

## SUMMARY REPORT: 2006-2007 INFLUENZA SEASON CITY OF HAMILTON

**Sources of data:** *RDIS and iPHIS, City of Hamilton  
Rapid Risk Factor Surveillance System (RRFSS), City of Hamilton  
Flu Watch, Public Health Agency of Canada,  
Community Influenza Vaccination Clinic Report*

Influenza illness and preventative vaccination practice is monitored in the City of Hamilton using the following data:

- Notification of laboratory confirmed influenza cases to Public Health
- Submissions and results of laboratory viral testing from regional laboratory.
- National-level strain identification
- Outbreaks of influenza in residential institutions
- Influenza-like illness in patients at sentinel physician practices
- Absenteeism in schools and workplaces in the City of Hamilton
- Immunization coverage of staff and residents in residential institutions and hospitals
- Total population immunized by community clinic location and total distribution of influenza vaccine to external agencies
- Self-reported vaccination coverage assessed by public health telephone survey (RRFSS)

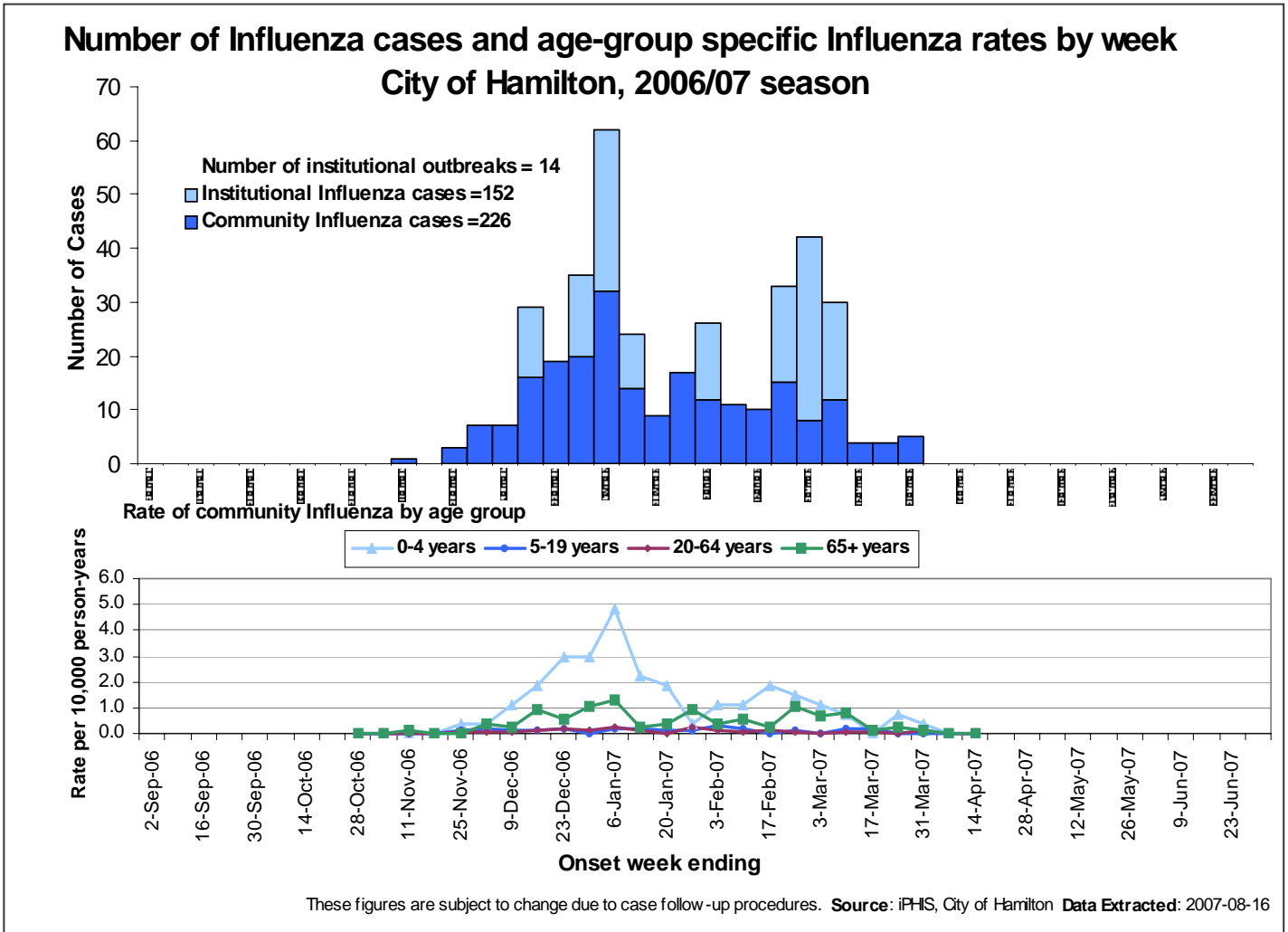
### ***Overview of the 2006 - 2007 Influenza season reported cases***

A total of 226 laboratory confirmed community cases of Influenza were reported in the City of Hamilton during the 2006-2007 influenza season. The season was predominantly comprised of Influenza A. Of the 226 isolates from these cases, 224 (99.1%) were identified as Influenza A, and 2 (0.9%) were Influenza B. For the remainder of this report, the two Influenza B cases have been excluded from the analysis unless otherwise specified. There were 152 cases of Influenza A, both lab-confirmed and epi-linked, among institutionalized residents (institutional cases) that arose from 14 declared institutional outbreaks. These institutional outbreak-related cases accounted for 40% of the total number of Influenza cases in the City of Hamilton.

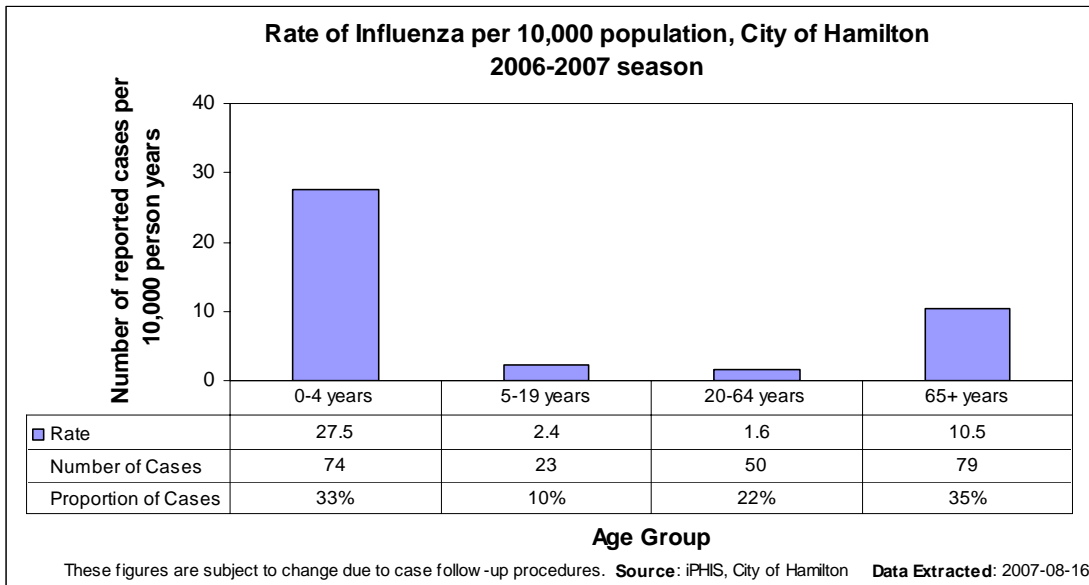
The peak in reported cases for 2006-2007 occurred the week ending January 6, 2007, with 32 community cases and 30 institutional cases (see Figure 1). There was a visible second wave of institutional-outbreak related cases peaking in the week ending March 3, but no pronounced second wave of community cases. Eighty-percent of the total community cases occurred by February 24, whereas 80% of the institutional cases did not occur until March 3.

