INFLUENZA IN MANITOBA – 2011/2012

End of Season Report and Recommendations

September 30, 2012

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

The following report details influenza activity in Manitoba for the 2011/2012 flu season (July 1, 2011 to June 30, 2012). The Epidemiology and Surveillance (E&S) unit of the Public Health Branch of Manitoba Health received its first laboratory-confirmed positive case of influenza for the season during the week of Jan. 1-7, 2012. This flu season in Manitoba, there were **280** lab-confirmed cases of influenza reported, of which **66** were influenza A and **214** were influenza B. Overall:

- This season peaked somewhat later (March) compared to previous influenza seasons.
- Over three-quarters of all laboratory-confirmed cases were typed as influenza B in contrast to previous seasons where typically more cases of influenza A than B have been reported.
- There were 68 hospitalizations reported associated with a laboratory report of influenza, of which 10 resulted in an ICU admission. There were four deaths in individuals with a positive laboratory report of influenza.
- The number of laboratory-confirmed influenza outbreaks (n=9) was within historical limits.
- Influenza vaccine uptake (20%) was comparable to what has been observed in previous seasons.
- The incidence rate of AEFI reports related to the seasonal influenza vaccine was lower this season (17.1 per 100,000 individuals vaccinated) than last season (24.3 per 100,000 doses administered).

The purpose of this report is to both summarize this season's influenza activity and to provide directions and recommendations for future influenza seasons.

METHODOLOGY/DATA SOURCES

A. Syndromic Surveillance

FluWatch

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

Manitoba Health 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 influenza-like illness (ILI) as reported by 22 sentinel physicians reflecting all five regional health authorities (as of July 17, 2012): Winnipeg (10), Brandon (1), North Eastman (2), South Eastman (2), Interlake (2), Central (2), Assiniboine (0), Parkland (2), Nor-Man (0), Burntwood (1), and Churchill (0).

Sentinels can also opt in to the voluntary swabbing component of the program, which 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).

The E&S unit receives weekly reports from the Public Health Agency of Canada 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 three influenza surveillance regions based on the following definitions and submits the completed report to *FluWatch*:

1 = No activity: No laboratory-confirmed influenza detections in the reporting week; however, sporadically occurring ILI may be reported.

2 = Sporadic: Sporadically occurring ILI and lab confirmed influenza detection(s) with NO outbreaks detected within the influenza surveillance region.

3 = Localized:
(1) Evidence of increased ILI* and
(2) Lab confirmed influenza detection(s) together with
(3) Outbreaks in schools, hospitals, residential institutions and/or other types of facilities occurring in less than 50% of the influenza surveillance region†.

4 = Widespread:
(1) Evidence of increased ILI* and
(2) Lab confirmed influenza detection(s) together with
(3) Outbreaks in schools, hospitals, residential institutions and/or other types of facilities occurring in greater than or equal to 50% of the influenza surveillance region†.

Note: ILI data may be reported through sentinel physicians, emergency room visits or health line telephone calls.
* More than just sporadic as determined by the provincial/territorial epidemiologist.
† Influenza surveillance regions within the province or territory as defined by the provincial/territorial epidemiologist.

Manitoba is divided into three influenza surveillance regions (see map below):

1) North Rural (grey): *Nor-Man, North Eastman, Burntwood, Churchill*
2) South Rural (white): *Brandon, Assiniboine, Parkland, Central, South Eastman, Interlake*
3) Winnipeg (blue): *Winnipeg*

For the 2011/2012 season, ILI in the general population is 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.

Definitions of ILI/influenza outbreaks for the 2011/2012 season:

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 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 not limited to long-term care facilities (LTCF) and prisons.

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

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) operated by Misericordia Health Centre in partnership with Manitoba Health and the Winnipeg Health Region.

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.[1]

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 Division at Manitoba Health on a weekly basis.

B. Laboratory-Confirmed Influenza

Reports of culture isolations and enzyme immunoassay (EIA) detections from Cadham Provincial Laboratory (CPL) are forwarded to the E&S unit weekly. While EIA detections and culture isolations comprise the largest number of reports from CPL, seroconversions are similarly forwarded to the PHS Unit weekly. Information contained within this update is based on positive lab reports received at the PHS Unit as of July 18, 2012. This includes specimen dates from July 1, 2011 to June 30, 2012. Out of province reports are excluded.

[1] Source: http://www.misericordia.mb.ca/files/phccfactsheet.pdf.

The specimen date is used to:

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

One of the general features by which cases are compared is status of federal referral. This indicator does not determine how many cases were First Nations or non-First Nations; however, it provides a proxy measurement of which cases live on and off reserve, based on their current address of residence.

C. Clinically Severe Cases

Aggregate Reporting of Influenza-Related Hospitalizations, ICU Admissions and Deaths

The Public Health Agency of Canada (PHAC) requested weekly collection of aggregate numbers of hospitalized cases (as well as ICU admissions and deaths). These data were collected in order to continue with the surveillance system implemented during the 2009 H1N1 pandemic to help monitor the severity/burden of illness during the influenza season.

Aggregate data were therefore reported by regions on a weekly basis using a reporting form developed by the Public Health Agency of Canada (PHAC). The regions were asked to complete a table that included the total number of hospitalized cases, of those, the number admitted to ICUs (where applicable), and deaths. The table also included a breakdown by age group and aboriginal identity; however, Manitoba did not collect information on Aboriginal identity.

Hospitalized cases were defined as follows:

Manitoba residents with laboratory confirmed influenza admitted to a hospital located within the reporting region. The positive specimen must have been obtained between August 28, 2011 and August 25, 2012. Due to very limited influenza activity being reported, aggregate reporting was later suspended the last week of May.

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

Reporting of influenza-related deaths is likely incomplete. Reports are based on notification by:

(a) Chief Medical Examiner;
(b) Medical Officers of Health in the Regional Health Authorities
(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[2], 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

[2] http://www.gov.mb.ca/health/publichealth/cdc/protocol/investigation.pdf.

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.[3]

Reports of suspected/confirmed influenza outbreaks are directed to the PHS Unit by:

(a) a phone call/email from public health staff within a 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

Uptake

Influenza vaccination data originates from 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 report uses a snapshot of the MIMS database capturing all influenza immunization events between September, 2011 and March, 2012 (extracted on April 7, 2012).

This influenza season, Manitoba Health 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 23 months of age
- Those with chronic illness such as:
  - kidney, heart or lung conditions
  - an immune system weakened by disease or medical treatment
  - a condition that makes it difficult to breathe
  - children on long-term aspirin therapy
  - other chronic medical conditions (ex. 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.

[3] Chin, James (Editor). *Control of Communicable Disease Manual*. American Public Health Association, Washington DC, 2000.

Adverse Events Following Immunization (AEFI)

Vaccine manufacturers are required by law (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 (http://www.gov.mb.ca/health/publichealth/cdc/docs/aefi_form.pdf) to their regional Medical Officer of Health.

An adverse event following immunization (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 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,
    (i) an event that has not been previously identified, or
    (ii) 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.

F. 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.

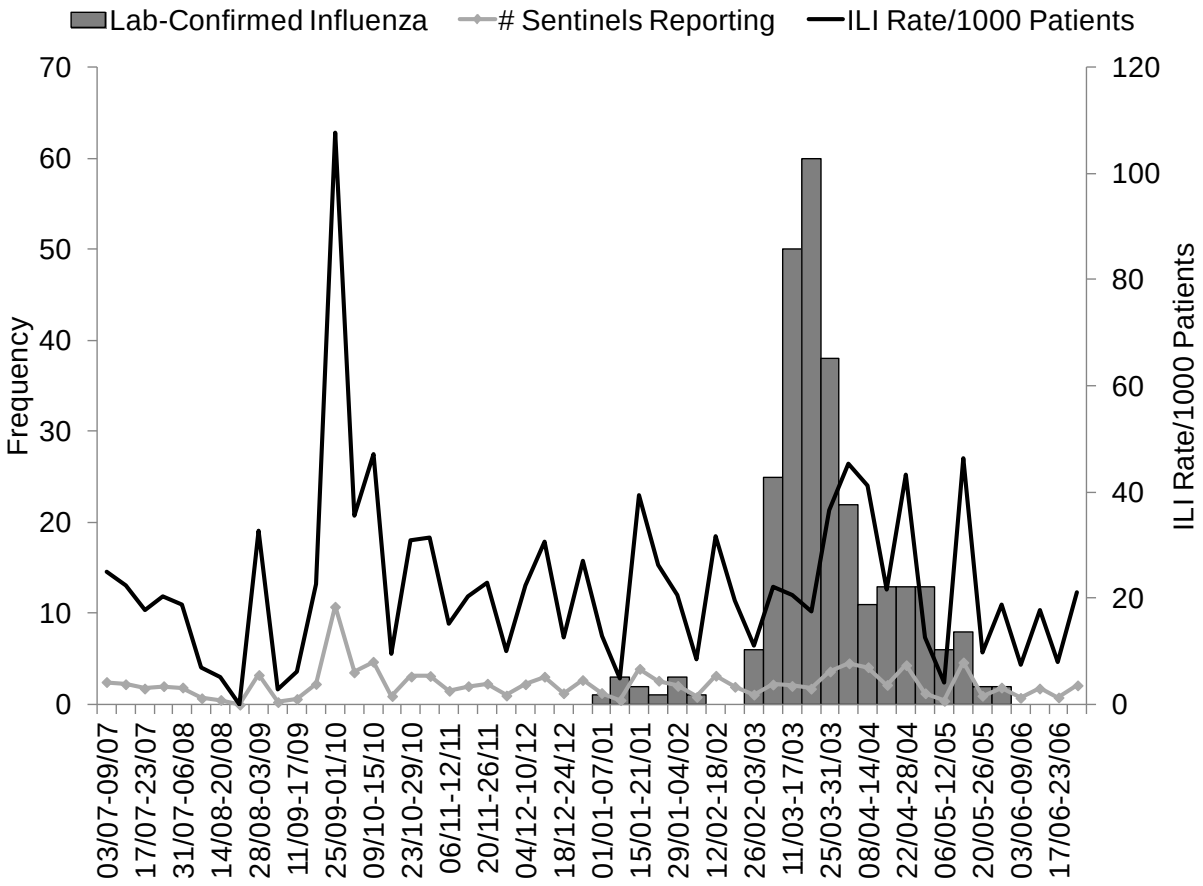
NML routinely antigenically characterizes influenza viruses received from Canadian laboratories. A random sample of positive influenza specimens isolated by culture was referred from Cadham Provincial Laboratory to the NML for strain characterization. Routine testing for antiviral resistance is also performed. This aggregate level information is shared with provinces and territories on a weekly basis during the influenza season.

