

California Influenza Surveillance Project

California Department of Public Health

2008-2009

Influenza Update

Pandemic (H1N1) 2009 Surveillance for July 31 – August 5, 2009

As the current H1N1 pandemic unfolds, CDPH continues to perform surveillance and provide PCR testing for influenza, confirmatory testing for pandemic (H1N1) 2009, and guidance and assistance to our local public health partners. Effective July 15, 2009, local health departments are no longer asked to report outpatient cases.

1. **Epi- Surveillance Update** (Updated August 5, 2009)

Highlights:

- CDPH received 193 reports of hospitalized pandemic (H1N1) 2009 cases this week; there have been 892 hospitalizations, with 275 cases requiring intensive care, to date.
- CDPH received 12 reports of fatal pandemic (H1N1) 2009 cases this week; a total of 92 pandemic (H1N1) 2009 deaths have been reported to CDPH to date.
- 222 hospitalized and fatal cases have been female and of childbearing age; 82 (37%) were pregnant.
- 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 pandemic (H1N1) 2009, reflecting that the predominant circulating influenza strain in California at present is pandemic (H1N1) 2009.
- Surveillance for the detection of antiviral resistance in pandemic (H1N1) 2009 influenza is ongoing. To date, 251 specimens have tested negative for the resistance mutation at VRDL. VRDL and CDC will continue prospective antiviral resistance testing from a sampling of pandemic (H1N1) 2009 influenza viruses through the summer and the 2009-10 influenza season.
- At this time, the data indicate that the prevalence of oseltamivir-resistant pandemic (H1N1) 2009 is quite limited.
- Fourteen (14) new cases meeting the case definition for severe pediatric influenza were reported this week, including one fatality; all 14 cases are confirmed/probable pandemic (H1N1) 2009.

California case counts for pandemic (H1N1) 2009 hospitalizations and fatalities in humans:

Table 1. Provisional number of pandemic (H1N1) 2009 hospitalizations and/or fatal cases in California, by local health jurisdiction, April 3 - August 4, 2009.

Jurisdiction	Incidence of		
	Total Hospitalizations ^a		Deaths ^b
CALIFORNIA	892	2.36	92
County Undetermined	0	0.00	0
Alameda	70	4.54	8
Berkeley City	3	2.80	0
Butte	11	4.85	0
Contra Costa	76	7.14	5
El Dorado	1	0.54	0
Fresno	16	1.66	1
Humboldt	3	2.24	0
Imperial	6	3.25	0
Inyo	1	5.24	0
Kern	5	0.59	0
Kings	1	0.62	0
Lake	1	1.50	0
Long Beach City	12	2.44	1
Los Angeles	86	0.82	14
Madera	2	1.26	0
Marin	19	7.49	2
Mendocino	4	4.33	0
Merced	4	1.49	0
Monterey	8	1.86	1
Napa	3	2.13	0
Orange	114	3.57	13
Pasadena City	2	1.33	0
Placer	1	0.29	1
Riverside	12	0.55	1
Sacramento	72	5.01	5
San Benito	2	3.20	0
San Bernardino	23	1.08	2
San Diego	136	4.29	12
San Francisco	39	4.79	6
San Joaquin	15	2.07	1
San Luis Obispo	1	0.37	1
San Mateo	27	3.68	7
Santa Barbara	5	1.16	0
Santa Clara	56	3.07	3
Santa Cruz	2	0.75	1
Shasta	2	1.06	0
Solano	9	2.06	2
Sonoma	12	2.44	4
Stanislaus	22	4.00	1
Tulare	5	1.10	0
Yolo	3	1.48	0

^a This number does not include reports of hospitalized cases not yet validated by LHJ, represents cases ever hospitalized

^b Not all fatal cases were hospitalized

Bold indicates the first (ever) report of probable or confirmed cases by the county

Table 2. Characteristics of hospitalized and/or fatal cases of pandemic (H1N1) in California, April 3, 2009 – August 4, 2009.

