

California Influenza Surveillance Project

Viral and Rickettsial Disease Laboratory

2008-2009

Influenza Update

Pandemic (H1N1) 2009 Surveillance for Week 29 (July 19 – July 25, 2009)

As the current pandemic of Pandemic (H1N1) 2009 influenza 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 asked to report hospitalizations, fatalities and outbreaks of pandemic (H1N1) 2009 influenza cases to CDPH. Reporting of individual outpatient cases is no longer required because, as laboratory testing is not recommended for outpatients and current testing in this setting is non-systematic and highly variable, outpatient data at present are potentially biased and non-representative of the population.

1. **Epi- Surveillance Update** (Updated 7/23/2009)

Highlights:

- CDPH received 150 reports of hospitalized cases this week. A total of 591 cases have been hospitalized and/or fatal, with 168 requiring intensive care.
- Of 148 hospitalized and fatal cases that are female and of childbearing age, 52 (35%) have been in pregnant women.
- CDPH received 6 reports of fatal pandemic (H1N1) 2009 cases this week. A total of 61 deaths have been reported to CDPH to date.
- The mean age of fatal cases (43 years) is significantly higher than the mean age of hospitalized cases (30 years) ($p < 0.0001$).
- In recent weeks, the proportion of influenza A-positive specimens tested by PCR at VRDL that are subsequently confirmed as pandemic (H1N1) 2009 is about 99%, 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, 222 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. CDPH does not recommend any changes in antiviral guidance at this time.

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

Table 1. Provisional number of pandemic (H1N1) 2009 hospitalizations and fatal cases in California, by local health jurisdiction, as of 07/23/09.

Jurisdiction	Total Hospitalizations^a	Incidence of Hospitalizations per 100,000 pop.	Deaths
CALIFORNIA	583	1.56	61
County Undetermined	0	0.00	0
Alameda	45	2.92	6
Berkeley City	1	0.93	0
Butte	10	4.41	0
Contra Costa	55	5.17	5
Fresno	7	0.73	0
Humboldt	3	2.24	0
Imperial	6	3.25	0
Inyo	1	5.24	0
Kern	2	0.23	0
Long Beach City	5	1.01	0
Los Angeles	60	0.57	8
Madera	2	1.26	0
Marin	16	6.31	2
Merced	4	1.49	0
Monterey	7	1.63	1
Napa	3	2.13	0
Orange	69	2.16	8
Pasadena City	2	1.33	0
Placer	1	0.29	1
Riverside	12	0.55	1
Sacramento	31	2.16	4
San Benito	2	3.20	0
San Bernardino	18	0.84	1
San Diego	89	2.81	8
San Francisco	19	2.33	3
San Joaquin	11	1.52	0
San Luis Obispo	1	0.37	0
San Mateo	21	2.86	6
Santa Barbara	3	0.70	0
Santa Clara	39	2.14	2
Santa Cruz	1	0.37	1
Shasta	1	0.53	0
Solano	9	2.06	1
Sonoma	18	3.66	2
Stanislaus	7	1.27	1
Tulare	1	0.22	0
Yolo	1	0.49	0

