Surveillance Report of the 2004/05 Ontario Influenza and Respiratory Infection Outbreak Surveillance Season

Background

Under the Ontario Regulation 559/91 and amendments to the *Health Protection and Promotion Act (HPPA)*, "Respiratory Infection Outbreaks in Institutions" were included among the specified Reportable Diseases in 2001. As a result, since the 2001/02 influenza and respiratory infection outbreak surveillance season, all respiratory infection outbreaks in institutions, irrespective of the causative organism (including those of unknown cause), are reported to the Public Health Division (PHD) of the Ministry of Health and Long Term Care (MOHLTC). Reporting of non-influenza respiratory infection outbreaks in institutions is necessary to assess the complete epidemiology of respiratory infection outbreaks, which is essential for adequate and timely control measures.

Data Summary

There were a total of 1,125 confirmed institutional respiratory infection outbreaks reported during the 2004/05 surveillance season (September 1, 2004 – August 31, 2005), of which 584 were attributed to influenza. Influenza A was determined to be the causative organism in 485 outbreaks, influenza B in 53, combined influenza A and B in 21 outbreaks and influenza B and other organisms in 5 outbreaks. Influenza A was combined with other organisms (parainfluenza virus (PIV), respiratory syncytial virus (RSV), rhinovirus, and adenovirus) in 20 other outbreaks. A number of other non-influenza organisms were detected in 129 outbreaks. The causative organism was unknown for 412 (36.6%) institutional respiratory infection outbreaks.

During the 2004/05 influenza and respiratory infection outbreak surveillance season (corresponding to national surveillance dates of October 30, 2004 and April 30, 2005), the Centre for Infectious Disease Prevention and Control (CIDPC) of the Public Health Agency of Canada (PHAC) reported 12,670 isolates tested positive for influenza, of which 10,688 (84.4%) were influenza A and 1,982 (15.6%) were influenza B. These figures represented a 14.7% increase in the total number of positive influenza isolates as compared to Canada's 2003/04 season, when a total of 11,045 positive specimens were reported.

Between October 1, 2004 and April 30, 2005, a total of 5,329 laboratory-confirmed influenza cases were reported through the Reportable Disease Information System (RDIS). This was a 0.5% decrease in influenza cases reported as compared to the 5,353 cases of laboratory- confirmed influenza reported during the same time period in the previous season. Of these cases, 4,104 (77%) were influenza A and 1,225 (23%) were influenza B. Peak activity of influenza cases in Ontario occurred in February, with a total of 2,222 laboratory-confirmed cases reported. Of these, 1,848 (83.1%) were influenza A.

Introduction

Influenza has been a reportable disease in Ontario since 1923 and a provincial surveillance program is conducted annually. Respiratory infection outbreaks in institutions have been reportable since 2001.

The objectives of the Ontario influenza and respiratory infection outbreak surveillance in institutions during the 2004/05 surveillance season were:

- To facilitate the timely detection of influenza in Ontario.
- To identify the strains of influenza circulating in Ontario, for comparison to national and international viral activity, and to monitor antigenic drift and shift.
- To determine the epidemiology (e.g. incidence and prevalence) of influenza and other respiratory illnesses (endemic, emerging and re-emerging), including the identification of high-risk groups for the implementation of appropriate control measures.
- To determine the duration and severity of the influenza season.
- To assess the effectiveness of outbreak control measures.
- To provide accurate and timely information on influenza and other respiratory infection activity to our stakeholders at the provincial, national and international levels.

2004/05 was the fifth season for the *Universal Influenza Immunization Program* (UIIP), in which all Ontarians over the age of 6 months who live, work, or go to school in Ontario were eligible to receive free influenza vaccine. A continued emphasis of this program was the immunization of people at high-risk for complications associated with influenza including:

- Healthy children aged 6 months to 23 months
- Adults and children with cardiac or pulmonary disease or chronic conditions such as diabetes mellitus, cancer, immunodeficiency, or immunosuppression
- People of any age who were residents of nursing homes and other chronic care facilities
- People ≥ 65 years of age
- Children and adolescents (aged 6 months to 18 years) receiving long term acetylsalicylic acid (ASA) therapy

Methods

The PHD of the MOHLTC used various data sources to track influenza activity in Ontario. The five components of influenza surveillance for the 2004/05 season included the following:

- Laboratory surveillance, conducted by PHAC's Centre for Infectious Disease Prevention and Control (CIDPC) in conjunction with the National Microbiology Laboratory;
- RDIS reports of laboratory confirmed influenza cases across Ontario;

- Reports of institutional respiratory infection outbreaks from health units across Ontario;
- Influenza activity level reports from health units across Ontario;
- Sentinel Physician influenza-like illness (ILI) consultation rates by PHAC/College of Family Physicians of Canada (CFPC) as part of the *FluWatch* Program.

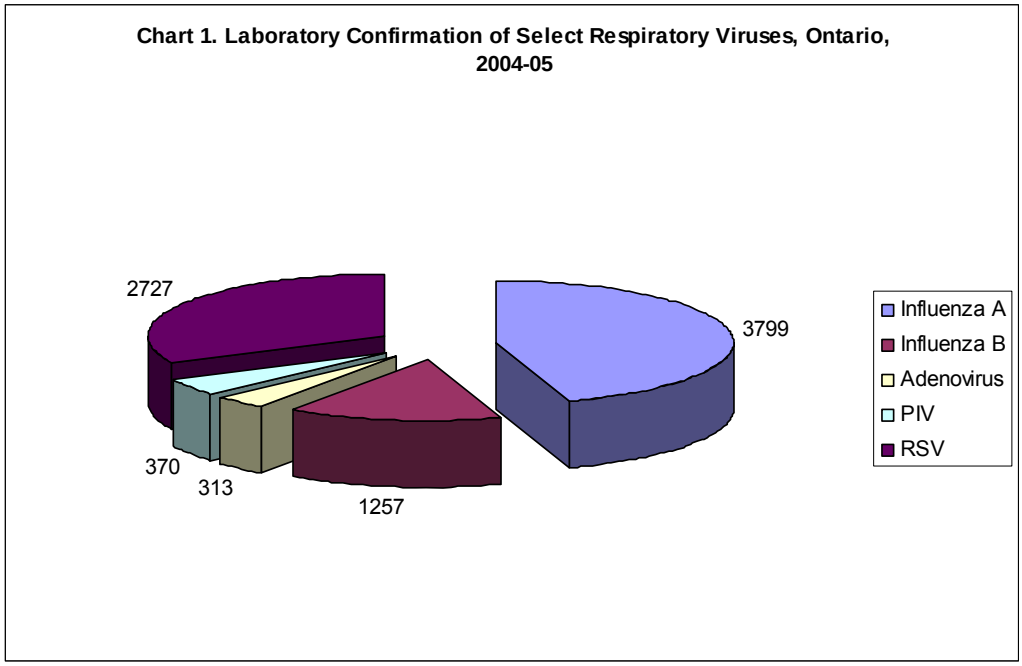
In addition to the above, data regarding influenza vaccination rates for residents and staff of Long-Term Care Homes (LTCHs) formerly Long-Term Care Facilities and hospital staff were included in this report.