		Number (%)
Total number		901
Sex**	Male	442 (49%)
	Female	458 (51%)
Age	Median (years)	27
	Mean (years)	30
	Min - Max	<1 - 92 years
	Cases between 0 - 18 years	293
Symptoms	Fever	787 (87%)
	Shortness of breath	502 (56%)
	Nausea/vomiting	299 (33%)
	Altered Mental Status	46 (5%)
Race/Ethnicity**	Hispanic	304 (43%)
	White	187 (27%)
	Asian/Pacific Islander	105 (15%)
	Black	77 (11%)
	Other	23 (3%)
	Native American	7 (1%)
Chronic co-morbid illness*		681 (76%)
	Chronic lung disease [†]	323 (36%)
	Obesity** [€]	180 (36%)
	Metabolic disease	166 (18%)
	Chronic cardiac disease [§]	133 (15%)
	Other immunosuppression [¶]	137 (15%)
	Neuromuscular disorder	96 (11%)
	Pregnancy***	82 (37%)
Clinical Findings and Course	Infiltrates on chest radiograph	410 (46%)
	Mechanical Ventilation**	191 (27%)
	Antiviral treatment**	602 (81%)

**Includes cases with known information only

*Conditions listed are not mutually exclusive due to the presence in some patients of multiple underlying chronic diseases

[†]Includes asthma, chronic obstructive pulmonary disorder, bronchopulmonary dysplasia/respiratory distress syndrome, bronchiolitis obliterans organizing pneumonia, Sjogren's syndrome and obstructive sleep apnea

[€]Includes cases where BMI ≥ 30 and/or those who were clinically considered obese.

[§]Includes congenital heart disease, atrial fibrillation, status-post aortic valve replacement, congestive heart failure, hypertensive heart

[¶]Includes immunosuppressive drugs, cancer, congenital immunodeficiency, and HIV

***Includes only females of childbearing age (15-44 years)

2. Laboratory Surveillance Update

VRDL Influenza PCR Results (Updated August 5, 2009)

- VRDL performs PCR testing for influenza A, influenza A subtyping, and pandemic (H1N1) 2009. Some specimens are screened at local public health or reference laboratories before being submitted to VRDL for additional or confirmatory testing.
- VRDL has received 4,297 specimens for pandemic (H1N1) 2009-related testing.
- Of 3,609 specimens tested at VRDL for influenza A, 2,376 (66%) have been positive.
- A total of 1,001 influenza A-positive specimens have been subtyped at VRDL.
- Of 1,630 unsubtypeable specimens tested at VRDL for pandemic (H1N1) 2009, 1,508 (93%) have been positive.

Respiratory Laboratory Network (RLN) Influenza PCR Surveillance Results (Updated August 5, 2009)
 As noted in the Table 3 below, during Week 30 (July 26 – August 1, 2009), approximately 47% of specimens received by the Respiratory Laboratory Network were positive for influenza A. This is an increase from the previous week, when 43% of specimens were positive for influenza A. All but one of the influenza A-positive samples tested this week was unsubtypeable, indicating that pandemic (H1N1) 2009 is the predominant strain circulating in California at this time.

Table 3. Respiratory Laboratory Network (RLN) Influenza PCR Surveillance Results, Week 30 (July 26 – August 1, 2009)

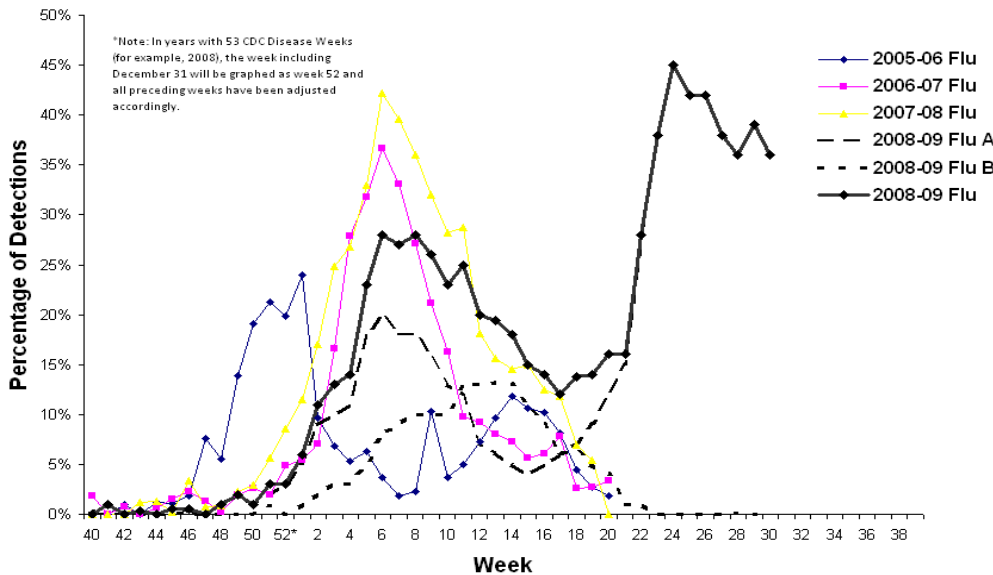
	Total tested	Flu A (% of total)	H1 (% of Flu A)	H3 (% of Flu A)	Unsubtypeable (% of Flu A)
All RLN*	781	368 (47%)	0 (0%)	1 (0.1%)	367 (99.7%)
Northern	346	171 (49%)	0 (0%)	0 (0.0%)	171 (100.0%)
Central	178	97 (54%)	0 (0%)	1 (0.6%)	96 (99.0%)
Southern	257	100 (39%)	0 (0%)	0 (0.0%)	100 (100.0%)

