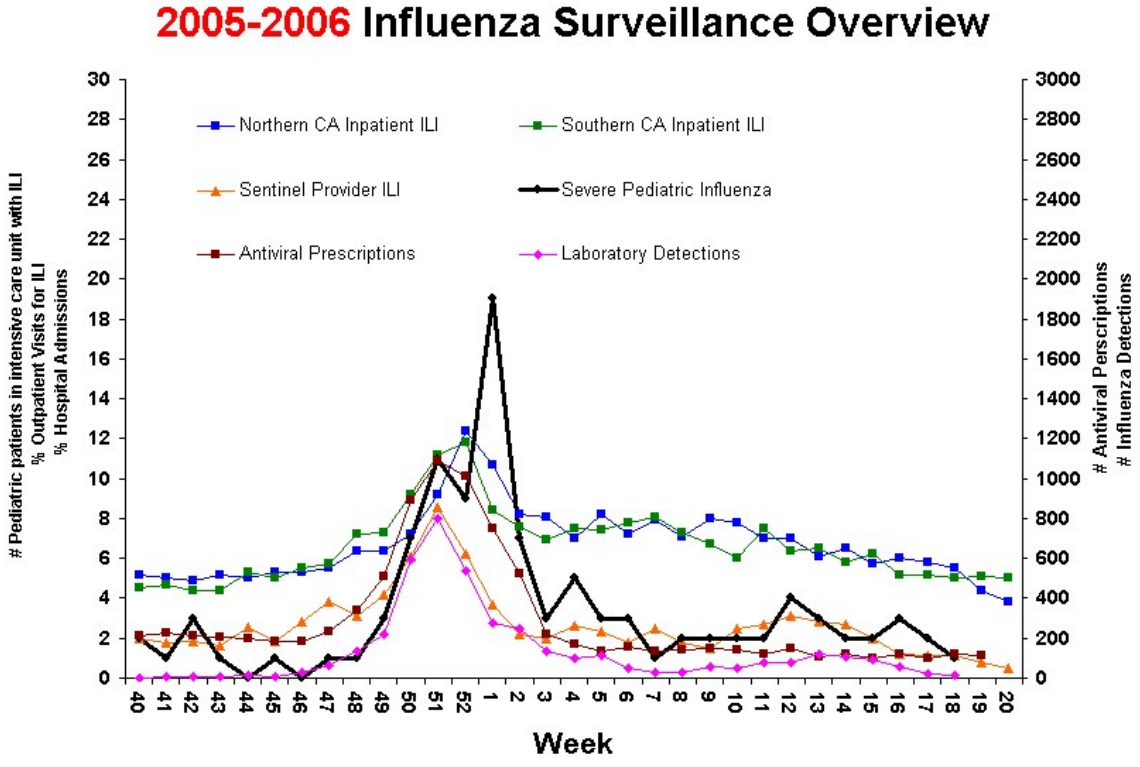
California Influenza Surveillance Project Summary

2005-2006*

The California Influenza Surveillance Project conducts statewide influenza surveillance year-round. Weekly updates of the website occur during influenza season. Please see the overview page for general descriptions of each of the surveillance methods. The data described below is for the 2005-2006 season and includes data through week 20.

Influenza-Like Illness Activity and Influenza and Pneumonia-Associated Hospitalization Surveillance:

Overall, influenza activity in California in the 2005-2006 influenza season was moderate in severity. The magnitude of influenza activity as described by the multiple parameters measured (percentages of Kaiser Permanente inpatient admissions for influenza and pneumonia, Kaiser Permanente antiviral prescriptions, CDC sentinel provider outpatient visits for influenza-like illnesses (ILI), laboratory detections for influenza, and severe pediatric influenza illnesses) was higher than last year, but comparable to previous years. The increase in activity in the current season compared to the 2004-05 season could be due to the fact that last season influenza B, which is often associated with less severe disease than influenza A, appeared to account for a large proportion of disease. The current season was marked by a large peak in weeks 51-52 of 2005 (mostly attributed to influenza A activity), followed by a smaller, less well defined peak spread out over the first 16 weeks of 2006 (attributed to a mixture of influenza A and B activity).



