California Influenza and Other Respiratory Disease Surveillance for Week 3 (January 17, 2016 to January 23, 2016)

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.

Overall influenza activity in California was "widespread*" during Week 3.

Influenza Report Highlights

- Influenza activity in California remains elevated based on increased laboratory detections of influenza viruses.
- Outpatient influenza-like illness (ILI)
  - 1.6% of patient visits during Week 3 were for ILI, which is slightly higher compared to Week 2 (1.5%); the percentage of visits for ILI is below expected levels for this time of year
- Hospitalization data
  - 5.6% of Kaiser patients hospitalized during Week 3 were admitted with a pneumonia and/or influenza (P&I) diagnosis, which is higher compared to Week 2 (5.0%); the percentage of P&I admissions is within expected levels for this time of year
- Influenza virus detections by Respiratory Laboratory Network and Sentinel Laboratories
  - 453 (15.1%) of 2,992 specimens tested were positive for influenza during Week 3, which is higher compared to Week 2 (9.0%)
- Influenza-associated deaths among patients 0–64 years of age
  - There were 0 laboratory-confirmed influenza deaths reported during Week 3
- Influenza-associated outbreaks
  - There was 1 laboratory-confirmed influenza outbreak reported during Week 3

***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.

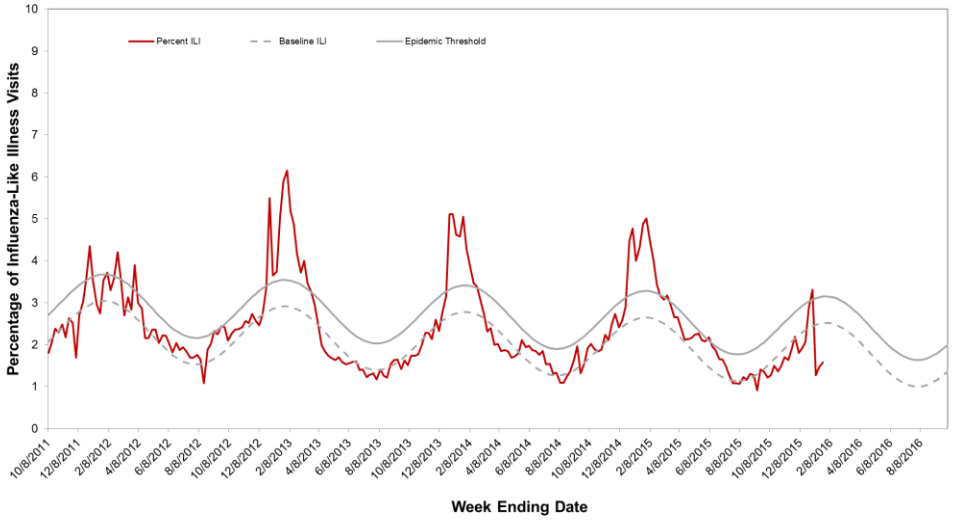
A. Outpatient and Inpatient Data

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 (≥100°F or 37.8°C) AND cough and/or sore throat (in the absence of a known cause other than influenza).

A total of 84 enrolled sentinel providers have reported data for Week 3. Based on available data, the percentage of visits for ILI in Week 3 (1.6%) was below expected baseline levels for this time of year (Figure 1). Please note that an influential sentinel provider has not yet reported for Weeks 1-3; the percentage of visits for ILI for Weeks 1-3 are expected to increase once these reports are received.

Figure 1. Percentage of Influenza-like Illness Visits Among Patients Seen by California Sentinel Providers, 2011-2016



