

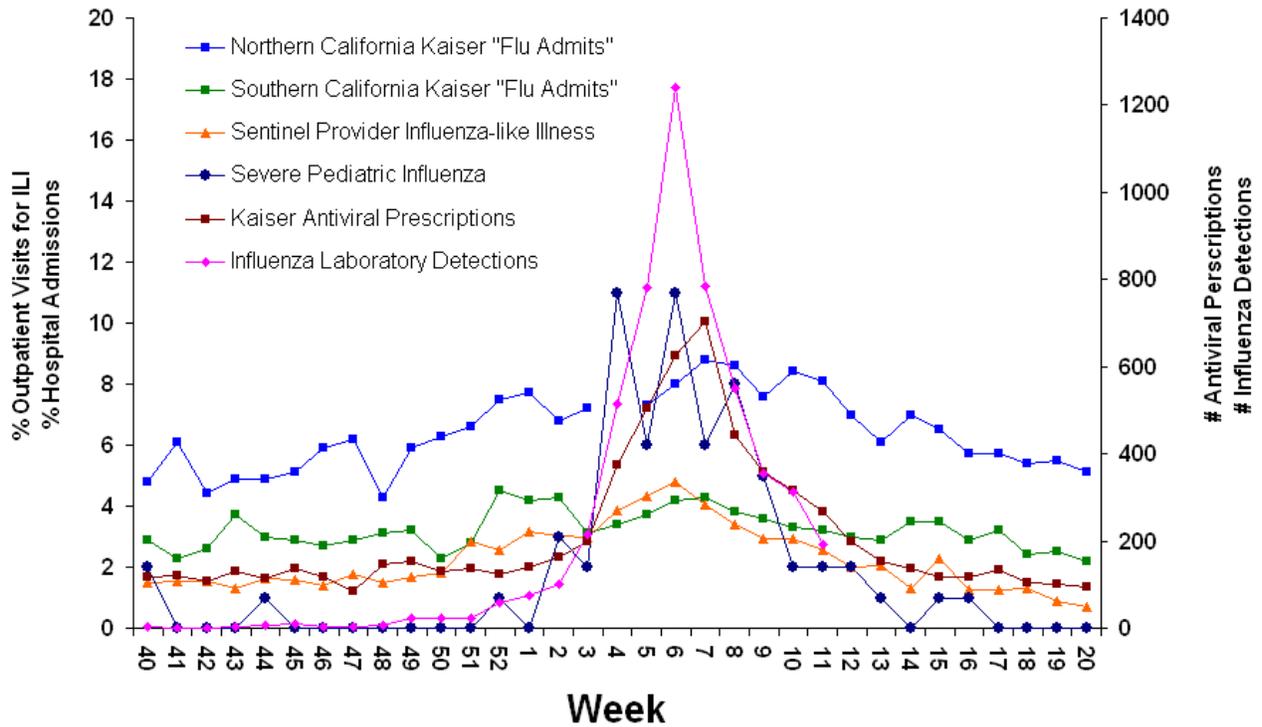
# California Influenza Surveillance Project

## 2006-2007 Influenza Season Summary

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 a summary of the 2006-2007 influenza season.

Overall, influenza activity in California in the 2006-2007 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 comparable to previous years, roughly peaking during weeks 2-12 of the influenza season (January 21, 2006- March 17, 2007). This season there was marked regional variation, with Northern California having a overall higher level of activity compared to Southern California. Influenza A (H1 subtype) predominated, with the majority of strains characterized matching the components contained in the 2006-07 influenza vaccine.