RESULTS

A. Syndromic Surveillance

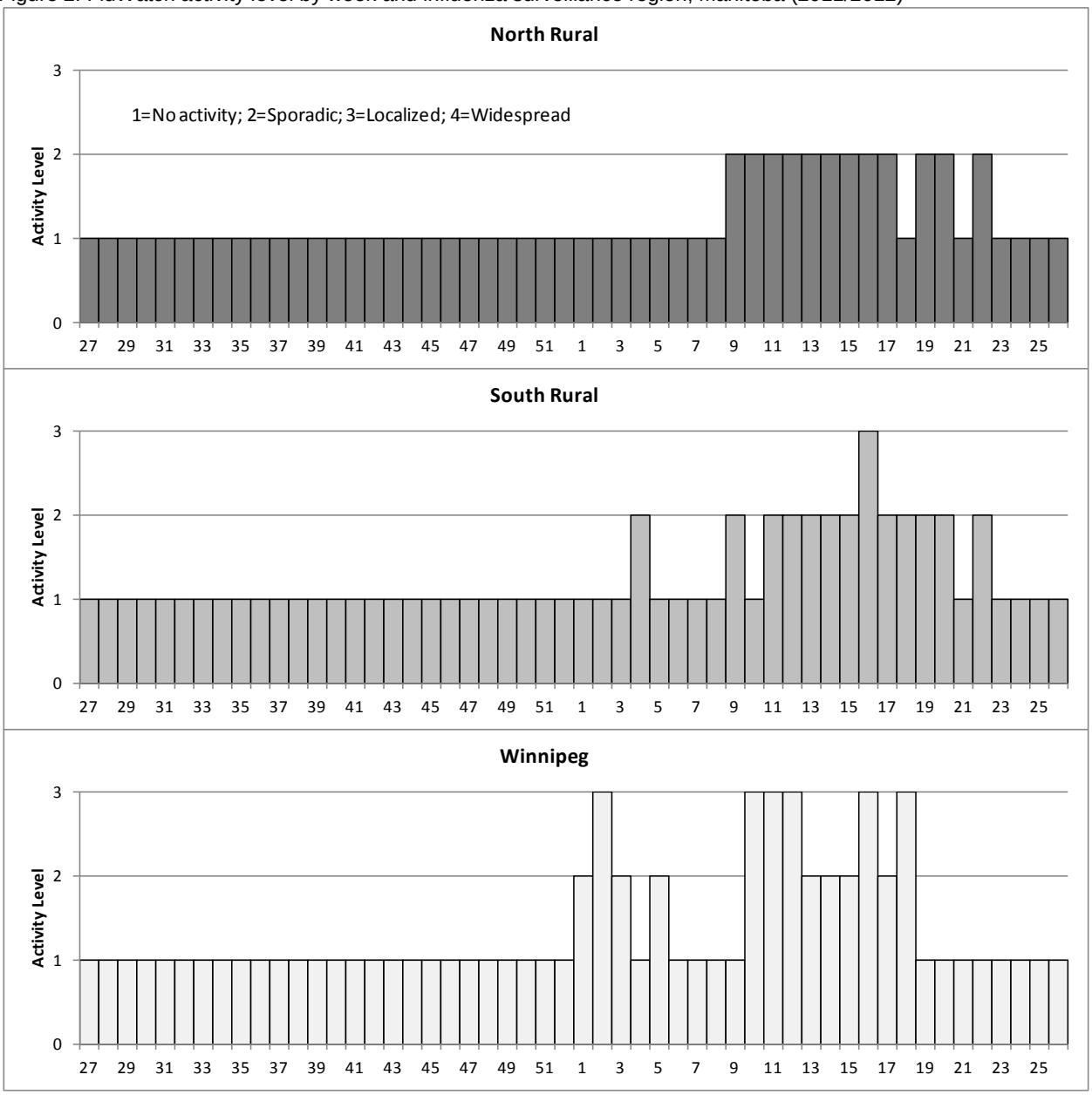
FluWatch

Figure 1. Number of influenza cases and sentinels reporting by influenza-like-illness rate, Manitoba (2011/2012)



The peak in ILI rate occurred during week 39 (Sep. 25 – Oct. 1, 2011), which was 25 weeks before the peak in reported cases of lab-confirmed influenza (Mar. 18-24, 2012) (Figure 1). The mean and median number of sentinels reporting during the flu season was 11.6 (53%) and 11.0 (50%), respectively, with a range of 4 to 19.

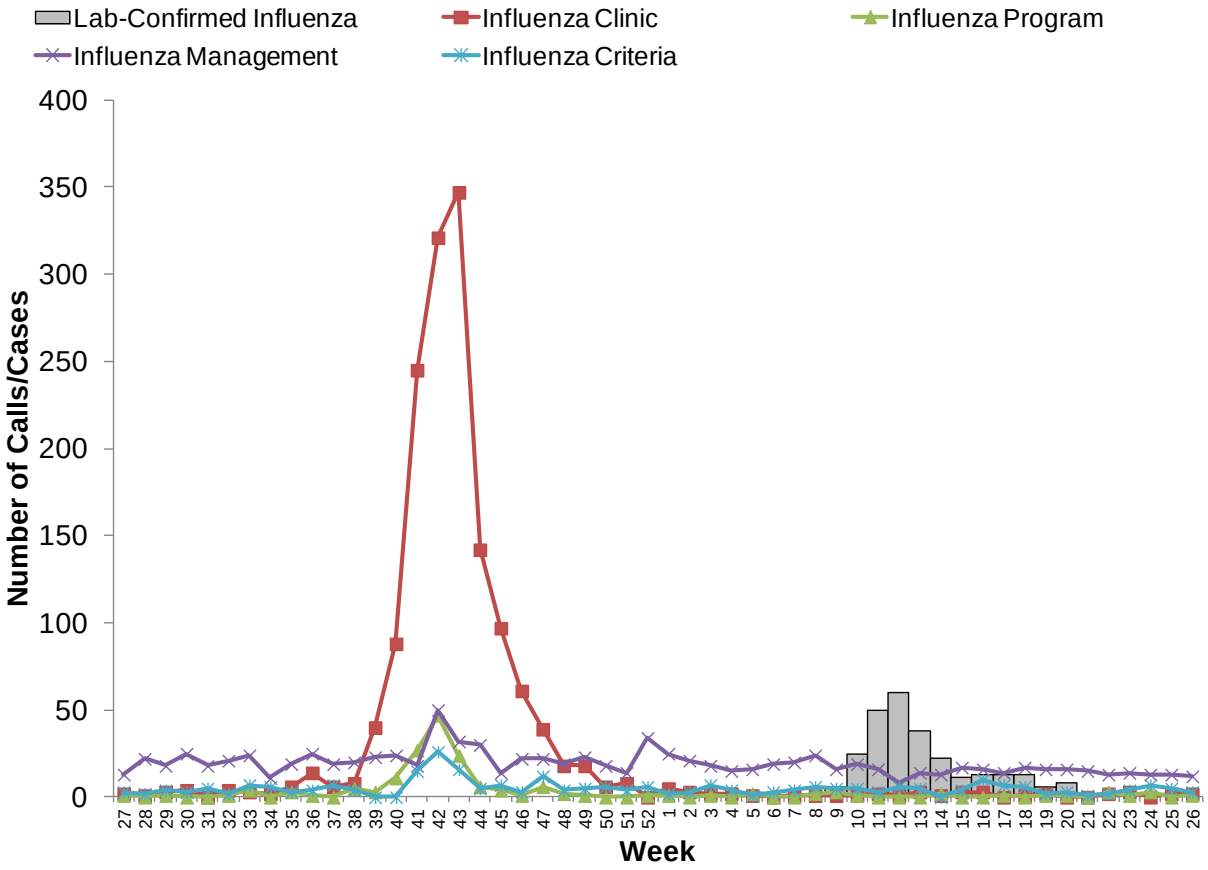
Figure 2. FluWatch activity level by week and influenza surveillance region, Manitoba (2011/2012)



The activity levels increased first in the Winnipeg influenza surveillance region in week 1 (Jan. 1-7, 2012) (Figure 2). It later increased in South Rural (SR) region in week 4 (Jan. 22-28, 2012) followed by North Rural (NR) region in week 9 (Feb. 26 – Mar. 3, 2012). The activity level was reported at level 3 for the greatest number of weeks in Winnipeg region (six weeks between week 2 (Jan. 8-14, 2012) and week 18 (Apr. 29 – May 5, 2012). The activity level increased to 3 in SR only once, during week 16 (Apr. 15-21, 2012) and never reached level 3 in NR. The overall provincial activity level did not exceed localized activity this past season.

