

# Influenza and Other Respiratory Viruses Weekly Report

California Influenza Surveillance Program

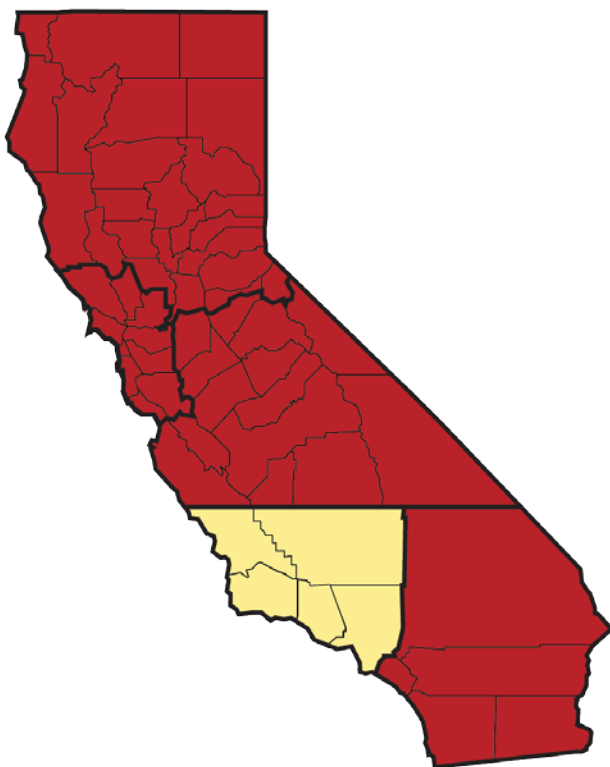


**Highlights** (Week 12: March 18, 2018 – March 24, 2018)

## Statewide Activity



### Regions with Elevated Activity



- ▶ **Deaths:** 8 (Age 0-64)
- ▶ **Outbreaks:** 34
- ▶ **Laboratory:** 19.7% positive
- ▶ **Outpatient ILI:** Above expected levels
- ▶ **Hospitalizations:** Above expected levels

*Click on images and links for more information*

### Key messages:

- Influenza activity remains elevated throughout most of California.
- While influenza A virus activity has decreased, influenza B virus activity persists.
- Several more weeks of flu activity are expected and may continue through the spring.
- Flu vaccination is still the best way to prevent illness and flu-related hospitalizations.

**Note:** This report includes data from many sources of influenza surveillance and it should be viewed as a preliminary “snapshot” of influenza activity for each surveillance week. Because data are preliminary, the information may be updated in later reports as additional data are received. These data should not be considered population-based or representative of all California public health jurisdictions.

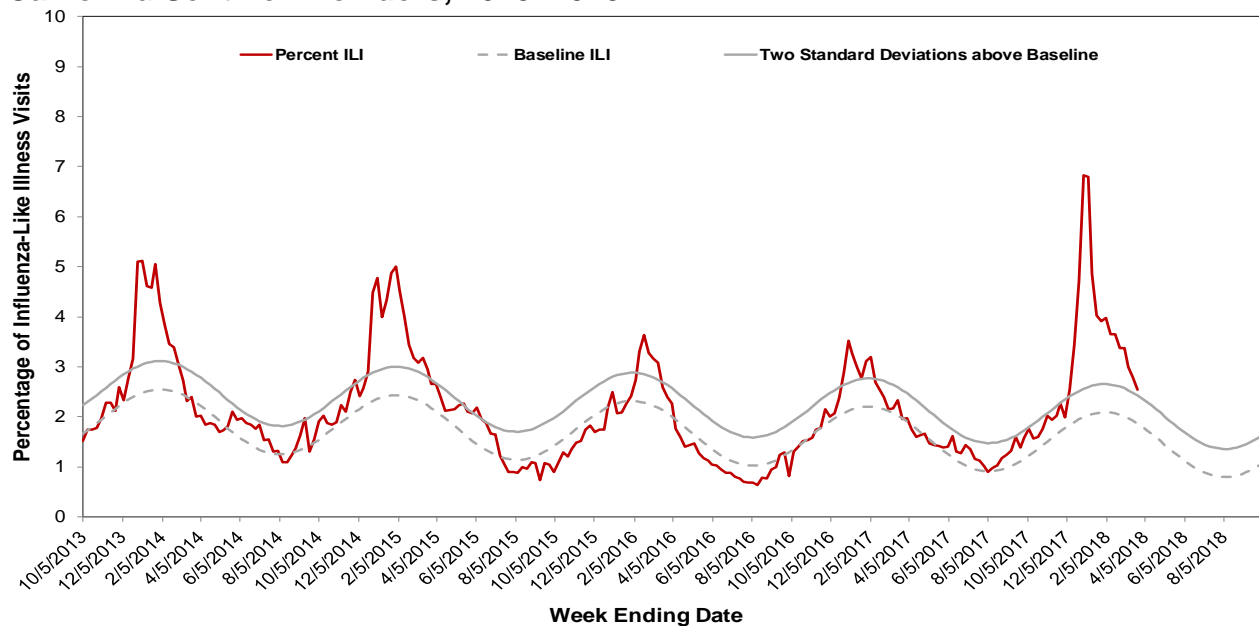
## A. Outpatient and Inpatient Data

### 1. Influenza Sentinel Providers

Sentinel providers (physicians, nurse practitioners, and physician assistants) situated throughout California report on a weekly basis the number of patients seen with influenza-like illness (ILI) and the total number of patients seen for any reason. ILI is defined as any illness with fever ( $\geq 100^{\circ}\text{F}$  or  $37.8^{\circ}\text{C}$ ) AND cough and/or sore throat (in the absence of a known cause other than influenza).

A total of 66 enrolled sentinel providers have reported data for Week 12. Based on available data, the percentage of visits for ILI during Week 12 was 2.5% compared to Week 11 (2.8%) and is above expected levels for this time of year (Figure 1).

