

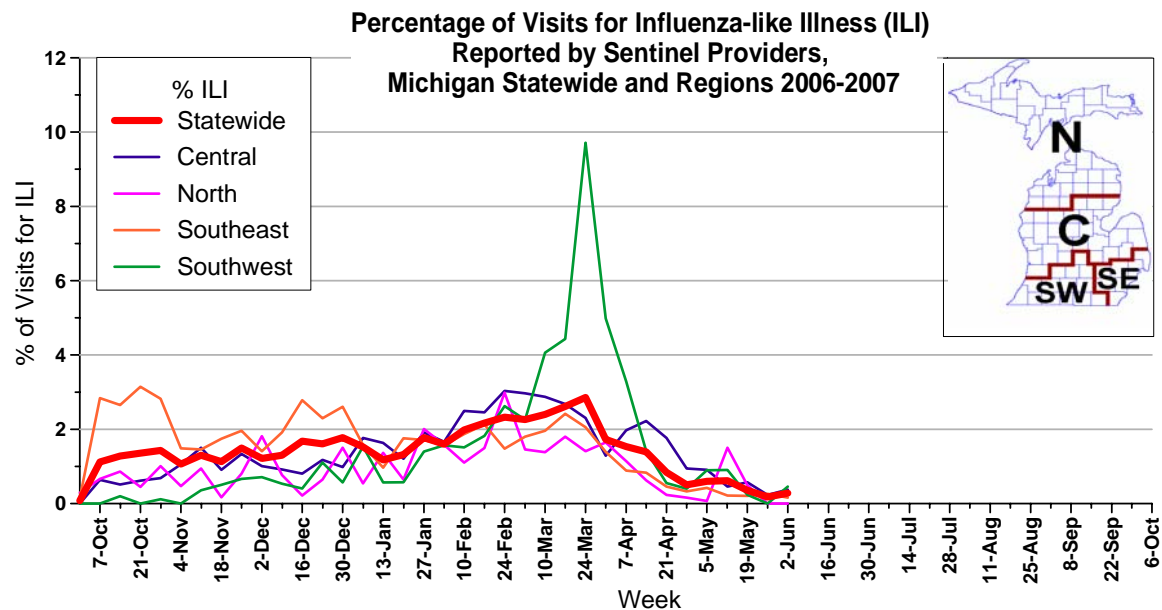
**Michigan Influenza Surveillance Summary  
2006-2007 Influenza Season  
Michigan Department of Community Health  
August 10, 2007**

