

California Influenza Surveillance Project

California Department of Public Health

2008-2009

Influenza Update

Influenza Surveillance for September 10 – September 16, 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 were asked to no longer report outpatient cases. Effective August 12, 2009, local health departments were asked to report hospitalized cases of pandemic (H1N1) 2009 as weekly aggregate numbers. Intensive care unit (ICU) cases and fatal cases continue to be reported with individual case report forms.

This week, overall influenza activity in California remained “regional” (defined by the CDC as outbreaks of influenza or increases in ILI and recent laboratory confirmed influenza in at least two but less than half the regions of the state). Laboratory detections and reports of influenza like illness from sentinel providers increased in week 36 (September 6 – 12, 2009).

1. Pandemic (H1N1) 2009 Epi- Surveillance Update (Updated September 16, 2009)

Highlights:

- Effective August 12, 2009, local health departments began reporting hospitalized pandemic (H1N1) 2009 cases as weekly aggregate numbers. From September 8 – September 12, 2009, 206 hospitalized/fatal cases were reported; there have been 2,012 hospitalizations and/or fatalities, with 548 cases requiring intensive care, reported to date.
- CDPH received 15 reports of fatal pandemic (H1N1) 2009 cases this week; a total of 167 pandemic (H1N1) 2009 deaths 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 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, of 378 specimens tested at VRDL, all but one have tested negative for the resistance mutation. VRDL detected one specimen with the H275Y resistance mutation (associated with oseltamivir resistance); the result was confirmed by the CDC. This is the first time that this mutation has been detected by the VRDL and provides strong evidence for the importance of enhanced surveillance for antiviral resistance testing. 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. On September 8, 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> and
<http://www.flu.gov/vaccine/antiviralguidance.html>.

- Seven (7) new cases meeting the case definition for severe pediatric influenza were reported this week; all of the cases are confirmed/probable pandemic (H1N1).

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

Table 1. Provisional number of pandemic (H1N1) 2009 hospitalizations, ICU and fatal cases in California, by local health jurisdiction, April 3 – September 15, 2009.

Jurisdiction	Total Hospitalizations, ICU cases and Deaths ^{a,b}	Incidence of Hospitalizations per 100,000 population	Deaths ^c
CALIFORNIA	2012	5.20	167
County Undetermined	0	0.00	0
Alameda	139	9.02	12
Berkeley City	7	6.53	1
Butte	14	6.17	0
Colusa	1	4.29	0
Contra Costa	136	12.77	6
El Dorado	5	2.68	1
Fresno	81	8.40	8
Glenn	1	3.29	0
Humboldt	7	5.22	1
Imperial	8	4.33	0
Inyo	1	5.24	0
Kern	21	2.46	1
Kings	5	3.11	1
Lake	3	4.50	0
Long Beach City	44	8.93	2
Los Angeles	262	2.51	30
Madera	2	1.26	0
Marin	30	11.83	4
Mendocino	4	4.33	0
Merced	27	10.09	1
Monterey	43	9.99	1
Napa	4	2.84	1
Orange	224	7.02	18
Pasadena City	2	1.33	0
Placer	8	2.35	2
Riverside	28	1.29	5
Sacramento	123	8.56	6
San Benito	8	12.81	0
San Bernardino	66	3.09	8
San Diego	251	7.92	18
San Francisco	63	7.74	6
San Joaquin	69	9.53	2
San Luis Obispo	6	2.24	1
San Mateo	47	6.40	7
Santa Barbara	19	4.41	0
Santa Clara	71	3.89	8
Santa Cruz	15	5.62	1
Shasta	7	3.70	0
Siskiyou	3	6.40	0
Solano	17	3.90	2
Sonoma	51	10.38	6
Stanislaus	52	9.46	6
Sutter	4	4.00	0
Tehama	1	1.55	0
Tulare	17	3.72	0
Yolo	11	5.43	1
Yuba	4	5.10	0

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

^b Includes the following individuals: (1) non-fatal hospitalized cases, (2) fatal hospitalized cases, (3) fatal non-hospitalized cases

^c Not all fatal cases were hospitalized.