Laboratory Surveillance:

This season was characterized by a large proportion of clinical specimens in late 2005 testing positive for influenza A, followed by a predominance of detections for influenza B reported in February-April 2006.

Using data from 22 sentinel laboratories located statewide, a total of 4156 positive detections for influenza were reported, with 3474 (84%) identifying influenza A, 653 (16%) identifying influenza B, and 28 (0.67%) identifying influenza A/B unspecified. These detections result from a mixture of diagnostic testing methods, including rapid antigen testing, immunofluorescence assays, cell culture and polymerase chain reaction (PCR). Of the 876 clinical specimens tested this season at the State Viral and Rickettsial Disease Laboratory (VRDL) using R-mix shell vial testing and viral isolation in primary monkey kidney and human fetal diploid cells, 330 (38%) had positive yield by isolation. Two hundred seventy-seven isolates were positive for influenza: a majority (187/277; 68%) were identified as influenza A compared to influenza B (90/277; 33%). One hundred fifty-five influenza A isolates were subtyped as H3, eight were subtyped as H1 and 24 were not subtyped. Fifty-three specimens had non-influenza viral pathogens diagnosed, including parainfluenza (18), adenovirus (11), RSV (9), and rhinovirus (7). A majority of specimens (577/876:66%) were submitted by sentinel providers; the rest were submitted from outbreak settings, requests for testing in individual cases with severe presentations (e.g., encephalitis, severe pneumonia requiring hospitalization in intensive care units, and fatal cases) or other unusual clinical presentations. These statewide laboratory results are similar to laboratory surveillance nationwide, where of the 17,068 influenza detections, 13,857 (81%) were influenza A viruses and 3,211 (18%) were influenza B viruses.

VRDL Subtyping and Strain-typing:

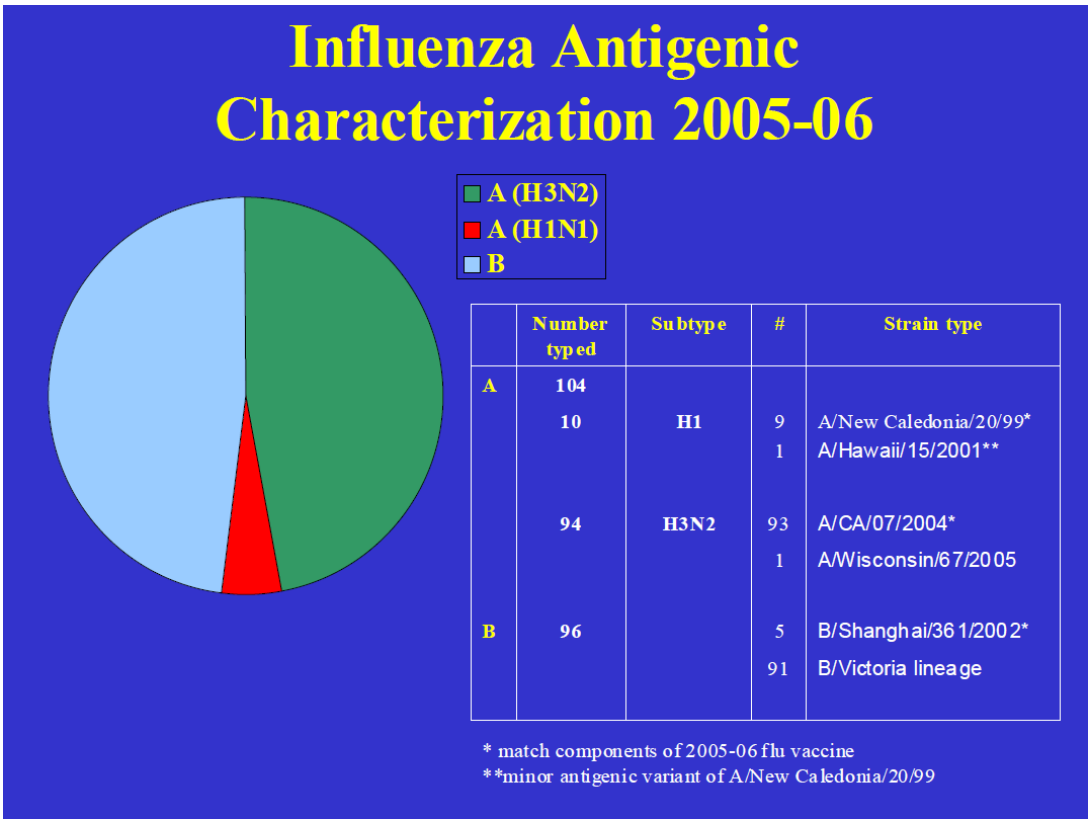
To date 200 influenza isolates: 104 (52%) type A and 96 (48%) type B, have been characterized antigenically by hemagglutination inhibition assay (HIA) at VRDL. Among the influenza type A isolates subtyped this season, 94 (90%) were A/H3N2 and 10 (10%) were A/H1.