### 2006-2007 Influenza Surveillance Overview

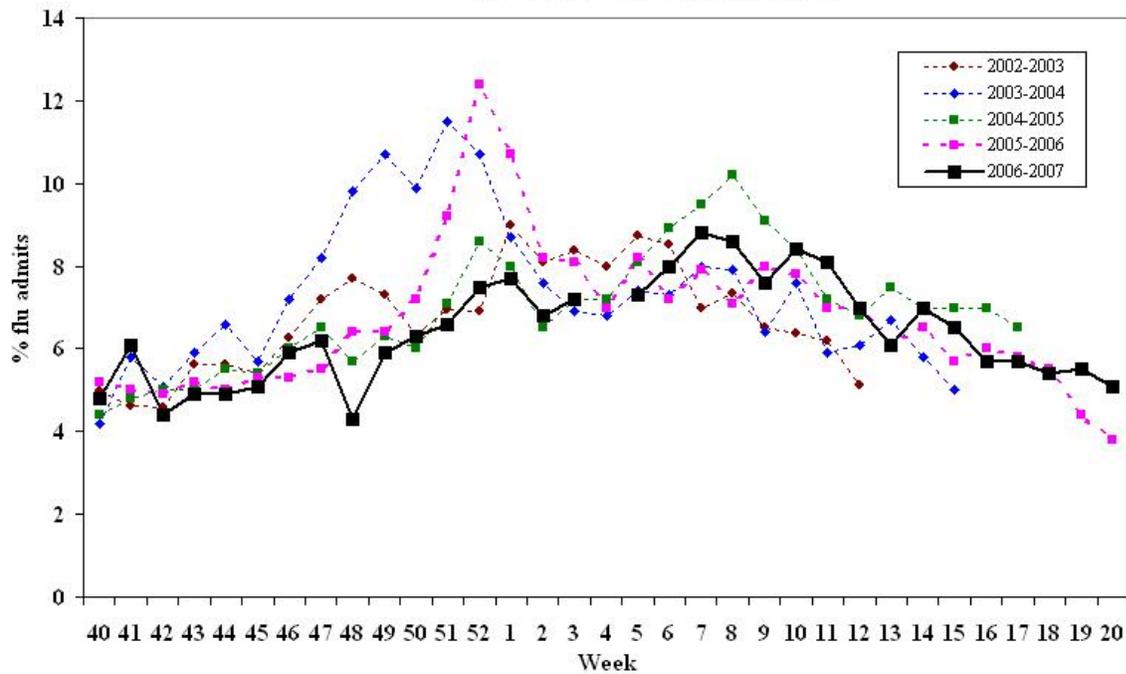


A breakdown of the individual parameters used and their comparison to previous years of data is shown below:

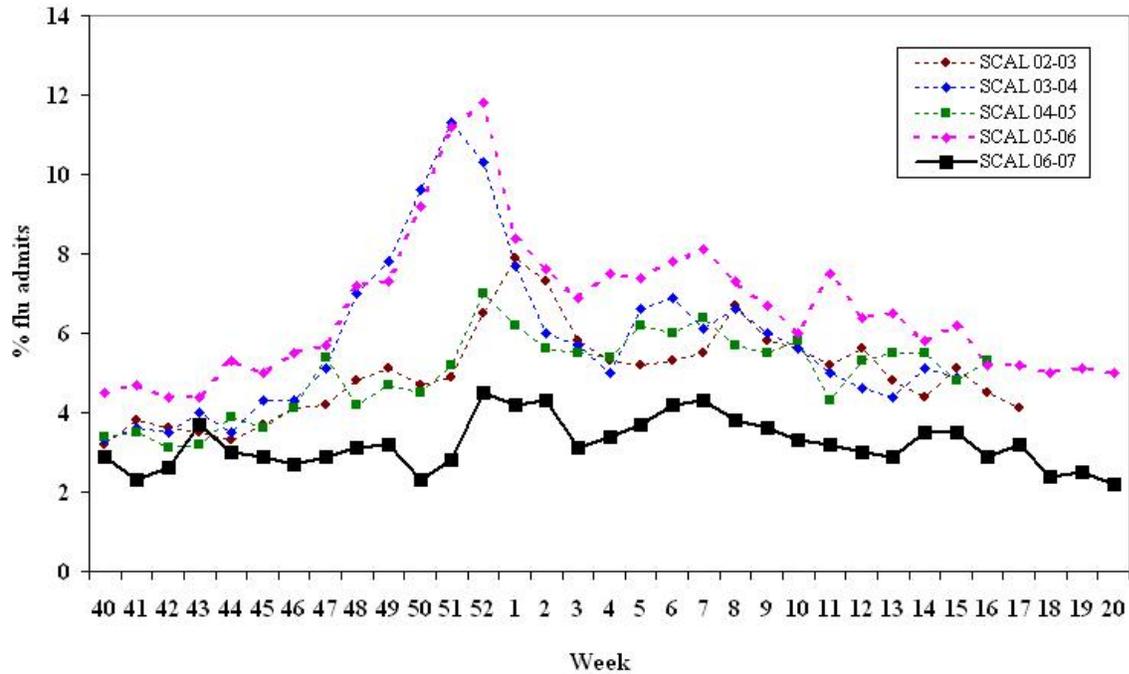
## Kaiser Permanente Inpatient Data

“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 same day surgery procedures are excluded from the denominator.

**Inpatient "Flu" Admissions 2002-2007**  
Northern California Kaiser



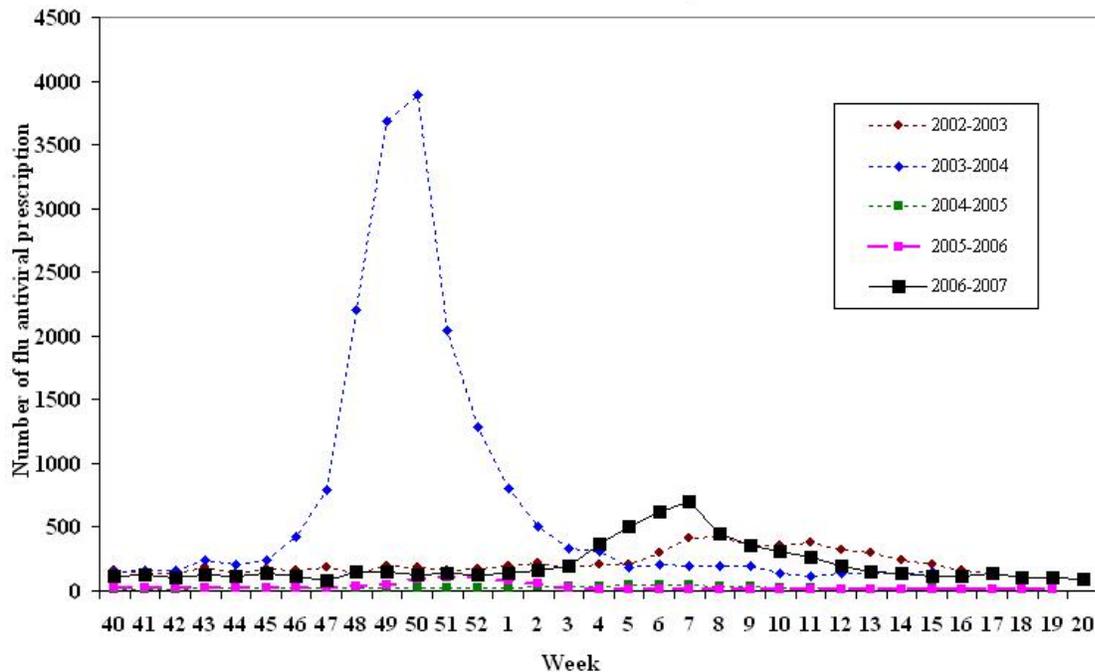
## Inpatient "Flu" Admissions 2002-2007 Southern California Kaiser



### Kaiser Permanente Antiviral Usage Data

The number of prescriptions filled for the antiviral drugs used to treat 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.

