New Jersey Department of Health and Senior Services (NJDHSS)
Communicable Disease Service
2007–2008 Influenza Season Summary

Highlights

- Influenza activity during the 2007–2008 season began slightly earlier than previous influenza seasons. The time of peak activity most closely coincided with that observed during the 2004–2005 influenza season. Activity during the 2007–2008 influenza season persisted longer than the past 3 influenza seasons with sporadic influenza activity reported after week 20.

- Emergency departments and long-term care facilities reported similar trends in influenza-like illness (ILI) activity with peaks during weeks 10 and 11, respectively. School absenteeism peaked at week 6, suggesting that influenza activity in schools was slightly earlier than that observed by emergency departments and long-term care facilities.

- 753 samples were tested at the New Jersey Public Health and Environmental Laboratories (PHEL). Influenza was isolated by viral culture from 700 samples tested by both PHEL and other hospital clinical laboratories with the capacity to perform viral culture. Influenza A was the predominant influenza type isolated (67%) followed by influenza B (33%).

- Data collected from sentinel providers indicated that peak ILI activity occurred during week 7 and closely matched trends that were based on the other ILI surveillance data collected.

Influenza Activity Levels

Influenza activity levels are determined by evaluating a number of parameters to determine geographic spread of influenza throughout the state. The definitions used to determine activity levels are described below.

State Activity Level Definitions

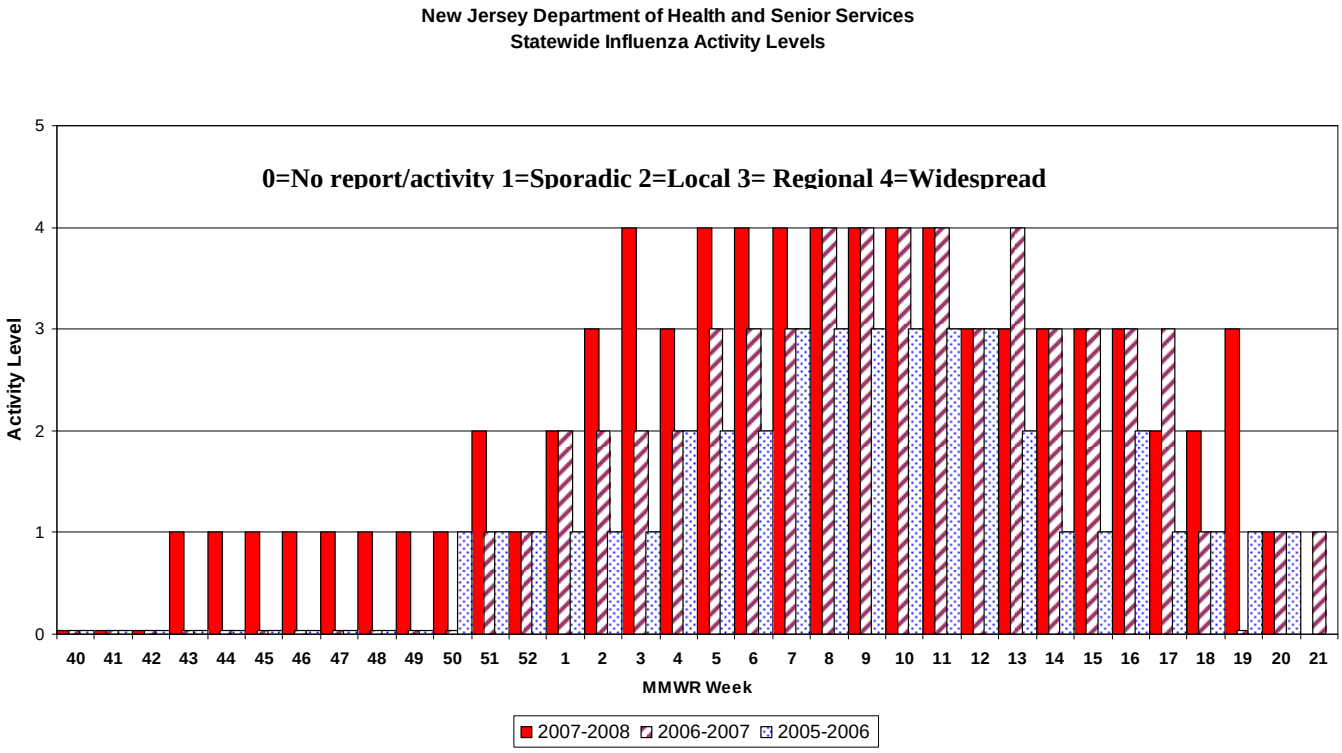
No Activity- At least 2 of 3 parameters at or below State baseline **AND** no laboratory-confirmed cases.
Sporadic – At least 2 of 3 parameters above State baseline **AND** laboratory-confirmed cases anywhere in the State within previous 3 weeks **OR** at least one institutional outbreak (ILI or lab-confirmed) anywhere in the State.
Local – At least 2 or 3 parameters above State baseline in a single county **AND** laboratory-confirmed cases from that same county within the previous 3 weeks (other counties may be above baseline without laboratory-confirmed cases) **OR** an outbreak (ILI or lab-confirmed) in 2 or more institutions in a single county
Regional – At least 2 of 3 parameters above State baseline in $\geq$2 but $\leq$10 counties **AND** laboratory-confirmed cases from these same counties in past 3 weeks **OR** institutional outbreaks (ILI or lab-confirmed) in $\geq$2 but $\leq$10 counties
Widespread – At least 2 of 3 parameters above State baseline in >10 counties **OR** institutional outbreaks (ILI or lab-confirmed) in >10 counties **AND** laboratory-confirmed influenza cases in the previous 3 weeks.
Parameters = School, emergency department (ED), or long-term care weekly surveillance data

Baseline is calculated by averaging statewide percentages of ILI for a 4-year (2004, 2005, 2006, 2007) period during months when influenza is less likely to be circulating (i.e., May–August). Weeks in which less than 4 counties reported data were not included in the calculation.

Four-year average is an average of the 2003-2004, 2004-2005, 2005-2006 and 2006-2007 influenza seasons.

