

MANITOBA ANNUAL SUMMARY OF COMMUNICABLE DISEASES 2017



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

Publication date: November 25, 2019.

(C) Her Majesty the Queen in Right of Canada, as represented by the Minister of Health, 2019

This publication may be reproduced for personal or internal use only without permission, provided the source is fully acknowledged.

Suggested Citation: Government of Manitoba, Manitoba Health, Seniors and Active Living, Information Management & Analytics, Resources and Performances, Manitoba Health, Seniors and Active Living, Epidemiology and Surveillance. (2019). Manitoba Annual Summary of Communicable Diseases 2017.

Let us know what you think. We appreciate your feedback! If you would like to comment on any aspect of this new report please send an email to: outbreak@gov.mb.ca.

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 (2017) 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.

TABLE OF CONTENTS

| | |
|--|-----------|
| ABBREVIATIONS & REGIONAL HEALTH AUTHORITIES..... | 3 |
| Abbreviations..... | 3 |
| Regional Health Authorities..... | 3 |
| ACKNOWLEDGMENTS..... | 4 |
| EXECUTIVE SUMMARY | 7 |
| Nosocomial Infections | 7 |
| Enteric Diseases..... | 7 |
| Non-Vaccine Preventable Diseases (Non-VPDs)..... | 7 |
| Vaccine Preventable Diseases (VPDs)..... | 7 |
| Zoonotic and Environmental Diseases | 8 |
| INTRODUCTION | 9 |
| METHODS..... | 10 |
| About Surveillance Data..... | 12 |
| TECHNICAL NOTES AND LIMITATIONS..... | 13 |
| REPORTABLE DISEASES IN MANITOBA | 14 |
| NOSOCOMIAL INFECTIONS..... | 16 |
| <i>Clostridioides difficile</i> infection (CDI)..... | 16 |
| ENTERIC DISEASES..... | 19 |
| Amebiasis..... | 19 |
| Campylobacteriosis | 22 |
| Cryptosporidiosis..... | 25 |
| Giardiasis | 27 |
| Hepatitis A | 30 |
| Salmonellosis..... | 33 |
| Shigellosis | 36 |
| Typhoid fever | 39 |
| Verotoxigenic Escherichiacoli (VTEC) | 41 |
| NON-VACCINE PREVENTABLE DISEASES | 44 |
| Streptococcal invasive disease (Group A) | 44 |
| Streptococcal invasive disease of the newborn (Group B) | 46 |
| VACCINE PREVENTABLE DISEASES..... | 48 |
| <i>Haemophilus influenzae</i> (non-serotype B, invasive disease) | 49 |

| | |
|--|-----------|
| Invasive pneumococcal disease | 52 |
| Mumps | 55 |
| Pertussis | 58 |
| ZOONOTIC AND ENVIRONMENTAL DISEASES | 61 |
| Blastomycosis | 61 |
| Malaria | 64 |
| APPENDICES | 66 |
| Appendix A | 66 |
| Appendix B | 69 |
| Appendix C | 71 |

EXECUTIVE SUMMARY

In 2017, the communicable disease that garnered the most attention was mumps. The province wide mumps outbreak that started September 2016 in university students in Winnipeg continued in 2017. From January 2017, the infection spread to Northern Health Region, the last health region to be affected by this outbreak. In Manitoba, the number of new mumps cases each month continued to increase from January and eventually peaked in September 2017.

Hepatitis A and pertussis also had counts outside the typical range. Many of the other communicable diseases followed more typical pattern as noted below.

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 2017 (68.2 per 100,000) was higher than the 5-year average incidence rate (63.5 per 100,000). Over half of the cases reported were in females (n=522) as compared to males (n = 404). The age group of 60 and older were the most affected accounting for 547 laboratory-confirmed cases.

ENTERIC DISEASES

- There were 222 laboratory-confirmed cases of Salmonellosis in 2017, which accounted for the most reported cases of all the enteric diseases. This was lower than the previous 5-year average of 225.2 cases.
- Hepatitis A had 16 laboratory-confirmed cases in 2017. This was almost three times higher than the previous 5-year average of 5.6 cases. The females and males were equally affected, with each reporting 8 laboratory-confirmed cases. The age group of 20-24 were the most affected accounting for 5 laboratory-confirmed cases.

NON-VACCINE PREVENTABLE DISEASES (NON-VPDS)

- Streptococcal invasive disease (group A), accounted for the majority of cases (n = 241) in this category for 2017, which was higher than the laboratory-confirmed cases in 2016 (n = 195). 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 (VPDS)

- A Mumps outbreak was still ongoing in 2017 and resulted in 1,631 laboratory-confirmed cases in 2017; this was higher than the 5-year average of 25.2 cases. Northern Health Region accounted for 1,229 (75.4%) of the 1,631 laboratory-confirmed cases.

- Pertussis had 75 laboratory-confirmed cases in 2017; this was higher than the previous 5-year average of 61.8 cases. The age group of 4 years old and under were the most affected with 46 laboratory-confirmed cases. Southern Health-Santé Sud accounted for 42 of the laboratory-confirmed cases.

ZOONOTIC AND ENVIRONMENTAL DISEASES

- All zoonotic and environmental diseases were within their expected incidences when compared to the average of previous 5-years.

INTRODUCTION

The *Manitoba Annual Summary of Communicable Diseases (2017)* provides a summary of laboratory-confirmed, communicable diseases in Manitoba for the year 2017. 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 2017, 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 infections,
2. enteric diseases,
3. non-vaccine preventable diseases,
4. vaccine preventable diseases, and
5. zoonotic and environmental diseases.

Case counts and incidence rates for each disease with **more than 5** cases in 2017 are presented in tables by:

- sex, with age analysis (2017 and the previous 5-year average [2012-2016]),
- age group and sex (2017), and
- RHA (2017 and the previous 5-year average [2012-2016])

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, 2012 and December 31, 2017, and were reported to MHSAL before the date of data extraction (June 14, 2019), were included in this report. Throughout the report, the 2017 data were compared to the data of the previous 5 years (in the form of the previous 5-year average [2012-2016] or year-by-year from 2012 to 2017), 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 2012-2016, and a denominator of the *average* population of the specified group, from 2012-2016.

For example, the incidence rate for males in the 15-19 years age group in 2017 would be calculated with the 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, 2017.

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. 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 2017 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 2017 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 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 care 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 across different 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 2017, 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, 2017 AND 5-YEAR AVERAGE (2012-2016).

| DISEASE NAME | COUNT | | INCIDENCE RATE (95% CI) | |
|---|-------|-------------------|-------------------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| NOSOCOMIAL INFECTIONS | | | | |
| CLOSTRIDIODES DIFFICILE INFECTION | 926 | 828.4 | 68.2 (63.9, 72.8) | 63.5 (59.2, 67.9) |
| ENTERIC DISEASES | | | | |
| AMEBIASIS | 21 | 27.2 | 1.5 (1.0, 2.4) | 2.1 (1.4, 3) |
| CAMPYLOBACTERIOSIS | 192 | 194.4 | 14.1 (12.2, 16.3) | 14.9 (12.9, 17.1) |
| CRYPTOSPORIDIOSIS | 9 | 52.2 | 0.7 (0.3, 1.3) | 4.0 (3.0, 5.2) |
| CYCLOSPORIASIS | 0 | 2.4 | 0.0 (0.0, 0.3) | 0.2 (0.0, 0.6) |
| GIARDIASIS | 103 | 103.0 | 7.6 (6.2, 9.2) | 7.9 (6.4, 9.6) |
| HEPATITIS A | 16 | 5.6 | 1.2 (0.7, 1.9) | 0.4 (0.2, 1) |
| LISTERIOSIS | 2 | 3.0 | 0.1 (0.0, 0.5) | 0.2 (0.0, 0.7) |
| PARATYPHOID FEVER | 3 | 4.0 | 0.2 (0.0, 0.6) | 0.3 (0.1, 0.8) |
| SALMONELLOSIS | 222 | 225.2 | 16.4 (14.3, 18.7) | 17.3 (15.1, 19.7) |
| SHIGELLOSIS | 17 | 33.0 | 1.3 (0.7, 2.0) | 2.5 (1.7, 3.6) |
| TYPHOID FEVER | 9 | 3.8 | 0.7 (0.3, 1.3) | 0.3 (0.1, 0.8) |
| VEROTOXIGENIC <i>ESCHERICHIA COLI</i> (VTEC) | 46 | 35.8 | 3.4 (2.5, 4.5) | 2.7 (1.9, 3.8) |
| 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) | 241 | - | 17.8 (15.6, 20.1) | - |
| STREPTOCOCCAL INVASIVE DISEASE OF THE NEWBORN (GROUP B) | 7 | - | 0.5 (0.2, 1.1) | - |
| VACCINE PREVENTABLE DISEASES | | | | |
| DIPHTHERIA | 2 | 0.2 | 0.1 (0.0, 0.5) | 0.0 (0.0, 0.3) |
| HAEMOPHILUS INFLUENZAE (NON-SEROTYPE B, INVASIVE DISEASE) | 27 | - | 2.0 (1.3, 2.9) | - |
| HAEMOPHILUS INFLUENZAE (SEROTYPE B, INVASIVE DISEASE) | 1 | - | 0.1 (0.0, 0.4) | - |
| INVASIVE MENINGOCOCCAL DISEASE | 5 | 5.0 | 0.4 (0.1, 0.9) | |
| INVASIVE PNEUMOCOCCAL DISEASE | 183 | 131.6 | 13.5 (11.6, 15.6) | 10.1 (8.4, 12) |
| MEASLES | 0 | 2.2 | 0.0 (0.0, 0.4) | 0.2 (0.0, 0.6) |
| MUMPS | 1,631 | 25.2 | 120.2 (114.4, 126.2) | 1.9 (1.3, 2.8) |
| PERTUSSIS | 75 | 61.8 | 5.5 (4.3, 6.9) | 4.7 (3.6, 6.1) |
| RUBELLA | 0 | 0.2 | 0.0 (0.0, 0.3) | 0.0 (0.0, 0.3) |
| YELLOW FEVER | 0 | 0.2 | 0.0 (0.0, 0.3) | 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, 2017 AND 5-YEAR AVERAGE (2012-2016).

| DISEASE NAME | COUNT | | INCIDENCE RATE (95% CI) | |
|--|-------|----------------------|-------------------------|----------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| ZOONOTIC AND ENVIRONMENTAL DISEASES | | | | |
| BLASTOMYCOSIS | 18 | 15.6 | 1.3 (0.8, 2.1) | 1.2 (0.7, 2) |
| BRUCELLOSIS | 0 | 1.0 | 0.0 (0, 0.3) | 0.1 (0, 0.4) |
| CREUTZFELDT-JAKOB DISEASE (CJD) | 0 | 1.6 | 0.0 (0, 0.4) | 0.1 (0, 0.5) |
| HANTAVIRUS INFECTION | 0 | 0.6 | 0.0 (0, 0.3) | 0.0 (0, 0.4) |
| LEGIONELLOSIS | 2 | 2.2 | 0.1 (0, 0.5) | 0.2 (0, 0.6) |
| MALARIA | 14 | 18.6 | 1.0 (0.6, 1.7) | 1.4 (0.9, 2.2) |
| TULAREMIA | 0 | 2.2 | 0.0 (0, 0.3) | 0.2 (0, 0.6) |

* 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 2017 was 60.6 years (with a standard deviation of 21.9 years). The average age in 2012 - 2016 was 61.8 years (with a standard deviation of 21.7 years). The median age in 2017 was 64 years (IQR: 48 - 77 years). The median age in 2012 - 2016 was 65 years (IQR: 50 - 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, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 926 | 828.4 | 68.2 | 63.5 |
| FEMALE | 522 | 477.6 | 76.5 | 72.6 |
| MALE | 404 | 350.8 | 59.9 | 54.2 |

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, 2017.

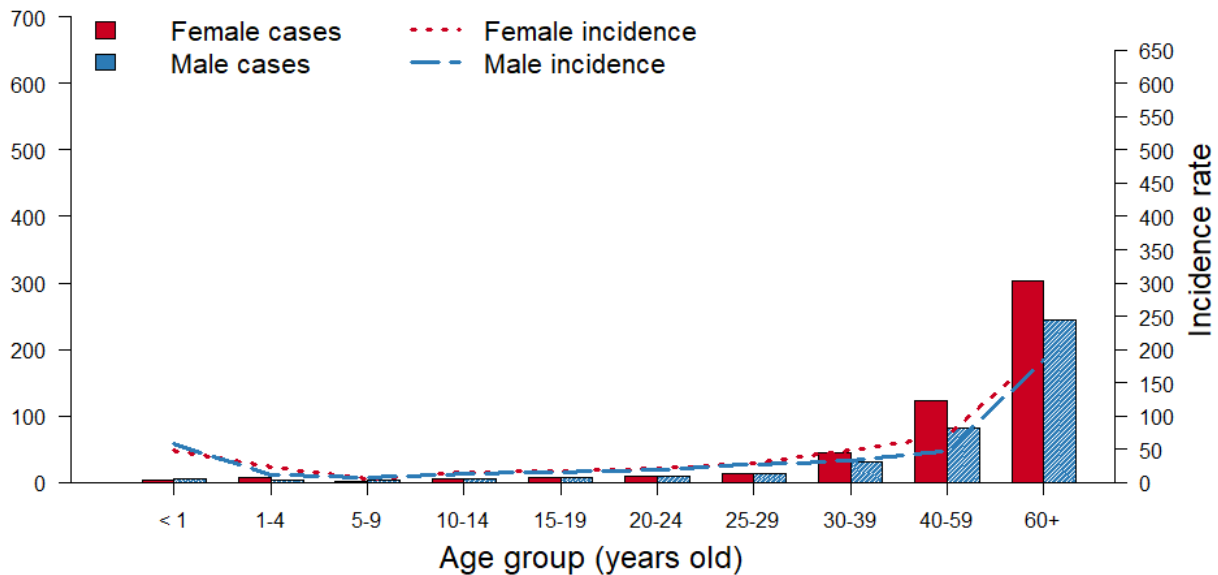


TABLE 3: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED *CLOSTRIDIODES DIFFICILE* INFECTION CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| AGE GROUP (YEARS) | COUNT | | | INCIDENCE RATE | | |
|----------------------|-------|--------|------|----------------|--------|-------|
| | TOTAL | FEMALE | MALE | TOTAL | FEMALE | MALE |
| <1 | 9 | 4 | 5 | 53.5 | 48.4 | 58.3 |
| 1-4 | 12 | 8 | 4 | 17.3 | 23.8 | 11.2 |
| 5-9 | 5 | 2 | 3 | 5.7 | 4.7 | 6.7 |
| 10-14 | 12 | 6 | 6 | 14.6 | 14.9 | 14.2 |
| 15-19 | 14 | 7 | 7 | 16.3 | 16.9 | 15.7 |
| 20-24 | 20 | 10 | 10 | 20.7 | 21.4 | 20.0 |
| 25-29 | 27 | 14 | 13 | 27.7 | 28.7 | 26.7 |
| 30-39 | 75 | 45 | 30 | 40.6 | 48.5 | 32.7 |
| 40-59 | 205 | 123 | 82 | 58.5 | 70.4 | 46.7 |
| 60+ | 547 | 303 | 244 | 191.5 | 197.7 | 184.4 |

FIGURE 2: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED *CLOSTRIDIODES DIFFICILE* INFECTION CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

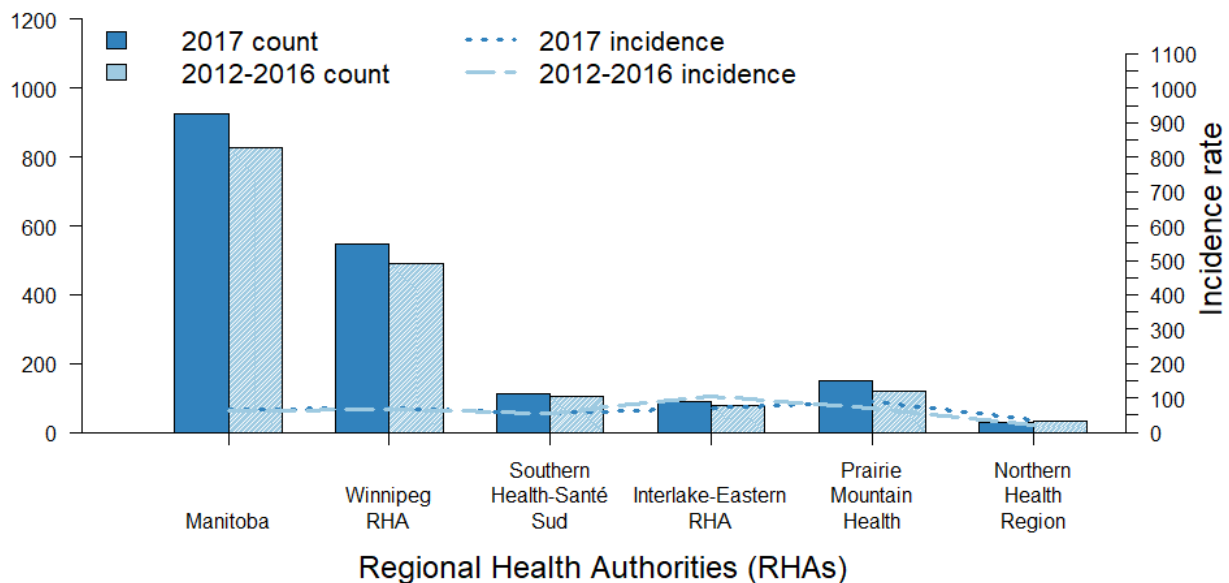
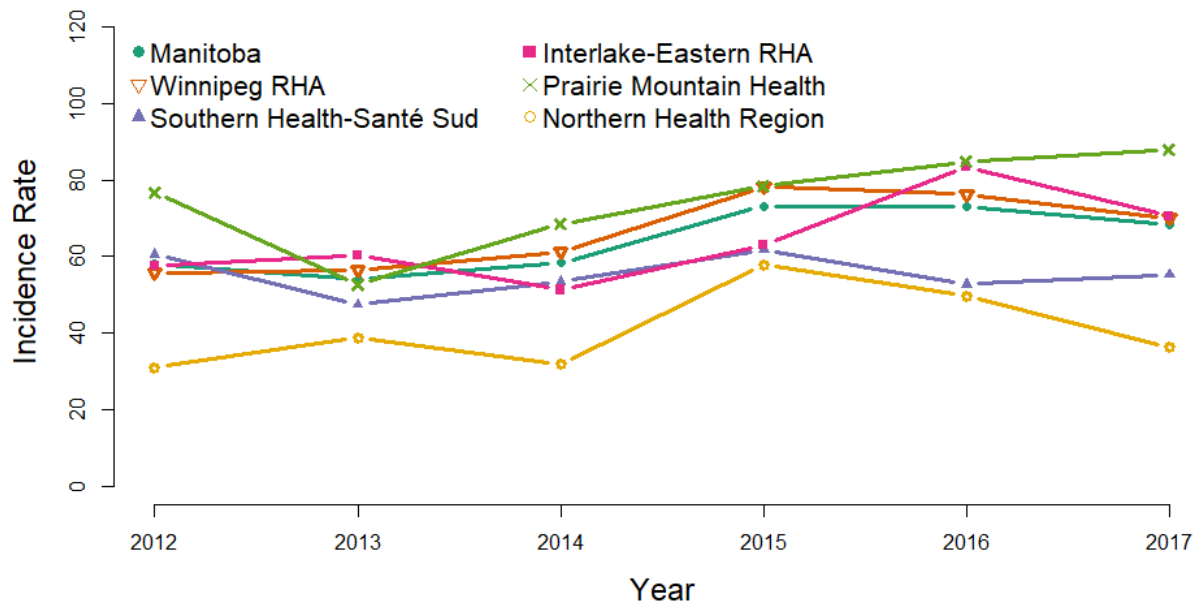


TABLE 4: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED *CLOSTRIDIODES DIFFICILE* INFECTION CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 546 | 490.4 | 70.1 | 65.8 |
| SOUTHERN HEALTH-SANTÉ SUD | 111 | 105.2 | 55.2 | 55.2 |
| INTERLAKE-EASTERN RHA | 91 | 80.0 | 70.5 | 106.2 |
| PRAIRIE MOUNTAIN HEALTH | 150 | 121.2 | 87.9 | 72.2 |
| NORTHERN HEALTH REGION | 28 | 31.6 | 36.4 | 20.7 |
| MANITOBA | 926 | 828.4 | 68.2 | 63.5 |

FIGURE 3: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED *CLOSTRIDIODES DIFFICILE* INFECTION CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.