**SEASONAL INFLUENZA**

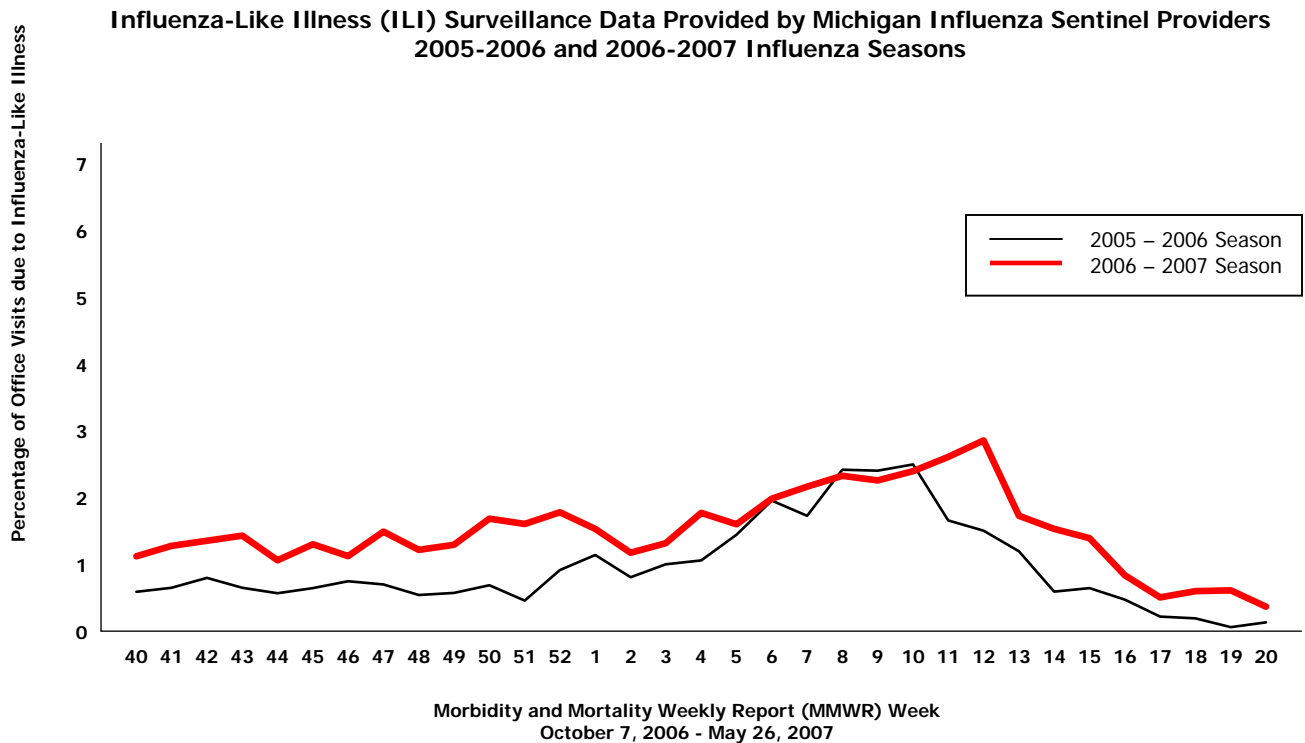
The 2006-2007 Michigan influenza season can be characterized as mild overall. Peak influenza activity occurred in late March, with this season marking the second year in a row with an unusually late peak. The first influenza virus isolated at the Michigan Department of Community Health Bureau of Laboratories was announced on November 17, 2006. Activity due to influenza A (H1N1) predominated during November through mid-February and contributed to a small peak of activity seen in late December. Cases due to influenza A (H3N2) increased in late February and continued through April; cases due to influenza A (H1N1) correspondingly decreased during this time period. Influenza B viruses co-circulated throughout the season, peaking in early March. Statewide activity was not widespread during the 2006-2007 season; overall influenza activity did reach the second highest level of reporting, regional, from the weeks ending February 24, 2007 through March 31, 2007.

**Sentinel Provider Data**

Weekly data provided by Michigan healthcare staff participating in the CDC U.S. Influenza Sentinel Provider Surveillance Network indicated that statewide influenza-like illness (ILI) activity occurred at a low level, less than 2% of all office visits, from October through mid-February. Subsequently, the proportion of visits due to ILI increased gradually each week until it peaked at 2.9% in the week ending March 24. Activity decreased rapidly afterward, returning to less than 1% of all visits by the week ending April 21. Data from each of the four surveillance regions followed the pattern described above, however the Southwest surveillance region reported a higher level of activity beginning in mid-March, peaking at 9.7%; these data were impacted by the activity experienced at one reporting site. Overall during the 2006-2007 season, influenza-like illness activity was prolonged with peak activity occurring later than most seasons.



In comparison, data provided by sentinel physicians during the 2005-2006 season showed peak influenza-like illness activity occurred in early March at 2.4% of all visits. The season was similarly prolonged and peak activity was later than most seasons.



### Individual Influenza Reports

On December 14, 2006, the Michigan Department of Community Health (MDCH) incorporated two new influenza reporting forms into the Michigan Disease Surveillance System (MDSS). An “Influenza” reportable disease condition was created to more accurately manage and track individual cases of influenza (previously listed under “Flu-like disease”). A “Novel Influenza” form was also added in the event of an occurrence of a novel human influenza strain or a human case of avian or pandemic influenza.

During the 2006-2007 influenza season, peak activity for individual influenza reports in MDSS was seen between the weeks ending March 17 (MMWR Week 11) and April 7 (MMWR Week 14)\*. From October 1, 2006 – May 31, 2007, 1,126 individual cases were reported. In contrast, for the 2005-2006 influenza season, peak individual flu-like illness activity occurred between the week ending March 4 and the week ending March 18. 1,306 individual reports were entered into MDSS during October 2005 – May 2006. Overall, individual influenza activity in MDSS indicates that the 2006-2007 season was milder with a slightly less-defined peak than the 2005-2006 season.

