

California Influenza Surveillance Project

California Department of Public Health

2009-2010

Influenza Update

This week, overall influenza activity in California was downgraded to “sporadic” (defined by the CDC as “small numbers of laboratory-confirmed influenza cases or a single laboratory-confirmed influenza outbreak has been reported, but there is no increase in cases of ILI”). Reports of ILI from sentinel providers decreased in *MMWR* week 2 (January 10-16, 2010). Laboratory detections of influenza remained similar to the previous reporting period. Detections of respiratory syncytial virus (RSV) continue to increase.

NATIONAL PERSPECTIVE

During the week of January 3 - 9, 2010, CDC reported that overall flu activity continued to decrease in the United States. No states reported widespread flu activity and 9 states reported regional flu activity (a decrease of 3 states from last week).

The proportion of visits to doctors for influenza-like illness (ILI) decreased to 1.9%, just below the national baseline level (2.3%). Nationally, 7.3% of deaths were attributed to pneumonia and influenza (P&I), just below the epidemic threshold (7.6%).

All influenza viruses reported were identified as influenza A and all subtyped viruses were identified as 2009 H1N1. 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*. One human infection with novel swine influenza A (H3N2) was reported.

*Since April 2009, 52 cases of oseltamivir resistance have been found in the United States, with no new cases during the last week.

CALIFORNIA 2009 H1N1 INFLUENZA UPDATE

Highlights:

Summary:

- In California, 2009 H1N1 influenza activity was downgraded to “sporadic” this week. Most indicators suggest that illness continues to decline, with levels of illness at or slightly below the usual range for this time of year. A total of 98 new cases (hospitalized and/or fatal) were reported to CDPH this week, 46 of which were from the current reporting period (January 10 - 16, 2010) and 52 of which were delayed reports from prior to January 10, 2009. Reported cases of new hospitalizations decreased from 129 cases last week to 98 cases this week. As

in previous weeks, the rate of hospitalizations remains highest among children under one year of age. A total of 12 fatalities were reported to CDPH this week, one of which occurred during this reporting week (January 10 – 16, 2010). Reports of ILI from sentinel providers decreased this past week (January 10 -16, 2010). Detections of respiratory syncytial virus (RSV) continue to increase. All influenza viruses subtyped over the last week by the Respiratory Laboratory Network were 2009 H1N1 influenza.

Specific Highlights:

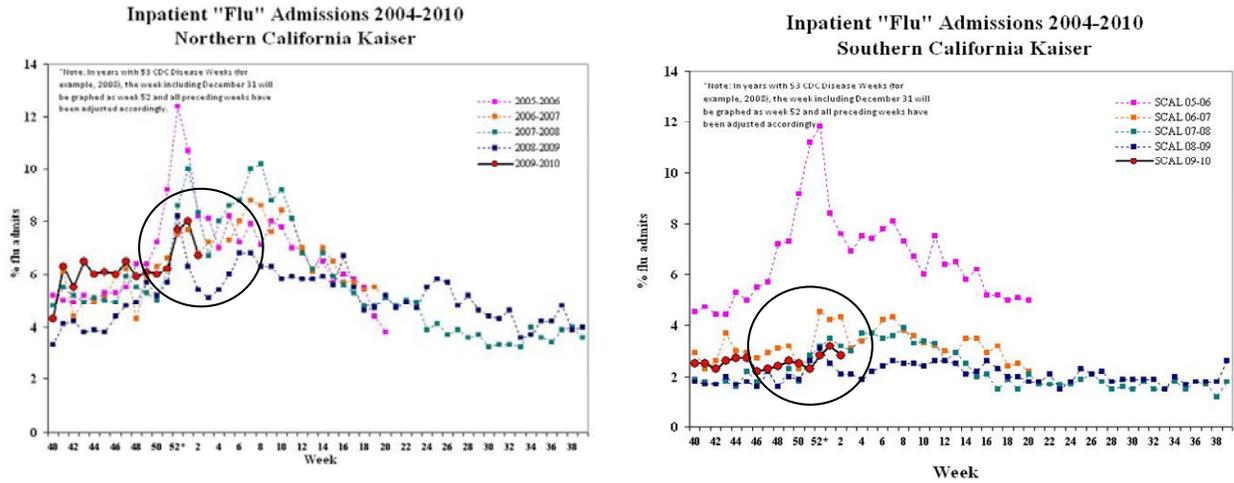
- Using the estimation approach reported by CDC, we calculate the total number of 2009 H1N1 infections among Californians to be approximately 5 million from April through the first week of January.
- Local health departments have been reporting hospitalized 2009 H1N1 influenza cases as weekly aggregate numbers since August 12, 2009. From January 10 - 16, 2010, 98 hospitalized and/or fatal cases were reported to CDPH, 46 of which were from the current reporting period (January 10 - 16, 2010) and 52 of which were delayed reports from prior to January 10, 2010.
- There have been 8,535 hospitalizations and/or fatalities, with 1,797 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/or fatalities is 22.1 per 100,000 population.
- CDPH received 12 reports of fatal 2009 H1N1 influenza cases for the week ending on January 16, 2010, one of which occurred during the reporting week (January 10 - 16, 2010); a total of 491 deaths due to 2009 H1N1 influenza have been reported to CDPH to date.
- A total of 2,989 hospitalized and/or fatal 2009 H1N1 influenza cases in pediatric patients 18 years or younger, including 50 deaths, have been reported to CDPH to date.
- Nine new cases meeting the case definition for severe pediatric influenza were reported this week, including two fatalities. Five of these cases are confirmed/probable 2009 H1N1 influenza; additional testing is pending for the remaining four cases.
- From January 10 – 16, 2010, 6 pregnant 2009 H1N1 influenza cases were reported to CDPH as aggregate numbers, two of which were from the current reporting period (January 10 – 16, 2010) and four of which were delayed reports from prior to January 10, 2010. A total of 555 pregnant hospitalized and/or fatal cases, including 17 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.
- A total of nine cases of oseltamivir resistance have been identified in California residents with laboratory-confirmed 2009 H1N1 influenza infections. Available data indicate that prevalence of oseltamivir-resistant 2009 H1N1 influenza is quite limited.

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 the percentage of Kaiser hospitalizations for pneumonia and influenza (P&I) decreased in both northern and southern California during Week 2 (January

10-16, 2010). Both data points remain within the range of percentages seen for seasonal influenza in previous years.

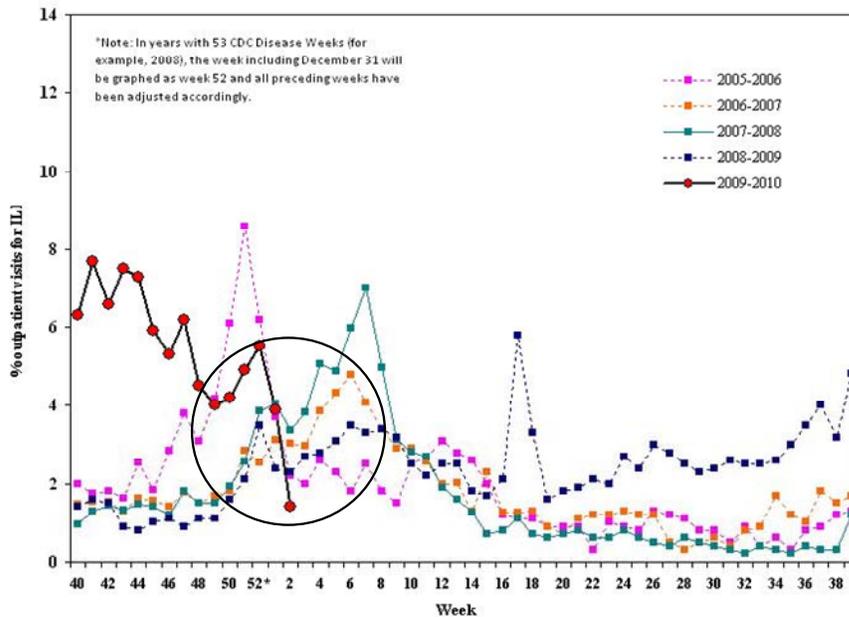
Figures 1-2. Inpatient “Flu” Admissions at Kaiser Facilities, 2004-2010.



