

California Influenza Surveillance Project Summary

2004-2005

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 2004-2005 season and includes data through week 15.

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

Overall, influenza activity in the 2004-2005 influenza season was moderate in severity. The magnitude of influenza activity in California as described by percentages of inpatient admissions for influenza and pneumonia and of outpatient visits for influenza-like illnesses (ILI) was lower than last year, but comparable to previous years with the exception of the 1999-2000 season. Northern California activity, as measured by both sentinel provider outpatient influenza-like illness activity and inpatient hospitalizations, was characterized by two peaks in week 52 of 2004 and weeks 7-9 in 2005. In comparison, Southern California activity was milder overall. 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.

Laboratory Surveillance:

This season was characterized by a large proportion of clinical specimens testing positive for influenza B in California, when compared to previous years. Using data from 18 sentinel laboratories located statewide, a total of 1050 positive detections for influenza were reported, with 58% identifying influenza A and 42% identifying influenza B. These detections result from a mixture of diagnostic testing methods, including rapid antigen testing, immunofluorescence assays, cell culture and PCR. These findings are somewhat similar to laboratory surveillance nationwide, where of the 22,074 influenza detections, 76.5% were influenza A viruses and 23.5% were influenza B viruses. In contrast, of the 719 clinical specimens tested at the State Viral and Rickettsial Disease Laboratory (VRDL) this season using either viral isolation or polymerase chain reaction (PCR), a majority were identified as influenza B (n=143) compared to influenza A (n=45). This may be due to the fact that there was a marked predominance of influenza B isolates identified by viral culture; of the 142 influenza isolates grown, 87% were identified as influenza B and only 13% were identified as influenza A (H3). There may be several reasons why influenza B was identified more frequently at VRDL, including 1) a majority of specimens submitted to VRDL have been from sentinel providers, who are mainly a reflection of outpatient activity, as influenza B can often cause milder disease when compared to influenza A; and 2) the nationally predominant influenza A strain this year appears to be more difficult to isolate in cell culture, which is the primary method used at VRDL for detection of respiratory viruses.

Subtyping and strain-typing:

During this season, much attention was drawn to the identification of a new strain from California, named the A/California/07/2004-like (H3N2) strain. The isolate was originally submitted by a local public health laboratory at the start of the season, and was obtained from a school-aged child who presented to clinic without history of travel or unusual clinical presentation. Because this virus has been difficult to grow in isolation, the California VRDL has only identified one isolate of A/California/07/2004-like (H3N2) strain to date; another 13 have been antigenically characterized as A/Fujian/411/2002-like (H3N2). However, nationally the A/California/7/2004-like strain has predominated, accounting for 71% of the influenza A(H3N2) isolates antigenically characterized at CDC, with the remaining 29% characterized as antigenically similar to A/Wyoming/3/2003, which is the A/Fujian/411/2002-like (H3N2) component of the 2004-05 influenza vaccine. For these reasons, the influenza A/California/7/2004-like (H3N2) strain has been recommended by the World Health Organization to be a component of the 2005-06 influenza vaccine.

Of the 128 influenza B isolates antigenically characterized at the VRDL, 118 (92%) were strain typed as B/Shanghai/361/2002-like (Yamagata Family), which is the B component of the 200405 vaccine for the North Hemisphere. Ten (8%) influenza B viruses belonged to B/Victoria-like family, which were circulating between 2001 and 2003.