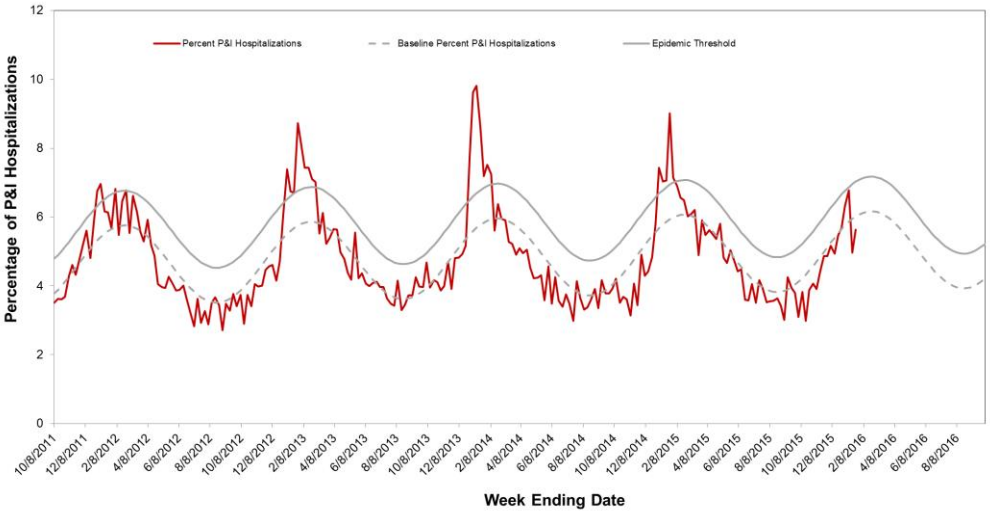
The seasonal baseline was calculated using a regression model applied to data from the previous five years. The epidemic threshold is two standard deviations above the seasonal baseline and is the point at which the observed percentage of ILI is significantly higher than would be expected at that time of the 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 3 was 5.6% compared to Week 2 (5.0%) and is within expected baseline levels for this time of the year (Figure 2).

Figure 2. Percentage of P&I Hospitalizations in Kaiser Permanente Northern California Hospitals, 2011–2016



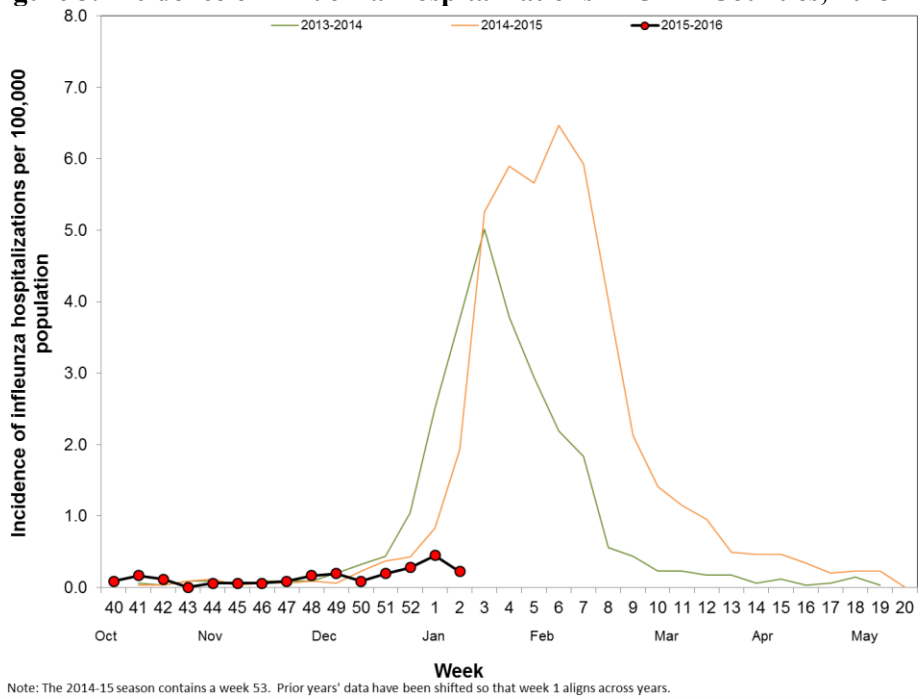
The seasonal baseline was calculated using a regression model applied to data from the previous five years. The epidemic threshold is two standard deviations above the seasonal baseline and is the point at which the observed percentage of pneumonia and influenza hospitalizations in Kaiser Permanente 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 in Week 2 (0.22) is lower compared to Week 1 (0.45) (Figure 3). Data for Week 3 are not presented because results are still being collected and are likely to change.

Figure 3. Incidence of Influenza Hospitalizations in CEIP Counties, 2013–2016



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

B. Laboratory Update - Influenza

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

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

The percentage of influenza detections in the RLN and sentinel laboratories in Week 3 (15.1%) increased compared to Week 2 (9.0%) (Figure 4). Additional details can be found in Figures 4 and 5 and Table 1.