* 12 RLN laboratories reporting, including:

- Northern CA: Contra Costa, Marin, Sacramento, Santa Clara, Shasta, Sonoma
- Central CA: Fresno, Tulare
- Southern CA: Orange, San Diego, Santa Barbara, Ventura

Figure 1 shows that laboratory detections peaked in week 24 (June 14 – June 20).

Figure 1. Influenza detections at sentinel laboratories/Respiratory Laboratory Network (RLN), 2005-2009.



Antiviral Resistance for Pandemic (H1N1) 2009

At VRDL, antiviral resistance testing is being performed on a subset of specimens tested to monitor for changing resistance patterns.

Table 4. Antiviral resistance testing at VRDL, 2009*.

Pandemic (H1N1)	Oseltamivir Resistant	Adamantanes Resistant
VRDL	0/251	59/59

* One oseltamivir-resistant virus was identified by an outside laboratory in a San Francisco resident who traveled to Hong Kong.

Overall California Influenza Activity for July 31 – August 5, 2009

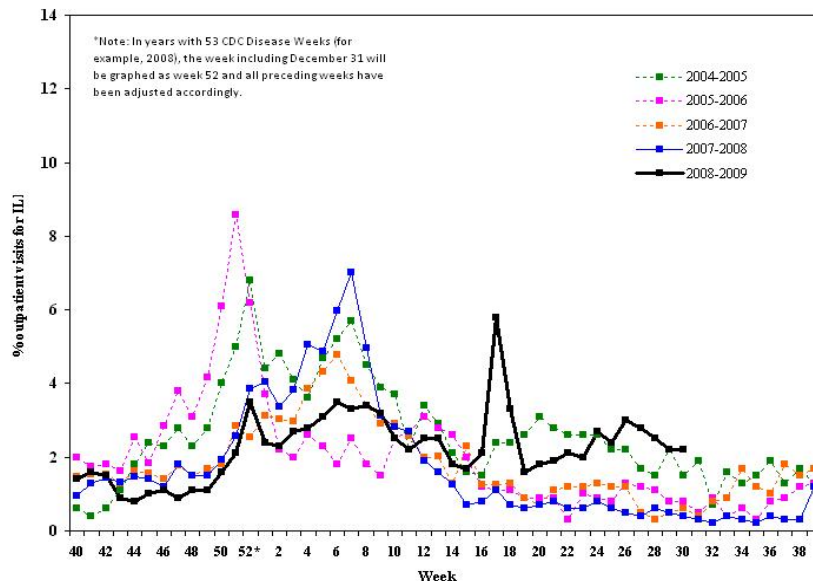
This week, influenza activity in California remained “widespread” (defined by CDC as outbreaks of influenza or increases in ILI cases and recent laboratory confirmed influenza in at least half of the regions in the state). CDPH continues to receive reports of hospitalizations and fatalities associated with pandemic (H1N1) 2009.

Seasonal Influenza A Surveillance

1. 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 1 shows a peak in Weeks 17-18 (April 26 – May 9, 2009) when pandemic (H1N1) 2009 was first identified. After a sharp decline, the number of reported outpatient visits for ILI increased steadily until Week 26 (June 28 - July 4, 2009). Outpatient visits for ILI have been declining since Week 26. A total of 51 sentinel providers reported during Week 30.