**Figure 1. Percentage of Influenza-like Illness Visits Among Patients Seen by California Sentinel Providers, 2013–2018**



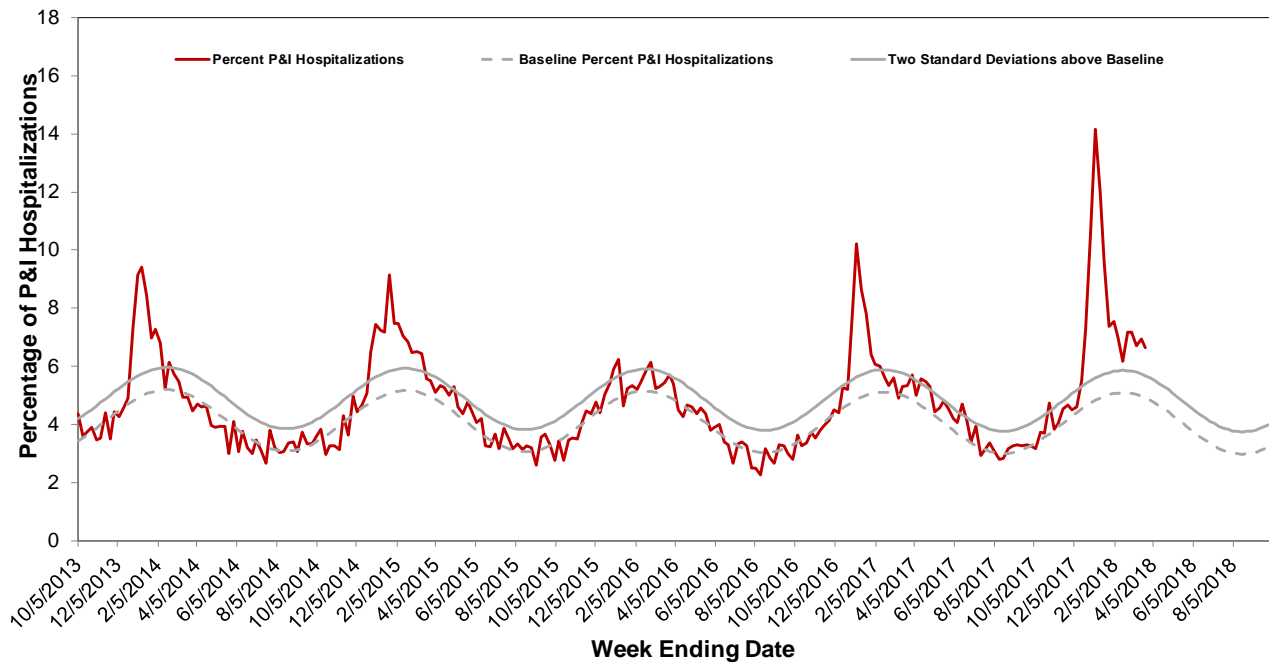
The seasonal baseline was calculated using a regression model applied to data from the previous five years. Two standard deviations above the seasonal baseline is the point at which the observed percentage of ILI is significantly higher than would be expected at that time of year.

### 2. Kaiser Permanente Hospitalization Data

Inpatients at Kaiser Permanente facilities with an admission diagnosis including the keywords “flu,” “influenza,” “pneumonia,” or variants of the keywords are defined as pneumonia and influenza (P&I)-related admissions. The number of P&I admissions is divided by the total number of hospital admissions occurring in the same time period to estimate the percentage of P&I admissions. Admissions for pregnancy, labor and delivery, birth, and outpatient procedures are excluded from the denominator.

The percentage of hospitalizations for pneumonia and influenza (P&I) in Kaiser Permanente facilities in northern California during Week 12 was 6.6% compared to Week 11 (6.9%) and is above expected levels for this time of the year (Figure 2).

**Figure 2. Percentage of P&I Hospitalizations in Kaiser Permanente Northern California Hospitals, 2013–2018**



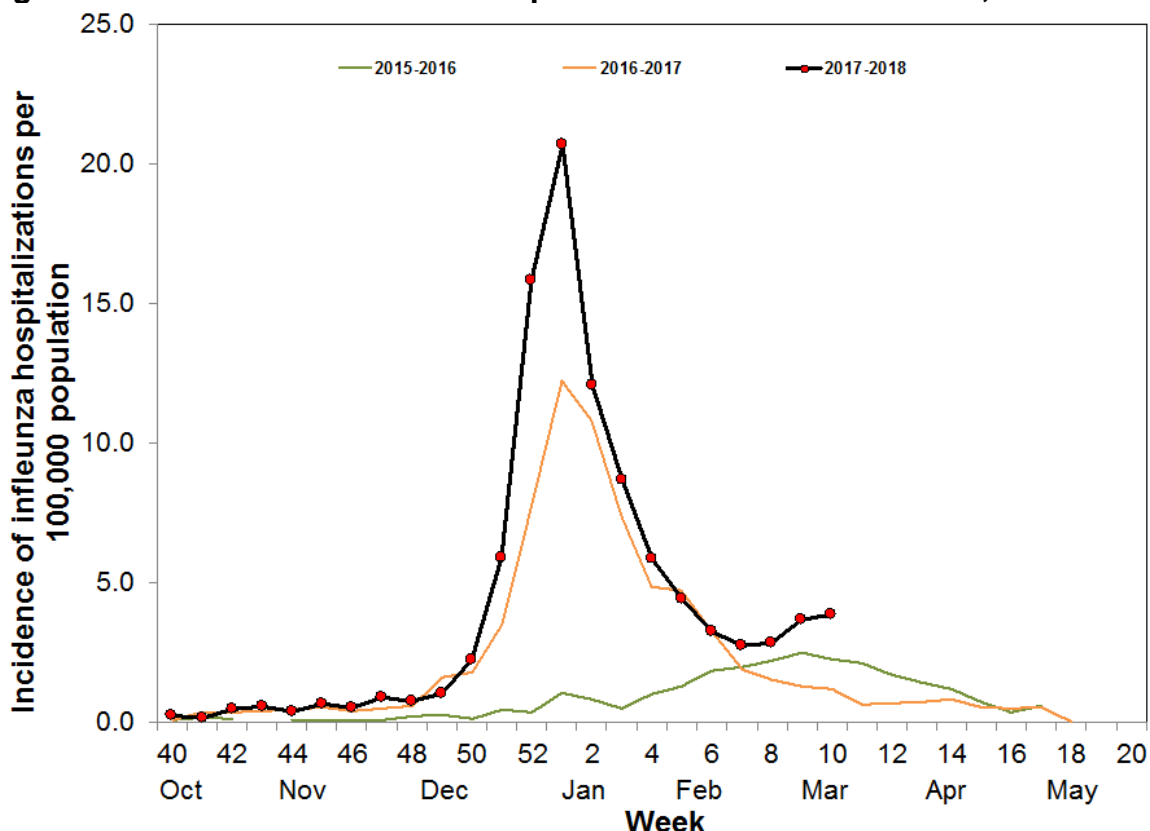
The seasonal baseline was calculated using a regression model applied to data from the previous five years. Two standard deviations above the seasonal baseline and is the point at which the observed percentage of pneumonia and influenza hospitalizations in Kaiser Permanente hospitals in Northern California is significantly higher than would be expected at that time of the year.

