

Influenza and Other Respiratory Viruses Weekly Report

California Influenza Surveillance Program



Highlights (Week 5: January 28, 2018 – February 3, 2018)

Statewide Activity



Regions with Elevated Activity



- ▶ **Deaths:** 36 (Age 0-64)
- ▶ **Outbreaks:** 36
- ▶ **Laboratory:** 21.1% positive
- ▶ **Outpatient ILI:** Above expected levels
- ▶ **Hospitalizations:** Above expected levels

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Key messages:

- Influenza activity is decreasing but remains elevated throughout California.
- Influenza A (H3N2) viruses are predominating this season.
- H3N2-predominant seasons have been associated with more severe illness especially those 65+ years and children.
- A [2017 study](#) found that [flu vaccination reduces a child's risk of dying from flu](#).

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.

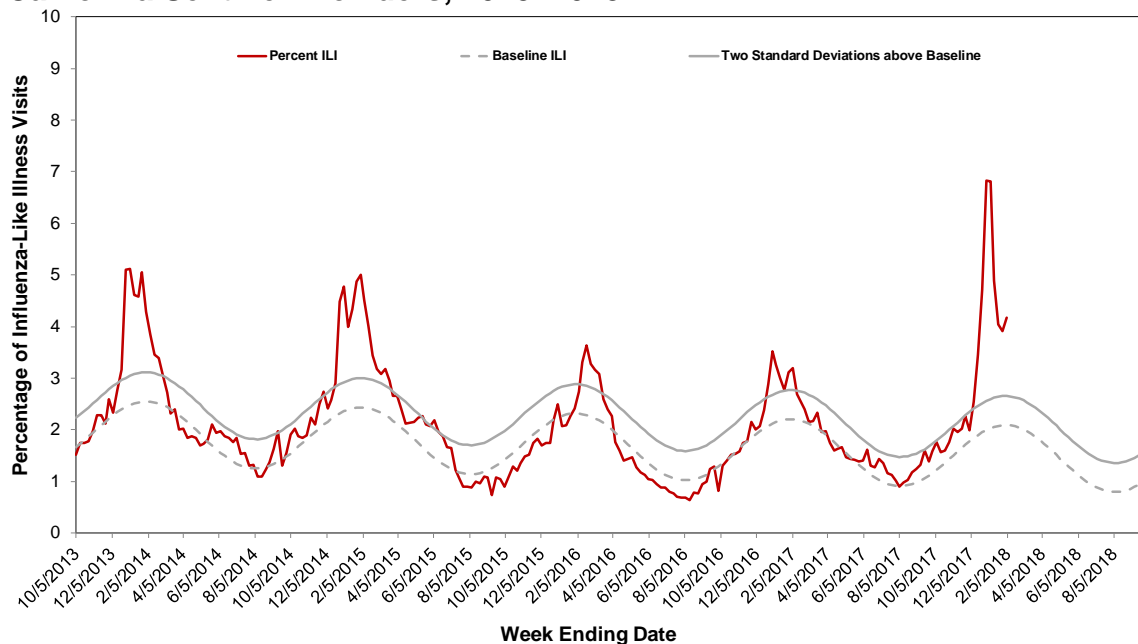
A. Outpatient and Inpatient Data

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°C) AND cough and/or sore throat (in the absence of a known cause other than influenza).

A total of 81 enrolled sentinel providers have reported data for Week 5. Based on available data, the percentage of visits for ILI during Week 5 was 4.2% compared to Week 4 (3.9%) 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