Health Links – Info Santé

Figure 3. Number of calls received at Health Links - Info Santé Influenza Service and the number of lab-confirmed cases of influenza by week (2011/2012), Manitoba



The number of callers who selected to hear information about influenza clinics peaked during week 43 (Oct. 23-29, 2011), 21 weeks prior to the peak in the number of lab-confirmed cases of influenza reported to Manitoba Health (week 12; Mar. 18-24, 2012) (Figure 3). The number of callers who selected to hear information about the other three categories all peaked during week 42.

B. Laboratory-Confirmed Influenza

General

Figure 4. Laboratory-confirmed influenza cases by specimen collection date, Manitoba, 2011/2012 (n=280)

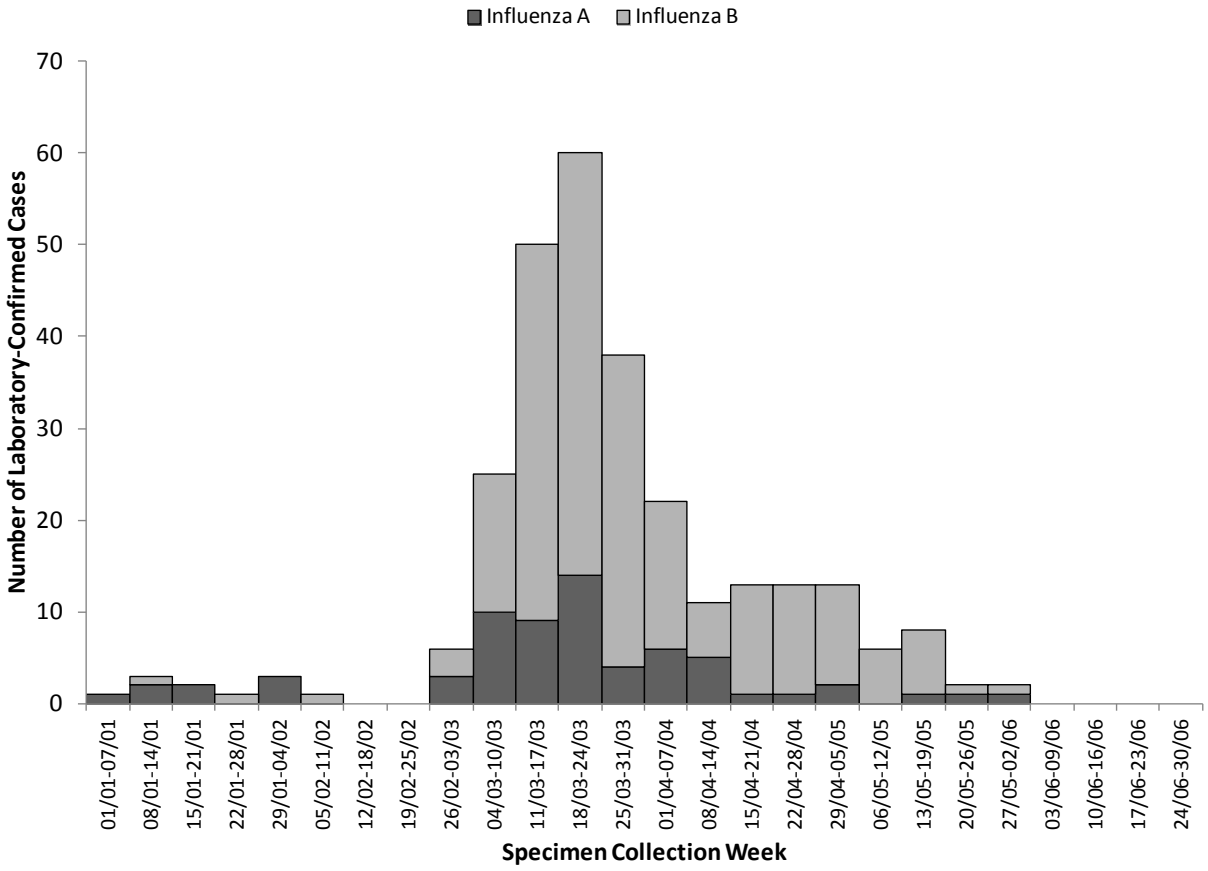
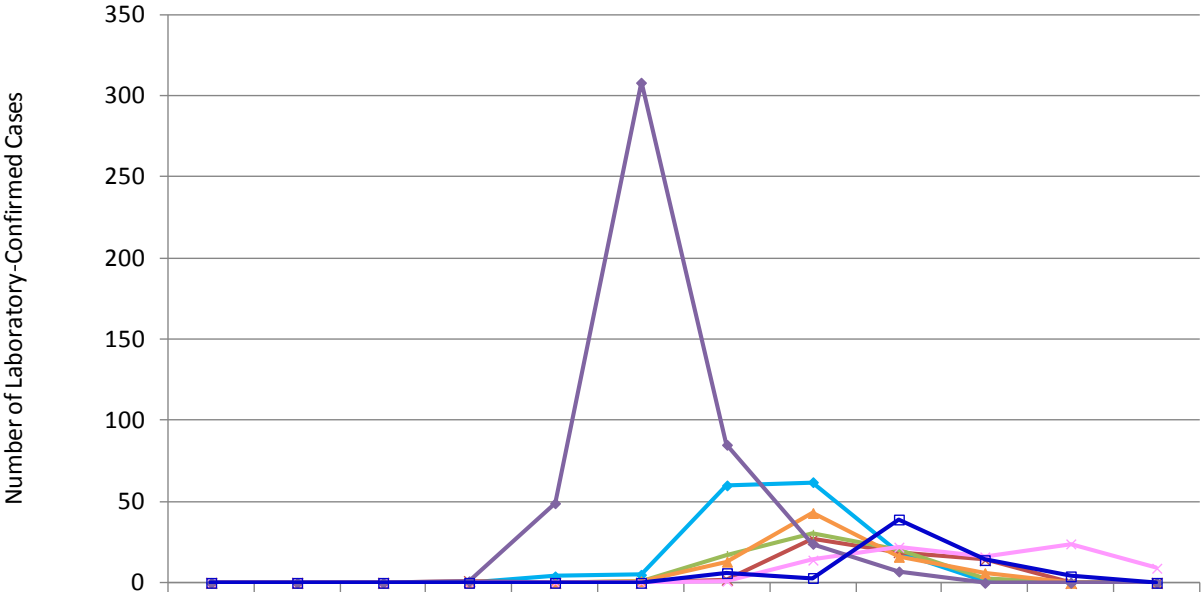


Figure 4 focuses on only those weeks of the year in which Manitoba Health received reports of laboratory-confirmed influenza. The first lab-confirmed case of influenza A was reported during the week of Jan. 1-7, 2012. The number of reported cases peaked during the week of Mar. 18-24, 2012 (n=14 cases) (Figure 4). The last reported lab-confirmed case of influenza A was reported during the week of May 27 – Jun. 2, 2012. The first lab-confirmed case of influenza B was reported during the week of Jan. 8-14, 2012 and the last was reported during the week of May 27 – Jun. 2, 2012.

There were a total of 66 (23.6%) cases of influenza A and 214 (76.4%) cases of influenza B during the 2011/2012 season. Of the influenza A cases, 43 (65.2%) were influenza A/unsubtyped. Of the 23 cases that were subtyped, there were 11 (16.7%) cases of influenza A/H3 and 12 (18.2%) cases of influenza A/H1.

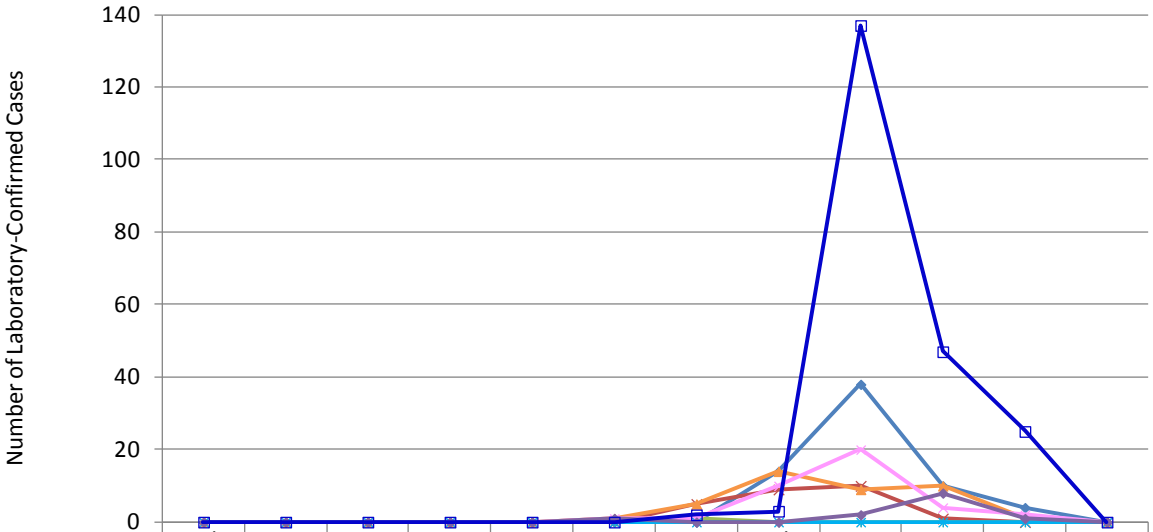
Figure 5. Seasonal influenza A 2011/2012 compared to the last six influenza seasons excluding the 2009/2010 pandemic H1N1 influenza season



	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
2004/2005	0	0	0	0	4	5	60	62	19	1	0	0
2005/2006	0	0	0	1	0	0	2	27	19	14	0	0
2006/2007	0	0	0	0	0	1	17	30	20	3	0	0
2007/2008	0	0	0	0	0	1	13	43	16	6	0	0
2008/2009	0	0	0	0	0	0	1	14	22	16	24	9
2010/2011	0	0	0	1	49	308	85	24	7	0	0	0
2011/2012	0	0	0	0	0	0	6	3	39	14	4	0

The overall total number of reported lab-confirmed cases of influenza A (n=66) was more typical of what has been observed in previous seasons prior to the H1N1 pandemic. This season's peak occurred in March (Figure 5). This is later than in any previous season since 2004/2005 with the exception of 2008/2009, where the peak occurred in May.