### 3. Influenza-Associated Hospitalizations, California Emerging Infections Program

The California Emerging Infections Program (CEIP), Influenza Surveillance Network (FluSurv-NET) conducts population-based surveillance for laboratory-confirmed influenza-associated hospitalizations among patients of all ages in Alameda, Contra Costa, and San Francisco counties.

The incidence of influenza-associated hospitalizations per 100,000 population increased in Week 10 (3.8) compared to Week 9 (3.7) (Figure 3). Data for the most recent two weeks are not presented because results are still being collected and are likely to change.

**Figure 3. Incidence of Influenza Hospitalizations in CEIP Counties, 2015–2018**



Note: The 2014-15 season contains a week 53. Data have been shifted so that week 1 aligns across years.

## B. Laboratory Update – Influenza

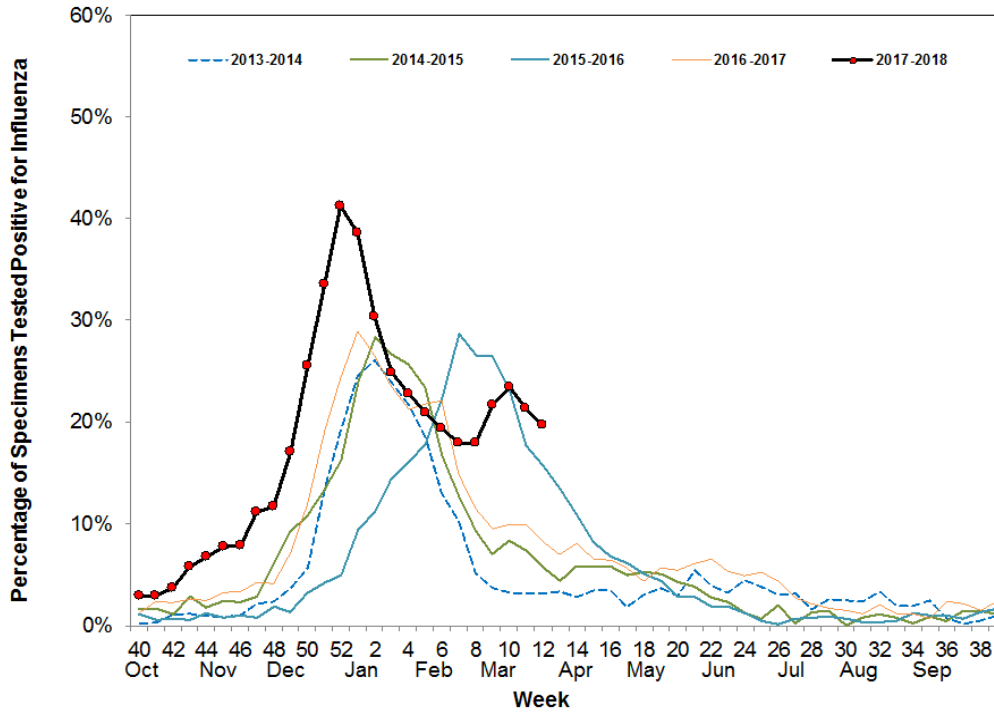
### 1. Respiratory Laboratory Network (RLN) and Clinical Sentinel Laboratory Surveillance Results

Laboratory surveillance for influenza and other respiratory viruses involves the use of data from clinical sentinel laboratories (hospital, academic, and private laboratories) and public health laboratories in the Respiratory Laboratory Network located throughout California. These laboratories report the number of laboratory-confirmed influenza and other respiratory virus detections and isolations on a weekly basis.

The overall percentage of influenza detections in clinical sentinel laboratories in Week 12 (19.7%) was lower than Week 11 (21.3%) (Figure 4). Additional details, including influenza typing and subtyping information from public health laboratories can be found in Figures 4 and 5 and Tables 1 and 2.

