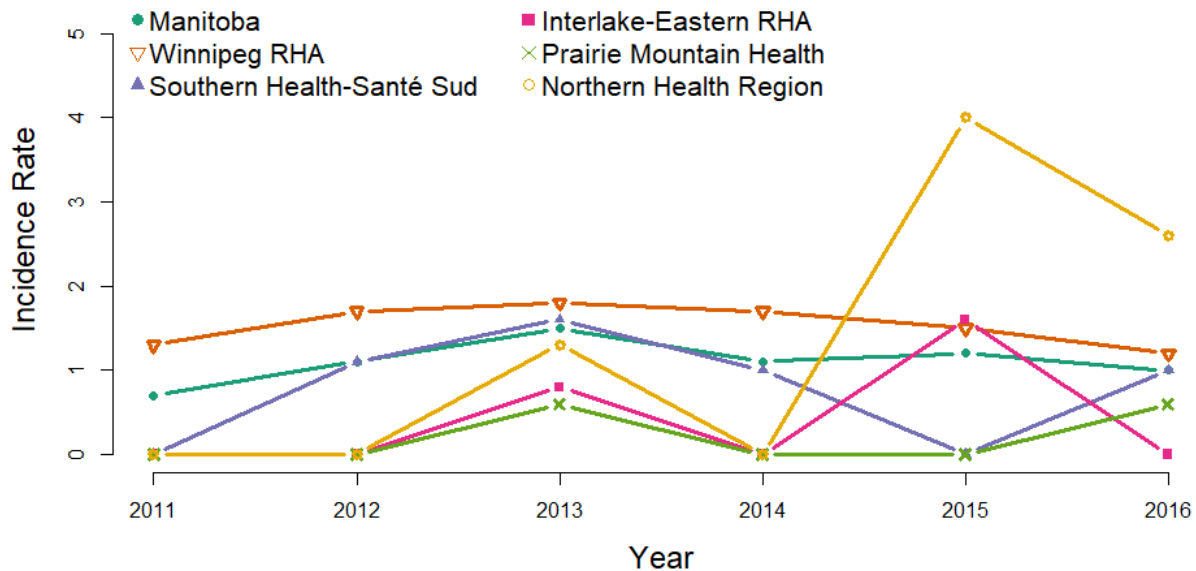
TABLE 48: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Blastomycosis cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	0	0	0	0.0	0.0	0.0
1-4	0	0	0	0.0	0.0	0.0
5-9	0	0	0	0.0	0.0	0.0
10-14	1	0	1	1.2	0.0	2.4
15-19	0	0	0	0.0	0.0	0.0
20-24	2	2	0	2.1	4.2	0.0
25-29	4	0	4	4.2	0.0	8.3
30-39	0	0	0	0.0	0.0	0.0
40-59	2	1	1	0.6	0.6	0.6
60+	5	1	4	1.8	0.7	3.1

TABLE 49: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Blastomycosis cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	9	11.6	1.2	1.6
Southern Health-Santé Sud	2	1.4	1.0	0.7
Interlake-Eastern RHA	0	0.6	0.0	0.8
Prairie Mountain Health	1	0.2	0.6	0.1
Northern Health Region	2	0.8	2.6	0.5
Manitoba	14	14.6	1.0	1.1

FIGURE 37: Annual crude incidence rate (per 100,000 population) of laboratory-confirmed Blastomycosis cases in Manitoba, by regional health authority (RHA), 2011-2016.



MALARIA

The average age in 2016 was 23 years (with a standard deviation of 17.4 years). The average age in 2011 - 2015 was 30 years (with a standard deviation of 18.4 years). The median age in 2016 was 21 years (IQR: 6.25 - 32.75 years). The median age in 2011 - 2015 was 29.5 years (IQR: 15.75 - 43 years).

TABLE 50: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Malaria cases in Manitoba, by sex, 2016 and 5-year average (2011-2015).

	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Total	20	20.0	1.5	1.6
Female	4	4.6	0.6	0.7
Male	16	15.4	2.4	2.4

FIGURE 38: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Malaria cases in Manitoba, by age group and sex, 2016.