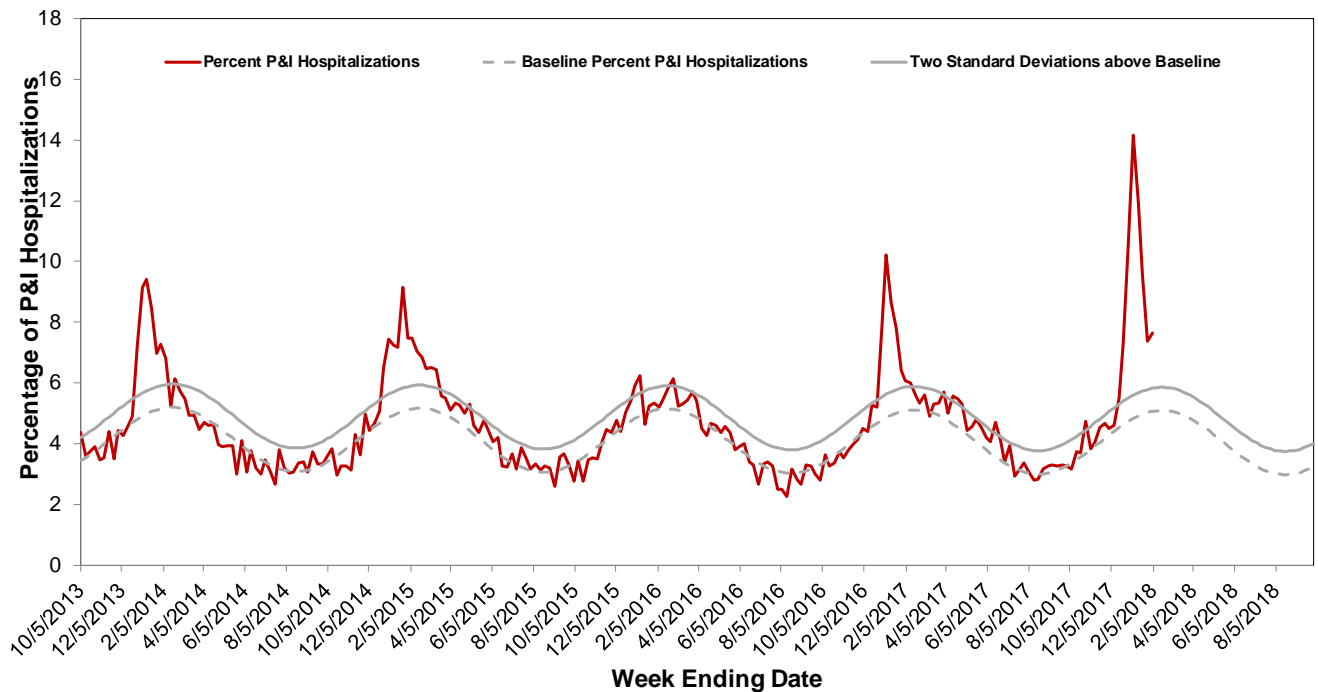
The seasonal baseline was calculated using a regression model applied to data from the previous five years. Two standard deviations above the seasonal baseline is the point at which the observed percentage of ILI is significantly higher than would be expected at that time of year.

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 5 was 7.6% compared to Week 4 (7.4%) 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



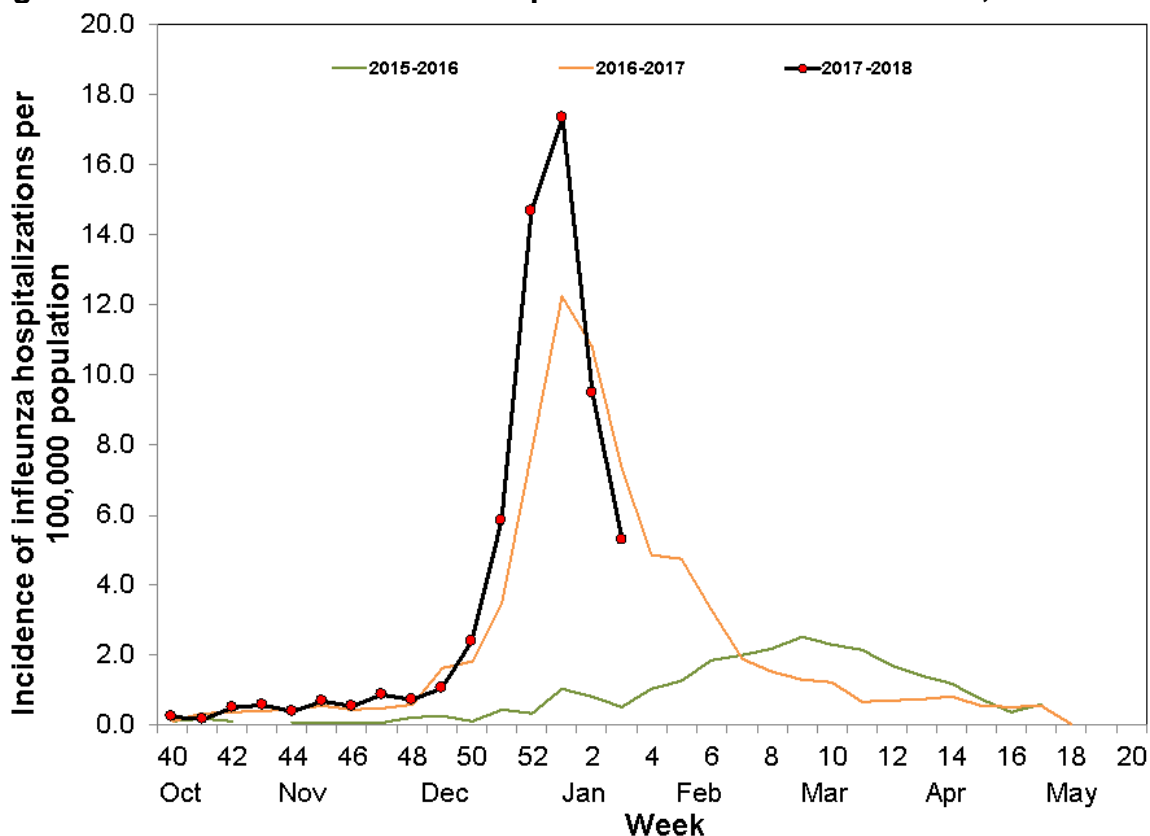
The seasonal baseline was calculated using a regression model applied to data from the previous five years. Two standard deviations above the seasonal baseline is the point at which the observed percentage of pneumonia and influenza hospitalizations in Kaiser Permanente hospitals in northern California is significantly higher than would be expected at that time of 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 decreased in Week 3 (5.3) compared to Week 2 (9.5) (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