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

Figure 4. Percentage of Influenza Detections in Respiratory Laboratory Network and Sentinel Laboratories, 2011–2016

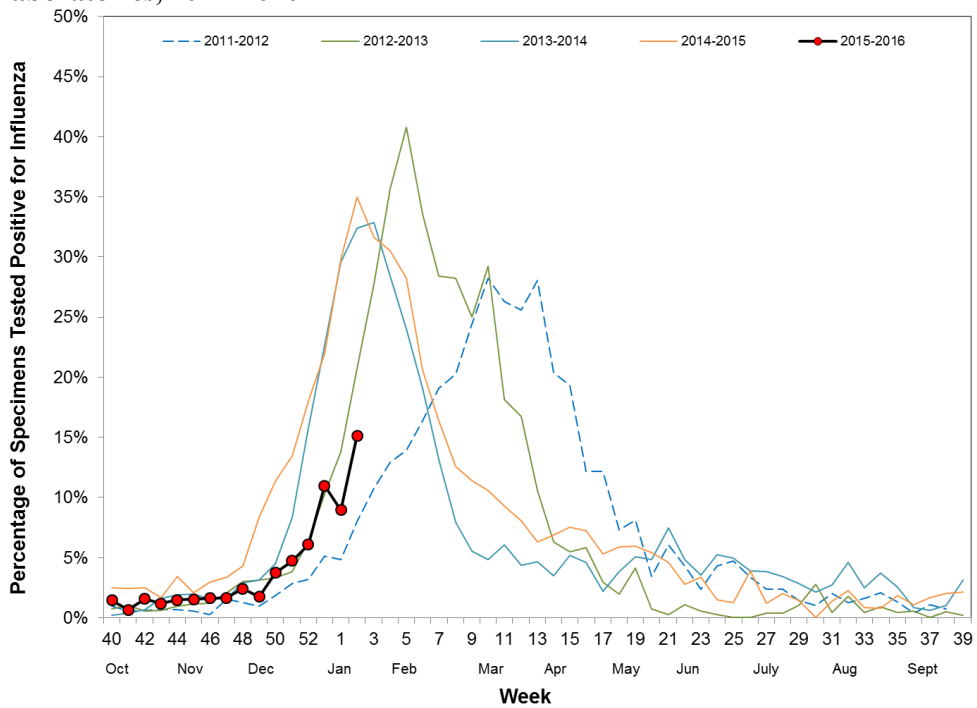


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Figure 5. Number of Influenza Detections by Type and Subtype Detected in Respiratory Laboratory Network and Sentinel Laboratories, 2015–2016