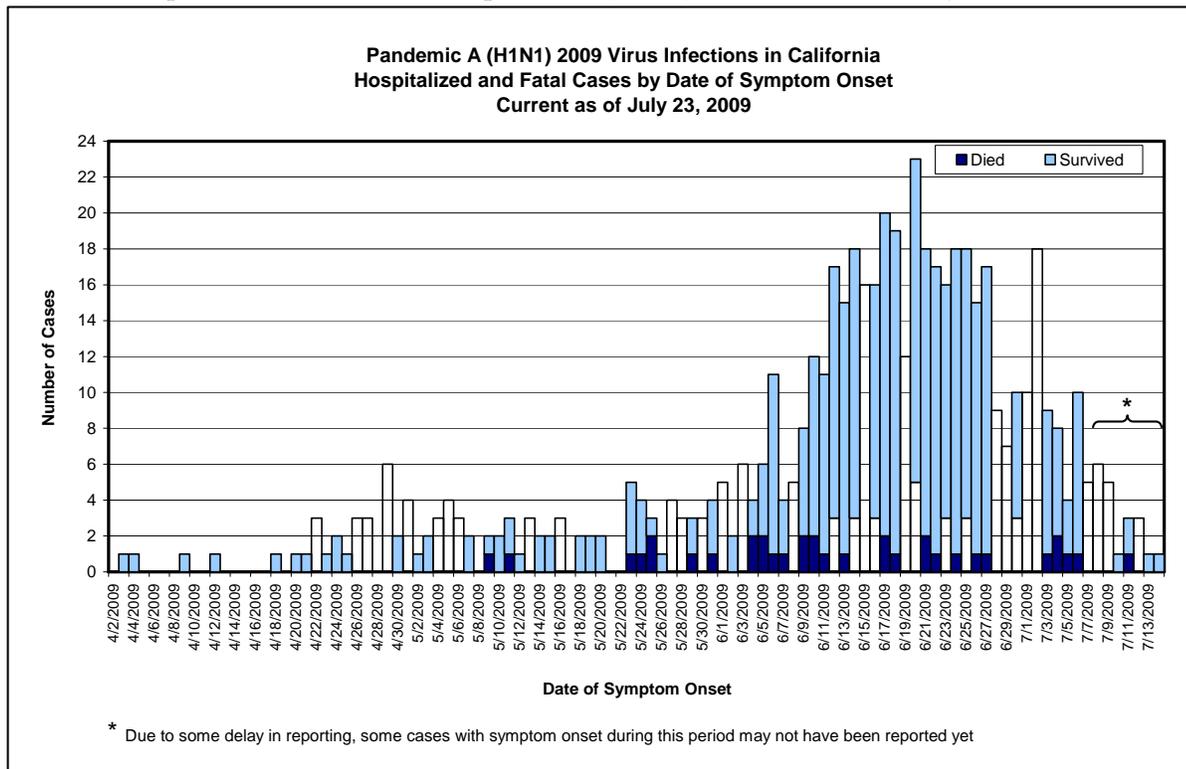
^a This number does not include reports of hospitalized cases not yet validated by LHJ, represents cases ever hospitalized.

b. Characteristics of pandemic (H1N1) 2009 hospitalized/fatal cases in California

Case report forms and medical records are reviewed for accuracy and follow-up data. The number of cases may be an underestimate, as identification of cases is dependent on local testing capacity and passive reporting of cases to local health departments.

Pandemic (H1N1) 2009 continues to be seen in hospitalized and fatal cases in California as evidenced in Figure 1. There were 150 new cases reported to CDPH in the past week. The number of reported cases steadily increased in June and has remained high, with an average of 20 cases per day. This increase may be due, in part, to the widespread presence of the virus in the community, thus people at higher risk of complications due to influenza have a greater chance of becoming exposed. Symptom onset has ranged from April 3, 2009 to July 12, 2009.

Figure 1. Hospitalized and fatal cases of pandemic (H1N1) 2009 in California, by date of onset.



The incidence of illness is high among those who are ≤ 35 years and 50 – 59 years (Figure 2). The median age for hospitalized and fatal cases is 27 years (< 1 to 92 years) (Figures 2 and Table 2).

The most predominant symptoms among hospitalized and fatal cases are fever (88%), cough (85%) and shortness of breath (54%). More than half have underlying medical conditions and received antivirals. Close to 50% developed pneumonia during the course of their illness (Table 2). Among fatal cases, the median number of days from illness onset to death is 10 days (2 to 30 days).

2. Laboratory Surveillance Update

VRDL Influenza PCR Results (Updated 7/23/09)

- 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 3,964 specimens for pandemic (H1N1) 2009-related testing.
- Of 3,432 specimens tested at VRDL for influenza A, 2,229 (65%) have been positive.
- A total of 1,001 influenza A-positive specimens have been subtyped at VRDL. Almost all influenza A-positive specimens that have been referred to VRDL in recent weeks have been unsubtypeable, i.e. probable pandemic (H1N1) 2009.
- Of 1,478 unsubtypeable specimens tested at VRDL for pandemic (H1N1) 2009, 1,392 (94%) have been positive.

Respiratory Laboratory Network (RLN) Influenza PCR Surveillance Results (Updated 7/23/09)

As noted in the RLN tables below, during week 28 (July 12-18, 2009), approximately 41% of specimens received by the Respiratory Laboratory Network were positive for influenza A. This is a decrease from 51% in week 27. Of these, 100% were unsubtypeable. Pandemic (H1N1) 2009 is the predominant strain circulating in California at this time.