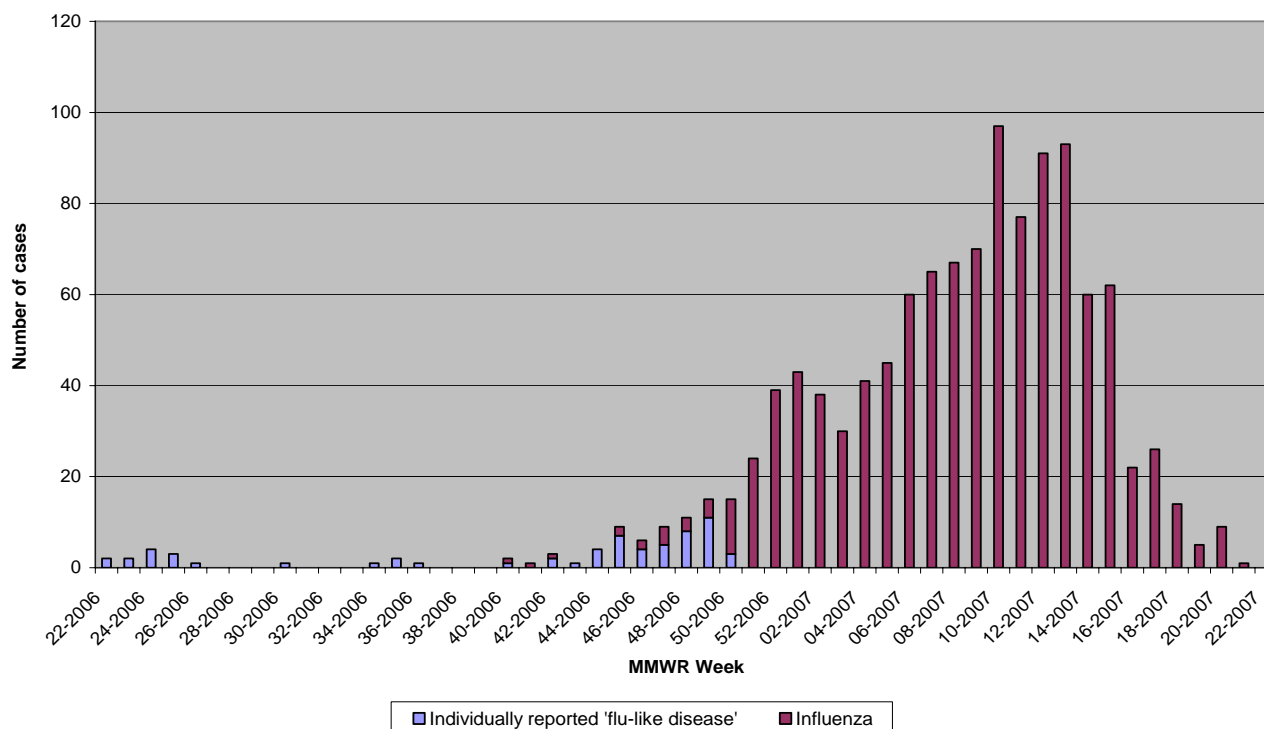
For the 2006-2007 influenza season, the median age of individually reported cases was 12 years, with a mean of 21 years. 50% of reported cases were male. Over the course of the season, the largest percentage of individually reported cases (25.4%) occurred in

very young children (0-4 years of age). Yearly influenza vaccination is recommended for all children aged 6 months to 4 years by the Advisory Committee on Immunization Practices\*\*. The lowest percentage of cases (13.8%) was seen in another high-risk group, those 50 years and older. The data may not be representative of the statewide impact of influenza as local health departments are not required to individually report influenza; in addition, the greater number of reports from large local health jurisdictions may unintentionally bias statewide results.