ENTERIC DISEASES

AMEBIASIS

The average age in 2017 was 36.6 years (with a standard deviation of 14.7 years). The average age in 2012 - 2016 was 30.5 years (with a standard deviation of 16.8 years). The median age in 2017 was 34 years (IQR: 29 - 50 years). The median age in 2012 - 2016 was 32 years (IQR: 19 - 40 years).

TABLE 5: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED AMEBIASIS CASES IN MANITOBA, BY SEX, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 21 | 27.2 | 1.5 | 2.1 |
| FEMALE | 7 | 11.6 | 1.0 | 1.8 |
| MALE | 14 | 15.6 | 2.1 | 2.4 |

FIGURE 4: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED AMEBIASIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

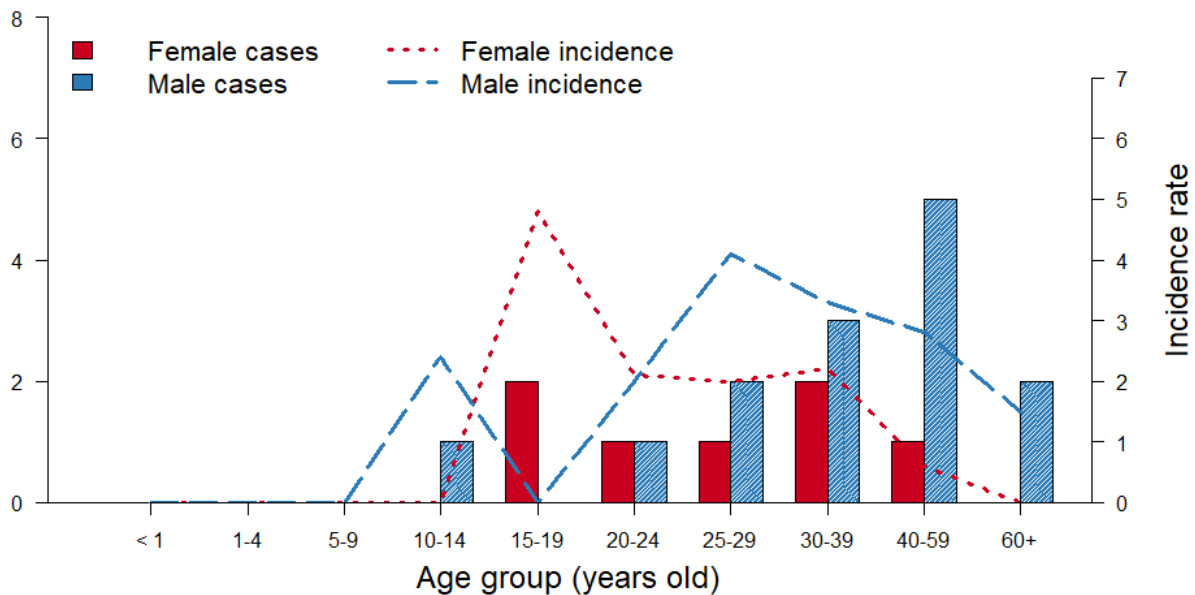


TABLE 6: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED AMEBIASIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| 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 | 2 | 2 | 0 | 2.3 | 4.8 | 0.0 |
| 20-24 | 2 | 1 | 1 | 2.1 | 2.1 | 2.0 |
| 25-29 | 3 | 1 | 2 | 3.1 | 2.0 | 4.1 |
| 30-39 | 5 | 2 | 3 | 2.7 | 2.2 | 3.3 |
| 40-59 | 6 | 1 | 5 | 1.7 | 0.6 | 2.8 |
| 60+ | 2 | 0 | 2 | 0.7 | 0.0 | 1.5 |

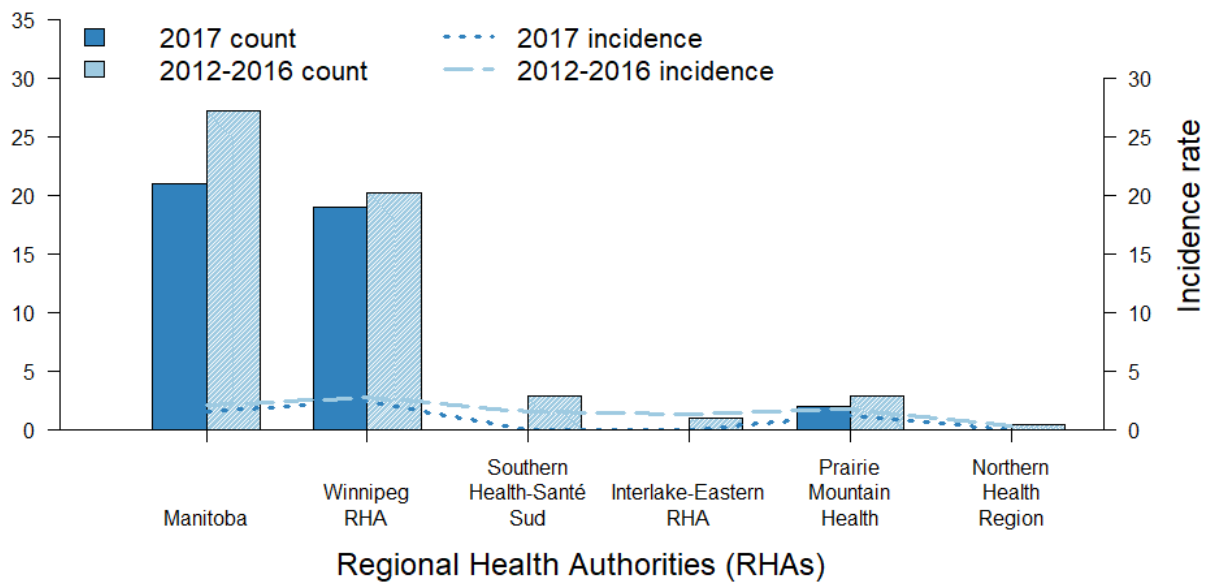
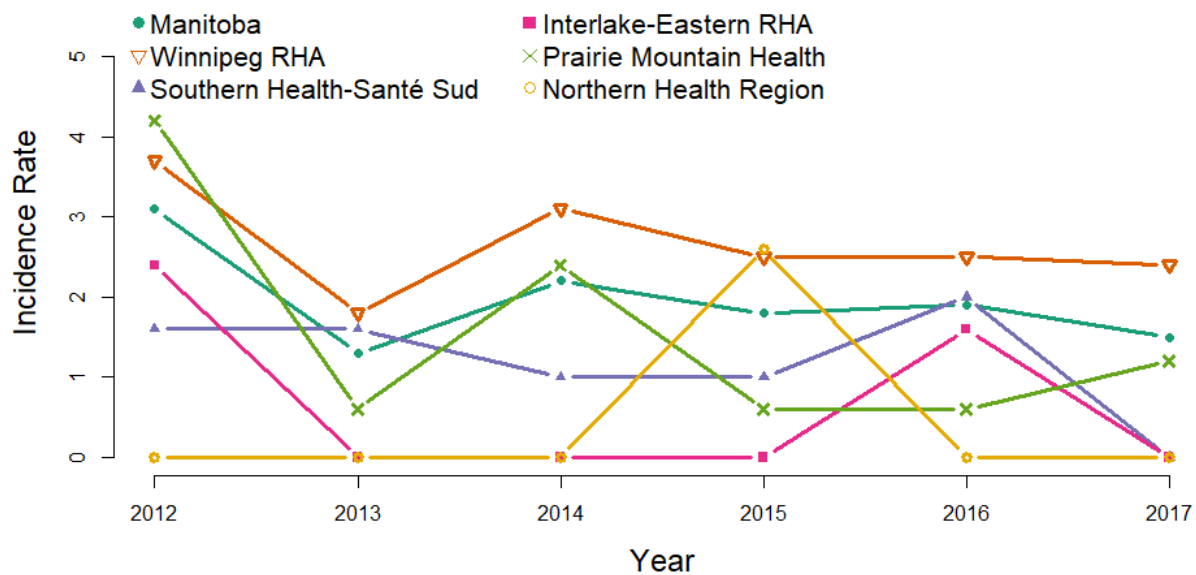
FIGURE 5: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED AMEBIASIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

TABLE 7: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED AMEBIASIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 19 | 20.2 | 2.4 | 2.7 |
| SOUTHERN HEALTH-SANTÉ SUD | 0 | 2.8 | 0.0 | 1.5 |
| INTERLAKE-EASTERN RHA | 0 | 1.0 | 0.0 | 1.3 |
| PRAIRIE MOUNTAIN HEALTH | 2 | 2.8 | 1.2 | 1.7 |
| NORTHERN HEALTH REGION | 0 | 0.4 | 0.0 | 0.3 |
| MANITOBA | 21 | 27.2 | 1.5 | 2.1 |

FIGURE 6: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED AMEBIASIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.



CAMPYLOBACTERIOSIS

The average age in 2017 was 37.5 years (with a standard deviation of 22.9 years). The average age in 2012 - 2016 was 35.5 years (with a standard deviation of 23.6 years). The median age in 2017 was 32 years (IQR: 21 - 58 years). The median age in 2012 - 2016 was 32.5 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, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 192 | 194.4 | 14.1 | 14.9 |
| FEMALE | 83 | 90.4 | 12.2 | 13.7 |
| MALE | 109 | 104 | 16.2 | 16.1 |

FIGURE 7: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED CAMPYLOBACTERIOSIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

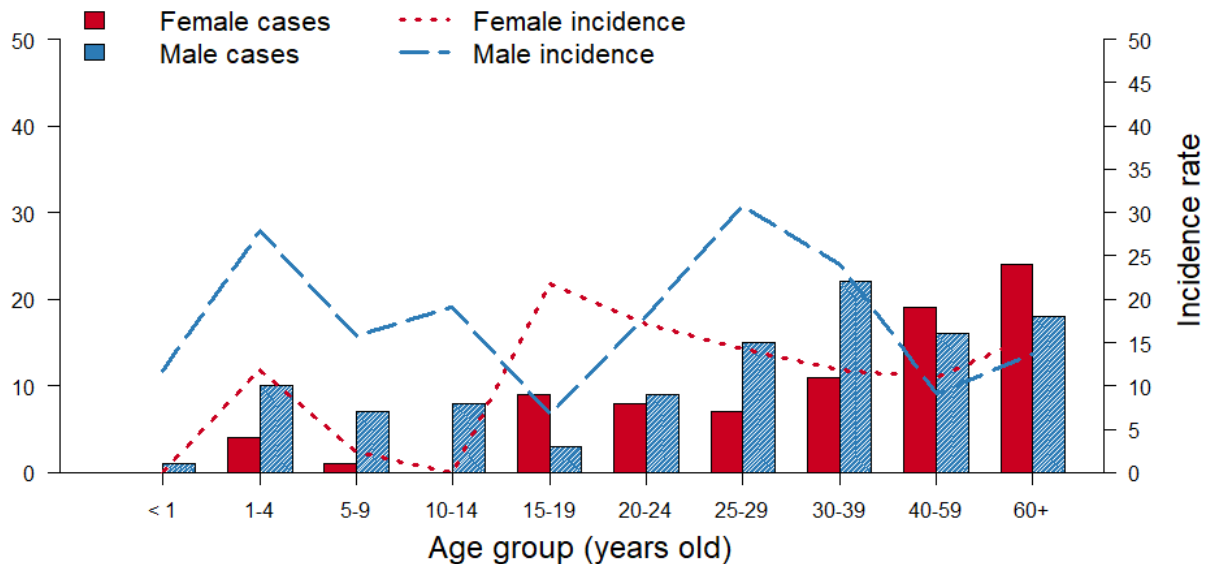


TABLE 9: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED CAMPYLOBACTERIOSIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| AGE GROUP (YEARS) | COUNT | | | INCIDENCE RATE | | |
|----------------------|-------|--------|------|----------------|--------|------|
| | TOTAL | FEMALE | MALE | TOTAL | FEMALE | MALE |
| <1 | 1 | 0 | 1 | 5.9 | 0.0 | 11.7 |
| 1-4 | 14 | 4 | 10 | 20.2 | 11.9 | 27.9 |
| 5-9 | 8 | 1 | 7 | 9.2 | 2.3 | 15.7 |
| 10-14 | 8 | 0 | 8 | 9.7 | 0.0 | 19.0 |
| 15-19 | 12 | 9 | 3 | 14.0 | 21.7 | 6.7 |
| 20-24 | 17 | 8 | 9 | 17.6 | 17.1 | 18.0 |
| 25-29 | 22 | 7 | 15 | 22.5 | 14.3 | 30.8 |
| 30-39 | 33 | 11 | 22 | 17.9 | 11.8 | 24.0 |
| 40-59 | 35 | 19 | 16 | 10.0 | 10.9 | 9.1 |
| 60+ | 42 | 24 | 18 | 14.7 | 15.7 | 13.6 |

FIGURE 8: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED CAMPYLOBACTERIOSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

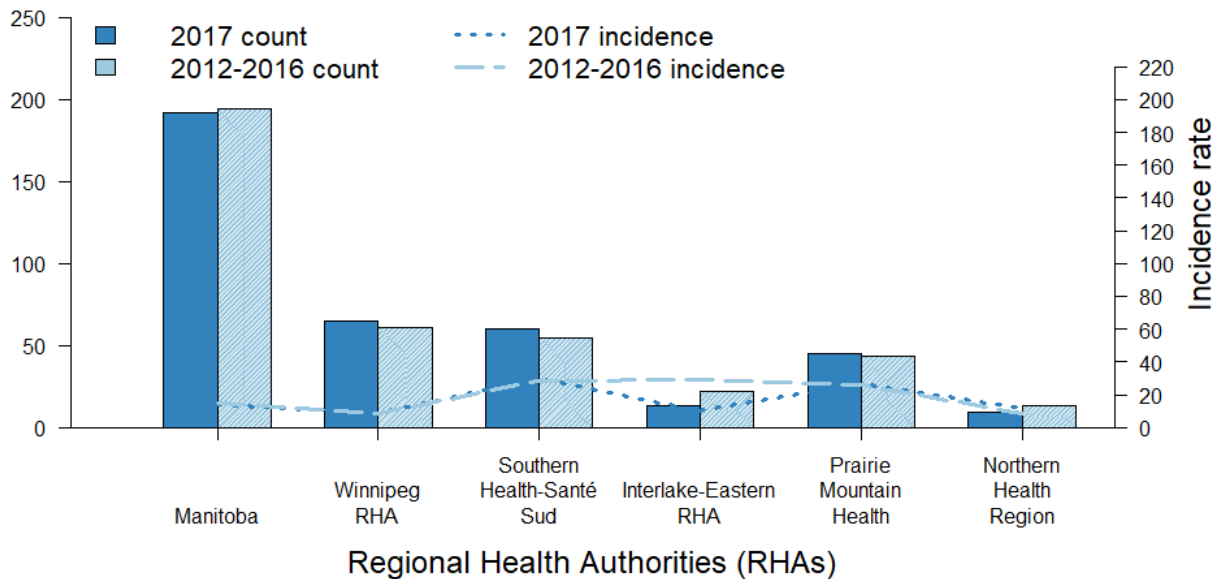
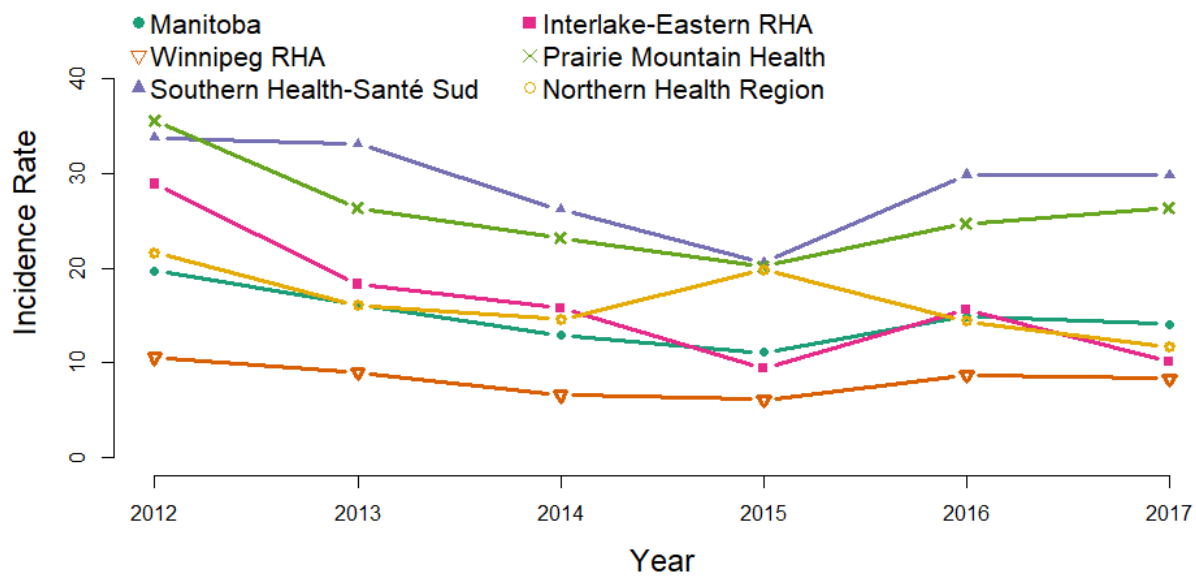


TABLE 10: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED CAMPYLOBACTERIOSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 65 | 61.0 | 8.3 | 8.2 |
| SOUTHERN HEALTH-SANTÉ SUD | 60 | 54.6 | 29.8 | 28.6 |
| INTERLAKE-EASTERN RHA | 13 | 22.2 | 10.1 | 29.5 |
| PRAIRIE MOUNTAIN HEALTH | 45 | 43.6 | 26.4 | 26.0 |
| NORTHERN HEALTH REGION | 9 | 13.0 | 11.7 | 8.5 |
| MANITOBA | 192 | 194.4 | 14.1 | 14.9 |

FIGURE 9: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED CAMPYLOBACTERIOSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.