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. ILI has decreased during the last two reporting periods. A total of 59 sentinel providers reported in Week 2.

Figure 3. California Sentinel Providers – Influenza-Like Visits, 2004-2010.



Respiratory Laboratory Network (RLN) Influenza PCR Surveillance Results

As noted in Table 1, during Week 2 (January 10-16, 2010), 11% of specimens received by the Respiratory Laboratory Network were positive for influenza A. This is an increase from 6% 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 2 (January 10-16, 2010)

| | 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* | 321 | 35 (11%) | 0 (0%) | 0 (0%) | 35 (100%) | 232 | 0 (0%) |
| Northern | 174 | 16 (9%) | 0 (0%) | 0 (0%) | 16 (100%) | 85 | 0 (0%) |
| Central | 86 | 8 (9%) | 0 (0%) | 0 (0%) | 8 (100%) | 86 | 0 (0%) |
| Southern | 61 | 11 (18%) | 0 (0%) | 0 (0%) | 11 (100%) | 61 | 0 (0%) |

* 16 RLN laboratories reporting, including:

Northern CA: Contra Costa, El Dorado, Marin, Monterey, Santa Clara, Shasta, Sonoma

Central CA: Fresno, San Joaquin, Tulare

Southern CA: Long Beach, Orange, Riverside, San Luis Obispo, Santa Barbara, Ventura

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 remained steady. Detections for respiratory syncytial virus (RSV) continue to increase.

Table 2. Influenza and other respiratory virus detections, January 10-16, 2010.

| | | Sentinel Laboratories/Respiratory Laboratory Network [‡] | Sentinel Providers |
|---------------|----------------------------------|-------------------------------------------------------------------|-----------------------------------------------------------|
| Week 2 | Number | 22 sites reporting | 451 specimens submitted (245 positive by PCR, 22 pending) |
| | Influenza A | 63 ^a Total tested week 2: 1480 | 0 |
| | Influenza B | 0 Total tested week 2: 1388 | 0 |
| | RSV | 205 ^b Total tested week 2: 1016 | N/A |
| | Other Respiratory Viruses | 9 ^c Total tested week 2: 202 | 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 Contra Costa (5); El Dorado (1); Fresno (2); Long Beach (10); Los Angeles (3); Madera (1); Orange (5); Placer (1); Riverside (1); Sacramento (1); San Joaquin (4); San Luis Obispo (1); San Mateo (2); Santa Barbara (1); Santa Clara (13); Solano (1); Sonoma (6); Stanislaus (1); Tulare (3); Yolo (1)

^b Alameda (30); Contra Costa (10); Fresno (25); Kern (1); Kings (2); Long Beach (22); Los Angeles (12); Madera (1); Marin (1); Napa (1); Orange (1); Placer (2); Riverside (4); Sacramento (18); San Francisco (11); San Mateo (14); Santa Clara (33); Solano (3); Sonoma (10); Stanislaus (2); Tulare (1); Yolo (1)

^c human metapneumovirus (5); adeno virus (2); parainfluenza type 1 (1); rhinovirus (1)

Figure 4 shows that laboratory detections peaked in week 27 (July 5 - 11, 2009). Influenza A detections remained similar to the previous reporting period. Figure 5 shows that detections of RSV continue to increase.