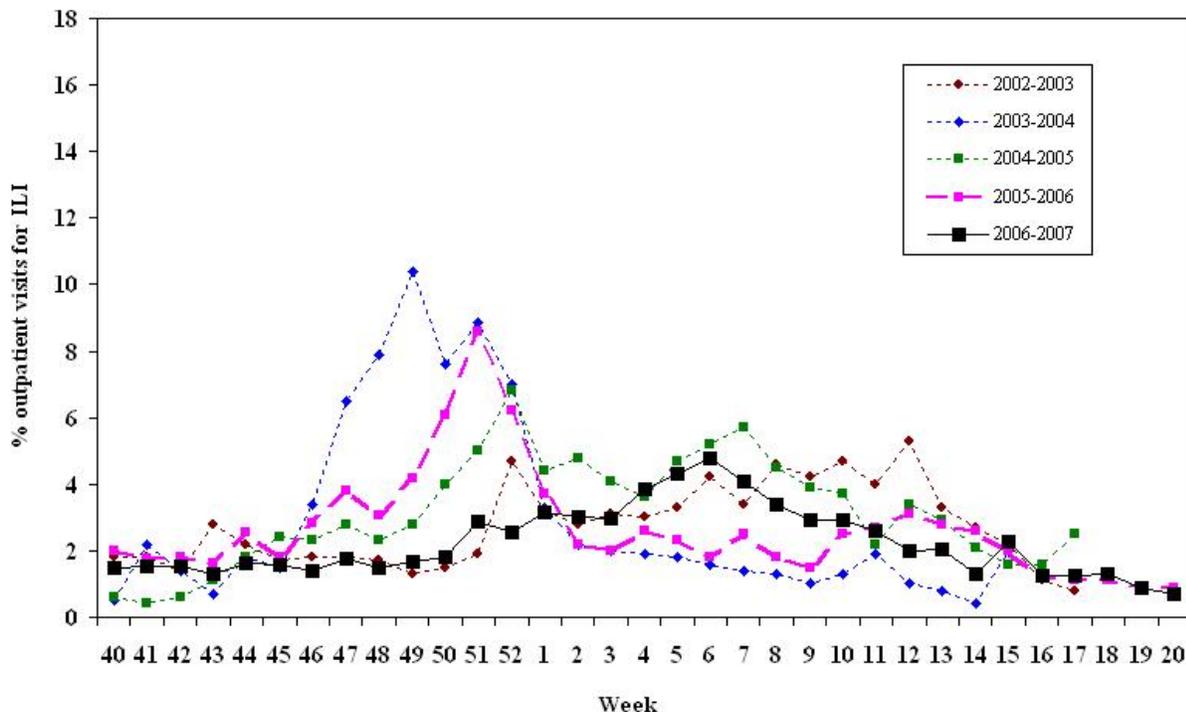
## Kaiser Pharmacy Data Influenza Antiviral Usage 2002-2007



## Sentinel Physician Influenza-Like Illness Data

Over 200 sentinel providers located throughout California participate in the CDC Sentinel Provider Influenza Surveillance Program. These sentinel providers report weekly data on the percentage of outpatient visits seen for influenza-like illness, calculated by dividing the number of influenza-like illness visits by the total number of outpatient visits per week. Influenza-like illness is defined as fever ( $> 100^{\circ}\text{F}$  [ $37.8^{\circ}\text{C}$ ], oral or equivalent) AND cough and /or sore throat (in the absence of a KNOWN cause other than influenza). One hundred twenty-two were "active", reporting ILI more than 50% of the time during the 2006-07 influenza season.