1. Laboratory Surveillance of Influenza

The laboratory surveillance component involved the reporting of positive influenza and other respiratory virus isolates from select Ontario laboratories, to CIDPC. Reports included results from both outbreak-associated and sporadic cases of respiratory infection. These data are then reported back weekly to the PHD of the MOHLTC. During the 2004/05 influenza surveillance season, 17 laboratories in Ontario participated in laboratory surveillance. The participating laboratories were: the Central Public Health Laboratory (Toronto), the Toronto Medical Laboratory, Kingston, Timmins, Windsor, Thunder Bay, Sault Saint Marie, Orillia, Sudbury, Ottawa Public Health Laboratory, Peterborough, London Public Health Laboratory and Hamilton. The hospital-based laboratories are the Children's Hospital of Eastern Ontario (Ottawa), the Hospital for Sick Children (Toronto), St. Joseph's Hospital (London), and Sunnybrook & Women's College Health Sciences Centre (Toronto). All laboratory data were published in the *Ontario Influenza Bulletin* throughout the season.

Results

Chart 1. Laboratory Confirmation of Select Respiratory Viruses, Ontario, 2004-05

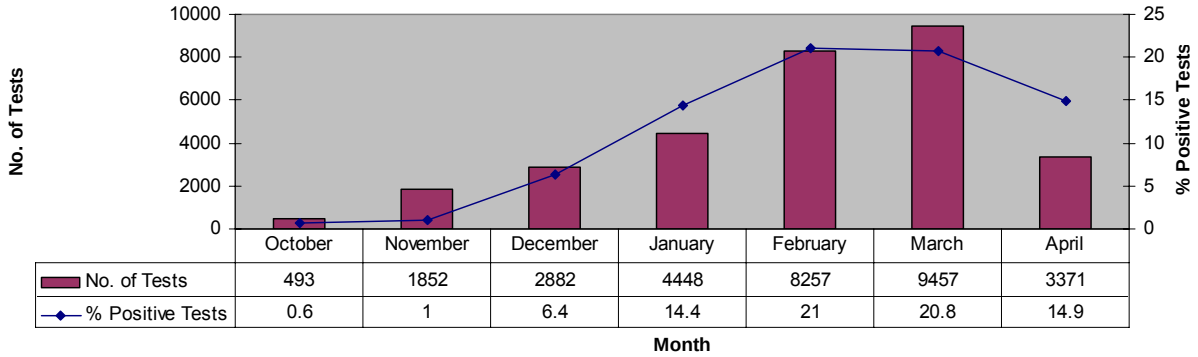


Source: Centre for Infectious Disease Prevention and Control

Influenza, Ontario

During the 2004/05 Ontario influenza season, influenza activity began in late November 2004 and peaked in early March 2005. Ontario's participating laboratories reported a total of 30,760 specimens tested between the week ending October 30, 2004 and April 30, 2005 (the period during which the national and Ontario's surveillance period most closely overlapped). Of these, a total of 5,056 (16.4%) tested positive (3,799 influenza A, and 1,257 influenza B) (Figure 1). This represented a 17.6% decrease in positive influenza A isolates and a 2,966% increase in positive influenza B isolates, compared to the previous season's 4,469 and 41, A and B respectively.

Figure 1. Laboratory Confirmation of Influenza, Ontario, 2004-05



	October	November	December	January	February	March	April
No. of Tests	493	1852	2882	4448	8257	9457	3371
% Positive Tests	0.6	1	6.4	14.4	21	20.8	14.9

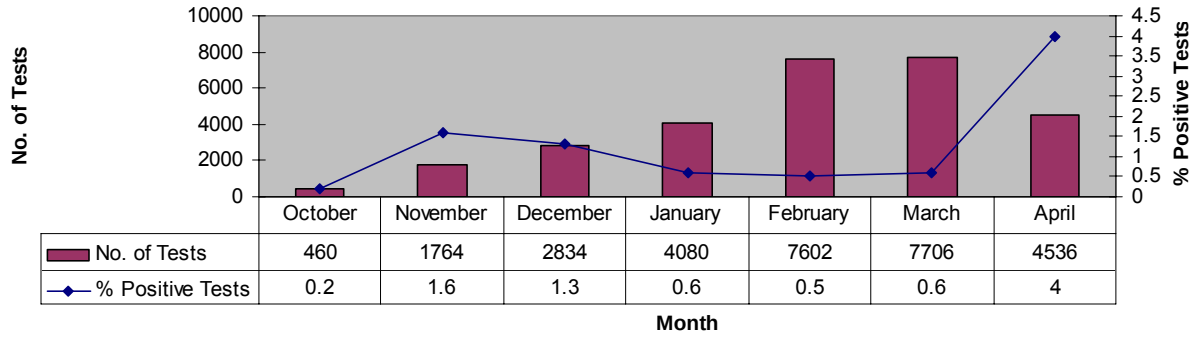
Source: Centre for Infectious Disease Prevention and Control

Non-Influenza Organisms, Ontario

Routine testing was conducted for three other viral respiratory organisms during the season (weeks ending October 30, 2004 to April 30, 2005): parainfluenza viruses (PIV), adenoviruses, and respiratory syncytial virus (RSV).

A total of 28,982 tests for PIV were performed, of which 370 (1.3%) tested positive (Figure 2).

Figure 2. Laboratory Confirmation of Parainfluenza, Ontario, 2004-05

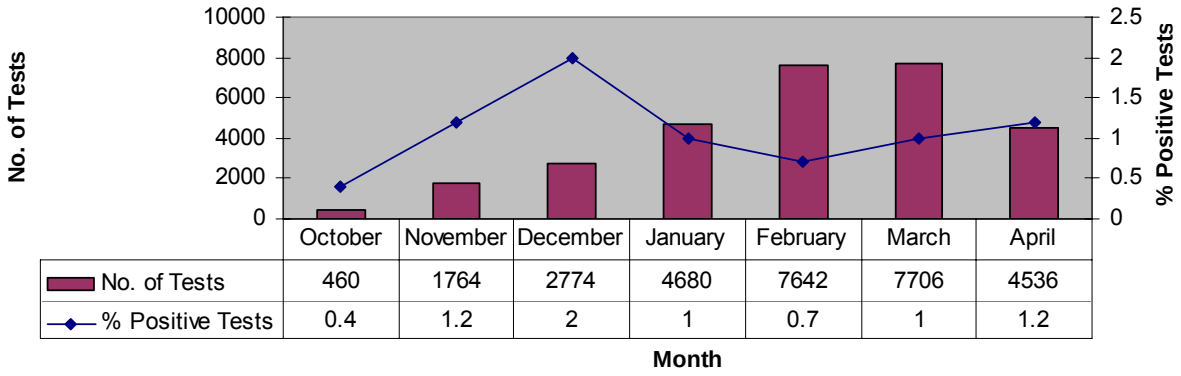


	October	November	December	January	February	March	April
No. of Tests	460	1764	2834	4080	7602	7706	4536
% Positive Tests	0.2	1.6	1.3	0.6	0.5	0.6	4

Source: Centre for Infectious Disease Prevention and Control

A total of 29,562 tests for adenovirus were performed, of which 313 (1%) tested positive (Figure 3).