More than half (56%) of the reported cases in the 2006/07 season were male; while 44% were female. The largest proportion of Influenza cases occurred in persons more than 64 years of age (35%) and children aged 0 to 4 years (33%). Age-specific rates of influenza were highest in children 0 to 4 years old (27.5 cases per 10,000 person years) followed by adults over 64 years of age (10.5 cases per 10,000 person years). The rate and total number of reported influenza cases in each age group are summarized in Figure 2.

The weekly rate curve of Influenza among cases aged 0-4 years is consistent with the epidemic curve of number of reported community Influenza cases (see Figure 1). This age group had the highest rate of Influenza throughout most of the season. The rate among adults aged 65+ years peaked the first weeks of January and March 2007, the same weeks as the highest number of institutional influenza cases.



**Figure 1**



**Figure 2**

### Comparison to Historical Data: 1997/98 to 2006/07 Influenza seasons

The 2006/07 influenza A season was 21 weeks in duration, beginning in mid-November 2006 and ending March 31, 2007. The length of the 2006/07 season was greater than the 10 year historical median of 19 weeks, however was consistent with data collected for the previous 3 seasons (21 weeks, 21 weeks and 19 weeks respectively). Similarly, the 226 community influenza cases in 2006/07 was more than double the 10 year historical median of 73 cases, but below the median number of cases reported between 2003/04 and 2005/06 (257 cases) (see Figure 3).

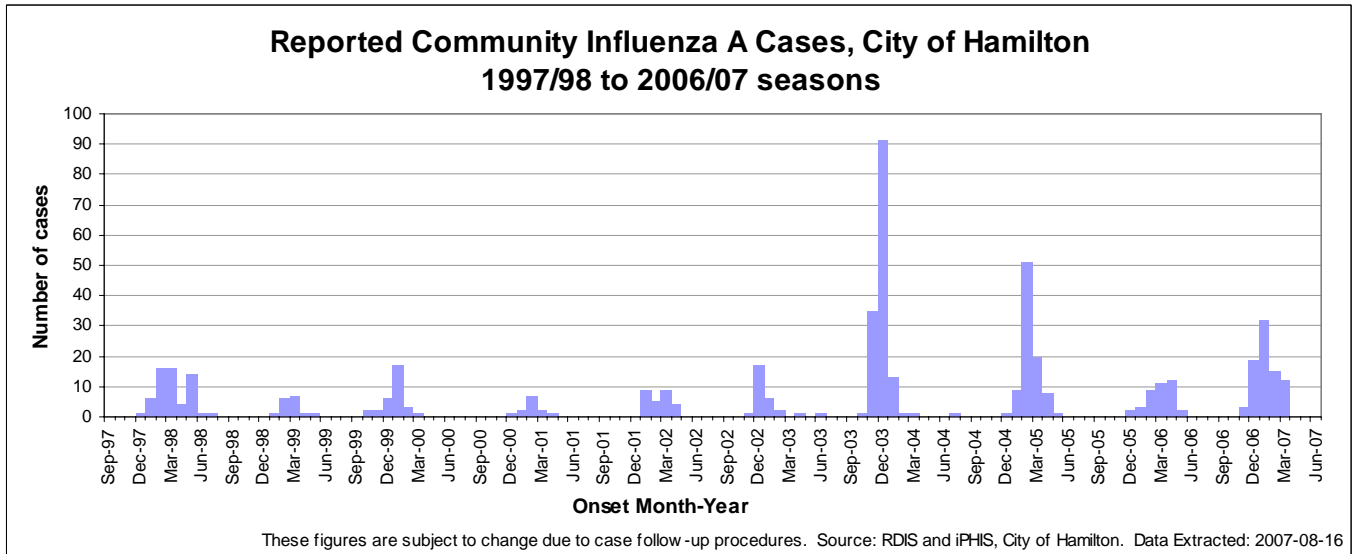


Figure 3

Two cases of Influenza B were reported in Hamilton in 2006/07. Both were community cases with an onset of symptoms in January 2007. The absence of Influenza B cases this season is notable compared to the high number of cases reported in 2005/06 (90 cases) and 2004/05 (99 cases) (see Figure 4). The high number of cases in 2005/06 may be due in part to the 2005-2006 influenza vaccine which did not match the majority of Influenza B isolates characterized by the PHAC that year. (Source: *CCDR Vol 32, 15 June 2006: Statement on Influenza vaccination for the 2006-2007 season.*)

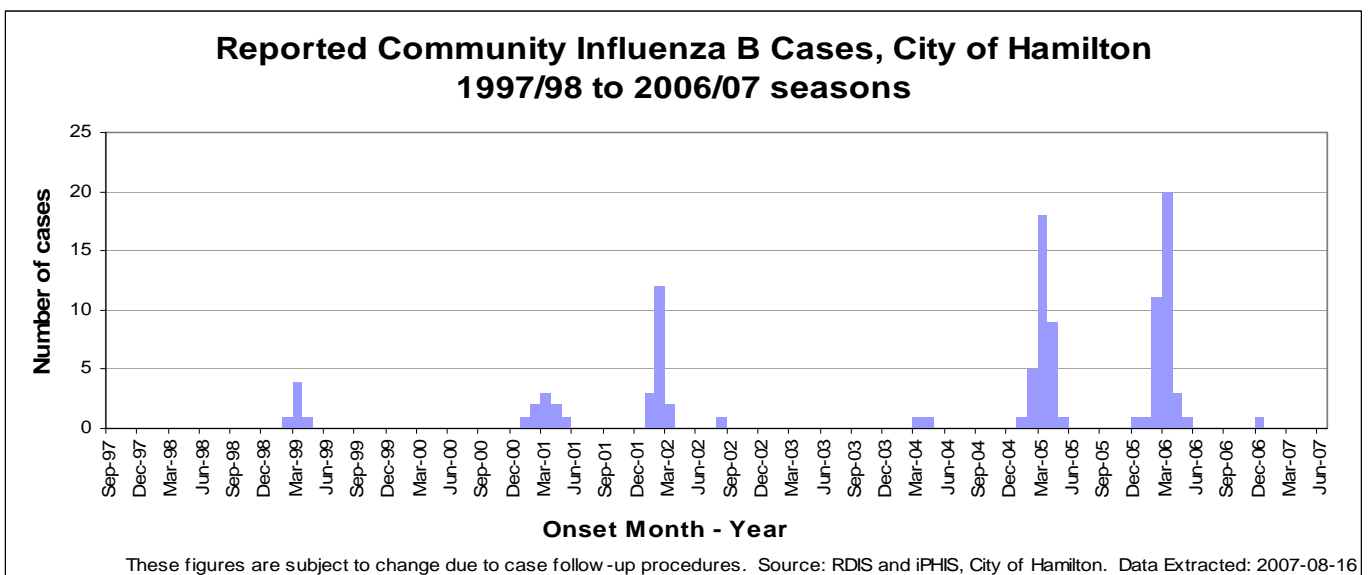
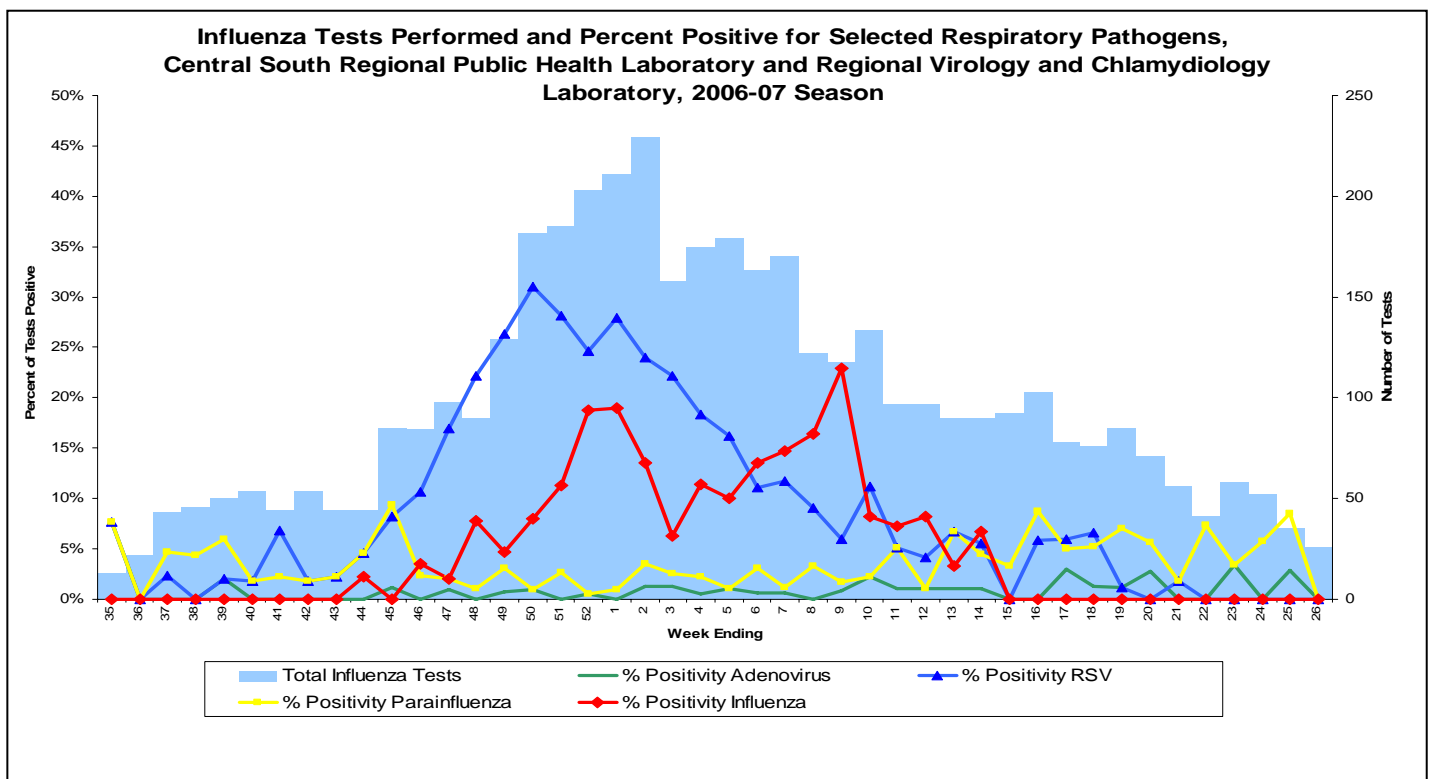