### California Sentinel Providers Influenza-Like Illness (ILI) Visits 2002-2007



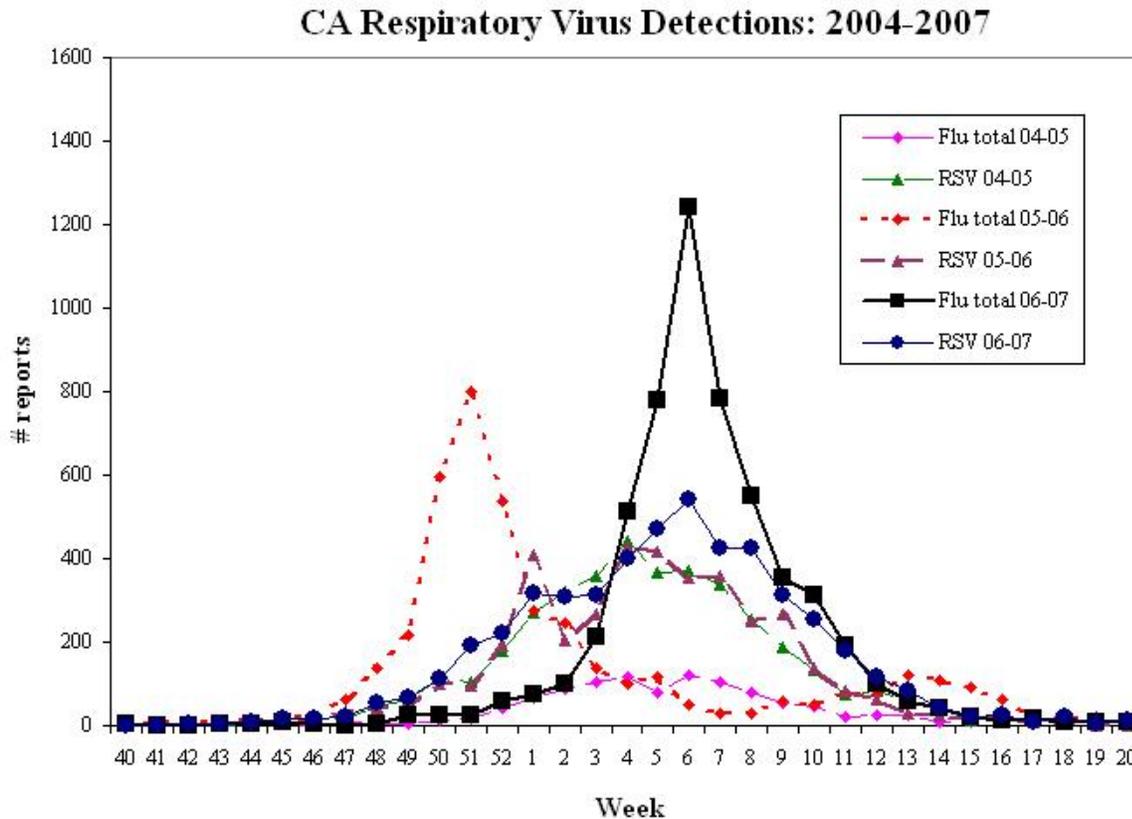
## Respiratory Virus Isolation/Detection Data

During the 2006-2007 influenza season, CISP receives weekly reports of laboratory detections and isolations of influenza and other respiratory viruses (predominantly RSV) from 22 participating sites situated throughout California, including hospital, academic, public health, and private laboratories. The CDHS Viral and Rickettsial Disease Laboratory (VRDL) also encourages submission of clinical respiratory specimens and isolates from a wide variety of settings, including local public health and clinical laboratory partners, hospitalized cases of severe respiratory illness, outpatient clinics and outbreak settings. Selected isolates were forwarded to CDC for confirmation and further analysis

In the 2006-07 season, a total of 860 clinical specimens were tested at VRDL using R-mix shell vial testing and viral isolation in primary monkey kidney and human fetal diploid cells; 373 (43.4%) had positive yield by isolation. Three hundred thirty three isolates were positive for influenza: a majority (288/333; 86%) were identified as influenza A compared to influenza B (45/333; 14%). These results are comparable to those reported by the World Health Organization National Respiratory and Enteric Virus Surveillance System (NREVSS) laboratory network, where across the US, of the 23,181 influenza viruses isolated, 18,392 (79.3%) were

influenza A viruses and 4,789 (20.7%) were influenza B viruses. Forty of the 373 specimens had non-influenza viral pathogens diagnosed, including parainfluenza (13), adenovirus (5), RSV (7), human metapneumovirus (3), picornaviruses (9) and herpes (3).

Seventy influenza-confirmed specimens were tested for antiviral resistance. 76% (26/34) of influenza A/H3 specimens and 6% (2/36) of influenza A/H1 specimens had the S31N mutation consistent with adamantane resistance. No mutations consistent with resistance to the neuraminidase inhibitors were found.