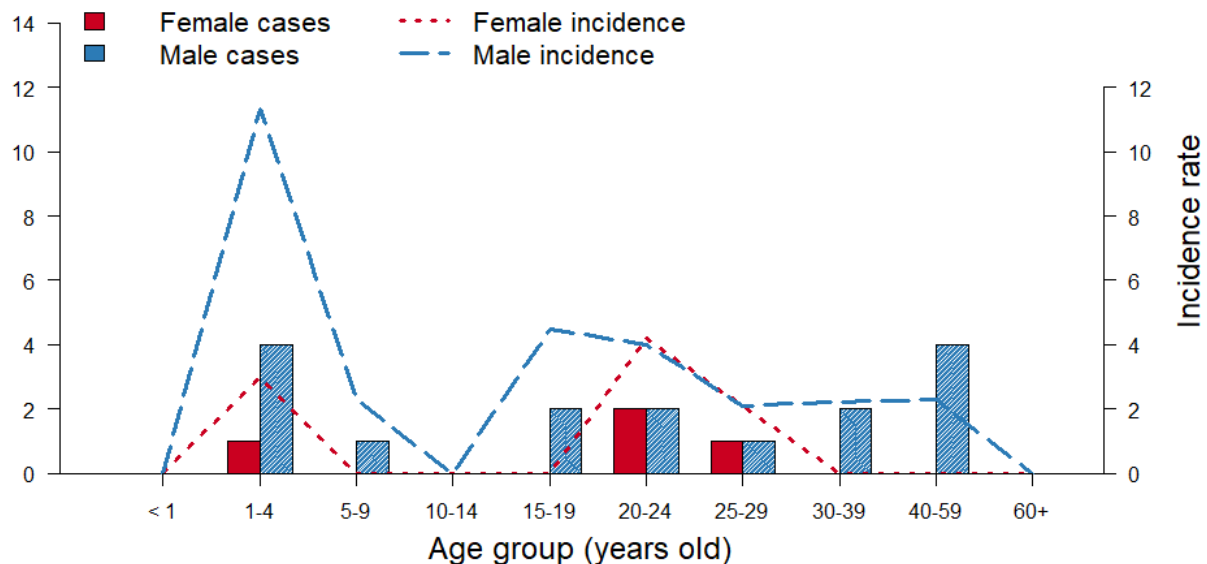


TABLE 51: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Malaria cases in Manitoba, by age group and sex, 2016.

Age Group (years)	Count			Incidence Rate		
	Total	Female	Male	Total	Female	Male
<1	0	0	0	0.0	0.0	0.0
1-4	5	1	4	7.3	3.0	11.3
5-9	1	0	1	1.2	0.0	2.3
10-14	0	0	0	0.0	0.0	0.0
15-19	2	0	2	2.3	0.0	4.5
20-24	4	2	2	4.1	4.2	4.0
25-29	2	1	1	2.1	2.1	2.1
30-39	2	0	2	1.1	0.0	2.2
40-59	4	0	4	1.1	0.0	2.3
60+	0	0	0	0.0	0.0	0.0

FIGURE 39: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Malaria cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