During this season, the A/California/07/2004-like (H3N2) strain predominated in California, accounting for 99% (93/94) of the A/H3N2 isolates characterized. Similarly, the A/California/07/2004-like (H3N2) strain accounted for over three-quarters of all influenza A/H3N2 strains characterized nationally; in addition, a minority of isolates characterized nationally were identified as A/Wisconsin/67/2005. The A/Wisconsin/67/2005 (H3N2) appears to represent a new antigenic variant, which evolved from A/California/07/2004, and has been selected by the World Health Organization (WHO) as the H3N2 component for the 2006-07 vaccine. This season there were reports of detections of the A/Wisconsin/67/2005 (H3N2)-like strain in southern California at clinics located near the border with Mexico. The only A/Wisconsin/67/2005 (H3N2)-like virus identified so far from California this season was from an isolate originally submitted by San Diego County Public Health Lab in

December. Full characterization of all the circulating strains in California for the 2005-06 season is still ongoing.

Of the ten A/H1 isolates strain-typed at VRDL, nine were characterized as A/New Caledonia /20/99-like. The eleventh A/H1 isolate was characterized as A/Hawaii/15/2001-like, a minor antigenic variant of A/New Caledonia/20/99. Both A/California/07/2004-like (H3N2) and A/New Caledonia /20/99-like were recommended as the H3 and H1 components of the 2005-06 influenza vaccine for the Northern Hemisphere and the 2006 Southern Hemisphere.

Among the influenza type B isolates, five (5%) were strain-typed as B/Shanghai/361/2002-like (Yamagata Family), which is the B component of the 2005-06 vaccine for the Northern Hemisphere. Ninety-one (95%) influenza B viruses belonged to the B/Victoria-like family**.** A B/Malaysia/2506/2004-like virus from the B/Victoria lineage was recommended by WHO as the B component for the 2006 Northern Hemisphere vaccine.



	Number typed	Subtype	#	Strain type
A	104			
	10	H1	9	A/New Caledonia/20/99*
			1	A/Hawaii/15/2001**
	94	H3N2	93	A/CA/07/2004*
			1	A/Wisconsin/67/2005
B	96		5	B/Shanghai/361/2002*
			91	B/Victoria lineage

* match components of 2005-06 flu vaccine
**minor antigenic variant of A/New Caledonia/20/99

The WHO recommendations for composition of the northern hemisphere 2006-2007 influenza vaccine are:

- A/New Caledonia/20/99(H1N1)-like virus
- A/Wisconsin/67/2005 (H3N2)-like virus
- B/Malaysia/2506/2004-like virus

