

California Influenza Surveillance Project

Viral and Rickettsial Disease Laboratory

2008-2009

Influenza Update

Pandemic (H1N1) 2009 Surveillance for Week 28 (July 12 – July 18, 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 7/16/2009)

Highlights:

- CDPH has received reports of 3,168 cases (2,655 confirmed, 513 probable) from 49 local health jurisdictions.
- 154 hospitalized cases were reported this week. A total of 441 cases have been hospitalized, with 133 requiring intensive care.
- Twenty-three fatal cases were reported this week in Alameda (2), Contra Costa (2), Los Angeles (4), Monterey (1), Orange (3), Placer (1), Riverside (1), San Diego (3), San Francisco (1), San Mateo (2), Santa Clara (1), Sonoma (1), and Stanislaus (1) counties. These were the first H1N1-related deaths reported in Monterey, Placer, Riverside and Stanislaus this year. A total of 55 fatal cases have been reported from the following counties: Alameda (5), Contra Costa (5), Los Angeles (7), Marin (1), Monterey (1), Orange (8), Placer (1), Riverside (1), Sacramento (2), San Bernardino (1), San Diego (8), San Francisco (2), San Mateo (6), Santa Clara (2), Santa Cruz (1), Solano (1), Sonoma (2), and Stanislaus (1).
- Of 805 cases that are female and of childbearing age, 65 (8%) have been in pregnant women.
- Of all cases reported, 117 (92 confirmed, 25 probable) have occurred in healthcare workers.
- The majority of reported cases to date have been individuals under 35 years of age. In recent weeks, the median age of new reported cases has increased, reflecting current testing and reporting recommendations for hospitalized cases. The median age of hospitalized cases (26 years) is older than the median age for cases overall (17 years).
- 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, 154 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 infection in humans:

Table 1. Provisional number of pandemic (H1N1) 2009 cases by local health jurisdiction, as of 07/16/09.

Jurisdiction	Total Cases	Confirmed	Probable	Hospitalizations ^a	Deaths
CALIFORNIA	3168	2655	513	441	55
County Undetermined	0	0	0	0	0
Alameda	131	114	17	31	5
Amador	2	2	0	0	0
Berkeley City	5	4	1	1	0
Butte	13	12	1	8	0
Calaveras	1	1	0	0	0
Contra Costa	313	269	44	49	5
El Dorado	12	9	3	0	0
Fresno	23	15	8	5	0
Humboldt	3	3	0	4	0
Imperial	78	69	9	6	0
Inyo	2	2	0	1	0
Kern	30	29	1	2	0
Kings	22	22	0	0	0
Lake	1	0	1	0	0
Long Beach City	57	24	33	4	0
Los Angeles	620	578	42	49	7
Madera	10	3	7	2	0
Marin	59	22	37	10	1
Merced	7	5	2	3	0
Mono	5	5	0	0	0
Monterey	27	19	8	6	1
Napa	12	3	9	2	0
Nevada	1	1	0	0	0
Orange	314	305	9	54	8
Pasadena City	6	6	0	2	0
Placer	13	12	1	1	1
Riverside	106	102	4	10	1
Sacramento	154	147	7	21	2
San Benito	12	1	11	2	0
San Bernardino	146	141	5	18	1
San Diego	359	348	11	70	8
San Francisco	38	25	13	14	2
San Joaquin	30	18	12	10	0
San Luis Obispo	30	23	7	1	0
San Mateo	98	54	44	13	6
Santa Barbara	33	26	7	2	0
Santa Clara	146	94	52	24	2
Santa Cruz	32	15	17	1	1
Shasta	12	1	11	1	0
Siskiyou	1	0	1	0	0
Solano	18	13	5	3	1
Sonoma	60	12	48	5	2
Stanislaus	14	13	1	4	1
Sutter	8	8	0	0	0
Tehama	4	4	0	0	0