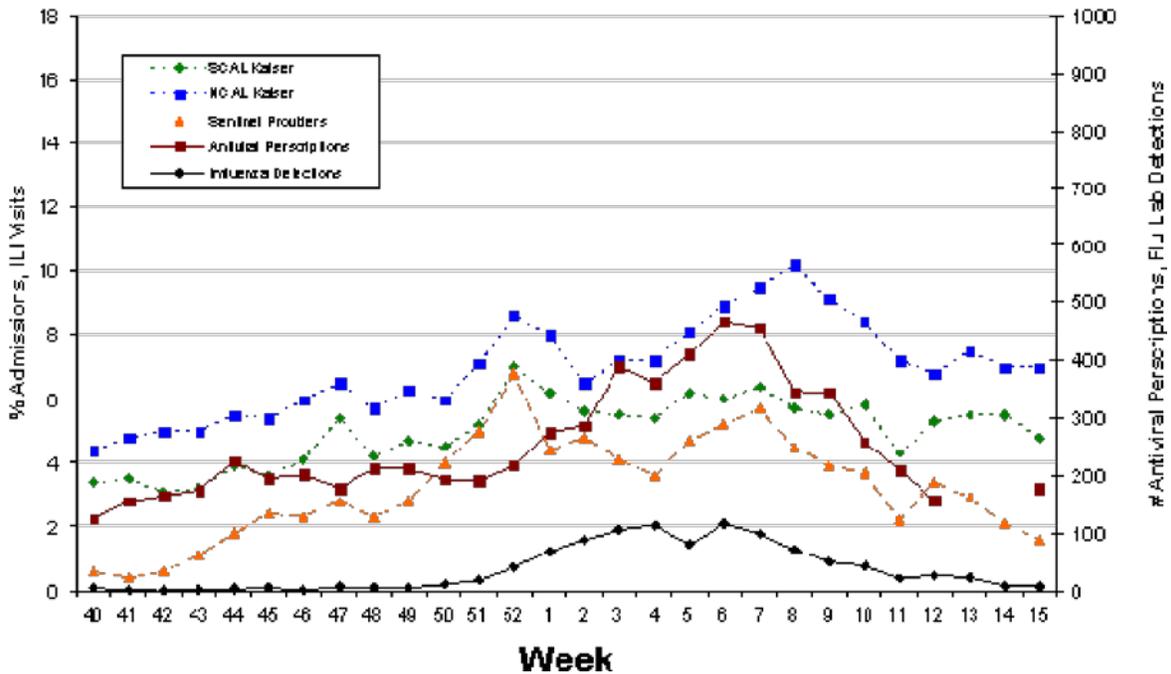
Severe Pediatric Influenza

For the 2004-05 influenza season, there were a total of 34 cases reported who met the following case definition for severe pediatric influenza: age 0- 17 years; a clinical syndrome consistent with influenza or complications of influenza; confirmation by laboratory testing; and have been hospitalized in the ICU or died (with no period of complete recovery between the illness and death). The low number of cases reported this season is in marked contrast to the 125 cases reported in the 2003-04 influenza season, which was characterized by introduction of the influenza A/Fujian/411/2002-like (H3N2) drift variant strain.

In 2004-05, the age range of the reported cases was from three weeks to seventeen years. The predominant presentation was lower respiratory tract infection, with 13 requiring mechanical ventilation. Fifteen were reported to be previously healthy, while the other 19 reported an underlying condition (s), including chronic cardiopulmonary disease, immunosuppression, neuromuscular disease, prematurity, developmental delay, and seizure disorder. All had influenza confirmed by laboratory testing, including 12 influenza A, 21 influenza B and one influenza that was not typed. Five cases received antiviral therapy, including two fatal cases. Of the 10 cases that had data available regarding influenza vaccination, two reported history of being vaccinated. Seven cases were fatal; of these, four had influenza B, two had influenza A, and one had influenza not typed further.

Figure 1:

Summary Influenza Surveillance Graph: 2004-2005



Kaiser Permanente Inpatient Data (Figures 2 and 3)

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.

Figure 2:

**Inpatient “Flu” Admissions 1999-2005
Northern California Kaiser**

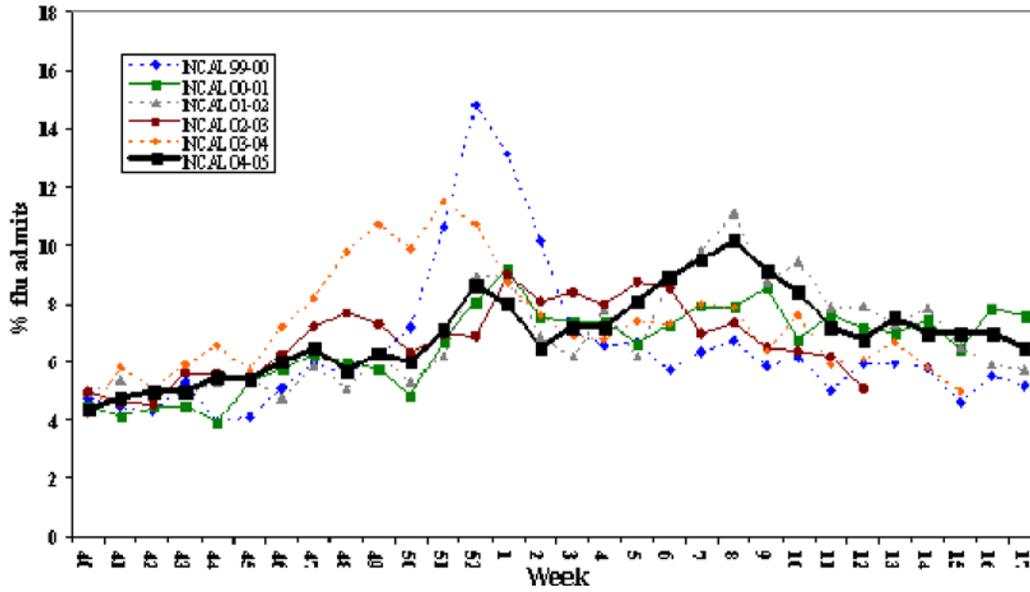
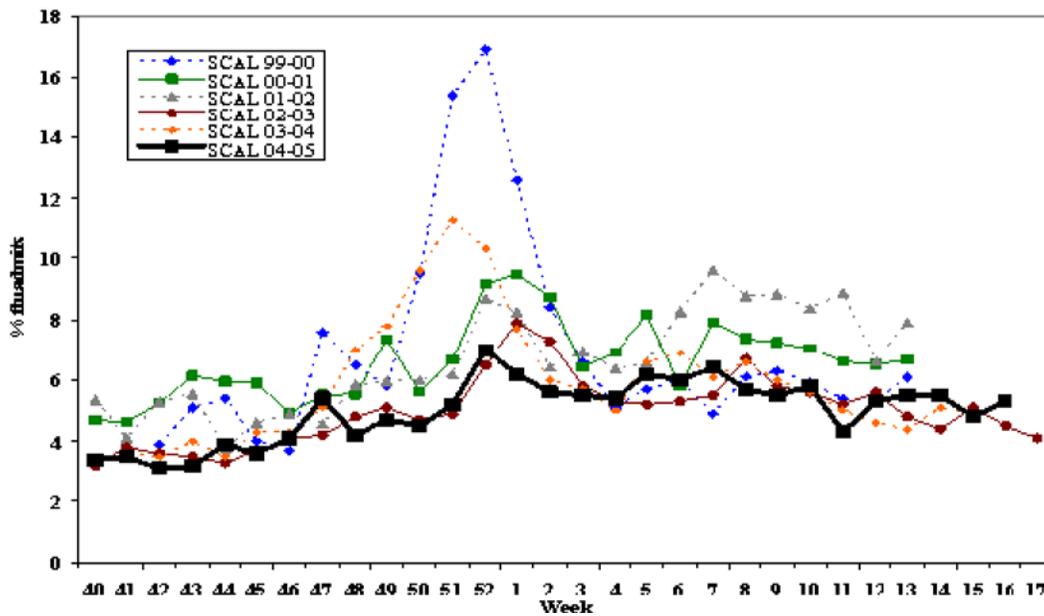


Figure 3:

**Inpatient “Flu” Admissions 1999-2005
Southern California Kaiser**

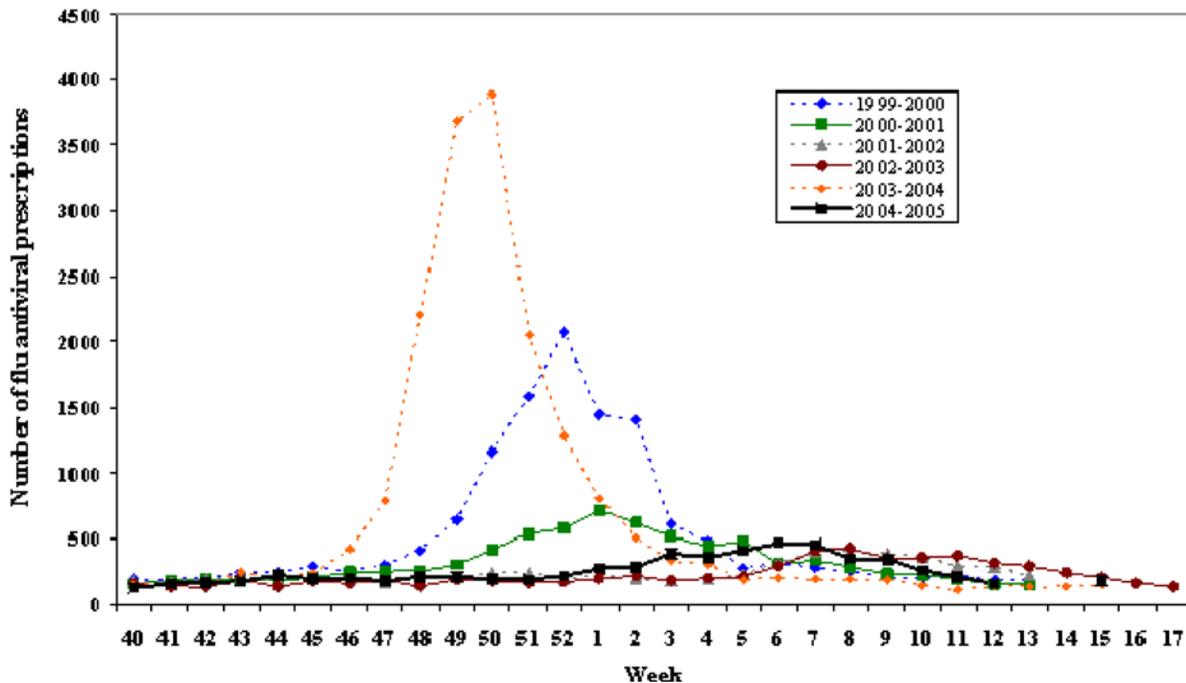


Kaiser Permanente Antiviral Usage Data (Figure 4)

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.

Figure 4:

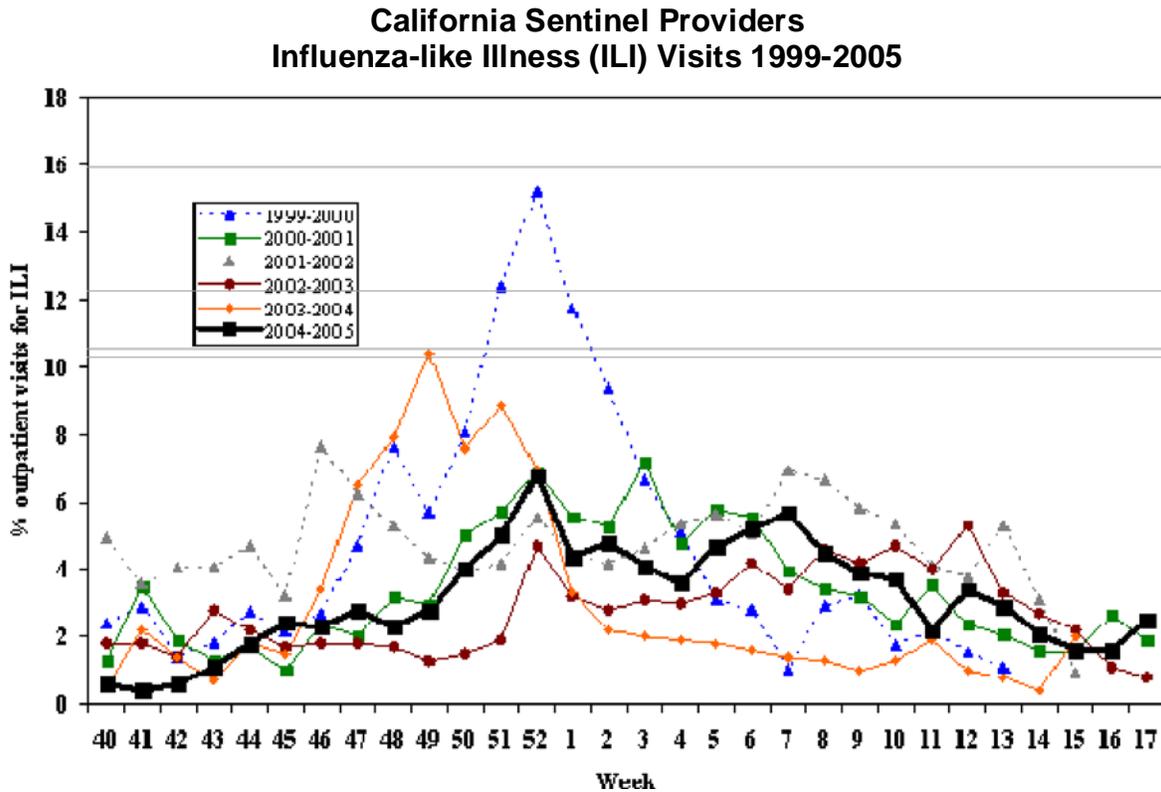
**Kaiser Pharmacy Data
Influenza Antiviral Usage 1999-2005**