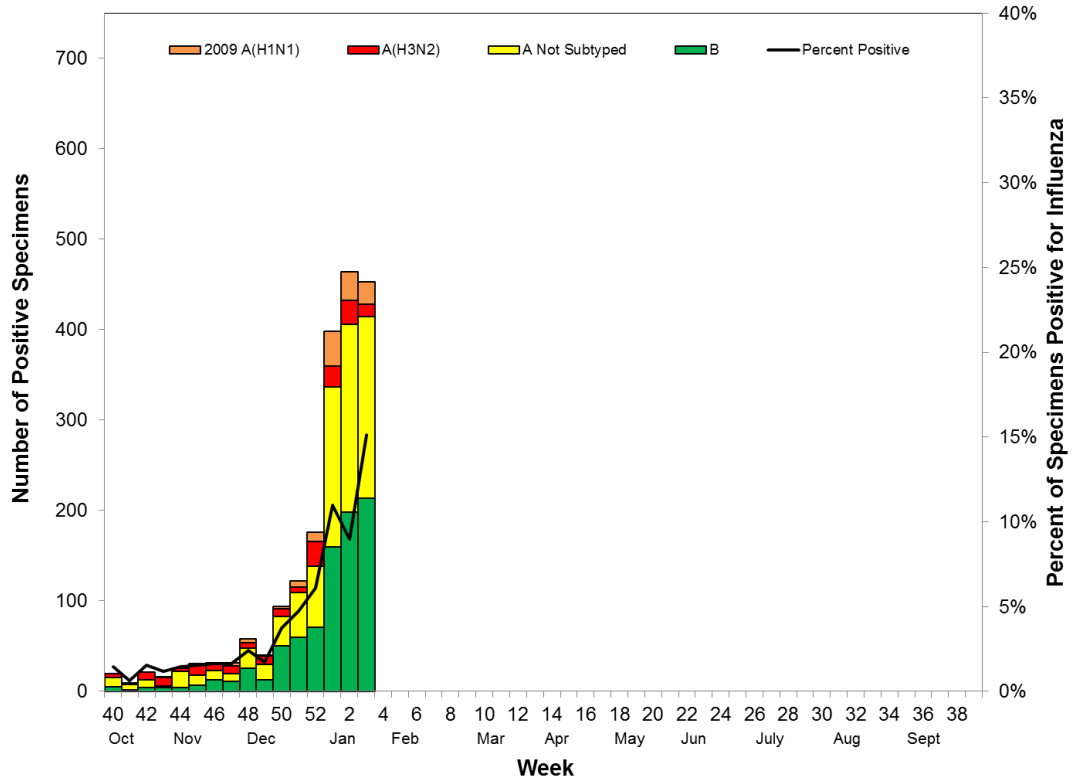


Table 1. Respiratory Specimens Testing Positive for Influenza by Influenza Type and Subtype — Respiratory Laboratory Network and Sentinel Laboratories, Current Week and Season to Date

	Week 3		Season to Date	
	Number	**Percent**	**Number**	**Percent**
Number of Specimens Tested	2,992		37,633	
Number of Specimens Positive for Influenza	453	15.1*	1,992	5.3*
Influenza Type/Subtype of Positive Specimens				
A	239	52.8†	1,150	57.7†
2009 A (H1)	25	10.5‡	128	11.1‡
A (H3)	14	5.9‡	174	15.1‡
A, not subtyped	200	83.6‡	848	73.7‡
B	214	47.2†	842	42.3†

* Percent of total specimens tested for influenza
† Percent of specimens positive for influenza
‡ Percent of influenza A positives

2. Antiviral Resistance Testing

Of the influenza specimens tested by the CDPH-VRDL to date this season, no specimens have been found to be resistant to Oseltamivir (Table 2).

Table 2. Number of specimens tested for antiviral resistance, 2015–2016

	Neuraminidase Inhibitors Resistance
Influenza A (H3)	0/5
Influenza 2009A (H1)	0/4
Influenza B	0/6

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 3). In addition, all influenza B antigenically characterized viruses in California have matched the influenza B Yamagata lineage virus included in the trivalent and quadrivalent influenza vaccines.

Table 3. Influenza virus antigenic characterization data — California and the United States, 2015–2016

		Match Vaccine Strain	
Influenza Subtype/Lineage	**Vaccine Strain**	**California**	**United States**
Influenza A (H1)	A/California/7/2009-like (H1N1)	2/2	74/74
Influenza A (H3)	A/Switzerland/9715293/2013-like (H3N2)	3/3	79/80*
Influenza B Victoria†	B/Brisbane/60/2008-like	0/0	25/25
Influenza B Yamagata‡	B/Phuket/3073/2013-like	3/3	25/25

* The Centers for Disease Control and Prevention also performs genetic sequencing of influenza A (H3) viruses. A total of 128 influenza A (H3) viruses were genetically sequenced, and all viruses belonged to genetic groups for which a majority of viruses antigenically characterized were similar to the cell-propagated A/Switzerland/9715293/2013.
† The influenza B Victoria lineage virus is included in only the 2015–2016 quadrivalent influenza vaccine
‡ The influenza B Yamagata lineage virus is included in both the 2015–2016 trivalent and quadrivalent influenza vaccines

C. Laboratory-Confirmed Severe Influenza 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 as of January 23, 2016 (Week 3).

During Week 3, there were no laboratory-confirmed fatalities reported. To date this season, there have been three reports of laboratory-confirmed influenza-associated deaths among patients <65 years of age during the 2015–2016 influenza season.