Figure 4

## Results of Viral testing from Regional Laboratories

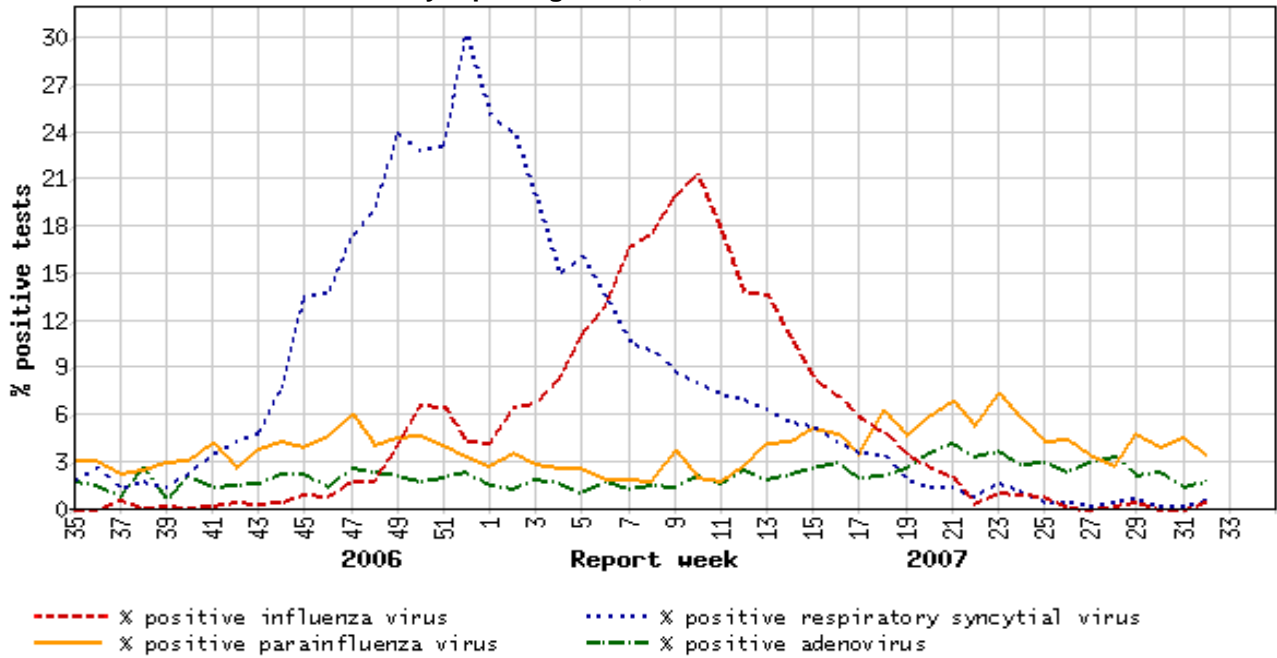
The City of Hamilton Surveillance Unit compiles the reported results of respiratory viral testing of naso-pharyngeal swabs at the Regional Virology and Chlamydiology Laboratory and the Central South Regional Public Health Laboratory. Together, these laboratories are the primary service provider for City of Hamilton residents, but also provide service to surrounding regions.

Figure 5 shows the weekly number of swabs tested for respiratory pathogens (blue bars) and also compares proportion of swabs that tested positive for Influenza virus to the proportion that tested positive for Adenovirus, Respiratory Syncytial virus (RSV), or Parainfluenza virus. Of the 4 pathogens, the 2006/07 season was predominantly comprised of Influenza and RSV detections. The initial visual rise in number of swabs tested corresponds with a rise in percent that test positive for RSV at around the week ending November 11<sup>th</sup> (week 45). The proportion of tests that were positive for RSV showed a relatively slow steady decline from a peak in the week ending December 16<sup>th</sup> (50). A larger jump in swabs tested starts around week ending December 9th (49) and peaks week ending (2) January 13th which closely corresponds to the first rise in percent positivity for Influenza virus. There was a second rise in percent positivity for Influenza virus which peaked on week ending February 3rd (5). As expected, these two peaks coincide with the peak in reported Influenza cases and the later peak in reported institutional Influenza cases for Hamilton (see Figure 1). The temporal pattern observed for percent positive RSV tests was similar to that reported for Canada (see Figure 6), however both the number of swabs tested and the percent positivity to Influenza virus peaked much earlier in the Hamilton region than for the country (see Figure 7).