Bold indicates the first report of hospitalized and/or fatal cases by the county

Table 2. Total number of hospitalized and/or fatal cases reported, incidence rate and age-specific case fatality ratio of pandemic (H1N1) 2009 in California, by age category, April 3 - September 15, 2009

Age category, in years	HOSPITALIZED AND/OR FATAL CASES [§]			FATAL CASES		
	Number of cases	Cumulative number of cases	Incidence per 100,000 population	Number of cases	Cumulative percentage of fatalities	Case Fatality Ratio*
<1	137	137	24.04	2	1.20%	1.5%
1-4	156	293	7.06	2	2.40%	1.3%
5-18	393	686	5.20	16	11.98%	4.1%
19-24	231	917	6.66	10	17.96%	4.3%
25-35	320	1237	5.44	32	37.13%	10.0%
36-49	328	1565	4.09	37	59.28%	11.3%
50-64	337	1902	5.03	51	89.82%	15.1%
65+	110	2012	2.52	17	100.00%	15.5%
ALL AGES	2012		5.19	167		8.3%

[§]Includes the following individuals: (1) hospitalized non-fatal cases, (2) hospitalized fatal cases, (3) non-hospitalized fatal cases

*The Case fatality ratio is calculated using the following formula: (number of fatalities from age group due to H1N1/ total number of hospitalized and/or fatal cases within that age group due to H1N1)*100.

The case report form used to report ICU and fatal cases of pandemic (H1N1) 2009 is available at:

<http://www.cdph.ca.gov/pubsforms/forms/Documents/PandemicH1N1HospFatalCaseReportForm.doc>

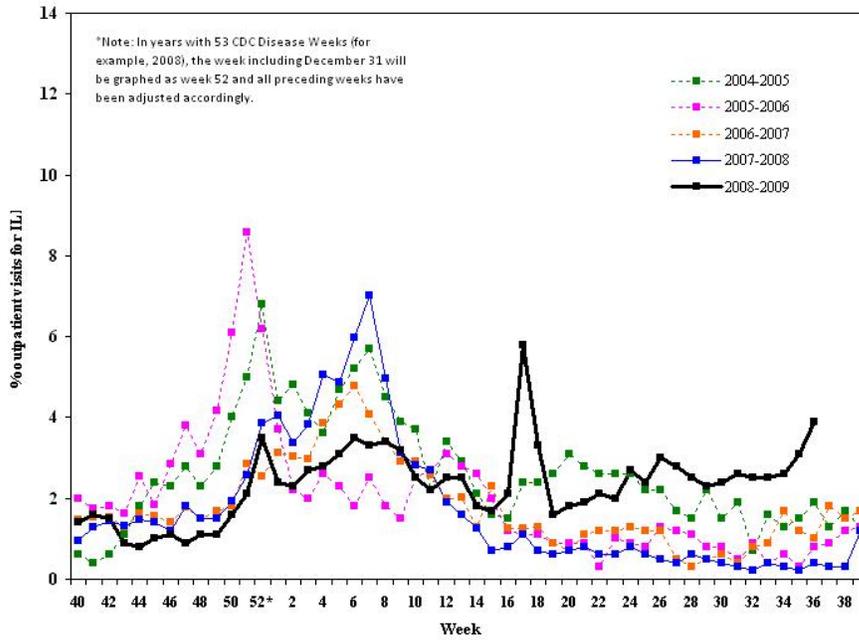
A template for reporting aggregate hospitalized cases is available at:

<http://www.cdph.ca.gov/pubsforms/forms/Documents/H1N1LHJAggHospitalizedCaseReportTemplate.xls>

2. **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. ILI is increasing. A total of 51 sentinel providers reported during Week 36 (September 6 – 12, 2009).