**VRDL Subtyping and Strain-typing:**

This season, 137 influenza A isolates were subtyped as H1, 83 were subtyped as H3, and 51 were not subtyped by cell culture.

To date 208 influenza isolates; 175 (84%) type A and 10 (16 %) type B viruses, have been characterized antigenically by hemagglutination inhibition assay (HIA) at VRDL. The total includes 178 isolated at the VRDL and 30 isolates submitted from collaborating laboratories. Among the influenza type A isolates subtyped this season, 98 (56%) were subtype A/H1 and 77 (44%) were A/H3.

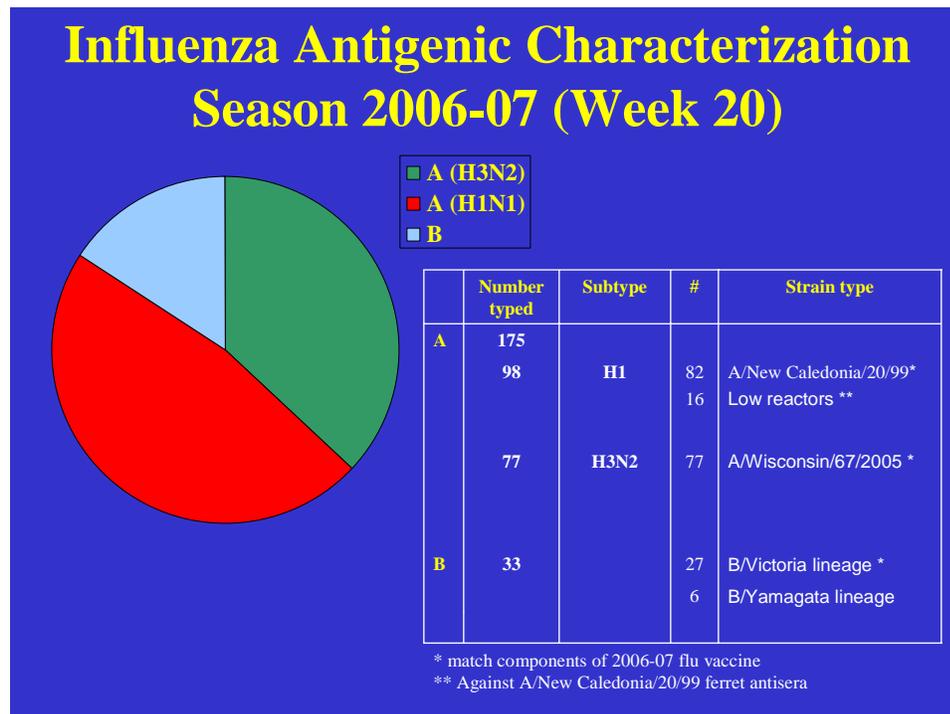
Of the 98 subtype A/H1 isolates characterized, 82 (84%) were A/New Caledonia /20/99-like. Of the 77 A/H3N2 isolates characterized, all were A/Wisconsin/67/2005 -like strain. Both strains were recommended as components of the 2006-07-influenza vaccine for the Northern Hemisphere. Sixteen (16%) of the A/H1 isolates were characterized as low reactors against A/New Caledonia /20/99 ferret antisera and were subsequently sent to CDC for further testing (results pending).

Among 33 B isolates characterized, 27 (82 %) were characterized as B/Victoria lineage-like and 6 (18 %) as B/Yamagata lineage. A B/Victoria lineage virus was recommended as the B component of the 2006-07 influenza vaccine for the Northern Hemisphere.

The VRDL strain-typing results differ only slightly from national results. In the US, similar to our findings, most influenza A/H1 viruses tested were A/New Caledonia/20/99-like, and a majority of influenza B viruses were characterized as belonging to the B/Victoria lineage of viruses.

However, of A/H3 viruses characterized, only 28% were characterized as A/Wisconsin/67/2005-like; 72% showed somewhat reduced titers with antisera produced against A/Wisconsin/67/2005. A proportion of these low-reacting viruses also showed poor reactivity with their homologous antisera, suggesting they are not a true antigenic variant, but low avid strains.