During the 2007–2008 influenza season, sporadic activity began during week 43 (2007) when positive rapid antigen test results were reported in 2 counties. At this time only 1 of 3 parameters was above state baseline. Widespread activity occurred for the first time during week 3 (2008) in which both statewide data and data from 11 counties revealed that 2 of 3 parameters were above state baseline. Also during week 3, culture-confirmed cases were reported from 10 of 21 counties. NJ began to see a decrease in activity during week 20 (2008) with a return to sporadic activity. Peak activity occurred during week 8 of the 2006–2007 influenza season and during week 7 of the 2005–2006 influenza season. (Figure 1)

Figure 1
Statewide Influenza Activity Levels, 2005-2008



Influenza Activity Levels by Region

Influenza activity levels were also determined for each public health region using the definitions described below.

Regional Activity Level Definition

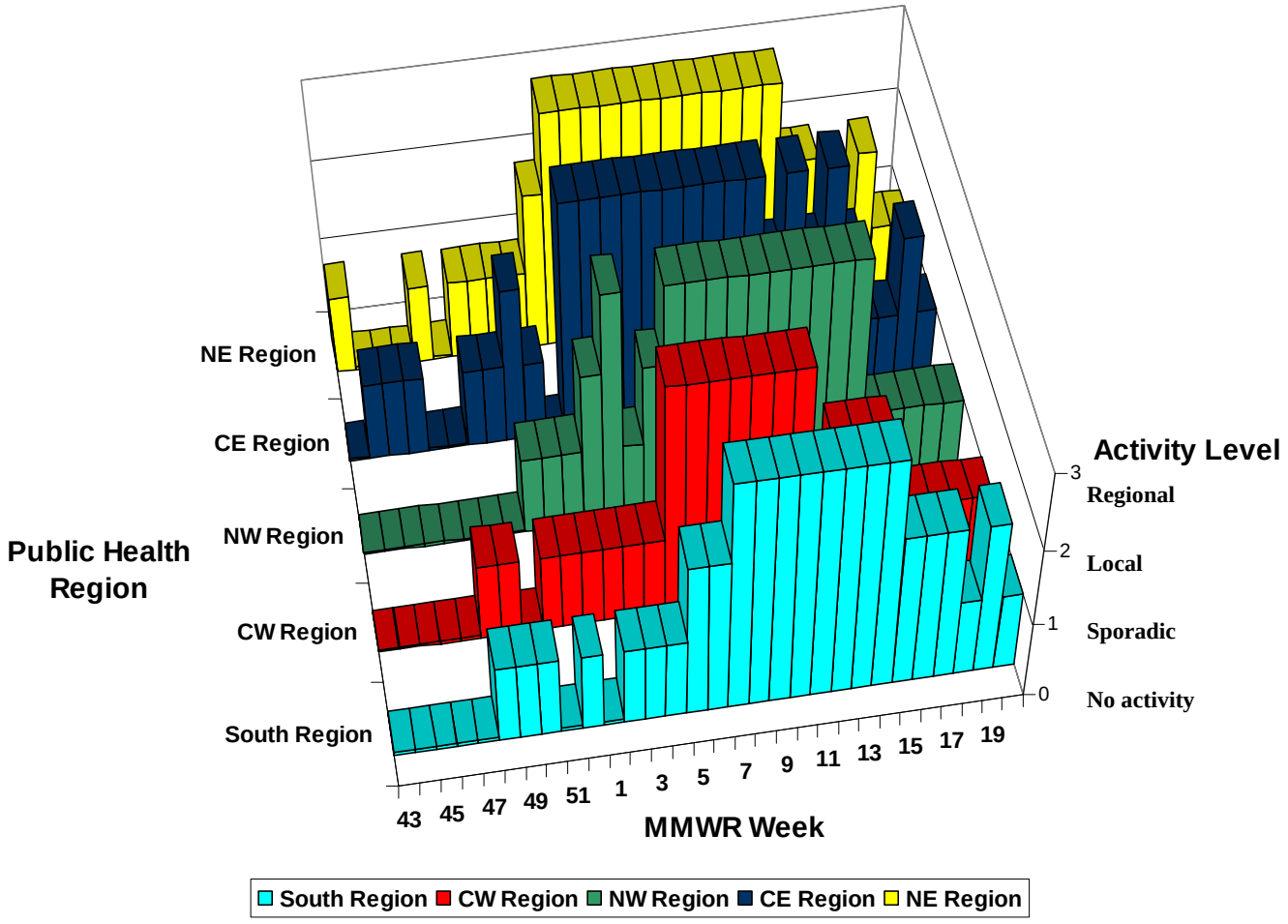
Public Health Regions

Northwest (NW) Region (Morris, Passaic, Sussex, Warren)
Northeast (NE) Region (Bergen, Essex, Hudson)
Central West (CW) Region (Hunterdon, Mercer, Somerset)
Central East (CE) Region (Middlesex, Monmouth, Ocean, Union)
South Region (Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Salem)

No Activity- At least 2 of 3 parameters at or below State baseline **AND** no laboratory-confirmed cases in the public health region
Sporadic – At least 2 of 3 parameters above state baseline **AND** laboratory-confirmed cases anywhere in the public health region **OR** at least one institutional outbreak (ILI or lab-confirmed) anywhere in the public health region
Local – At least 2 or 3 parameters above state baseline in a single county in a public health region **AND** laboratory-confirmed cases from that same county within the previous 3 weeks (other counties may be above baseline without laboratory-confirmed cases) **OR** an outbreak (ILI or lab-confirmed) in 2 or more institutions in a single county in a public health region
Regional – At least 2 of 3 parameters above state baseline in at least half of the counties in the public health region **AND** laboratory-confirmed cases from these same counties in past 3 weeks **OR** an institutional outbreak (ILI or laboratory-confirmed) in at least half of the counties in the public health region
Widespread – Not used for public health region data

Activity levels by public health region in the State for the 2007–2008 influenza season are displayed in Figure 2 and Table 1. Sporadic activity first occurred during week 43 (2007) in the Northeast public health region. Both the Northeast region and Central East public health region reached regional activity during week 2 (2008) while the Central West, Northwest, and South public health regions reached regional activity during weeks 5, 6 and 7, respectively.