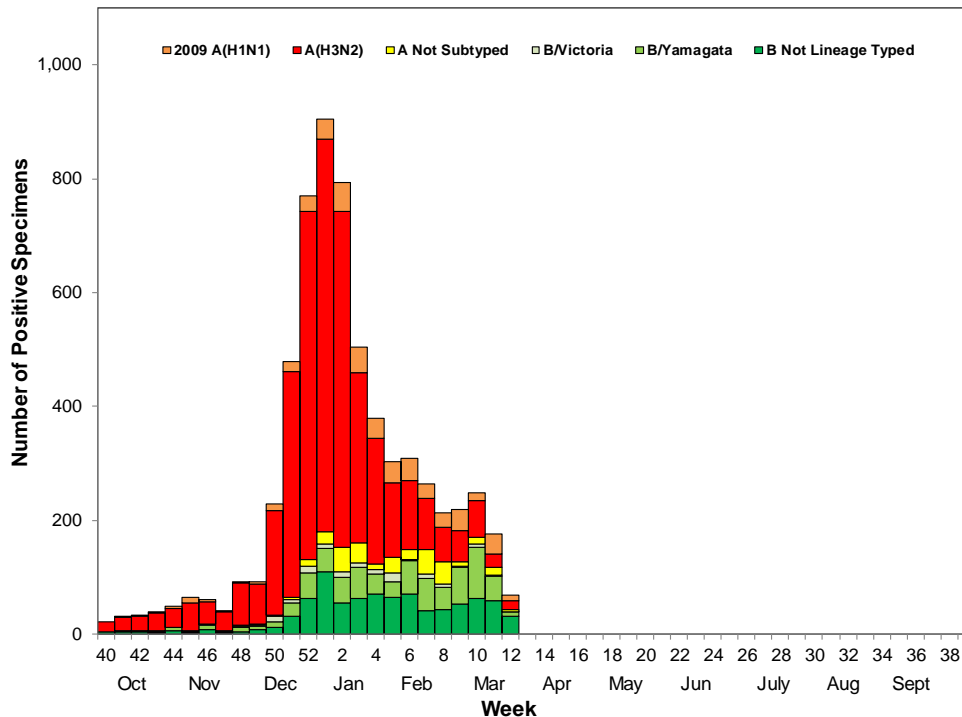
Neither the RLN nor CDPH-VRDL has identified any influenza viruses by polymerase chain reaction (PCR) that are suggestive of a novel influenza virus.

**Figure 4. Percentage of Influenza Detections at Clinical Sentinel Laboratories, 2013–2018**



Note: The 2014–15 season contains a week 53. Data have been shifted so that week 1 aligns across years.

**Figure 5. Number of Influenza Detections by Type and Subtype Detected in the Respiratory Laboratory Network, 2017–2018**



**Table 1. Respiratory Specimens Testing Positive for Influenza — Clinical Sentinel Laboratories, Current Week and Season to Date**

	<b>Current Week Number</b>	<b>Current Week Percent</b>	<b>Season to Date Number</b>	<b>Season to Date Percent</b>
<b>Number of Specimens Tested</b>	4,039		123,711	
<b>Influenza Positive</b>	796	19.7	27,351	22.1
<b>A</b>	429	53.9*	16,827	61.5*
<b>B</b>	367	46.1*	10,524	38.5*

\* Percent of specimens positive for influenza

**Table 2. Respiratory Specimens Testing Positive for Influenza by Influenza Type and Subtype — Respiratory Laboratory Network, Current Week and Season to Date**

	<b>Current Week Number</b>	<b>Current Week Percent</b>	<b>Season to Date Number</b>	<b>Season to Date Percent</b>
<b>Influenza Positive</b>	68		6,376	
<b>A</b>	29	42.6*	4,714	73.9*
<b>2009 A (H1)</b>	10	34.5†	472	10.0†
<b>A (H3)</b>	15	51.7†	3,952	83.8†
<b>A, not subtyped</b>	4	13.8†	290	6.2†
<b>B</b>	39	57.4*	1,662	26.1*
<b>B Victoria</b>	1	2.6‡	123	7.4‡
<b>B Yamagata</b>	6	15.4‡	676	40.7‡
<b>B, not lineage typed</b>	32	82.1‡	863	51.9‡

\* Percent of specimens positive for influenza

† Percent of influenza A positives

‡ Percent of influenza B positives

## 2. Antiviral Resistance Testing

Of the influenza specimens tested by the CDPH-VRDL to date this season, two Influenza 2009 A (H1) specimens has been found to be resistant to Oseltamivir (Table 3).

**Table 3. Number of Specimens Tested for Oseltamivir Resistance, 2017–2018**

	<b>Oseltamivir Resistance</b>
<b>Influenza 2009A (H1)</b>	2/62
<b>Influenza A (H3)</b>	0/84
<b>Influenza B</b>	0/56

### 3. Influenza Virus Strain Characterization

To date in California, all influenza 2009 A (H1) and A (H3) antigenically characterized viruses have matched the influenza 2009 A (H1) and A (H3) components included in the trivalent and quadrivalent influenza vaccines (Table 4). In addition, all influenza B antigenically characterized viruses in California have matched the influenza B Victoria lineage virus in the trivalent and quadrivalent influenza vaccines and the B Yamagata lineage virus included in the quadrivalent influenza vaccine.

**Table 4. Number of Influenza Viruses Antigenically Characterized that Matched Vaccine Strains — California and the United States, 2017–2018**

Influenza Subtype/Lineage	Vaccine Strain	California	United States
Influenza A (H1)	A/Michigan/45/2015-like	9/9	391/391
Influenza A (H3)	A/Hong Kong/4801/2014-like	11/11	446/458
Influenza B Victoria*	B/Brisbane/60/2008-like	12/12	32/73
Influenza B Yamagata†	B/Phuket/3073/2013-like	15/15	443/443

\* The influenza B Victoria lineage virus is included in both the 2017–2018 trivalent and quadrivalent influenza vaccines

† The influenza B Yamagata lineage virus is included in only the 2017–2018 quadrivalent influenza vaccine