**Individually Reported 'Flu-like Disease' and Influenza by Month and Age Group, Michigan, 2006-2007**

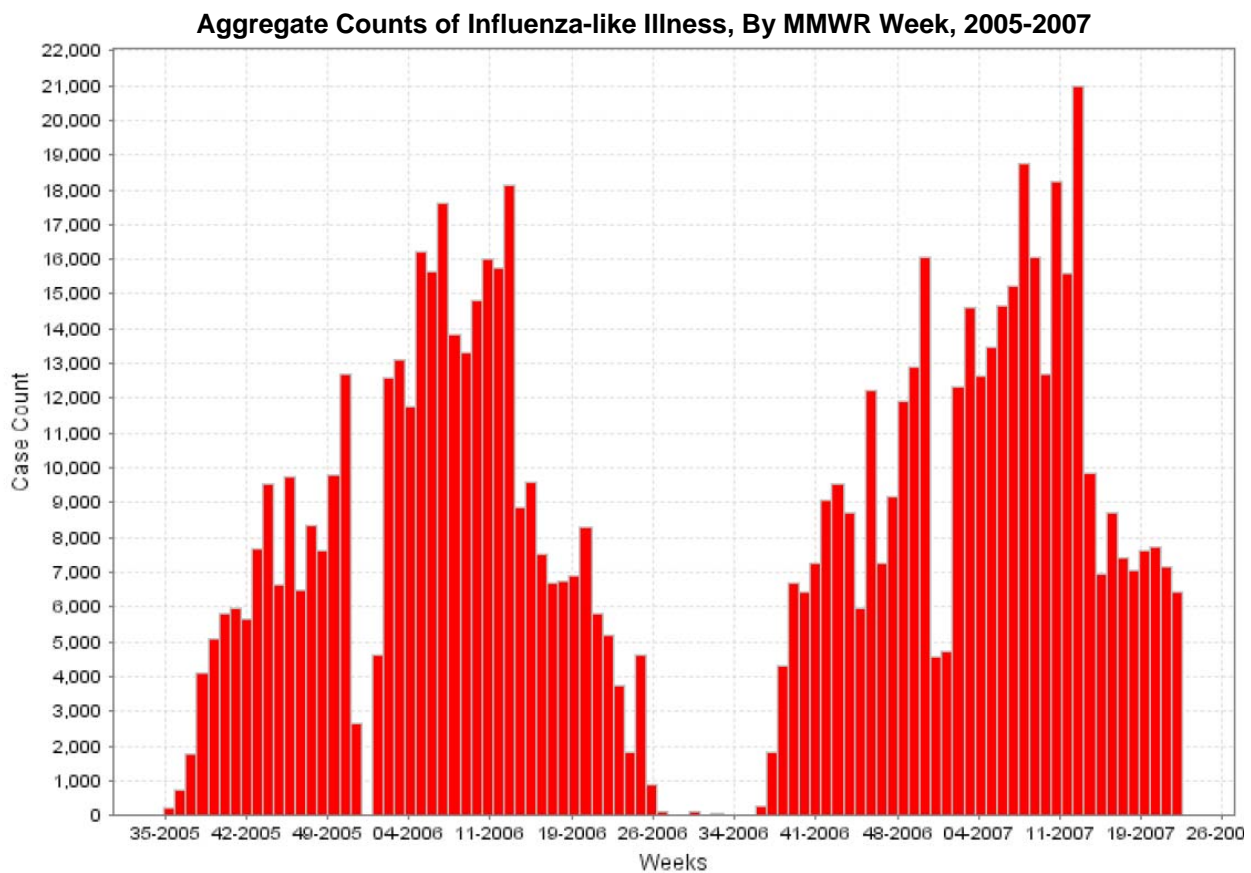
Month	Age Group; No. %										
	0-4 y		5-9 y		10-18 y		19-49 y		50+ y		Total
Oct	2	28.6%	0	0.0%	1	14.3%	3	42.9%	1	14.3%	<b>7</b>
Nov	9	24.3%	8	21.6%	3	8.1%	9	24.3%	8	21.6%	<b>37</b>
Dec	16	17.0%	31	33.0%	15	16.0%	16	17.0%	16	17.0%	<b>94</b>
Jan	50	28.9%	44	25.4%	25	14.5%	30	17.3%	24	13.9%	<b>173</b>
Feb	74	30.3%	61	25.0%	31	12.7%	54	22.1%	24	9.8%	<b>244</b>
Mar	85	22.8%	60	16.1%	93	24.9%	89	23.9%	46	12.3%	<b>373</b>
Apr	46	26.3%	25	14.3%	24	13.7%	48	27.4%	32	18.3%	<b>175</b>
May	4	18.2%	3	13.6%	2	9.1%	9	40.9%	4	18.2%	<b>22</b>
<b>Total</b>	<b>286</b>	<b>25.4%</b>	<b>232</b>	<b>20.6%</b>	<b>194</b>	<b>17.2%</b>	<b>258</b>	<b>22.9%</b>	<b>155</b>	<b>13.8%</b>	<b>1125</b>