Figure 2
Influenza Activity Levels by Public Health Region
MMWR Week 43 to 20, 2008*



*Sporadic activity was first reported in MMWR week 43 (2007). No activity was reported in any public health region from MMWR week 40 (2007) to week 42 (2007).

Table 1
Influenza Activity Levels by Public Health Region, 2007-2008*

MMWR Week	NW Region	NE Region	CW Region	CE Region	South Region
40	No activity	No activity	No activity	No activity	No activity
41	No activity	No activity	No activity	No activity	No activity
42	No activity	No activity	No activity	No activity	No activity
43	No activity	Sporadic	No activity	No activity	No activity
44	No activity	No activity	No activity	Sporadic	No activity
45	No activity	No activity	No activity	Sporadic	No activity
46	No activity	No activity	No activity	Sporadic	No activity
47	No activity	Sporadic	No activity	No activity	No activity
48	No activity	No activity	Sporadic	No activity	Sporadic
49	No activity	Sporadic	Sporadic	Sporadic	Sporadic
50	No activity	Sporadic	No activity	Sporadic	Sporadic
51	Sporadic	Sporadic	Sporadic	Local	No activity
52	Sporadic	Sporadic	Sporadic	Sporadic	Sporadic
1	Sporadic	Local	Sporadic	No activity	No activity
2	Local	Regional	Sporadic	Regional	Sporadic
3	Regional	Regional	Sporadic	Regional	Sporadic
4	Sporadic	Regional	Sporadic	Regional	Sporadic
5	Local	Regional	Regional	Regional	Local
6	Regional	Regional	Regional	Regional	Local
7	Regional	Regional	Regional	Regional	Regional
8	Regional	Regional	Regional	Regional	Regional
9	Regional	Regional	Regional	Regional	Regional
10	Regional	Regional	Regional	Regional	Regional
11	Regional	Regional	Regional	Regional	Regional
12	Regional	Regional	Sporadic	Local	Regional
13	Regional	Regional	Local	Regional	Regional
14	Regional	Local	Local	Local	Regional
15	Regional	Local	Local	Regional	Local
16	Sporadic	Sporadic	Sporadic	Local	Local
17	Sporadic	Sporadic	Sporadic	Sporadic	Local
18	Sporadic	Local	Sporadic	Sporadic	Sporadic
19	Regional	Regional	Sporadic	Local	Local
20	Sporadic	Sporadic	Sporadic	Sporadic	Sporadic

*MMWR weeks 40-52 represent the period of the influenza season occurring in 2007; weeks 1-20 represent the period of the influenza season occurring in 2008

Laboratory Surveillance

From week 40 (2007) to week 20 (2008), New Jersey Public Health and Environmental Laboratories (PHEL) tested 753 samples for influenza. Influenza was also isolated from 87 additional samples that were tested by hospital clinical laboratories. During this timeframe, influenza was isolated by viral culture from 700 samples. The proportion of influenza subtypes circulating during the 2007–2008 influenza was similar to the proportion observed during the 2006–2007 influenza season (Table 2). Influenza rapid antigen test and culture results by county of residence, for MMWR weeks 40–20, during the 2007–2008 season appear in Table 3.

Table 2
Circulating Respiratory Viruses in the U.S. and NJ as Determined by Testing Performed by CDC/WHO and PHEL, Influenza Seasons 2006-2007 and 2007-2008

Virus Identified		Influenza Season 2006-2007		Influenza Season 2007-2008	
		CDC/WHO (U.S.) No. of Samples Tested = 172,735	PHEL (NJ) No. of Samples Tested = 810	CDC/WHO (U.S.) No. of Samples Tested = 220,666	PHEL (NJ) No. of Samples Tested = 753
		No. of Positive Samples		No. of Positive Samples	
		23,181	611	39,453	700*
Influenza A, No. (%)		18,392 (80%)	428 (70%)	28,105 (71%)	469 (67%)
	A (unsubtyped)	12,290 (67%)	49 (11%)	19,831 (67%)	58 (12%)
	A (H1)	3,872 (21%)	144 (34%)	2,173 (21%)	151(32%)
	A (H3)	2,230 (12%)	123 (55%)	6,101 (12%)	260 (55%)
Influenza B, No. (%)		4,789 (20%)	183 (30%)	11,348 (29%)	231 (33%)
Other Virus Isolated, No.			9		1
NVI†, No.			158		130
QNS†, No.			32		9

*Some positive samples were reported via the National Respiratory and Enteric Virus Surveillance System (NREVSS)
†NVI = no virus isolated. QNS = quantity not sufficient.

Table 3
Influenza Rapid Antigen Test and Culture Results by County of Residence, 2007-2008*