Tulare ^b	32	32	0	1	0
Ventura	44	21	23	0	0
Yolo	22	22	0	1	0
Yuba	2	1	1	0	0

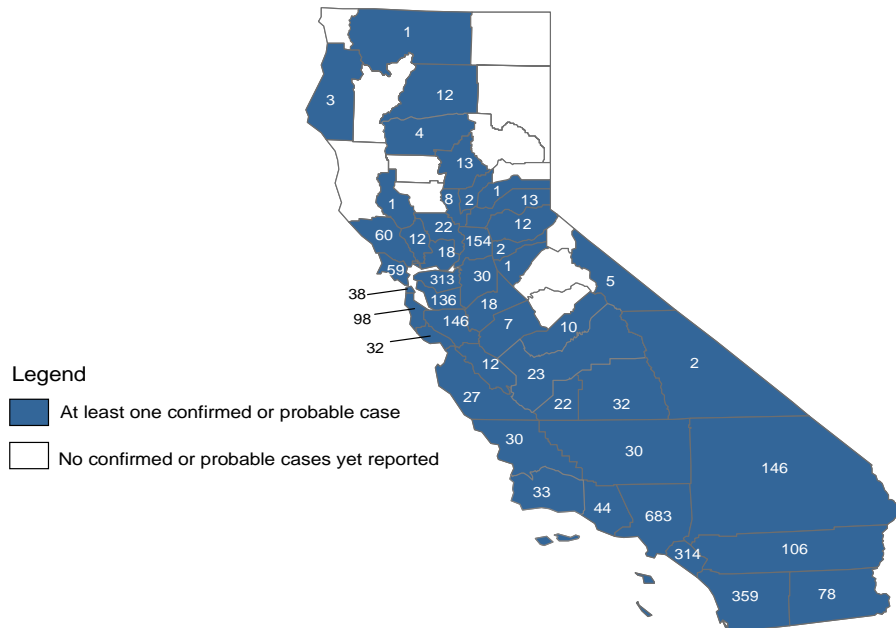
a. This number does not include reports of hospitalized cases not yet validated by LHJ, represents cases ever hospitalized

b. Includes one patient diagnosed out of county

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

Figure 1. Pandemic (H1N1) 2009 virus infections in humans - California, 2009.

**California counties reporting pandemic (H1N1) 2009 virus infections in humans
Current as of July 16, 2009**



b. Characteristics of hospitalized and fatal Pandemic (H1N1) 2009 cases

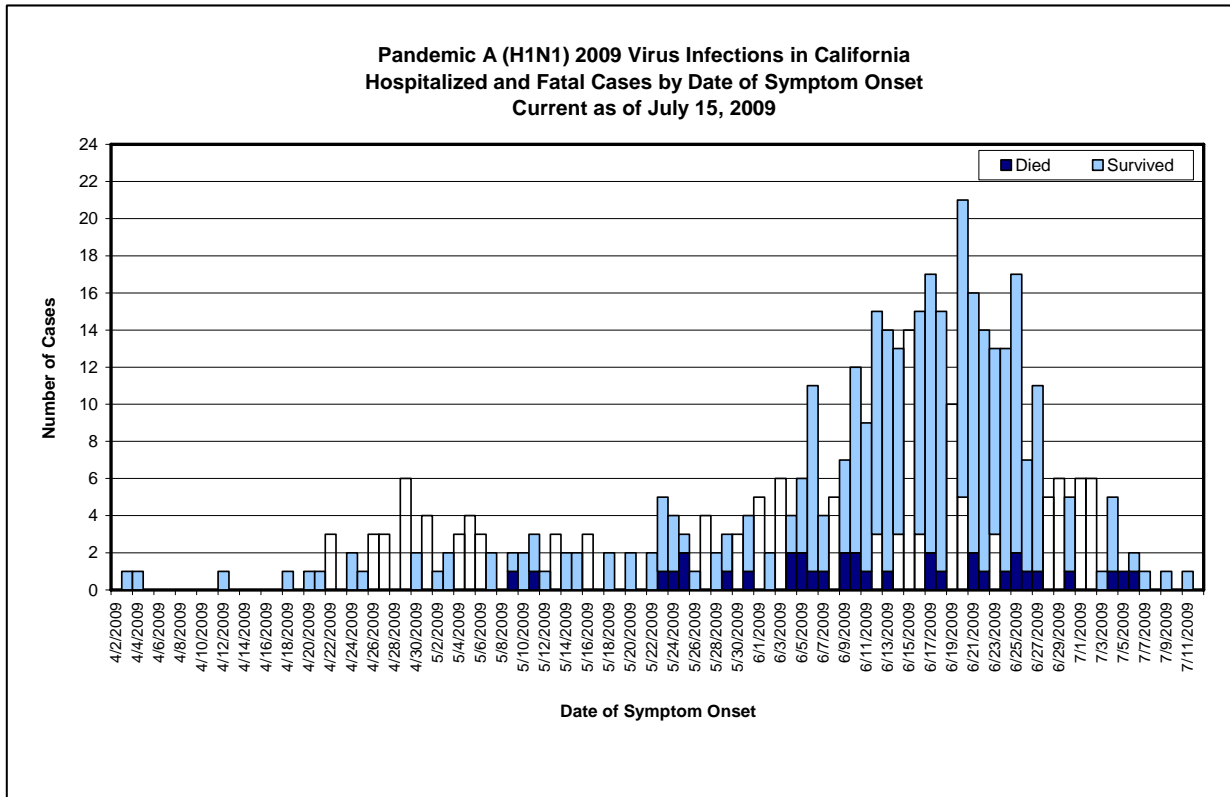
Case report forms and medical records are reviewed for accuracy and follow-up data. The number of cases may be an underestimate, as identification of cases is dependent on local testing capacity and passive reporting of cases to local health departments.

