



# INFLUENZA WATCH LOS ANGELES COUNTY

**The Pandemic Year in Review:** This final issue of Volume 4 of *Influenza Watch* summarizes a year of data from April 19, 2009 through April 17, 2010 to reflect flu activity in Los Angeles County in this unique year of pandemic H1N1 (pH1N1). Of all flu tests conducted and reported during this time, 12.2% were positive (Table 1) with two distinct waves of flu activity occurring in the summer and fall of 2009 (Figure 1). Throughout the same period, 8.4% of RSV tests were positive (Table 1) with one distinct peak in week 5 (1/31/10-2/6/10) (Figure 1). The % of emergency department visits due to ILI (influenza-like illness) spiked in week 17 (late April) during the initial stage of the H1N1 pandemic and peaked in early November during week 44 (Figure 2). The spike in week 17 was likely due to increased health-care-seeking behavior during the early stages of the pandemic rather than a true increase in ILI as other indicators of flu activity remained relatively low during this time. Over the course of the year, there were a total of 401 severe cases of pH1N1 (387 ICU admissions and 149 deaths; of the 149 deaths, 135 (91%) had also been admitted to the ICU). Similar to Figure 1, the graph of pH1N1 ICU/deaths displayed in Figure 3 indicates two waves with the smaller first wave occurring June and July and the second larger wave occurring in the fall and peaking in late October/early November. There were 120 ICU/death pediatric cases and 407 respiratory outbreaks (outbreaks were counted if they were confirmed or are still being investigated).

**Table 1: Surveillance System Overview**

SURVEILLANCE SYSTEM*	Week 16 2009 - Week 15 2010
Percent Positive Influenza Tests <sup>±</sup>	12.2
Percent Positive RSV Tests <sup>‡</sup>	8.4
Percent Flu A / Flu B <sup>±</sup>	97.6 / 2.4
Severe Pediatric Influenza Cases <sup>†</sup>	120 (16)
Respiratory Outbreaks	407
Influenza Deaths	149

\*See <http://lapublichealth.org/acd/flu.htm> for a description of surveillance methods.

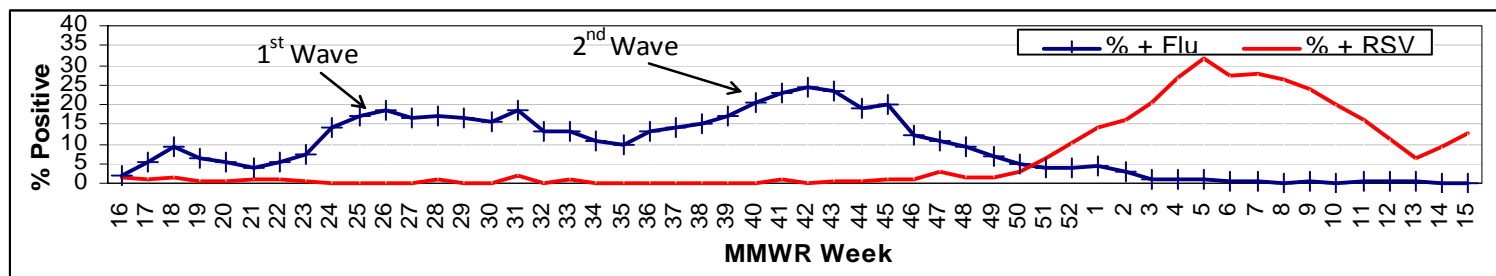
± Sentinel sites (9 participating facilities)

‡ Sentinel sites (4 participating facilities)

