

## Manitoba Health, Healthy Living and Seniors

Annual Influenza Report, 2013/14

---

July 1, 2013 – June 30, 2014

Epidemiology & Surveillance  
Public Health Branch

Public Health and Primary Health Care Division

## TABLE OF CONTENTS

|  |    |
|--|----|
| Executive Summary .....  | 4  |
| Abbreviations and Acronyms .....   | 5  |
| Introduction .....   | 6  |
| Methods.....   | 7  |
| A. Syndromic Surveillance .....  | 7  |
| a. <i>Sentinel Surveillance of ILI in the Community</i> .....                          | 7  |
| b. <i>Health Links – Info Santé</i> .....  | 8  |
| B. Laboratory Reporting of Influenza.....  | 9  |
| C. Hospitalizations, ICU Admissions, and Deaths.....                                   | 9  |
| D. Influenza Outbreaks.....  | 10 |
| E. Vaccination Data .....  | 10 |
| a. <i>Uptake</i> .....   | 10 |
| b. <i>Adverse Events Following Immunization (AEFI)</i> .....                           | 11 |
| c. <i>STRIVE (Surveillance Team Research on Influenza Vaccine Effectiveness)</i> ..... | 11 |
| F. Influenza Antiviral Dispensing and Distribution.....                                | 12 |
| G. Strain Characterization and Antiviral Resistance .....                              | 12 |
| Results.....   | 13 |
| A. Syndromic Surveillance .....  | 13 |
| a. <i>Sentinel surveillance of influenza-like illness in the community</i> .....       | 13 |
| b. <i>Health Links – Info Santé</i> .....  | 13 |
| B. Laboratory Reporting of Influenza.....  | 15 |
| C. Hospitalizations, ICU Admissions, and Deaths.....                                   | 18 |
| D. Influenza Outbreaks.....  | 19 |
| E. Vaccination Data .....  | 20 |
| a. <i>Uptake</i> .....   | 20 |
| b. <i>Adverse Events Following Immunization (AEFI)</i> .....                           | 20 |
| c. <i>STRIVE (Surveillance Team Research on Influenza Vaccine Effectiveness)</i> ..... | 22 |
| F. Influenza Antiviral Dispensing and Distribution.....                                | 22 |
| G. Strain Characterization and Antiviral Resistance .....                              | 23 |
| Discussion .....   | 25 |

## LIST OF FIGURES

|   |    |
|---|----|
| Figure 1 Sentinel physician influenza-like illness consultations per 1000 patients by epidemiologic week and three-year historical average, Manitoba, 2013/14 influenza season..... | 13 |
| Figure 2 Number of calls to Health Links-Info Santé and influenza A cases by epidemiologic week, Manitoba, 2013/14 .....  | 14 |
| Figure 3 Per cent of total weekly calls to Health Links-Info Santé by type of call and epidemiologic week, Manitoba, 2013/14 .....  | 14 |
| Figure 4 Number of laboratory-confirmed influenza cases by three-year historical average and epidemiologic week, Manitoba, 2013/14 .....  | 15 |
| Figure 5 Number of laboratory-confirmed influenza A cases and incidence rate (per 100,000 individuals) by age group, Manitoba, 2013/14 .....  | 16 |
| Figure 6 Number of laboratory-confirmed influenza B cases by three-year historical average and epidemiologic week, Manitoba, 2013/14 .....  | 16 |
| Figure 7 Number of laboratory-confirmed influenza B cases and incidence rate (per 100,000 individuals) by age group, Manitoba, 2013/14 .....  | 17 |
| Figure 8 Number of hospitalizations, intensive care unit admissions, and deaths in individuals with laboratory-confirmed influenza A, Manitoba, 2013/14 .....                       | 18 |
| Figure 9 Number of units of oseltamivir dispensed by community retail pharmacies and number of laboratory-confirmed influenza cases by week, 2013/14 season, Manitoba....           | 22 |

## LIST OF TABLES

|  |    |
|--|----|
| Table 1 Cases of laboratory-confirmed influenza per 100,000 individuals by influenza type and Regional Health Authority in Manitoba, 2013/14 .....                                       | 17 |
| Table 2 Hospitalizations, intensive care unit admissions, and deaths by age group and influenza type, Manitoba, 2013/14 .....  | 19 |
| Table 3 Hospitalizations, intensive care unit admissions, and deaths by influenza type/subtype in Manitoba, 2013/14 .....  | 19 |
| Table 4 Number of adverse events following immunization with the influenza vaccine and events per 100,000 individuals vaccinated by age group, 2013/14 season, Manitoba (n=53) .....     | 20 |
| Table 5 Type of adverse event following immunization with the influenza vaccine, 2013/14 season, Manitoba.....   | 21 |
| Table 6 Level of care required for an adverse event following immunization with an influenza vaccine, 2013/14 season, Manitoba (n=53).....   | 21 |
| Table 7 Outcome of adverse event following immunization with the influenza vaccine, 2013/14 season, Manitoba (n=53) .....  | 21 |
| Table 8 National Microbiology Laboratory strain characterization completed on influenza isolates in Canada between September 1, 2013 and July 3, 2014 .....                              | 23 |
| Table 9 National Microbiology Laboratory antiviral resistance by influenza type and subtype for Manitoban and Canadian influenza viruses between September 1, 2013 and July 3, 2014..... | 24 |

## Executive Summary

Seasonal influenza can cause severe morbidity and mortality, especially in vulnerable populations at the extremes of life.

Influenza is a reportable disease under *The Public Health Act* of Manitoba and routine monitoring of influenza is performed by Manitoba Health, Healthy Living and Seniors through a variety of mechanisms. Although the typical North American influenza season usually occurs in late fall/winter, the emergence of novel strains and proliferation of global air travel has led to influenza infections being observed outside of the typical months.

A variety of data sources and surveillance indicators are evaluated together in order to gain an understanding of influenza disease in the province of Manitoba. These surveillance data are utilized to identify and monitor the arrival of influenza, its geographic spread, intensity of activity, characteristics of those infected, as well as severity and changing trends in order to guide prevention and control recommendations. Routine surveillance also serves to create an expected baseline that allows for the detections of significant changes in activity/trends.

The purpose of this report is to present an overview of the 2013/14 influenza season in Manitoba.

In 2013/14, influenza A/H1 was the dominant circulating sub-type and the season was characterized by an intensive increase in the number of laboratory-confirmed cases as compared to previous years. The highest incidence occurred in children under the age of four years ; illness in older adults was decreased as were reported outbreaks from long-term care facilities as compared to the previous season. The severity of this season as evidenced by the number of hospitalizations, intensive care unit admissions, and deaths was similar to that observed in the 2012/13 season, although the age groups most affected were those under 65 years old.