Figure 6. Seasonal influenza B 2011/2012 compared to the last seven influenza seasons



	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
2004/2005	0	0	0	0	0	0	0	14	38	10	4	0
2005/2006	0	0	0	0	0	0	5	9	10	1	0	0
2006/2007	0	0	0	0	0	0	1	0	0	0	0	0
2007/2008	0	0	0	0	0	1	5	14	9	10	1	0
2008/2009	0	0	0	0	0	1	1	10	20	4	2	0
2009/2010	0	0	0	0	0	0	0	0	0	0	0	0
2010/2011	0	0	0	0	0	1	0	0	2	8	1	0
2011/2012	0	0	0	0	0	0	2	3	137	47	25	0

There were 214 positive lab-confirmed cases of influenza B reported to Manitoba Health this season (Figure 6). This is the highest number of reported cases since the 2004/2005 season. The season peaked in March this year, which is characteristic of most previous seasons since 2004/2005.

Features

Table 1. Number of influenza cases and crude incidence rate[a] per 100,000 by age group and type in Manitoba (2011/2012)

	Influenza A		**Influenza B**	
Age Group	N	Inc. Rate[b]	N	Inc. Rate[b]
<1	7	44.4	22	139.4
1-4	8	12.3	38	58.5
5-9	5	6.5	44	57.5
10-14	3	3.7	24	29.9
15-19	3	3.4	9	10.2
20-24	2	2.2	3	3.4
25-29	4	4.7	5	5.9
30-39	5	3.1	16	10.0
40-49	7	4.0	12	6.9
50-59	8	4.6	11	6.4
60-69	2	1.7	5	4.2
70-79	2	2.9	7	10.0
>79	10	18.8	18	33.9
Total	**66**	**5.3**	**214**	**17.1**

a. 2011 Population file used to calculate crude incidence rates.
b. per 100,000 population

Age Group

The incidence rate (per 100,000) of influenza A was greatest among the very young (44 cases per 100,000 among those <1 year) followed by the very old (19 cases per 100,000 among those >79 years) (Table 1).

The incidence rate (per 100,000) of influenza B was greatest among those aged <1 year (139 cases per 100,000) followed by those aged 1-4 years (59 cases per 100,000) and those aged 5-9 years (58 cases per 100,000) (Table 1).

Sex

Forty two percent (28/66) of influenza A cases were male. Fifty percent (108/214) of influenza B cases were male.

Regional Health Authority

Table 2. Number, proportion, and crude incidence rate[a] per 100,000 of influenza cases by Regional Health Authority in Manitoba (2011/2012)

	Influenza A		**Influenza B**		**Influenza A + B**	
RHA	N	%	N	%	N	Inc. Rate[b]
Winnipeg	33	50.0%	51	23.8%	84	11.8
Brandon	0	0.0%	3	1.4%	3	5.6
North Eastman	2	3.0%	7	3.3%	9	21.1
South Eastman	3	4.5%	2	0.9%	5	7.1
Interlake	2	3.0%	6	2.8%	8	10.1
Central	9	13.6%	10	4.7%	19	17.4
Assiniboine	3	4.5%	11	5.1%	14	20.3
Parkland	2	3.0%	3	1.4%	5	12.0
Nor-Man	0	0.0%	6	2.8%	6	24.1
Burntwood	12	18.2%	115	53.7%	127	260.6
Churchill	0	0.0%	0	0.0%	0	0.0
Total	**66**		**214**		**280**	**22.4**

a. 2011 Population file used to calculate crude incidence rates.
b. per 100,000 population.

As the number of cases was fairly small in some RHAs, crude incidence rates were calculated only for all influenza cases combined and not separately for influenza A and B. Proportions are presented in Table 2 separately by RHA for influenza A and B for comparison purposes only.

The highest incidence rate of influenza was observed in Burntwood RHA (261 cases per 100,000). There were no cases reported from Churchill. The remaining RHAs had incidence rates between 5.6 (Brandon) and 24 (Nor-Man) cases per 100,000 (Table 2).

Table 3. Number, proportion, and crude incidence rate[a] per 100,000 of influenza cases by Winnipeg Community Area in Manitoba (2011/2012)

	Influenza A		Influenza B		Influenza A + B	
Community Area	N	%	N	%	N	Inc. Rate[b]
Assiniboine South	4	12.1%	0	0.0%	4	11.3
Downtown	7	21.2%	11	21.6%	18	22.5
Fort Garry	4	12.1%	4	7.8%	8	10.5
Inkster	0	0.0%	0	0.0%	0	0.0
Point Douglas	4	12.1%	7	13.7%	11	24.5
River East	3	9.1%	7	13.7%	10	10.3
River Heights	2	6.1%	3	5.9%	5	8.9
Seven Oaks	3	9.1%	4	7.8%	7	10.0
St. Boniface	1	3.0%	4	7.8%	5	9.1
St. James - Assiniboia	2	6.1%	2	3.9%	4	6.8
St. Vital	2	6.1%	8	15.7%	10	14.8
Transcona	1	3.0%	1	2.0%	2	5.5
Total	**33**		**51**		**84**	**11.8**

a. 2011 Population file used to calculate crude incidence rates.
b. per 100,000 population.

As the number of cases was fairly small in some Winnipeg neighbourhoods, crude incidence rates were calculated only for all influenza cases combined and not separately for influenza A and B. Proportions are presented by neighbourhood in Table 3 separately for influenza A and B for comparison purposes only.

The proportion of influenza cases was highest in Point Douglas (25 cases per 100,000) and lowest in Inkster where no cases were reported (Table 3). The remaining neighbourhoods varied between 6 cases per 100,000 in Transcona to 23 cases per 100,000 in the Downtown area.

Referred Federally

The proportion of influenza A cases referred federally was 19.7% (n=13/66). The proportion of influenza B cases referred federally was 52.8% (n=113/214).

C. Clinically Severe Cases

Aggregate Reporting of Influenza-Related Hospitalizations, ICU Admissions, and Deaths

There were 68 Manitoba residents hospitalized in Manitoba. Ten of these individuals were admitted to a Manitoba ICU. There were four deaths in individuals with a positive lab report of influenza. The severe outcome did not necessarily have to be attributable to influenza but only required temporal association with a positive lab report of influenza to be counted.

Figure 7. Number of hospitalizations (n=68) reported by week in Manitoba (2011/2012)

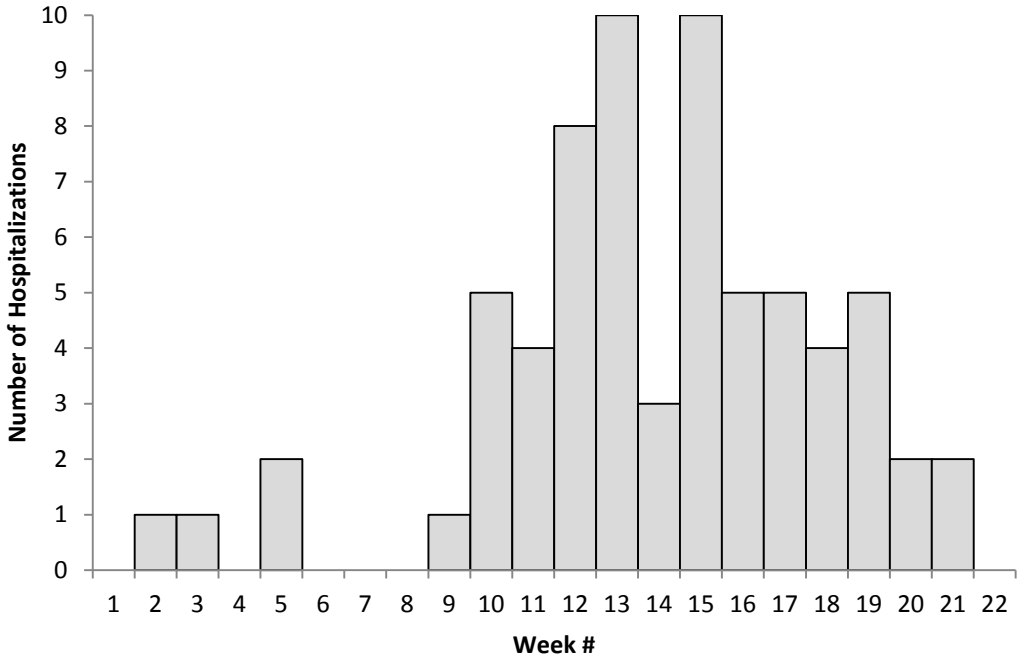


Figure 7 shows the number of Manitoba residents with laboratory confirmed influenza admitted to a Manitoba hospital (including both ICU and non-ICU admissions). The majority of hospitalizations occurred in weeks 13 and 15 (Mar. 25-31 and Apr. 8-14, 2012).