CRYPTOSPORIDIOSIS

The average age in 2017 was 23.2 years (with a standard deviation of 10.7 years). The average age in 2012 - 2016 was 20.8 years (with a standard deviation of 17 years). The median age in 2017 was 22 years (IQR: 21 - 34 years). The median age in 2012 - 2016 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, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|----------------------|----------------|----------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 9 | 52.2 | 0.7 | 4.0 |
| FEMALE | 5 | 29.8 | 0.7 | 4.5 |
| MALE | 4 | 22.4 | 0.6 | 3.5 |

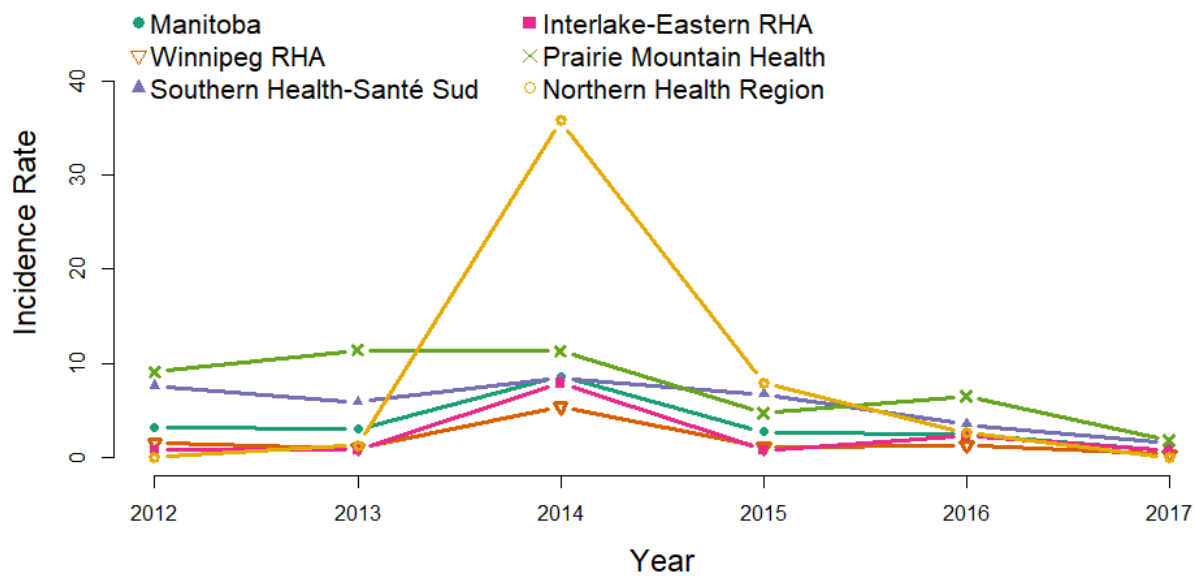
TABLE 12: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED CRYPTOSPORIDIOSIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| 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 | 1 | 0 | 1.1 | 2.3 | 0.0 |
| 10-14 | 1 | 1 | 0 | 1.2 | 2.5 | 0.0 |
| 15-19 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 |
| 20-24 | 4 | 2 | 2 | 4.1 | 4.3 | 4.0 |
| 25-29 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 |
| 30-39 | 3 | 1 | 2 | 1.6 | 1.1 | 2.2 |
| 40-59 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 |
| 60+ | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 |

TABLE 13: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED CRYPTOSPORIDIOSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 2 | 15.2 | 0.3 | 2.0 |
| SOUTHERN HEALTH-SANTÉ SUD | 3 | 12.2 | 1.5 | 6.4 |
| INTERLAKE-EASTERN RHA | 1 | 3.2 | 0.8 | 4.2 |
| PRAIRIE MOUNTAIN HEALTH | 3 | 14.4 | 1.8 | 8.6 |
| NORTHERN HEALTH REGION | 0 | 7.2 | 0.0 | 4.7 |
| MANITOBA | 9 | 52.2 | 0.7 | 4.0 |

FIGURE 10: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED CRYPTOSPORIDIOSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.



GIARDIASIS

The average age in 2017 was 31.4 years (with a standard of deviation 24 years). The average age in 2012 - 2016 was 26.2 years (with a standard deviation of 22.3 years). The median age in 2017 was 32 years (IQR: 6 - 47 years). The median age in 2012 - 2016 was 24 years (IQR: 5 - 42 years).

TABLE 14: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED GIARDIASIS CASES IN MANITOBA, BY SEX, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 103 | 103.0 | 7.6 | 7.9 |
| FEMALE | 44 | 42.4 | 6.4 | 6.4 |
| MALE | 59 | 60.6 | 8.7 | 9.4 |

FIGURE 11: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED GIARDIASIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

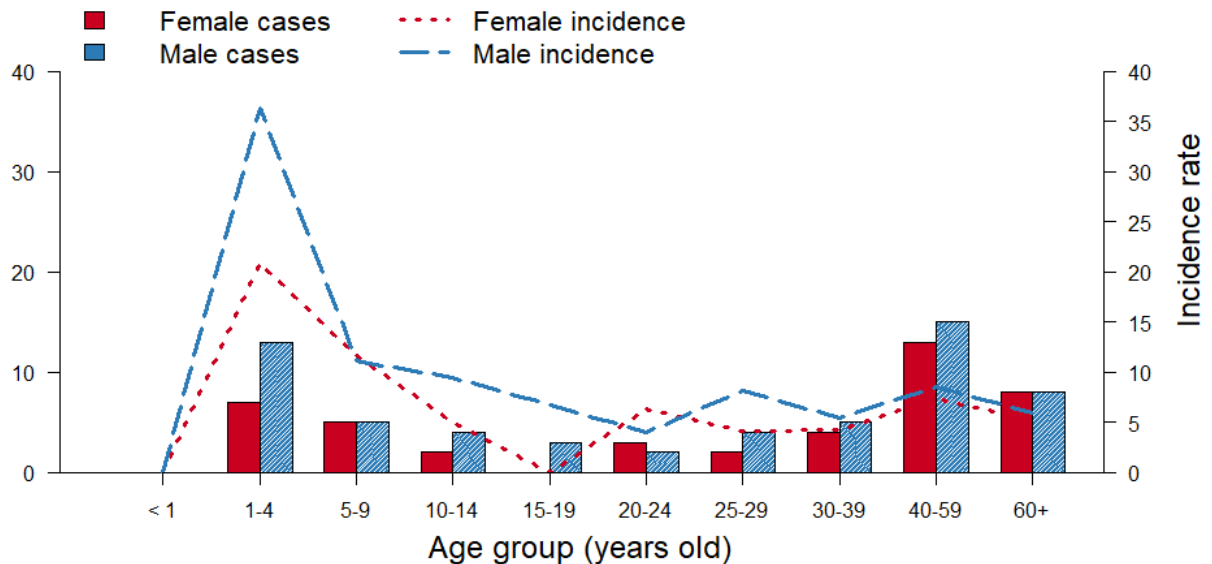


TABLE 15: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED GIARDIASIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| 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 | 7 | 13 | 28.8 | 20.9 | 36.3 |
| 5-9 | 10 | 5 | 5 | 11.4 | 11.7 | 11.2 |
| 10-14 | 6 | 2 | 4 | 7.3 | 5.0 | 9.5 |
| 15-19 | 3 | 0 | 3 | 3.5 | 0.0 | 6.7 |
| 20-24 | 5 | 3 | 2 | 5.2 | 6.4 | 4.0 |
| 25-29 | 6 | 2 | 4 | 6.1 | 4.1 | 8.2 |
| 30-39 | 9 | 4 | 5 | 4.9 | 4.3 | 5.4 |
| 40-59 | 28 | 13 | 15 | 8.0 | 7.4 | 8.5 |
| 60+ | 16 | 8 | 8 | 5.6 | 5.2 | 6.0 |

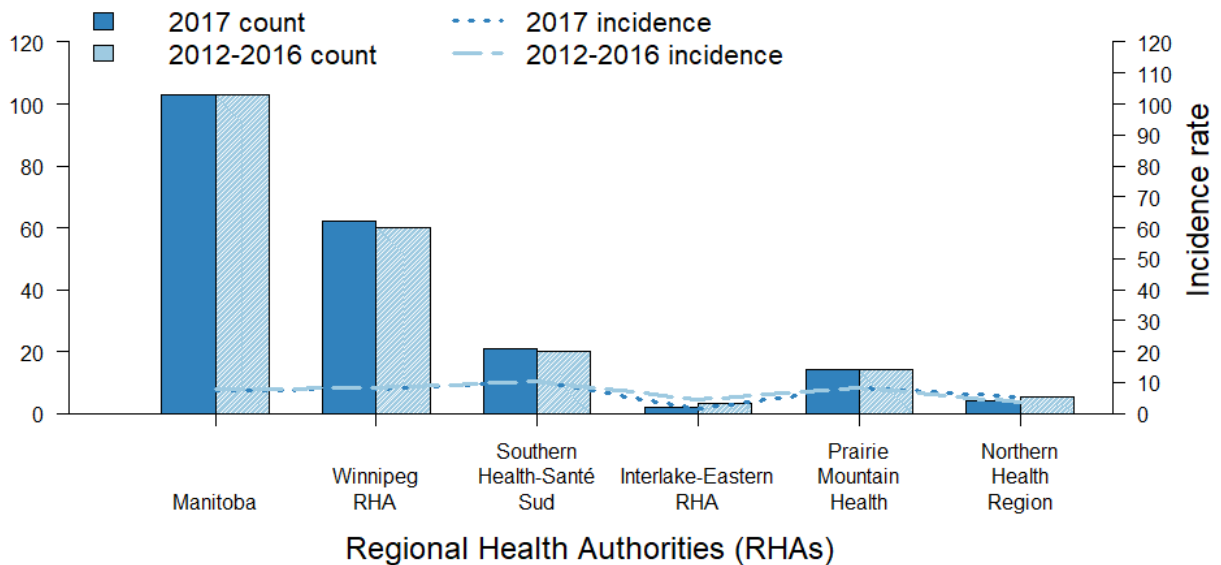
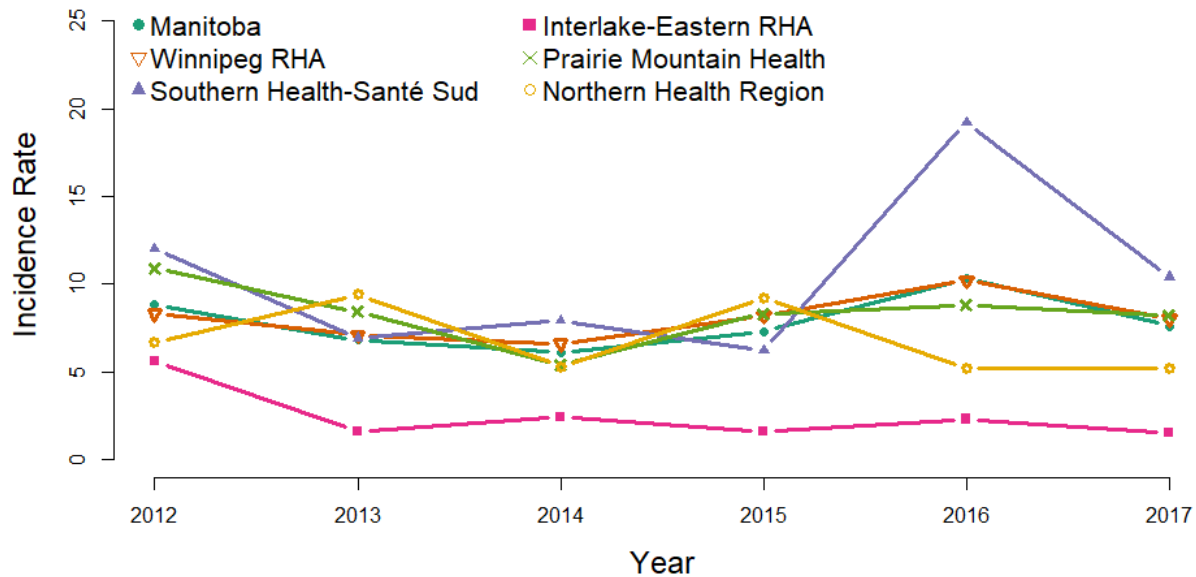
FIGURE 12: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED GIARDIASIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

TABLE 16: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED GIARDIASIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 62 | 60.2 | 8.0 | 8.1 |
| SOUTHERN HEALTH-SANTÉ SUD | 21 | 20.0 | 10.4 | 10.5 |
| INTERLAKE-EASTERN RHA | 2 | 3.4 | 1.5 | 4.5 |
| PRAIRIE MOUNTAIN HEALTH | 14 | 14.0 | 8.2 | 8.3 |
| NORTHERN HEALTH REGION | 4 | 5.4 | 5.2 | 3.5 |
| MANITOBA | 103 | 103.0 | 7.6 | 7.9 |

FIGURE 13: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED GIARDIASIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.



HEPATITIS A

The average age in 2017 was 32.4 years (with a standard deviation of 24.6 years). The average age in 2012 - 2016 was 24.3 years (with a standard deviation of 21.8 years). The median age in 2017 was 21 years (IQR: 16.75 - 49.75 years). The median age in 2012 - 2016 was 19.5 years (IQR: 9 - 28.25 years).

TABLE 17: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED HEPATITIS A CASES IN MANITOBA, BY SEX, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 16 | 5.6 | 1.2 | 0.4 |
| FEMALE | 8 | 2.0 | 1.2 | 0.3 |
| MALE | 8 | 3.6 | 1.2 | 0.6 |

FIGURE 14: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED HEPATITIS A CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

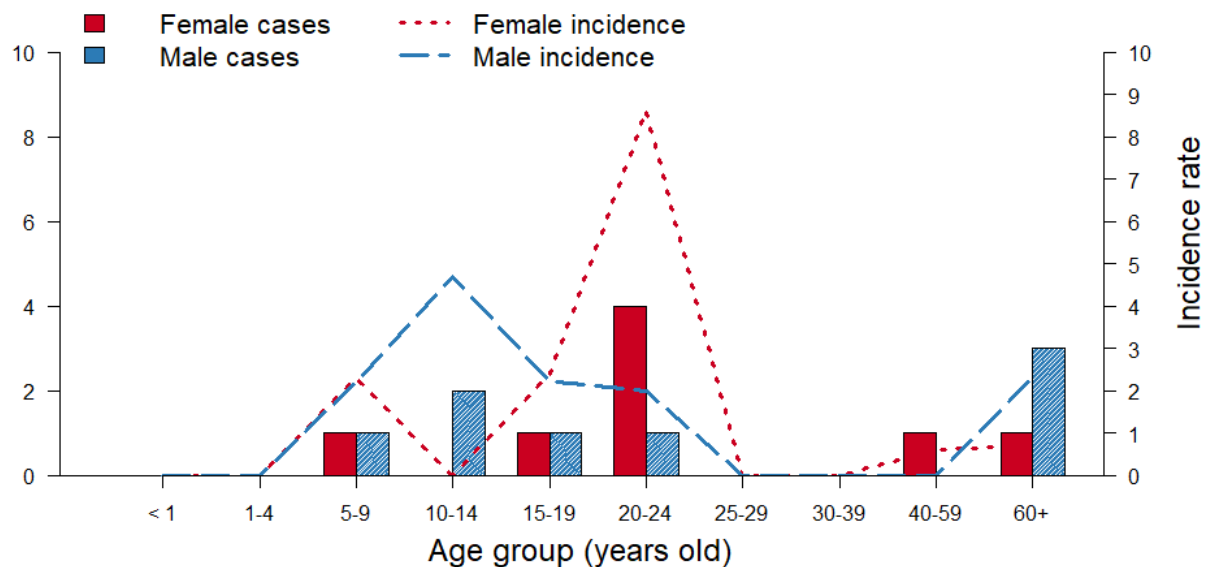


TABLE 18: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED HEPATITIS A CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| 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 | 2 | 1 | 1 | 2.3 | 2.3 | 2.2 |
| 10-14 | 2 | 0 | 2 | 2.4 | 0.0 | 4.7 |
| 15-19 | 2 | 1 | 1 | 2.3 | 2.4 | 2.2 |
| 20-24 | 5 | 4 | 1 | 5.2 | 8.6 | 2.0 |
| 25-29 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 |
| 30-39 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 |
| 40-59 | 1 | 1 | 0 | 0.3 | 0.6 | 0.0 |
| 60+ | 4 | 1 | 3 | 1.4 | 0.7 | 2.3 |

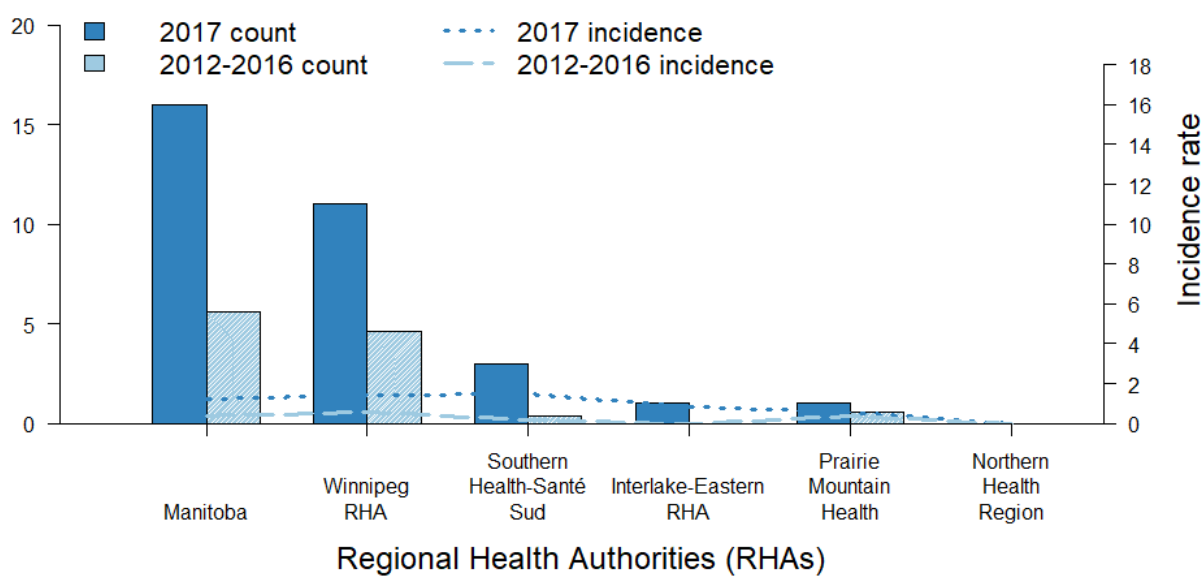
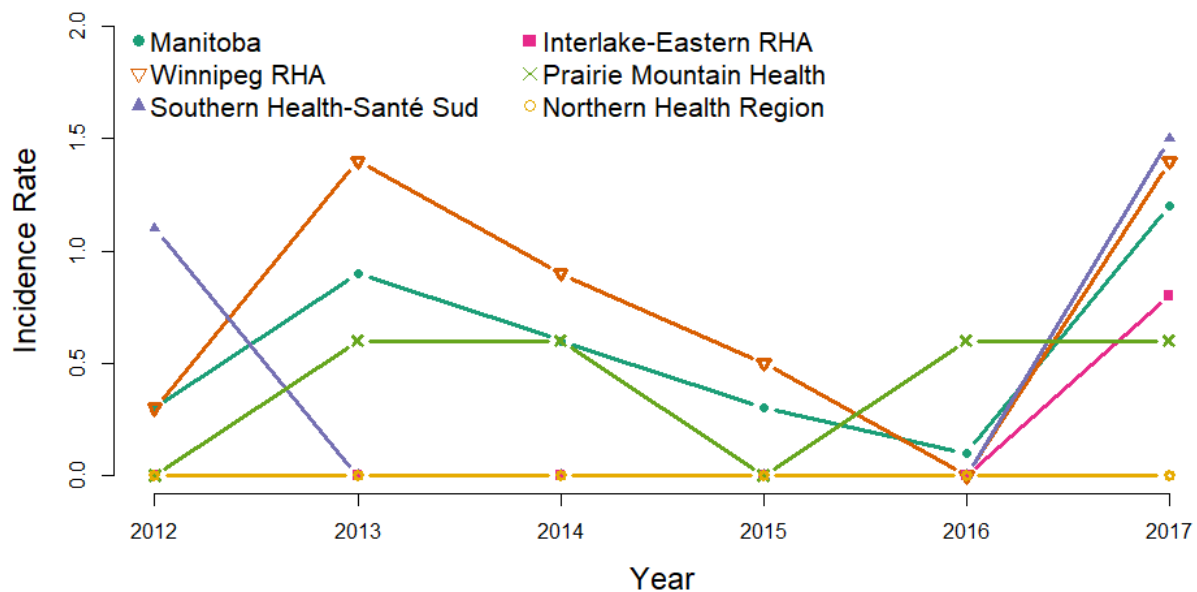
FIGURE 15: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED HEPATITIS A CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

TABLE 19: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED HEPATITIS A CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 11 | 4.6 | 1.4 | 0.6 |
| SOUTHERN HEALTH-SANTÉ SUD | 3 | 0.4 | 1.5 | 0.2 |
| INTERLAKE-EASTERN RHA | 1 | 0.0 | 0.8 | 0.0 |
| PRAIRIE MOUNTAIN HEALTH | 1 | 0.6 | 0.6 | 0.4 |
| NORTHERN HEALTH REGION | 0 | 0.0 | 0.0 | 0.0 |
| MANITOBA | 16 | 5.6 | 1.2 | 0.4 |

FIGURE 16: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED HEPATITIS A CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.