**Figure 5**

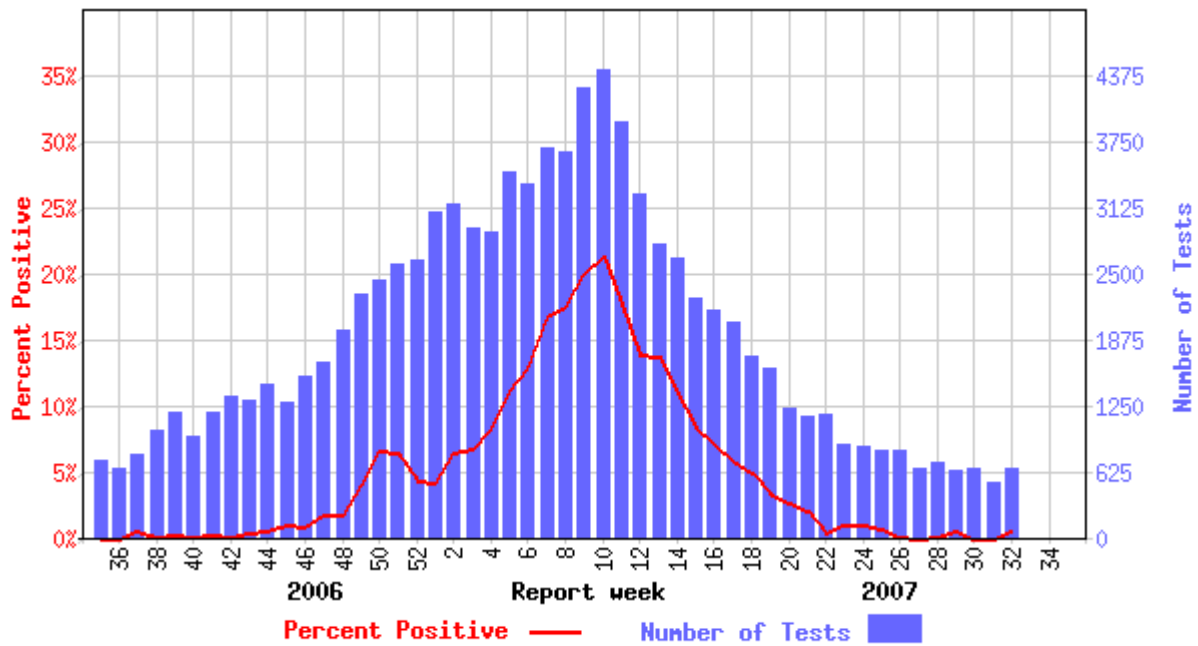
**Percent positive influenza tests, compared to other respiratory viruses, Canada, by reporting week, 2006-2007**



Source: FluWatch: (Weeks 31 & 32) July 29, 2007 to August 11, 2007 Please note, the above graph may change as late returns come in.

**Figure 6**

**Influenza tests reported and percentage of tests positive, Canada, by report week, 2006-2007**

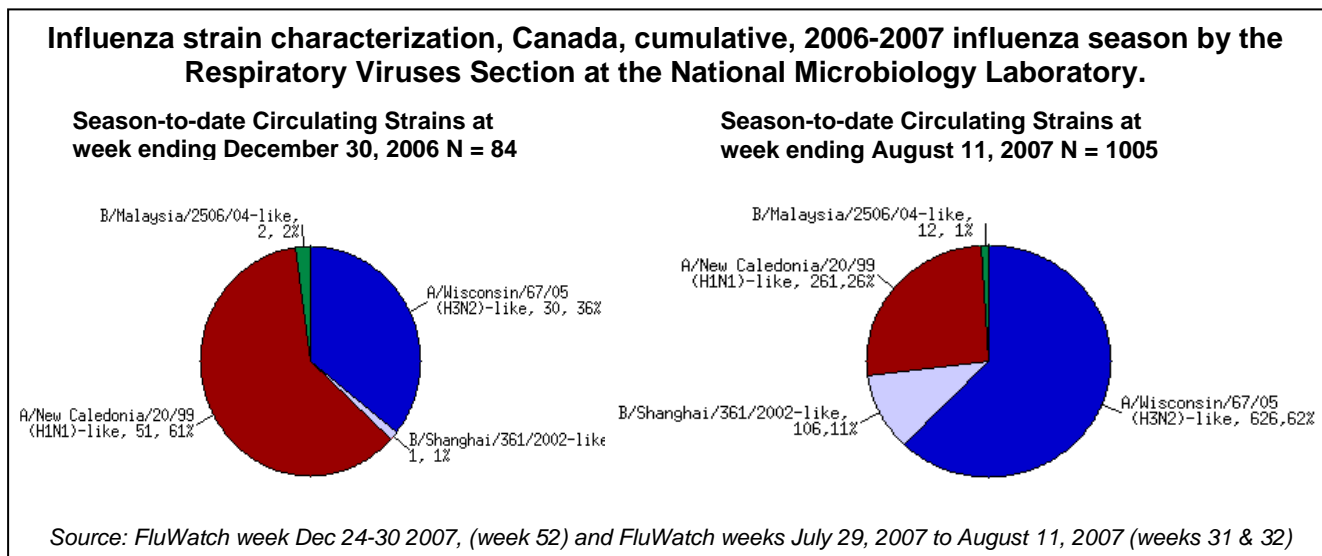


Source: FluWatch: (Weeks 31 & 32) July 29, 2007 to August 11, 2007 Please note, the above graph may change as late returns come in.

**Figure 7**

## Circulating Strains

For the 2006-2007 season in Canada, NACI recommended that the trivalent vaccine contain A/New Caledonia/20/1999 (H1N1)-like, A/Wisconsin/67/2005 (H3N2)-like, and B/Malaysia/2506/2004-like virus antigens. (Source: *CCDR Vol 32, 15 June 2006: Statement on Influenza vaccination for the 2006-2007 season*). Early on in the season, at approximately the time of the first peak of influenza cases in Hamilton, the National Microbiology Laboratory reported that 60% of all isolates submitted in the 2006/07 season-to-date were A/New Caledonia/20/99 (H1N1)-like strain (see Figure 8). For the entire 2006-2007 influenza season, 62% of all isolates whose subtypes were identified as Influenza A/Wisconsin/67/05 (H3N2)-like strain, and 26% of isolates typed were Influenza A/New Caledonia/20/99 (H1N1)-like strain. It is possible that the two distinct peaks in the influenza epidemic curve for the 2006/07 season (see Figure 1) are the result of two different strains of Influenza A circulating in Hamilton. Only a single isolate from the City of Hamilton had the subtype identified from a case that had an onset in March 2007; it was identified as H1N1. Eleven percent and 1% of isolates characterized were Influenza B/Shanghai/361/2002-like and Influenza B/Malaysia/2506/04-like, respectively.