## **Abbreviations and Acronyms**

|        |   |
|--------|---|
| AEFI   | Adverse event following immunization                          |
| CPL    | Cadham Provincial Laboratory                                  |
| DPIN   | Drug Programs Information Network                             |
| E&S    | Epidemiology and Surveillance                                 |
| EIA    | Enzyme immunoassay  |
| HL-IS  | Health Links-Info Santé                                       |
| ICU    | Intensive Care Unit   |
| ILI    | Influenza-like illness  |
| MHLS   | Manitoba Health, Healthy Living and Seniors                   |
| MIMS   | Manitoba Immunization Monitoring System                       |
| NML    | National Microbiology Laboratory                              |
| PCR    | Polymerase chain reaction                                     |
| PHCC   | Provincial Health Contact Centre                              |
| PHAC   | Public Health Agency of Canada                                |
| RHA    | Regional Health Authority                                     |
| STRIVE | Surveillance Team Research on Influenza Vaccine Effectiveness |

## Introduction

The following report details influenza activity in Manitoba for the 2013/14 influenza season (July 1, 2013 – June 30, 2014). Epidemiology and Surveillance (E&S) in the Public Health Branch of Manitoba Health, Healthy Living and Seniors (MHLS) received its first laboratory-confirmed positive case of influenza for the season during the week of June 30 – July 6, 2013. This season, there were 768 laboratory-confirmed cases of influenza reported, of which 697 were influenza A, and 71 were influenza B. Overall:

- The influenza A season peaked in mid-January 2014, and the influenza B season peaked in late April, 2014.
- There were 127 hospitalizations associated with a laboratory report of influenza, of which 44 resulted in an intensive care unit (ICU) admission. There were 9 deaths in individuals with a positive report of influenza.
- The number of laboratory-confirmed influenza outbreaks (N=9) was less than observed in the previous season.
- Due to increased public demand for influenza vaccine in the early part of 2014, the provincial uptake increased to 22.3% in 2013/14 from 20.1% in 2012/13.
- The incidence rate of adverse events following immunization (AEFI) reports associated with the seasonal influenza vaccine was 18 events per 100,000 individuals vaccinated.
- National vaccine effectiveness estimates provided evidence that the 2013/14 seasonal trivalent influenza vaccine provided substantial protection against the circulating influenza A/H1N1 strain.

## Methods

Epidemiology and Surveillance at MHLS works with partners at the local, provincial, and national level to monitor influenza activity in the province. Methods used to conduct surveillance are explained in detail below and include:

- A. Syndromic surveillance
  - a. Sentinel surveillance of influenza-like illness (ILI) in the community
  - b. Respiratory-related calls to Health Links/ Info Santé
- B. Laboratory reporting of confirmed influenza infections
- C. Reports of hospitalizations, ICU admissions, and deaths of individuals with influenza
- D. Reports of influenza outbreaks
- E. Influenza vaccination including vaccine uptake, adverse events following immunization, and vaccine effectiveness
- F. Influenza antiviral distribution and dispensing
- G. Influenza strain characterization and antiviral resistance

### A. Syndromic Surveillance

#### a. Sentinel Surveillance of ILI in the Community

*FluWatch* is Canada's national surveillance system that monitors the spread of influenza and influenza-like illnesses on an on-going basis. The *FluWatch* program consists of a network of laboratories, hospitals, doctor's offices and provincial and territorial ministries of health.

Manitoba participates in *FluWatch*, which is co-ordinated by the Public Health Agency of Canada (PHAC). In addition to lab-confirmation of influenza, this program relies on weekly reports of ILI as reported by 22 sentinel physicians throughout the province.

Sentinels can opt in to the voluntary swabbing component of the program. This consists of the submission of either two posterior pharyngeal swabs or two nasopharyngeal swabs within 48 hours of symptom onset from patients presenting with ILI. Requisitions, swabs, and antiviral transport media are available from Cadham Provincial Laboratory (CPL).

E&S receives weekly reports from PHAC presenting the provincial ILI rate and the specific data for each of the participating sentinel physicians. The provincial epidemiologist then assigns an activity level code to each of Manitoba's five influenza surveillance regions and submits the completed report to *FluWatch*.

For the 2013/14 season, ILI in the general population was defined as:

Acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia, myalgia, or prostration which is likely due to influenza. In children under 5, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent.

For the 2013/14 season, ILI/influenza outbreaks were defined as:

*Schools:* Greater than 10% absenteeism (or absenteeism that is higher (e.g. >5-10%) than expected level as determined by school or public health authority) which is likely due to ILI. Note: it is recommended that ILI school outbreaks be laboratory confirmed at the beginning of the influenza season as it may be the first indication of community transmission in an area.

*Hospitals and residential institutions:* Two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case. Institutional outbreaks should be reported within 24 hours of identification. Residential institutions include but are not limited to long-term care facilities (LTCF) and prisons.

*Workplace:* Greater than 10% absenteeism on any day which is most likely due to ILI.

*Other settings:* Two or more cases of ILI within a seven-day period, including at least one laboratory-confirmed case; i.e. closed communities.

#### ***b. Health Links – Info Santé***

Health Links - Info Santé (HL-IS) is one of 30 inbound and outbound calling programs offered by the Provincial Health Contact Centre (PHCC). HL-IS is operated by Misericordia Health Centre in partnership with MHLS and the Winnipeg Regional Health Authority.

Implemented in 1994, the bilingual program was the first telephone, nurse-based triage system in Canada. A staff of 80 full- and part-time registered nurses answer calls 24 hours a day, seven days a week, 365 days a year. Interpreters are available for more than 110 different languages.

Nurses obtain information about symptoms and follow clinical protocols on their computer screens to offer advice on whether to treat the symptoms at home, see a family doctor, or visit an emergency room. Calls range from concerns about abdominal pain to flu virus symptoms.<sup>1</sup>

When a caller phones HL-IS and selects the Influenza Service, they are given an option to select information on (1) the groups of individuals who are at an increased risk of serious illness, (2) how to arrange a flu shot, (3) the annual influenza immunization campaign, or (4) the management of flu and its potential complications.

Aggregate data from HL-IS Influenza Service is emailed to the Public Health Branch at MHLS on a weekly basis.

---

<sup>1</sup> Source: <http://www.misericordia.mb.ca/files/phccfactsheet.pdf>.



## **B. Laboratory Reporting of Influenza**

Reports of influenza nucleic acid detection, culture isolation and enzyme immunoassay (EIA) detections from Cadham Provincial Laboratory (CPL) (and occasionally other labs) are forwarded to E&S within 24 hours of confirmation. Information contained within this report is based on positive lab reports received at E&S as of July 7, 2014. This includes specimen dates from July 1, 2013 to June 30, 2014. Out-of-province reports are excluded.

The specimen date is used to:

- (a) extract cases; and,
- (b) assign cases to the appropriate week/month.

## **C. Hospitalizations, ICU Admissions, and Deaths**

Again this influenza season, PHAC requested weekly collection of aggregate numbers of hospitalized cases (as well as ICU admissions and deaths) to monitor the severity/burden of illness of influenza.

The Regional Health Authorities (RHAs) were asked to submit an aggregated line list that included the number of hospitalizations, ICU admissions, and deaths to MHHLS. The form also included type/subtype of influenza, age group, and reporting week. Aggregate data were then reported to PHAC on a weekly basis using a reporting form developed by PHAC.

Hospitalized cases were defined as:

Manitoba residents with laboratory-confirmed influenza admitted to a hospital located within the reporting region. The positive specimen must have been obtained between August 25, 2013 and August 23, 2014. Due to very limited influenza activity being reported, aggregate reporting in Manitoba was suspended the second week of June, 2014.

The reason for hospitalization, ICU admission, or cause of death did not have to be attributable to influenza. A positive laboratory test was sufficient for reporting purposes.

### ***Additional Data Sources for Influenza-Related Deaths***

Reports of deaths in individuals with influenza can also be based on notification by:

- (a) Chief Medical Examiner;
- (b) Medical Officers of Health in the Regional Health Authorities; and
- (c) Infection Control Practitioners in long-term care facilities.

## D. Influenza Outbreaks

As outlined in Manitoba's Communicable Disease Management Protocol Manual on Epidemiological Investigation of Outbreaks<sup>2</sup>, the common definition of an outbreak is:

The occurrence in a community or region of cases of an illness with a frequency clearly in excess of normal expectancy. The number of cases indicating presence of an outbreak will vary according to the infectious agent, size and type of population exposed, previous experience or lack of exposure to the disease, and time and place of occurrence. Therefore, the status of an outbreak is relative to the usual frequency of the disease in the same area, among the same population, at the same season of the year.<sup>3</sup>

Reports of suspected/confirmed influenza outbreaks are directed to E&S by:

- (a) a phone call/email from public health staff within an RHA; or
- (b) a phone call/email from CPL advising of the assignment of an outbreak code; or
- (c) completion and submission of an outbreak summary report.