SALMONELLOSIS

The average age in 2017 was 41.5 years (with a standard deviation of 25.4 years). The average age in 2012 - 2016 was 38 years (with a standard deviation of 24.7 years). The median age in 2017 was 46 years (IQR: 22.25 - 60.75 years). The median age in 2012 - 2016 was 36 years (IQR: 19 - 58 years).

TABLE 20: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED SALMONELLOSIS CASES IN MANITOBA, BY SEX, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 222 | 225.2 | 16.4 | 17.3 |
| FEMALE | 123 | 123.6 | 18.0 | 18.8 |
| MALE | 99 | 101.6 | 14.7 | 15.7 |

FIGURE 17: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED SALMONELLOSIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

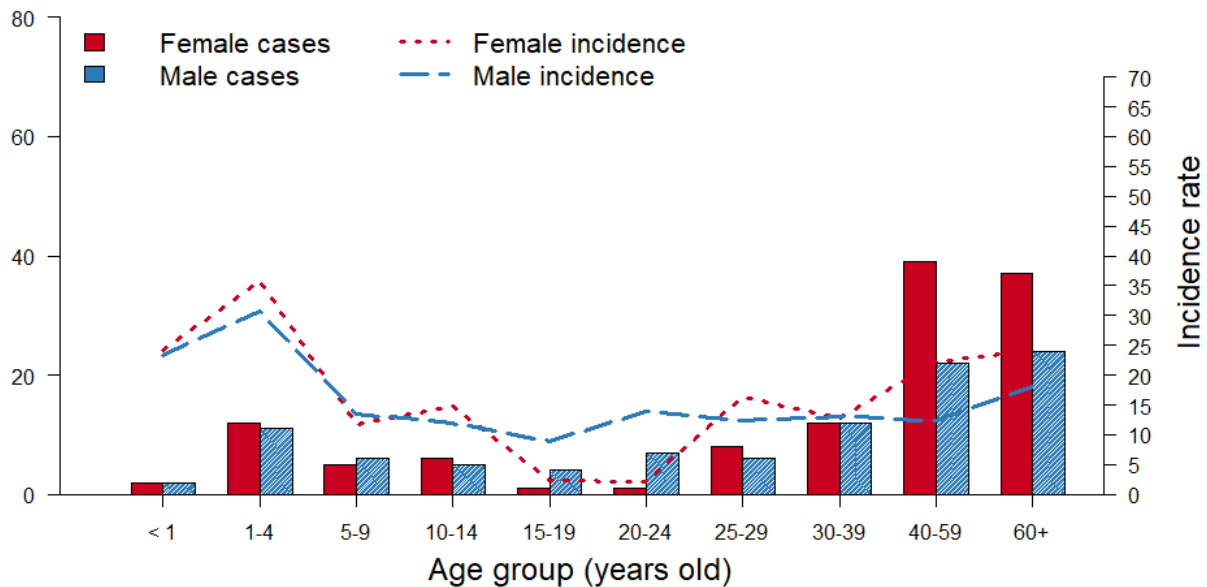


TABLE 21: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED SALMONELLOSIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| AGE GROUP (YEARS) | COUNT | | | INCIDENCE RATE | | |
|-------------------|-------|--------|------|----------------|--------|------|
| | TOTAL | FEMALE | MALE | TOTAL | FEMALE | MALE |
| <1 | 4 | 2 | 2 | 23.8 | 24.2 | 23.3 |
| 1-4 | 23 | 12 | 11 | 33.2 | 35.8 | 30.7 |
| 5-9 | 11 | 5 | 6 | 12.6 | 11.7 | 13.4 |
| 10-14 | 11 | 6 | 5 | 13.4 | 14.9 | 11.9 |
| 15-19 | 5 | 1 | 4 | 5.8 | 2.4 | 9.0 |
| 20-24 | 8 | 1 | 7 | 8.3 | 2.1 | 14.0 |
| 25-29 | 14 | 8 | 6 | 14.3 | 16.4 | 12.3 |
| 30-39 | 24 | 12 | 12 | 13.0 | 12.9 | 13.1 |
| 40-59 | 61 | 39 | 22 | 17.4 | 22.3 | 12.5 |
| 60+ | 61 | 37 | 24 | 21.4 | 24.1 | 18.1 |

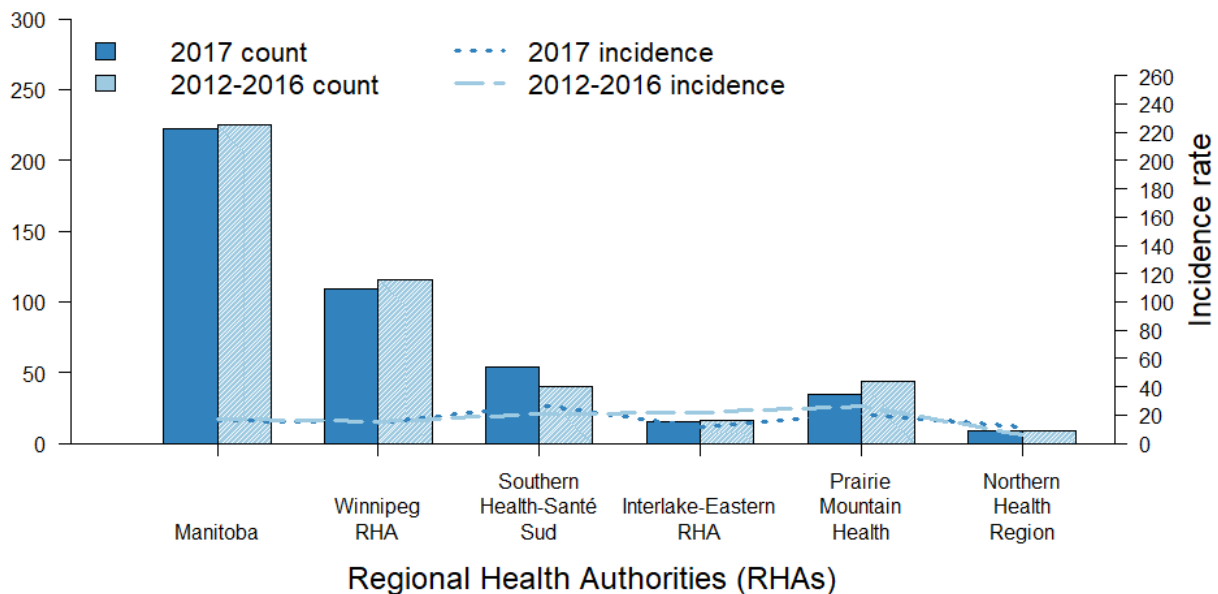
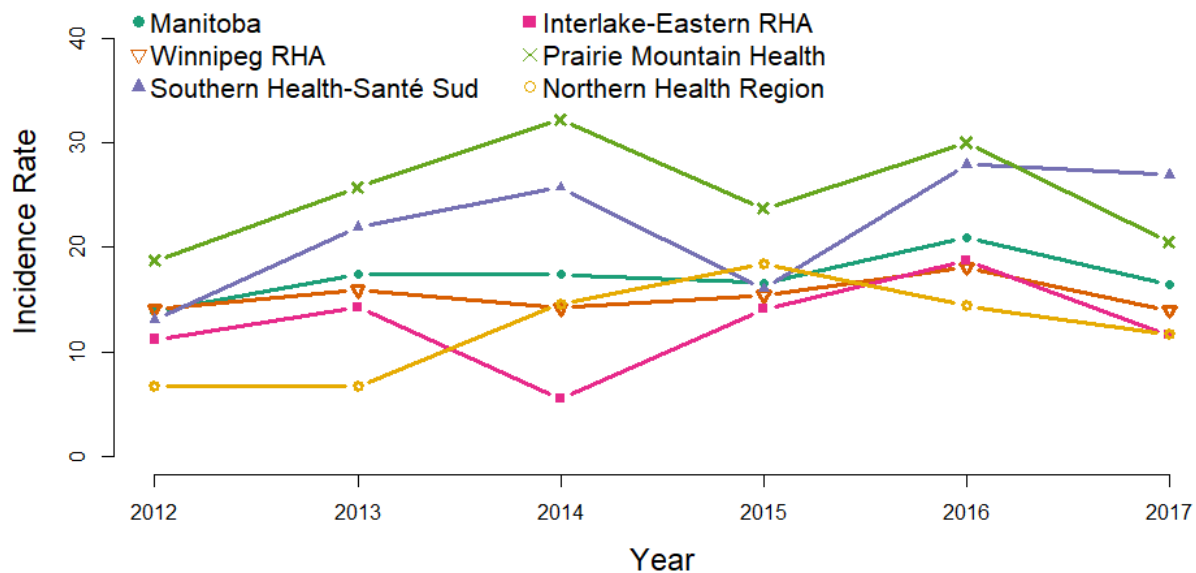
FIGURE 18: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED SALMONELLOSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

TABLE 22: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED SALMONELLOSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 109 | 116.0 | 14.0 | 15.6 |
| SOUTHERN HEALTH-SANTÉ SUD | 54 | 40.0 | 26.9 | 21.0 |
| INTERLAKE-EASTERN RHA | 15 | 16.2 | 11.6 | 21.5 |
| PRAIRIE MOUNTAIN HEALTH | 35 | 43.8 | 20.5 | 26.1 |
| NORTHERN HEALTH REGION | 9 | 9.2 | 11.7 | 6.0 |
| MANITOBA | 222 | 225.2 | 16.4 | 17.3 |

FIGURE 19: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED SALMONELLOSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.



SHIGELLOSIS

The average age in 2017 was 38 years (with a standard deviation of 25.7 years). The average age in 2012 - 2016 was 25 years (with a standard deviation of 22.1 years). The median age in 2017 was 33 years (IQR: 21 - 53 years). The median age in 2012 - 2016 was 18 years (IQR: 6 - 43 years).

TABLE 23: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED SHIGELLOSIS CASES IN MANITOBA, BY SEX, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 17 | 33.0 | 1.3 | 2.5 |
| FEMALE | 8 | 16.4 | 1.2 | 2.5 |
| MALE | 9 | 16.6 | 1.3 | 2.6 |

FIGURE 20: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED SHIGELLOSIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

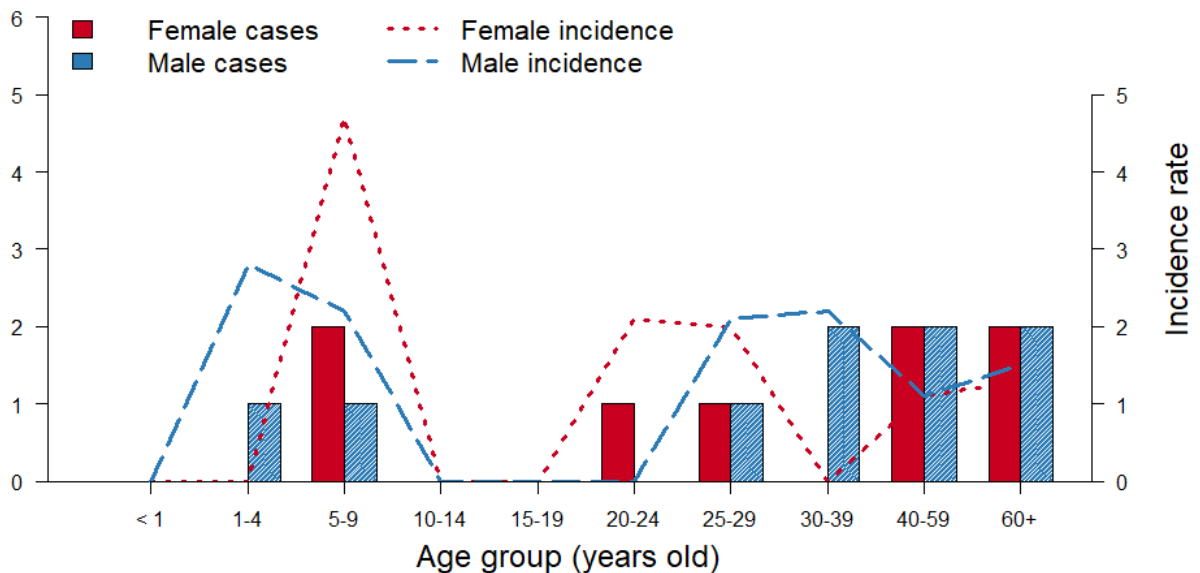


TABLE 24: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED SHIGELLOSIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| 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 | 1.4 | 0.0 | 2.8 |
| 5-9 | 3 | 2 | 1 | 3.4 | 4.7 | 2.2 |
| 10-14 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 |
| 15-19 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 |
| 20-24 | 1 | 1 | 0 | 1.0 | 2.1 | 0.0 |
| 25-29 | 2 | 1 | 1 | 2.0 | 2.0 | 2.1 |
| 30-39 | 2 | 0 | 2 | 1.1 | 0.0 | 2.2 |
| 40-59 | 4 | 2 | 2 | 1.1 | 1.1 | 1.1 |
| 60+ | 4 | 2 | 2 | 1.4 | 1.3 | 1.5 |

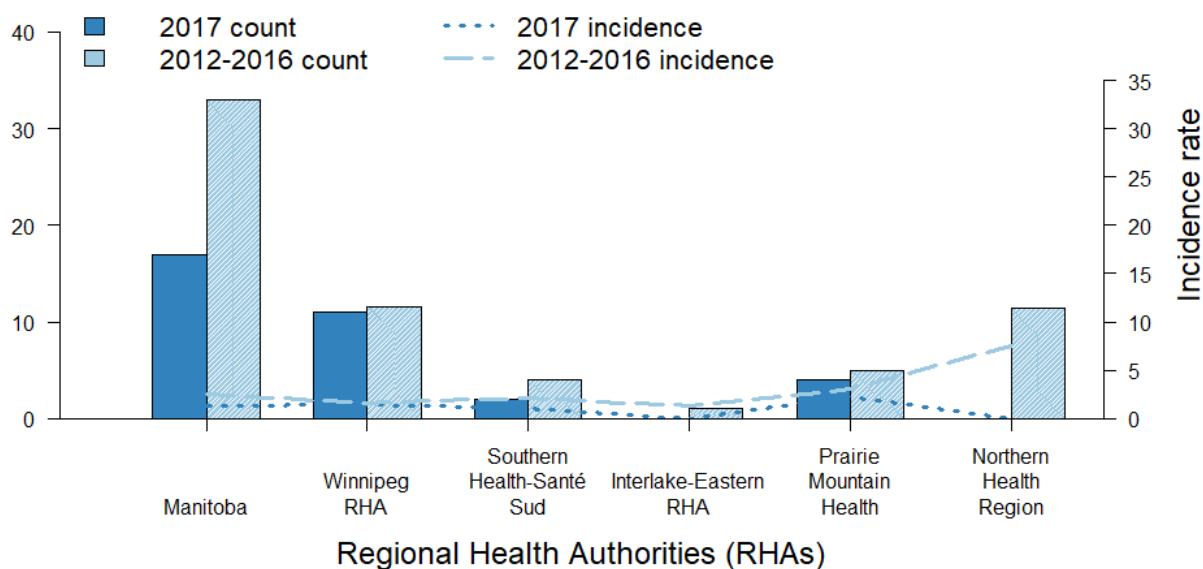
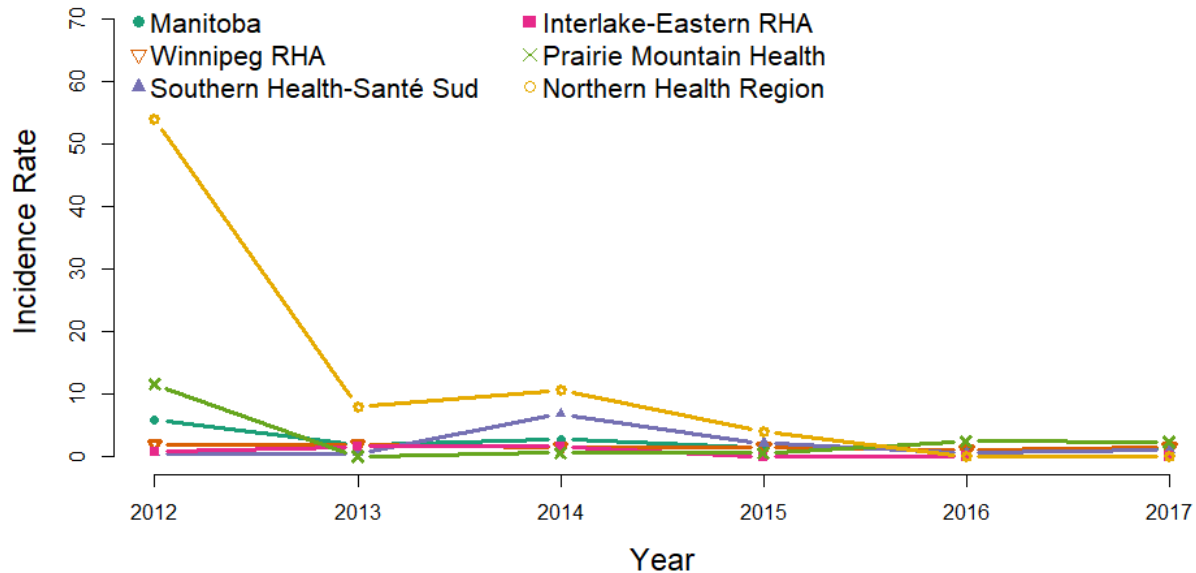
FIGURE 21: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED SHIGELLOSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

TABLE 25: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED SHIGELLOSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 11 | 11.6 | 1.4 | 1.6 |
| SOUTHERN HEALTH-SANTÉ SUD | 2 | 4.0 | 1.0 | 2.1 |
| INTERLAKE-EASTERN RHA | 0 | 1.0 | 0.0 | 1.3 |
| PRAIRIE MOUNTAIN HEALTH | 4 | 5.0 | 2.3 | 3.0 |
| NORTHERN HEALTH REGION | 0 | 11.4 | 0.0 | 7.5 |
| MANITOBA | 17 | 33.0 | 1.3 | 2.5 |

FIGURE 22: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED SHIGELLOSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.



TYPHOID FEVER

The average age in 2017 was 19.9 years (with a standard deviation of 15.9 years). The average age in 2012 - 2016 was 23.8 years (with a standard deviation of 18.1 years). The median age in 2017 was 27 years (IQR: 4 - 35 years). The median age in 2012 - 2016 was 25 years (IQR: 4.5 - 35 years).