Figure 8. Number of ICU admissions (n=10) reported by week in Manitoba (2011/2012)

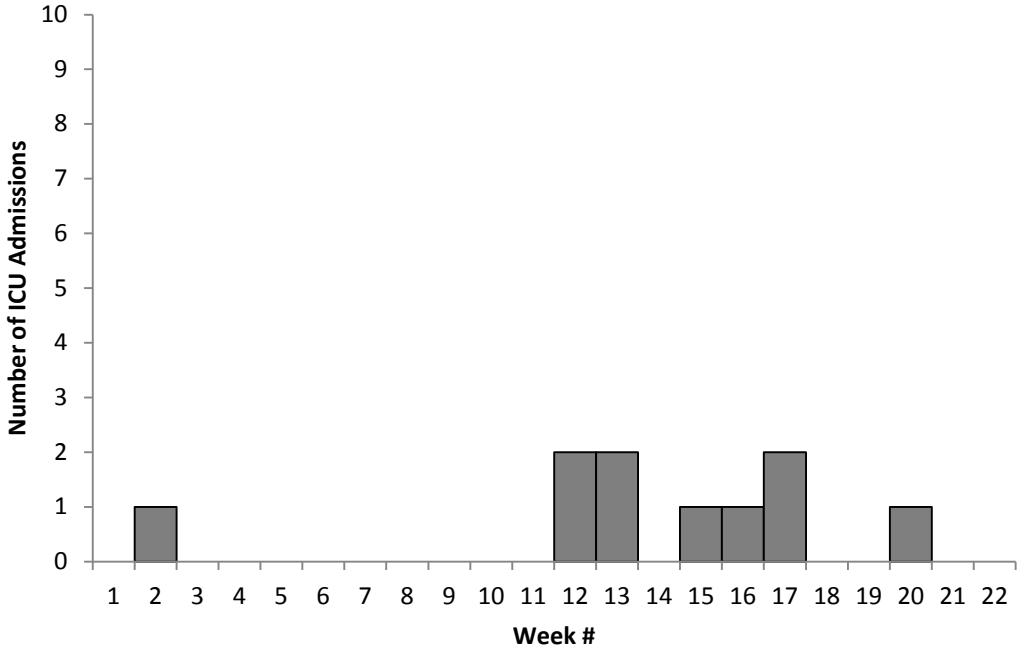


Figure 8 shows the number of Manitoba residents with laboratory confirmed influenza admitted to a Manitoba ICU (n=10). The first ICU admission was reported during week 2 (Jan. 8-14, 2012), and the last

ICU admission was reported during week 20 (May 13-19, 2012). The weekly number of ICU admissions reported never exceeded two.

The four deaths that occurred in Manitoba associated with a positive lab report of influenza were reported between weeks 4 and 12 (Jan. 22-28 and Mar. 18-24, 2012). Again, the cause of death did not necessarily have to be attributable to influenza to be counted.

Age

Table 4. Age breakdown of hospitalized cases in Manitoba (2011/2012)

Age Group	Hospitalizations	ICU Admissions
< 1	11	1
1-4	16	2
5-19	17	1
20-44	9	2
45-64	7	1
65+	8	3
Total	68	10

The greatest number of hospitalizations was reported among those aged 5-19 years (n=17), followed by those aged 1-4 years (n=16), and those aged <1 year (n=11) (Table 4). The number of ICU admissions by age group was fairly evenly distributed (between one and three ICU admissions reported within each age category). Three of the four deaths were reported among those aged 65 and over and the other occurred among an individual aged less than one year.

Location of Residence

Table 5. Location of residence for laboratory confirmed influenza cases admitted to a hospital in Manitoba (2011/2012)

Region of Residence	Hospitalized Cases
Winnipeg	46
Brandon	2
North Eastman	0
South Eastman	1
Interlake	0
Central	3
Assiniboine	6
Parkland	1
Nor-Man	0
Burntwood	4
Churchill	5
Total	68

Subtyping

Table 6. Typing and subtyping of hospitalized influenza cases in Manitoba (2011/2012)

Type/Subtype	Hospitalizations n (%)	ICU Admissions n (%)
A/Unsubtyped	25 (36.8%)	4 (40%)
A/H1	3 (4.4%)	2 (20%)
A/H3	1 (1.5%)	0 (0%)
B	39 (57.4%)	4 (40%)
Total	68	10

Fifty seven percent (n=39) of hospitalized cases were typed as influenza B. Of the 43% (n=29) who were typed as influenza A, 25 were unsubtyped, three were subtyped as H1, and one as H3. Forty percent of

ICU-admitted cases were typed as influenza B (n=4). Of the 60% (n=6) who were typed as influenza A, four were unsubtyped, and two were subtyped as H1.

D. Influenza Outbreaks

Between January and May 2012, there were three laboratory confirmed outbreaks of influenza A and six of influenza B. All but one of the outbreaks were reported from Winnipeg, the other from Interlake. The number of reported outbreaks peaked in March (n=4) (Table 7). All of the outbreaks occurred in long term care facilities.

Table 7. Number of lab-confirmed influenza outbreaks by month and type in Manitoba (2011/2012)

Month	Influenza A	Influenza B
January	1	0
February	0	1
March	2	2
April	0	2
May	0	1
Total	**3**	**6**

E. Vaccination Data

Uptake

The overall provincial influenza vaccine uptake by individuals vaccinated was 20% in the 2011/2012 season. By age group, the highest uptake was among Manitobans aged 65 years and over (55%), followed by those 2 years and younger (17%), those 19-64 years (15%), and individuals aged 3-18 years (9%) (Figure 9).

By RHA, the lowest uptake was observed in South Eastman (14%) and the highest in Churchill (27%). The remaining RHAs varied between 15% (Central) to 22% (Assiniboine) (Figure 10).

Figure 9. Influenza vaccine uptake by age group in Manitoba (2011/2012)

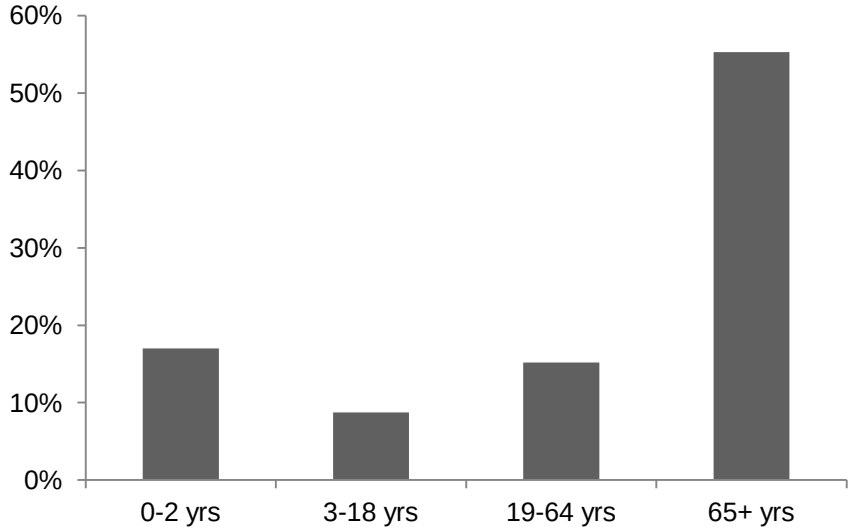
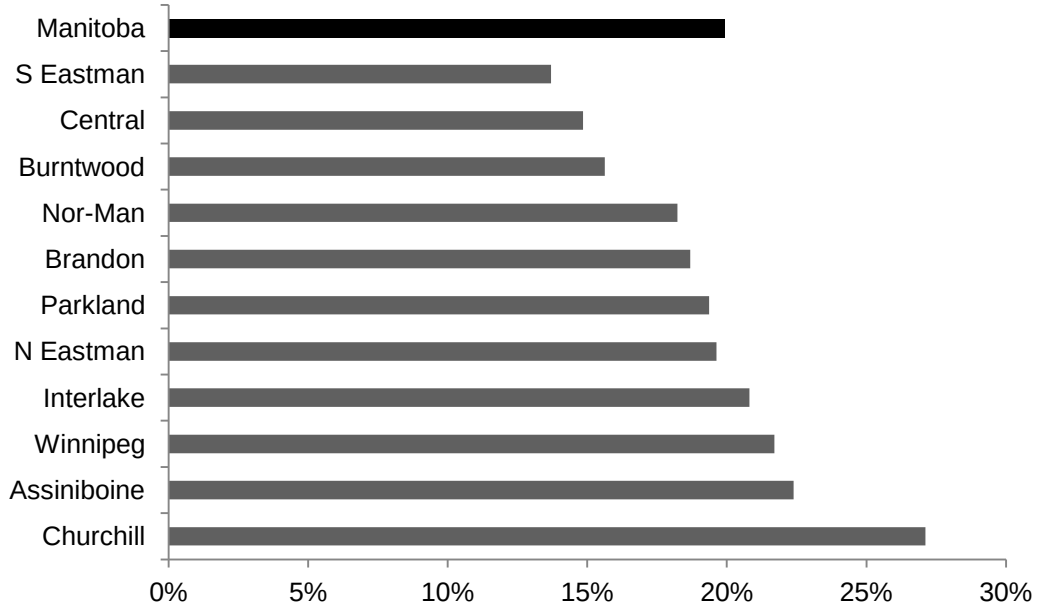


Figure 10. Influenza vaccine uptake by RHA in Manitoba (2011/2012)



Notes:
All proportions based on immunization events found in the April 7, 2012 snapshot of MIMS.
Includes all immunization events with TARIFF code 8791.