**Individually Reported 'Flu-like Disease' and Influenza, Michigan, 2006-2007**



### Aggregate Influenza-like Illness

For aggregate influenza-like illness reports from local health departments, the top three weeks of the season were the weeks ending March 31 (20,996 reports), February 24 (18,742 reports) and March 17 (18,240 reports). The weeks ending March 31 and March 17 also correspond to peak activity for ILI sentinel reporting and individual MDSS influenza reports. During the 2005-2006 influenza season, peak activity was seen in the weeks ending April 1 (18,139 reports), February 18 (17,607 reports), and February 4 (16,214 reports). Overall, MDSS aggregate counts from the current influenza season appear to have been similar to the previous season in timing, length and severity. As a reminder, while the majority of aggregate reports come from school-based absenteeism due to influenza-like illness, sometimes these reports capture absenteeism due to other causes. However, even with possible confounding data, aggregate reporting trends with confirmed cases of influenza in the state in most years.



### Syndromic Surveillance

For the 2006-2007 season, emergency department visits due to constitutional complaints started increasing above baseline levels in November and remained elevated until late April. Constitutional visits peaked twice – in late December at 11.5% of all visits and again in late March at just over 11.5% of all visits. Visits due to respiratory complaints increased above baseline levels starting in September, remained elevated around 13-15% throughout the season and peaked at 19% of all visits in early

January. During the 2005-2006 season, visits due to constitutional complaints peaked in late February at roughly 10% of all visits, while visits due to respiratory complaints peaked twice – in late October at less than 14% of all visits and again in late February at over 14% of all visits. Comparisons between the 2005-2006 and 2006-2007 influenza seasons are difficult to make, as the number of emergency departments providing syndromic data increased from 25 to 62 between the two seasons. In addition, this method of surveillance only captures chief complaints, not clinical or laboratory diagnoses.

Over-the-counter product sales were more variable over the course of the year, but were consistent with the other indicators in suggesting peak activity in flu-like illness activity in March 2007 that was similar to levels seen in the previous year. One notable variation was the adult and pediatric cold relief liquids, which were about 1-2% below their percentage of total sales for the previous year.

### **Pediatric Mortalities and Congregate Setting Outbreaks**

No confirmed pediatric influenza-related mortalities were identified in Michigan over the 2006-2007 season. MDCH investigated four possible pediatric influenza-related mortalities; two of these investigations are still pending. One congregate setting outbreak was reported this season, which occurred in late February at an extended care facility in the Central region. Influenza A was identified at an outside laboratory; subtyping was not available.