Table 2. Respiratory Laboratory Network (RLN) Influenza PCR Surveillance Results, Week 28 (July 12 -18, 2009)

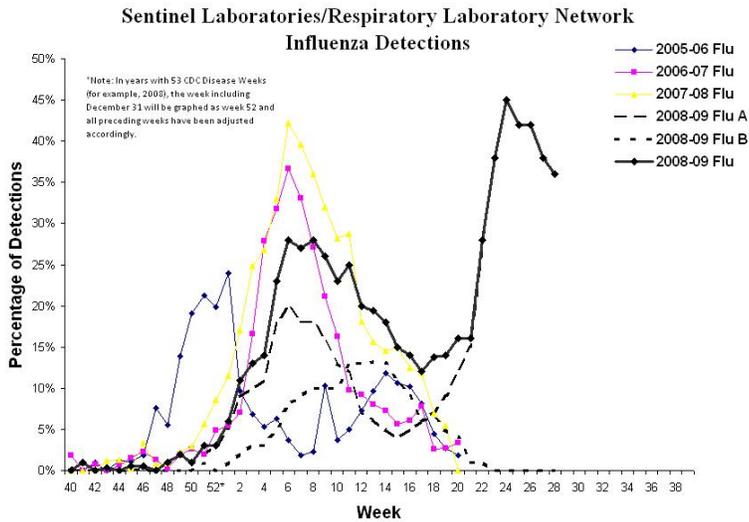
	Total tested	Flu A (% of total)	Unsubtypeable (% of Flu A)
All RLN*	529	216 (41%)	216 (100%)
Northern	118	45 (38%)	45 (100%)
Central	170	64 (38%)	64 (100%)
Southern	241	107 (44%)	107 (100%)

* 22 of 23 RLN laboratories reporting, including:

Northern CA: Contra Costa, El Dorado, Marin, Monterey, Sacramento, San Francisco, San Mateo, Santa Clara, Shasta, Sonoma
Central CA: Fresno, Stanislaus, San Joaquin, Tulare
Southern CA: Long Beach, Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara, Ventura

Figure 2 shows that laboratory detections have been declining in recent weeks. This is consistent with other influenza surveillance parameters.

Figure 2. Influenza Detections at Sentinel Laboratories/Respiratory Laboratory Network (RLN).



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 3. Antiviral resistance testing at VRDL, 2009*.

Pandemic (H1N1)	Oseltamivir Resistant	Adamantanes Resistant
VRDL	0/222	48/48

* 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 Week 29 (July 19 – 25, 2009)

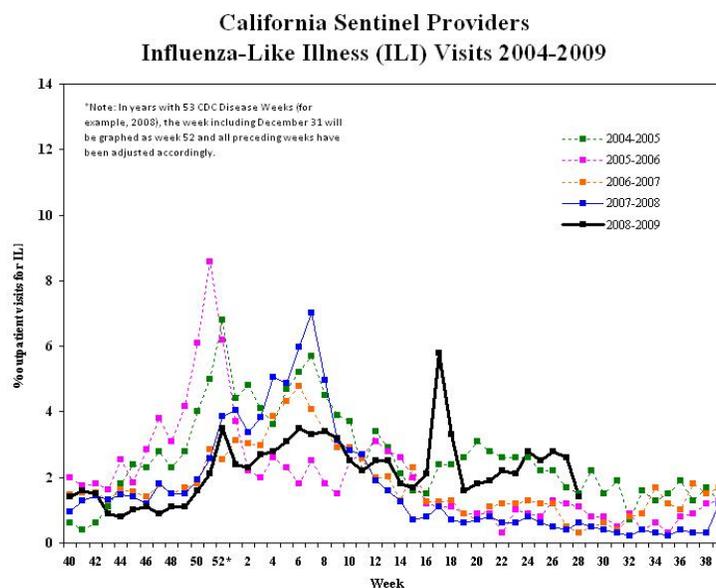
This week, influenza activity in California remained “widespread” (defined by CDC as outbreaks of influenza or increases in ILI cases and recent laboratory confirmed influenza in at least half of the regions in the state). Laboratory detections of pandemic (H1N1) 2009 and outpatient visits for influenza-like illness (ILI) are declining. CDPH continues to receive reports of hospitalizations and fatalities associated with pandemic (H1N1) 2009. Pandemic (H1N1) 2009 accounted for 100% of influenza viruses circulating in week 28.