D. Influenza-Associated Outbreaks

During Week 3, there was one laboratory-confirmed outbreak reported. To date, seven laboratory-confirmed influenza outbreaks have been reported to CDPH for the 2015–2016 season.

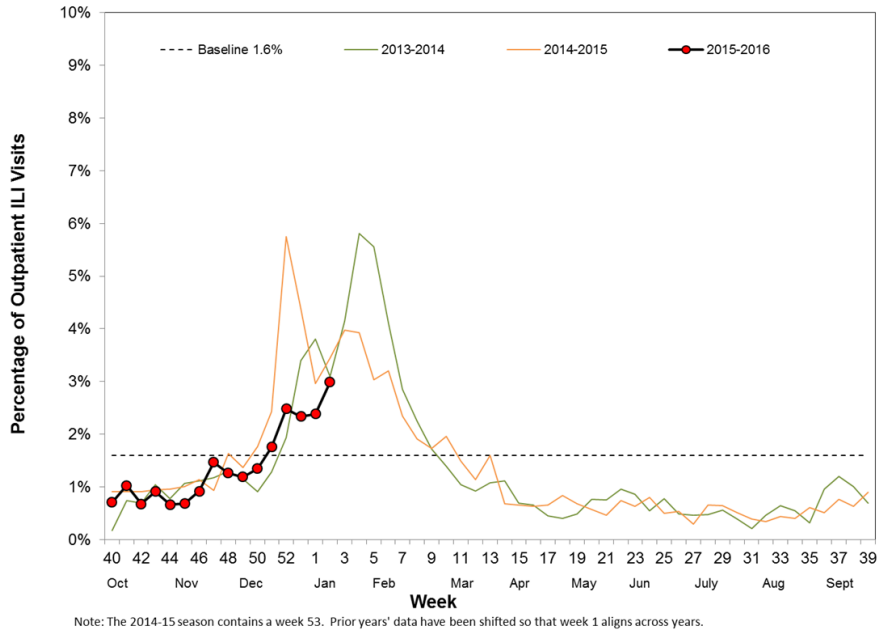
E. California Border Region Influenza Surveillance Network Data

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, and some parts of Riverside County.

Syndromic Surveillance Update

A total of seven border region sentinel providers reported data during Week 3 of 2016, two less than Week 2 of 2016. The total number of patients screened by all sentinel sites for ILI during Week 3 was 4,752. Outpatient ILI activity was lower in Week 2 (2.4% ILI) compared to Week 3 (3.0% ILI). ILI activity for the California border region during Week 3 was lower when compared to activity for the same week during the 2014–2015 and 2013-2014 seasons (Figure 6). All influenza syndromic data summarized for the border region represents a subset of CDC influenza sentinel providers in California.

Figure 6. Percentage of Influenza-like Illness Visits Among Patients Seen by California Border Region Sentinel Providers, 2013-2016