Pandemic (H1N1) 2009 continues to be seen in hospitalized and fatal cases in California as evidenced in Figure 4. There were 154 new cases that were reported to CDPH in the past week. The number of hospitalized and fatal cases reported in April and May remained steady between two to four per week, with a slight increase on April 29. The number of reported cases steadily increased in June and has remained high, with an average of 10 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. It is unclear, at this point, if the number of cases has reached its peak in June since some cases with onset in late June to early July have not yet been reported to CDPH.

As of July 15, 2009, there were 26, 72, 312, and 24 cases (based on date of illness onset) of hospitalized and fatal cases in April, May, June and July, respectively.

The majority of hospitalized cases remain in the age groups 5-19 years and 20-39 years. The most predominant co-morbidity is chronic lung disease followed by chronic cardiac disease and the most common symptoms are fever, cough and shortness of breath. More than 40% of hospitalized cases have developed pneumonia and more than half have been treated with antivirals (Table 4). Less than a quarter of the cases have required mechanical ventilation and 30% have required ICU admissions.

Figure 2. Hospitalized and fatal cases of pandemic (H1N1) 2009 in California, by date of onset. Due to some delay in reporting, the actual number of cases is most likely higher in the past week than what is depicted.



2. Laboratory Surveillance Update

VRDL Influenza PCR Results (Updated 7/16/09)

- 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 3,855 specimens for pandemic (H1N1) 2009-related testing.
- Of 3,275 specimens tested at VRDL for influenza A, 2,102 (64%) have been positive.
- A total of 1,000 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 1,332 unsubtypeable specimens tested at VRDL for pandemic (H1N1) 2009, 1,266 (95%) have been positive.

Respiratory Laboratory Network (RLN) Influenza PCR Surveillance Results (Updated 7/16/09)

As noted in the RLN tables below, during week 27 (July 5-11, 2009), approximately 51% of specimens received by the Respiratory Laboratory Network have been positive for influenza A. Of these, 99% are