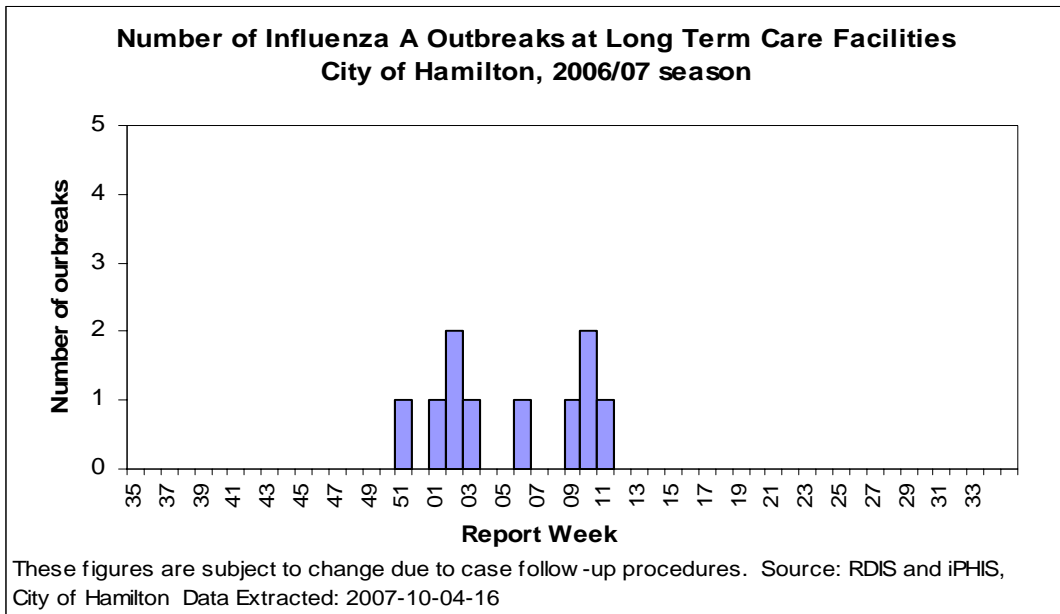


**Figure 8**

## Outbreaks in Residential Institutions

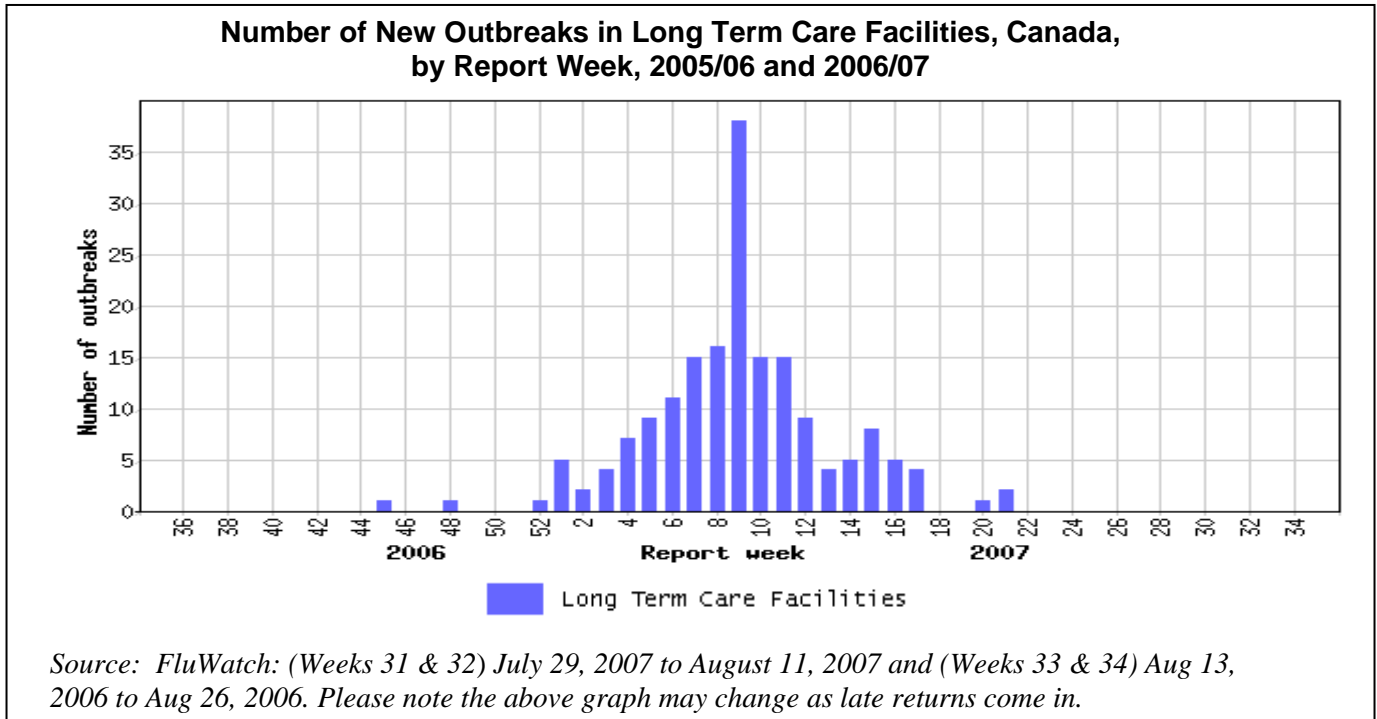
Outbreaks in residential institutions are defined as two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case of influenza. (Source: *FluWatch 2007-05-08*).

In the City of Hamilton, there were 14 outbreaks of Influenza A in residential institutions compared to a median number of 9 over the previous 4 seasons. Ten of these 14 outbreaks this season were reported in long-term facilities (LTCF). This was a slight increase in the number of LTCF outbreaks as compared to the 2005-2006 season, when 6 LTCF influenza A outbreaks were recorded. Similarly, the number of LTCF outbreaks reported throughout Canada in the 2006-2007 season was slightly higher (n=178) than the number reported in the previous year (n=164).



**Figure 9**

In the current season, the outbreaks occurred during weeks 51 in 2006 to 11 in 2007, visually clustering in weeks 1-3 and 9-11 (see Figure 9). In weeks 1-3, four of the eleven nationally reported outbreaks were in Hamilton. The 9-11 week cluster corresponds to the peak in reported outbreaks in LTCF throughout Canada (see Figure 10).



**Figure 10**

This season there were no Influenza B outbreaks reported compared to 1 outbreak last season and compared to a median of 1 over the previous 4 seasons.

## Sentinel Surveillance: Influenza-like Illness

For the purposes of influenza surveillance, influenza-like illness (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
- In children under 5 years of age, gastrointestinal symptoms may be present
- Fever may not be prominent in persons less than 5 years of age or over 65

(Source: FluWatch 2007-05-08)

In the City of Hamilton, rates of influenza-like illness (ILI) among patients visiting two sentinel physician's offices were recorded on a weekly basis. [Note: Due to the low number of weekly patient visits under surveillance, rates of ILI are unstable]. The rate of ILI during consultation in 2006/07 appeared to decrease from the year before and ranged between 0 and 6% of visits under surveillance with little obvious seasonal pattern (see Figure 11). In Canada, the highest reported rates of ILI in 2006/07 occurred the first week of January (week 1) and March (week 9) 2007 (see Figure 12).

