

California Influenza Surveillance Project

California Department of Public Health

2009-2010

Influenza Update

This week, overall influenza activity in California remained “widespread” [defined by CDC as outbreaks of influenza or increases in influenza-like illness (ILI) cases and recent laboratory confirmed influenza in at least half of the regions in the state].

NATIONAL PERSPECTIVE

During the week of November 29 – December 5, 2009, CDC reported that flu continues to be widespread and activity remained high in the United States. Fourteen states reported widespread flu activity; a decline of 11 states over last week. Overall flu activity, especially deaths, however, remained at higher levels than is expected for this time of year.

Visits to doctors for influenza-like illness (ILI) nationally decreased for the sixth week after four consecutive weeks of sharp increases. ILI reports, however, remained elevated nationally. Total influenza hospitalization rates for laboratory-confirmed flu are decreasing but remained higher than expected for this time of year. The highest hospitalization rates were reported in children 0-4 years old.

The proportion of deaths* attributed to pneumonia and influenza (P&I) based on the 122 Cities Report continued to increase and was above the epidemic threshold for the tenth consecutive week.

Over 99% of the influenza viruses reported were identified as 2009 H1N1 influenza A viruses. These viruses remain similar to the virus chosen for the 2009 H1N1 vaccine, and remain susceptible to the antiviral drugs oseltamivir and zanamivir with rare exception.

***Notable:** On December 10, 2009, CDC released new estimates of 2009 H1N1 cases, hospitalizations and deaths occurring in the US from April – November 14, 2009.

This report includes data for an additional month over the previous estimates (posted on November 12, 2009). For the period of April – November 14 2009, CDC estimated between 34 - 67 million cases, 154,000 - 303,000 hospitalizations, and 7,070 -13,930 deaths from 2009 H1N1 influenza in the United States. Estimated values nearly doubled within the addition of data from approximately one month (October 17 – November 14, 2009).

CALIFORNIA 2009 H1N1 INFLUENZA UPDATE

Highlights:

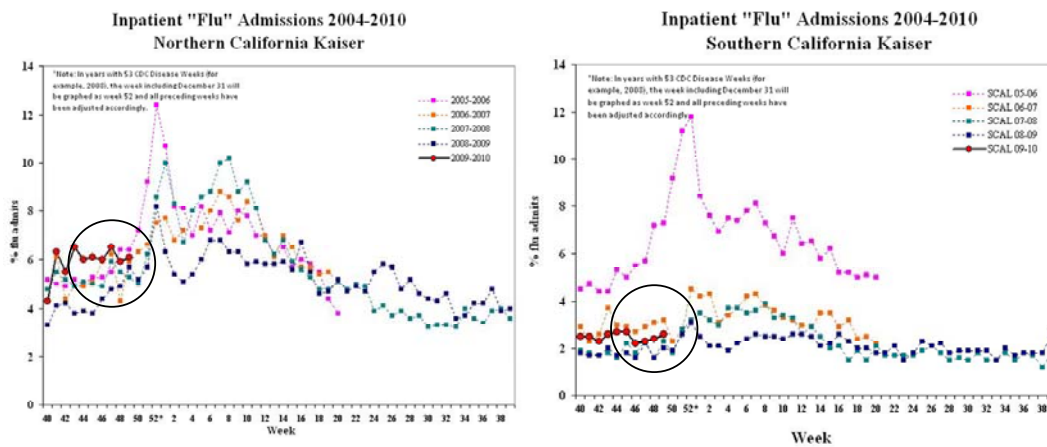
- In California, 2009 H1N1 influenza continues to be widespread. Most indicators suggest that illness may be leveling off, however, levels of illness remain above normal for this time of year. A total of 248 new cases were reported to CDPH this week, 103 of which were from the current reporting period (December 6 – 12, 2009) and 145 of which were delayed reports from prior to December 6, 2009. Reported cases of new hospitalizations decreased from 278 cases last week to 248 cases this week. As in previous weeks, the rate of hospitalizations remains highest among children under one year of age. The number of fatalities reported to CDPH decreased from 31 cases last week to 20 this week. Of these 20, 3 fatalities occurred during the reporting week (December 6-12, 2009); the remaining 17 occurred during preceding weeks. Outpatient ILI illness continues to be above expected levels for this time of year; however, the percent of visits for ILI appears to be declining. Influenza A detections at sentinel laboratories also appear to be leveling off, following six weeks of a downward trend. As with national data, almost all influenza viruses detected over the last week continue to be 2009 H1N1.
- Using the estimation approach reported by CDC, we calculate the total number of 2009 H1N1 infections among Californians to be approximately 4.3 million from April through the first week of December.
- Local health departments have been reporting hospitalized 2009 H1N1 influenza cases as weekly aggregate numbers since August 12, 2009. From December 6 – December 12, 2009, 248 hospitalized/fatal cases were reported to CDPH, 103 of which were from that reporting period (Dec. 6-12) and 145 of which were delayed reports from prior to December 6, 2009.
- There have been 7,794 hospitalizations and/or fatalities, with 1,507 cases requiring intensive care, reported to date since the beginning of the pandemic.
- The statewide cumulative incidence rate of reported 2009 H1N1 influenza hospitalizations and fatalities is 20.1 per 100,000 population.
- CDPH received 20 reports of fatal 2009 H1N1 influenza cases for the week ending on December 12, 2009, of which 3 occurred during that reporting week; a total of 417 2009 H1N1 influenza deaths have been reported to CDPH to date.
- A total of 2,771 hospitalized or fatal 2009 H1N1 influenza cases in pediatric patients 18 years or younger, including 44 deaths, have been reported to CDPH to date.
- Twenty-two new cases meeting the case definition for severe pediatric influenza were reported this week, with no fatalities. Nineteen of the cases are confirmed/probable 2009 H1N1 influenza; additional testing is pending for the remaining three cases.
- The aggregate numbers of hospitalized or fatal cases reported to CDPH this week included 5 pregnant 2009 H1N1 influenza cases; a total of 522 pregnant hospitalized or fatal cases, including 16 deaths (case-fatality proportion 3.1%), have been reported to CDPH to date.
- In recent weeks, almost all influenza A-positive specimens tested by PCR at VRDL and by the Respiratory Laboratory Network have been subsequently confirmed as 2009 H1N1 influenza, reflecting that the predominant circulating influenza strain in California remains 2009 H1N1 influenza.
- This week, VRDL identified a case of oseltamivir-resistance in a resident of San Luis Obispo County; the test result was confirmed by CDC. A total of four cases of oseltamivir resistance have been identified in California residents with laboratory-confirmed 2009 H1N1 influenza infections. Two cases were initially identified at VRDL; the other two were initially confirmed by outside laboratories. To date, of 1,667 specimens tested at VRDL, all but three have tested negative for the H275Y resistance mutation.
- Available data indicate that prevalence of oseltamivir-resistant 2009 H1N1 influenza is quite limited. On December 7, 2009, the CDC released updated interim recommendations for the

use of antiviral medications in the treatment and prevention of influenza. These recommendations are available at: <http://www.cdc.gov/h1n1flu/recommendations.htm>.

Kaiser Permanente Hospitalization Data ("Flu Admits")

The admission diagnoses of flu, pneumonia, and influenza ("Flu Admits") serve as surrogate markers for the more accurate discharge diagnoses. Influenza activity is tracked by dividing the number of Flu Admits by the total number of hospital admissions for the same day to obtain a percentage of influenza and pneumonia admissions. As indicated in the circles, Figures 1 and 2 show that in both northern and southern California, the percentage of Kaiser hospitalizations for pneumonia and influenza (P&I) increased slightly in Week 49 (December 6 – 12, 2009). However, the percentage of hospital admissions for P&I in both regions is within the range of percentages seen for seasonal influenza in previous years.

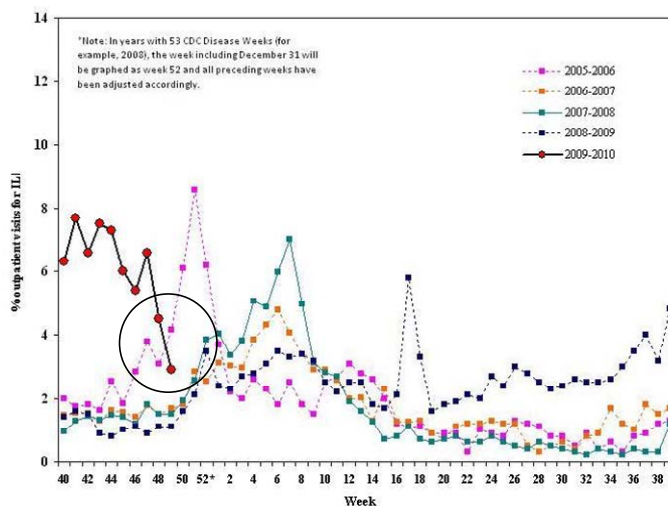
Figures 1-2. Inpatient "Flu" Admissions at Kaiser Facilities, 2004-2009.