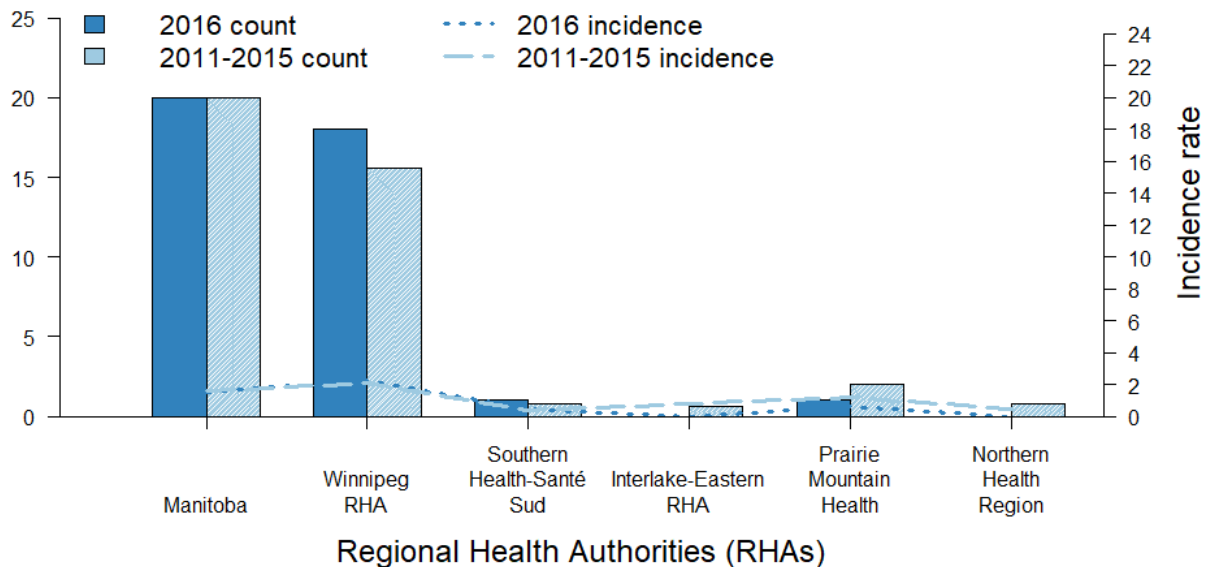
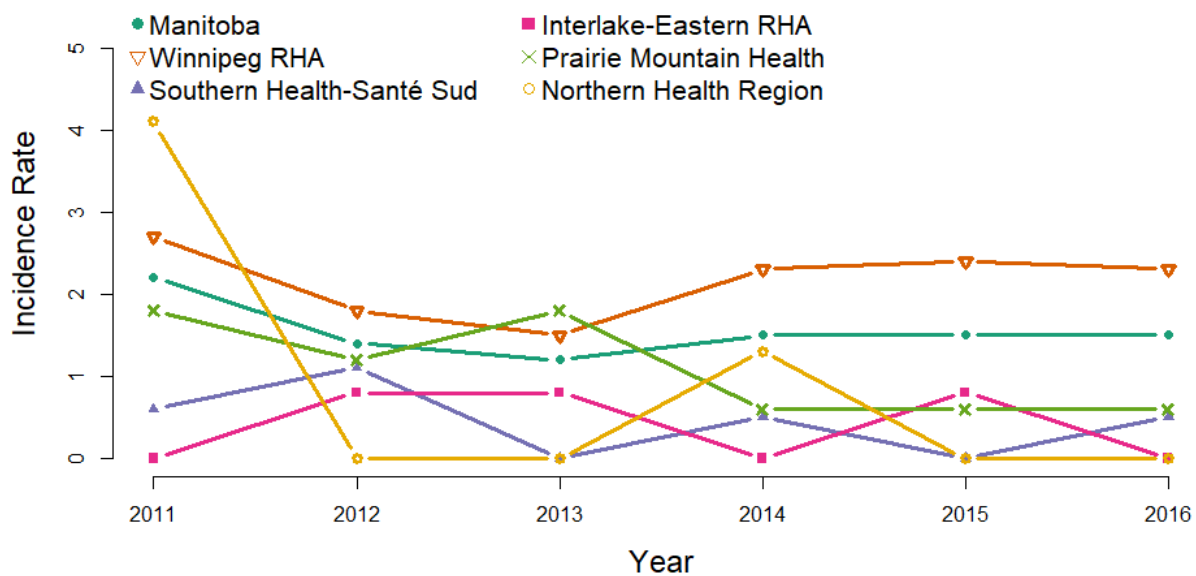


TABLE 52: Case count and crude incidence rate (per 100,000 population) of laboratory-confirmed Malaria cases in Manitoba, by regional health authority (RHA), 2016 and 5-year average (2011-2015).

Health Authority	Count		Incidence Rate	
	2016	2011-2015 Average	2016	2011-2015 Average
Winnipeg RHA	18	15.6	2.3	2.1
Southern Health-Santé Sud	1	0.8	0.5	0.4
Interlake-Eastern RHA	0	0.6	0.0	0.8
Prairie Mountain Health	1	2.0	0.6	1.2
Northern Health Region	0	0.8	0.0	0.5
Manitoba	20	20.0	1.5	1.6

FIGURE 40: Annual crude incidence rate (per 100,000 population) of laboratory-confirmed Malaria cases in Manitoba, by regional health authority (RHA), 2011-2016.



APPENDICES

APPENDIX A

The following diseases and/or conditions are (human) reportable diseases in Manitoba for the year 2016, as prescribed by *The Reporting of Diseases and Conditions Regulation* under *The Public Health Act*.