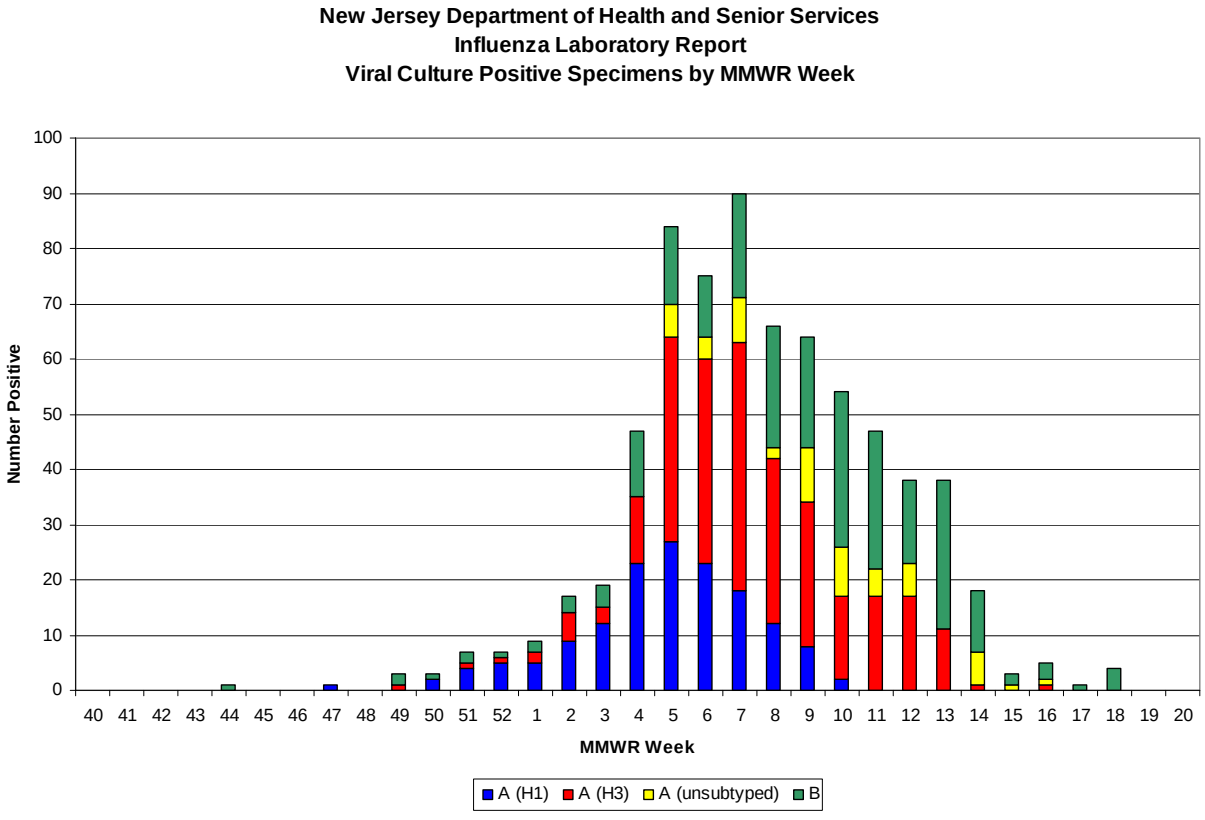
	Rapid Antigen Test Results†			Culture† Type (Subtype)			
	A	B	A/B	A (H1)	A (H3)	A (unsubtyped)	B
Atlantic County	41	12	0	0	1	1	3
Bergen County	81	30	0	5	4	57	37
Burlington County	194	42	0	0	1	0	2
Camden County	0	0	0	0	0	0	0
Cape May County	0	0	0	0	1	0	0
Cumberland County	0	0	0	0	2	0	1
Essex County	229	68	50	9	23	0	18
Gloucester County	0	0	0	21	38	0	2
Hudson County	25	17	0	12	18	0	18
Hunterdon County	0	0	0	8	10	0	12
Mercer County	216	101	0	8	9	0	11
Middlesex County	44	15	0	11	11	0	13
Monmouth County	177	36	164	9	8	0	3
Morris County	0	0	0	19	43	0	25
Ocean County	0	0	0	1	2	0	1
Passaic County	96	47	0	12	6	0	11
Salem County	7	1	0	0	0	0	0
Somerset County	7	2	17	12	16	0	7
Sussex County	48	14	2	0	3	0	3
Union County	22	12	0	12	21	0	25
Warren County	67	40	0	0	11	0	7
Unknown	0	0	0	12	32	0	32
State Total	1254	437	233	151	260	58	231

*Data from MMWR weeks 40-52 represent the period of the influenza season occurring in 2007; weeks 1-20 represent the period of the influenza season occurring in 2008

†Rapid antigen test results are acquired from facilities reporting these results via NREVSS or the CDRSS ILI module. Culture results are obtained from PHEL and hospital clinical laboratories that perform viral culture.

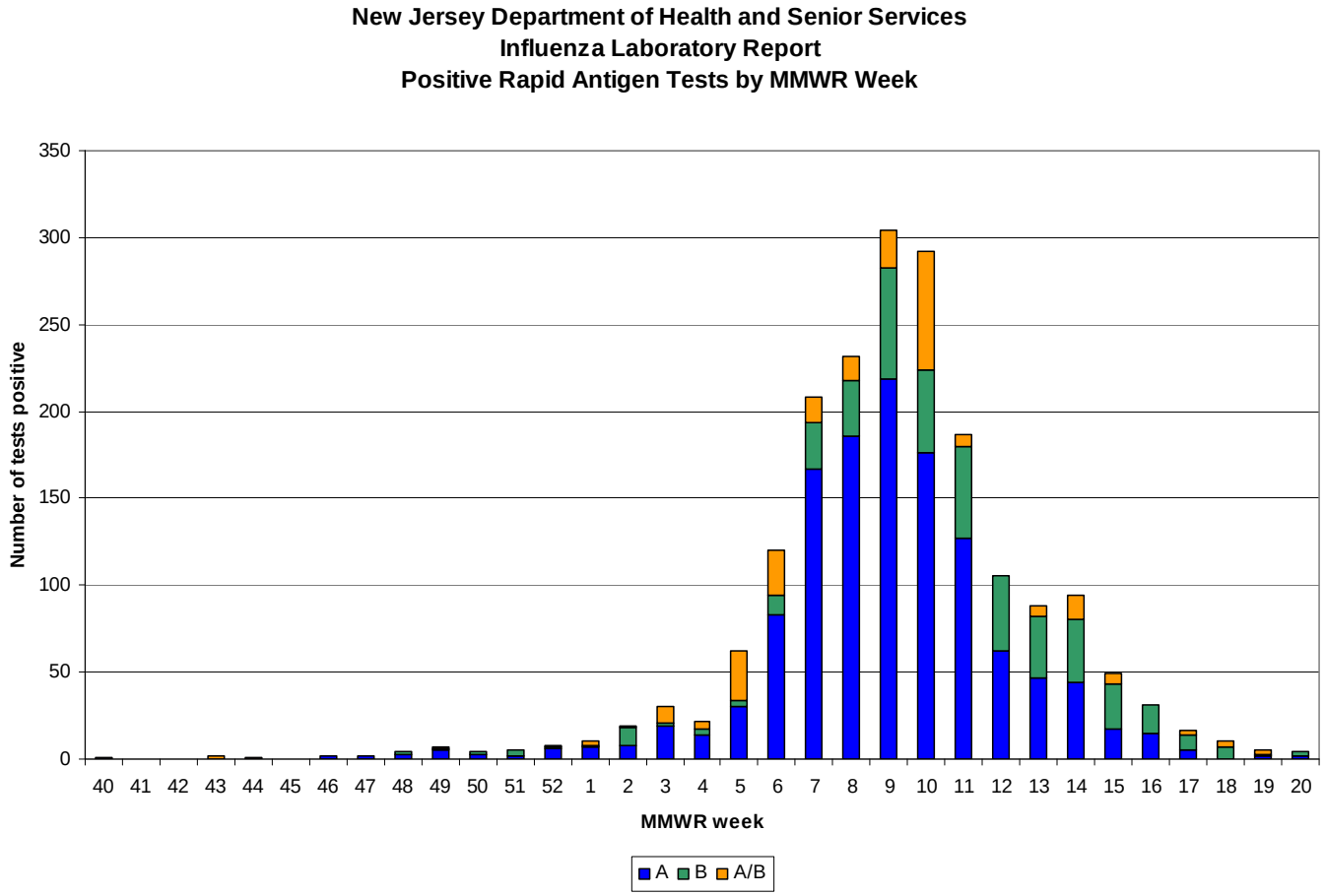
A gradual increase in the number of positive samples began after week 49, primarily due to influenza A (H1). The largest number of samples that tested positive was observed during week 7 with 90 samples positive by culture (Figure 3A). Peak activity associated with influenza A (H1) occurred during week 5, influenza A (H3) during week 7, and influenza B during week 10. Samples found to be positive by culture began to decline after week 7.