TABLE 26: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED TYPHOID FEVER CASES IN MANITOBA, BY SEX, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 9 | 3.8 | 0.7 | 0.3 |
| FEMALE | 1 | 2.0 | 0.1 | 0.3 |
| MALE | 8 | 1.8 | 1.2 | 0.3 |

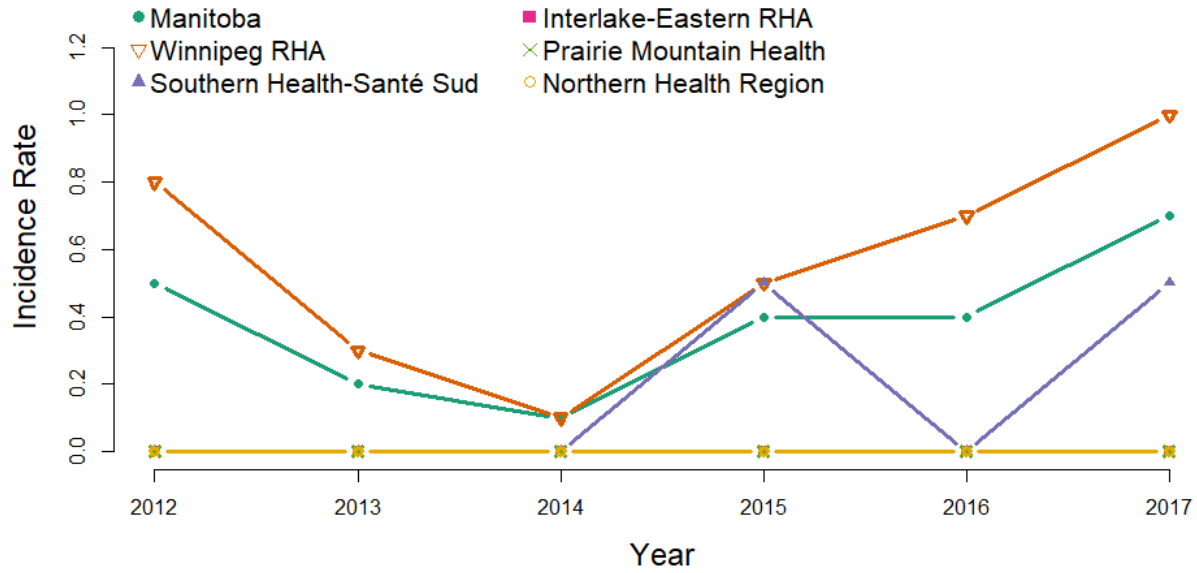
TABLE 27: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED TYPHOID FEVER CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| 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 | 0 | 3 | 4.3 | 0.0 | 8.4 |
| 5-9 | 1 | 0 | 1 | 1.1 | 0.0 | 2.2 |
| 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 | 0 | 1 | 1.0 | 0.0 | 2.1 |
| 30-39 | 4 | 1 | 3 | 2.2 | 1.1 | 3.3 |
| 40-59 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 |
| 60+ | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 |

TABLE 28: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED TYPHOID FEVER CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 8 | 3.6 | 1.0 | 0.5 |
| SOUTHERN HEALTH-SANTÉ SUD | 1 | 0.2 | 0.5 | 0.1 |
| INTERLAKE-EASTERN RHA | 0 | 0.0 | 0.0 | 0.0 |
| PRAIRIE MOUNTAIN HEALTH | 0 | 0.0 | 0.0 | 0.0 |
| NORTHERN HEALTH REGION | 0 | 0.0 | 0.0 | 0.0 |
| MANITOBA | 9 | 3.8 | 0.7 | 0.3 |

FIGURE 23: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED TYPHOID FEVER CASES IN MANITOBA, BY YEAR AND REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.



VEROTOXIGENIC ESCHERICHIA COLI (VTEC)

The average age in 2017 was 28.2 years (with a standard deviation of 23.4 years). The average age in 2012 - 2016 was 27 years (with a standard deviation of 20.9 years). The median age in 2017 was 20 years (IQR: 6.25 - 45.5 years). The median age in 2012 - 2016 was 22 years (IQR: 10 - 37.5 years).

TABLE 29: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED VEROTOXIGENIC *ESCHERICHIA COLI* (VTEC) CASES IN MANITOBA, BY SEX, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 46 | 35.8 | 3.4 | 2.7 |
| FEMALE | 20 | 18.0 | 2.9 | 2.7 |
| MALE | 26 | 17.8 | 3.9 | 2.7 |

FIGURE 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, 2017.

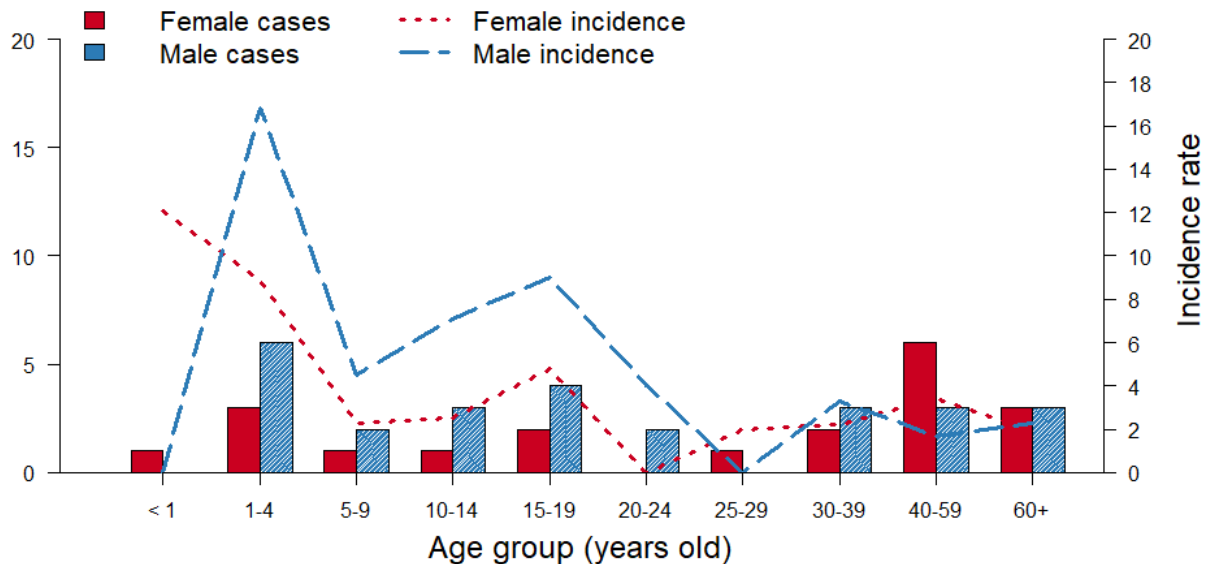


TABLE 30: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED VEROTOXIGENIC *ESCHERICHIA COLI* (VTEC) CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| AGE GROUP (YEARS) | COUNT | | | INCIDENCE RATE | | |
|----------------------|-------|--------|------|----------------|--------|------|
| | TOTAL | FEMALE | MALE | TOTAL | FEMALE | MALE |
| <1 | 1 | 1 | 0 | 5.9 | 12.1 | 0.0 |
| 1-4 | 9 | 3 | 6 | 13.0 | 8.9 | 16.8 |
| 5-9 | 3 | 1 | 2 | 3.4 | 2.3 | 4.5 |
| 10-14 | 4 | 1 | 3 | 4.9 | 2.5 | 7.1 |
| 15-19 | 6 | 2 | 4 | 7.0 | 4.8 | 9.0 |
| 20-24 | 2 | 0 | 2 | 2.1 | 0.0 | 4.0 |
| 25-29 | 1 | 1 | 0 | 1.0 | 2.0 | 0.0 |
| 30-39 | 5 | 2 | 3 | 2.7 | 2.2 | 3.3 |
| 40-59 | 9 | 6 | 3 | 2.6 | 3.4 | 1.7 |
| 60+ | 6 | 3 | 3 | 2.1 | 2.0 | 2.3 |

FIGURE 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), 2017 AND 5-YEAR AVERAGE (2012-2016).

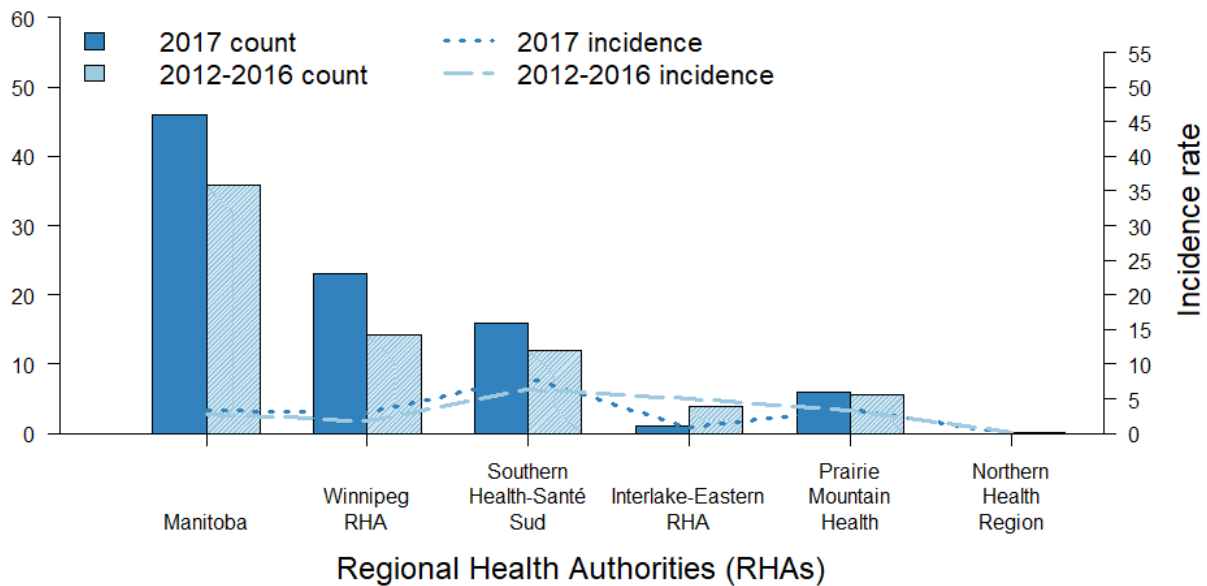
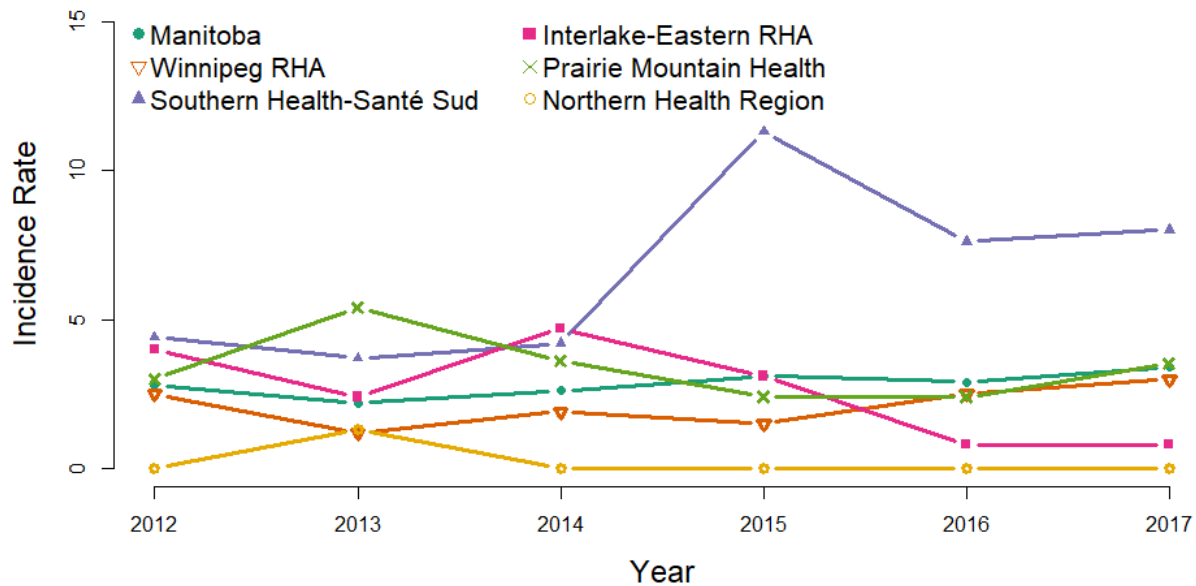


TABLE 31: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED VEROTOXIGENIC *ESCHERICHIA COLI* (VTEC) CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 23 | 14.2 | 3.0 | 1.9 |
| SOUTHERN HEALTH-SANTÉ SUD | 16 | 12.0 | 8.0 | 6.3 |
| INTERLAKE-EASTERN RHA | 1 | 3.8 | 0.8 | 5.0 |
| PRAIRIE MOUNTAIN HEALTH | 6 | 5.6 | 3.5 | 3.3 |
| NORTHERN HEALTH REGION | 0 | 0.2 | 0.0 | 0.1 |
| MANITOBA | 46 | 35.8 | 3.4 | 2.7 |

FIGURE 26: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED VEROTOXIGENIC *ESCHERICHIA COLI* (VTEC) CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.



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 2017 was 44.7 years (with a standard deviation of 24.4 years). The average age in 2012 - 2016 was 44.9 years (with a standard deviation of 23.2 years). The median age in 2017 was 46 years (IQR: 27 - 61 years). The median age in 2012 - 2016 was 47 years (IQR: 31 - 61 years).

TABLE 32: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED STREPTOCOCCAL INVASIVE DISEASE (GROUP A) CASES IN MANITOBA, BY SEX, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|----------------------|----------------|----------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 241 | - | 17.8 | - |
| FEMALE | 96 | - | 14.1 | - |
| MALE | 145 | - | 21.5 | - |

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

FIGURE 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, 2017.

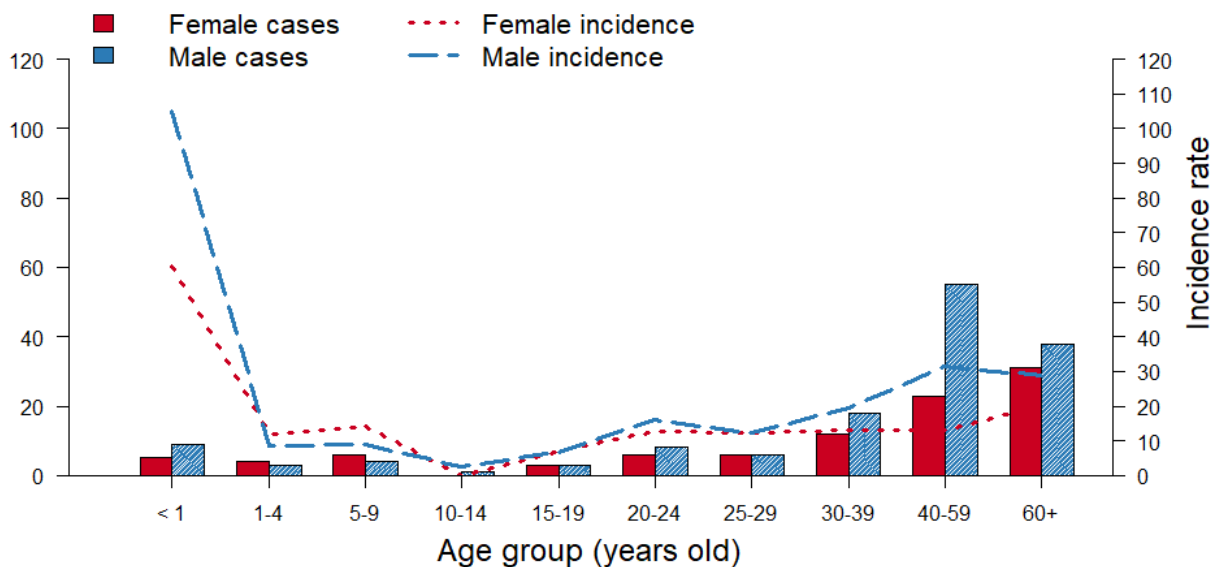


TABLE 33: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED STREPTOCOCCAL INVASIVE DISEASE (GROUP A) CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| AGE GROUP (YEARS) | COUNT | | | INCIDENCE RATE | | |
|----------------------|-------|--------|------|----------------|--------|-------|
| | TOTAL | FEMALE | MALE | TOTAL | FEMALE | MALE |
| <1 | 14 | 5 | 9 | 83.1 | 60.5 | 104.9 |
| 1-4 | 7 | 4 | 3 | 10.1 | 11.9 | 8.4 |
| 5-9 | 10 | 6 | 4 | 11.4 | 14.1 | 8.9 |
| 10-14 | 1 | 0 | 1 | 1.2 | 0.0 | 2.4 |
| 15-19 | 6 | 3 | 3 | 7.0 | 7.2 | 6.7 |
| 20-24 | 14 | 6 | 8 | 14.5 | 12.8 | 16.0 |
| 25-29 | 12 | 6 | 6 | 12.3 | 12.3 | 12.3 |
| 30-39 | 30 | 12 | 18 | 16.2 | 12.9 | 19.6 |
| 40-59 | 78 | 23 | 55 | 22.3 | 13.2 | 31.3 |
| 60+ | 69 | 31 | 38 | 24.2 | 20.2 | 28.7 |

FIGURE 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), 2017 AND 5-YEAR AVERAGE (2012-2016).

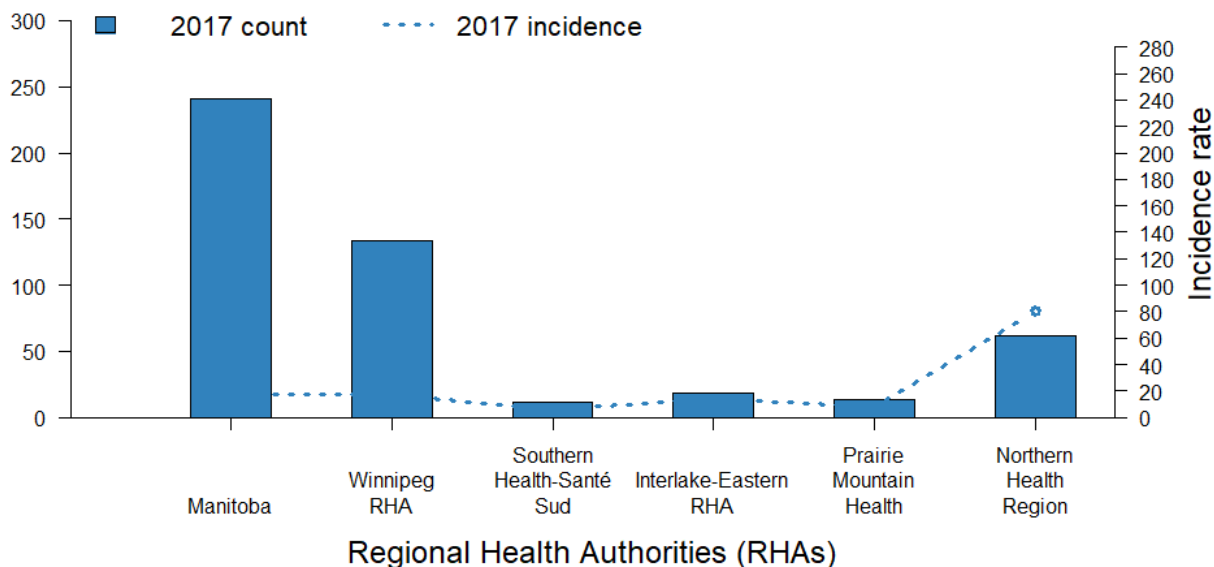


TABLE 34: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED STREPTOCOCCAL INVASIVE DISEASE (GROUP A) CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 134 | - | 17.2 | - |
| SOUTHERN HEALTH-SANTÉ SUD | 12 | - | 6.0 | - |
| INTERLAKE-EASTERN RHA | 18 | - | 13.9 | - |
| PRAIRIE MOUNTAIN HEALTH | 13 | - | 7.6 | - |
| NORTHERN HEALTH REGION | 62 | - | 80.7 | - |
| MANITOBA | 241 | - | 17.8 | - |

* 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.