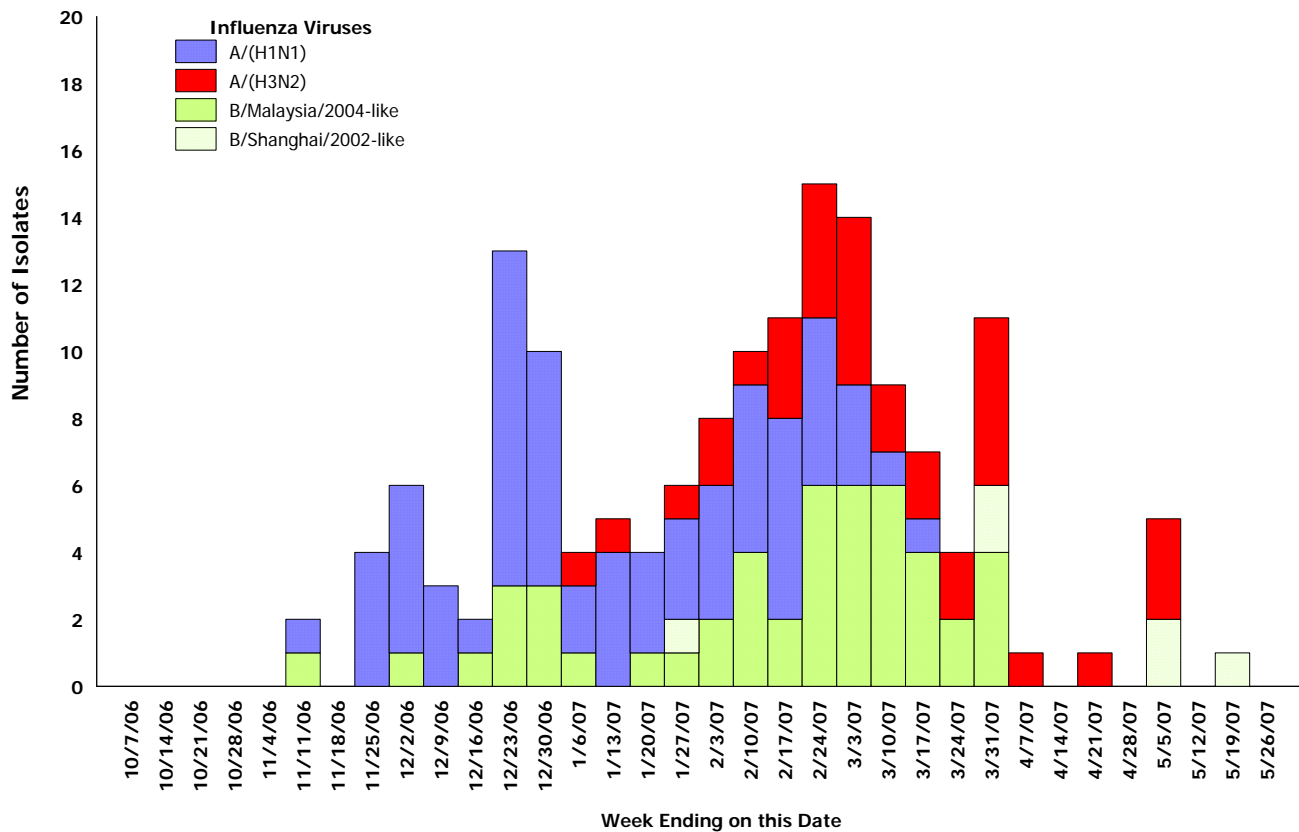
### **MDCH Laboratory Isolates**

Sentinel physicians, sentinel laboratories and other clinical health partners provide virologic data by submitting clinical specimens and/or viral isolates for respiratory virus culture at the MDCH laboratory. During October 1, 2006 to May 31, 2007, there were 157 laboratory-confirmed influenza cases from the MDCH laboratory. Of these, 69 (44%) were due to influenza A (H1N1), 34 (22%) were influenza A (H3N2), and 54 (34%) were influenza B. In comparison, during the 2005-2006 season, 138 total influenza cases were identified, with 132 (96%) attributed to influenza A (H3N2) and 6 (4%) to influenza B.

MDCH has submitted influenza isolated to the Centers for Disease Control and Prevention (CDC) for strain typing. Of these isolates, two influenza A (H1N1) isolates were identified as A/New Caledonia/20/99-like, which matched the vaccine strain for 2006-2007. Three influenza A (H3N2) isolates were confirmed as A/Wisconsin/67/2005-like, which was the H3N2 component of this season's vaccine. One influenza B isolate was characterized as B/Ohio/01/2005-like, which belongs to the B/Victoria lineage and is antigenically equivalent to the 2006-2007 influenza B vaccine strain B/Malaysia/2506/2004-like. Another influenza B isolate was determined to be B/Florida/07/2004-like, a recent strain of the B/Shanghai/361/2002-like viruses that belong to the B/Yamagata lineage. Additional isolates from the end of the influenza season have been submitted for strain typing; results are pending.

These results suggest that a variety of influenza viruses were circulating in Michigan during the 2006-2007 season, with the majority of submitted isolates matching the vaccine strains.

Michigan Department of Community Health Laboratory-Confirmed Influenza  
2006 - 2007 Influenza Season



### Sentinel Laboratories

Eight sentinel laboratories across the state submitted weekly respiratory virologic testing results to MDCH. Positive test results were first seen during late November to early December in the majority of sentinel labs. While variation in peak activity was noted, the majority of labs saw their highest number of positive influenza test results in late February through March, corresponding with other influenza activity indicators.