**Fig 1: Summary of all isolates strain typed**

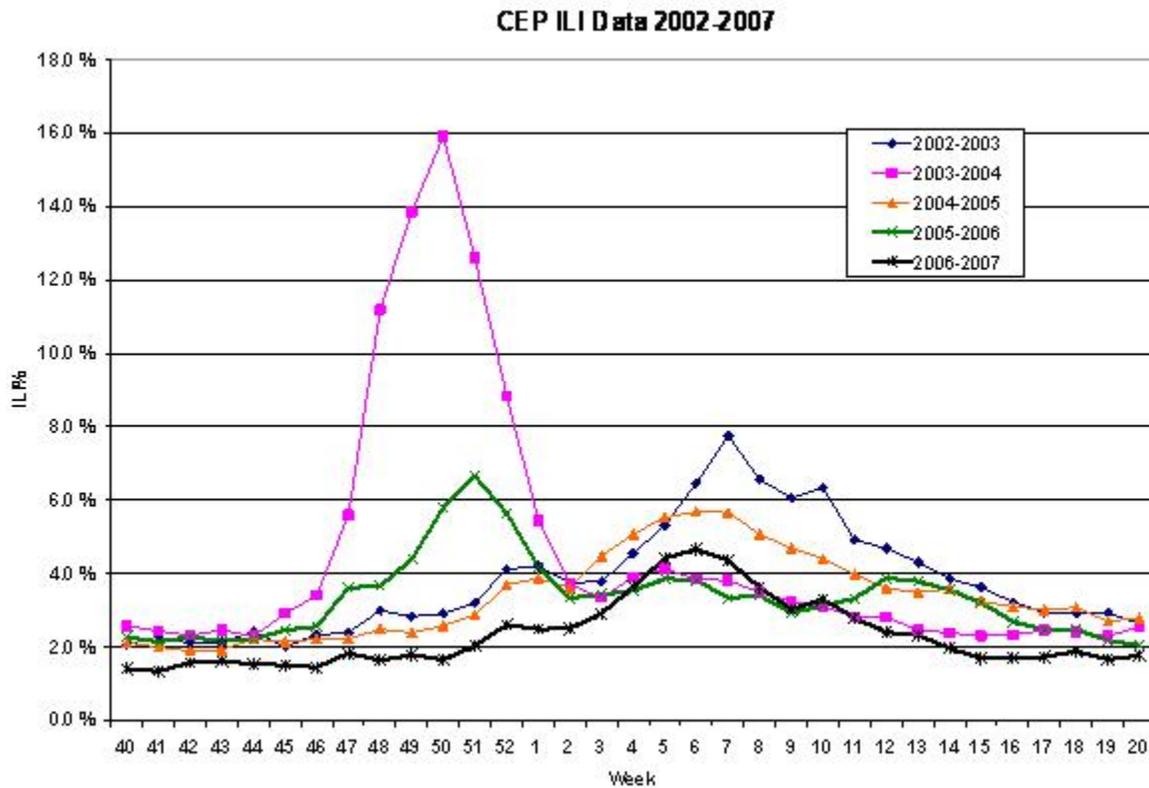


- It is important to note that our surveillance system does not receive data from ALL labs, physicians, hospitals, or pharmacies in California; therefore our numbers reported do not represent all cases of influenza, but are intended to demonstrate trends in influenza activity.

**Emergency Room Visit Data [data supplied by California Emergency Physicians (CEP)]:**

Influenza-like illnesses (ILI) activity is monitored by over 1,100 providers in 58 emergency departments throughout the state by use of electronic billing data that captures specific codes which may identify ILI, including patients with either an influenza diagnosis, or fever in combination with one or more of the following: cough, throat pain, acute pharyngitis or acute respiratory infection\*. The CEP data is not collected by CDHS; further information is available at [www.cep.com](http://www.cep.com).

\*These symptoms are not part of the CDC sentinel provider definition for ILI.



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