**Only laboratory-confirmed reports of influenza outbreaks are included in this report.**

## E. Vaccination Data

### a. Uptake

Influenza vaccination data is recorded in the Manitoba Immunization Monitoring System (MIMS). Immunization events are captured in MIMS in two ways: publicly-funded immunizations administered by physicians are entered into the system via the physician billing system. All other immunizations, such as those provided by public health nurses, are recorded by data entry staff in the regions. MIMS captures information related to an immunization event, including type of vaccine administered, date of administration and service provider. This influenza season, MHLS again offered a targeted universal program for the influenza vaccine. While all Manitobans were eligible to receive the vaccine, those at increased risk of serious illness or complications from the flu, their caregivers, and close contacts were particularly encouraged to get the flu shot. This included:

- seniors age 65 or older
- residents of personal care homes or long-term care facilities
- children six to 59 months of age
- those with chronic illness such as:
  - kidney, heart or lung conditions
  - an immune system weakened by disease or medical treatment

---

<sup>2</sup> <http://www.gov.mb.ca/health/publichealth/cdc/protocol/investigation.pdf>

<sup>3</sup> Chin, James (Editor). *Control of Communicable Disease Manual*. American Public Health Association, Washington DC, 2000.

- a condition that makes it difficult to breathe
- children on long-term aspirin therapy
- other chronic medical conditions (e.g. diabetes, mental disabilities)
- pregnant women
- health care workers and first responders
- individuals of Aboriginal ancestry
- people who are severely overweight or obese
- or as determined by a primary health care provider.

In addition, all international students were eligible to receive the publicly-funded influenza vaccine regardless of third-party insurance and/or Manitoba Health coverage.

**This report captures all influenza immunization events entered in MIMS using tariff codes 8791, 8792, 8969, and 9899 between September 1, 2013 and April 4, 2014.**

**b. Adverse Events Following Immunization (AEFI)**

Vaccine manufacturers are required by *The Food and Drugs Act* and Regulations to report to PHAC all serious AEFI reports with vaccines (active immunizing agents) for which they are the Market Authorization Holder within 15 days of knowledge of their occurrence. No other legal requirement for reporting AEFI exists nationally. Health care professionals who become aware of reportable adverse events are to report them within 7 days by completing and faxing the AEFI form<sup>4</sup> to their regional Medical Officer of Health.

An AEFI is reportable under *The Public Health Act* of Manitoba as prescribed in the Immunization Regulation (C.C.S.M. c.P210) if it is temporally associated with an immunizing agent, cannot be attributed to a co-existing condition, and if it meets at least one of the following criteria:

- a. the event is life-threatening, could result in permanent disability, requires hospitalization or urgent medical attention, or for any other reason is considered to be of a serious nature;
- b. the event is unusual or unexpected, including, without limitation,
  - a. an event that has not been previously identified, or
  - b. an event that has been previously identified but is being reported at an increased frequency;
- c. at the time of the report there is nothing in the patient's medical history — such as a recent disease or illness, or the taking of medication — that could explain the event.

**c. STRIVE (Surveillance Team Research on Influenza Vaccine Effectiveness)**

Beginning with the 2012/13 influenza season, Manitoba Health has participated in STRIVE, a national multi-site vaccine effectiveness surveillance. Operated in collaboration with CPL, STRIVE aims to assess the effectiveness of the seasonal trivalent influenza vaccine in protecting against influenza and to monitor influenza activity in the region. STRIVE specimens are tested for influenza and other respiratory viruses through polymerase chain reaction (PCR) test and Seeplex RV15 panel. Results of respiratory

<sup>4</sup> [http://www.gov.mb.ca/health/publichealth/cdc/docs/aei\\_form.pdf](http://www.gov.mb.ca/health/publichealth/cdc/docs/aei_form.pdf)

testing performed by network members were regularly featured throughout the influenza season in the provincial weekly influenza report. For the 2013/14 season, the Manitoba STRIVE Network included 17 sentinel sites comprising 45 sentinel clinicians. Data collection began on October 1, 2013 and concluded April 30, 2014.

## **F. Influenza Antiviral Dispensing and Distribution**

The number of antiviral drugs (Tamiflu®) dispensed to Manitobans throughout the influenza season was obtained on a weekly basis from the Drug Programs Information Network (DPIN). The numbers in this report include only drugs dispensed from community retail pharmacies. **Therefore, these totals do not include any antiviral drugs that were dispensed to in-patients or through nursing stations.**

## **G. Strain Characterization and Antiviral Resistance**

The Influenza and Respiratory Viruses section of the National Microbiology Laboratory (NML) undertakes enhanced surveillance, investigations, and research on influenza and other respiratory pathogens, as well as develops, evaluates, and improves new molecular techniques and reagents for early detection and identification of potential epidemic and pandemic influenza strains and other new emerging respiratory viruses. NML routinely antigenically characterizes influenza viruses received from Canadian laboratories. A random sample of positive influenza specimens isolated by culture was referred from CPL to the NML for strain characterization. Routine testing for antiviral resistance is also performed. This aggregate level information is shared with provinces and territories on a weekly basis during the influenza season.

## Results

### A. Syndromic Surveillance

#### a. Sentinel surveillance of influenza-like illness in the community

ILI consultations peaked in week 52. Although the 2013/14 rates were above the three-year historical point estimates for much of the season, consultation rates were generally within the historical confidence intervals (Figure 1).

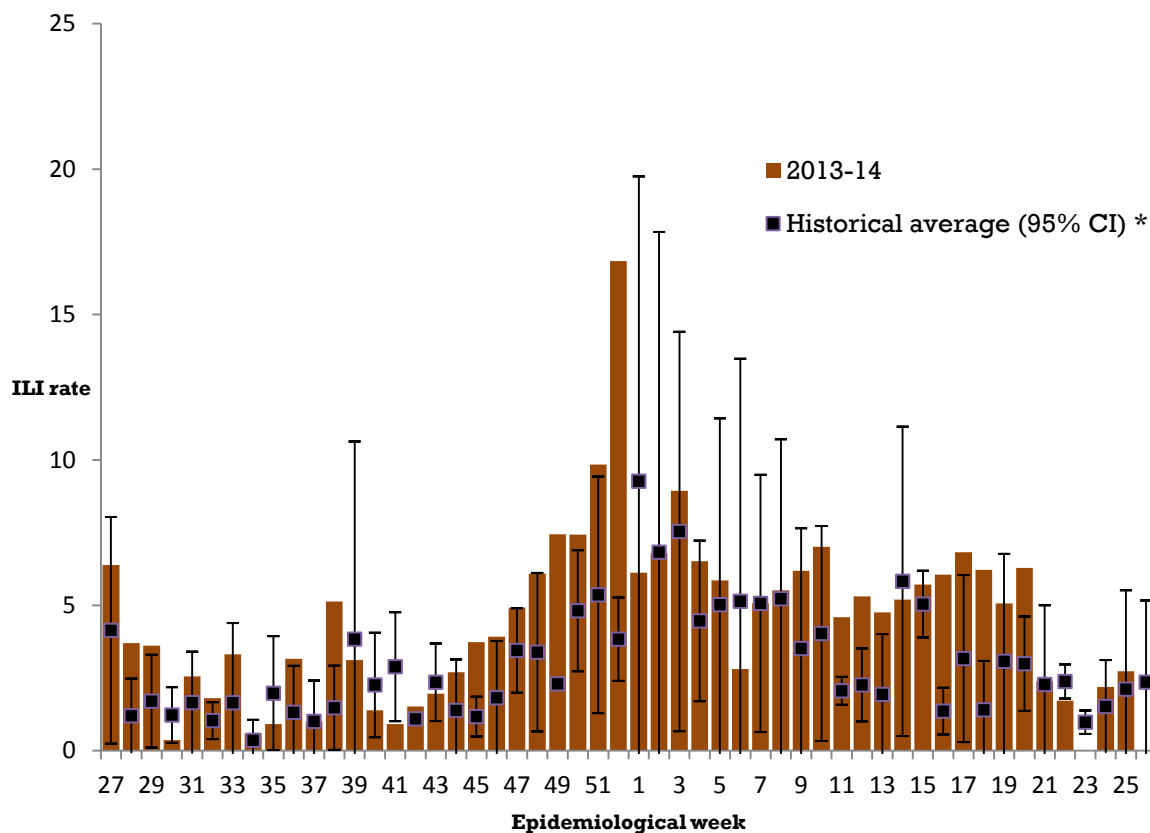


Figure 1 Sentinel physician influenza-like illness consultations per 1000 patients by epidemiologic week and three-year historical average, Manitoba, 2013/14 influenza season