### C. Laboratory-Confirmed Severe Influenza-associated Case Reports

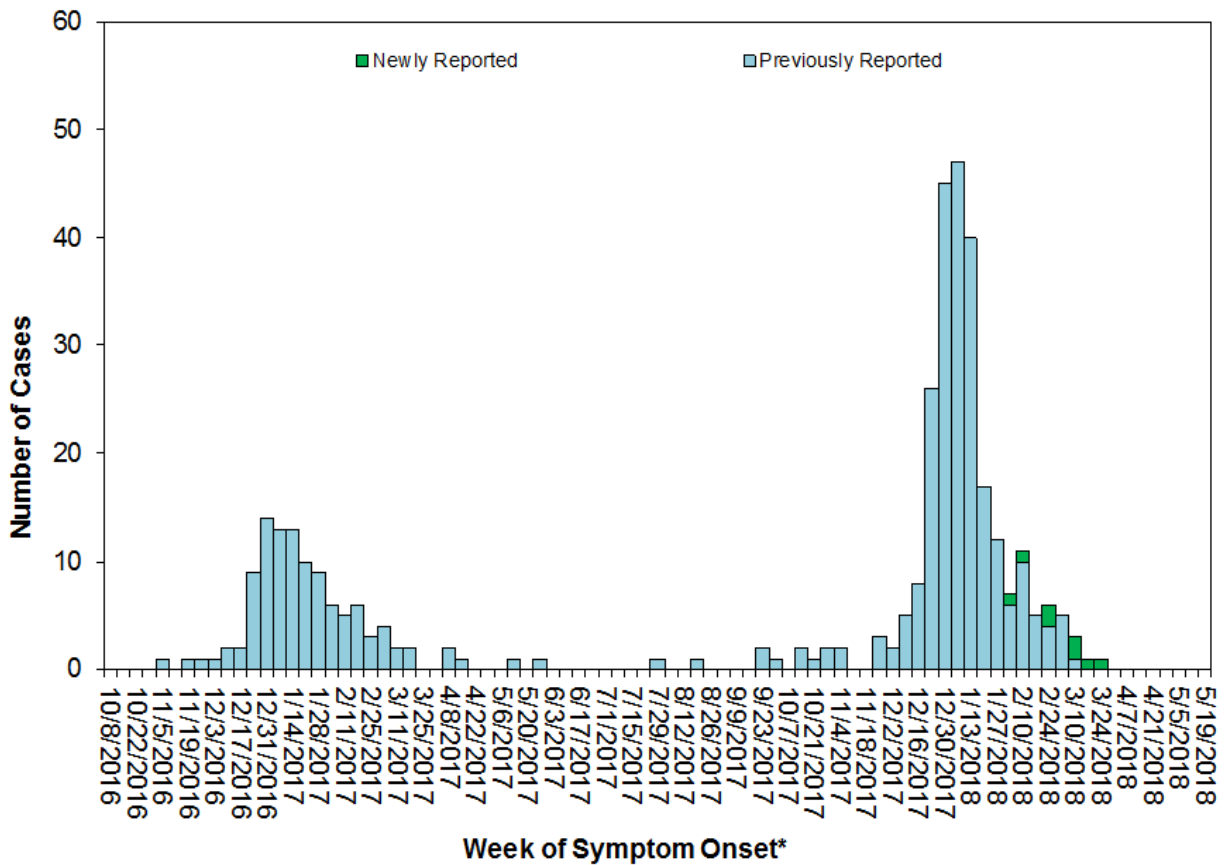
Currently, as mandated under Section 2500 of the California Code of Regulations, deaths among patients aged 0–64 years with laboratory-confirmed influenza are reportable to CDPH. The weekly influenza report includes confirmed deaths formally reported to CDPH through March 24, 2018 (Week 12).

Eight laboratory-confirmed influenza-associated fatalities were reported to CDPH during Week 12 (Figure 6). To date, CDPH has received 252 reports of laboratory-confirmed influenza-associated deaths among patients <65 years of age during the 2017–2018 influenza season. Additional regional numbers can be found in Table 5.

**Table 5. Number of Influenza-Associated Fatalities by California Region, 2017–2018**

Region	Number of Fatalities Season to Date	Percent
Bay Area	51	20.2
Central	32	12.7
Northern	35	13.9
Lower Southern	79	31.3
Upper Southern	55	21.8

**Figure 6. Number of Laboratory-Confirmed Influenza-Associated Fatalities in Persons <65 Years of Age by Week of Onset, 2016–2018**



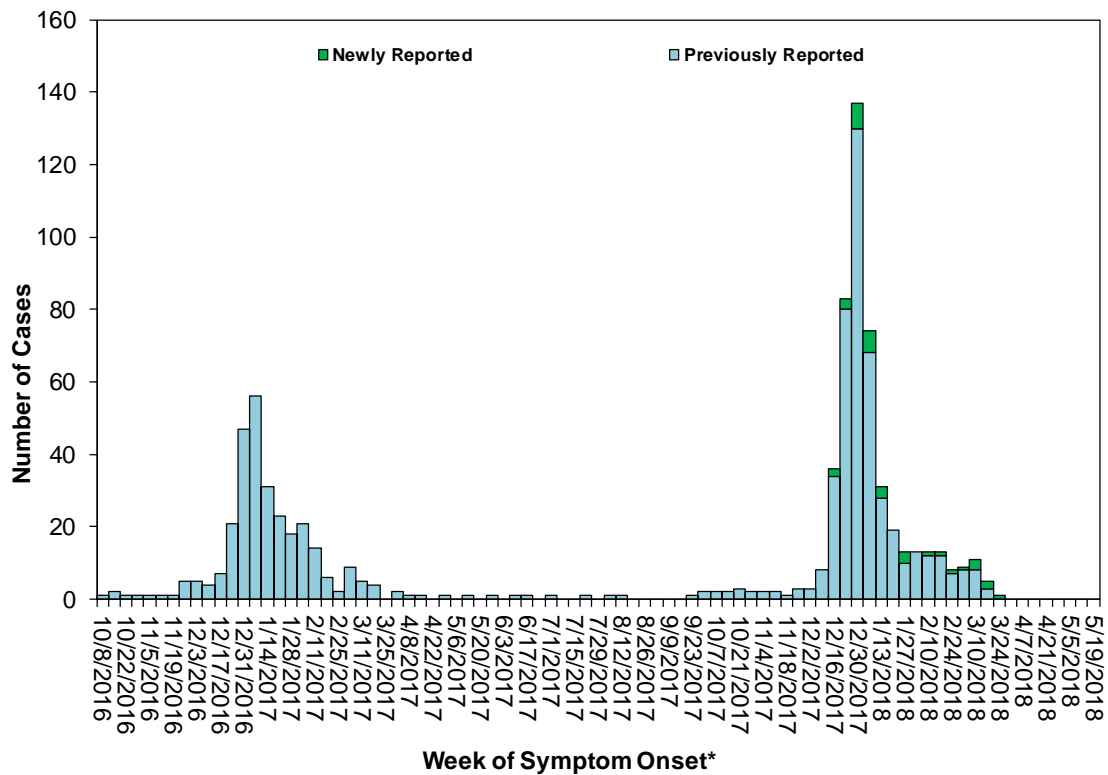
\*Earliest date associated with the illness was used for cases without reported date of symptom onset.