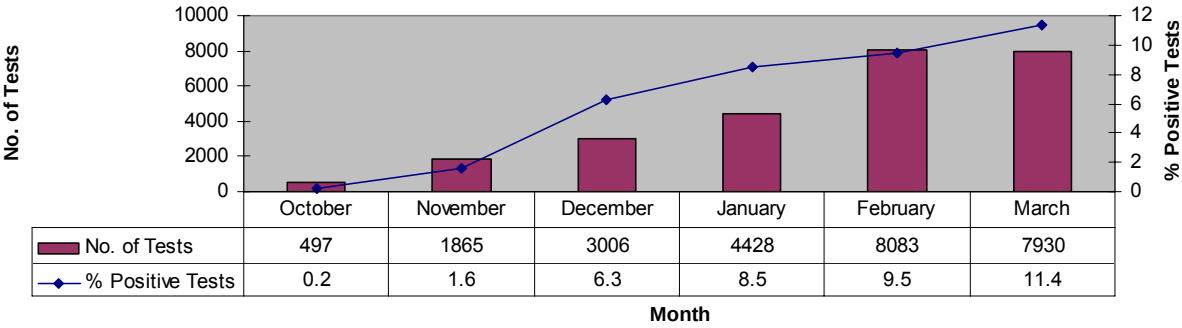
Figure 3. Laboratory Confirmation of Adenovirus, Ontario 2004-05



Source: Centre for Infectious Disease Prevention and Control

A total of 30,612 tests for RSV were performed, of which 2,727 (8.9%) tested positive (Figure 4).

Figure 4. Laboratory Confirmation of Respiratory Syncytial Virus, Ontario 2004-05



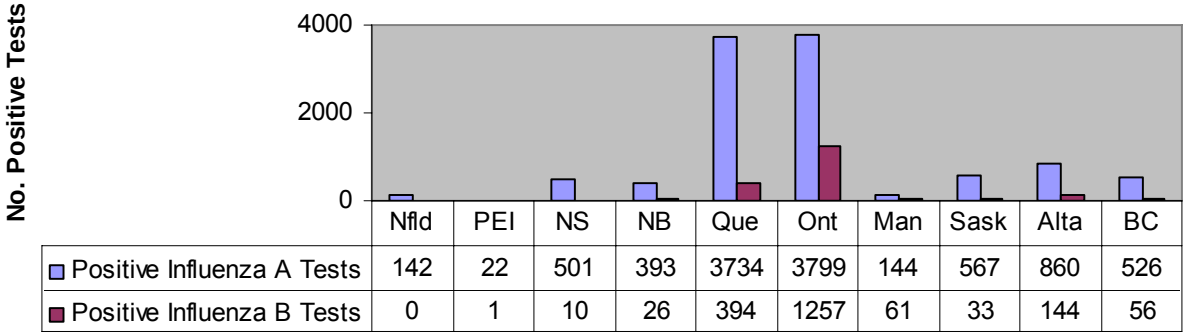
Source: Centre for Infectious Disease Prevention and Control

Influenza, Canada

During the 2004/05 surveillance season (corresponding to national surveillance dates of October 30, 2004 and April 30, 2005), the CIDPC reported 12,670 isolates which tested positive for influenza; 10,688 (84.4%) tested positive for influenza A and 1,982 (15.6%) for influenza B. This figure represented a 14.7% increase in the total number of positive influenza isolates as compared to Canada's 2003/04 data, when a total of 11,045 isolates tested positive for influenza. These figures also represented a 2.1% decrease in positive influenza A isolates, and a 1,436% increase in positive influenza B isolates. Ontario reported the highest numbers of laboratory-confirmed influenza: 3,799 influenza

A and 1,257 influenza B, while PEI reported the lowest numbers: 23 influenza A and 1 influenza B (Figure 5).

Figure 5. Laboratory Confirmation of Influenza A and B, Canada 2004/05



	Nfld	PEI	NS	NB	Que	Ont	Man	Sask	Alta	BC
Positive Influenza A Tests	142	22	501	393	3734	3799	144	567	860	526
Positive Influenza B Tests	0	1	10	26	394	1257	61	33	144	56

Source: Centre for Infectious Disease Prevention and Control

Non-Influenza Organisms, Canada

During the 2004/05 surveillance season, the CIDPC reported 982 laboratory-confirmed PIV isolates, 1,340 laboratory-confirmed adenovirus, and 7,920 laboratory-confirmed RSV. This represented a 90% decrease in positive PIV, a 78% increase in positive adenovirus, and 19.7% increase in positive RSV.

Composition of the 2004/05 Canada Influenza Vaccine

The influenza vaccine for the 2004/05 season was developed based on antigenic characteristics of current and emerging influenza virus strains. The trivalent influenza vaccine developed for the 2003/04 season included the following: A/New Caledonia/20/99 (H1N1)-like, A/Wyoming/3/2003 (H3N2)-like, and B/Jiangsu/10/2003-like virus antigens.

Influenza Strains Circulating in Canada

The predominant circulating strain in Canada during the 2003/04 surveillance season was A/Fujian/411/2002 (H3N2)-like, a new variant of the A/(H3N2) strain that was identified during the previous season. Additional circulating strains included A/California/7/2004, A (H1N1), B/Hong Kong/330/2001 and B/Shanghai/361/02.

During the 2004/05 season, the National Microbiology Laboratory (NML) at Public Health Agency of Canada sub-typed and characterized 688 influenza A isolates and 87 influenza B isolates.

Of the 688 influenza A isolates: 503 (73%) were A/Fujian/411/2002 (H3N2)-like, 185 (27%) were A/California/7/2004-like virus, a reference strain to the A/Fujian/411/2002

that is antigenically distinguishable. Of the 87 influenza B isolates, 73 were B/Shanghai/361/2002-like, and 14 were B/Hong Kong/330/2001 (Table 1).