Figure 3A
Influenza Laboratory Report
Positive Viral Culture Results by MMWR Week, 2007-2008



During the 2007-2008 season, NJDHSS asked hospital laboratories to also report positive influenza rapid antigen test results (Figure 3B). Peak influenza activity based on rapid antigen test data for both influenza A and B occurred during week 9. Samples found to be positive by rapid antigen testing began to decline after week 9.

Figure 3B
Influenza Laboratory Report
Positive Rapid Antigen Test Results* by MMWR Week, 2007-2008



*As reported in the Communicable Disease Reporting and Surveillance System (CDRSS) ILI module or National Respiratory and Enteric Virus Surveillance System (NREVSS)

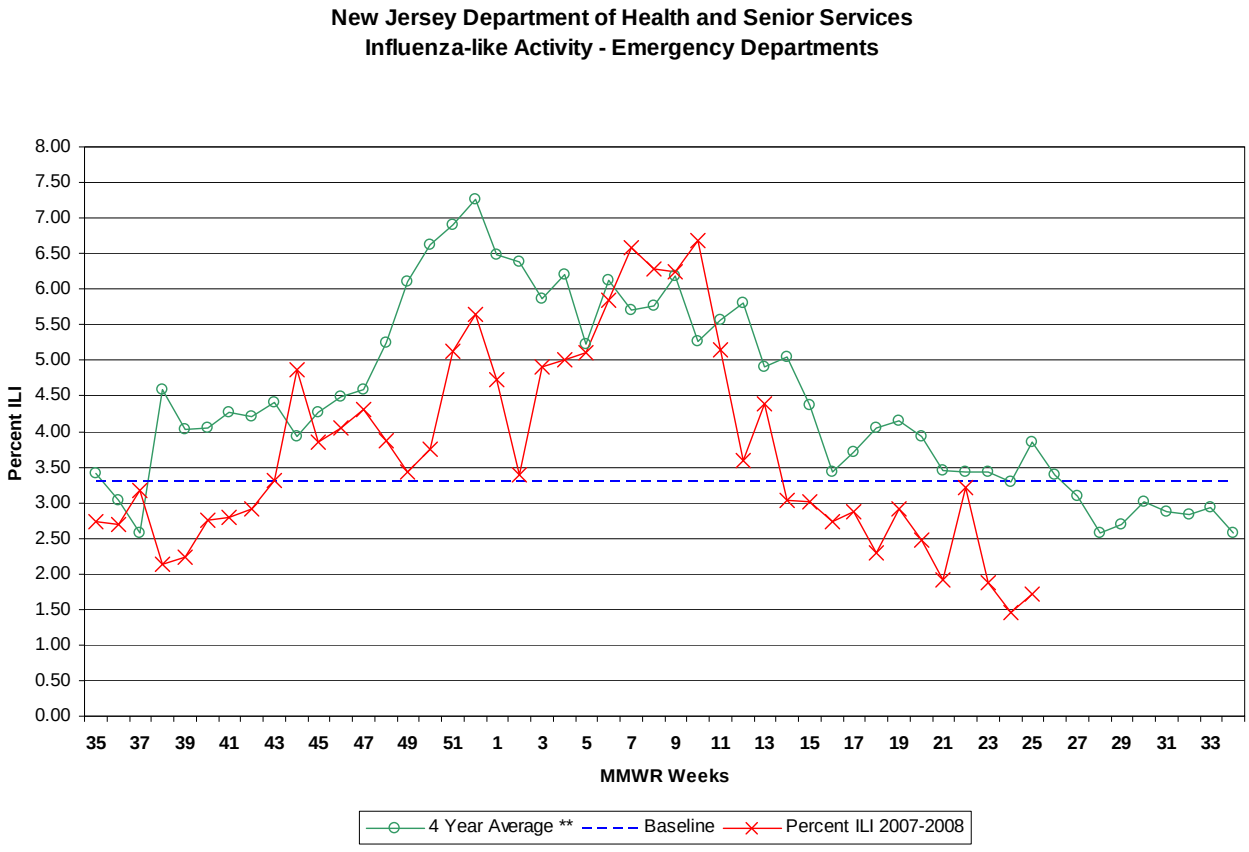
Influenza-like Illness (ILI) Surveillance

Once a week, NJDHSS collects statewide ILI data from hospital emergency departments and long-term care facilities as well as school absenteeism rates. All information is recorded in a dedicated ILI module in the Communicable Disease Reporting and Surveillance System (CDRSS). The following is a summary of these data.