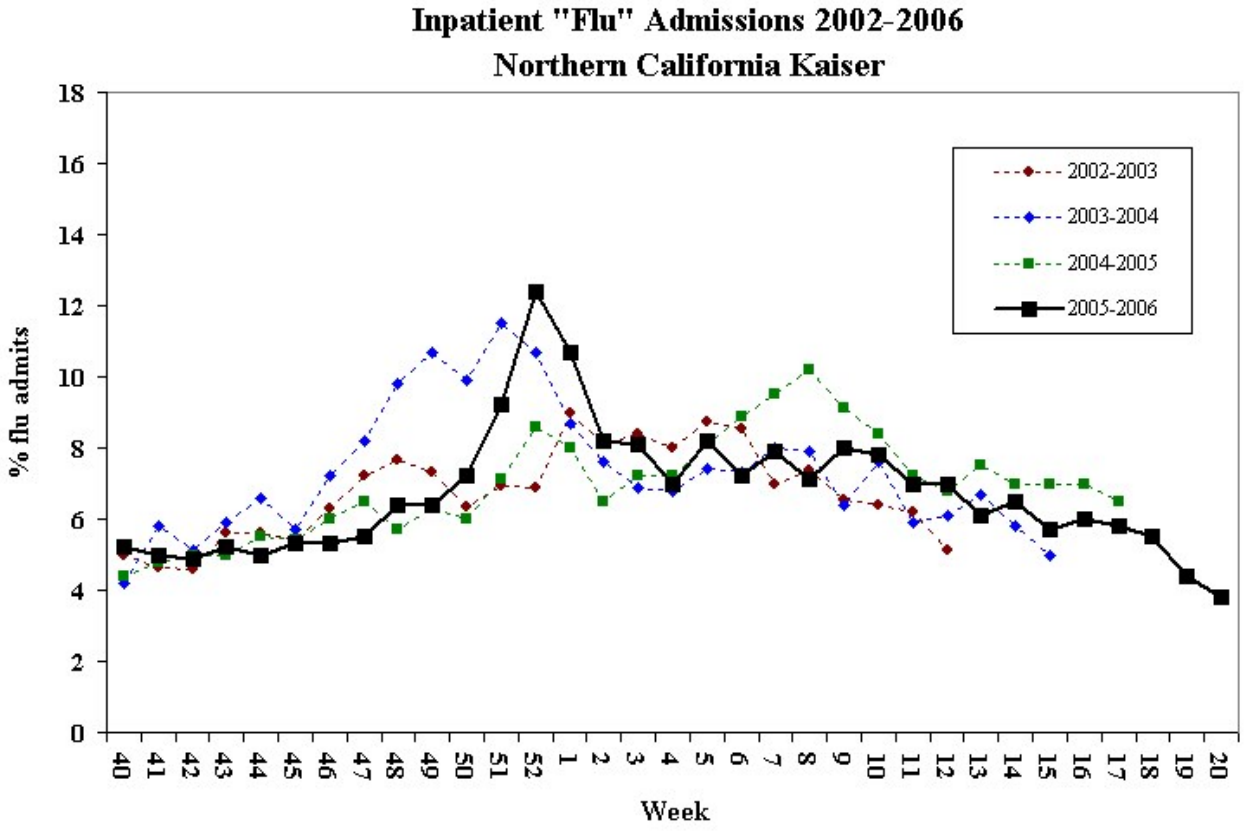
Candidate vaccine viruses include:

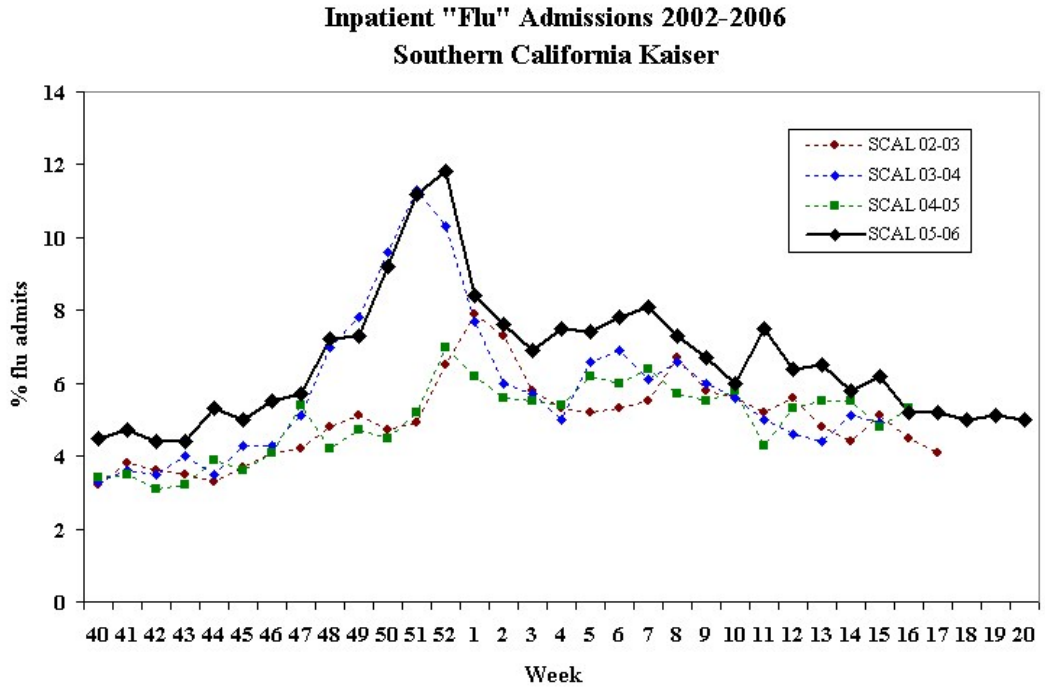
- A/Wisconsin/67/2005 (H3N2) and A/Hiroshima/52/2005(H3N2)
- B/Malaysia/2506/2004 virus and B/Ohio/1/2005

A breakdown of the individual parameters used and their comparison to previous years of data is shown below:

Kaiser Permanente Inpatient Data

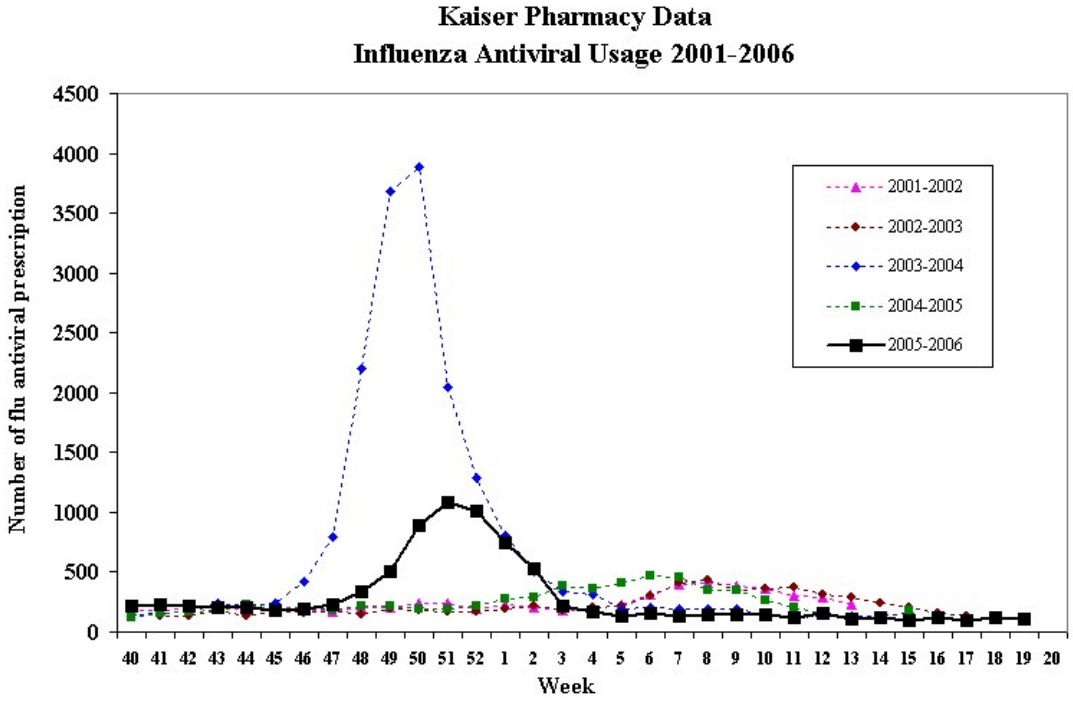
For the purpose of our surveillance system, “flu admits” are defined as inpatient hospital admissions for the diagnoses of pneumonia or influenza. ICD-9 discharge codes 480-487 are well known to correlate with influenza activity but are not useful for tracking activity in real time. Based on data collected in previous years, admitting diagnoses of “flu”, ‘influenza” and “pneumonia” approximate ICD-9 codes 480-487, and are used to track influenza activity. “Flu admits” are present year-round because of baseline pneumonia admissions. The estimated baseline rate for the off-season is approximately 3-5%. The percentage of flu admits is calculated by dividing the number of flu admissions by the total number of hospital admissions for the same day. Admissions for pregnancy, labor and delivery, birth, and outpatient procedures are excluded from the denominator.