Table 1. Influenza A & B Strains Circulating in Canada 2002/03 to 2004/05 Seasons

Season	Main Circulating Strains	Season's Vaccine Strains
2002/03	A/Panama/2007/99-like (H3N2) A/(H1N2) A/New Calendonia/20/99-like (H1N1) B/Hong Kong/330/01-like	A/Panama/2001/99-like (H3N2) A/New Caledonia/20/99- like (H1N1) B/Hong Kong/330/2001 like
2003/04	A/Fujian/411/2002 (H3N2)-like A/Panama/2007/99-like (H3N2) A/New Caledonia/20/9/9-like (H1N1) A/(H1N2)* B/Hong Kong/330/2001 B/Sichuan/379/99	A/Panama/2007/99- like (H3N2) A//New Caledonia/20/99- like (H1N1) B/Hong Kong/330/2001 like
2004/05	A/Fujian/411/2002 (H3N2)-like A/California/07/2004 A/(H1N1) B/Hong Kong/330/2001 B/Shanghai/361/2002	A//New Caledonia/20/99- like (H1N1) A/Wyoming/3/2003 (H3N2) B/Jiangsu/10/2003

Source: National Microbiology Lab (NML), Population & Public Health Branch, Public Health Agency of Canada
* Note: The influenza A (H1N2) virus strain is a reassortment virus derived from the influenza A (H1N1) and A (H3N2) virus strains.

2. Reportable Disease Information System (RDIS): Laboratory-Confirmed Cases of Influenza

In Ontario, influenza is a reportable disease under Regulation 559/51 of the *Health Protection and Promotion Act (HPPA)* and boards of health were required to transmit data on all laboratory-confirmed cases of influenza to the PHD through RDIS. Since only laboratory-confirmed cases of influenza are entered through RDIS, this number represents only a portion of the true number of influenza cases in Ontario. Information obtained from reports on institutional outbreaks is complementary to the total number of cases of influenza in the province.

The RDIS influenza case definition includes the following:

- Clinically compatible signs and symptoms of influenza with either:
  - laboratory confirmation by detection or isolation or influenza virus in pharyngeal or nasal secretions;

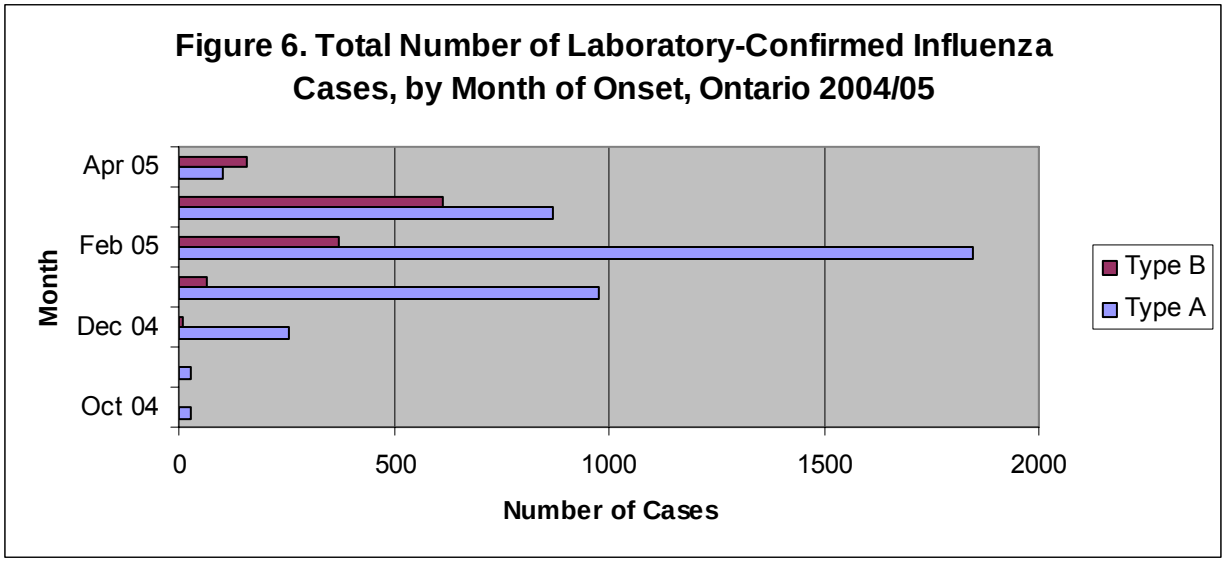
or

- demonstration of a four-fold or greater increase in hemagglutination antibody titres to influenza (seroconversion).

RDIS Results

Between October 1, 2004 and April 30, 2005 (please note this does not correspond with the CIDPC surveillance period), a total of 5,329 laboratory-confirmed influenza cases were reported through RDIS. This was a 0.5% decrease in influenza cases reported through RDIS as compared to the 5,353 cases of influenza reported during the same time period in the previous season. Of these 5,329 cases, 4,104 (77%) were influenza A and 1,225 (23%) were influenza B. Peak activity occurred in February, with a total of 2,222 laboratory-confirmed cases reported. Of these 5,329, 1,848 (83.1%) were influenza A (Figure 6).

Figure 6. Total Number of Laboratory-Confirmed Influenza Cases, by Month of Onset, Ontario 2004/05



Source: Reportable Disease Information System (RDIS), Public Health Division

During the year-round 2004/05 surveillance season, numbers of influenza cases per capita were highest in the Central West region of the province; the regional rate of influenza cases was 53.6/100,000 population. The Southwest region province demonstrated the lowest regional rate at 26.8/100,000 population. Provincial rates of influenza during the 2004/05 surveillance season were similar to the rates in the previous season (Table 2).

Table 2. Laboratory-Confirmed Influenza Cases by Health Unit and Region, Ontario, 2004-05 (RDIS data)				
Health Region				
	Health Unit	**Population 2004***	**Number of Confirmed Influenza Cases (A&B)**	**Rate per 100,000 population**
Northern	Algoma	120,378	56	46.5
	North Bay Parry Sound	125,306	86	68.6
	Northwestern	82,264	40	48.6
	Porcupine	89,721	107	119.3
	Sudbury	197,230	59	29.9
	Thunder Bay	159,770	24	15.0
	Timiskaming	35,590	50	140.5
Region Total		810,259	422	52.1
Eastern	Eastern Ontario	199,109	115	57.8
	Hastings-Prince Edward	161,187	114	70.7
	Kingston-Frontenac	188,934	98	51.9
	Leeds-Grenville	168,917	40	23.7
	Ottawa-Carleton	829,588	268	32.3
	Renfrew	100,717	25	24.2
Region Total		1,648,452	660	40.0
Central East	Durham	563,153	188	33.4
	Haliburton-Kawartha	173,193	140	80.8
	Peel Region	1,171,520	443	37.8
	Peterborough	133,165	86	64.6
	Simcoe Muskoka	476,212	203	42.6
	Toronto	2,613,479	934	35.7
	York	886,321	534	60.2
Region Total		6,017,043	2,605	43.29
Southwest	Grey Bruce	161,614	56	34.7
	Elgin-St. Thomas	87,383	5	5.7
	Huron	61,749	55	89.1