#### b. Health Links – Info Santé

There were two clear peaks in influenza related calls to HL-IS; one in week 43, and one in week 2 (Figure 2). The first peak coincided with the onset of the annual influenza vaccination campaign, and the proportion of calls attributed to questions about the influenza clinics and influenza program also peaked at the same time (Figure 3). The second peak occurred one week prior to the peak in influenza A cases.

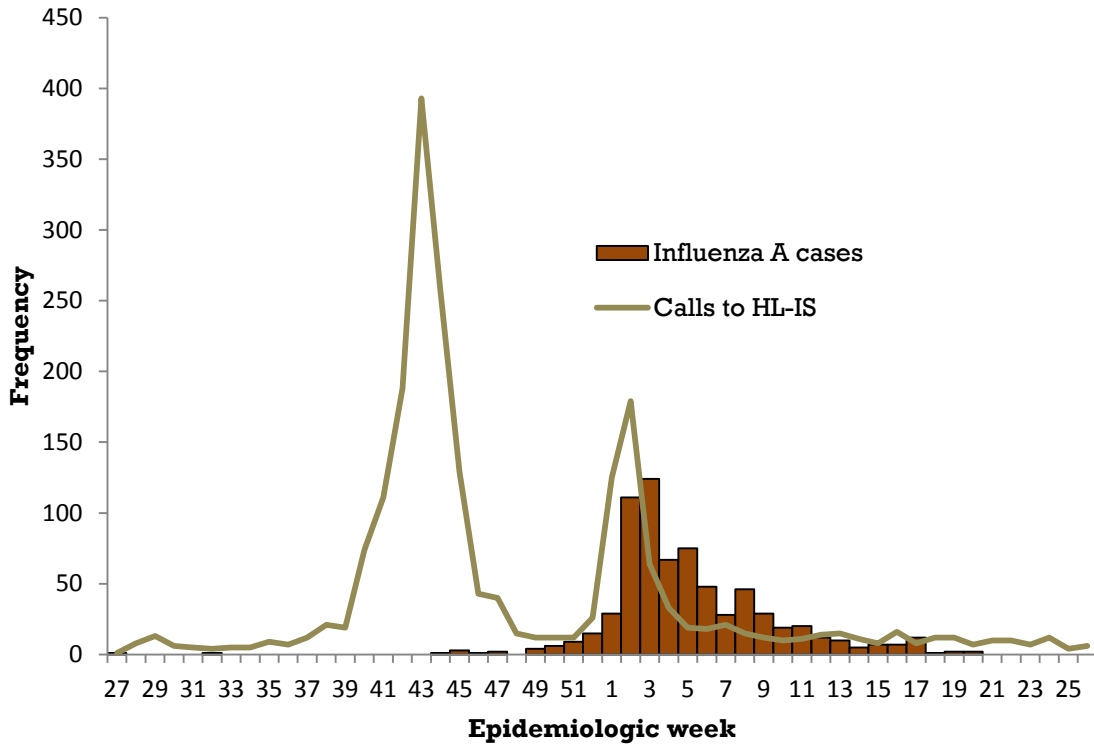


Figure 2 Number of calls to Health Links-Info Santé and influenza A cases by epidemiologic week, Manitoba, 2013/14

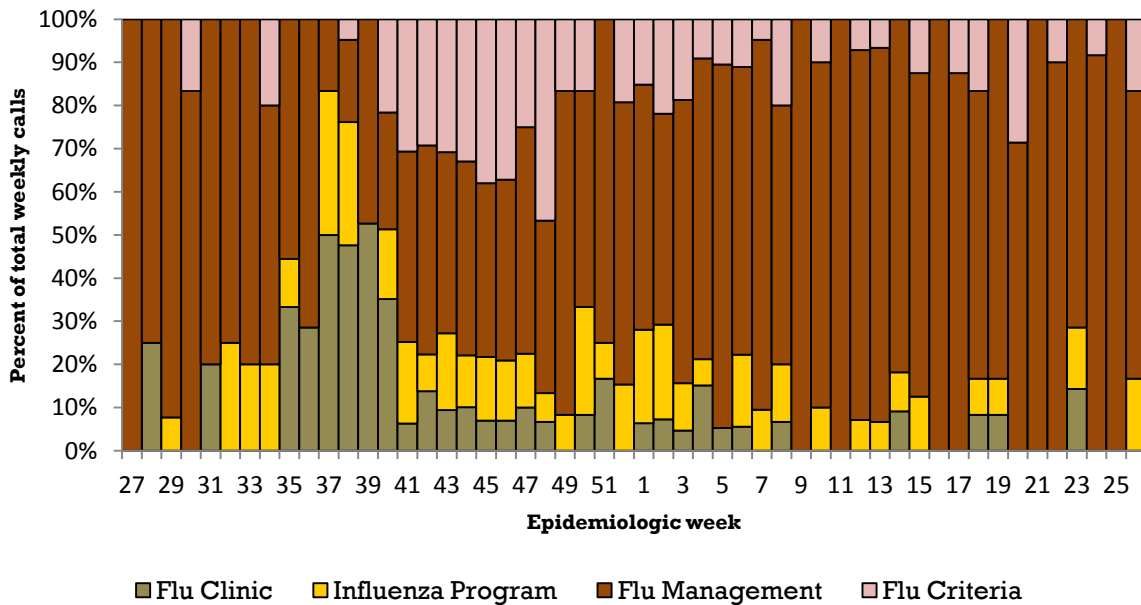


Figure 3 Per cent of total weekly calls to Health Links-Info Santé by type of call and epidemiologic week, Manitoba, 2013/14

### B. Laboratory Reporting of Influenza

Between July 1, 2013 and June 30, 2014, there were 697 laboratory-confirmed cases of influenza A and 71 laboratory-confirmed cases of influenza B reported in Manitoba residents.

#### *Influenza A*

Sporadic cases of influenza A appeared during weeks 27 and 32, and the seasonal epidemic began in week 49 (Figure 4). The season peaked in week 3. The 2013/14 season started later than the average observed over the previous three seasons and had significantly more cases than in the average peak in weekly activity; 124 cases were seen during the peak in 2013/14 as compared to 116, 14, and 82 cases respectively in the previous three seasons. The last cases were reported in week 20. Of the 697 influenza A cases, 199 (29%) were influenza A/not sub-typed, 481 (69%) were influenza A/H1, and 17 (2%) were influenza A/H3.