Adverse Events Following Immunization (AEFI)

A total of 42 AEFI reports were received this season related to the influenza vaccine. Overall, the incidence rate of AEFI was 17.1 per 100,000 individuals vaccinated. By age group, the highest incidence rate was among those less than three years-old (38.1 AEFIs per 100,000 individuals vaccinated) and the lowest among those aged 65 years and over (11.2 AEFIs per 100,000 individuals vaccinated) (Table 8).

The majority of AEFI reports (n=22, 52%) reported a local reaction, followed by allergic or allergic-like event (n=19, 45%), and other defined event of interest (n=12, 29%) (Table 9). There were seven neurologic events reports, one report of oculo-respiratory syndrome, and one report of anaphylaxis. Some people experienced more than one reaction in a single episode, which means there were a greater number of reactions reported (n=62) than reports submitted (n=42).

In terms of level of care obtained, the majority (33%) of AEFI reports reported an emergency visit by the person experiencing the adverse event (Table 10). The next most frequent level of care obtained was none (26%), followed by the same proportion reporting a non-urgent visit to a health care professional and telephone advice from a health professional (17% each). There were no hospitalizations reported.

The most frequently reported outcome following the AEFI was “not yet recovered” at time of form completion (57%) followed by fully recovered (26%) (Table 11). There were no permanent disabilities or deaths reported.

The most frequently reported recommendation following review of the adverse event by the regional Medical Officer of Health (MOH) was no change to the immunization schedule (79%) followed by expert referral (12%; e.g. to an allergist), controlled setting for next immunization (7%), active follow-up for AEFI recurrence (7%), and no further immunization with the influenza vaccine (5%) (Table 12). There was one report received with no recommendation by an MOH.

Table 8. Number and incidence rate (per 100,000)* of adverse events following immunization with the influenza vaccine by age group, 2011/2012 season, Manitoba

Age Group	N	Inc. Rate
0-2	3	38.1
3-18	3	13.2
19-64	25	21.2
65+	11	11.2
Total	**42**	**17.1**

* Number of individuals vaccinated used as denominator.

Table 9. Type of adverse event following immunization with the influenza vaccine, 2011/2012 season, Manitoba

Type of adverse event:	N	%*
Local reaction	22	52.4
Allergic or allergic-like event	19	45.2
Anaphylaxis	1	2.4
Oculo-respiratory syndrome	1	2.4
Neurologic events	7	16.7
Other defined event of interest	12	28.6
Total number of reports**	**42**	100.0

* Percentage based on total number of reports received.
** Total number of types of reactions is greater than total number of reports received as some people experienced more than one reaction in a single episode.

Table 10. Level of care obtained reported in an adverse event following immunization with the influenza vaccine, 2011/2012 season, Manitoba

Level of Care:	N	%
None	11	26.2
Telephone advice from health professional	7	16.7
Non-urgent visit	7	16.7
Emergency visit	14	33.3
Hospitalization	0	0.0
Prolongation of existing hospitalization	0	0.0
Missing	3	7.1
Total	**42**	**100.0**

Table 11. Outcome of adverse event following immunization with the influenza vaccine, 2011/2012 season, Manitoba

Outcome:	N	%
Fully recovered	11	26.2
Not yet recovered	24	57.1
Permanent disability	0	0.0
Death	0	0.0
Unknown	2	4.8
Missing	5	11.9
Total	**42**	**100.0**

Table 12. MOH recommendation of adverse event following immunization with the influenza vaccine, 2011/2012 season, Manitoba

Recommendation:	N	%*
No change to immunization schedule	33	78.6
Expert referral	5	11.9
Determine protective antibody level	0	0.0
Controlled setting for next immunization	3	7.1
No further immunization with flu vaccine	2	4.8
Active follow-up for AEFI recurrence	3	7.1
None	1	2.4
Total**	**42**	

* Percentage based on total number of reports received.
** Total number of recommendations (n=47) is greater than the number of reports received (n=42) as more than one recommendation was made for some single episodes of an adverse event.

F. Strain Characterization and Antiviral Resistance

Strain Characterization

From September 1, 2011 to May 30, 2012, National Microbiology Laboratory (NML) reported that it antigenically characterized **30** influenza viruses received from CPL. Two influenza A/H3N2 viruses characterized were antigenically related to A/Perth/16/2009-like, three influenza A/H1N1 viruses were antigenically related to A/California/07/09-like, seven influenza B viruses were antigenically related to B/Brisbane/60/2008-like, and 18 influenza B viruses were antigenically related to B/Wisconsin/01/2010-like.

Antiviral Resistance

From September 1, 2011 to May 30, 2012, NML has tested for antiviral resistance on Manitoba isolates with the following results:

Table 13. Antiviral resistance summary of Manitoba influenza isolates, 2011/2012

	Influenza A(H3N2)		Influenza A(H1N1)pdm09		Influenza B	
Antiviral:	Resistant	Sensitive	Resistant	Sensitive	Resistant	Sensitive
Amantadine	8	0	7	0	N/A	N/A
Oseltamivir	0	0	0	3	0	25
Zanamivir	0	0	0	2	0	13

Nationally, from September 1, 2011 to May 30, 2012, NML has tested for antiviral resistance on Canadian isolates with the following results:

Table 14. Antiviral resistance summary of Canadian influenza isolates, 2010/2011

	Influenza A(H3N2)		Influenza A(H1N1)pdm09		Influenza B	
Antiviral:	Resistant	Sensitive	Resistant	Sensitive	Resistant	Sensitive
Amantadine	383	1	327	0	N/A	N/A
Oseltamivir	0	225	0	235	0	838
Zanamivir	0	207	0	229	0	787

DISCUSSION AND RECOMMENDATIONS

General Limitations

Influenza surveillance is biased towards more severe outcomes as not all individuals experiencing symptoms will seek medical attention, and not all clinicians will routinely test ILI cases for influenza. The true burden of influenza in Manitoba is likely under-estimated as there is no true denominator for all individuals infected. The information available will serve to characterize severe cases and to monitor trends; however, since we cannot compare characteristics of severe to mild cases, we will not be able to identify true risk factors for severe clinical outcome for this influenza season. Comparison of severe clinical cases from the 2009 pandemic to the severe cases seen this and last season will be limited by the fact that different data collection forms were used and not all of the same information was collected during each season.

A. Syndromic Surveillance

FluWatch

Surveillance of influenza-like illness (ILI) approximates the true burden of influenza in the population. While it may also capture the burden of other circulating respiratory viruses, it can provide a good estimate of disease when combined with other reliable data sources such as laboratory testing.

The *FluWatch* ILI data would suggest that routine monitoring of the weekly ILI rate does not provide any early indication of the peak in the flu season. Compared to last season where the peak in ILI occurred two weeks after the peak in reported cases of lab-confirmed influenza, this season, the peak in ILI occurred several weeks prior to the peak in lab-confirmed cases. After review, there was also no association found between the peak in ILI and other monitored respiratory viruses including parainfluenza, adenovirus, respiratory syncytial virus, and rhinovirus (data not shown).

In order to enhance the capacity to monitor ILI trends in Manitoba, a model similar to that currently used by the *FluWatch* program is being considered. This model compares the current ILI rate to a calculated expected ILI rate based on the mean observation rate for the previous ten seasons.

It is difficult to determine if Manitoba's sentinels provide adequate provincial representation, as on average, less than 50% of sentinels are reporting each week. Moving forward into subsequent flu seasons, it will be important to consider innovative methods of sentinel retention and recruitment in order to maximize the effectiveness of this ILI surveillance program.

One way Manitoba Health has addressed this issue is by recently partnering with the Winnipeg Regional Health Authority and the University of Manitoba to support a national multi-site vaccine effectiveness surveillance network, which is already operational in four other Canadian provinces. While the primary function of this network is to assess the effectiveness of the seasonal influenza vaccine, a secondary function is to monitor influenza activity through sentinel sites across the province. During the 2011/2012 season, sites were restricted to the Winnipeg area; however, the recently formed partnership will also serve to expand the network of sites throughout Manitoba for next and subsequent influenza seasons.

Health Links – Info Santé

The peak in the number of calls related to obtaining the influenza vaccine occurred prior to the beginning of the influenza season, which is a feature observed last flu season as well. This is encouraging, as this

would suggest that Manitoba Health's influenza immunization campaign is positively creating awareness about the importance of getting the vaccine.

The peak in the number of calls for influenza management occurred one week prior to the peak in the number of calls related to obtaining the influenza vaccine. This is different than what was observed last season, where the peak in the number of calls related to influenza management occurred in the middle of the influenza season. However, due to the limitations of the data, their interpretation is difficult. Demographic and other information is not collected from the callers; therefore, it is not known if the people at greatest risk of severe outcomes are receiving the information about the flu vaccine. The geographic distribution of callers is also unknown; it is unknown if all Manitobans are utilizing this service or if utilization is concentrated within a specific geographic area.

B. Laboratory-Confirmed Influenza

General

The number of reported cases of influenza A in 2011/2012 (n=66) was more typical of previous seasons compared to 2010/2011 (n=474). The reason for this is unclear; however, it could be speculated that any increased vigilance to seek care and be tested that may have existed last season post-pandemic may have subsided, returning to what is more expected. Also, the peak occurred somewhat later (March) than in previous seasons. This could be a function of various factors such as a mild winter or similarity of the dominant circulating strain to previous flu seasons.

In contrast, in 2011/2012, there were many more cases of influenza B reported than in any previous flu season since 2004/2005. This may have been the result of a vaccine type mismatch to the dominant circulating strain of influenza B; however, this is speculation, and a vaccine efficacy study would be required to confirm this.