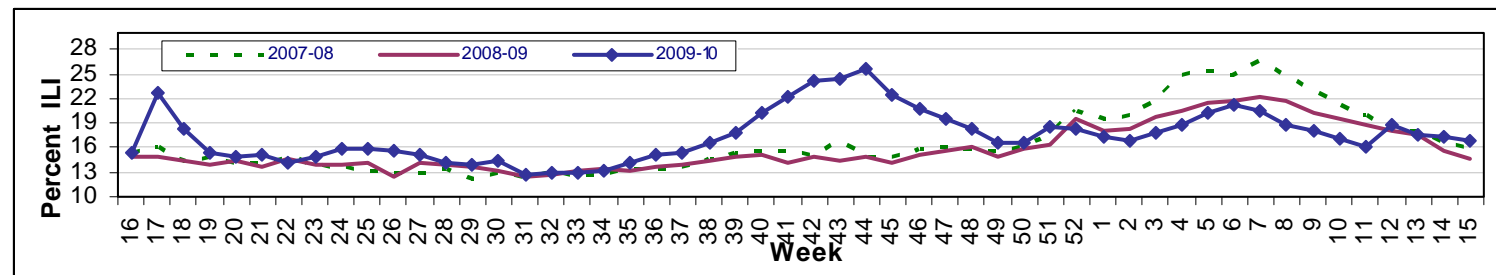
†The number of deaths is indicated by the parenthesis.

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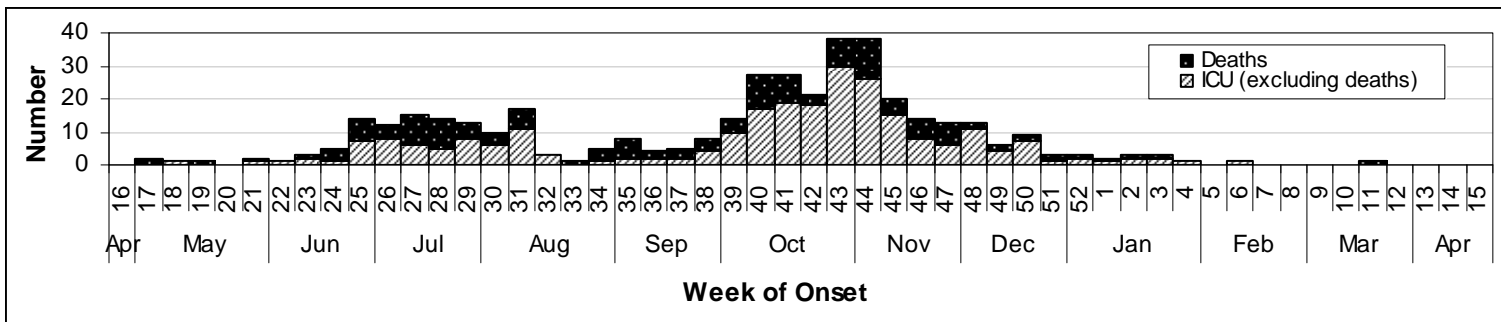
**Figure 1: Percent Positive Influenza and Percent Positive Respiratory Syncytial Virus (RSV) by MMWR Week**



**Figure 2: Percent of Emergency Department Visits for Influenza-Like Illness by MMWR Week, All Ages**



**Figure 3: Number of Pandemic H1N1 Cases by MMWR Week of Onset as of May 10, 2010, Individual Case Reporting**





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## Analysis of Pandemic H1N1 Cases in Los Angeles County (LAC)