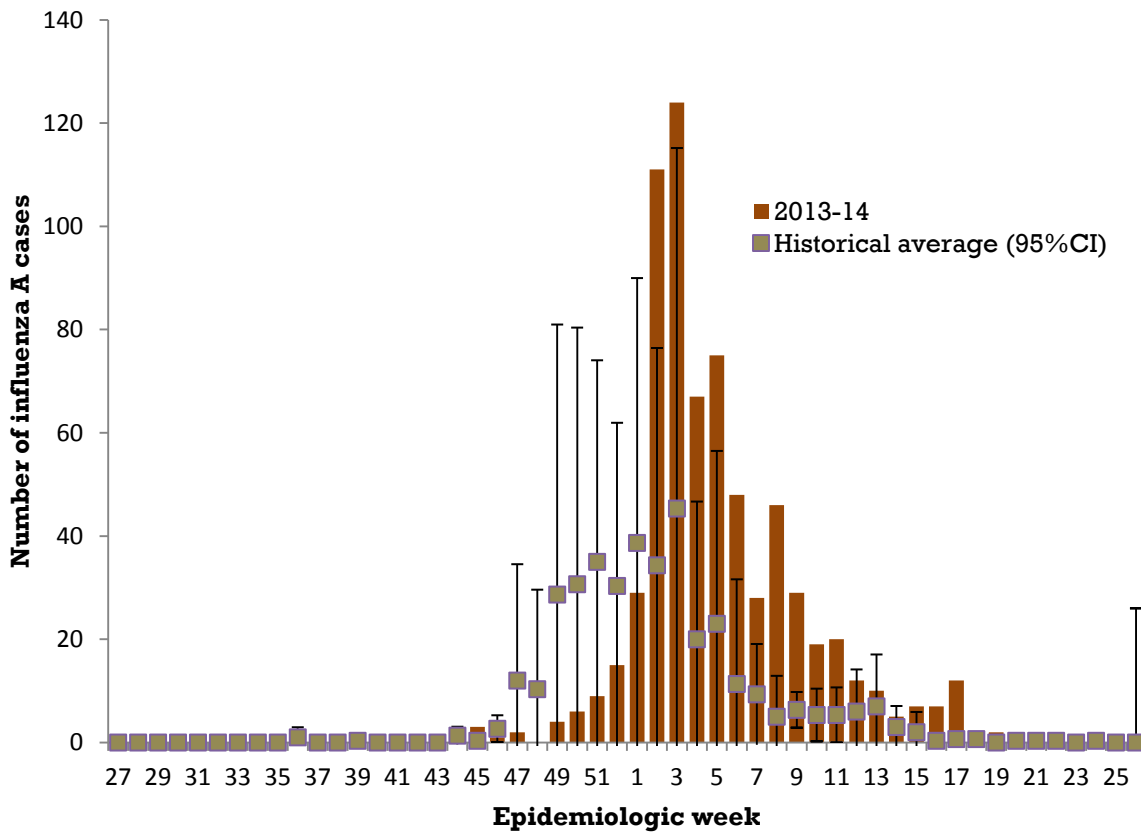


Figure 4 Number of laboratory-confirmed influenza cases by three-year historical average and epidemiologic week, Manitoba, 2013/14

In 2013/2014, 45% of all influenza A cases occurred in adults between the ages of 30 and 60 years old, although the incidence was highest in children under the age of 4 years old (Figure 5).

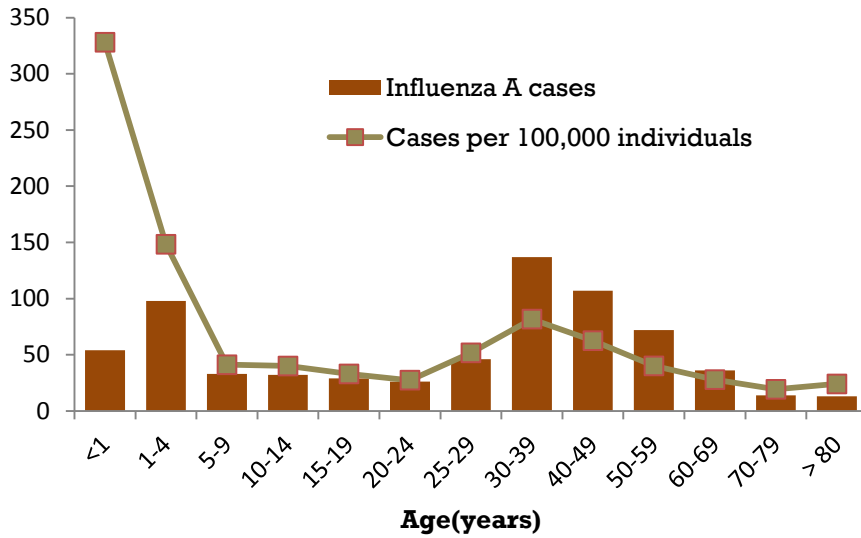


Figure 5 Number of laboratory-confirmed influenza A cases and incidence rate (per 100,000 individuals) by age group, Manitoba, 2013/14

*Influenza B*

Influenza B cases occurred sporadically throughout the season, and peaked around week 18 (Figure 6). The last two reported cases occurred in week 24. The majority of the influenza B cases this season occurred later than in the previous three seasons, but number of cases generally occurred within the expected historical averages.

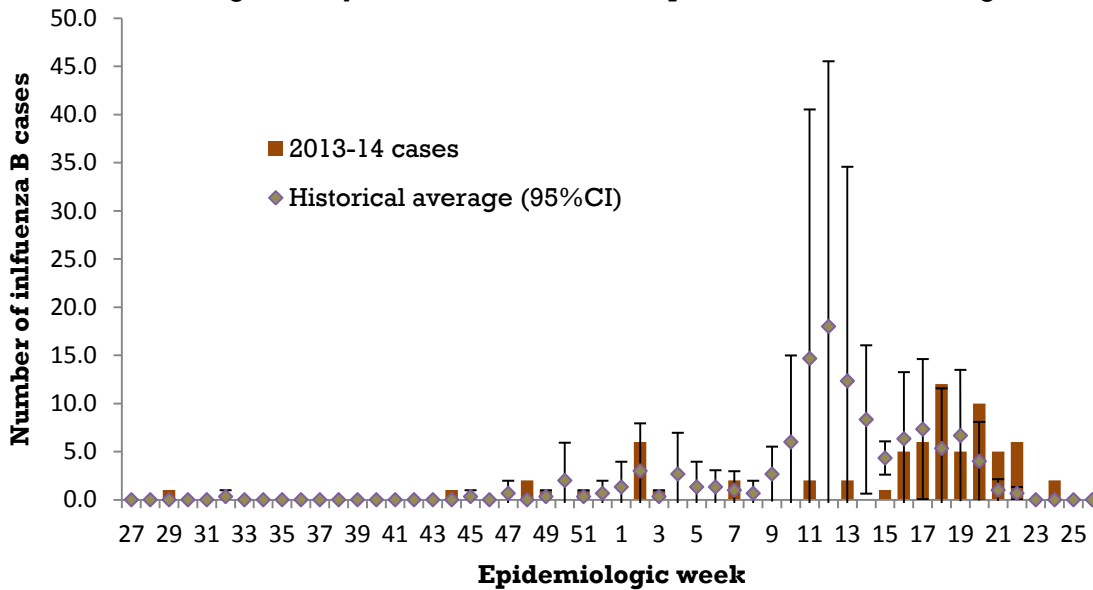


Figure 6 Number of laboratory-confirmed influenza B cases by three-year historical average and epidemiologic week, Manitoba, 2013/14

The incidence of influenza B was highest in the over 80-year-old age group (Figure 7).