Features

In general, the ages of cases most affected were those typically seen in past non-pandemic flu seasons (the very young and very old age groups). Excluding the influenza A pandemic H1N1 season, this age trend has been observed repeatedly in previous flu seasons (Table 15). The highest incidence rates have consistently been observed among these two age groups (see Appendix A on page 32 on for extended table):

Table 15. Incidence rate (per 100,000) of influenza A by youngest and oldest age group in Manitoba

	Age Group	
Season:	<1 year	>79 years
2003/2004	135.6	100.1
2004/2005	57.3	155.7
2005/2006	34.9	58.2
2006/2007	67.0	33.7
2007/2008	90.3	21.5
2008/2009	44.2	51.9
2010/2011	194.7	189.9

The crude incidence rate of influenza was highest in Burntwood RHA (261 cases per 100,000 for influenza A and B combined), which is the same trend observed during the pandemic season for influenza A (482.7 cases per 100,000 in Burntwood and 535.3 cases per 100,000 in Churchill). This was

also observed in 2010/2011 where the crude incidence rate of influenza A was 263 cases per 100,000 in Burntwood and Churchill together.

It is difficult to validate the reasons why the north has a greater burden of illness without age-standardized rates or data on risk factors; however, age standardized rates calculated for Manitoba's H1N1 Technical Report (unreleased) were comparable to the crude rates, which suggest that other risk factors may be driving the higher rates in the north. A more comprehensive exploration of risk factors may be warranted to better understand these RHA disparities.

Crude incidence rates calculated for Winnipeg Community Areas reveal similar trends as were observed in 2010/2011. In both 2010/2011 and 2011/2012, a higher burden of illness was reported Downtown (31 and 23 cases per 100,000, respectively) and in Point Douglas (41 and 25 cases per 100,000, respectively) than in most other neighbourhoods. However, it 2010/2011, higher incidence rates were also reported in St Vital (41 cases per 100,000) and in St. James Assiniboia (32 cases per 100,000), which was not observed in 2011/2012. This difference could be due to the high number of influenza outbreaks reported in these neighbourhoods compared to other Winnipeg Community Areas.

It is difficult to draw any conclusions from cases that were referred federally, as this is not a reliable indicator for First Nations status. It can be stated that a smaller proportion of influenza A cases were referred federally (20%) than influenza B cases, where the distribution was fairly even (53% referred federally).

C. Clinically Severe Cases

Data on clinical severity have only been collected since 2009 in response to the Influenza A H1N1 pandemic. Historically, there is no record of these data being collected in previous seasons prior to the pandemic; therefore, limited comparisons can be made.

During the pandemic season, there were 383 hospitalized cases, of which 71 (19%) were admitted to an ICU. In 2010/2011, there were 98 hospitalized cases, of which 15 (15%) were admitted to an ICU. The peak in the number of hospitalizations occurred in May and November during the pandemic whereas it occurred in December during the 2010/2011 season. This past season, the peak in the number of hospitalizations occurred in December. This trend coincides with the late peak in lab-confirmed cases.

There were 11 reported deaths during the H1N1 pandemic, seven reported in 2010/2011, and four reported in 2011/2012. Five of the seven deaths reported in 2010/2011 occurred among cases aged over 75 years. Similarly, three of the four deaths reported in 2011/2012 occurred among cases aged 65 and over. In contrast, the majority of deaths (73%) reported during the pandemic occurred among cases aged between 20-59 years.

The greatest proportion of hospitalizations this past season was among cases aged 5-19 years (25%) closely followed by cases aged 1-4 years (24%). This is in contrast to the 2010/2011 season, where the greatest proportion of hospitalizations occurred among cases aged 65 and over (25%). This is possibly due to the fact that influenza B was the dominant circulating type, which is more common among younger

age groups[4]. During the pandemic, the highest proportion was 22% among 45-65 year-olds, with only 4% occurring among those aged over 65 years.

This season, the greatest proportion of ICU admissions was observed among cases aged 65 and over (30%). This is the same trend that was observed last season (33%). In contrast, during the pandemic, 4% of ICU admissions occurred among cases aged over 65 years with the majority occurring among cases aged 46-65 years (28%), followed by 20% among 26-35 year-olds and 20% among 36-45 year-olds.

This season, additional surveillance data were not collected from ICU-admitted cases; therefore, no comparisons can be made to these enhanced data that were collected during the 2010/2011 season.

In accordance with the recommendations made by the Public Health Agency of Canada, aggregate reporting of severe outcomes related to lab-confirmed influenza will continue in Manitoba for the 2012/2013 season. There will be no additional data collected from hospitalized cases unless a significant change in activity should occur as determined by Manitoba Health or by the Public Health Agency of Canada.

D. Influenza Outbreaks

Outbreaks of respiratory illnesses are reported to Manitoba Health by regional stakeholders on a voluntary level, and the actual number of outbreaks may be greater due to under-reporting.

The number of laboratory confirmed outbreaks was much lower this season (n=9) than the 2010/2011 season (n=38). The number of outbreaks reported this past season was more typical of what has been observed in previous seasons prior to the pandemic (between 9 and 20 outbreaks reported seasonally since 2005/2006) (Table 16). It is possible that the number of outbreaks in 2010/2011 was higher because it was the first post-pandemic season, and there may have been residual increased vigilance as a result of effects of the pandemic.

This season, there were three outbreaks of influenza A and six outbreaks of influenza B. Last season, there were no outbreaks of Influenza B. This is likely because influenza B was the dominant circulating type this season whereas last season it was influenza A.

This past season, all outbreaks were reported by long-term care facilities (LTCF). The majority of outbreaks have been reported by LTCF in all previous non-pandemic seasons since 2005/2006 (85% of outbreaks reported by LTCF in 2005/2006, 56% in 2006/2007, 83% in 2007/2008, 55% in 2008/2009, and 90% in 2010/2011).

The reasons for this increase are not known due to the limited amount of summary level data collected on outbreaks; however, potential contributing factors to explore might include increased reporting and testing by LTCF as compared to other types of facilities or unvaccinated populations visiting high risk residents within LTCF. A comprehensive investigation of contributing factors of this trend may be warranted to determine strategies to reduce its occurrence in future seasons.

[4] Belshe, R.B. (2010). The need for quadrivalent vaccine against seasonal influenza. *Vaccine, 28 Suppl 4*, D45-53. doi:10.1016/j.vaccine.2010.08.028

Table 16. Number of reported lab-confirmed influenza outbreaks by season (excluding pandemic H1N1 season), Manitoba

Season:	Influenza A	Influenza B	Total
2005/2006	12	1	13
2006/2007	9	0	9
2007/2008	6	6	12
2008/2009	19	1	20
2010/2011	38	0	38
2011/2012	3	6	9

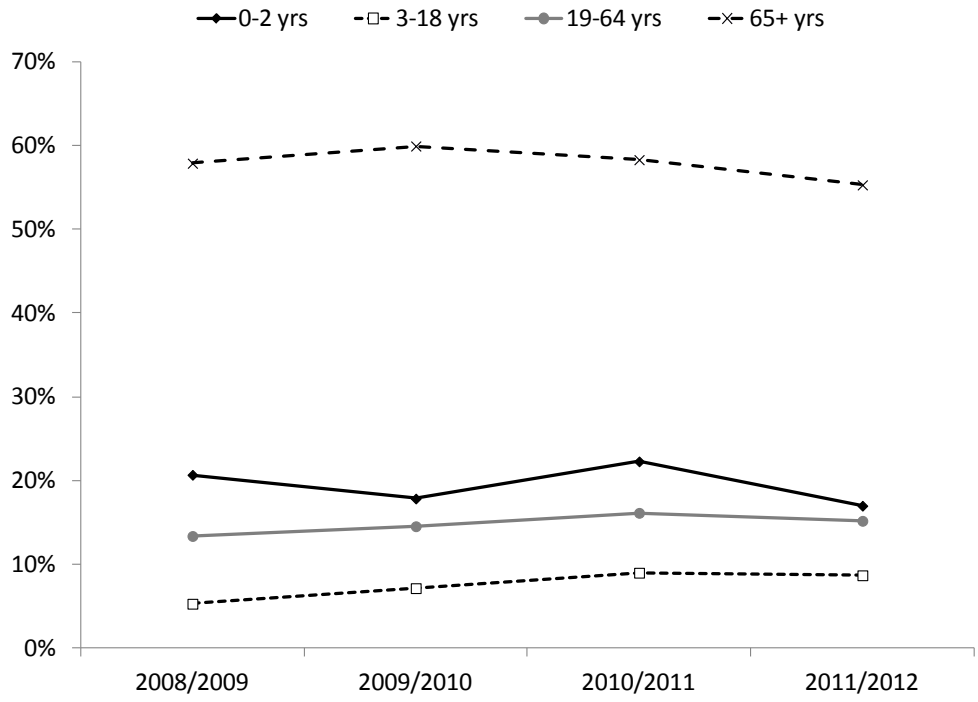
E. Vaccination Data

Uptake

The overall provincial influenza vaccine uptake for the 2011/2012 season was 20%, which is comparable to the uptake reported for the 2010/2011 season (21%) and for the 2009/2010 season (19%). Currently, Manitoba does not have provincial uptake targets; however, a provincial immunization strategy is under development, which will address this topic.

The same age group trends were observed for all of these seasons, with the lowest uptake observed among 3-18 year-olds and the highest among those aged 65 years and over (Figure 11). Between 2010/2011 and 2011/2012, the uptake has decreased in all four age categories, the largest difference observed among 0-2 year-olds (5.3% less uptake) and the smallest difference among 3-18 year-olds (0.3% less uptake).