Emergency Departments (ED)

ED visits for ILI peaked during week 10, with ILI accounting for 6.68% of ED visits (Figure 4). The percentage of ED visits for ILI was above baseline for the first time during week 43 and remained above baseline for 22 consecutive weeks. ED visits returned to below-baseline levels during week 14.

Figure 4
Percentage of Emergency Department Visits for Influenza-like Illness (ILI), 2007- 2008*



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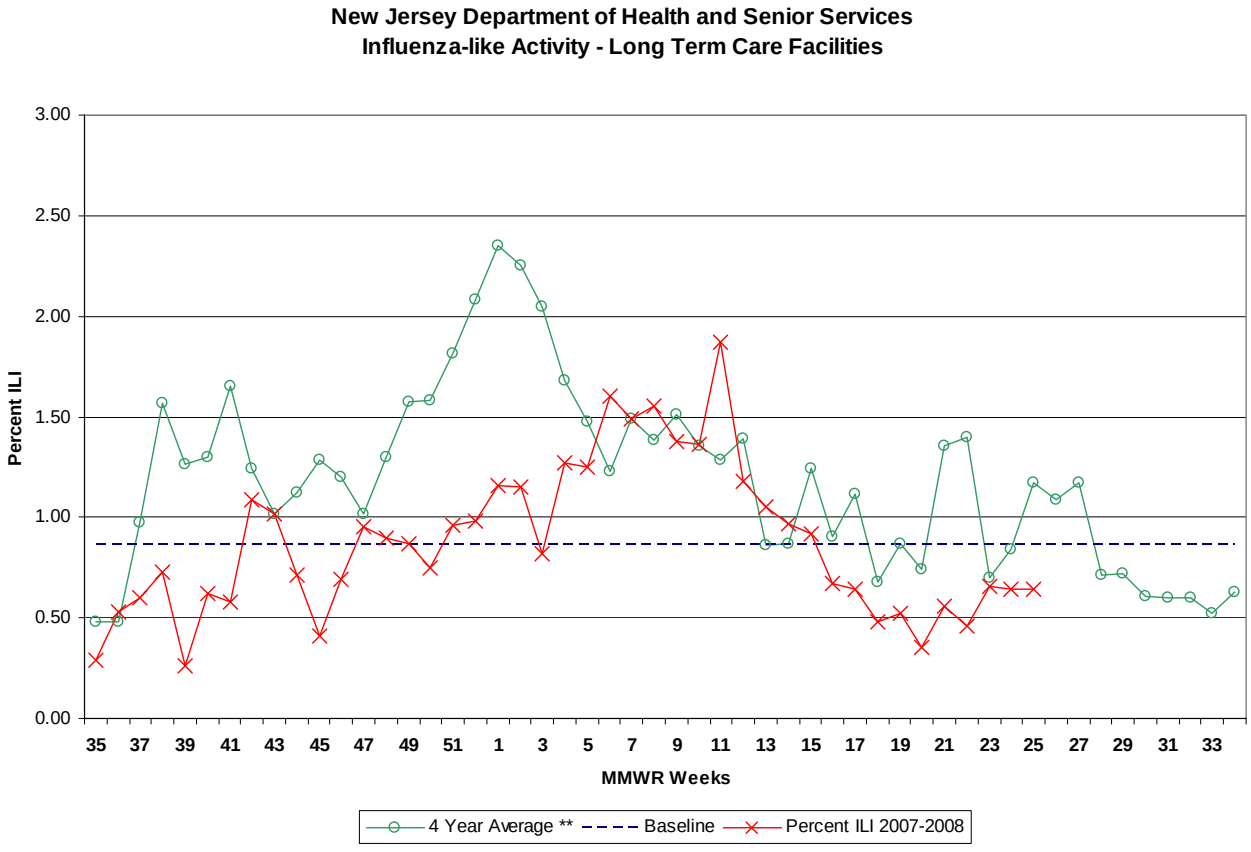
Long-term Care Facilities

ILI activity in long-term care facilities peaked during week 11 with 1.87% of residents identified with ILI reported (Figure 5). ILI activity in long-term care facilities was initially above baseline during week 42. After week 42, activity fluctuated until week 4 when activity was again above baseline and remained there for 11 consecutive weeks. ILI activity returned to below-baseline levels during week 16.

Nosocomial outbreaks

During the 2007-2008 influenza season, there were 21 reported upper respiratory or ILI outbreaks in long-term care facilities. Testing for influenza was performed during 11 (52%) of the 21 outbreaks. Rapid antigen test results were positive in eight outbreaks; the number of positive test results is as follows: influenza A (3), influenza B (1), influenza A/B (4). In 3 of 8 outbreaks, influenza was confirmed by viral isolation and PCR. During the 2006–2007 influenza season, 7 outbreaks of upper respiratory or ILI were reported compared to 10 outbreaks during the 2005-2006 influenza season.

Figure 5
Influenza-like Illness (ILI) Activity, Long Term Care Facilities, 2007-2008*