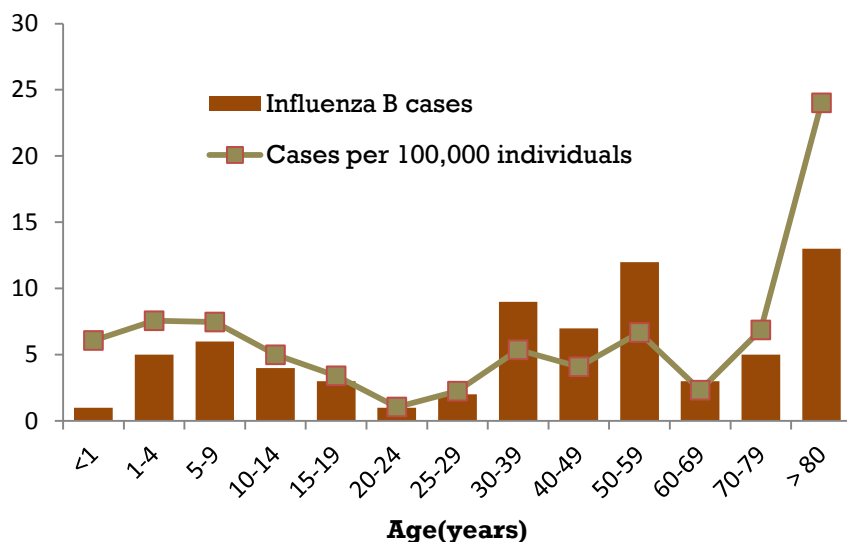


Figure 7 Number of laboratory-confirmed influenza B cases and incidence rate (per 100,000 individuals) by age group, Manitoba, 2013/14

*Regional Health Authority*

The highest number of influenza A cases per 100,000 population was observed in Northern RHA (301 cases per 100,000 population), followed by Prairie Mountain RHA (74 cases per 100,000 population) (Table 1). The highest incidence rates of influenza B were seen in Northern RHA and Southern RHA (both 8.0 cases/100,000 individuals).

Table 1 Cases of laboratory-confirmed influenza per 100,000 individuals by influenza type and Regional Health Authority in Manitoba, 2013/14

| RHA               | Influenza A |               | Influenza B |               |
|-------------------|-------------|---------------|-------------|---------------|
|                   | N           | Cases/100,000 | N           | Cases/100,000 |
| Winnipeg          | 163         | 22.2          | 42          | 5.7           |
| Northern          | 225         | 301.1         | 6           | 8.0           |
| Prairie Mountain  | 124         | 74.2          | 6           | 3.6           |
| Interlake-Eastern | 92          | 73.1          | 2           | 1.6           |
| Southern          | 93          | 49.6          | 15          | 8.0           |
| Total             | 697         | 54.1          | 71          | 5.5           |

### C. Hospitalizations, ICU Admissions, and Deaths

There were 127 Manitoba residents with laboratory-confirmed influenza hospitalized in the 2013/14 season; 120 with influenza A and 7 with influenza B. Of those residents, 44 were admitted to an ICU; 42 with influenza A and 2 with influenza B. A total of 9 deaths were reported; 8 influenza A and 1 influenza B. The hospitalization, ICU admission, or death did not have to be attributable to influenza, but only required temporal association with a positive influenza laboratory result to be counted.

The peak number of influenza A hospitalizations occurred in week 2, with 17 hospitalizations reported (Figure 8). The first ICU admission occurred in week 48 and the last ICU admission occurred in week 20. The highest number of ICU admissions occurred in weeks 2 and 5 (n=6). Of the 8 influenza A deaths reported, the highest number occurred in week 5 (n=3). All but one of the influenza A deaths occurred in hospital, the other death occurred in the community.

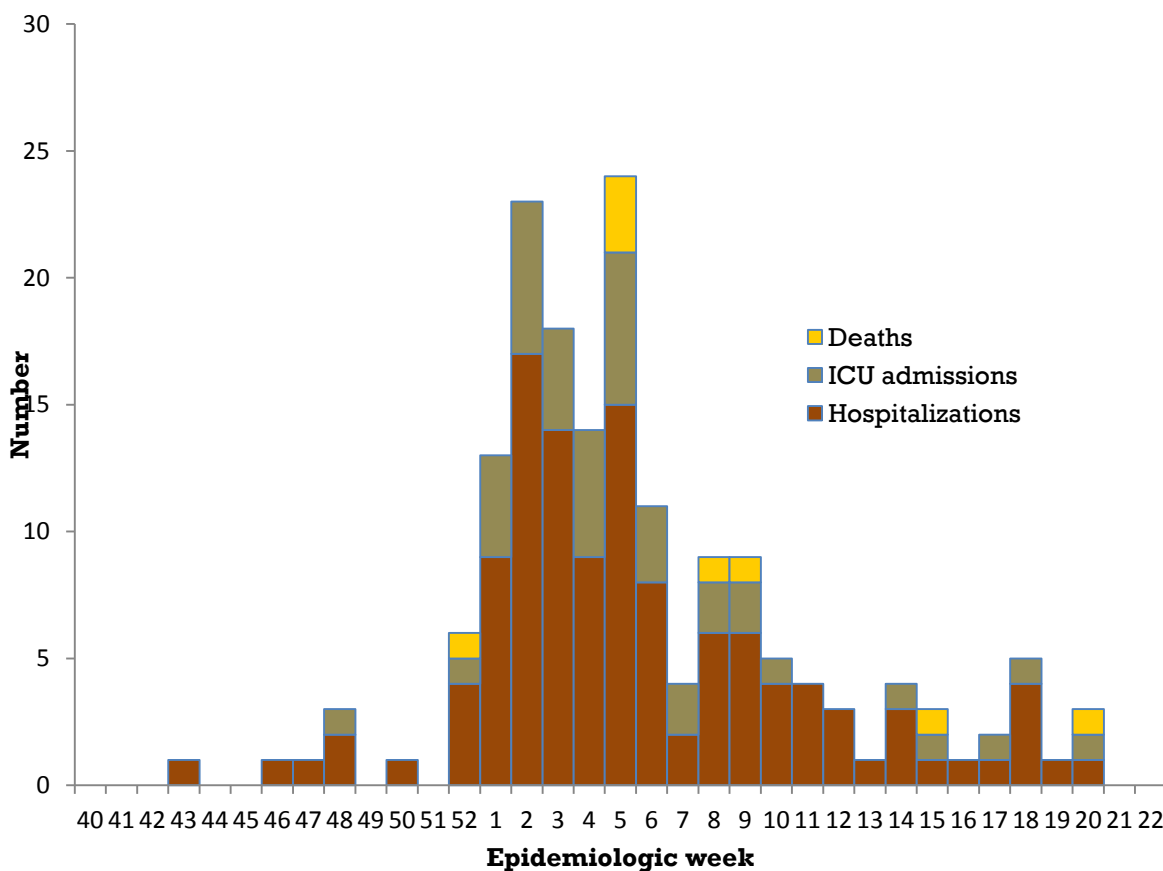


Figure 8 Number of hospitalizations, intensive care unit admissions, and deaths in individuals with laboratory-confirmed influenza A, Manitoba, 2013/14

The greatest proportion of influenza A hospitalizations (n=77, 64%), ICU admissions (n=33, 79%), and deaths (n=6, 75%) occurred among individuals between 20 and 64 years old (Table 2).

Table 2 Hospitalizations, intensive care unit admissions, and deaths by age group and influenza type, Manitoba, 2013/14

| Age group    | Hospitalizations |             | ICU admissions |             | Deaths      |             |
|--------------|------------------|-------------|----------------|-------------|-------------|-------------|
|              | Influenza A      | Influenza B | Influenza A    | Influenza B | Influenza A | Influenza B |
| <6 months    | 8                | 0           | 2              | 0           | 0           | 0           |
| 6-23 months  | 11               | 1           | 1              | 1           | 0           | 0           |
| 2-4 years    | 8                | 1           | 0              | 1           | 1           | 0           |
| 5-9 years    | 2                | 0           | 0              | 0           | 0           | 1           |
| 10-19 years  | 2                | 0           | 0              | 0           | 0           | 0           |
| 20-44 years  | 34               | 1           | 14             | 0           | 3           | 0           |
| 45-64 years  | 43               | 0           | 19             | 0           | 3           | 0           |
| >65 years    | 12               | 4           | 6              | 0           | 1           | 0           |
| <b>Total</b> | <b>120</b>       | <b>7</b>    | <b>42</b>      | <b>2</b>    | <b>8</b>    | <b>1</b>    |

The majority of hospitalizations (n=100, 79%), ICU admissions (n=38, 86%), and deaths (n=7, 78%) were attributed to influenza A/H1. Influenza A/H3 comprised 2% of the hospitalized cases and none of the ICU admissions or deaths. This season, influenza B accounted for 6% (n=7) of hospitalizations, 4% (n=2) ICU admissions, and 11% (n=1) of the deaths in Manitoba.