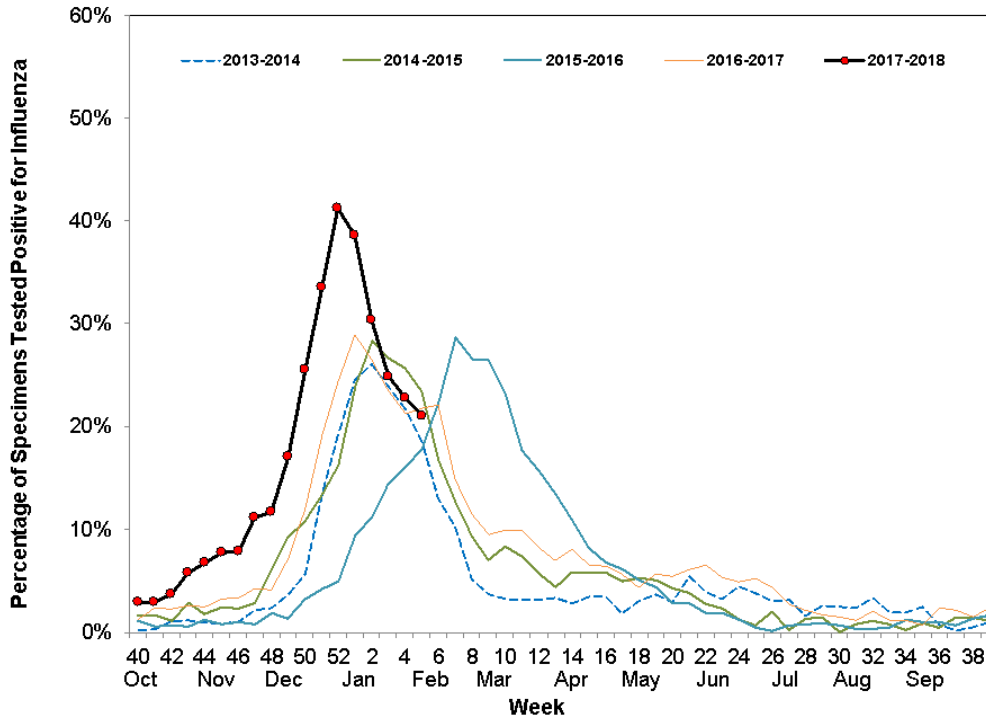
1. Respiratory Laboratory Network (RLN) and Clinical Sentinel Laboratory Surveillance Results

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 5 (21.1%) was lower than Week 4 (22.8%) (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