**Table 2: Characteristics of Pandemic H1N1 ICU/Deaths, LAC, 04/19/2009-04/17/2010**

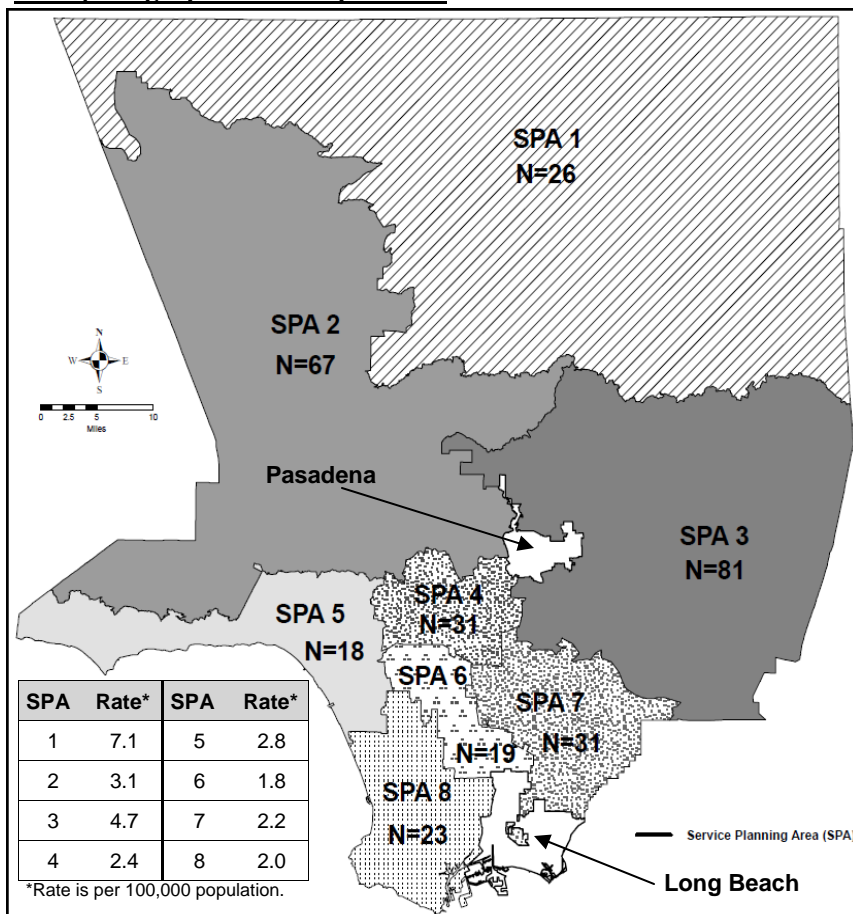
	ICU/Deaths Number* (%)	ICU Rate	Death Rate
<b>Age Group (n=401)</b>			
0-4	49 (12.2)	6.9	0.7
5-24	114 (28.4)	4.0	0.8
25-49	126 (31.4)	3.4	1.7
50-64	89 (22.2)	5.6	3.2
65+	23 (5.7)	2.2	1.3
All Ages	401	4.0	1.6
<b>Race† (n=359)</b>			
Asian	22 (6.1)	1.5	0.5
Black	35 (9.7)	4.1	1.3
Latino	219 (61.0)	4.5	2.0
White	75 (20.9)	2.4	1.1
Other	8 (2.2)	----	----
<b>Sex (n=399)</b>			
Female	194 (48.6)	3.8	1.7
Male	205 (51.4)	4.1	1.3
<b>Underlying Medical Conditions‡</b>			
Cardiac (n=383)	99 (25.8)	----	----
Pulmonary (n=384)	151 (39.3)	----	----
Metabolic (n=386)	117 (30.3)	----	----
Developmental (n=384)	80 (20.8)	----	----
Immunosuppression (n=380)	58 (15.3)	----	----
Obesity (n=334)	154 (46.1)	----	----
Pregnant (n=162)‡	9 (5.6)	----	----
Any condition (n=397)	348 (87.7)	----	----
<b>Clinical Complications‡</b>			
ARDS (n=385)	235 (61.0)	----	----
Bacterial Pneumonia (n=374)	86 (23.0)	----	----
Sepsis/Organ Failure (n=395)	160 (40.5)	----	----
Encephalitis (n=375)	9 (2.3)	----	----
Other Complication (n=379)	183 (48.3)	----	----

\*Total n=401. The n for different variables varies and includes only those cases for which information on that variable was available.  
 †All rates for race are age-adjusted.  
 ‡Overlapping conditions and complications may total over 100%.  
 ‡n includes women of child-bearing age (15--44 years).