	Health Unit	Population 2004*	Number of Confirmed Influenza Cases (A&B)	Rate per 100,000 population
Health Region	Chatham-Kent	109,986	51	46.4
	Lambton	132,413	52	39.3
	Middlesex-London	431,757	48	11.1
	Oxford	104,783	44	42.0
	Perth	77,563	70	90.2
	Windsor-Essex	402,823	40	9.9
Region Total		1,570,071	421	26.8
Central West	Brant	133,647	69	51.6
	Haldiman-Norfolk Region	110,483	42	38.0
	Halton Region	429,578	247	57.5
	Hamilton-Wentworth	519,281	381	73.4
	Niagara Region	432,565	141	32.6
	Waterloo Region	477,885	269	56.3
	Wellington-Dufferin	258,083	117	45.3
Region Total		2,361,522	1,266	53.6
Provincial Total		12,407,347	5,374	43.0

*Source: Provincial Health Planning Data Base (PHPBD) Version 16.08 June 22, 2006

Age distribution of influenza cases showed that most of the RDIS reported cases occurred among persons ≥ 65 years of age. Persons ≥ 65 years of age represented 46% of cases (2,163 influenza A and 280 influenza B cases). Young children less than four years of age accounted for 14.6% of cases (485 influenza A and 282 influenza B).

3. Reports of Influenza and Respiratory Infection Outbreaks in Institutions, Ontario, 2004/05 Season

Since 2001, in addition to reporting influenza outbreaks, health units were required to report all respiratory infection outbreaks caused by known or unknown respiratory organisms that occurred in Long-Term Care Homes (LTCHs), formerly Long-Term Care Facilities and other health care institutions in their jurisdictions.

Data were collected and analyzed for outbreaks that occurred in LTCHs, retirement homes (RH) with more than 10 residents, acute care hospitals (ACH), chronic care hospitals (CCF), psychiatric hospitals, and schedule I and II facilities (the latter two facilities were designated as “other”). Data on combined LTCHs (i.e. nursing

homes/homes for the aged, nursing homes/retirement homes, hospitals/nursing homes) were included in LTCH reports.

Continuous home-wide surveillance is required to establish baseline levels of infection throughout the year. “Potential” outbreaks are recognized when infection rates increase above the baseline. Criteria for a “potential” influenza outbreak in a LTCH were:

- one laboratory confirmed case – residents, patients, or staff with an organism such as influenza virus isolated or detected from a nasopharyngeal swab or with four-fold or greater hemagglutination antibody titre; or

- two cases of acute respiratory tract illness occurring within 48 hours in a geographic area; or

- more than one unit (in a facility) having a case of acute respiratory illness within 48 hours.

Any further progression of the “potential” outbreak is to be considered a “confirmed” outbreak. Both laboratory-confirmed and epidemiologically-linked cases are also included in the total number of cases for institutional respiratory infection outbreaks.

Final reports on respiratory infection outbreaks in institutions include epidemiologic information on residents/patients and staff, such as influenza immunization coverage rates, morbidity and mortality attributes, outbreak duration, seasonal distribution of outbreaks, and antiviral usage for prophylaxis or therapy to control an outbreak. Preliminary reports were faxed to the PHD Call Centre, by health units within 24 hours of outbreak notification. Preliminary reports were useful for warning purposes and for monitoring respiratory infection outbreak activity in the province.

Final reports were submitted within three weeks of the outbreaks being declared over, and were used in the formulation of this summary report.

Results

There were 1,125 confirmed institutional respiratory infection outbreaks reported to the PHD during the 2004/05 surveillance season (September 1, 2004 – August 31, 2005), of which 584 (51.9%) were attributed to influenza. This represented a 21.1% increase in the total number of institutional respiratory infection outbreaks when compared to the 2003/04 surveillance season. In addition, this represented a 47% increase in the number of influenza outbreaks and a 1.7% increase in the number of non-influenza outbreaks, when compared to the previous season’s 397 influenza and 532 non-influenza outbreaks. Nationally, the 2004/05 season had more impact on the elderly as opposed to children, as reflected by the large number of outbreaks in LTCHs compared with last season; this was also experienced in Ontario. In addition, the large number of outbreaks reported in Ontario may have also been due to increased reporting post the Severe Acute Respiratory Syndrome (SARS) outbreak of 2003, and the mismatch

between one of the influenza A components of the 2004/05 vaccine and one of the circulating influenza A strains.

All 36 health units reported at least one respiratory infection outbreak this season, with the majority of outbreaks (870) occurring in LTCHs.

Data Analysis

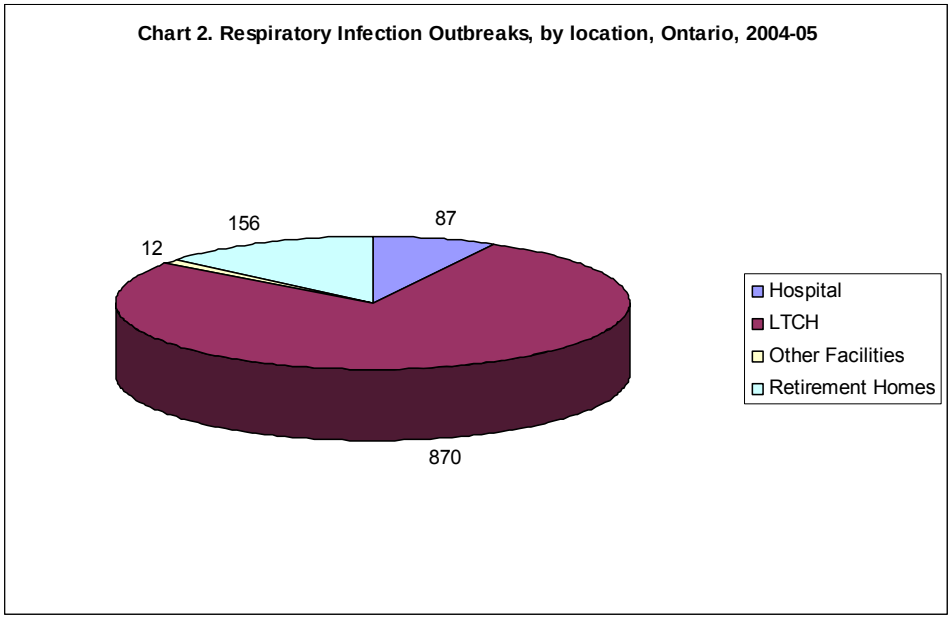
Causative Organisms

Of the 1,125 reported respiratory infection outbreaks, 584 were laboratory-confirmed influenza. Influenza A was determined to be the causative organism in 485 outbreaks, influenza B in 53, and combined influenza A and B in 21 outbreaks. Influenza A was combined with other organisms (PIV, RSV, rhinovirus, and adenovirus) in 20 other outbreaks. A number of non-influenza organisms were identified in 129 outbreaks. The causative organism was unknown for 412 institutional respiratory infection outbreaks (Table 3).