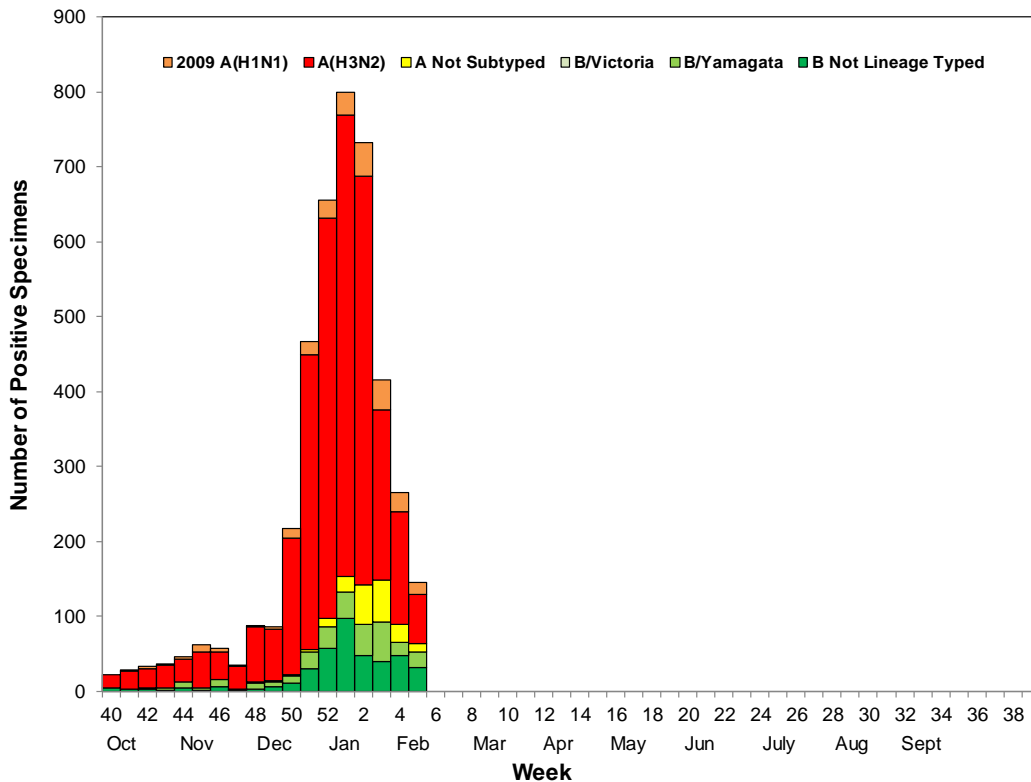


Table 1. Respiratory Specimens Testing Positive for Influenza — Clinical Sentinel Laboratories, Current Week and Season to Date

| | Current Week Number | Current Week Percent | Season to Date Number | Season to Date Percent |
|-----------------------------------|----------------------------|-----------------------------|------------------------------|-------------------------------|
| Number of Specimens Tested | 5,811 | | 80,935 | |
| Influenza Positive | 1,224 | 21.1 | 18,741 | 23.2 |
| A | 626 | 51.1* | 13,860 | 74.0* |
| B | 598 | 48.9* | 4,881 | 26.0* |

* 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

| | Current Week Number | Current Week Percent | Season to Date Number | Season to Date Percent |
|-----------------------------|----------------------------|-----------------------------|------------------------------|-------------------------------|
| Influenza Positive | 160 | | 4,275 | |
| A | 93 | 58.1* | 3,526 | 82.5* |
| 2009 A (H1) | 15 | 16.1† | 236 | 6.7† |
| A (H3) | 66 | 71.0† | 3,105 | 88.1† |
| A, not subtyped | 12 | 12.9† | 185 | 5.2† |
| B | 67 | 41.9* | 749 | 17.5* |
| B Victoria | 15 | 22.4‡ | 84 | 11.2‡ |
| B Yamagata | 20 | 29.9‡ | 265 | 35.4‡ |
| B, not lineage typed | 32 | 47.8‡ | 400 | 53.4‡ |

* 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, one Influenza 2009 A (H1) specimen has been found to be resistant to Oseltamivir (Table 3).

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

| | Oseltamivir Resistance |
|-----------------------------|-------------------------------|
| Influenza 2009A (H1) | 1/20 |
| Influenza A (H3) | 0/71 |
| Influenza B | 0/52 |

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 | 136/136 |
| Influenza A (H3) | A/Hong Kong/4801/2014-like | 11/11 | 242/245 |
| Influenza B Victoria* | B/Brisbane/60/2008-like | 12/12 | 17/29 |
| Influenza B Yamagata† | B/Phuket/3073/2013-like | 15/15 | 202/202 |