Figure 4 shows the number of *confirmed* respiratory outbreaks by SPA. SPA 3 had the highest number of outbreaks followed by SPA 2 while SPAs 5 and 6 had the lowest number of reported outbreaks. However, SPA 1 had the highest *rate* of outbreaks (7.1 per 100,000) followed by SPA 3 (4.7 per 100,000). SPAs 6, 7, and 8 had the lowest *rates* of outbreaks (1.8, 2.2, and 2.0 per 100,000 respectively). A large majority of outbreaks occurred in schools. Differences in rates could be due to many factors including different race and age constituencies of SPAs as well as differences in reporting practices by schools, health facilities, camps, daycares, and other facilities.

Table 2 describes the demographics, underlying medical conditions, and clinical complications of pH1N1 cases that were admitted to the ICU and/or died between April 19, 2009 and April 17, 2010. The highest rate of ICU admission due to pH1N1 was found among children aged 0-4 years. However, this same age group had the lowest fatality rate of all age groups. The highest fatality rate due to pH1N1 occurred in persons 50-64 years old. These findings suggest that young children may be more likely to be admitted to the ICU for observation and/or adults may be more likely to delay care until illness is severe. The highest rates of both ICU admission and death occurred among Latinos while the lowest rates of ICU admission and death occurred among Asians. While women had a slightly lower rate of ICU admission than men, they had a higher fatality rate due to pH1N1. Obesity was the most frequently cited risk factor among pH1N1 ICU/deaths followed by underlying pulmonary, metabolic, and cardiac conditions. Approximately 88% of pH1N1 ICU/deaths had some kind of underlying medical condition. The most frequently cited clinical complication of pH1N1 ICU/deaths was acute respiratory distress syndrome (61%) followed by sepsis/multi-organ failure (41%). Approximately 23% of cases were complicated by a secondary bacterial pneumonia.

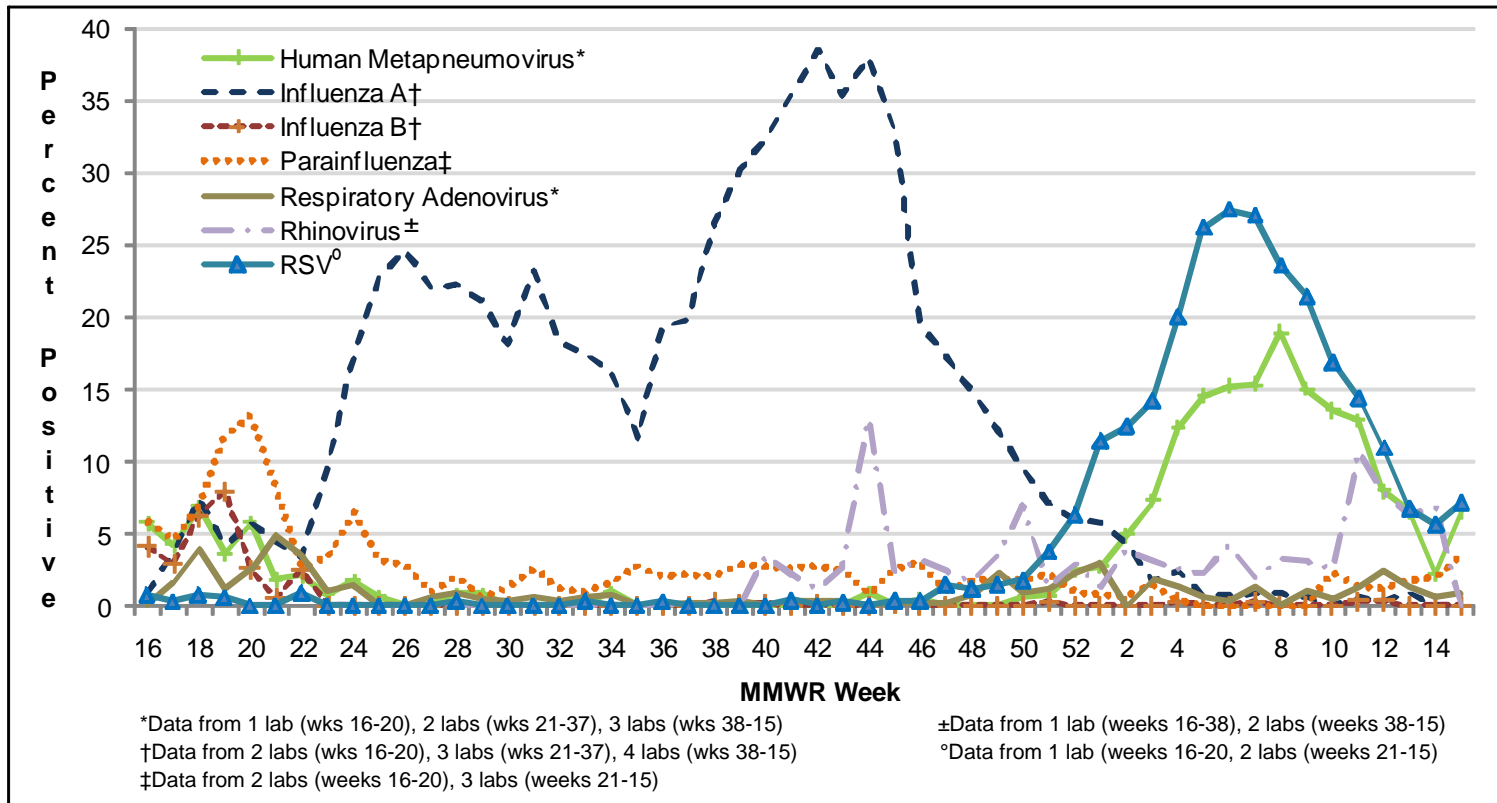
**Figure 4: Confirmed Respiratory Outbreaks by Service Planning Area (SPA), April 2009 - April 2010**