Table 3. Number of Outbreaks, by Causative Organisms, Ontario, 2004-05

Causative Organisms	# of Outbreaks	% of Total Outbreaks
Influenza A	485	43.1
Influenza B	53	4.7
Influenza A & B	21	1.9
Influenza A & PIV	2	0.2
Influenza A & RSV	15	1.3
Influenza A & Rhinovirus	1	0.1
Influenza A & Adenovirus	1	0.1
Influenza A & H. Influenzae	1	0.1
Influenza B & PIV	2	0.2
Influenza B & RSV	3	0.3
Influenza (A&B) Outbreaks	584	51.9
PIV	32	2.8
PIV & Rhinovirus	1	0.1
PIV & RSV	1	0.1
RSV	47	4.2
Rhinovirus	29	2.6
Rhinovirus & RSV	1	0.1
S. Pneumoniae	2	0.2
Adenovirus	1	0.1
Enterovirus-like	14	1.2
HSV	1	0.1
Unknown	412	36.6
Non-Influenza Outbreaks	541	48.1

Institution Type



There were 1,125 respiratory infection outbreaks reported in institutions in Ontario during the 2004/05 surveillance season. Of the total number of respiratory infection outbreaks, 87 (7.7%) occurred in hospitals, 870 (77.3%) in LTCHs, and 168 (14.9%) in "other" facilities (Figure 8).

Of the 87 respiratory infection outbreaks that occurred in hospitals, 41 (3.6%) occurred in acute care hospitals, while 28 (2.5%) were in chronic care facilities (Table 4).

Table 4. Number of Respiratory Infection Outbreaks, by Type of Hospital, Ontario, 2004-05

Type of Hospital	# of Outbreaks	% of Hospital Outbreaks
Acute Care	41	
Chronic Care	28	
Combined acute and chronic care	2	
Psychiatric	16	
TOTAL	**87**	

Of the total number of respiratory infection outbreaks, 870 (77.3%) occurred in LTCHs. Of these, 171 (15.2%) occurred in homes for the aged, 677 (60.2%) in nursing homes, and 22 (2%) were in combined facilities, which were either combined nursing home / home for the aged or combined nursing home / retirement home or hospital / nursing home (Table 5).

Table 5. Number of Respiratory Infection Outbreaks, by Type of LTCH, Ontario, 2004-05

Type of LTCH	# of Outbreaks	% of Total Outbreaks
Home for the Aged	171	15.2
Nursing Home	677	60.2
Combined Facility (NH/HFA; NH/RH; hospital/NH)	22	2.0
TOTAL	**870**	**77.3**

Influenza Outbreaks

A total of 584 influenza infection outbreaks were reported in institutions. Of all the influenza outbreaks, 65 (11.1%) occurred in hospitals; the majority occurring in acute care facilities (Table 6).

Table 6. Number of Influenza Outbreaks, by Type of Hospital, Ontario, 2004-05

Type of Hospital Setting	# of Outbreaks	% of Total # of Influenza Outbreaks
Acute Care	37	6.3
Chronic Care	20	3.4
Combined acute and chronic care	2	0.3
Psychiatric	6	1.0
TOTAL	**65**	**11.1**

A total of 418 influenza outbreaks in LTCHs were reported, which made up 71.6% of influenza outbreaks; with the majority occurring in nursing homes (Table 7). A total of 101 (17.3%) influenza outbreaks occurred in "other" facilities.

Table 7. Number of Influenza Outbreaks, by Type of LTCH, Ontario, 2004-05

Type of LTCH	# of Outbreaks	% of Total # of Influenza Outbreaks
Home for the Aged	68	11.6
Nursing Home	344	58.9
Combined Facility (NH/HFA; NH/RH; hospital/NH)	6	1.0
TOTAL	**418**	**71.6**

Non-Influenza Outbreaks

A total of 541 outbreaks were attributed to non-influenza organisms, 22 (4.1%) of which occurred in hospitals (Table 8).

Table 8. Number of Outbreaks Caused by Non-Influenza Organisms, by Type of Hospital, Ontario, 2004-05

Type of Hospital	# of Outbreaks	% of Total # of Non-Influenza Outbreaks
Acute Care	4	0.7
Chronic Care	8	1.5
Psychiatric	10	1.8
TOTAL	**22**	**4.1**

Of all the non-influenza outbreaks, a total of 452 (83.5%) occurred in LTCHs (Table 9).

Table 9. Number of Outbreaks Caused by Non-Influenza Organisms, by Type of LTCH, Ontario, 2004-05		
Type of LTCH	**# of Outbreaks**	**% of Total # of Non-Influenza Outbreaks**
Home for the Aged	110	20.3
Nursing Home	328	60.6
Combined Facility (NH/HFA; NH/RH; hospital/NH)	14	2.6
TOTAL	**452**	**83.5**

A total of 67 (12.4%) non-influenza outbreaks occurred in “other” facilities.

Outbreak Duration

Outbreak duration was defined as the number of days from the onset of illness in the first case until the outbreak was declared over. Due to the wide range of data results, median results are reported.

Median duration for all respiratory infection outbreaks for which data was available was 17 days (range 2-82 days). Median duration of outbreaks caused by influenza A and B was 16 days (range 8-82 days) and 17 days (range 9-42 days) respectively. Median duration for outbreaks caused by both influenza A and B was 18 days (range 13-42). This is comparable to results from 2003/04 when the duration for all respiratory infection outbreaks was 18 days, and for influenza A and B the duration was 17 and 19 days respectively.

Median duration of respiratory infection outbreaks caused by non-influenza organisms was 21 days for PIV, 20 days for rhinovirus, and 25.5 days for RSV. The median duration for outbreaks in which the organisms were unknown was 17 days (range 2-52 days) (Table 10).