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. This data is reported weekly as a percentage of total visits. Figure 1 shows a peak in weeks 17-18 when pandemic (H1N1) 2009 was first identified. After a sharp decline, ILI increased steadily until week 26. Outpatient visits for ILI appear to be declining. A total of 34 sentinel providers reported during Week 28.

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

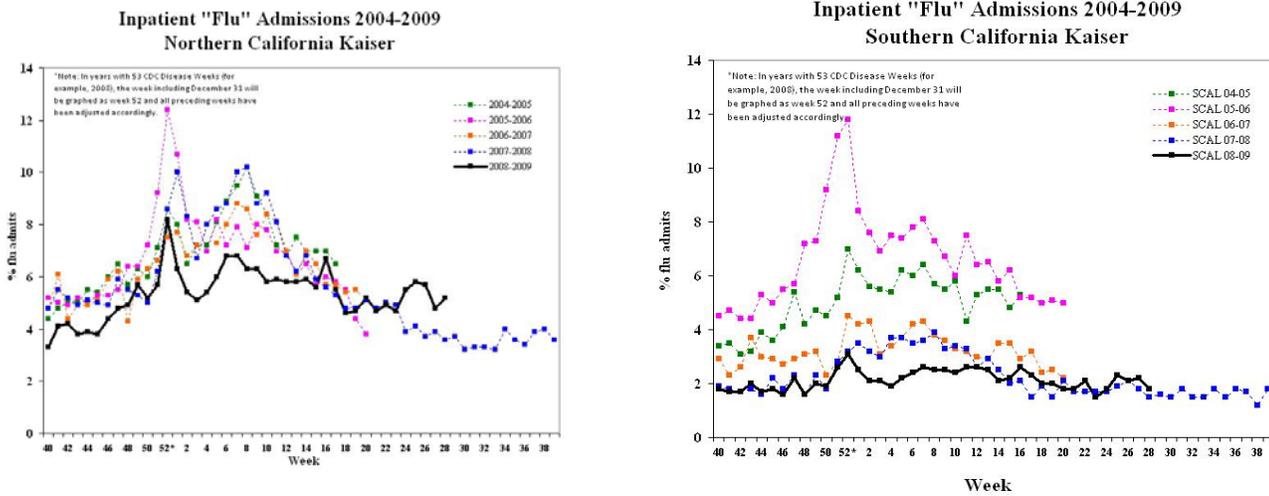


2. Kaiser Permanente Hospitalization Data (“Flu Admits”)

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 Northern and Southern California the percentage of Kaiser hospitalizations for P&I (pneumonia and influenza) peaked during week 17 with a smaller peak in week 24.

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



3. Laboratory Positive Results Data

Positive influenza and other virus results from sentinel laboratories, local public health laboratories and VRDL. Influenza A detections increased in week 28, however, the percentage of total detections is declining.

Table 1. Influenza and other respiratory virus detections, July 12– 18, 2009.

		Sentinel Laboratories/Respiratory Laboratory Network [‡]	Sentinel Providers
Week 28	Number of Sites Reporting	22	850 specimens submitted (371 positive by PCR)
	Influenza A	913 ^a Total tested week 28: 2382 Total detections to date: 11347	0 Total tested week 28: 0 Total detections to date: 267
	Influenza B	1 ^b Total tested week 28: 1809 Total detections to date: 4811	0 Total tested week 28: 0 Total detections to date: 104
	RSV	0 Total tested week 28: 1436 Total detections to date: 8818	N/A
	Other Respiratory Viruses	6 ^c Total tested week 28: 301 Total detections to date: 209	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 (89); Contra Costa (62); El Dorado (3); Fresno (36); Kern (1); Long Beach (57); Los Angeles (66); Madera (2); Marin (6); Orange (54); Placer (28); Riverside (21); Sacramento (83); San Bernardino (5); San Diego (62); San Francisco (29); San Joaquin (28); San Mateo (35); Santa Clara (75); Shasta (9); Solano (39); Sonoma (50); Stanislaus (7); Tulare (45); Ventura (14); Yolo (5); Unknown (2)

^b Tulare (1)

^c parainfluenza type 3 (4); adenovirus (1); human metapneumovirus (1)