The average age in 2017 was 0 years (with a standard deviation of 0 years). The average age in 2012 - 2016 was 0 years (with a standard deviation of 0 years). The median age in 2017 was 0 years (IQR: 0 - 0 years). The median age in 2012 - 2016 was 0 years (IQR: 0 - 0 years).

TABLE 35: 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, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 7 | - | 0.5 | - |
| FEMALE | 3 | - | 0.4 | - |
| 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 36: 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, 2017.

| AGE GROUP (YEARS) | COUNT | | | INCIDENCE RATE | | |
|-------------------|-------|--------|------|----------------|--------|------|
| | TOTAL | FEMALE | MALE | TOTAL | FEMALE | MALE |
| <1 | 7 | 3 | 4 | 41.6 | 36.3 | 46.6 |
| 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 37: 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), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|----------------------|----------------|----------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 3 | - | 0.4 | - |
| SOUTHERN HEALTH-SANTÉ SUD | 1 | - | 0.5 | - |
| INTERLAKE-EASTERN RHA | 1 | - | 0.8 | - |
| PRAIRIE MOUNTAIN HEALTH | 0 | - | 0.0 | - |
| NORTHERN HEALTH REGION | 2 | - | 2.6 | - |
| MANITOBA | 7 | - | 0.5 | - |

* 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 is not valuable in these situation because the meaning of the codes have changed. While it would be possible to manually go through existing cases and update their ICD9 codes based on their serotype, this will not give us reliable data. For example, when the case is reported, the serotype may not be included, meaning there is no valid way of identifying what the updated ICD9 code should be. Additionally, manually changing the code leaves lots of room for human error. For the purposes of the report, the decision was made to report only the cases that occurred after January 1, 2017.

The average age in 2017 was 41.8 years (with a standard deviation of 28.9 years). The average age in 2012 - 2016 was 35.1 years (with a standard deviation of 31.7 years). The median age in 2017 was 51 years (IQR: 13.5 - 66.5 years). The median age in 2012 - 2016 was 35 years (IQR: 1 - 64 years).

TABLE 38: 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, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|----------------------|----------------|----------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 27 | - | 2.0 | - |
| FEMALE | 18 | - | 2.6 | - |
| MALE | 9 | - | 1.3 | - |

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

FIGURE 29: 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, 2017.

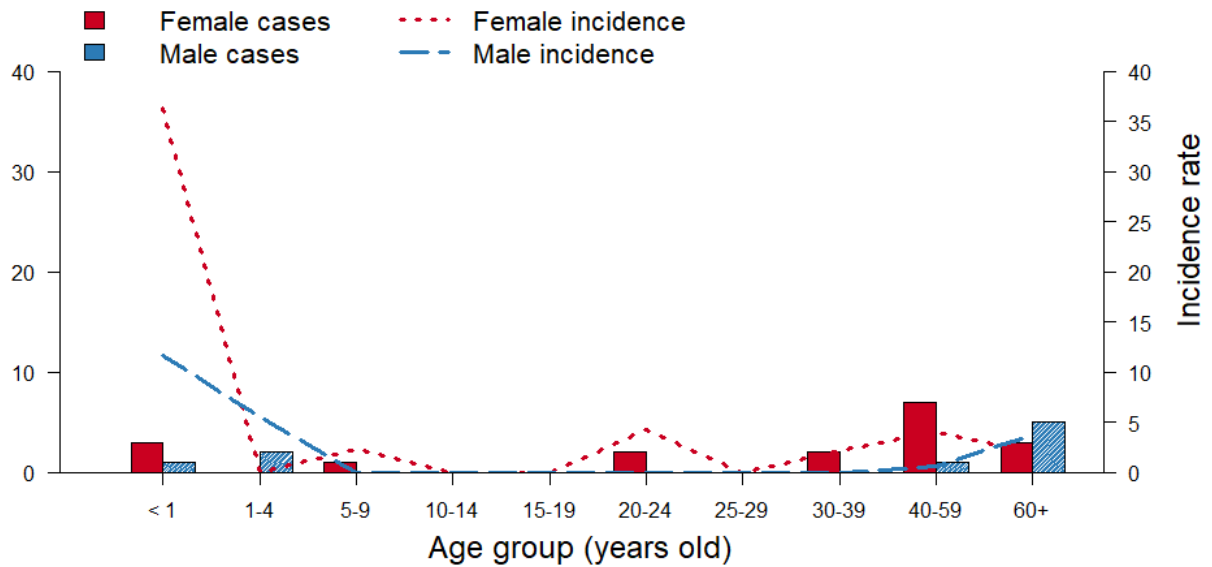


TABLE 39: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED *HAEMOPHILUS INFLUENZAE* (NON-SEROTYPE B, INVASIVE DISEASE) CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| AGE GROUP (YEARS) | COUNT | | | INCIDENCE RATE | | |
|----------------------|-------|--------|------|----------------|--------|------|
| | TOTAL | FEMALE | MALE | TOTAL | FEMALE | MALE |
| <1 | 4 | 3 | 1 | 23.8 | 36.3 | 11.7 |
| 1-4 | 2 | 0 | 2 | 2.9 | 0.0 | 5.6 |
| 5-9 | 1 | 1 | 0 | 1.1 | 2.3 | 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 | 2 | 2 | 0 | 2.1 | 4.3 | 0.0 |
| 25-29 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 |
| 30-39 | 2 | 2 | 0 | 1.1 | 2.2 | 0.0 |
| 40-59 | 8 | 7 | 1 | 2.3 | 4.0 | 0.6 |
| 60+ | 8 | 3 | 5 | 2.8 | 2.0 | 3.8 |

FIGURE 30: 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), 2017 AND 5-YEAR AVERAGE (2012-2016).

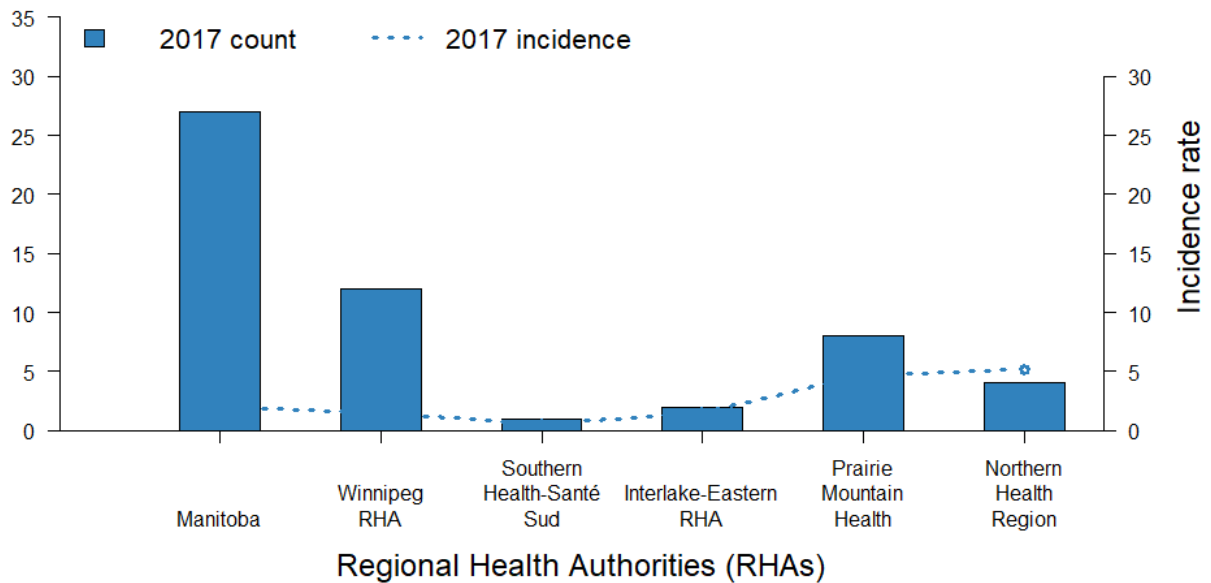


TABLE 40: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED *HAEMOPHILUS INFLUENZAE* (NON-SEROTYPE B, INVASIVE DISEASE) CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 12 | - | 1.5 | - |
| SOUTHERN HEALTH-SANTÉ SUD | 1 | - | 0.5 | - |
| INTERLAKE-EASTERN RHA | 2 | - | 1.5 | - |
| PRAIRIE MOUNTAIN HEALTH | 8 | - | 4.7 | - |
| NORTHERN HEALTH REGION | 4 | - | 5.2 | - |
| MANITOBA | 27 | - | 2.0 | - |

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

INVASIVE PNEUMOCOCCAL DISEASE

The average age in 2017 was 48.2 years (with a standard deviation of 25.5 years). The average age in 2012 - 2016 was 48.4 years (with a standard deviation of 25.8 years). The median age in 2017 was 53 years (IQR: 31.5 - 68 years). The median age in 2012 - 2016 was 52 years (IQR: 32 - 67 years).

TABLE 41: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED INVASIVE PNEUMOCOCCAL DISEASE CASES IN MANITOBA, BY SEX, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 183 | 131.6 | 13.5 | 10.1 |
| FEMALE | 90 | 64.8 | 13.2 | 9.8 |
| MALE | 93 | 66.8 | 13.8 | 10.3 |

FIGURE 31: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED INVASIVE PNEUMOCOCCAL DISEASE CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

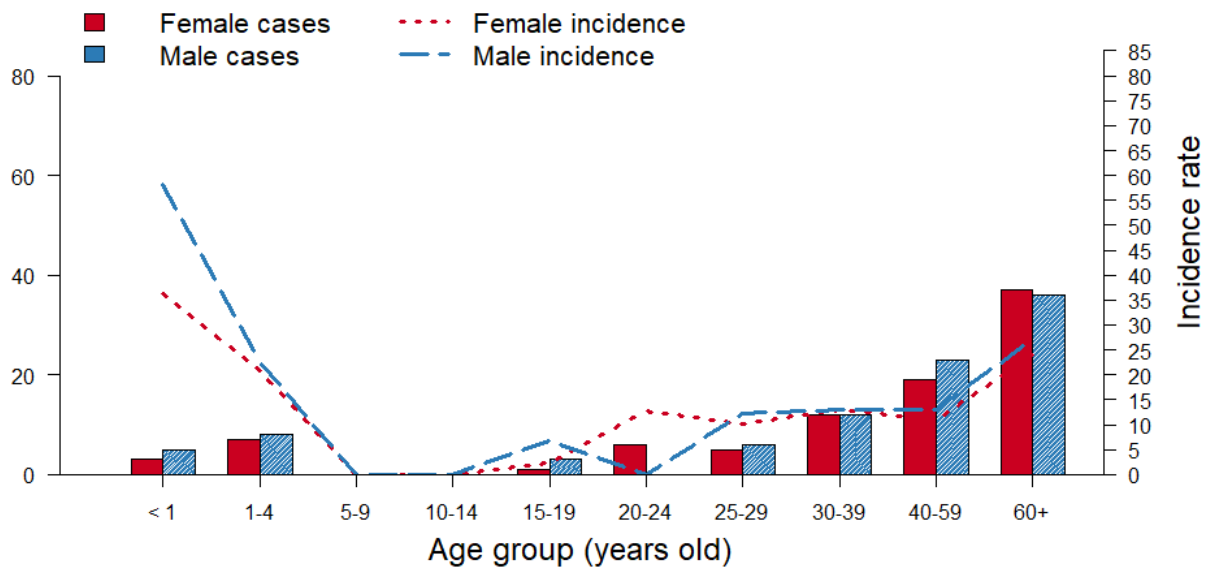


TABLE 42: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED INVASIVE PNEUMOCOCCAL DISEASE CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| AGE GROUP (YEARS) | COUNT | | | INCIDENCE RATE | | |
|----------------------|-------|--------|------|----------------|--------|------|
| | TOTAL | FEMALE | MALE | TOTAL | FEMALE | MALE |
| <1 | 8 | 3 | 5 | 47.5 | 36.3 | 58.3 |
| 1-4 | 15 | 7 | 8 | 21.6 | 20.9 | 22.3 |
| 5-9 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 |
| 10-14 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 |
| 15-19 | 4 | 1 | 3 | 4.7 | 2.4 | 6.7 |
| 20-24 | 6 | 6 | 0 | 6.2 | 12.8 | 0.0 |
| 25-29 | 11 | 5 | 6 | 11.3 | 10.2 | 12.3 |
| 30-39 | 24 | 12 | 12 | 13.0 | 12.9 | 13.1 |
| 40-59 | 42 | 19 | 23 | 12.0 | 10.9 | 13.1 |
| 60+ | 73 | 37 | 36 | 25.6 | 24.1 | 27.2 |

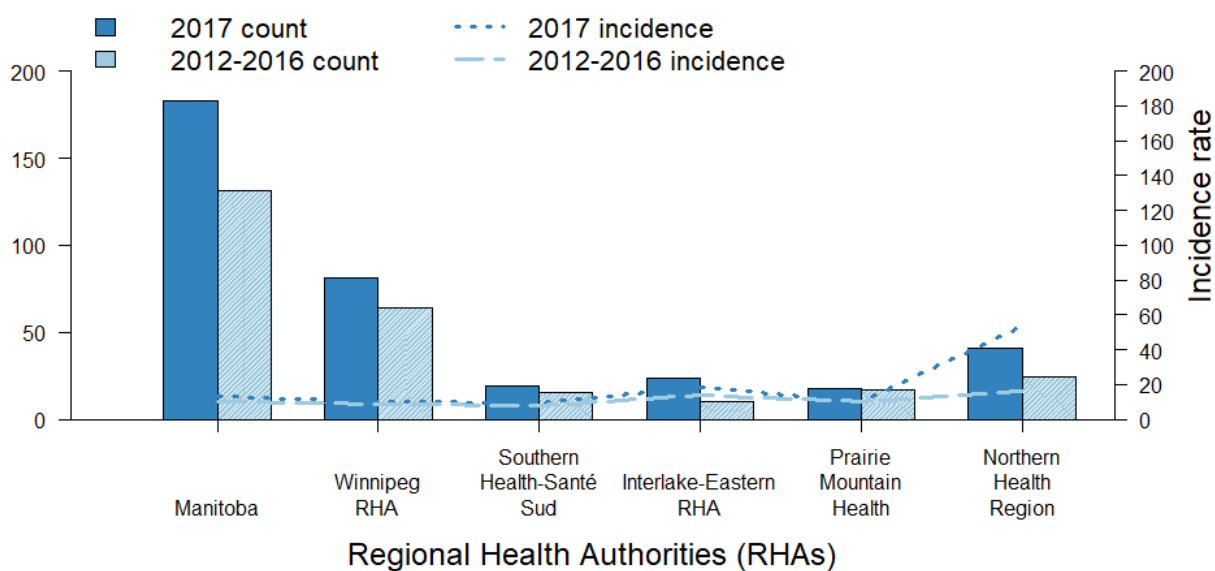
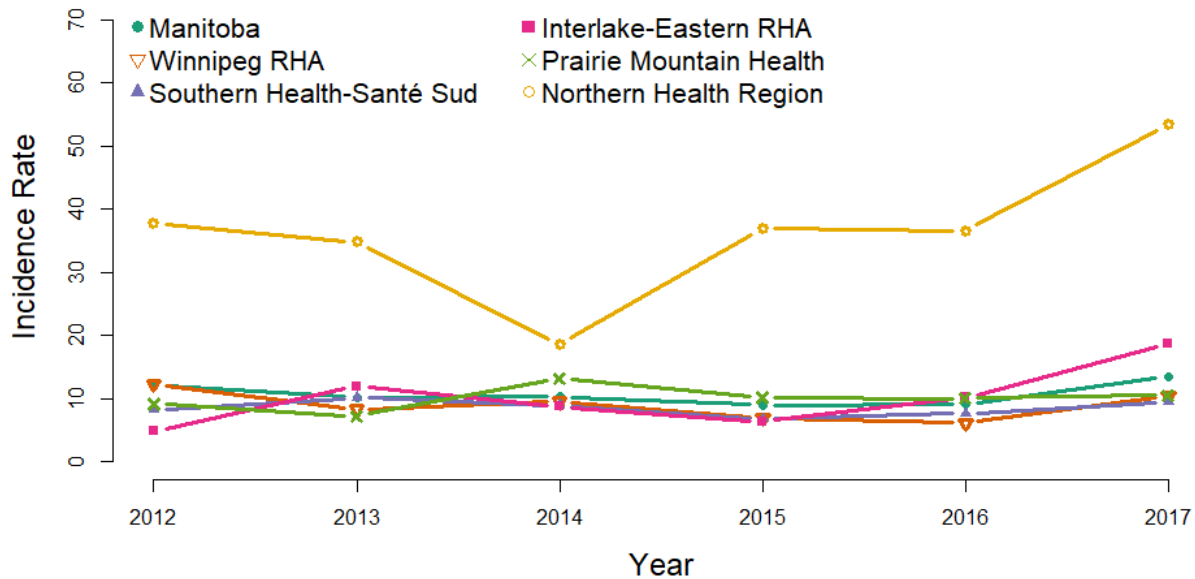
FIGURE 32: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED INVASIVE PNEUMOCOCCAL DISEASE CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

TABLE 43: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED INVASIVE PNEUMOCOCCAL DISEASE CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 81 | 63.8 | 10.4 | 8.6 |
| SOUTHERN HEALTH-SANTÉ SUD | 19 | 15.8 | 9.5 | 8.3 |
| INTERLAKE-EASTERN RHA | 24 | 10.6 | 18.6 | 14.1 |
| PRAIRIE MOUNTAIN HEALTH | 18 | 16.6 | 10.5 | 9.9 |
| NORTHERN HEALTH REGION | 41 | 24.8 | 53.4 | 16.3 |
| MANITOBA | 183 | 131.6 | 13.5 | 10.1 |

FIGURE 33: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED INVASIVE PNEUMOCOCCAL DISEASE CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.



MUMPS

The province wide mumps outbreak that started in university students in Winnipeg in October 2016 continued in 2017. From January 2017, the infection had spread to Northern Health Region, the last health region being affected by this outbreak. In Manitoba, the number of new mumps cases each month continued to increase from January and eventually peaked in September 2017.

The average age in 2017 was 26.6 years (with a standard deviation of 13.9 years). The average age in 2012 - 2016 was 25.8 years (with a standard deviation of 12.2 years). The median age in 2017 was 25 years (IQR: 16 - 36 years). The median age in 2012 - 2016 was 22 years (IQR: 19 - 29 years).