* 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

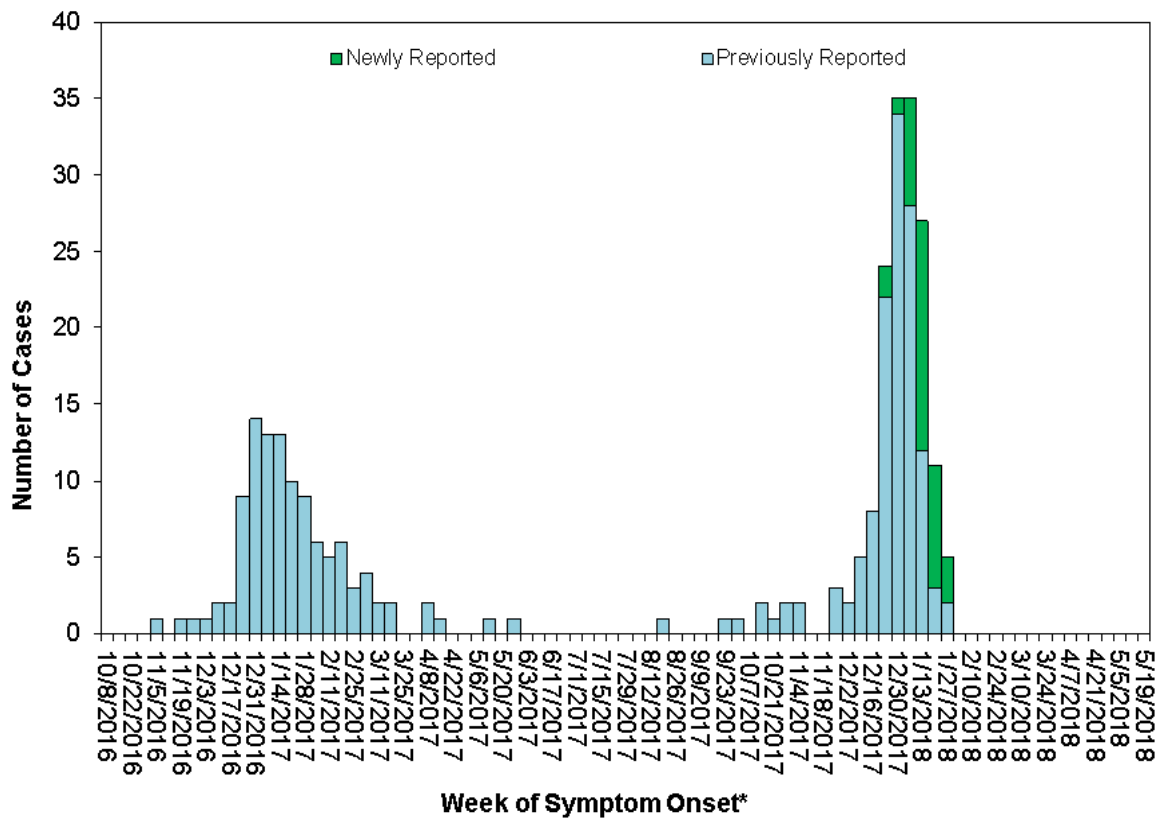
Currently, as mandated under Section 2500 of the California Code of Regulations, deaths among patients aged 0–64 years with laboratory-confirmed influenza are reportable to CDPH. The weekly influenza report includes confirmed deaths formally reported to CDPH through February 3, 2018 (Week 5).

Thirty-six laboratory-confirmed influenza-associated fatalities were reported to CDPH during Week 5 (Figure 6). To date, CDPH has received 163 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 | 30 | 18.4 |
| Central | 24 | 14.7 |
| Northern | 18 | 11.0 |
| Lower Southern | 58 | 35.6 |
| Upper Southern | 33 | 20.2 |