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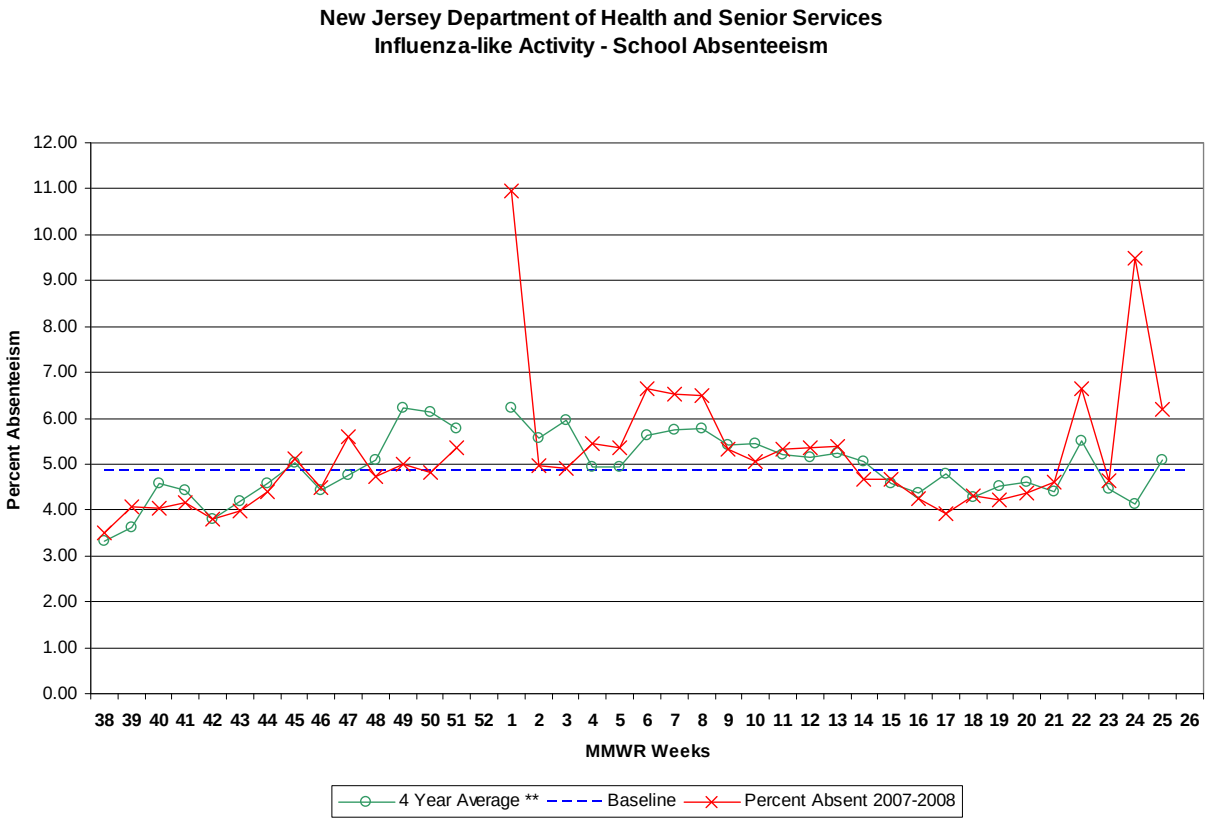
School Absenteeism

A spike in the school absenteeism rate (10.95%) was observed during week 1 (Figure 6). Due to a holiday break, this rate is based on data from only 19 schools in 4 counties and may not be a reliable indicator of statewide school absenteeism. Another peak in the rate (6.65%) was observed during week 6. Data from week 6 is a more reliable indicator of absenteeism as it is based on reports from 357 schools in 18 counties. The school absenteeism rate was initially above baseline during week 45. After week 45, absenteeism rates fluctuated until week 51 when they remained above baseline for 13 consecutive weeks. Due to a holiday break, absenteeism data for week 52 is missing. The spike in absenteeism during week 24 is probably secondary to heat-related student absences that occurred during a heat wave in NJ.

Figure 6
School Absenteeism, 2007-2008*



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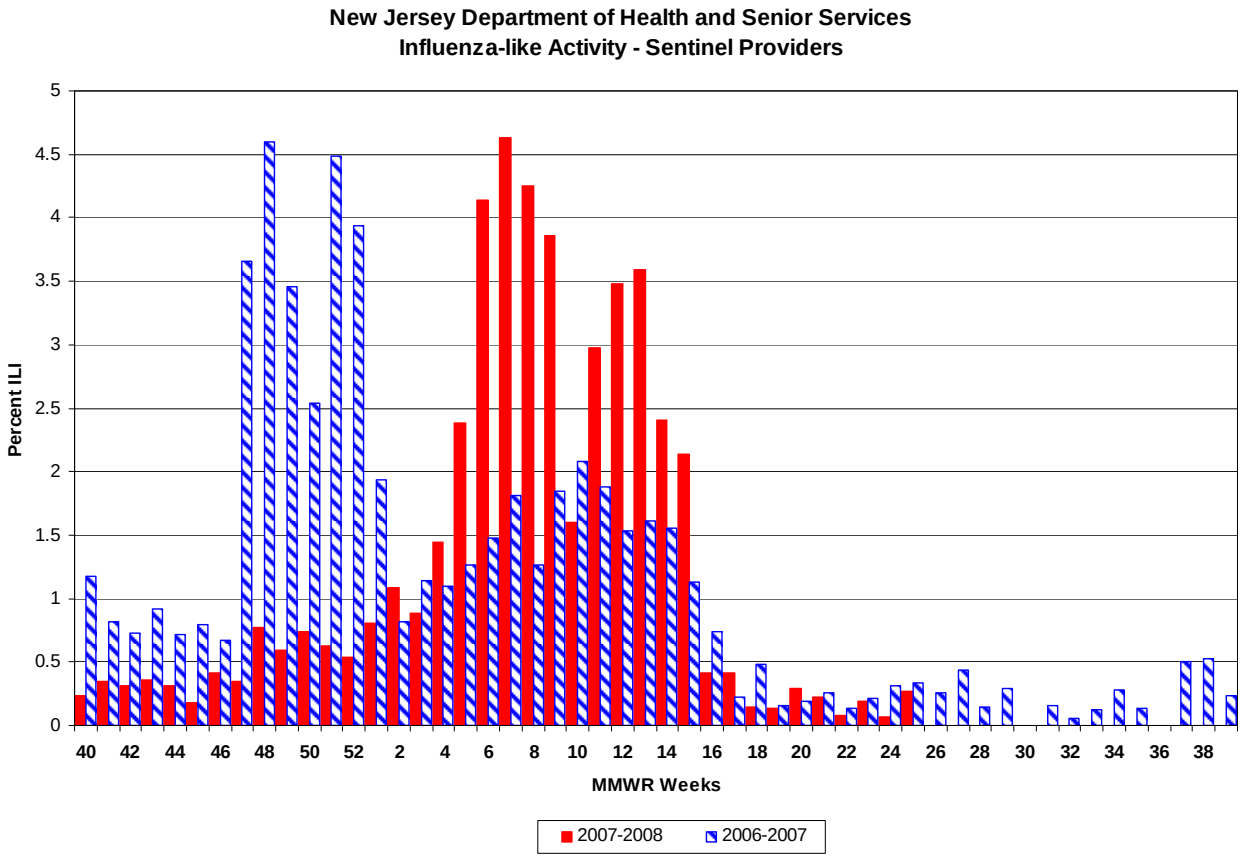
Sentinel Provider Surveillance

NJDHSS currently has 43 providers enrolled in CDC's Influenza Sentinel Provider Surveillance Program. Once a week, these providers report the total number of patient visits and the number of patients seen with ILI (i.e., cough and/or fever). During the 2007–2008 influenza season, an average of 14 reporters per week reported a total of 85,295 visits; of these, 1,162 (1.4%) were associated with ILI. The Mid-Atlantic region baseline for sentinel provider reporting as calculated by CDC is 1.8%. Peak ILI activity based on sentinel provider surveillance occurred during week 7, in which 4.63% of patient visits were due to ILI (Figure 7).