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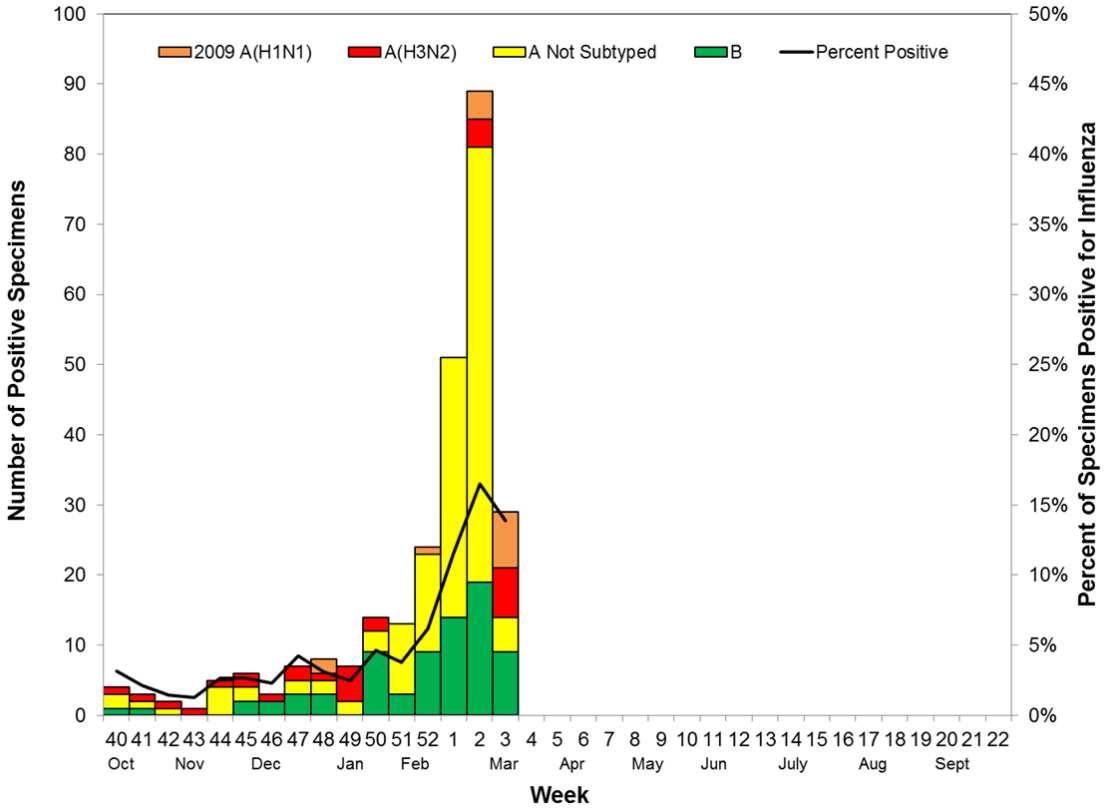
Virologic Surveillance Update

Cumulatively this season, a total of 3,963 respiratory specimens have been tested from border region clinics; of these, 266 (6.7%) tested positive for influenza. Of the 266 specimens that tested positive, 191 (71.8%) were influenza A and 75 (28.2%) were influenza B. Of the 191 specimens that tested positive for influenza A, 29 (15.2%) were subtyped as A (H3), 15 (7.9%) were subtyped as 2009 A (H1), and 147 (77.0%) had no further subtyping performed. For Week 3, a total of 209 respiratory specimens were submitted for testing; 29 (13.9%) were positive for influenza virus. Of the 29 specimens that tested positive, 20 (69.0%) were influenza A, and 9 (31.0%) were influenza B. Of the 20 specimens that tested positive for influenza A, seven (35.0%) were subtyped as A (H3), eight (40.0%) were subtyped as 2009 A (H1), and 5 (25.0%) had no further subtyping performed. Laboratory data summarized in Figure 7 includes data from influenza sentinel sites as well as laboratory data from other border region laboratories.

Figure 7. Number of Influenza Detections by Type and Subtype Detected in California Border Region Respiratory Laboratory Network and Sentinel Laboratories, 2015-2016



F. Laboratory Update – Other Respiratory Viruses

During Week 3, 2,447 specimens were tested for RSV and 352 (14.4%) were positive, which is higher compared to Week 2 (7.1%) (Figure 8). Information on other respiratory viruses can be found in Figure 9.

Figure 8. Percentage of RSV Detections in Respiratory Laboratory Network and Sentinel Laboratories, 2011–2016