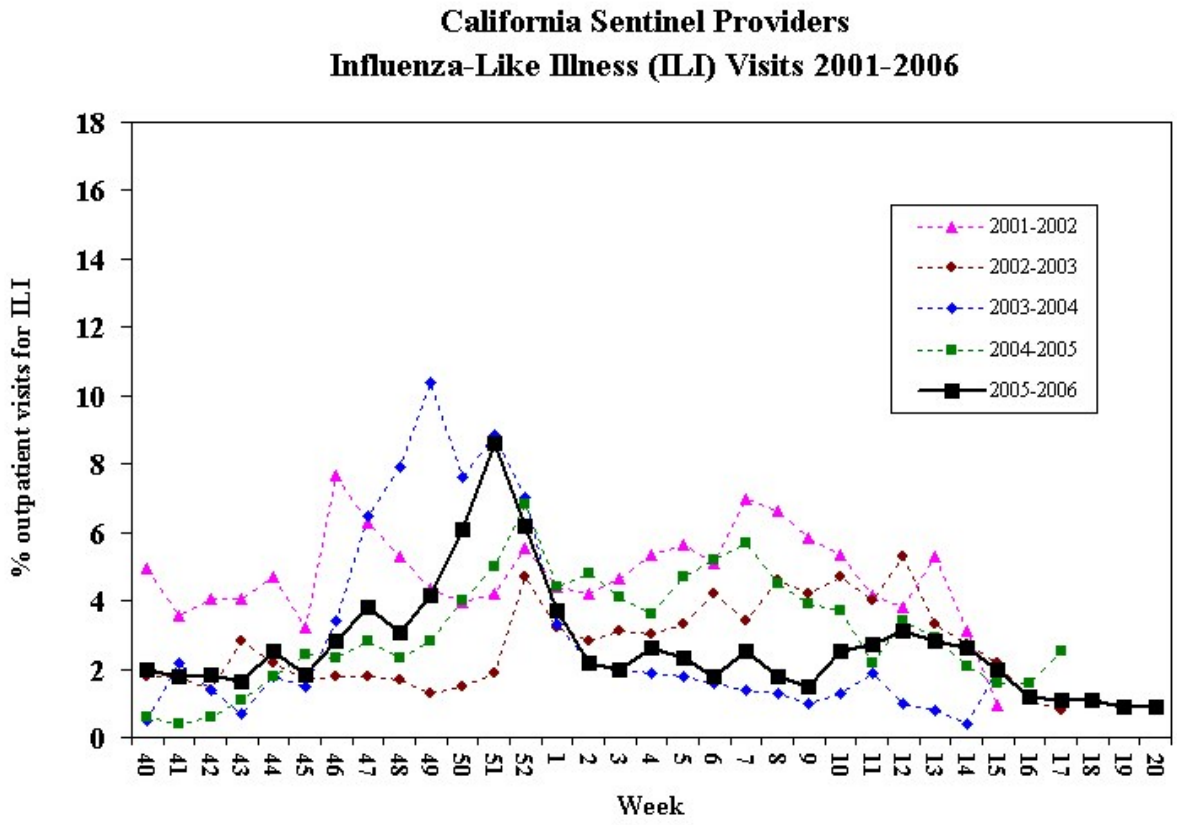
Kaiser Permanente Antiviral Usage Data

The number of prescriptions filled for the antiviral drugs used for influenza (amantadine, rimantadine, zanamivir and oseltamivir) by Kaiser outpatient pharmacies in California is reported to us weekly. Baseline amantadine usage is present year-round for disorders such as Parkinson's disease.