Figure 7
Influenza-like Illness (ILI) Activity Reported by Sentinel Providers, 2006-2008*



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Pediatric Influenza Surveillance

During the 2007-2008 season, NJDHSS received 52 reports of influenza-associated pediatric illness. Of these, 26 cases met the case definition for severe pediatric illness or death associated with influenza. A detailed report regarding pediatric influenza surveillance will be released separately.

122 City Mortality Report

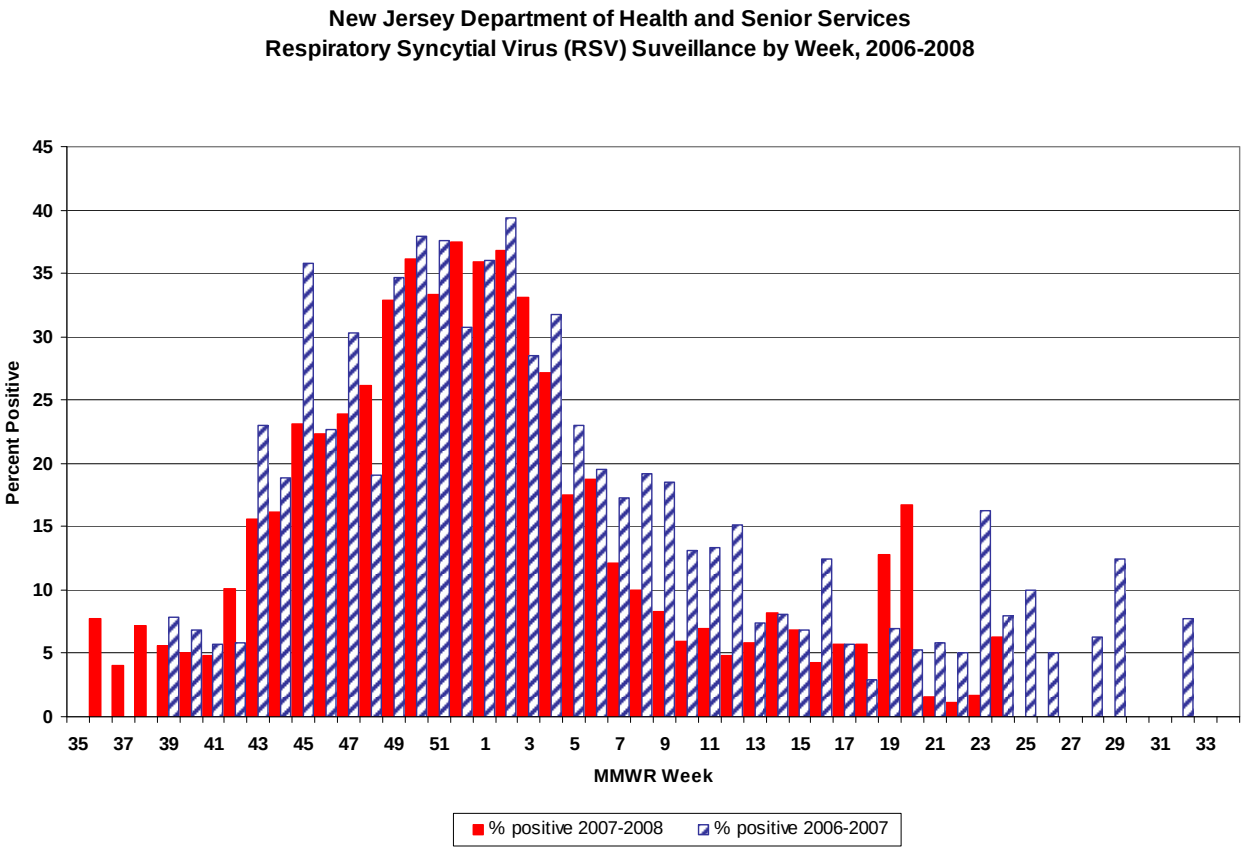
As part of national influenza surveillance efforts, the Centers for Disease Control and Prevention (CDC) receives weekly mortality reports from 122 cities and metropolitan areas in the United States within 2-3 weeks from dates of death. These reports summarize the total number of deaths occurring in these cities/areas each week, as well as the number due to pneumonia and influenza.

New Jersey evaluates these data from vital statistics offices in 6 New Jersey cities (Camden, Elizabeth, Jersey City, Newark, Paterson, Trenton). For the 2007-2008 influenza season, deaths due to pneumonia or influenza peaked during week 1 with 14.91% of reported deaths being associated with pneumonia or influenza.

Respiratory Syncytial Virus (RSV) Surveillance

NJDHSS receives weekly reports from select hospital laboratories on the number of RSV tests performed and the number that are positive. During the 2007-2008 influenza season, there were 13,151 tests reported; of these, 2,585 (20%) were positive for RSV (Figure 8). The percentage of positive tests peaked during week 52, with 37.45% positive for RSV. During the 2006-2007 season, the percentage of positive tests peaked during week 2, with 39.43% of samples being positive for RSV.

Figure 8
Positive Respiratory Syncytial Virus (RSV) Test Results, 2006-2008



Additional Information

For additional information regarding influenza surveillance please visit the following websites.

http://nj.gov/health/flu/surveillance.shtml
http://www.cdc.gov/flu/