**D. Influenza-Associated Outbreaks**

Thirty-four laboratory-confirmed influenza outbreaks were reported to CDPH during Week 12. To date, 496 laboratory-confirmed influenza outbreaks have been reported to CDPH for the 2017–2018 season.



**Figure 7. Number of Laboratory-Confirmed Influenza-Associated Outbreaks by Week of First Onset, 2016–2018**



\*Earliest date associated with the outbreak was used for outbreaks without reported date of first patient's symptom onset.

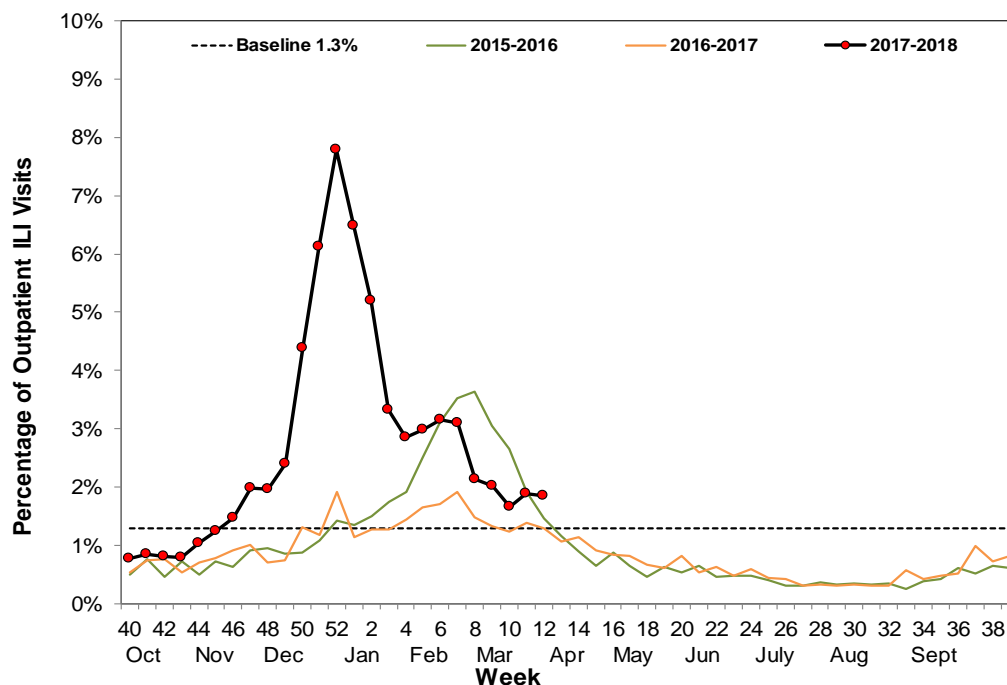
**E. California Border Region Influenza Surveillance Network Data**

The border influenza surveillance network is comprised of outpatient provider sentinel sites whose geographical coverage extends approximately 100 kilometers (60 miles) north of the California-Baja California border and includes Imperial and San Diego Counties, as well as some parts of Riverside County.

**1. Syndromic Surveillance Update**

A total of 13 border region sentinel providers reported data during Week 12. The total number of patients screened by all sentinel sites for ILI during Week 12 was 12,010. Outpatient ILI activity was 1.8% in Week 12. ILI activity for the California border region during Week 12 was higher when compared to activity for the same week during the 2015–2016 and 2016–2017 seasons (Figure 8). All influenza syndromic data summarized for the border region represent a subset of CDC influenza sentinel providers in California.

**Figure 8. Percentage of Influenza-like Illness Visits among Patients Seen by Sentinel Providers – California Border Region, 2015–2018**