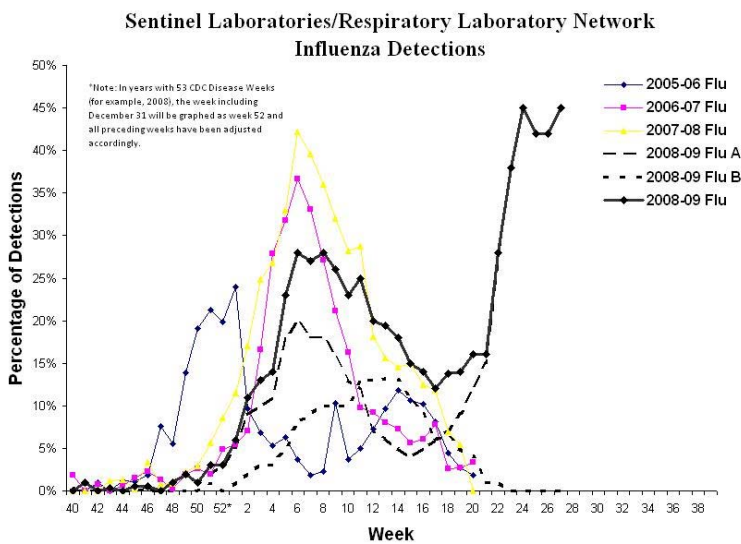
unsubtypeable. This is a notable difference since the beginning of this pandemic, when seasonal influenza was still circulating in approximately half of specimens tested.

Table 2. Respiratory Laboratory Network (RLN) Influenza PCR Surveillance Results, Week 27 (July 5 -11, 2009)

	Total tested	Flu A (% of total)	Unsubtypeable (% of Flu A)
All RLN*	300	153 (51%)	152 (99%)
Northern	191	80 (42%)	79 (99%)
Central	54	31 (57%)	31 (100%)
Southern	55	42 (76%)	42 (100%)

Figure 3 below shows that laboratory detections for influenza laboratory detections for influenza have again reached a peak of 45% in week 27.

Figure 3. 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	0/150	45/45

* 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 28 (July 12 – 18, 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) based on the high level of laboratory detections of pandemic (H1N1) 2009 throughout the state. Influenza activity throughout the state remains similar to previous weeks, with CDPH continuing to receive reports of hospitalizations and fatalities associated with pandemic (H1N1) 2009. Pandemic (H1N1) 2009 accounted for 99% of influenza viruses circulating in week 27.

National Influenza Activity

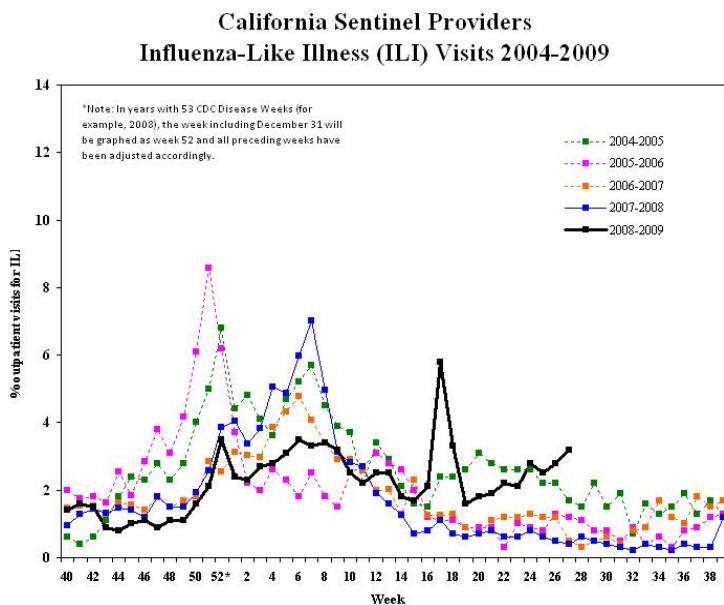
During week 27 (July 5-11, 2009), influenza activity decreased in the United States, however, there were still higher levels of influenza-like illness than is normal for this time of year. One thousand two hundred seventy-eight (23.8%) specimens tested by U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories and reported to CDC/Influenza Division were positive for influenza. Over 99% of all subtyped influenza A viruses being reported to CDC were novel influenza A (H1N1) viruses. One influenza-associated pediatric death was reported and was associated with novel influenza A (H1N1) virus infection. The proportion of outpatient visits for influenza-like illness (ILI) was below national and region-specific baseline levels.