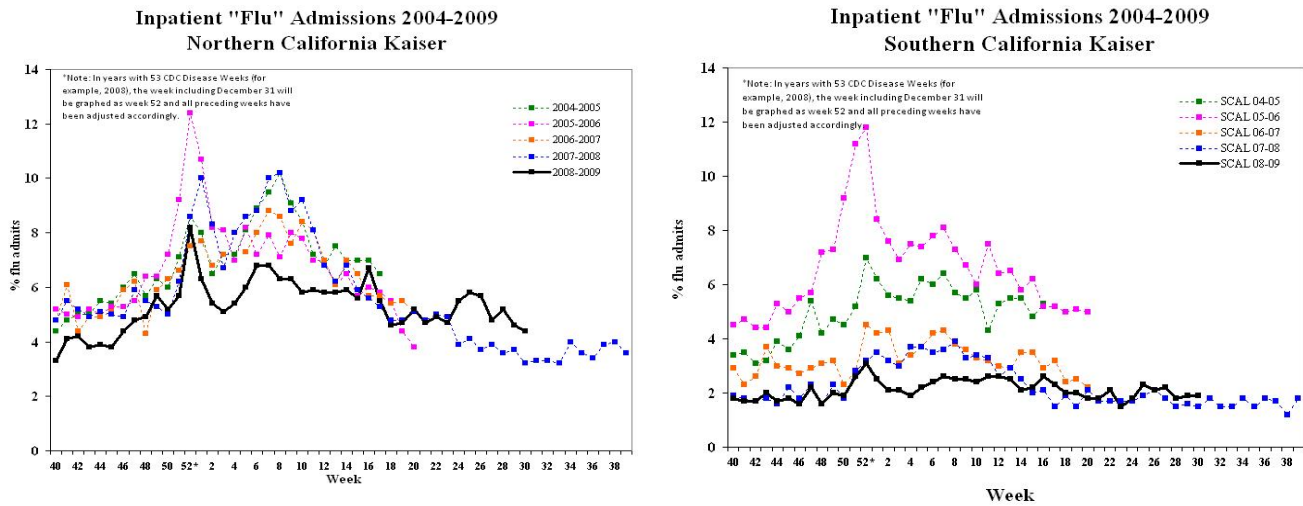
Figure 1. California Sentinel Providers – Influenza-Like Visits, 2004-2009.



2. 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. Figures 2 and 3 show that in both Northern and Southern California, the percentage of Kaiser hospitalizations for pneumonia and influenza (P&I) peaked during Week 17 (April 26 – May 2, 2009), with a smaller peak occurring in Week 24 (June 14 – June 20, 2009).

Figures 2-3. Inpatient “Flu” Admissions at Kaiser Facilities, 2004-2009.



3. Laboratory Positive Results Data

The table below shows positive influenza and other virus results from sentinel laboratories, local public health laboratories and VRDL.

Table 1. Influenza and other respiratory virus detections, July 26– August 1, 2009.

		Sentinel Laboratories/Respiratory Laboratory Network [‡]	Sentinel Providers
Week 30	Number of Sites Reporting	19	898 specimens submitted (371 positive by PCR)
	Influenza A	810 ^a Total tested week 30: 2328	0 Total tested week 30: 0
	Influenza B	1 ^b Total tested week 30: 1705	0 Total tested week 30: 0
	RSV	1 ^c Total tested week 30: 1306	N/A
	Other Respiratory Viruses	3 ^d Total tested week 30: 169	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 (76); Contra Costa (58); Fresno (41); Long Beach (31); Los Angeles (33); Marin (13); Napa (1), Orange (30); Placer (12); Riverside (3); Sacramento (154); San Bernardino (5); San Diego (20); San Francisco (20); San Joaquin (14); San Mateo (14); Santa Clara (84); Shasta (1); Solano (17); Sonoma (91); Stanislaus (11); Tulare (74); Ventura (1); Yolo (5); Unknown (1)

^b Santa Clara (1)

^c Sacramento (1)

^d adenovirus (2); parainfluenza type 3 (1)