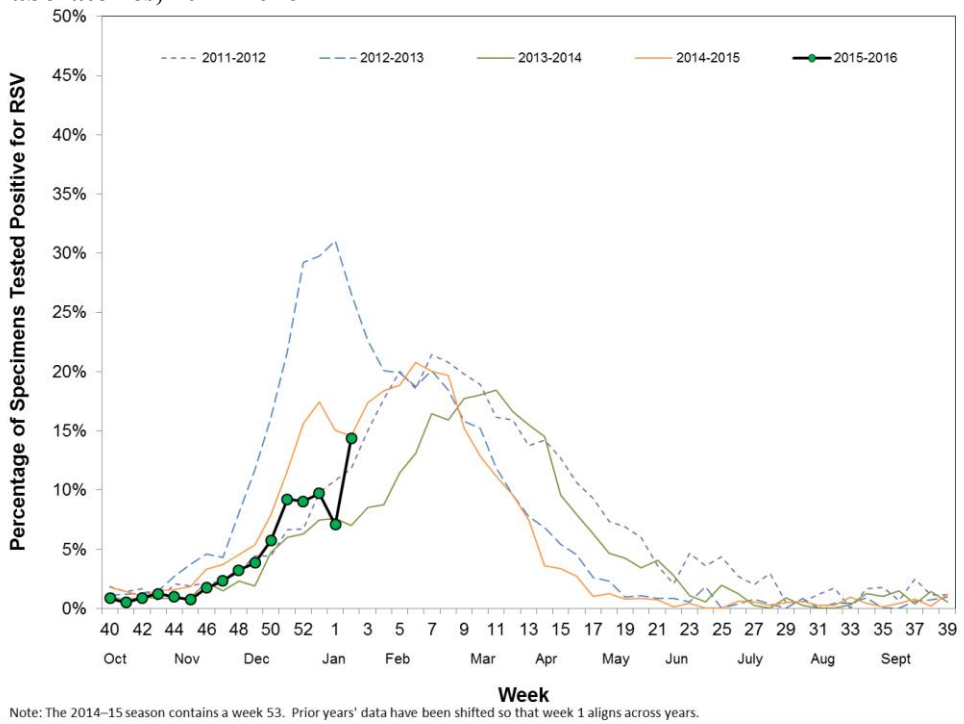


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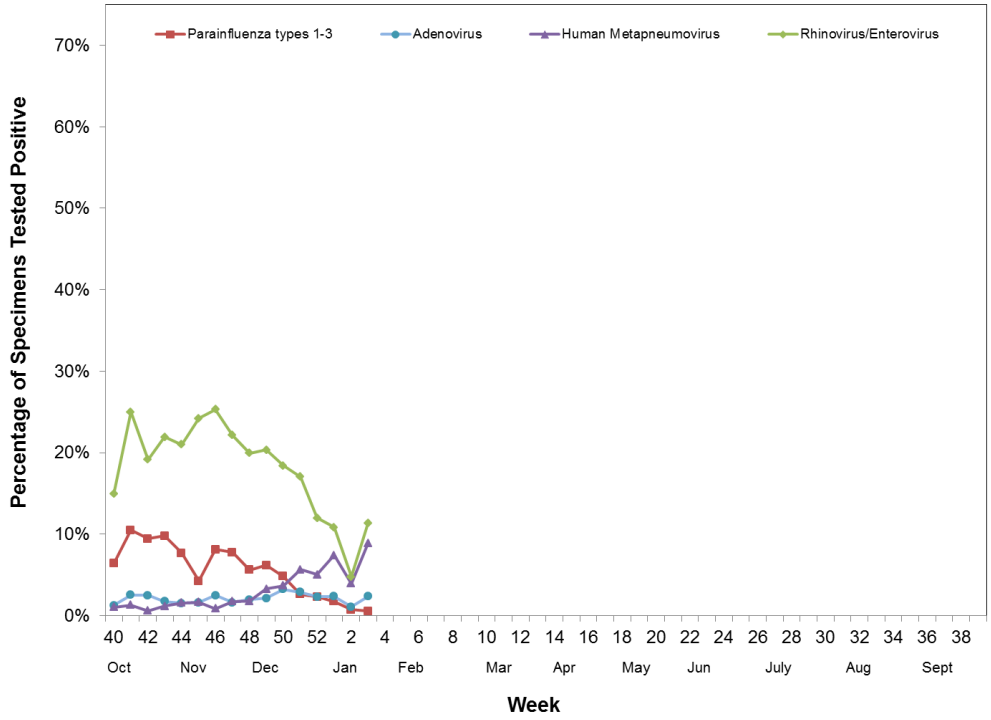
Figure 9. Percentage of Other Respiratory Pathogen Detections in Respiratory Laboratory Network and Sentinel Laboratories, 2015–2016



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

For more information regarding the different influenza surveillance data sources, please visit the CDPH Influenza Surveillance Program at http://www.cdph.ca.gov/programs/dcdc/Pages/CaliforniaInfluenzaSurveillanceProject.aspx.

To obtain additional information regarding influenza, please visit the CDPH influenza website at http://www.cdph.ca.gov/HealthInfo/discond/Pages/Influenza(Flu).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 http://www.cdph.ca.gov/HealthInfo/discond/Pages/Influenza(Flu).aspx.