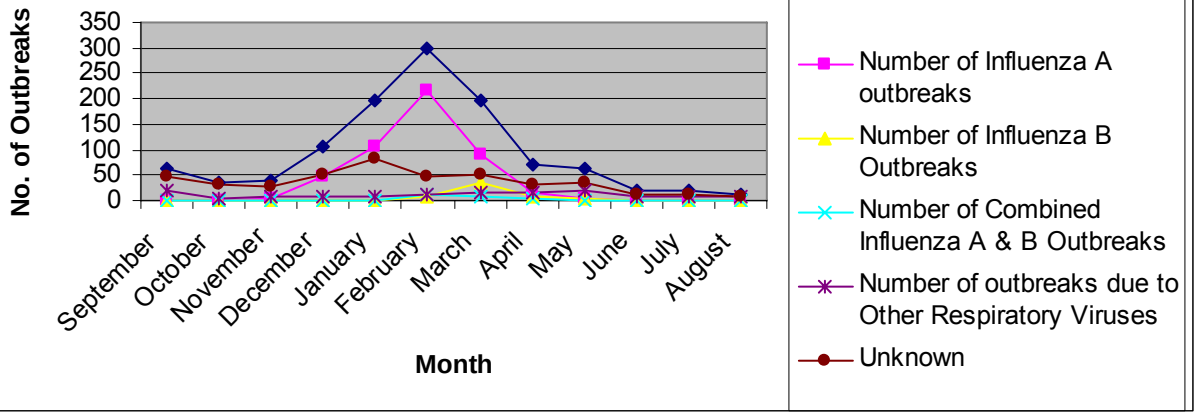
Table 10. Median Duration of Outbreaks, by Type of Causative Organism, Ontario, 2004-05		
Type of Causative Organism	**Median (days)**	**Range (days)**
All types of organisms	17	2-82
Influenza A	16	8-82
Influenza B	17	9-42
Combined Influenza A & B	18	13-42
PIV	21	11-57
Rhinovirus	20	8-37
RSV	25.5	6-57
Unknown Organism	17	2-52

Occurrence of Respiratory Infection Outbreaks, including influenza

Peak activity for all institutional respiratory infection outbreaks occurred in February, with a total of 299 respiratory infection outbreaks. Of these, 238 (80%) were due to influenza. Outbreak activity due to non-influenza organisms (outbreaks due to unknown

organisms excluded) was at the highest in May, with 21 respiratory infection outbreaks (Figure 8).

Figure 8. Number of Respiratory Infection Outbreaks, by Type of Causative Organisms, by Month of Onset, 2004/05



Attack Rates for All Institutional Respiratory Infection Outbreaks

Patients/Residents

During the year round 2004/05 surveillance season, 16,611 cases were reported among 148,893 exposed patients/residents. The overall attack rate for the season (total number for resident cases for all outbreaks/total number of residents in affected areas of institutions involved in the outbreak) was 11.2%. Resident attack rate in LTCHs was 11.8%, with 13,860 cases among 116, 983 exposed residents. The patient attack rate in hospitals was 4.5%, with 820 cases reported among 18,123 exposed patients. Attack rates of patients/residents ranged from 0.3% to 100%. Two outbreaks experienced resident attack rate of 100%; one in a retirement home where all 76 residents experienced influenza B infections, and the other in a nursing home where all 45 residents experienced influenza A infections.

The year's attack rate was similar to the attack rate of 11.3% among patients/residents during the 2003/04 surveillance season.

There were insufficient data to determine attack rates among staff in outbreak institutions.

Attack Rates for Influenza Outbreaks

Patients/Residents

There were 584 influenza outbreaks between September 1, 2004 and August 31, 2005. There were 9,561 patient/resident cases among 80,414 exposed in the outbreak

institutions. The overall attack rate for influenza infection outbreaks was 11.9%. Attack rates of patients/residents ranged from 0.3% to 100%.

Of the 584 influenza outbreaks, 65 occurred in hospitals. The overall attack rate of influenza in hospital patients was 4.6%.

A total of 452 influenza outbreaks occurred in LTCHs, of which the overall resident attack rate was 13.2%.

A total of 101 influenza outbreaks occurred in “other” facilities, in which the attack rate was 15.1%.

The year’s attack rate among patients/residents in institutions with influenza outbreaks was 11.9%, which was slightly higher when compared to the previous season’s attack rate of 11.6%.

Attack Rates for Non-Influenza Outbreaks

Patients/Residents

There were 541 non-influenza outbreaks with 7,091 patient/resident cases among 68,479 exposed in the outbreak institutions. The overall attack rate for non-influenza infection outbreaks was 10.4%. Attack rates for patients/residents ranged from 0.8% to 80%. The highest attack rate for a non-influenza outbreak occurred in a nursing home, where eight of the 10 at-risk patients/residents experienced respiratory infections of an unknown organism.

Of the 541 non-influenza outbreaks, 22 occurred in hospital settings. The overall attack rate of non-influenza outbreaks for hospital patients was 4.7%.

A total of 452 non-influenza outbreaks occurred in LTCHs, in which the overall resident attack rate was 10.5%.

A total of 67 non-influenza outbreaks occurred in “other” facilities, in which the attack rate was 12.8%.

The year’s attack rate among patients/residents in institutions with non-influenza outbreaks was 10.4%, which was slightly lower when compared to the previous season’s attack rate of 11%.

Complications and Mortality among Patients/Residents for Respiratory infection outbreaks

During the 2004/05 surveillance season, a total of 608 deaths were attributed to respiratory infection outbreaks. The majority of deaths occurred in LTCHs, with a total of 554 (91.1%) deaths. The remainder occurred in hospitals with 29 deaths, and “other” facilities with 25 deaths. The mean case fatality rate for all institutions that reported

outbreaks was 3.7%. The case fatality rate for hospitals, LTCHs, and “other” facilities were 3.5%, 4%, and 1.3% respectively.

For all institutional respiratory infection outbreaks, the number of cases hospitalized as a consequence of the respiratory infection outbreak was 1,105, of which 802 (72.6%) occurred in LTCHs.

There were 868 radiologically-confirmed cases of pneumonia as a result of respiratory infection outbreak activity, of which 740 (85.3%) were in LTCHs.

During the 2003/04 surveillance season, there were a total of 520 deaths, 898 hospitalizations as a result of respiratory infection outbreak activity, and 761 radiologically-confirmed cases of pneumonia. This year’s data represented a 17% increase in the number of deaths attributed to influenza, a 14% increase in the number of radiologically-confirmed cases of pneumonia, and a 23% increase in the number of cases hospitalized, not unexpected since there was a 21% increase in the number of respiratory infection outbreaks.

Complications and Mortality among Patients/Residents, Influenza Outbreaks

In institutions reporting influenza outbreaks, there were a total of 454 deaths, comprizing 74.7% of the total number of deaths attributed to respiratory infection outbreaks. There were 554 radiologically-confirmed cases of pneumonia (63.8% of the total number of cases), and a total of 806 cases were hospitalized (72.9%) as a consequence of the influenza outbreak.