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

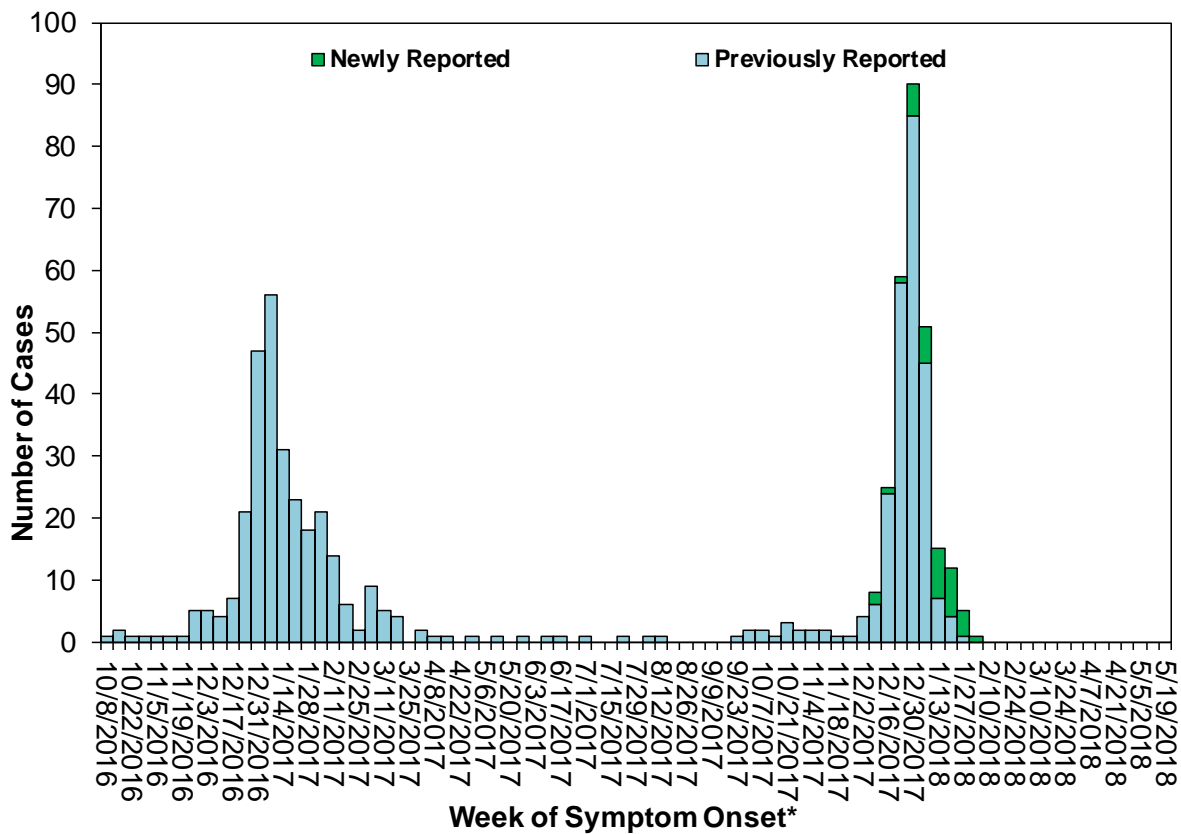


*Earliest date associated with the illness was used for cases without reported date of symptom onset.

D. Influenza-Associated Outbreaks

Thirty-six laboratory-confirmed influenza outbreaks were reported to CDPH during Week 5. To date, 286 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.

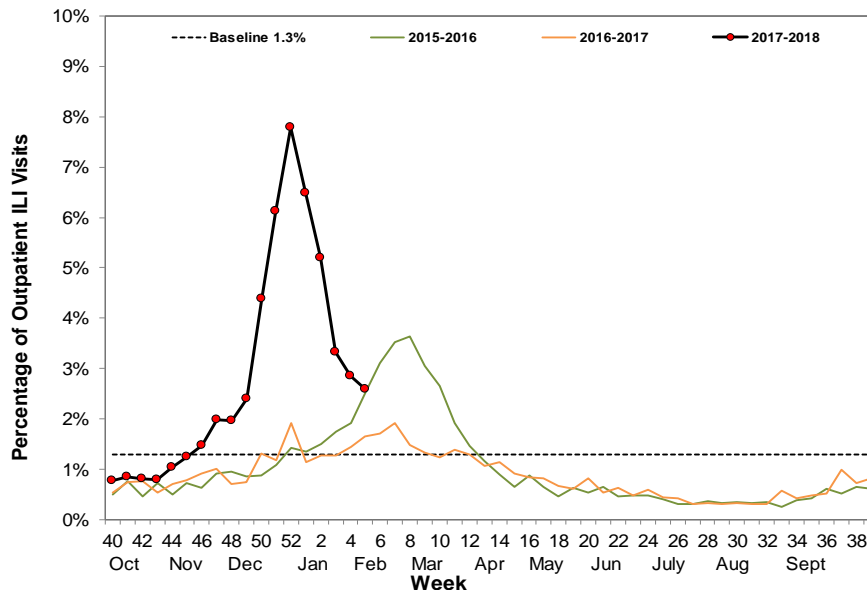
E. California Border Region Influenza Surveillance Network Data

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 9 border region sentinel providers reported data during Week 5. The total number of patients screened by all sentinel sites for ILI during Week 5 was 8,306. Outpatient ILI activity was 2.6% in Week 5. ILI activity for the California border region during Week 5 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