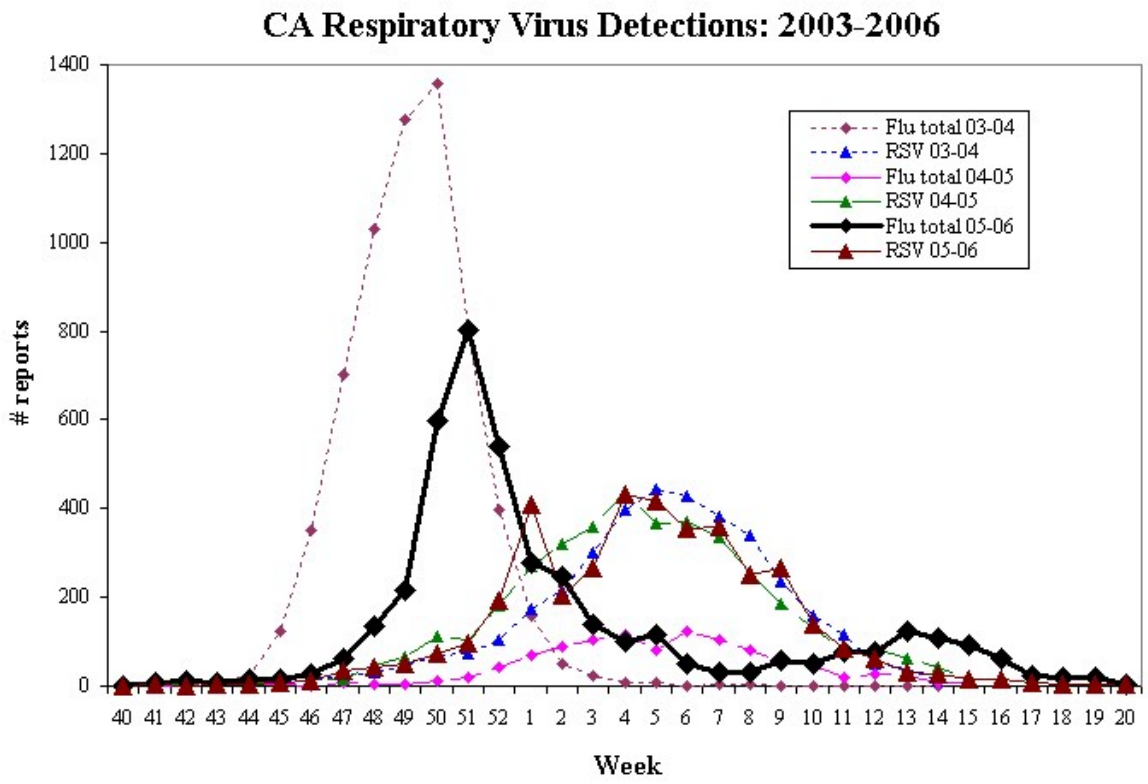
Sentinel Physician Influenza-Like Illness Data

The percentage of outpatient visits for influenza-like illness is calculated by dividing the number of influenza-like illness visits by the total number of outpatient visits per week reported by sentinel providers situated throughout California. For purposes of this surveillance influenza-like illness is defined as fever (> 100° F [37.8° C], oral or equivalent) AND cough and /or sore throat (in the absence of a KNOWN cause other than influenza).



Respiratory Virus Isolation/Detection Data

During the 2005-2006 influenza season, CISP received weekly reports of laboratory detections and isolations of influenza and other respiratory viruses (predominantly RSV) from 21 participating sites, including hospital, academic, public health, and private laboratories, situated throughout California. In addition, influenza clinical specimens/isolates were requested from participating sites for detailed antigenic characterization. Selected isolates were forwarded to CDC for confirmation and further analysis.



*It is important to note that our surveillance system does not receive data from ALL labs, physicians, hospitals, or pharmacies in California and the numbers reported do not represent all cases of influenza but are intended to demonstrate trends in influenza activity.

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