LTCHs represented a significant proportion of institutions reporting complications as a result of influenza outbreaks. Of the 454 deaths that occurred as a result of influenza, 409 (90%) occurred in LTCHs. Of the 554 radiologically-confirmed cases of pneumonia, 453 (81.8%) occurred in LTCHs. Similarly, LTCHs represented 546 of 802 (68%) influenza related hospitalizations.

Complications and Mortality among Patients/Residents, Non-Influenza Outbreaks

Institutions reporting non-influenza outbreaks noted 154 patient/resident deaths (25.3% of the total number of deaths in all respiratory infection outbreaks), 314 (36.2%) radiologically-confirmed cases of pneumonia, and a total of 299 (27%) patients/residents hospitalized as a consequence of the outbreak.

Of the 154 deaths attributed to non-influenza outbreaks, 145 (94.2%) deaths occurred in LTCHs. Of the 314 radiologically-confirmed cases of pneumonia, 287 (91.4%) occurred in LTCHs. Similarly, LTCH residents represented 256 of 299 (85.6%) non-influenza outbreak related hospitalizations.

Antiviral Use

In Ontario, antivirals have been in use for the prophylaxis and treatment of influenza A since 1988. However, amantadine can be used as prophylaxis or treatment for influenza A only. The National Advisory Committee on Immunization (NACI) recommends oseltamivir (Tamiflu ®), a neuraminidase inhibitor, for use as treatment and prophylaxis for both influenza A and B outbreaks. Studies indicate that when used for treatment both amantadine and oseltamivir should be given within 48 hours of onset of symptoms for maximum benefit.

Patients/Residents

Of the 584 influenza outbreaks, data on antiviral use was available for 305. A total of 26,061 patients/residents were given antiviral medication as prophylaxis. For treatment of influenza, 3,306 patients/residents were given antivirals within 48 hours of onset of symptoms; 971 patients/residents were given antivirals after 48 hours of onset of symptoms.
There were insufficient data to analyze amantadine usage. Oseltamivir (Tamiflu ®) was used as prophylaxis in 282 influenza outbreaks; the average length of use was 12.9 days (range 2-36). Oseltamivir was used as treatment in 269 influenza outbreaks; the average length of use was six days. Note: The recommended treatment duration for oseltamivir and amantadine is five days.

Staff

Of the 584 influenza outbreaks, 252 institutions (43.1%) reported having used antivirals during the outbreak for staff.

A total of 4,205 staff were prescribed antiviral medication for prophylaxis; 213 staff were prescribed antivirals for treatment, 158 staff took antivirals within 48 hours of onset of symptoms; 55 staff took antivirals after 48 hours of onset of symptoms.

There were insufficient data to permit a more detailed analysis on amantadine and oseltamivir usage as either prophylaxis or treatment.

4. Influenza Activity Level Reporting

Every week, influenza activity was assessed and reported by the medical officer of health of each health unit to the PHD. The data was then mapped and published in the *Ontario Influenza Bulletin*. Suggested indicators for determining local influenza activity included the following: community (e.g. day care facilities) outbreaks, institutional (e.g. long-term care homes) outbreaks and results from local virology laboratories.

For reporting purposes, influenza activity is defined as the level of influenza-like illness (ILI) prevalent in the local community. ILI is defined by acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia,

myalgia, or prostration which could be due to influenza virus. In children under five, gastrointestinal symptoms may also be present. In patients under five or 65 and older, fever may not be prominent.

Influenza activity was categorized into one of the following four levels:

- "*No Activity*"
- "*Sporadic Activity*" (sporadically occurring ILI and lab-confirmed influenza with no outbreaks detected)
- "*Localized Activity*" (outbreaks affecting a single geographic area within the health unit jurisdiction; these can be institution-based and/or community outbreaks)
- "*Widespread Activity*" (outbreaks affecting multiple/non-adjacent geographic areas within the health unit jurisdiction, and involving two or more regions in a health unit.

Results

Influenza activity in Ontario was low through the months of November and early December 2005, but started to increase in late December. By January 2005, influenza activity was mostly "widespread". Activity levels continued to be "widespread" through until the end of March.

5. Public Health Agency of Canada / College of Family Physicians of Canada (CFPC) *FluWatch* Program

Sentinel physician data were collected, collated and disseminated through the national *FluWatch* program. The College of Family Physicians of Canada (CFPC) recruited 71 physicians by census divisions across Ontario, for the *FluWatch* program. Sentinel physicians were asked to report the number of consultations for influenza-like-illness (ILI) per age group for one day each week, and the total number of patient visits per age group for the same day. The rates of consultations to sentinel physicians for ILI ranged from three to 60 visits of ILI per 1000 patients seen.

Vaccination Rates in LTCHs and Hospitals (All facilities)

The *Mandatory Health Programs and Services Guidelines* 1997 *(MHPSG)* issued under the *HPPA* 1990, state that all LTCHs should achieve the provincial immunization target rate of 95% for residents and 70% for health care workers in contact with high-risk individuals. Under the "Influenza Prevention and Surveillance Protocol for Ontario Long-Term Care Facilities" released by the MOHLTC in November 1999 and the "Influenza Surveillance Protocol for Public Hospitals" issued by the Ontario Hospital Association in July 2000, influenza vaccine coverage rates as of November 15 of each year for residents and staff of LTCHs and staff of public hospitals are to be reported to the local medical officer of health by December 1st of each year. The rates are the reported to the province by the health unit.

Residents

Resident immunization data was available for 576 of 597 LTCHs in Ontario. The median vaccination coverage rate among residents was 95% (range 56.5% - 100%). In 2003, the median rate was also 95% with a range of 77-100%.

Staff

Staff immunization data was available for 576 of 597 LTCHs in Ontario. The median vaccination coverage rate among staff was 82.8% (range 23.3 - 100%). In 2003, median coverage was 84% with a range of 13-100%.

Immunization data was also available for 170 of 228 hospital sites in Ontario. The median vaccination coverage rate among staff was 52.9% (range 19.9% - 96.3%). In 2003, median staff coverage was 55% with a range of 13-97%.

LTCH Influenza Outbreak Policies

Of the 584 influenza outbreaks, there was sufficient data from 330 outbreaks to determine facility immunization policy. A total of 312 influenza outbreak facilities indicated that they had a policy requiring staff influenza immunization. The majority of facilities, 321 (97.3%) offered influenza vaccine to staff on-site during the 2004/05 season, of which 228 (69%) facilities offered the vaccine on-site after onset of the outbreak.

A total of 214 facilities reported excluding staff from work during an outbreak, because they were not immunized and not receiving antiviral medication. In 206 of 214 (96.3%) outbreaks, staff were excluded in accordance of institutional policy. In eight outbreaks, an order issued by the local medical officer of health under section 22 of the HPPA was used to exclude staff from work.

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