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



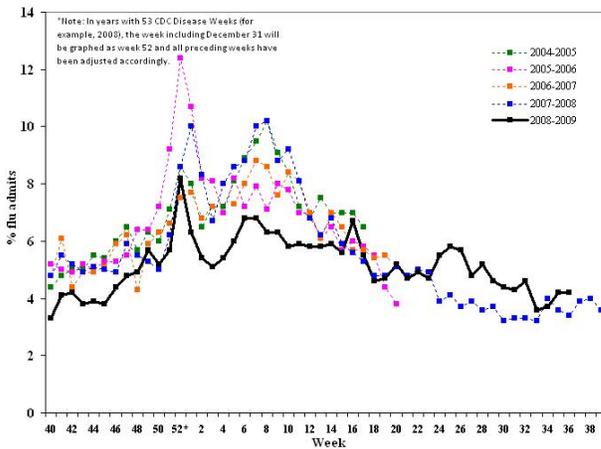
3. Kaiser Permanente Hospitalization Data (“Flu Admits”)

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.

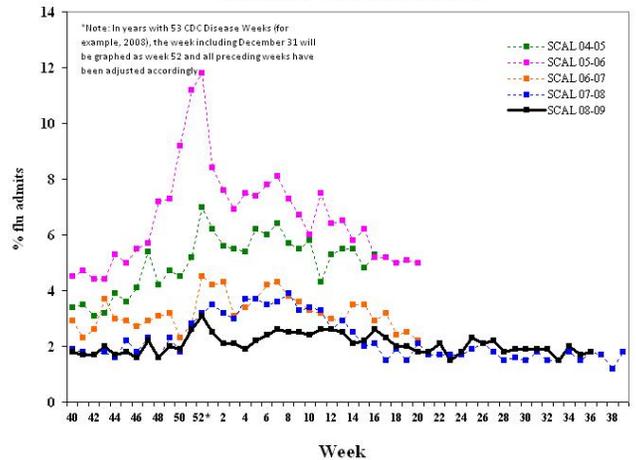
Inpatient “Flu” Admissions 2004-2009

Northern California Kaiser



Inpatient “Flu” Admissions 2004-2009

Southern California Kaiser



5. Laboratory Surveillance Update

VRDL Influenza PCR Results (Updated September 16, 2009)

- VRDL performs PCR testing for influenza A, influenza A subtypes H1 and H3, 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 5,292 specimens for pandemic (H1N1) 2009 testing, including specimens submitted by sentinel providers.
- Of 4,708 specimens tested at VRDL for influenza A, 3,215 (68%) have been positive.
- A total of 1,043 influenza A-positive specimens have been subtyped at VRDL.
- Of 2,208 unsubtypeable specimens tested at VRDL for pandemic (H1N1) 2009, 1,982 (90%) have been positive.

Respiratory Laboratory Network (RLN) Influenza PCR Surveillance Results (Updated September 16, 2009)

As noted in Table 3 below, during Week 36 (September 6 – 12, 2009), 36% of specimens received by the Respiratory Laboratory Network were positive for influenza A. Due to a change in testing policy, some labs within the RLN are no longer subtyping for influenza A-positive specimens. Of the RLN labs that performed subtyping during week 36, all but one specimen was unsubtypeable. Pandemic (H1N1) 2009 continues to be the predominant strain circulating in California at this time.

Table 3. Respiratory Laboratory Network (RLN) Influenza PCR Surveillance Results, Week 36 (September 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)
All RLN*	797	285 (36%)	0 (0%)	1 (1%)	271 (95%)	475	2 (0%)
Northern	329	109 (33%)	0 (0%)	1 (1%)	95 (87%)	112	2 (2%)
Central	291	115 (40%)	0 (0%)	0 (0%)	115 (100%)	217	0 (0%)
Southern	177	61 (34%)	0 (0%)	0 (0%)	61 (100%)	146	0 (0%)

* 15 RLN laboratories reporting, including:

Northern CA: Contra Costa, El Dorado, Sacramento, San Francisco, Santa Clara, Shasta, Sonoma

Central CA: Fresno, San Joaquin, Tulare

Southern CA: Los Angeles, Riverside, San Bernardino, Santa Barbara, Ventura

Laboratory Positive Results Data (Updated September 16, 2009)

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

Table 4. Influenza and other respiratory virus detections, September 6 – 12, 2009.