TABLE 44: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED MUMPS CASES IN MANITOBA, BY SEX, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 1631 | 25.2 | 120.1 | 1.9 |
| FEMALE | 814 | 10.0 | 119.1 | 1.5 |
| MALE | 817 | 15.2 | 121.1 | 2.3 |

FIGURE 34: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED MUMPS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

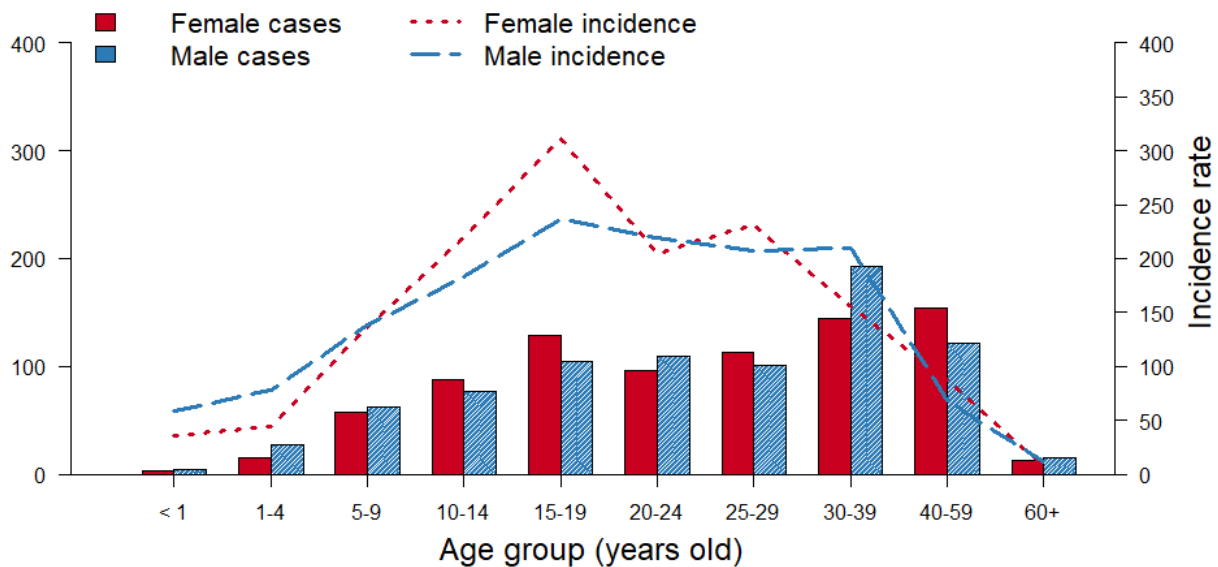


TABLE 45: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED MUMPS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| AGE GROUP (YEARS) | COUNT | | | INCIDENCE RATE | | |
|----------------------|-------|--------|------|----------------|--------|-------|
| | TOTAL | FEMALE | MALE | TOTAL | FEMALE | MALE |
| <1 | 8 | 3 | 5 | 47.5 | 36.3 | 58.3 |
| 1-4 | 43 | 15 | 28 | 62.0 | 44.7 | 78.2 |
| 5-9 | 120 | 58 | 62 | 137.3 | 135.8 | 138.7 |
| 10-14 | 165 | 88 | 77 | 200.6 | 219.1 | 182.9 |
| 15-19 | 234 | 129 | 105 | 272.1 | 310.7 | 236.2 |
| 20-24 | 206 | 96 | 110 | 212.7 | 205.3 | 219.6 |
| 25-29 | 214 | 113 | 101 | 219.3 | 231.4 | 207.1 |
| 30-39 | 338 | 145 | 193 | 182.5 | 155.0 | 210.2 |
| 40-59 | 275 | 154 | 121 | 78.5 | 88.2 | 68.8 |
| 60+ | 28 | 13 | 15 | 9.8 | 8.5 | 11.3 |

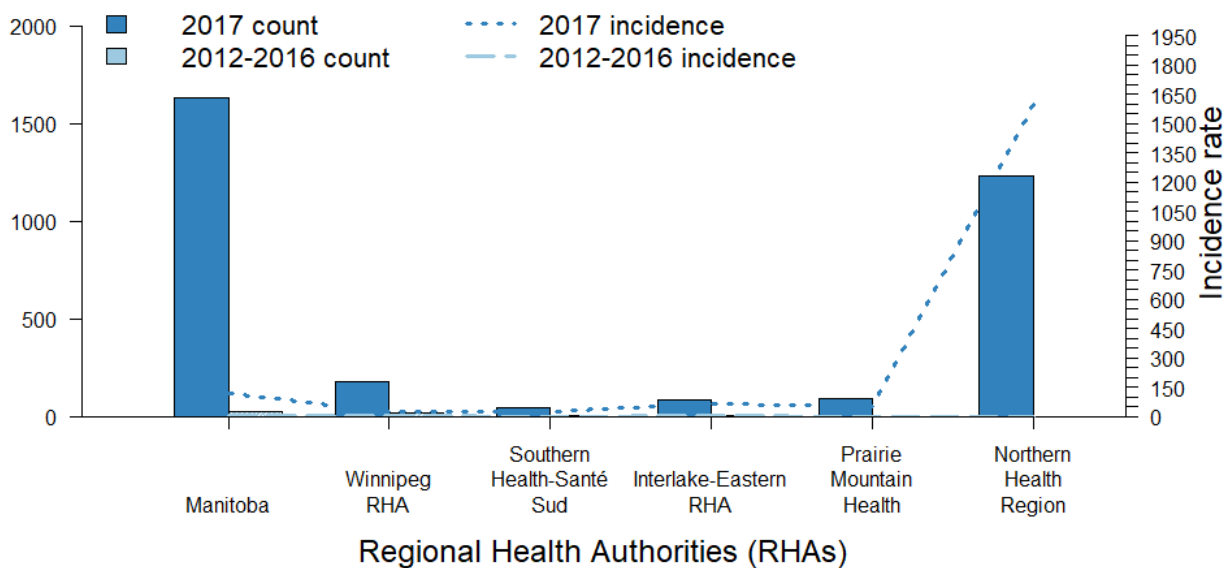
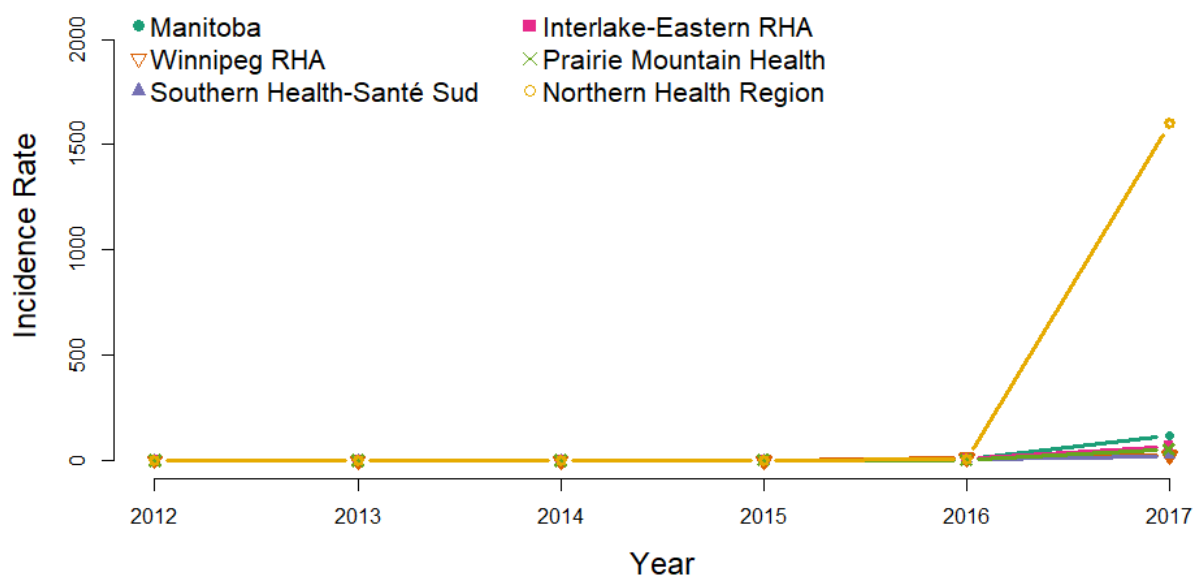
FIGURE 35: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED MUMPS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

TABLE 46: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED MUMPS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 178 | 19.4 | 22.8 | 2.6 |
| SOUTHERN HEALTH-SANTÉ SUD | 44 | 2.4 | 21.9 | 1.3 |
| INTERLAKE-EASTERN RHA | 87 | 1.8 | 67.4 | 2.4 |
| PRAIRIE MOUNTAIN HEALTH | 93 | 1.0 | 54.5 | 0.6 |
| NORTHERN HEALTH REGION | 1,229 | 0.6 | 1,599.3 | 0.4 |
| MANITOBA | 1,631 | 25.2 | 120.2 | 1.9 |

FIGURE 36: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED MUMPS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.

PERTUSSIS

The average age in 2017 was 10.6 years (with a standard deviation of 17.2 years). The average age in 2012 - 2016 was 10.2 years (with a standard deviation of 15.9 years). The median age in 2017 was 3 years (IQR: 0.5 - 12.5 years). The median age in 2012 - 2016 was 3 years (IQR: 0 - 12 years).

TABLE 47: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED PERTUSSIS CASES IN MANITOBA, BY SEX, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 75 | 61.8 | 5.5 | 4.7 |
| FEMALE | 42 | 33.4 | 6.2 | 5.1 |
| MALE | 33 | 28.4 | 4.9 | 4.4 |

FIGURE 37: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED PERTUSSIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

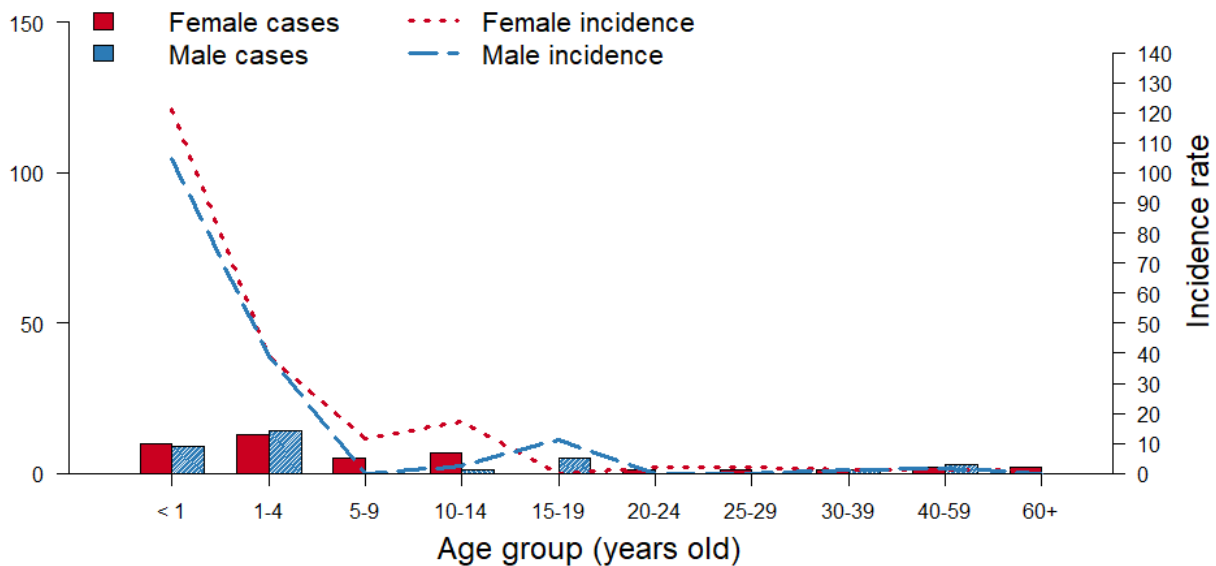


TABLE 48: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED PERTUSSIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| AGE GROUP (YEARS) | COUNT | | | INCIDENCE RATE | | |
|----------------------|-------|--------|------|----------------|--------|-------|
| | TOTAL | FEMALE | MALE | TOTAL | FEMALE | MALE |
| <1 | 19 | 10 | 9 | 112.8 | 121.0 | 104.9 |
| 1-4 | 27 | 13 | 14 | 38.9 | 38.7 | 39.1 |
| 5-9 | 5 | 5 | 0 | 5.7 | 11.7 | 0.0 |
| 10-14 | 8 | 7 | 1 | 9.7 | 17.4 | 2.4 |
| 15-19 | 5 | 0 | 5 | 5.8 | 0.0 | 11.2 |
| 20-24 | 1 | 1 | 0 | 1.0 | 2.1 | 0.0 |
| 25-29 | 1 | 1 | 0 | 1.0 | 2.0 | 0.0 |
| 30-39 | 2 | 1 | 1 | 1.1 | 1.1 | 1.1 |
| 40-59 | 5 | 2 | 3 | 1.4 | 1.1 | 1.7 |
| 60+ | 2 | 2 | 0 | 0.7 | 1.3 | 0.0 |

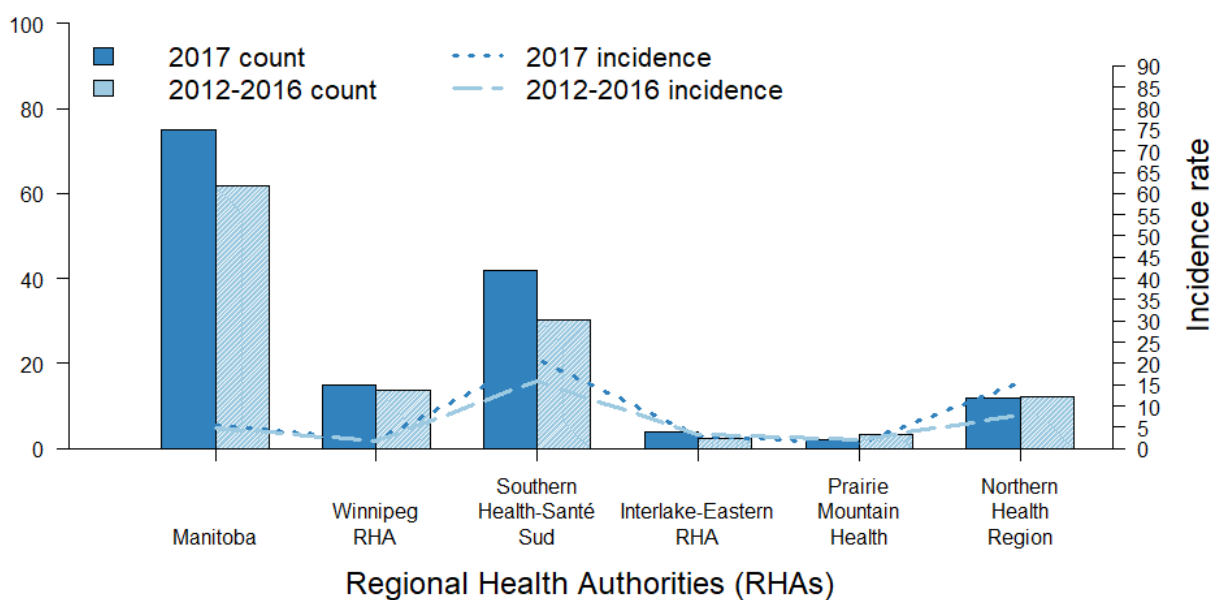
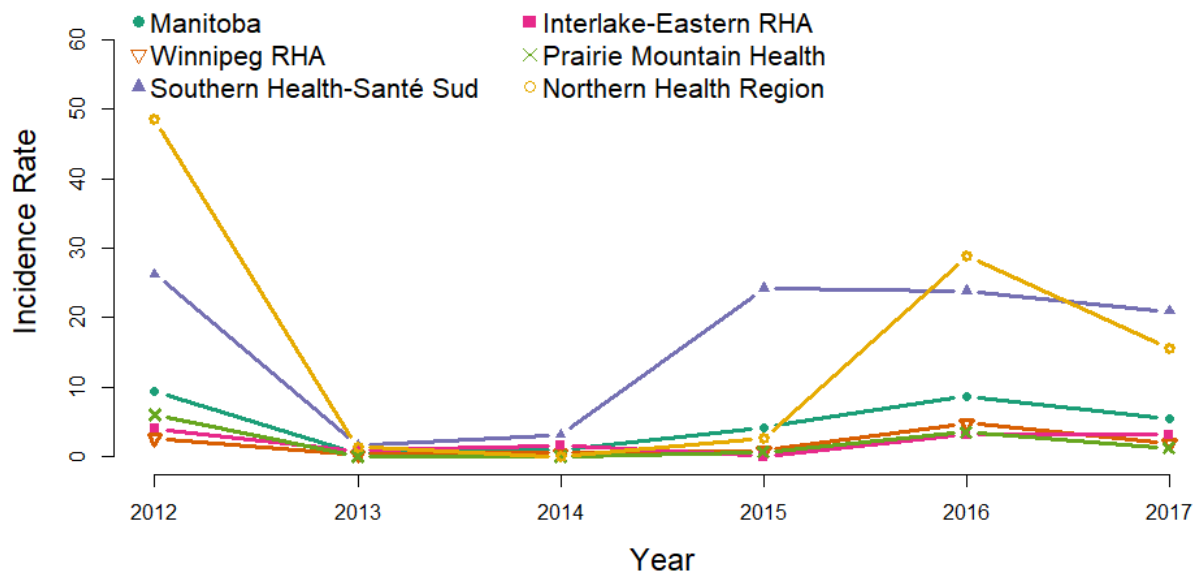
FIGURE 38: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED PERTUSSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

TABLE 49: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED PERTUSSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 15 | 13.6 | 1.9 | 1.8 |
| SOUTHERN HEALTH-SANTÉ SUD | 42 | 30.2 | 20.9 | 15.8 |
| INTERLAKE-EASTERN RHA | 4 | 2.4 | 3.1 | 3.2 |
| PRAIRIE MOUNTAIN HEALTH | 2 | 3.4 | 1.2 | 2.0 |
| NORTHERN HEALTH REGION | 12 | 12.2 | 15.6 | 8.0 |
| MANITOBA | 75 | 61.8 | 5.5 | 4.7 |

FIGURE 39: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED PERTUSSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.



ZOONOTIC AND ENVIRONMENTAL DISEASES

BLASTOMYCOSIS

The average age in 2017 was 36.7 years (with a standard deviation of 22.2 years). The average age in 2012 - 2016 was 37.7 years (with a standard deviation of 23 years). The median age in 2017 was 35.5 years (IQR: 22.25 - 48 years). The median age in 2012 - 2016 was 32.5 years (IQR: 20 - 55 years).