Figure 11. Influenza vaccine uptake by age group and season, Manitoba



The highest uptake was observed in Churchill this season (27%), which was also the case last season (30%). The same was true for South Eastman having the lowest uptake both seasons (13% in 2010/2011 and 14% in 2011/2012). Between 2010/2011 and this season, uptake decreased in most RHAs except for Assiniboine, Interlake, and South Eastman, where uptake increased. This is in contrast to last season where uptake had increased in most regions compared to the previous season. The decrease in uptake within RHAs ranged from 0.2% less uptake in North Eastman to 7% less uptake in Burntwood.

Information on uptake among priority groups was not obtained apart from during the H1N1 pandemic and therefore cannot be commented on in this report.

Adverse Events Following Immunization (AEFI)

The incidence rate of AEFI reports related to the seasonal influenza vaccine is lower (17.1 per 100,000 individuals vaccinated) than the incidence rate last season (24.3 per 100,000 doses administered). It should be noted that the denominator provided for the 2011/2012 season was individuals vaccinated whereas in 2010/2011 it was doses administered. However, it can be inferred that the incidence rate in 2011/2012 would be slightly decreased if doses administered were used, as the denominator would be slightly larger.

The same discrepancy exists for age group denominators; however, for comparison purposes, the incidence rates using individuals vaccinated (2011/2012) would be a little lower if doses administered had been used (as was used in 2010/2011). The highest incidence rate was observed among the youngest age group (6 months to 2 years) both this season (38.1 per 100,000 individuals vaccinated) and in 2010/2011 (121.6 per 100,000 doses administered). The same was true for the lowest incidence rate, which was observed among the oldest age group, those aged 65 and over (11.2 per 100,000 individuals vaccinated in 2011/2012 and 9.1 per 100,000 doses administered in 2010/2011).

There were various changes made to the AEFI reporting form between this year and last year; therefore, some of the reaction type category names will have changed slightly. The highest proportion of adverse events was reported as a local reaction (52.4%) this year, whereas last year the highest was “other allergic event” (53.2%), which can be compared to “allergic or allergic-like event” this season (45.2%). There was roughly the same proportion of neurologic events reported this season (16.7%) as last season (14.5%). The number of episodes of anaphylaxis was the same this season as last (n=1, representing 2.4% this season and 1.6% last season). This season there was one reported episode of Oculo-Respiratory Syndrome; there were none last season. Finally, there were more reports categorized as “other defined event of interest” last season (40.3%) than this season (28.6%).

In terms of level of care obtained following the adverse event, the proportion of people who sought no care this season (26.2%) was comparable to last season (25.8%). In contrast to last season, the level of care sought most often this season was an emergency visit (33.3% in 2011/2012 compared to 12.9% in 2010/2011). This season there were no hospitalizations reported associated with an adverse event; last season there were four. The proportion of reports submitted with this information missing was lower this season (7.1%) than last (16.1%), which could be a reflection of the users becoming more familiar with the new reporting form, which was introduced in 2009.

There was a substantially higher proportion of AEFI reports indicating that the client had not yet recovered from the episode at the time of form completion this season (57.1%) compared to last season (27.4%). However, last season there was a higher proportion of reports with missing outcome information (29.0%) compared to this season (11.9%); consequently, it’s possible a similar trend would have been observed if there had been more complete information last season.

This observation may be skewed by the time to form completion. It would be expected that forms administered shortly after vaccine administration would be more likely to be "not recovered" compared to forms completed later on. For reports with complete information this season, the median number of days between vaccine administration and date of form completion was slightly lower among those reporting "not yet recovered" (median=4 days, range 0-94 days) than among those reporting "recovered" (median=5 days, range 0-28 days).

The proportion of reports with a Medical Officer of Health recommending no change to the immunization schedule was highest in both 2010/2011 and 2011/2012; however, it was over three-quarters this season (78.6%) while it was just under half last season (45.2%). The remaining categories were fairly similar in terms of rank except that the proportion with no recommendation decreased considerably between 2010/2011 (16.1%) and 2011/2012 (2.4%). This is an encouraging trend indicating that form completeness has improved since the introduction of this new AEFI form.

Limitations with AEFI data include the inability to determine a direct cause and effect relationship between the immunizing agent and the adverse event due to a multitude of other competing factors. For example, in this summary, people may have received other vaccines at the same time as receiving the seasonal influenza vaccine. Further, frequently missing information impedes the ability to identify patterns or issues with a specific lot number, for example. However, this issue appears to be improving. Finally, the reporting system is paper-based in Manitoba, which decreases efficiency and reliability of the data, as it is being filled out by hand and then submitted to Manitoba Health where it is later entered into an electronic database. A web-based paperless system would simplify the review process, increase data reliability, and facilitate data submissions to PHAC. This option is currently being explored by Manitoba Health.

F. Strain Characterization and Antiviral Resistance

Strain Characterization

Nationally, from September 1, 2011 to May 30, 2012, NML antigenically characterized 1311 influenza viruses received from Canadian laboratories. Of these, 239 A/H3N2 viruses were antigenically related to A/Perth/16/2009-like, 208 A/H1N1 viruses were antigenically related to A/California/07/09-like, 417 B viruses were antigenically related to B/Brisbane/60/2008-like, and 447 B viruses were antigenically related to B/Wisconsin/01/2010-like.

Again this year, the World Health Organization recommended that the trivalent influenza vaccine contain A/California/7/2009(H1N1)-like, A/Perth/16/2009(H3N2)-like, and B/Brisbane/60/2008(Victoria lineage)-like antigens for the 2011/2012 season in the Northern Hemisphere.[5] These recommendations correspond to Manitoba's characterized influenza A viruses submitted by our Provincial Public Health Laboratory. This provides evidence that the seasonal trivalent influenza vaccine provided protection against the circulating strains of the influenza A virus. However, the higher number of B/Wisconsin/01/2010-like strains reported this season may be an indication of a lineage level vaccine mismatch to this circulating strain. In Manitoba, 72% of the influenza B viruses characterized were antigenically related to B/Wisconsin/01/2010-like. A similar trend was observed in other neighbouring provinces (80% in Saskatchewan, 64% in Ontario); however, in other provinces the B/Brisbane/60/2008-like strain was more dominant. Nationally, this division was more equal with 52% of viruses antigenically related to B/Wisconsin/01/2010-like.

[5] http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/11vol37/acs-dcc-5/assets/pdf/acs-dcc-5-eng.pdf.

Antiviral Resistance

Oseltamivir and Zanamivir are the recommended antiviral treatments in Canada. Antiviral susceptibility testing by NML on Manitoba isolates indicated that Oseltamivir-resistance and Zanamivir-resistance was not observed for any of the isolates tested. This was also the case for all isolates tested in Canada. Influenza A viruses showed ongoing resistance to Amantadine, further supporting the recommendation that Amantadine should not be considered as an antiviral option in Canada.

APPENDIX A: Incidence rate of influenza A by age group

Incidence rate (per 100,000) of influenza A (excluding pandemic H1N1 season) by age group and season (July 1 – June 30), Manitoba

	1999-2000		2000-2001		2001-2002		2002-2003		2003-2004		2004-2005		2005-2006		2006-2007		2007-2008		2008-2009		2010-2011	
Age Group:	**N**	**Inc.**	**N**	**Inc.**	**N**	**Inc.**	**N**	**Inc.**	**N**	**Inc.**	**N**	**Inc.**	**N**	**Inc.**	**N**	**Inc.**	**N**	**Inc.**	**N**	**Inc.**	**N**	**Inc.**
<1	27	187.15	20	142.78	16	114.93	6	43.56	19	135.63	8	57.29	5	34.89	10	67.04	14	90.31	7	44.24	31	194.67
1-4	11	18.20	10	16.86	18	30.86	3	5.19	14	24.29	14	24.51	1	1.76	13	22.64	8	13.56	9	14.82	45	71.57
5-9	1	1.19	2	2.42	1	1.23	1	1.26	10	12.75	2	2.60	3	3.98	1	1.33	9	12.03	2	2.67	27	35.93
10-14	2	2.39	1	1.19	7	8.25	2	2.35	6	6.99	3	3.51	3	3.55	4	4.81	1	1.21	3	3.69	32	39.73
15-19	3	3.70	7	8.55	6	7.26	2	2.42	4	4.77	1	1.18	0	0.00	3	3.47	3	3.44	3	3.40	13	14.69
20-24	7	9.15	3	3.92	0	0.00	1	1.28	9	11.38	4	5.00	1	1.24	1	1.23	6	7.33	4	4.81	18	20.89
25-29	7	9.21	0	0.00	5	6.72	1	1.34	7	9.29	6	7.98	0	0.00	1	1.31	3	3.85	2	2.50	23	28.07
30-39	13	7.55	2	1.19	8	4.87	1	0.62	8	5.07	6	3.87	4	2.61	4	2.61	7	4.52	9	5.75	52	32.93
40-49	9	5.18	5	2.82	8	4.45	1	0.55	4	2.18	7	3.81	6	3.28	4	2.21	7	3.92	5	2.81	42	23.89
50-59	22	17.37	0	0.00	2	1.47	4	2.85	4	2.75	9	5.98	2	1.29	7	4.44	5	3.11	6	3.65	40	23.76
60-69	18	20.97	0	0.00	3	3.45	2	2.26	4	4.40	7	7.52	4	4.18	2	1.98	2	1.89	3	2.71	18	15.59
70-79	25	34.67	0	0.00	7	9.82	5	7.07	14	20.03	10	14.46	7	10.16	4	5.84	3	4.37	6	8.72	33	47.87
>79	102	235.09	1	2.25	20	43.72	11	23.39	48	100.11	76	155.71	29	58.22	17	33.72	11	21.45	27	51.91	100	189.93