Table 3 Hospitalizations, intensive care unit admissions, and deaths by influenza type/subtype in Manitoba, 2013/14

| Type/subtype | Hospitalizations |    | ICU admissions |    | Deaths   |    |
|--------------|------------------|----|----------------|----|----------|----|
|              | N                | %  | N              | %  | N        | %  |
| A/Unsubtyped | 18               | 14 | 4              | 9  | 1        | 11 |
| A/H1         | 100              | 79 | 38             | 86 | 7        | 78 |
| A/H3         | 2                | 2  | 0              | 0  | 0        | 0  |
| B            | 7                | 6  | 2              | 4  | 1        | 11 |
| <b>Total</b> | <b>127</b>       |    | <b>44</b>      |    | <b>9</b> |    |

## D. Influenza Outbreaks

Between July 1, 2013 and June 30, 2014, there were 9 outbreaks of laboratory-confirmed influenza reported to MHLS; 4 outbreaks of influenza A, 4 outbreaks of influenza B, and 1 mixed outbreak of influenza B and human metapneumovirus. All of the outbreaks occurred in 2014, 2 in January (influenza A), 1 in March (influenza A), 3 in April (1 influenza A and 2 influenza B), and 3 in May (2 influenza B and 1 mixed influenza B and human metapneumovirus). Seven of the outbreaks were reported from the Winnipeg RHA, and 2 were reported from the Southern RHA.

## E. Vaccination Data

### a. Uptake

The overall provincial influenza vaccine uptake by individuals vaccinated was 22.3% in the 2013/14 influenza season. By age group, the highest uptake was among Manitobans aged 65 years and over (55.8%) followed by the 0-2 year-old age group (22.6%), the 19-64 year-old age group (17.5%), and the 3-18 year-old age group (12.7%).

By RHA, the highest uptake was observed in Northern RHA (24.5%), followed by Winnipeg RHA (23.6%), Prairie Mountain RHA (22.6%), Interlake-Eastern RHA (21.9%), and Southern RHA (16.1%).

### b. Adverse Events Following Immunization (AEFI)

A total of 53 AEFI reports were received this season related to the influenza vaccine. Overall, the incidence rate of AEFI was 18.4 events per 100,000 individuals vaccinated. By age group, the highest incidence rate was among those aged 3 to 18 years, and the lowest among those aged 65 years and over.

Table 4 Number of adverse events following immunization with the influenza vaccine and events per 100,000 individuals vaccinated by age group, 2013/14 season, Manitoba (n=53)

| Age group (years) | N         | Rate        |
|-------------------|-----------|-------------|
| 0-2               | 4         | 38.4        |
| 3-18              | 14        | 41.9        |
| 19-64             | 29        | 20.8        |
| 65+               | 6         | 5.7         |
| <b>Total</b>      | <b>53</b> | <b>18.4</b> |

The majority of AEFI reports (n=27, 51%) were for allergic or allergic-like events, followed by local reaction (n=20, 38%) (Table 5). There was one report of anaphylaxis, and two reports of oculo-respiratory syndrome. As some individuals experienced more than one reaction in a single episode, there were a greater number of reactions reported (n=74) than reports submitted (n=53).

Table 5 Type of adverse event following immunization with the influenza vaccine, 2013/14 season, Manitoba

| Type of adverse event            | N         | %* |
|----------------------------------|-----------|----|
| Local reaction                   | 20        | 38 |
| Allergic or allergic-like event  | 27        | 51 |
| Anaphylaxis                      | 1         | 2  |
| Oculo-respiratory syndrome       | 2         | 4  |
| Neurologic events                | 6         | 11 |
| Other defined event of interest  | 18        | 34 |
| <b>Total number of reports**</b> | <b>53</b> |    |

\*percentage based on total number of reports received

\*\*total number of types of adverse events is greater than the total number of reports received as some individuals experience more than one reaction in a single episode

Varying levels of care were required with respect to the reported AEFI with the majority (n=22, 42%) requiring a non-urgent visit to a healthcare professional. There were 8 individuals that required an emergency visit (15%) and 4 required hospitalization (8%).

Table 6 Level of care required for an adverse event following immunization with an influenza vaccine, 2013/14 season, Manitoba (n=53)

| Level of care required                    | N         | %  |
|---|-----------|----|
| None                                      | 11        | 21 |
| Telephone advice from health professional | 7         | 13 |
| Non-urgent visit                          | 22        | 42 |
| Emergency visit                           | 8         | 15 |
| Hospitalization                           | 4         | 8  |
| Prolongation of existing hospitalization  | 0         | 0  |
| Unknown                                   | 0         | 0  |
| Missing                                   | 1         | 2  |
| <b>Total</b>                              | <b>53</b> |    |

The majority of individuals experiencing an AEFI were fully recovered at the time of reporting (n=24, 48%), followed by 21 individuals who had not yet recovered at the time the report was submitted (40%). There was one death reported.

Table 7 Outcome of adverse event following immunization with the influenza vaccine, 2013/14 season, Manitoba (n=53)

| Outcome              | N         | %  |
|----------------------|-----------|----|
| Fully recovered      | 25        | 47 |
| Not yet recovered    | 22        | 42 |
| Permanent disability | 0         | 0  |
| Death                | 1         | 2  |
| Unknown              | 3         | 6  |
| Missing              | 2         | 4  |
| <b>Total</b>         | <b>53</b> |    |

**c. STRIVE (Surveillance Team Research on Influenza Vaccine Effectiveness)**

Throughout the 2013/14 influenza season, there were a total of 142 samples collected by STRIVE sentinel clinicians; 5 of which were not able to be tested either as a result of insufficient material or leaking specimen. Of those tested, 30 (22%) were positive for influenza A and 9 (7%) were positive for influenza B. These cases are included in the total number of provincial influenza cases.

Just over half of the participants (51%) were between the ages of 35 and 64 years at the time of specimen collection. There were 32 (23%) participants that reported receiving the 2013/14 seasonal vaccine.

**F. Influenza Antiviral Dispensing and Distribution**

Between November 1, 2013 and June 30, 2014, 1409 units of oseltamivir were dispensed from community retail pharmacies.

Figure 9 indicates that the number of units of oseltamivir dispensed roughly paralleled the number of laboratory-confirmed influenza cases reported.