TABLE 50: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED BLASTOMYCOSIS CASES IN MANITOBA, BY SEX, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 18 | 15.6 | 1.3 | 1.2 |
| FEMALE | 6 | 5.4 | 0.9 | 0.8 |
| MALE | 12 | 10.2 | 1.8 | 1.6 |

FIGURE 40: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED BLASTOMYCOSIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

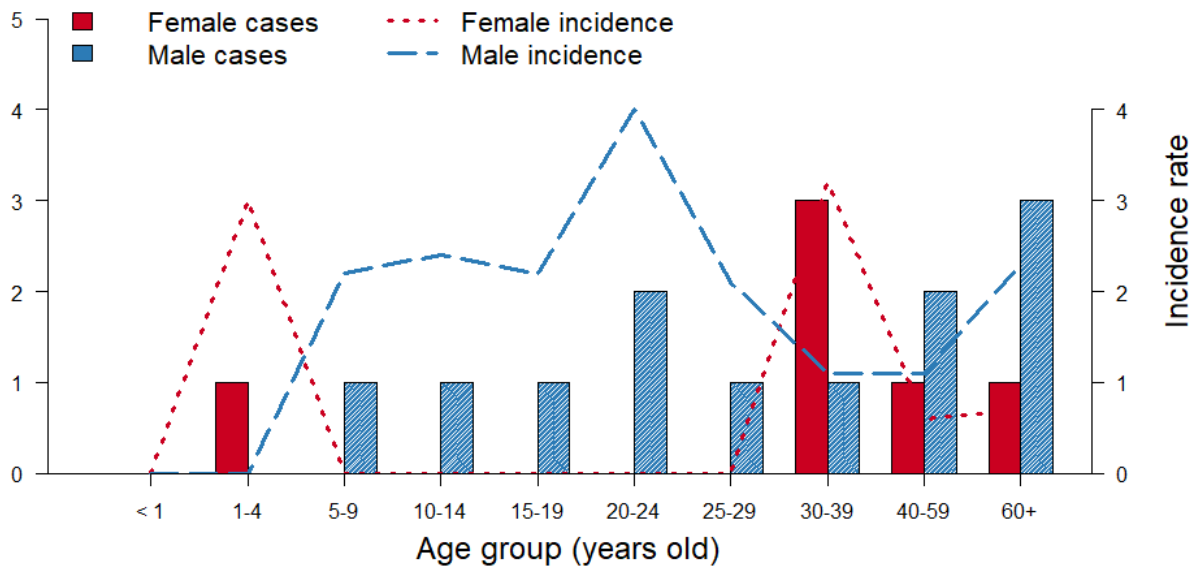
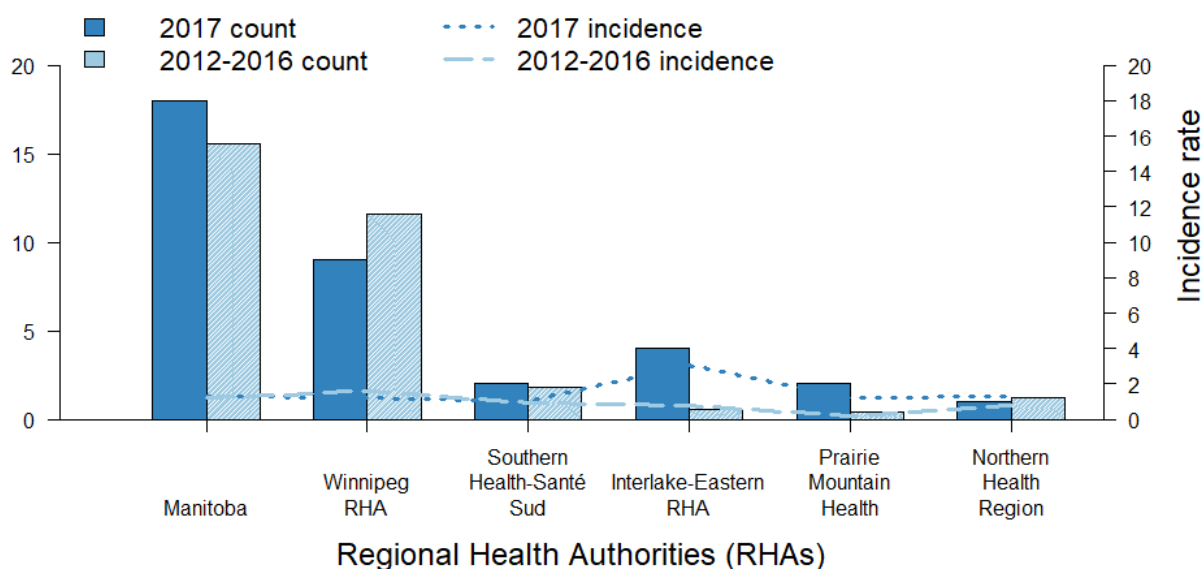


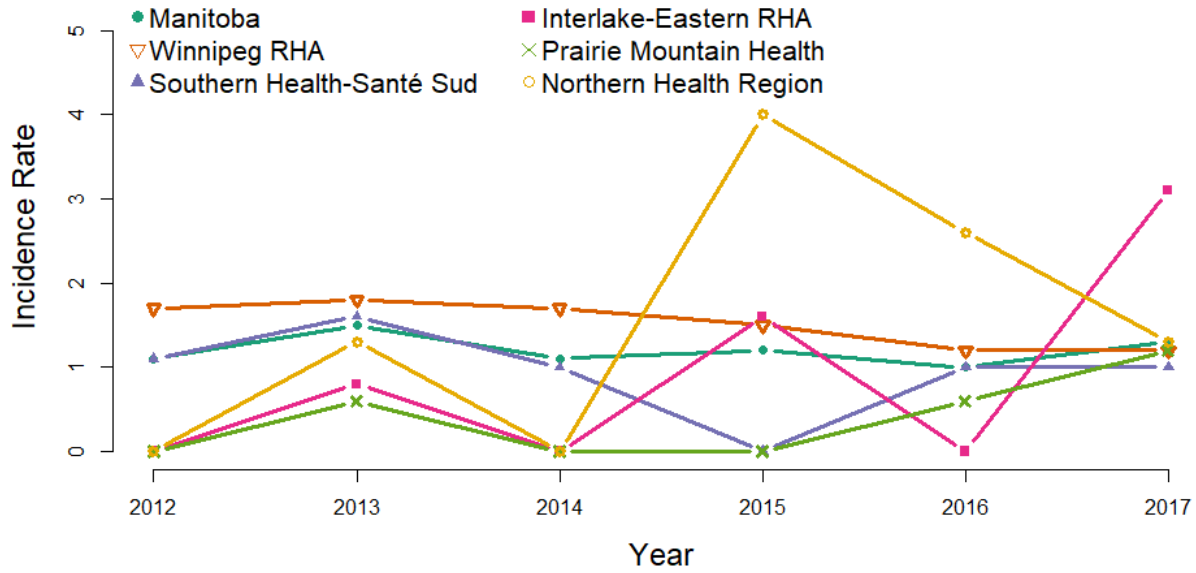
TABLE 51: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED BLASTOMYCOSIS CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| 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 | 1 | 0 | 1.4 | 3.0 | 0.0 |
| 5-9 | 1 | 0 | 1 | 1.1 | 0.0 | 2.2 |
| 10-14 | 1 | 0 | 1 | 1.2 | 0.0 | 2.4 |
| 15-19 | 1 | 0 | 1 | 1.2 | 0.0 | 2.2 |
| 20-24 | 2 | 0 | 2 | 2.1 | 0.0 | 4.0 |
| 25-29 | 1 | 0 | 1 | 1.0 | 0.0 | 2.1 |
| 30-39 | 4 | 3 | 1 | 2.2 | 3.2 | 1.1 |
| 40-59 | 3 | 1 | 2 | 0.9 | 0.6 | 1.1 |
| 60+ | 4 | 1 | 3 | 1.4 | 0.7 | 2.3 |

FIGURE 41: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED BLASTOMYCOSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).**TABLE 52:** CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED BLASTOMYCOSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|-------------------|----------------|-------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 9 | 11.6 | 1.2 | 1.6 |
| SOUTHERN HEALTH-SANTÉ SUD | 2 | 1.8 | 1.0 | 0.9 |
| INTERLAKE-EASTERN RHA | 4 | 0.6 | 3.1 | 0.8 |
| PRAIRIE MOUNTAIN HEALTH | 2 | 0.4 | 1.2 | 0.2 |
| NORTHERN HEALTH REGION | 1 | 1.2 | 1.3 | 0.8 |
| MANITOBA | 18 | 15.6 | 1.3 | 1.2 |

FIGURE 42: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED BLASTOMYCOSIS CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.



MALARIA

The average age in 2017 was 37.1 years (with a standard deviation of 16 years). The average age in 2012 - 2016 was 26.9 years (with a standard deviation of 18.1 years). The median age in 2017 was 37 years (IQR: 23.5 - 50.5 years). The median age in 2012 - 2016 was 25 years (IQR: 15 - 41 years).

TABLE 53: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED MALARIA CASES IN MANITOBA, BY SEX, 2017 AND 5-YEAR AVERAGE (2012-2016).

| | COUNT | | INCIDENCE RATE | |
|--------|-------|----------------------|----------------|----------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| TOTAL | 14 | 18.6 | 1.0 | 1.4 |
| FEMALE | 8 | 3.8 | 1.2 | 0.6 |
| MALE | 6 | 14.8 | 0.9 | 2.3 |

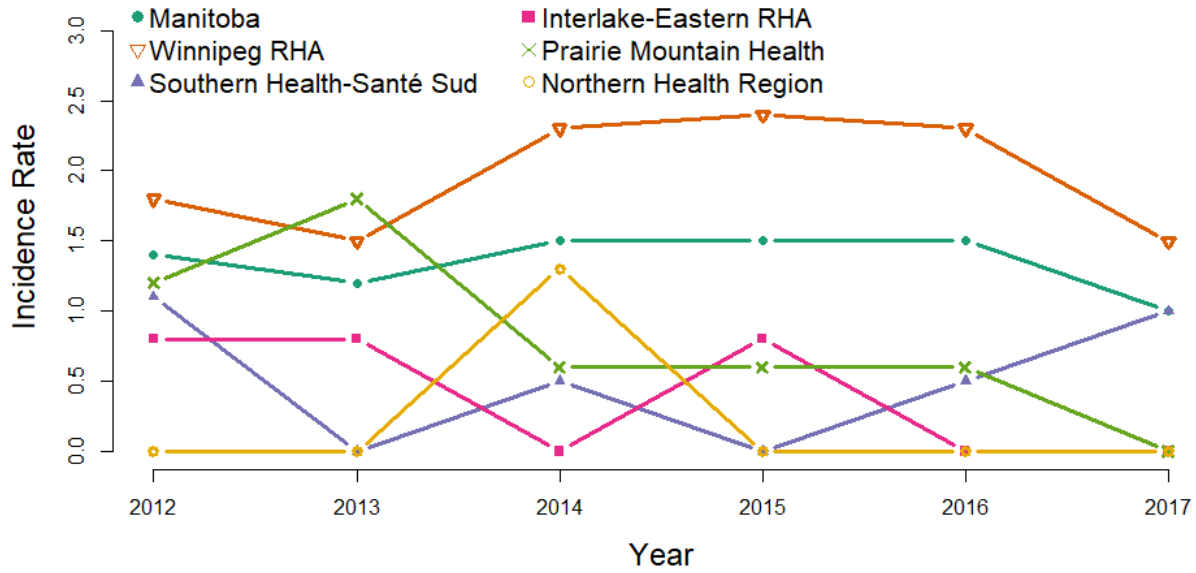
TABLE 54: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED MALARIA CASES IN MANITOBA, BY AGE GROUP AND SEX, 2017.

| 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 | 1 | 0 | 1.2 | 2.5 | 0.0 |
| 15-19 | 1 | 0 | 1 | 1.2 | 0.0 | 2.2 |
| 20-24 | 2 | 1 | 1 | 2.1 | 2.1 | 2.0 |
| 25-29 | 2 | 1 | 1 | 2.0 | 2.0 | 2.1 |
| 30-39 | 1 | 1 | 0 | 0.5 | 1.1 | 0.0 |
| 40-59 | 6 | 4 | 2 | 1.7 | 2.3 | 1.1 |
| 60+ | 1 | 0 | 1 | 0.4 | 0.0 | 0.8 |

TABLE 55: CASE COUNT AND CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED MALARIA CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2017 AND 5-YEAR AVERAGE (2012-2016).

| HEALTH AUTHORITY | COUNT | | INCIDENCE RATE | |
|---------------------------|-------|----------------------|----------------|----------------------|
| | 2017 | 2012-2016 AVERAGE | 2017 | 2012-2016 AVERAGE |
| WINNIPEG RHA | 12 | 15.4 | 1.5 | 2.1 |
| SOUTHERN HEALTH-SANTÉ SUD | 2 | 0.8 | 1.0 | 0.4 |
| INTERLAKE-EASTERN RHA | 0 | 0.6 | 0.0 | 0.8 |
| PRAIRIE MOUNTAIN HEALTH | 0 | 1.6 | 0.0 | 1.0 |
| NORTHERN HEALTH REGION | 0 | 0.2 | 0.0 | 0.1 |
| MANITOBA | 14 | 18.6 | 1.0 | 1.4 |

FIGURE 43: ANNUAL CRUDE INCIDENCE RATE (PER 100,000 POPULATION) OF LABORATORY-CONFIRMED MALARIA CASES IN MANITOBA, BY REGIONAL HEALTH AUTHORITY (RHA), 2012-2017.



APPENDICES

APPENDIX A

The following diseases and/or conditions are (human) reportable diseases in Manitoba for the year 2017, as established by *The Reporting of Diseases and Conditions Regulation* under *The Public Health Act*.

TABLE 56: REPORTABLE DISEASES LIST, 2017.

| 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> |
| Giardiasis | <i>Giardia lamblia</i> , <i>intestinalis</i> , <i>duodenalis</i> |

| Common name | Scientific or technical name of disease or its infectious agent |
|---|---|
| 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 meningitidis</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 |
| Streptococcal Invasive Disease (Group A) | <i>Streptococcus pyogenes</i> |

| Common name | Scientific or technical name of disease or its infectious agent |
|---|---|
| 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 57: CASE COUNT AND CRUDE INCIDENCE RATE OF NOSOCOMIAL RESISTANT ORGANISMS IN MANITOBA, BY YEAR, 2012-2017.

| DISEASE NAME | COUNT | | | | | | INCIDENCE RATE | | | | | |
|---|-------|------|------|------|------|------|----------------|------|------|------|------|------|
| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| CLOSTRIDIODES DIFFICILE INFECTION (CDI) | 737 | 697 | 762 | 967 | 979 | 926 | 58.0 | 54.1 | 58.3 | 73.2 | 73.1 | 68.2 |

TABLE 58: CASE COUNT AND CRUDE INCIDENCE RATE OF ENTERIC DISEASES IN MANITOBA, BY YEAR, 2012-2017.

| DISEASE NAME | COUNT | | | | | | INCIDENCE RATE | | | | | |
|--|-------|------|------|------|------|------|----------------|------|------|------|------|------|
| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| AMEBIASIS | 40 | 17 | 29 | 24 | 26 | 21 | 3.1 | 1.3 | 2.2 | 1.8 | 1.9 | 1.5 |
| CAMPYLOBACTERIOSIS | 250 | 207 | 169 | 147 | 199 | 192 | 19.7 | 16.1 | 12.9 | 11.1 | 14.9 | 14.1 |
| CRYPTOSPORIDIOSIS | 41 | 39 | 112 | 36 | 33 | 9 | 3.2 | 3.0 | 8.6 | 2.7 | 2.5 | 0.7 |
| CYCLOSPORIASIS | 0 | 2 | 5 | 4 | 1 | 0 | 0.0 | 0.2 | 0.4 | 0.3 | 0.1 | 0.0 |
| GIARDIASIS | 112 | 88 | 80 | 97 | 138 | 103 | 8.8 | 6.8 | 6.1 | 7.3 | 10.3 | 7.6 |
| HEPATITIS A | 4 | 11 | 8 | 4 | 1 | 16 | 0.3 | 0.9 | 0.6 | 0.3 | 0.1 | 1.2 |
| LISTERIOSIS | 4 | 2 | 2 | 3 | 4 | 2 | 0.3 | 0.2 | 0.2 | 0.2 | 0.3 | 0.1 |
| PARATYPHOID FEVER | 7 | 6 | 4 | 3 | 0 | 3 | 0.6 | 0.5 | 0.3 | 0.2 | 0.0 | 0.2 |
| SALMONELLOSIS | 176 | 224 | 227 | 219 | 280 | 222 | 13.8 | 17.4 | 17.4 | 16.6 | 20.9 | 16.4 |
| SHIGELLOSIS | 75 | 23 | 35 | 19 | 13 | 17 | 5.9 | 1.8 | 2.7 | 1.4 | 1.0 | 1.3 |
| TYPHOID FEVER | 6 | 2 | 1 | 5 | 5 | 9 | 0.5 | 0.2 | 0.1 | 0.4 | 0.4 | 0.7 |
| VEROTOXIGENIC <i>ESCHERICHIA COLI</i> (VTEC) | 36 | 29 | 34 | 41 | 39 | 46 | 2.8 | 2.2 | 2.6 | 3.1 | 2.9 | 3.4 |

TABLE 59: CASE COUNT AND CRUDE INCIDENCE RATE OF NON-VACCINE PREVENTABLE DISEASES IN MANITOBA, BY YEAR, 2012-2017.

| DISEASE NAME | COUNT | | | | | | INCIDENCE RATE | | | | | |
|---|-------|------|------|------|------|------|----------------|------|------|------|------|------|
| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| LEPROSY | 0 | 0 | 1 | 0 | 0 | 0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| STREPTOCOCCAL INVASIVE DISEASE (GROUP A) | - | - | - | - | 195 | 241 | - | - | - | - | 14.6 | 17.8 |
| STREPTOCOCCAL INVASIVE DISEASE OF THE NEWBORN (GROUP B) | - | - | - | - | 10 | 7 | - | - | - | - | 0.7 | 0.5 |

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

TABLE 60: CASE COUNT AND CRUDE INCIDENCE RATE OF VACCINE PREVENTABLE DISEASES IN MANITOBA, BY YEAR, 2012-2017.

| DISEASE NAME | COUNT | | | | | | INCIDENCE RATE | | | | | |
|---|-------|------|------|------|------|------|----------------|------|------|------|------|-------|
| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| DIPHTHERIA | 0 | 0 | 0 | 0 | 1 | 2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 |
| HAEMOPHILUS INFLUENZAE (NON-SEROTYPE B, INVASIVE DISEASE) | - | - | - | - | 33 | 27 | - | - | - | - | 2.5 | 2.0 |
| HAEMOPHILUS INFLUENZAE (SEROTYPE B, INVASIVE DISEASE) | - | - | - | - | 0 | 1 | - | - | - | - | 0.0 | 0.1 |
| INVASIVE MENINGOCOCCAL DISEASE | 2 | 9 | 3 | 3 | 8 | 5 | 0.2 | 0.7 | 0.2 | 0.2 | 0.6 | 0.4 |
| INVASIVE PNEUMOCOCCAL DISEASE | 153 | 132 | 135 | 118 | 120 | 183 | 12.0 | 10.2 | 10.3 | 8.9 | 9.0 | 13.5 |
| MEASLES | 0 | 0 | 9 | 2 | 0 | 0 | 0.0 | 0.0 | 0.7 | 0.2 | 0.0 | 0.0 |
| MUMPS | 6 | 1 | 0 | 8 | 111 | 1631 | 0.5 | 0.1 | 0.0 | 0.6 | 8.3 | 120.2 |
| PERTUSSIS | 118 | 7 | 12 | 56 | 116 | 75 | 9.3 | 0.5 | 0.9 | 4.2 | 8.7 | 5.5 |
| RUBELLA | 1 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| YELLOW FEVER | 0 | 0 | 0 | 0 | 1 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 |

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

TABLE 61: CASE COUNT AND CRUDE INCIDENCE RATE OF ZONOTIC AND ENVIRONMENTAL DISEASES IN MANITOBA, BY YEAR, 2012-2017.

| DISEASE NAME | COUNT | | | | | | INCIDENCE RATE | | | | | |
|---------------------------------|-------|------|------|------|------|------|----------------|------|------|------|------|------|
| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| BLASTOMYCOSIS | 14 | 19 | 15 | 16 | 14 | 18 | 1.1 | 1.5 | 1.1 | 1.2 | 1.0 | 1.3 |
| BRUCELLOSIS | 1 | 2 | 1 | 0 | 1 | 0 | 0.1 | 0.2 | 0.1 | 0.0 | 0.1 | 0.0 |
| CREUTZFELDT-JAKOB DISEASE (CJD) | 0 | 1 | 3 | 1 | 0 | 0 | 0.0 | 0.1 | 0.2 | 0.1 | 0.0 | 0.0 |
| HANTAVIRUS INFECTION | 1 | 0 | 0 | 1 | 1 | 0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 |
| LEGIONELLOSIS | 3 | 4 | 2 | 1 | 1 | 2 | 0.2 | 0.3 | 0.2 | 0.1 | 0.1 | 0.1 |
| MALARIA | 18 | 15 | 20 | 20 | 20 | 14 | 1.4 | 1.2 | 1.5 | 1.5 | 1.5 | 1.0 |
| TULAREMIA | 0 | 4 | 2 | 2 | 3 | 0 | 0.0 | 0.3 | 0.2 | 0.2 | 0.2 | 0.0 |

APPENDIX C - CHANGES IN ICD9 CODING PRACTICES

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 triggering 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 valuable if the meaning has changed. For diseases removed from the Regulation 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): 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). 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.