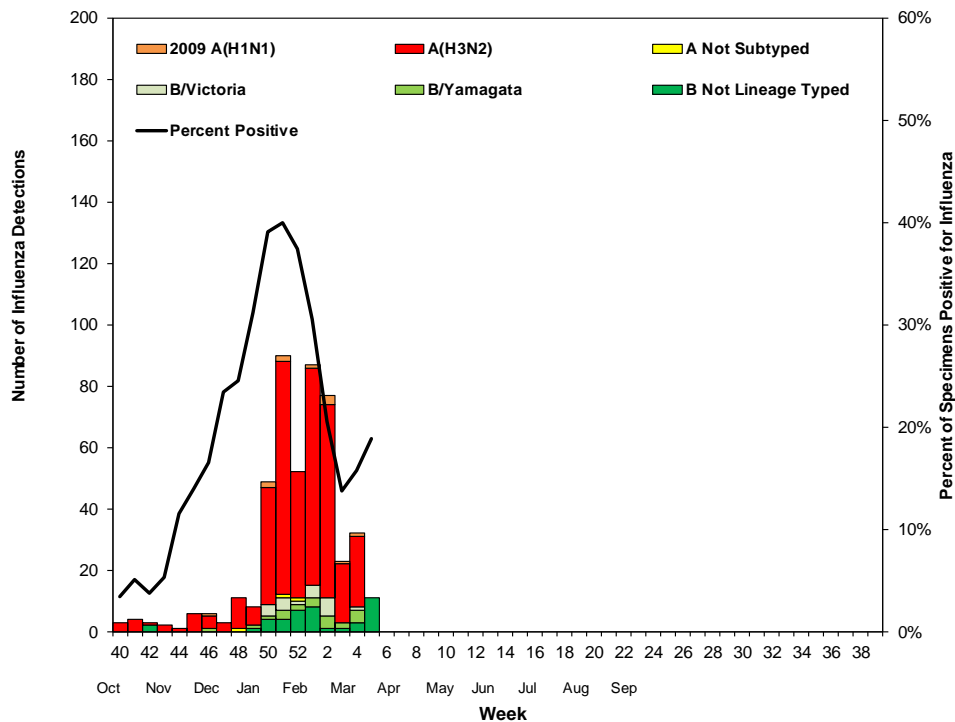
2. Virologic Surveillance Update

During Week 5, a total of 494 respiratory specimens were tested from border region sentinel clinical laboratories; of these, 93 (18.8%) tested positive for influenza (45 [48.4%] influenza A; 48 [51.6%] influenza B). Cumulatively this season, a total of 15,429 respiratory specimens were tested from border region sentinel clinical laboratories; of these, 4,049 (26.2%) tested positive for influenza (3,277 [80.9%] influenza A, 772 [19.1%] influenza B).

During Week 5, 11 influenza positive specimens were detected at border region RLN laboratories, of which 11 (100.0%) were influenza B. Of the specimens that tested positive for influenza B, 11 (100.0%) had no further lineage typing performed. Cumulatively this season, a total of 468 influenza positive specimens have been detected at border region RLN laboratories, of which 385 (82.3%) were influenza A, and 83 (17.7%) were influenza B. Of the 385 specimens that tested positive for influenza A at RLN laboratories, 11 (2.9%) were subtyped as 2009 A (H1), 371 (96.4%) were subtyped as A (H3), and three (0.8%) had no further subtyping performed. Of the 83 specimens that tested positive for influenza B, 21 (25.3%) were lineage typed as B (Yamagata), 20 (24.1%) were lineage typed as B (Victoria), and 42 (50.6%) 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