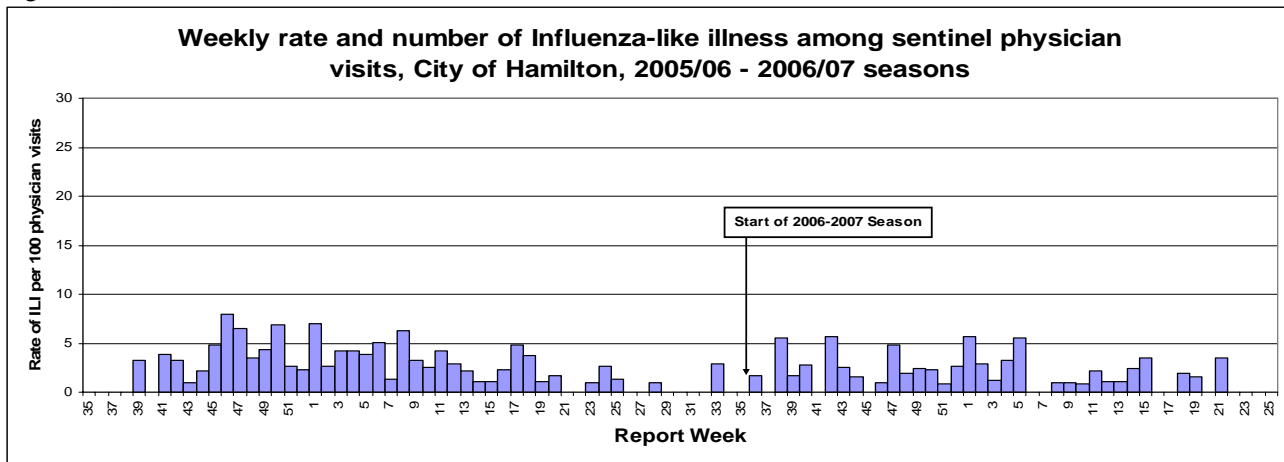


Figure 11

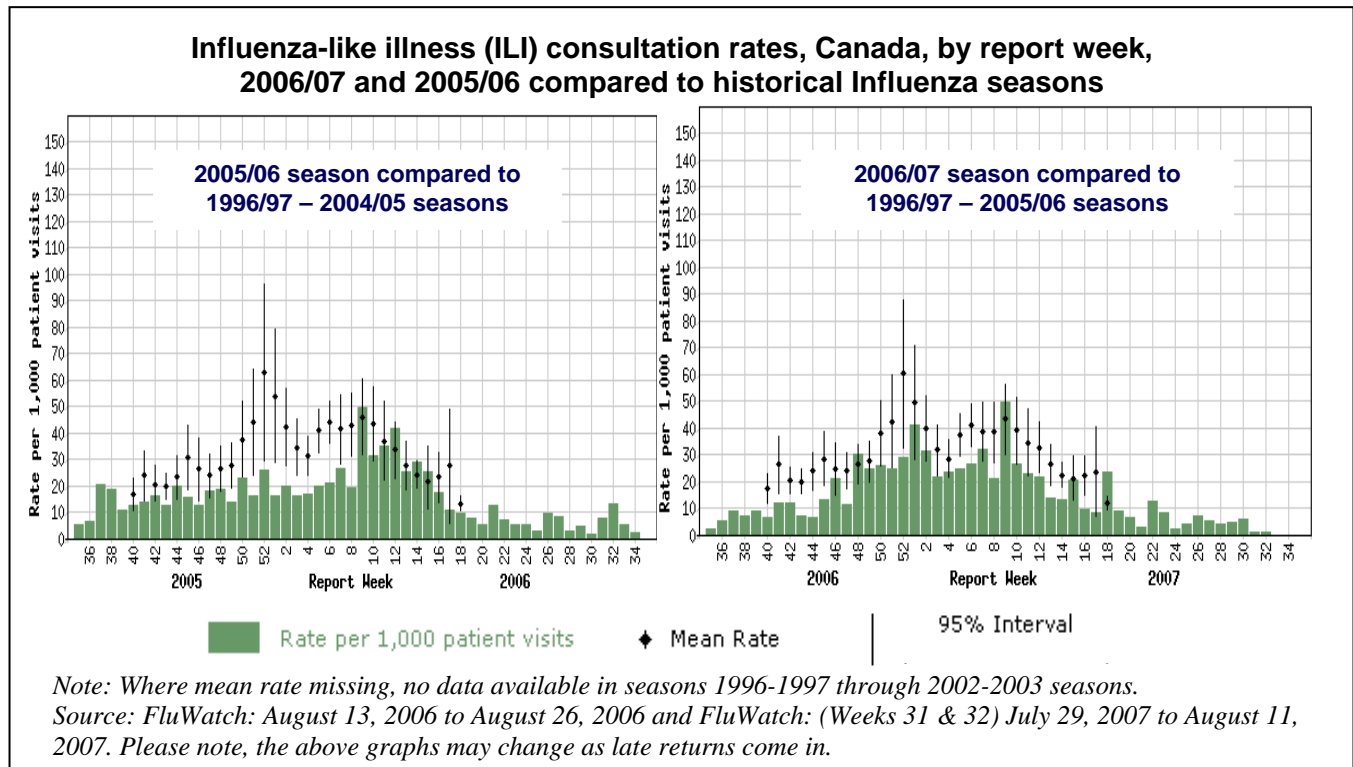


Figure 12

### Sentinel Surveillance: Absenteeism

During the course of the 2006-2007 influenza season, the City of Hamilton Surveillance Unit was able to monitor weekly absenteeism in 42 daycare centres, 53 elementary schools governed by the Hamilton Wentworth Catholic District School Board and 1 workplace in the City, recorded as the proportion of students or workers absent due to illness over the course of each week.

In general, the temporal trend of absenteeism in daycares was similar to that in elementary schools during the 2006-2007 influenza season and these trends follow the epidemic curve for community influenza cases (see Figure 13). We compared absenteeism in the influenza season to the non-season period by defining the influenza season as any week with more than one influenza case and excluding a 2 week buffer between season and non-season weeks. We also excluded early September and late June values. For the Hamilton-Wentworth Catholic District School Board (HWCDDB) (*time under surveillance was mid-February 2006 to mid-June 2007*) mean influenza season absenteeism was 5.3% compared to mean non-season absenteeism of 2.3% with an upper-expected threshold of 2.9% (mean + 2 standard deviations). Absenteeism in the HWCDDB exceeded this threshold on the week ending November 11, 2006. For sentinel day care absenteeism (*time under surveillance was mid-Sep 2004 to mid-June 2007*), influenza season absenteeism had a mean of 5.4% and a non-season absenteeism mean of 3.6% with a 5.2% upper expected threshold (note that the values were not normally distributed). The trend in absenteeism for the workplace remained relatively stable throughout the entire influenza season.

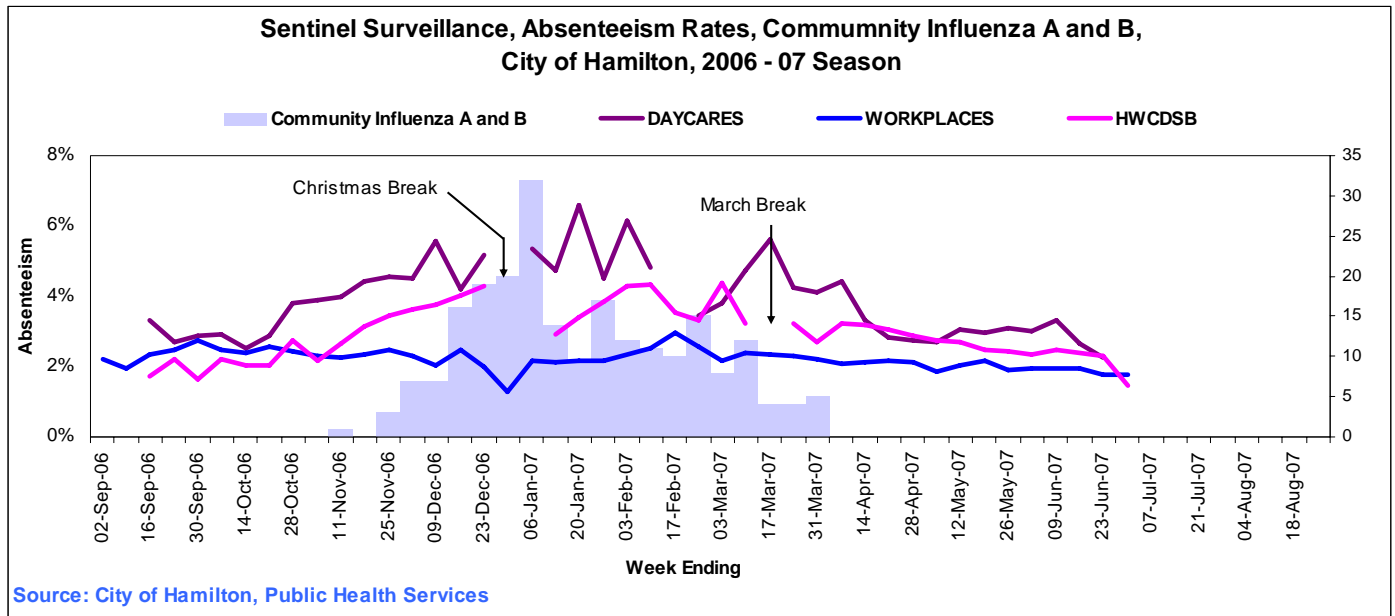
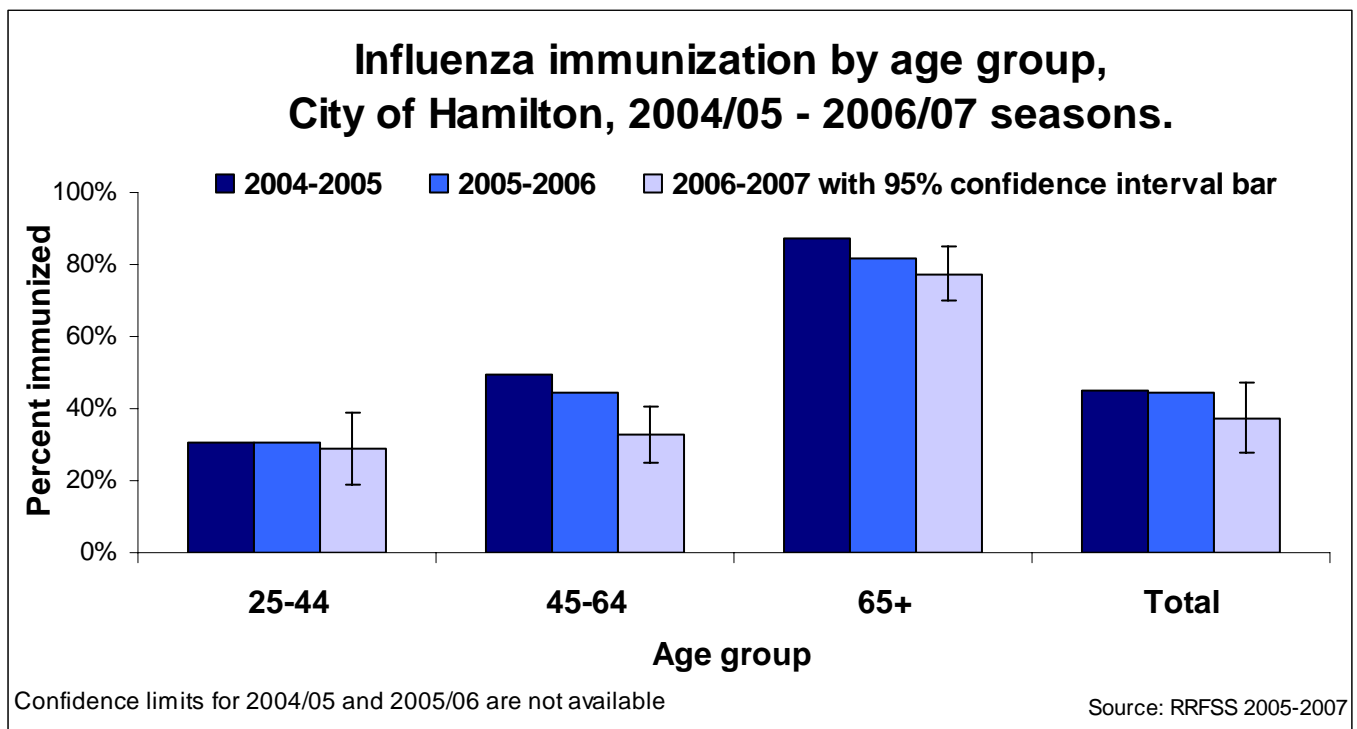