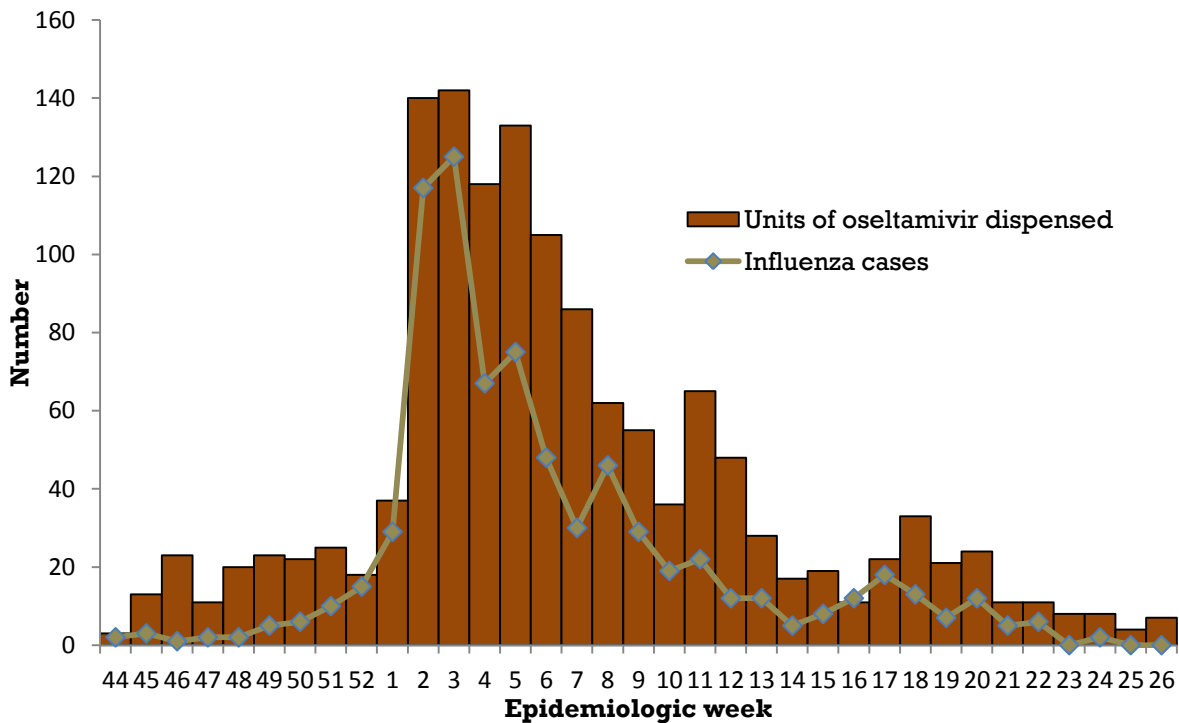


Figure 9 Number of units of oseltamivir dispensed by community retail pharmacies and number of laboratory-confirmed influenza cases by week, 2013/14 season, Manitoba

## G. Strain Characterization and Antiviral Resistance

### *Strain characterization*

Between September 1, 2013 and July 3, 2014, the NML reported that it had antigenically characterized 77 influenza viruses from Manitoba (Table 8). Of those, 1 influenza A/H3N2 virus was related to A/Texas/50/2012 and 63 influenza A/H1N1 viruses were antigenically related to A/California/07/09. There were 6 influenza B cases antigenically related to B/Brisbane/60/2008 and 7 to B/Massachusetts/02/12. In Canada, the season was dominated by the A/California/07/09-like strain, which was the recommended H1N1 component for the 2013/14 Northern hemisphere influenza vaccine. A/Texas/50/2012-like virus was the recommended H3N2 component for the seasonal vaccine, and B/Massachusetts/02/12-like virus was the recommended B component of the 2013/14 influenza vaccine.

Table 8 National Microbiology Laboratory strain characterization completed on influenza isolates in Canada between September 1, 2013 and July 3, 2014

| Influenza Type                 | Manitoba | Canada |
|--------------------------------|----------|--------|
| <b>Influenza A</b>             |          |        |
| H3N2 – A/Texas/50/2012-like    | 1        | 169    |
| H1N1 – A/California/07/09-like | 63       | 1395   |
| <b>Influenza B</b>             |          |        |
| B/Brisbane/60-2008-like        | 6        | 28     |
| B/Massachusetts/02/12-like     | 7        | 164    |

### *Antiviral resistance*

Between September 1, 2013 and July 3, 2014, NML reported that all influenza isolates submitted from Manitoba were susceptible to Oseltamivir, although nationally there were 5 influenza A/H1N1 isolates that demonstrated resistance (Tables 9 and 10). All Manitoba viruses tested were resistant to Amantadine, and all Manitoba viruses tested were sensitive to Zanamivir.

Table 9 National Microbiology Laboratory antiviral resistance by influenza type and subtype for Manitoban and Canadian influenza viruses between September 1, 2013 and July 3, 2014

| Virus<br>type/subtype | Oseltamivir |             | Zanamivir   |             | Amantadine  |             |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                       | # Resistant | # Sensitive | # Resistant | # Sensitive | # Resistant | # Sensitive |
| <b>Manitoba</b>       |             |             |             |             |             |             |
| A(H3N2)               | 0           | 1           | 0           | 1           | 1           | 0           |
| A(H1N1)               | 0           | 63          | 0           | 63          | 71          | 0           |
| B                     | 0           | 13          | 0           | 13          | N/A         | N/A         |
| <b>Canada</b>         |             |             |             |             |             |             |
| A(H3N2)               | 0           | 157         | 0           | 156         | 204         | 0           |
| A(H1N1)               | 5           | 1392        | 0           | 1398        | 1443        | 0           |
| B                     | 0           | 748         | 0           | 146         | N/A         | N/A         |



## Discussion

Influenza surveillance is inherently biased towards more severe outcomes as not all individuals experiencing symptoms will seek medical attention and not all clinicians will routinely test cases of ILI for influenza. The true burden of influenza in Manitoba is likely under-estimated as there is no true denominator for all individuals infected. Therefore, the information available for this report will serve to characterize severe cases and to monitor broad trends.

Care should be taken when comparing influenza seasons as factors such as circulating strain, vaccine formulation, and heightened public awareness resulting in greater health-seeking behaviours, can strongly influence findings.

In 2013/14, there was an increase in the number of laboratory-confirmed influenza cases as compared to the historical average observed over the previous three seasons. This may have been partially driven by an increase in testing as a result of enhanced public sensitivity. The severity of this season as evidenced by the number of hospitalizations, ICU admissions, and deaths, was similar to that observed in the 2012/13 season even though the number of confirmed cases was higher. There was also a large drop in the number of confirmed influenza outbreaks reported, with only 9 for the 2013/14 season as compared to 40 confirmed outbreaks the previous season. Increased public demand late in the season also raised the overall influenza vaccine uptake from 20.1% in 2012/13 to 22.3% in 2013/14.

In Canada, the 2013/14 influenza season was dominated by the A/California/07/09–like strain, which was the recommended H1N1 component for the 2013/14 Northern hemisphere influenza vaccine. In Manitoba, the largest proportion of influenza belonged to the influenza A/H1 subtype. NML antigenically characterized 63 influenza A/H1N1 viruses for the province and all were antigenically related to A/California/07/09. This indicates that the 2013/14 vaccine strain was a good match to the circulating virus in Manitoba. Interim estimates from Canada's sentinel surveillance network showed that the adjusted-VE against influenza A(H1N1)pdm09 infection was 74% (95% CI: 58-83) indicating that the trivalent vaccine provided substantial protection with respect to the H1N1 component<sup>5</sup>.

B/Massachusetts/02/12-like virus was the recommended B component of the 2013/14 influenza vaccine. Of the Manitoba isolates tested by NML, 6 influenza B cases were antigenically related to B/Brisbane/60/2008 (Victoria lineage) and 7 to B/Massachusetts/02/ (Yamagata lineage). Circulation of both influenza B lineages occurred in Manitoba, which means that the B component of the trivalent vaccine was a partial lineage-level mismatch this season. A quadrivalent influenza vaccine is not yet available in Manitoba.

Nationally, there was a shortage of influenza vaccine towards the end of the season due to unprecedented late-season demand by the public; this shortage led to a variety of influenza vaccine products being offered in Manitoba from suppliers that were not

---

<sup>5</sup> <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20690>

routine provincial sources. Although more products were offered and vaccine uptake was higher, the number of AEFI reported this season was similar to that of 2012/13.

Syndromic indicators included in the surveillance system continued to be reliable sources of increasing influenza activity with the peak in ILI consultations occurring roughly two weeks prior to the peak in confirmed cases. The second peak in calls to Health Links-Info Santé also occurred just prior to the peak in laboratory-confirmed cases.