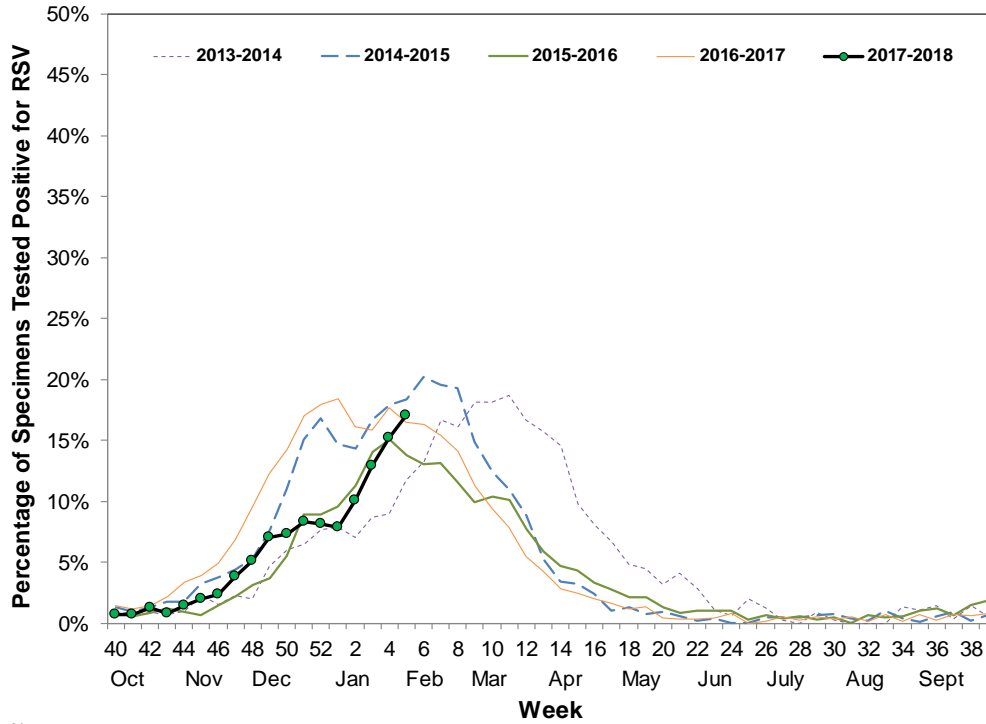
Currently, as mandated under Section 2500 of the California Code of Regulations, deaths among children aged 0–4 years with laboratory-confirmed respiratory syncytial virus (RSV) are reportable to CDPH. The weekly influenza report includes confirmed deaths formally reported to CDPH through February 3, 2018 (Week 5).

No laboratory-confirmed RSV fatalities in a child <5 years of age were reported to CDPH during Week 5. To date, CDPH has received two reports of a laboratory-confirmed RSV-associated death among children <5 years of age during the 2017–2018 influenza season.

2. Other Respiratory Virus Laboratory Update

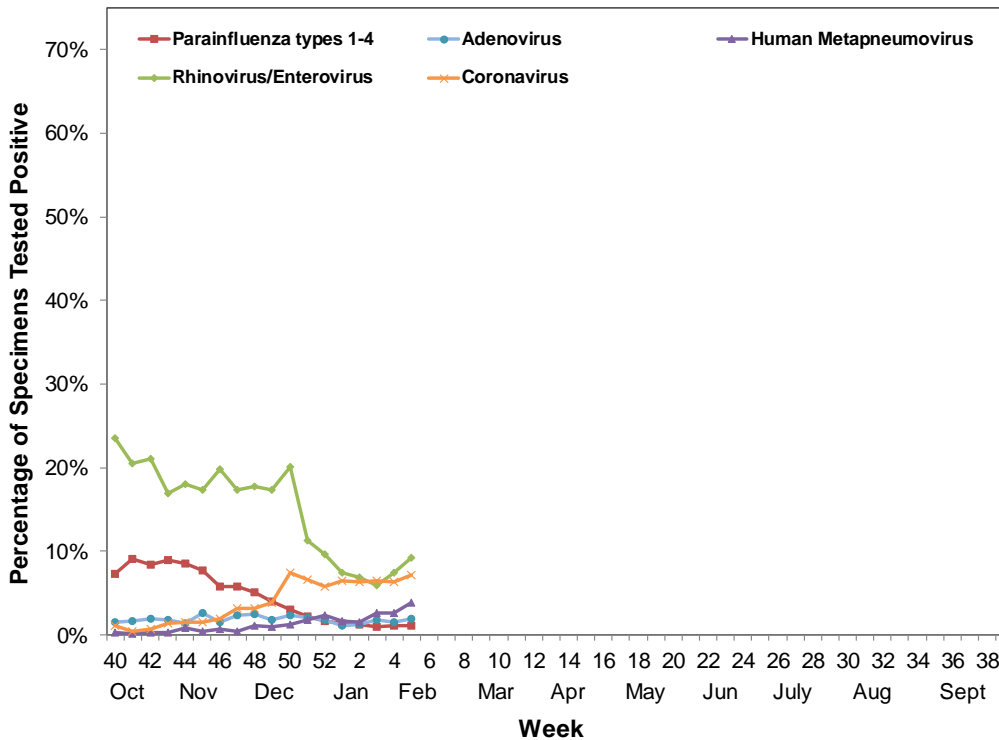
During Week 5, 4,874 specimens were tested for RSV and 830 (17.0%) were positive, which was higher than Week 4 (15.2%) (Figure 10). During Week 5, rhinovirus/enterovirus, human metapneumovirus, adenovirus, and parainfluenza activity increased; and coronavirus activity decreased compared to the previous week (Figure 11).

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



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

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



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. 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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