TABLE 53: Reportable Diseases List, 2016.

Common name	Scientific or technical name of disease or its infectious agent
AIDS	Acquired Immunodeficiency Syndrome
Amebiasis	<i>Entamoeba histolytica</i>
Anaplasmosis (human granulocytic anaplasmosis)	<i>Anaplasma phagocytophilum</i>
Anthrax	<i>Bacillus anthracis</i>
Babesiosis	<i>Babesia</i> species
Blastomycosis	<i>Blastomyces dermatitidis</i>
Botulism	<i>Clostridium botulinum</i>
Brucellosis	<i>Brucella</i> species
Campylobacteriosis	<i>Campylobacter</i> species
Cancer or Malignant Neoplasm	Cancer or Malignant Neoplasm
Chancroid	<i>Haemophilus ducreyi</i>
Chlamydia	<i>Chlamydia trachomatis</i> (including <i>Lymphogranuloma venereum</i> (LGV) serovars)
Cholera	<i>Vibrio cholerae</i> , serogroup O1, O139 or other toxigenic only
<i>Clostridioides difficile</i> , previously known as <i>Clostridium difficile</i> (CDI), associated diarrhea	<i>Clostridium difficile</i> toxin
Congenital Rubella Infection/Syndrome	Rubella virus
Creutzfeldt–Jakob Disease, Classic and Variant	Creutzfeldt–Jakob disease prion
Cryptosporidiosis	<i>Cryptosporidium</i> species
Cyclosporiasis	<i>Cyclospora cayetanensis</i>
Diphtheria	The following toxin-producing <i>Corynebacterium</i> species: <i>diphtheriae</i> , <i>ulcerans</i> , <i>pseudotuberculosis</i>

Common name	Scientific or technical name of disease or its infectious agent
Giardiasis	<i>Giardia lamblia, intestinalis, duodenalis</i>
Gonorrhoea	<i>Neisseria gonorrhoeae</i>
<i>Haemophilus influenzae</i> Serotype B Invasive Disease	<i>Haemophilus influenzae</i> (serotype B)
<i>Haemophilus influenzae</i> , non-Serotype B Invasive Disease	<i>Haemophilus influenzae</i> (non-serotype B)
Hantavirus Pulmonary Syndrome	Hantavirus
Hepatitis A	Hepatitis A virus
Hepatitis B	Hepatitis B virus
Hepatitis C	Hepatitis C virus
HIV	Human immunodeficiency virus
Influenza, Laboratory-Confirmed	Influenza virus
Legionellosis	<i>Legionella</i> species
Leprosy	<i>Mycobacterium leprae</i>
Listeriosis, invasive disease	<i>Listeria monocytogenes</i>
Lyme Disease	<i>Borrelia burgdorferi</i>
Malaria	<i>Plasmodium</i> species
Measles	Measles virus
Meningococcal Invasive Disease	<i>Neisseria meningitides</i>
Mumps	Mumps virus
Pertussis	<i>Bordetella pertussis</i>
Plague	<i>Yersinia pestis</i>
Pneumococcal Disease, Invasive	<i>Streptococcus pneumoniae</i>
Poliomyelitis	Poliovirus
Q fever	<i>Coxiella burnetii</i>
Rabies	Rabies virus
Rubella	Rubella virus
Salmonellosis	<i>Salmonella</i> species, excluding <i>S. typhi</i>
Severe Acute Respiratory Infection (SARI)	Severe Acute Respiratory Infection
Shigellosis	<i>Shigella</i> species
Smallpox	<i>Variola major</i> virus <i>Variola minor</i> virus

Common name	Scientific or technical name of disease or its infectious agent
Streptococcal Invasive Disease (Group A)	<i>Streptococcus pyogenes</i>
Streptococcal Invasive Disease of the Newborn (Group B)	<i>Streptococcus agalactiae</i>
Syphilis (All categories)	<i>Treponema pallidum</i> subspecies <i>pallidum</i>
Tetanus	<i>Clostridium tetani</i>
Tuberculosis	<i>Mycobacterium tuberculosis</i> <i>Mycobacterium africanum</i> <i>Mycobacterium canetti</i> <i>Mycobacterium caprae</i> <i>Mycobacterium microti</i> <i>Mycobacterium pinnipedi</i> <i>Mycobacterium bovis</i> (excluding <i>M. bovis</i> BCG strain)
Tularemia	<i>Francisella tularensis</i>
Typhoid Fever	<i>Salmonella typhi</i>
Verotoxigenic <i>Escherichia coli</i> Infection	Verotoxin-producing strains of <i>E. coli</i>
Viral Hemorrhagic Fever	Crimean Congo Lassa Ebola Marburg Rift Valley
West Nile Virus (WNV)	West Nile virus
Yellow Fever	Yellow fever virus

APPENDIX B

TABLE 54: Case count and crude incidence rate of nosocomial infection in Manitoba, by year, 2011-2016.