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 and may be on the rise once again. A total of 47 sentinel providers reported during Week 27.

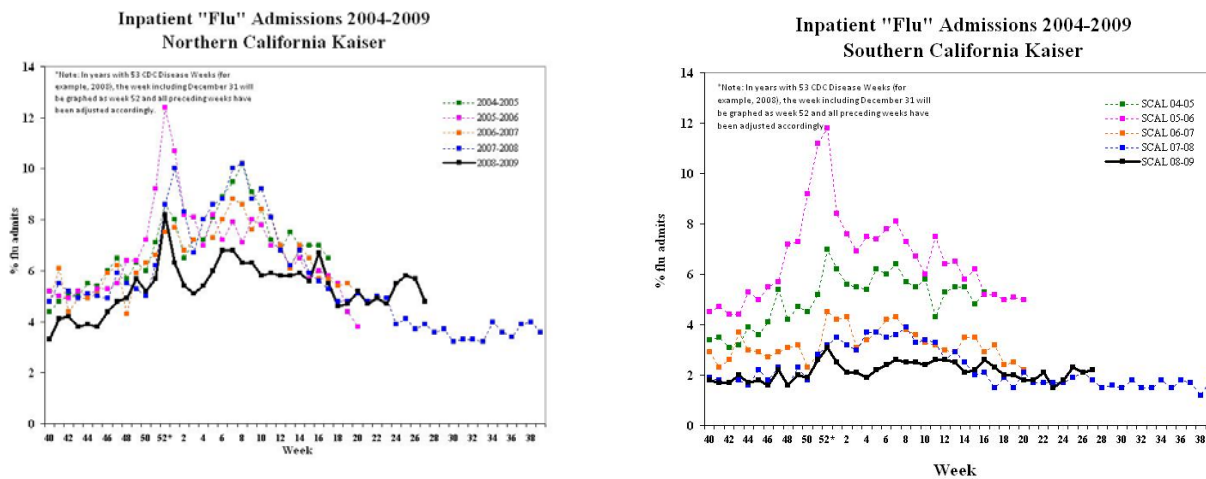
Figure 1. California Sentinel Providers – Influenza-Like Visits, 2004-2009.



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 2-3. Inpatient “Flu” Admissions at Kaiser Facilities, 2004-2009. These figures 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. Inpatient “Flu” Admissions are declining in Northern California but remain steady in Southern California.



3. Laboratory Positive Results Data

Positive influenza and other virus results from sentinel laboratories, local public health laboratories and VRDL. Influenza A detections continue to decrease from a peak of 1018 in week 24 although the overall detection rate remains high. There was one reported Influenza A/Influenza B co-infection in San Francisco County in week 27.

Table 1. Influenza and other respiratory virus detections, July 5– 11, 2009.

		Sentinel Laboratories/Respiratory Laboratory Network [‡]	Sentinel Providers
Week 27	Number of Sites Reporting	23	766 specimens submitted (324 positive by PCR)
	Influenza A	706 ^a Total tested week 27: 1584 Total detections to date: 10,434	0 Total tested week 27: 0 Total detections to date: 220
	Influenza B	1 ^b Total tested week 27: 1222 Total detections to date: 4810	0 Total tested week 27: 0 Total detections to date: 104
	RSV	1 ^c Total tested week 27: 1035 Total detections to date: 8818	N/A
	Other Respiratory Viruses	6 ^d Total tested week 27: 301 Total detections to date: 440	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 (105); Contra Costa (65); Fresno (28); Kings (1); Long Beach (56); Los Angeles (36); Madera (2); Marin (14); Merced (1); Monterey (6); Orange (10); Placer (13); Riverside (7); Sacramento (56); San Diego (12); San Francisco (36); San Joaquin (17); San Mateo (51); Santa Barbara (3); Santa Clara (94); Shasta (7); Solano (32); Sonoma (26); Stanislaus (3); Tulare (19); Ventura (5); Yolo (1)
- ^b San Francisco (1)
- ^c San Francisco (1)
- ^d parainfluenza type 1 (3); adenovirus (2); human metapneumovirus (1)