Sentinel Physician Influenza-Like Illness Data (Figure 5)

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 ($> 100^{\circ} \text{F}$ [37.8°C], oral or equivalent) AND cough and /or sore throat (in the absence of a KNOWN cause other than influenza).

Figure 5:



Respiratory Virus Isolation/Detection Data (Figures 6 and 7)

During the 2004-2005 influenza season, CISP received weekly reports of laboratory detections and isolations of influenza and other respiratory viruses (predominantly RSV) from 19 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.

Figure 6:

California Respiratory Virus Detections: 2003-2005

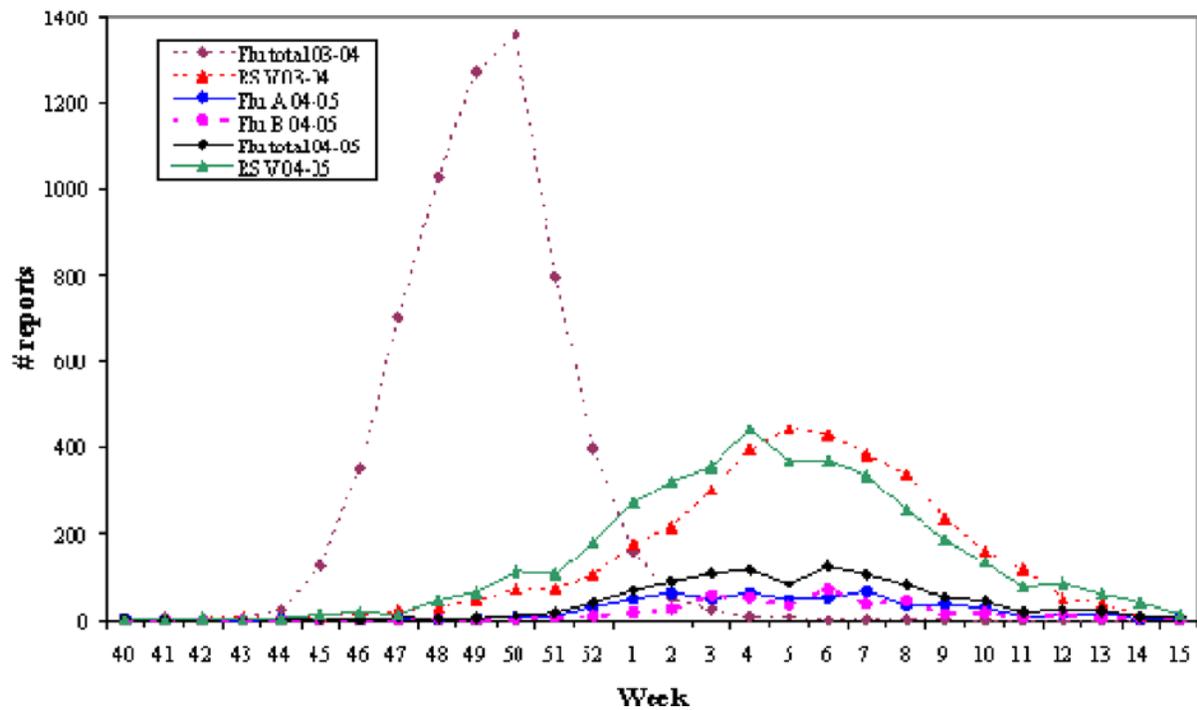
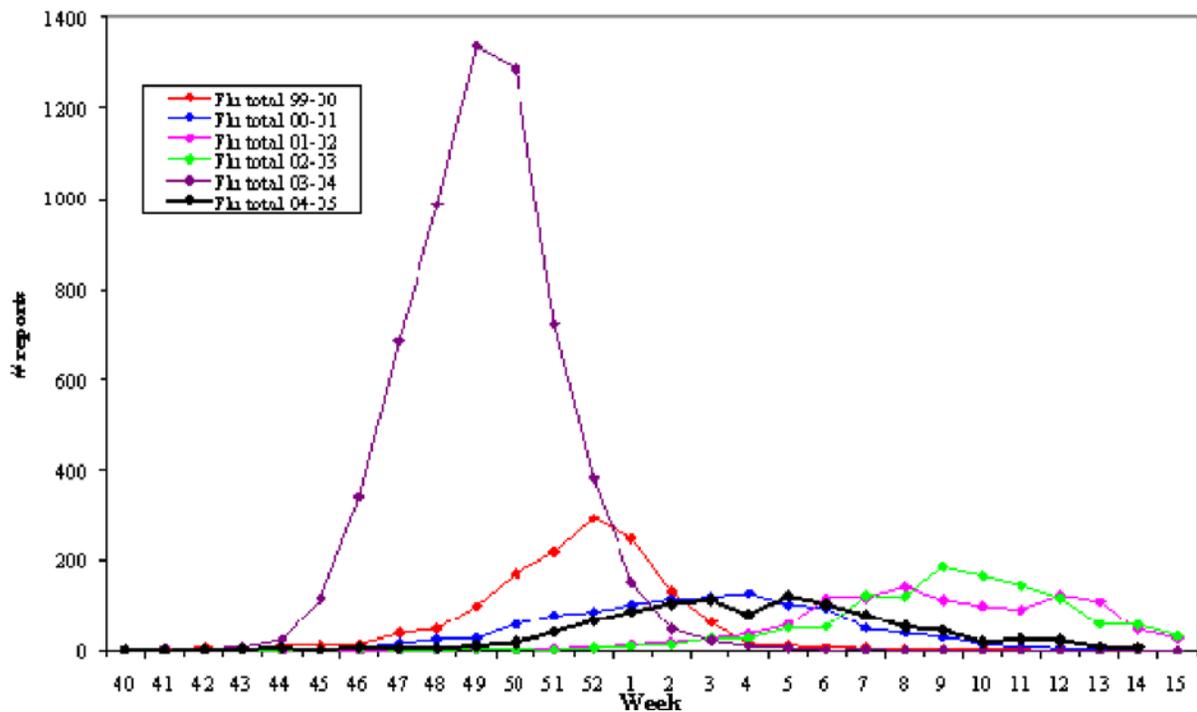


Figure 7:

California Influenza Detections: 1999-2005



Antigenic Characterization of Influenza Isolates, 2004-2005

	N	#	Strain type
Influenza Type A	82		
H1	1	1	A/New Caledonia/20/99*
H3	81	71	A/CA/07/2004
		10	A/Fujian/411/2002*
Influenza Type B	173	154	B/Shanghai/361/2002*
		19	B/Victoria lineage

*strains included in the 2004-2005 vaccine.

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