Figure 13

## *Influenza Vaccine Coverage*

Estimates on the proportion of Hamilton residents immunized against influenza are obtained from the Rapid Risk Factor Surveillance System (RRFSS), a telephone survey administered to adults aged 18 years or older. Between January and April, one individual per randomly selected household is asked whether they have received the vaccine for the current influenza season. The 2006-07 estimates include 95% confidence intervals between which the true population proportion is likely to lie, however 95% confidence limits are not available for previous seasons. In addition, RRFSS employs a small sample size and estimates are statistically adjusted to account for household (not individual) level sampling, therefore results must be interpreted with caution.

Overall, approximately 40% of respondents aged 18 and older surveyed in the City of Hamilton indicated they had been immunized against influenza for the 2006/07 season. Approximately 80% of adults aged 65+ years received the influenza vaccine. There appears to be a slight downward trend in vaccination coverage over the past three seasons, however these estimates are based on small sample size and the trend may not be statistically significant. Data for vaccination of adults aged 18-24 years have not been presented due to the small sample size for this age group. Immunization coverage by age group is summarized in Figure 14.

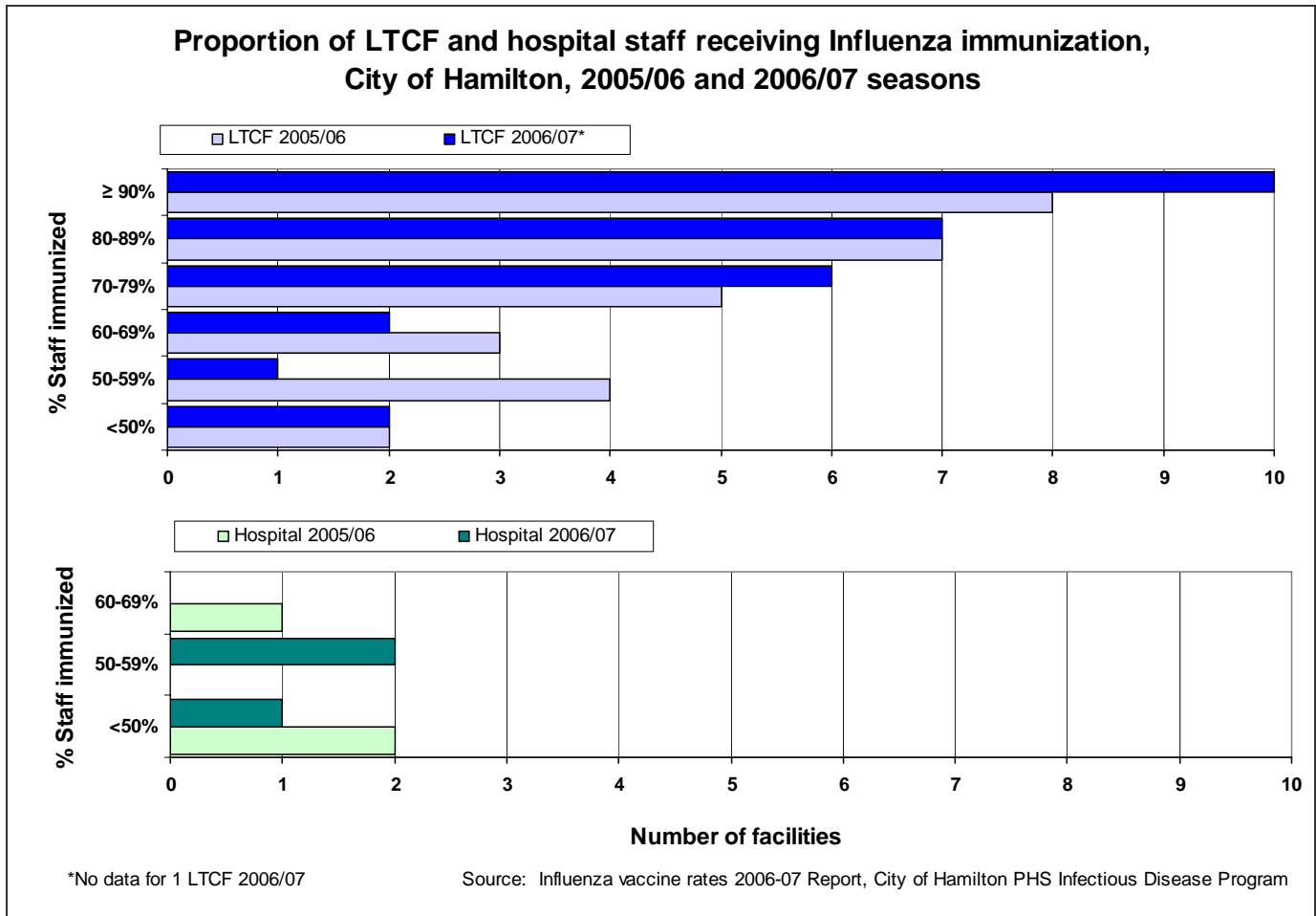


**Figure 14**

## *Influenza Vaccine Coverage in Long Term Care Facilities and Hospitals*

Local hospitals and LTCFs in Hamilton provide to Public Health Services – Infectious Disease Program the proportion of their staff and their residents who have been immunized against influenza. These data have been received every season since 2003/2004. Among the 29 long-term care facilities (LTCF) in the City of Hamilton, about a third (10 institutions) attained staff immunization coverage of 90% or more during the 2006-2007 influenza season (see Figure 15). This was an increase of 2 LTCF from the year before. Relatively low rates (< 50%) of influenza immunization were reported in only 2 institutions. One long-term care institution provided no data for this past season.

Staff in hospitals generally showed a lower percentage of vaccine coverage than those of LTCF; between 33% and 57% of staff were immunized against influenza in 3 City of Hamilton hospitals.