### 2007-2008 Influenza Vaccine

The 2007-2008 influenza vaccine for the Northern Hemisphere will contain the A/Solomon Islands strain as its H1 component, A/Wisconsin strain as its H3 component and the B/Ohio strain for its B component (used for B/Malaysia/2506/2004-like virus). This represents a change for the influenza A (H1N1) lineage, with A/Solomon Islands being a recent antigenic variant of the previous vaccine strain A/New Caledonia. The influenza A (H3N2) and influenza B components remain the same.

## **National Data**

Influenza activity peaked nationwide in mid-February, which was about 4 weeks prior to peak activity in Michigan. The 2006-2007 season was associated with less mortality and lower rates of pediatric hospitalizations than during the previous three seasons. Nationwide virologic data mirrored that seen in Michigan, with influenza A (H1) viruses predominating overall but influenza A (H3) viruses being isolated more frequently late in the season. Forty-one states reported widespread influenza activity at least once during the 2006-2007 season. The percentage of deaths attributed to pneumonia and influenza, as reported by the 122 Cities Mortality Reporting System, did not exceed the epidemic threshold this season. 68 pediatric deaths associated with influenza were reported from 26 states.

In May 2007, a Health Alert Network advisory was issued by CDC regarding an increase in the number of influenza-associated pediatric deaths and coinfections with *Staphylococcus aureus* during the 2006-2007 season. Only one pediatric death with influenza and *S. aureus* coinfection had been reported during 2004-2005, and three had been reported during the 2005-2006 season. Of the 68 reported deaths among children associated with influenza infections during October 1, 2006-May 19, 2007, a total of 21 had coinfections with influenza and either methicillin-resistant or sensitive *S. aureus*.

## **WORLDWIDE NOVEL AND AVIAN INFLUENZA STRAINS**

2006-2007 saw the continuation of the highly pathogenic avian influenza A (H5N1) outbreak in human, poultry and wild birds. Several countries in Europe, the Middle East, Africa and Asia reported their first H5N1 outbreaks in poultry during this time period. From 2003 to July 16, 2007, there have been 318 human cases, including 192 deaths, in 12 countries spanning Asia, the Middle East and Africa. Nigeria and Lao People's Democratic Republic recorded their first human fatalities due to H5N1 in 2007. In August 2006, China retrospectively confirmed a case from November 2003, originally attributed to SARS, which became the first confirmed human case in the current outbreak.

In September 2006, Indonesia announced a possible case of human-to-human transmission from May 2006. The case was a 27 year-old male with no poultry exposure who visited his H5N1-positive sister in the hospital. However, no further transmission was reported from this situation. In December 2006, Egypt confirmed a genetic mutation in H5N1 viruses isolated from three cases in an extended family; this mutation conferred a moderately reduced susceptibility to oseltamivir. However, WHO did not change its treatment recommendations for human cases of H5N1.

National and international surveillance has also revealed cases of low pathogenic avian influenza. Mute swans from Michigan, as well as subsequent wild birds in multiple states and a turkey flock in Virginia, have tested positive for a strain of low pathogenic H5N1 that is unrelated to the current highly pathogenic H5N1 outbreak in the Eastern Hemisphere. Low pathogenic avian influenza A strains, including H5N1, have been found to circulate normally in wild birds, especially waterfowl. In May 2007, at least four

human infections occurred in conjunction with a low pathogenic avian influenza H7N2 outbreak in poultry in the United Kingdom.

### **OTHER RESOURCES**

For information about influenza, go to the MDCH influenza homepage at <http://www.michigan.gov/influenza>.

- Between October and May, the most current U.S. influenza data is available from the CDC at <http://www.cdc.gov/flu/weekly/fluactivity.htm>.
- Current worldwide human avian influenza activity from the World Health Organization (WHO): [http://www.who.int/csr/disease/avian\\_influenza/en/](http://www.who.int/csr/disease/avian_influenza/en/).
- The CDC 2006-2007 Influenza Activity Summary is available online at [http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5631a2.htm?s\\_cid=mm5631a2\\_e](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5631a2.htm?s_cid=mm5631a2_e).

\* For more information on the designation of MMWR weeks, please visit [http://www.cdc.gov/epo/dphsi/phs/mmwrweek/MMWR\\_Week\\_Fact\\_Sheet.doc](http://www.cdc.gov/epo/dphsi/phs/mmwrweek/MMWR_Week_Fact_Sheet.doc).

\*\* Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices, 2007. Available online at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr56e629a1.htm>.