CDC Influenza Sentinel Providers

Sentinel providers report the number of outpatient visits for influenza-like illness (ILI) and the total number of visits per week. These data are reported weekly as a percentage of total visits. Figure 3 shows a peak in Weeks 17-18 (April 26 – May 9, 2009) when 2009 H1N1 influenza was first identified. As indicated in the circle, ILI decreased in the last two reporting periods. A total of 96 sentinel providers reported in Week 49.

Figure 3. California Sentinel Providers – Influenza-Like Visits, 2004-2009.



Respiratory Laboratory Network (RLN) Influenza PCR Surveillance Results

As noted in Table 1, during Week 49 (December 6 - 12, 2009), 22% of specimens received by the Respiratory Laboratory Network were positive for influenza A. This is a slight increase from 20% in the previous week. 2009 H1N1 influenza remains the predominant strain circulating in California.

Table 1. Respiratory Laboratory Network (RLN) Influenza PCR Surveillance Results from Selected Laboratories*, Week 49 (December 6-12, 2009)

	Total Flu A tested	Flu A (% of total)	H1 (% of Flu A)	H3 (% of Flu A)	Unsubtypeable (% of Flu A)	Total Flu B tested	Flu B (% of total)
Total RLN*	684	152 (22%)	0 (0%)	1 (1%)	142 (93%)	425	0 (0%)
Northern	283	49 (17%)	0 (0%)	0 (0%)	44 (90%)	251	0 (0%)
Central	230	67 (29%)	2 (1%)	0 (0%)	67 (100%)	114	0 (0%)
Southern	171	36 (21%)	0 (0%)	1 (3%)	31 (86%)	60	0 (0%)

* 16 RLN laboratories reporting, including:
 Northern CA: Contra Costa, El Dorado, Monterey, Sacramento, San Francisco, Santa Clara, Shasta, Sonoma
 Central CA: Fresno, San Joaquin, Tulare
 Southern CA: Long Beach, Los Angeles, Orange, San Luis Obispo, Santa Barbara

Laboratory Positive Results Data

Table 2 shows positive influenza and other virus results from sentinel laboratories, local public health laboratories and VRDL. Detections for influenza A remain steady. Detections for respiratory syncytial virus (RSV) remained similar to the previous reporting period.

Table 2. Influenza and other respiratory virus detections, December 6-12, 2009.

		Sentinel Laboratories/Respiratory Laboratory Network [‡]	Sentinel Providers
Week 49	Number of Sites Reporting	22	435 specimens submitted (223 positive by PCR, 70 pending)
	Influenza A	248 ^a Total tested week 49: 1830	0
	Influenza B	0 Total tested week 49: 11151	0
	RSV	28 ^b Total tested week 49: 874	N/A
	Other Respiratory Viruses	6 ^c Total tested week 49: 119	N/A

[‡]Sentinel laboratories are hospital, academic, private, and public health laboratories located throughout California that provide data on the number of laboratory-confirmed influenza and other respiratory virus detections and isolations. The Respiratory Laboratory Network (RLN) is a network of 23 local public health laboratories that offer enhanced diagnostic testing with the “R-mix” shell vial assay, which detects several respiratory pathogens, including influenza A and B viruses, respiratory syncytial virus, parainfluenza virus, and adenovirus. Some RLN labs also offer PCR testing for influenza A and B.