Disease name	Count						Incidence Rate					
	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016
<i>Clostridioides difficile</i>	812	734	697	762	967	979	64.9	57.7	54.1	58.3	73.2	73.1

TABLE 55: Case count and crude incidence rate of enteric diseases in Manitoba, by year, 2011-2016.

Disease name	Count						Incidence Rate					
	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016
Amebiasis	29	40	17	29	24	26	2.3	3.1	1.3	2.2	1.8	1.9
Campylobacteriosis	289	250	207	169	147	199	23.1	19.7	16.1	12.9	11.1	14.9
Cholera	1	0	0	0	0	0	0.1	0.0	0.0	0.0	0.0	0.0
Cryptosporidiosis	19	41	39	112	36	33	1.5	3.2	3.0	8.6	2.7	2.5
Cyclosporiasis	2	0	2	5	4	1	0.2	0.0	0.2	0.4	0.3	0.1
Giardiasis	116	112	88	80	97	138	9.3	8.8	6.8	6.1	7.3	10.3
Hepatitis A	7	4	11	8	4	1	0.6	0.3	0.9	0.6	0.3	0.1
Listeriosis	5	4	2	2	3	4	0.4	0.3	0.2	0.2	0.2	0.3
Paratyphoid fever	4	7	6	4	3	0	0.3	0.6	0.5	0.3	0.2	0.0
Salmonellosis	174	176	224	227	219	280	13.9	13.8	17.4	17.4	16.6	20.9
Shigellosis	29	75	23	35	19	13	2.3	5.9	1.8	2.7	1.4	1.0
Typhoid fever	8	6	2	1	5	5	0.6	0.5	0.2	0.1	0.4	0.4
Verotoxigenic <i>Escherichia coli</i> (VTEC)	56	36	29	34	41	39	4.5	2.8	2.2	2.6	3.1	2.9

TABLE 56: Case count and crude incidence rate of non-vaccine preventable diseases in Manitoba, by year, 2011-2016.

Disease name	Count						Incidence Rate					
	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016
Leprosy	0	0	0	1	0	0	0.0	0.0	0.0	0.1	0.0	0.0
Streptococcal invasive disease (Group A)	-	-	-	-	-	195	-	-	-	-	-	14.6
Streptococcal invasive disease of the newborn (Group B)	-	-	-	-	-	10	-	-	-	-	-	0.7

*The dash indicates that the comparison to previous years is not possible due to changes in disease coding (See Appendix C).

TABLE 57: Case count and crude incidence rate of vaccine preventable diseases in Manitoba, by year, 2011-2016.

Disease name	Count						Incidence Rate					
	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016
Congenital rubella syndrome	1	0	0	0	0	0	0.1	0.0	0.0	0.0	0.0	0.0
Diphtheria	1	0	0	0	0	1	0.1	0.0	0.0	0.0	0.0	0.1
<i>Haemophilus influenzae</i> (non-serotype B, invasive)	-	-	-	-	-	33	-	-	-	-	-	2.5
<i>Haemophilus influenzae</i> (serotype B, invasive)	-	-	-	-	-	0	-	-	-	-	-	0.0
Invasive meningococcal disease	2	2	9	3	3	8	0.2	0.2	0.7	0.2	0.2	0.6
Invasive pneumococcal disease	130	153	132	135	118	120	10.4	12.0	10.2	10.3	8.9	9.0
Measles	0	0	0	9	2	0	0.0	0.0	0.0	0.7	0.2	0.0
Mumps	7	6	1	0	8	111	0.6	0.5	0.1	0.0	0.6	8.3
Pertussis	30	118	7	12	56	116	2.4	9.3	0.5	0.9	4.2	8.7
Rubella	0	1	0	0	0	0	0.0	0.1	0.0	0.0	0.0	0.0
Yellow fever	0	0	0	0	0	1	0.0	0.0	0.0	0.0	0.0	0.1

*The dash indicates that the comparison to previous years is not possible due to changes in disease coding (See Appendix C).