		Sentinel Laboratories/Respiratory Laboratory Network [‡]	Sentinel Providers
Week 36	Number of Sites Reporting	22	1167 specimens submitted (534 positive by PCR)
	Influenza A	841 ^a Total tested week 36: 2680	0 Total tested week 36: 0
	Influenza B	2 ^b Total tested week 36: 2239	0 Total tested week 36: 0
	RSV	2 ^c Total tested week 36: 1370	N/A
	Other Respiratory Viruses	2 ^d Total tested week 36: 102	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 (43); Contra Costa (23); El Dorado (2); Fresno (43); Kern (2); Long Beach (5); Los Angeles (91); Marin (1); Napa (1), Orange (19); Placer (34); Riverside (33); Sacramento (158); San Bernardino (26); San Diego (23); San Francisco (16); San Joaquin (29); San Mateo (15); Santa Barbara (1); Santa Clara (49); Shasta (5); Solano (10); Sonoma (80); Stanislaus (19); Tulare (94); Ventura (11); Yolo (8)

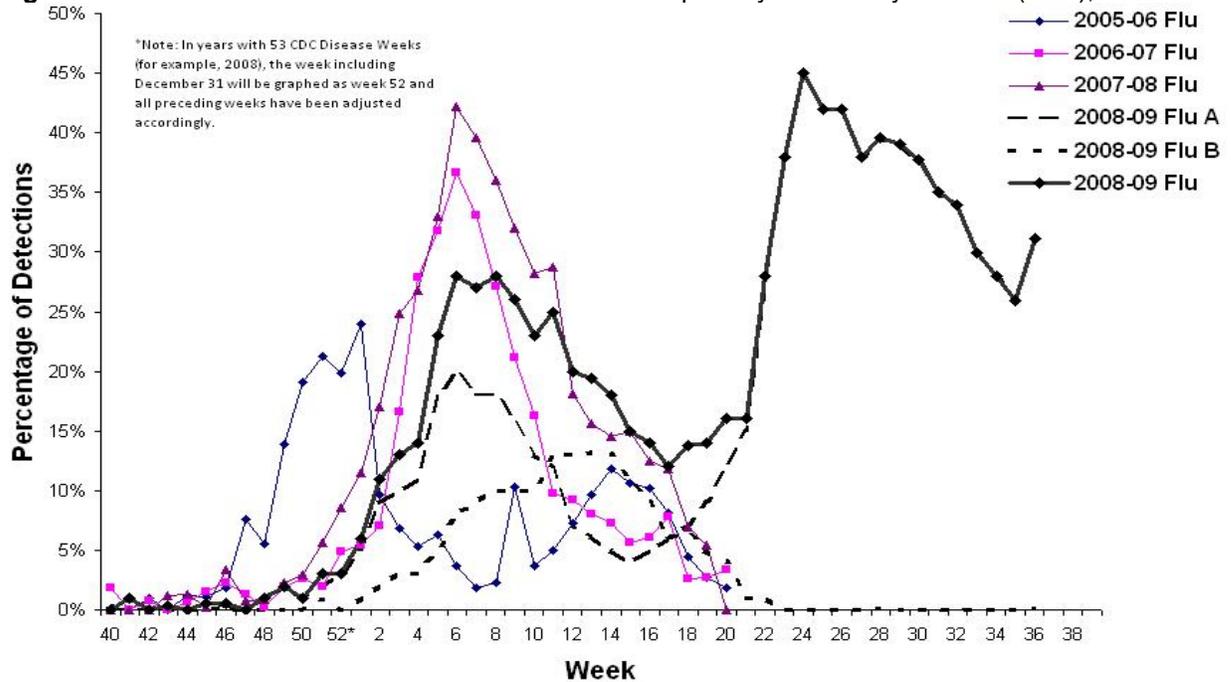
^b Contra Costa (2)

^c Orange (1); Placer (1)

^d parainfluenza type 1 (2)

Figure 4 shows that laboratory detections peaked in week 24 (June 14 –20, 2009) and may be rising once again.

Figure 4. 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. During Week 33 (August 16 – 22, 2009), VRDL detected a specimen with the H275Y resistance mutation (associated with oseltamivir resistance); this result was confirmed by the CDC. This is the first case of this mutation detected by VRDL.

Table 5. Antiviral resistance testing at VRDL, 2009*.

Pandemic (H1N1)	Oseltamivir Resistant	Adamantanes Resistant
VRDL testing	1/378	87/87

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