- ^a Alameda (13); Contra Costa (13); El Dorado (1); Fresno (8); Long Beach (10); Los Angeles (25); Marin (1); Monterey (1); Orange (20); Placer (1); Riverside (1); Sacramento (12); San Bernardino (1); San Diego (4); San Francisco (4); San Joaquin (7); San Luis Obispo (1); San Mateo (8); Santa Barbara (2); Santa Clara (40); Shasta (1); Solano (9); Sonoma (8); Stanislaus (1); Tulare (56)
- ^b Alameda (5); Contra Costa (1); Fresno (1); Long Beach (1); Los Angeles (3); Placer (1); Sacramento (1); San Diego (3); San Francisco (1); San Joaquin (1); San Mateo (1); Santa Clara (7); Solano (1); Sonoma (1);
- ^c rhinovirus (5); parainfluenza type 1 (1);

Figure 4 shows that laboratory detections peaked in week 27 (July 5 - 11, 2009). As indicated in the circle below, Influenza A detections have declined for several reporting periods but may be leveling off. Figure 5 shows that RSV detections are starting to increase.

Figure 4. Influenza detections at sentinel laboratories/Respiratory Laboratory Network (RLN), 2005-2010.

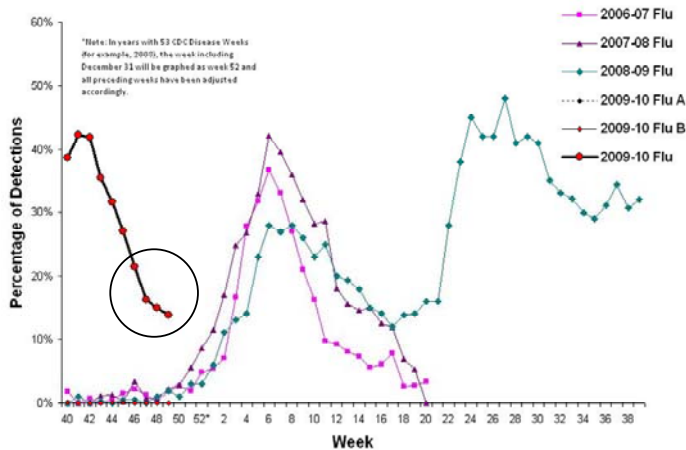
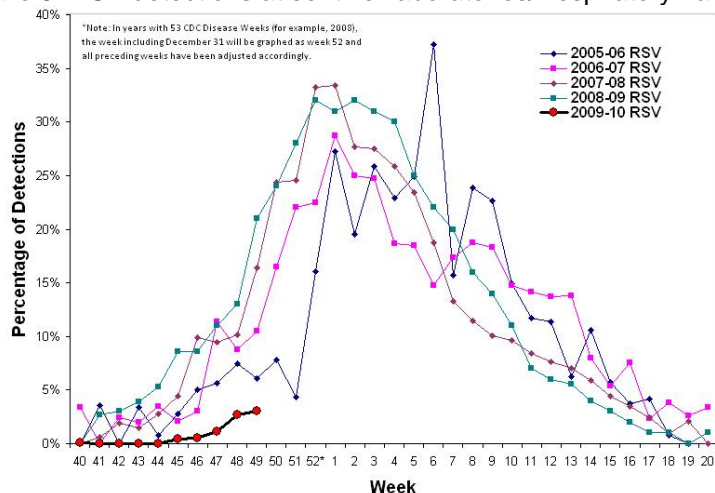


Figure 5. RSV detections at sentinel laboratories/Respiratory Laboratory Network (RLN), 2005-2010.



Antiviral Resistance for 2009 H1N1 influenza

Four cases of oseltamivir resistance have been identified in California residents with laboratory-confirmed 2009 H1N1 influenza infections. Two cases, including the most recent case in a resident of San Luis Obispo County, were initially identified at VRDL, while the other two were initially confirmed by outside laboratories (Table 3). Of 1,667 specimens from California residents tested this year, VRDL has detected three specimens with the H275Y resistance mutation (Table 4), including one specimen that was previously confirmed by the CDC. VRDL has intensified testing for antiviral resistance to monitor for changing resistance patterns.

Table 3. Oseltamivir-resistant viruses identified in California residents.

	Total	Detected at VRDL	Detected at Other Laboratory*
Oseltamivir-Resistant Individuals	4	2	2

* Two oseltamivir-resistant viruses were identified by outside laboratories; the first in a San Francisco resident who traveled to Hong Kong, and a second in a San Diego resident that was initially tested by the CDC

Table 4. Antiviral resistance testing of California residents, VRDL, 2009.

2009 H1N1 influenza	Oseltamivir Resistant	Adamantanes Resistant
VRDL testing	3*/ 1,667	219/219

* One oseltamivir-resistant virus was identified in a sample from a San Diego resident previously confirmed and reported by the CDC