TABLE 58: Case count and crude incidence rate of zoonotic and environmental diseases in Manitoba, by year, 2011-2016.

Disease name	Count						Incidence Rate					
	2011	2012	2013	2014	2015	2016	2011	2012	2013	2014	2015	2016
Blastomycosis	9	14	19	15	16	14	0.7	1.1	1.5	1.1	1.2	1.0
Brucellosis	3	1	2	1	0	1	0.2	0.1	0.2	0.1	0.0	0.1
Creutzfeldt-Jakob Disease (CJD)	1	0	1	3	1	0	0.1	0.0	0.1	0.2	0.1	0.0
Hantavirus infection	0	1	0	0	1	1	0.0	0.1	0.0	0.0	0.1	0.1
Legionellosis	4	3	4	2	1	1	0.3	0.2	0.3	0.2	0.1	0.1
Malaria	27	18	15	20	20	20	2.2	1.4	1.2	1.5	1.5	1.5
Tularemia	1	0	4	2	2	3	0.1	0.0	0.3	0.2	0.2	0.2

APPENDIX C – CHANGES IN ICD9 CODING PRACTICE

Manitoba's *Public Health Act* came into effect on April 1, 2009. The Act provides a legislative framework that helps the province anticipate and respond to public health emergencies and creates a framework for the other provincial public health functions, such as health surveillance, disease and injury prevention, and population health assessments¹. The *Reporting of Diseases and Conditions Regulation* under *The Public Health Act* also came into effect at that time.

The Reporting of Diseases and Conditions Regulation outlines the responsibilities of laboratories and health professionals with regard to reporting the diseases outlined in Schedule B to the Chief Provincial Public Health Officer and performing contact notification for those diseases in Schedule A.

The Reporting of Diseases and Conditions Regulation remained unchanged from April 1, 2009 to December 31, 2014; on January 1, 2015 an amendment to Schedules A and B of the regulation was introduced² creating the version of the Regulation used in this report³. The amendments to Schedules A and B of the regulation included the removal of some diseases, the addition of others, and triggered the re-classification of some ICD9 codes used in surveillance databases. This means that some ICD9 codes may have had different meanings prior to January 1, 2015 than it does after January 1, 2015. These changes have had an effect on our ability to do a comparative analysis for some diseases.

For example, for diseases added to the Regulation as of January 1, 2015 (i.e. those for which a new ICD9 code was given), there are no prior-year's data available in the surveillance databases housed at MHSAL with which to perform a 5-year comparison. For diseases for which the definition of their ICD9 code changed as of January 1, 2015, we also cannot perform a 5-year comparison because, in simple terms, it would be like comparing apples to oranges. Even though it may be the same ICD9 code, the comparison is not valid if the meaning has changed. For diseases removed from the Regulations as of January 1, 2015, they simply will not be included in this report going forward.

In the 2016 Annual Summary of Communicable Diseases, the following diseases will not have a 5-year comparison performed:

- *Haemophilus influenza* (serotype B): ICD9 code is new as of January 1, 2015 so there is no data available for comparison.
- *Haemophilus influenza* (non-serotype B invasive disease): ICD9 code changed as of January 1, 2015 so comparison is not valuable
- Streptococcal Invasive Disease (Group A): ICD9 code(s) changed as of January 1, 2015 so comparison is not valuable
- Streptococcal Invasive Disease of the Newborn (Group B): ICD9 code is new as of January 1, 2015 so there is no data available for comparison.

¹ <http://www.gov.mb.ca/health/publichealth/act.html>

² <http://web2.gov.mb.ca/laws/regs/annual/2014/289.pdf>

³ http://web2.gov.mb.ca/laws/regs/current/_pdf-regs.php?reg=37/2009

As of January 1, 2015 the ICD9 code, A41.3, was created to capture *Haemophilus influenzae* (serotype B invasive disease). This includes all *Haemophilus influenzae* cases with serotype B.

Making a comparison is not possible in these situations because the code did not exist during the years we are comparing the data.