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

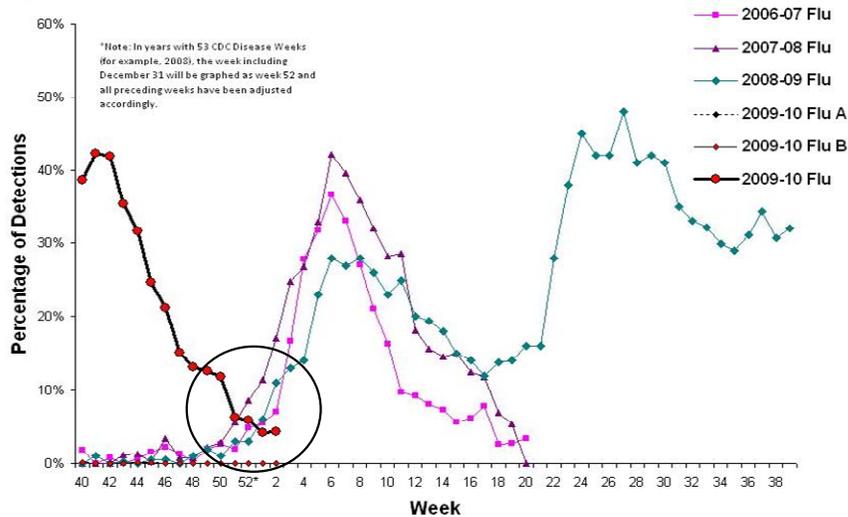
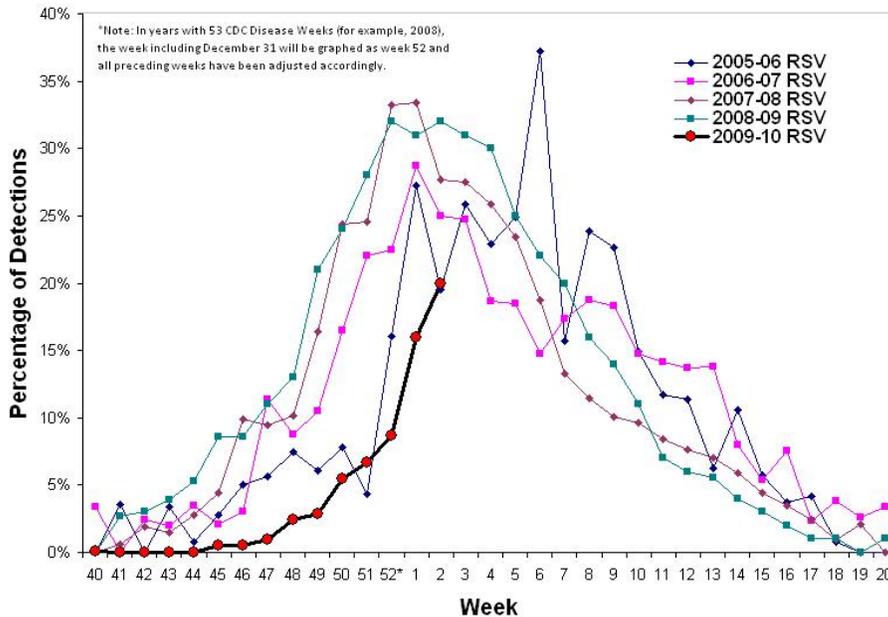


Figure 5. RSV detections at sentinel laboratories/Respiratory Laboratory Network (RLN), 2005-2010.



4. Antiviral Resistance for 2009 H1N1 influenza

A total of nine cases of oseltamivir resistance have been identified in California residents with laboratory-confirmed 2009 H1N1 influenza infections. Seven of the cases were initially identified at VRDL, while the other two were initially confirmed by outside laboratories (Table 3). Of 1,971 specimens from California residents tested this year, VRDL has detected the H275Y resistance mutation in 8 specimens (Table 4), including one result that was previously confirmed by the CDC. VRDL continues 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 | 9 | 7 | 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, 2009-10.

| 2009 H1N1 influenza | Oseltamivir Resistant | Adamantanes Resistant |
|----------------------------|------------------------------|------------------------------|
| VRDL testing | 8*/ 1971 | 246/246 |

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