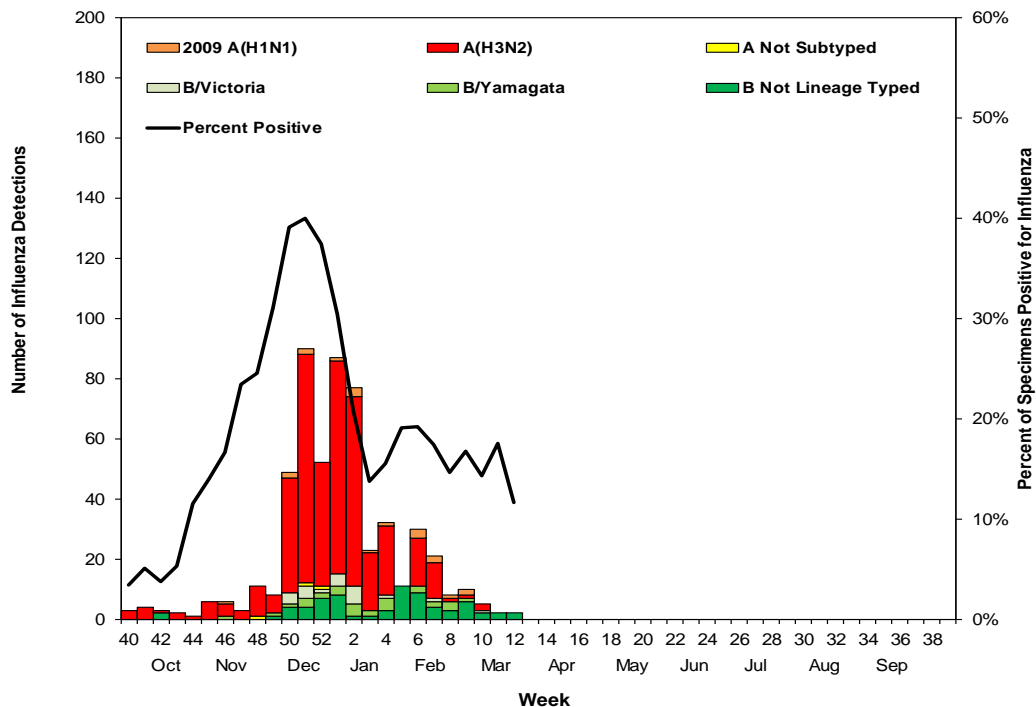
## 2. Virologic Surveillance Update

During Week 12, a total of 719 respiratory specimens were tested from border region sentinel clinical laboratories; of these, 84 (11.7%) tested positive for influenza (17 [20.2%] influenza A; 67 [79.8%] influenza B). Cumulatively this season, a total of 22,102 respiratory specimens were tested from border region sentinel clinical laboratories; of these, 5,153 (23.3%) tested positive for influenza (3,542 [68.7%] influenza A, 1,611 [31.3%] influenza B).

During Week 12, two influenza positive specimens were detected at border region RLN laboratories, of which two (100.0%) were influenza B. Of the two specimens that tested positive for influenza B, two (100.0%) had no further lineage typing performed. Cumulatively this season, a total of 546 influenza positive specimens have been detected at border region RLN laboratories, of which 425 (77.8%) were influenza A, and 121 (22.2%) were influenza B. Of the 425 specimens that tested positive for influenza A at RLN laboratories, 19 (4.5%) were subtyped as A (H1), 403 (94.8%) were subtyped as A (H3), and three (0.7%) had no further subtyping performed. Of the 121 specimens that tested positive for influenza B, 29 (24.0%) were lineage typed as B (Yamagata), 22 (18.2%) were lineage typed as B (Victoria), and 70 (57.9%) had no further lineage typing performed.

Laboratory data summarized in Figure 9 include data from border region influenza clinical sentinel laboratories (percentage of specimens testing positive for influenza) as well as data from border region RLN laboratories (influenza type and subtype/lineage type).

**Figure 9. Number of Influenza Detections by Type and Subtype Detected in Respiratory Laboratory Network Laboratories and the Percentage of Specimens Testing Positive at Clinical Sentinel Laboratories – California Border Region, 2017–2018**



## F. Other Respiratory Viruses

### 1. Laboratory-Confirmed Severe Respiratory Syncytial Virus Case Reports

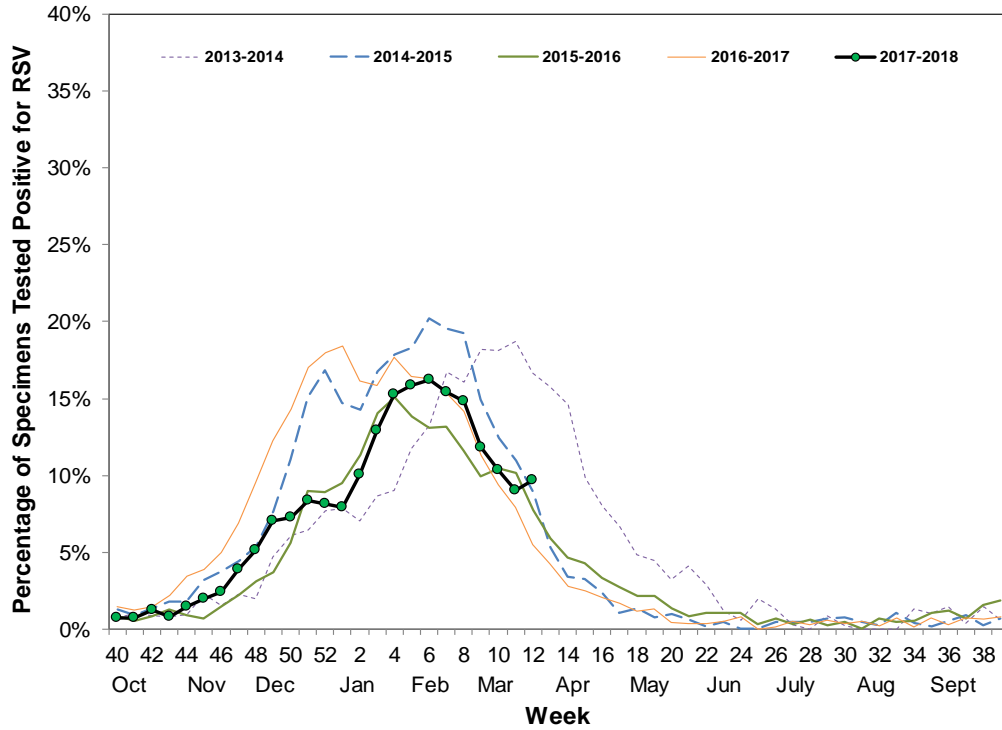
Currently, as mandated under Section 2500 of the California Code of Regulations, deaths among children aged 0–4 years with laboratory-confirmed respiratory syncytial virus (RSV) are reportable to CDPH. The weekly influenza report includes confirmed deaths formally reported to CDPH through March 17, 2018 (Week 11).