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**Figure 5: Percent of Specimens Positive for Seven Respiratory Viruses from Four Laboratories by MMWR Week  
Los Angeles County, 04/19/09 - 04/17/10**



**Figure 5** displays the percent of tests that were positive for several different respiratory viruses. The data were obtained from four different laboratories in Los Angeles County. While influenza A showed the highest amount of activity as a result of pH1N1, other viruses were circulating as well, namely parainfluenza, human metapneumovirus, and rhinovirus. These other viruses showed the most activity during the winter and spring months of 2010, causing the majority of illness in individuals tested for respiratory viruses during the later time period, whereas pH1N1 was most prevalent during the summer and fall of 2009. Consistent with the figures on page 1, Figure 5 shows two peaks for influenza A, the first occurring in week 26 (6/28/09-7/4/09) and the second during weeks 42-44 (10/18/09-11/7/09). Influenza B peaked at 7.9% positivity during week 19 (5/10/09-5/16/09) after which influenza B dropped to virtually undetectable levels for the remainder of the year. Parainfluenza peaked in week 20 (5/17/09-5/23/09) with a percent positivity of 13.2% and remained relatively low (below 5%) for most of the year. The majority of parainfluenza viruses consisted of types 1 and 3. Both RSV and human metapneumovirus showed the most activity during the beginning of 2010 during weeks 6 (2/7/10-2/13/10) and 8 (2/21/10-2/27/10) respectively. Rhinovirus activity was fairly variable showing two significant increases during weeks 44 (11/1/09-11/7/09) and 11 (3/14/10-3/20/10). Finally, there was relatively low activity for adenovirus with a small peak occurring during week 21 (5/24/09-5/30/09).

**The Acute Communicable Disease Control program would like to thank** each member of our extensive network of clinicians, laboratories and public health professionals who have tirelessly reported data during a challenging and unpredictable pandemic influenza season. From our exceptional hospital infection preventionists reporting individual cases and aggregate data, to our sentinel laboratories reporting test results, to our emergency departments participating in syndromic surveillance, to Community Health Services staff investigating outbreaks, we have been fortunate to work with exemplary professionals without whom none of these data would be available and our response to the pandemic would have been blinded. A sincere thank you to everyone and we hope that this report serves as a testament to all of your hard work. We look forward to ongoing surveillance efforts as we continue to respond to complex and ever-changing influenza (and other respiratory) viruses.