**Figure 15**

Compared to staff of hospitals and LTCF, vaccine coverage among LTCF residents was relatively high. Between 90% and 100% of residents in 25 of 29 LTCF in the City of Hamilton were immunized against influenza during the 2006-2007 season, while between 80% and 89% of residents in the other 3 facilities were immunized.

### ***Community Influenza Vaccination Clinic Report 2006-2007***

Each year, Public Health Services offers community influenza vaccination clinics located across the city of Hamilton at which basic demographic information on individuals vaccinated is collected. Data collected include each clinic attendee's gender, age-range and priority (high-risk / general population) level. Since the high of almost 26,000 doses for the 2003/04 season, there has been a downward trend in vaccines administered by public health (see Figure 16). In the fall of 2006 there was a delay in the availability of the influenza vaccine for the upcoming season. Priority was given to facilities that cared for persons at high risk for influenza and influenza-related complications (i.e. long-term care homes, hospitals, physicians) and health units were instructed to defer influenza clinics that were open to the general public until November 15, 2006. During the 2006/07 season, about 20,500 individuals were vaccinated at these clinics, with 5,554 (27%) reported as persons who are at high risk of influenza-related complications. This includes 122 children less than 2 years, 644 children aged 2-4 years, 4,072 persons aged 5-18 years, 11,929 persons aged 19-64 years and 3733 persons aged 65 years or older. Among those identified as being at 'high risk', the highest proportion of individuals were aged 65+ years (67%) followed by those aged 19-64 years (27%). Among all age-groups, the 19-64 years age group had the highest number of individuals immunized against influenza (about 12,000 or 87%) of which about 1500 (13%) were from a high-risk group.

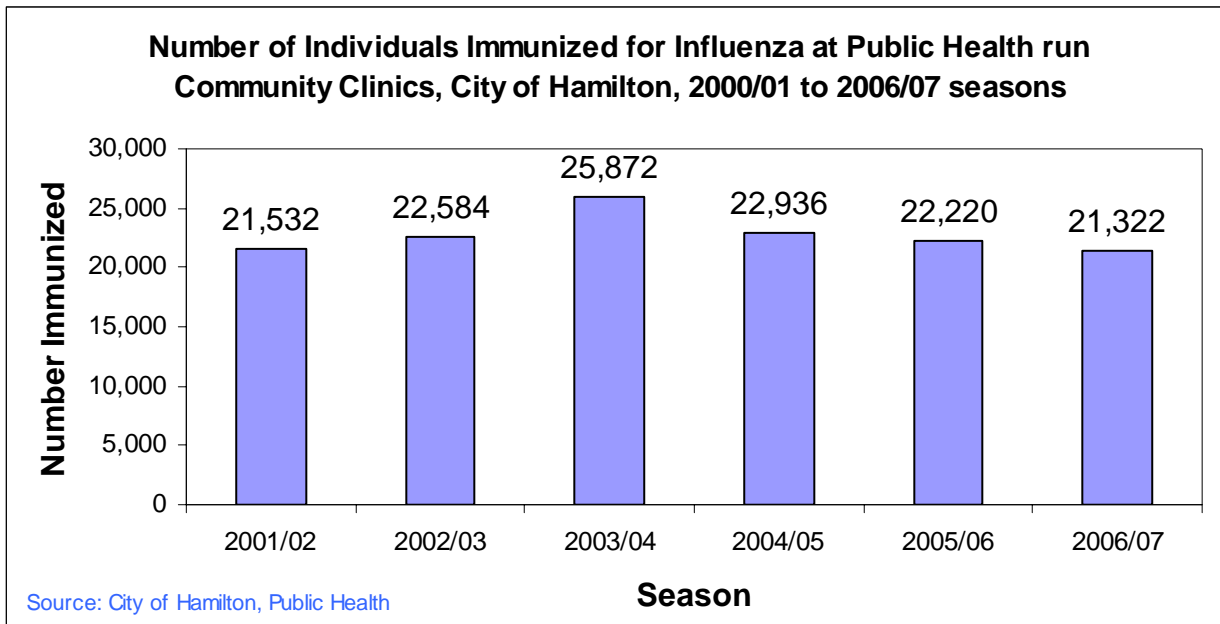


Figure 16

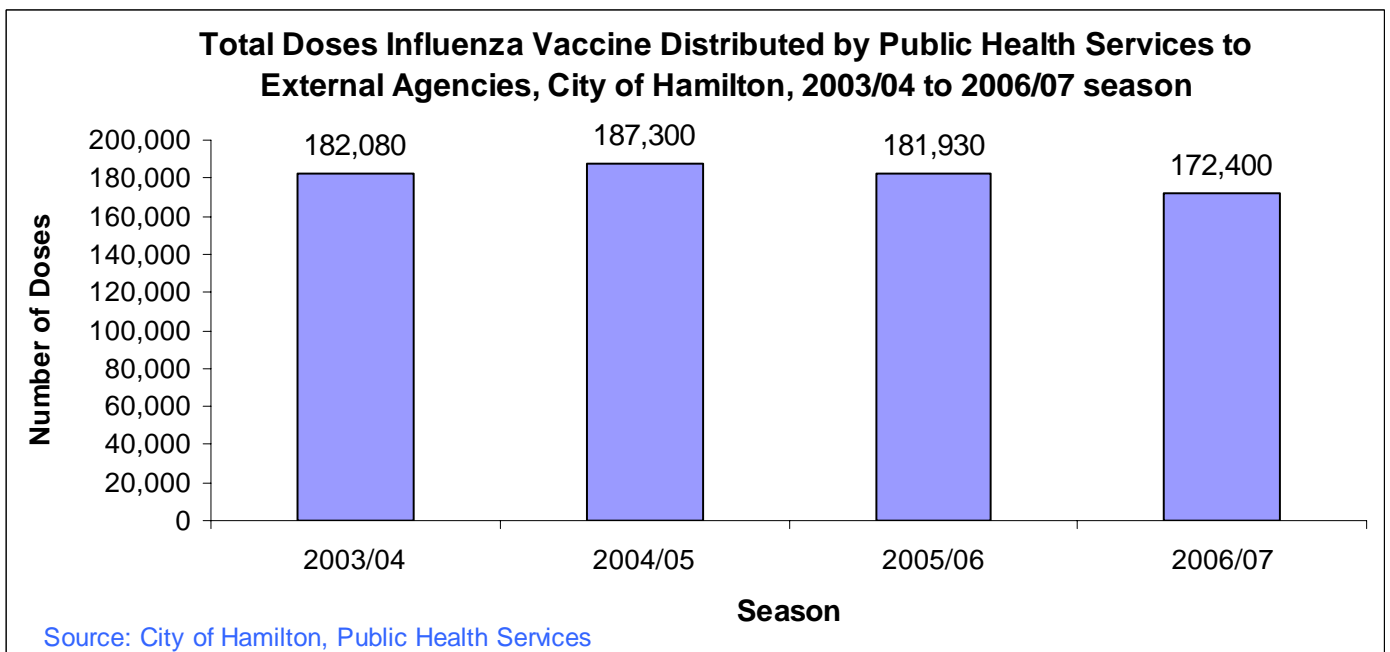


Figure 17

Public Health distributes all influenza vaccine doses. Vaccine distribution to external agencies/physicians (agencies other than Public Health run clinics and vaccination of City of Hamilton employees), is summarized in Figure 17. Since 2004, there has been a decrease in the total number of doses of influenza vaccine distributed by Public Health Services to external agencies from about 187,000 doses to 172,000 doses – a difference of about 15,000 doses or 8% (Note: Data for the actual use of distributed vaccine by physician offices is not yet available for the 2006/07 season). The decrease in influenza vaccine distribution, supported by the downward trend in vaccines administered by Public Health Services is consistent with the slight downward trend in vaccination coverage over the past three years among adults surveyed in the City of Hamilton. Based on anecdotal reports shared by various program managers responsible for the ‘Universal Influenza Immunization Program’ in public health units across the province during MOHLC-led teleconferences, the decrease in influenza immunization coverage during the 2006/07 season is not unique to Hamilton Public Health Services.