One laboratory-confirmed RSV fatality in a child <5 years of age was reported to CDPH during Week 12. To date, CDPH has received five reports of laboratory-confirmed RSV-associated deaths among children <5 years of age during the 2017–2018 influenza season.

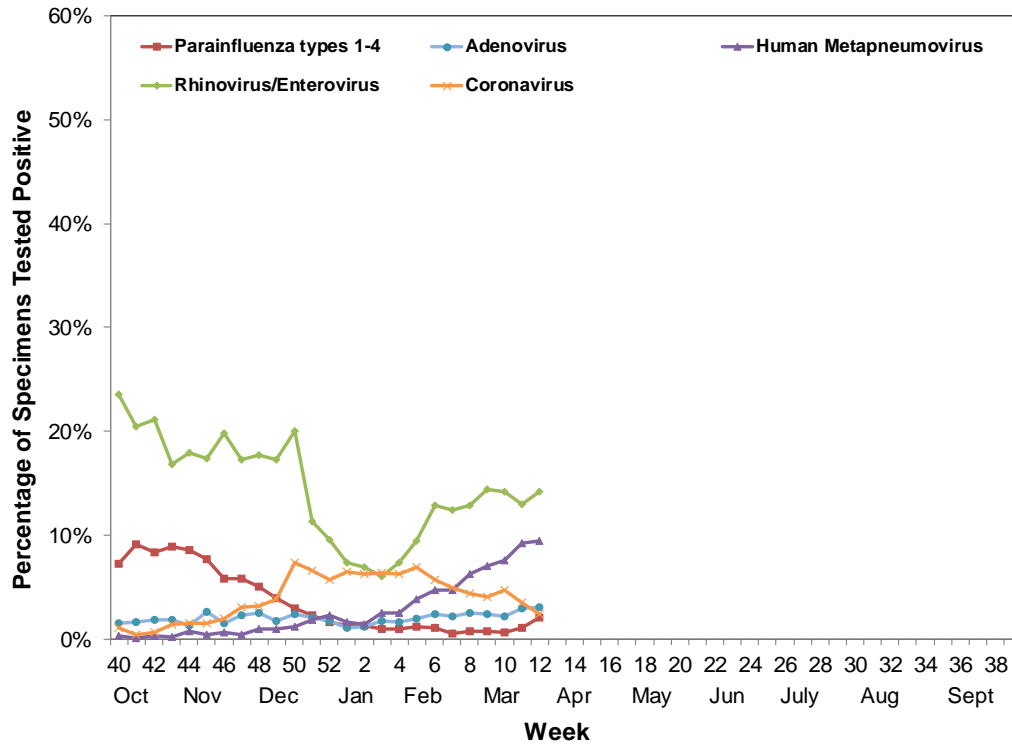
### 2. Other Respiratory Virus Laboratory Update

During Week 12, 3,107 specimens were tested for RSV and 300 (9.7%) were positive, which was higher than Week 11 (9.0%) (Figure 10). During Week 12, parainfluenza virus and rhinovirus/enterovirus activity increased; coronavirus activity decreased; and human metapneumovirus and adenovirus activity remained stable compared to the previous week (Figure 11).

**Figure 10. Percentage of RSV Detections at Clinical Sentinel Laboratories, 2013–2018**



**Figure 11. Percentage of Other Respiratory Pathogen Detections at Clinical Sentinel Laboratories, 2017–2018**



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### **Activity Levels:**

**No Activity:** No laboratory-confirmed cases of influenza and no reported increase in the number of cases of ILI.

**Sporadic:** Small numbers of laboratory-confirmed influenza cases or a single laboratory-confirmed influenza outbreak has been reported, but there is no increase in cases of ILI.

**Local:** Outbreaks of influenza or increases in ILI cases and recent laboratory-confirmed influenza in a single region of the state.

**Regional:** 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 with recent laboratory evidence of influenza in those regions.

**Widespread:** Outbreaks of influenza or increases in ILI cases and recent laboratory-confirmed influenza in at least half the regions of the state with recent laboratory evidence of influenza in the state.

### **California Regions:**

**Northern:** Alpine, Amador, Butte, Colusa, Del Norte, El Dorado, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Nevada, Placer, Plumas, Sacramento, Shasta, Sierra, Siskiyou, Sutter, Tehama, Trinity, Yolo, and Yuba counties

**Bay Area:** Alameda, Contra Costa, Marin, Napa, Solano, San Francisco, San Mateo, Santa Clara, Santa Cruz, and Sonoma counties

**Central Valley:** Calaveras, Fresno, Inyo, Kings, Mono, Madera, Mariposa, Merced, Monterey, San Benito, San Joaquin, Stanislaus, Tulare, and Tuolumne counties

**Upper Southern:** Kern, Los Angeles, San Luis Obispo, Santa Barbara, and Ventura counties

**Lower Southern:** Imperial, Orange, Riverside, San Bernardino, and San Diego counties

For questions regarding influenza surveillance and reporting in California, please email [InfluenzaSurveillance@cdph.ca.gov](mailto:InfluenzaSurveillance@cdph.ca.gov). This account is monitored daily by several epidemiologists.

To obtain additional information regarding influenza, please visit the [CDPH influenza website](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Influenza.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Influenza.aspx>).

A copy of the case report form for reporting any laboratory-confirmed influenza case that was either admitted to the ICU or died can be downloaded from the [CDPH influenza website](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Influenza.aspx) (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Immunization/Influenza.aspx>).

For information about national influenza activity, please visit the Centers for Disease Control and Prevention's [FluView](https://www.cdc.gov/flu/weekly/index.htm) (<https://www.cdc.gov/flu/weekly/index.htm>) and [FluView Interactive](https://www.cdc.gov/flu/weekly/fluviewinteractive.htm) (<https://www.cdc.gov/flu/weekly/fluviewinteractive.htm>) websites.

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