

Influenza and Other Respiratory Viruses Weekly Report



California Influenza Surveillance Program

Highlights (Week 16: April 17, 2022 – April 23, 2022)

Statewide Activity



Regions with Elevated Activity



- ▶ **Deaths:** 45* since Oct. 3, 2021
- ▶ **Outbreaks:** 5 since Oct. 3, 2021
- ▶ **Laboratory:** 6.8% flu positive
- ▶ **Hospitalizations:** 0.1% flu admissions
- ▶ **Outpatient ILI:** Within expected levels

* Influenza-coded deaths from death certificates
Click on images and links for more information

Key messages:

- Influenza continues to circulate at low levels in CA but is increasing.
- The majority of detected influenza viruses are A (H3N2).
- CDPH continues to recommend influenza vaccination. Flu vaccines are available at many different locations. Visit www.vaccines.gov to find a flu vaccine near you.

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.

Important: An accessible excel file with data for all figures can be downloaded from the [CDPH flu webpage](#).

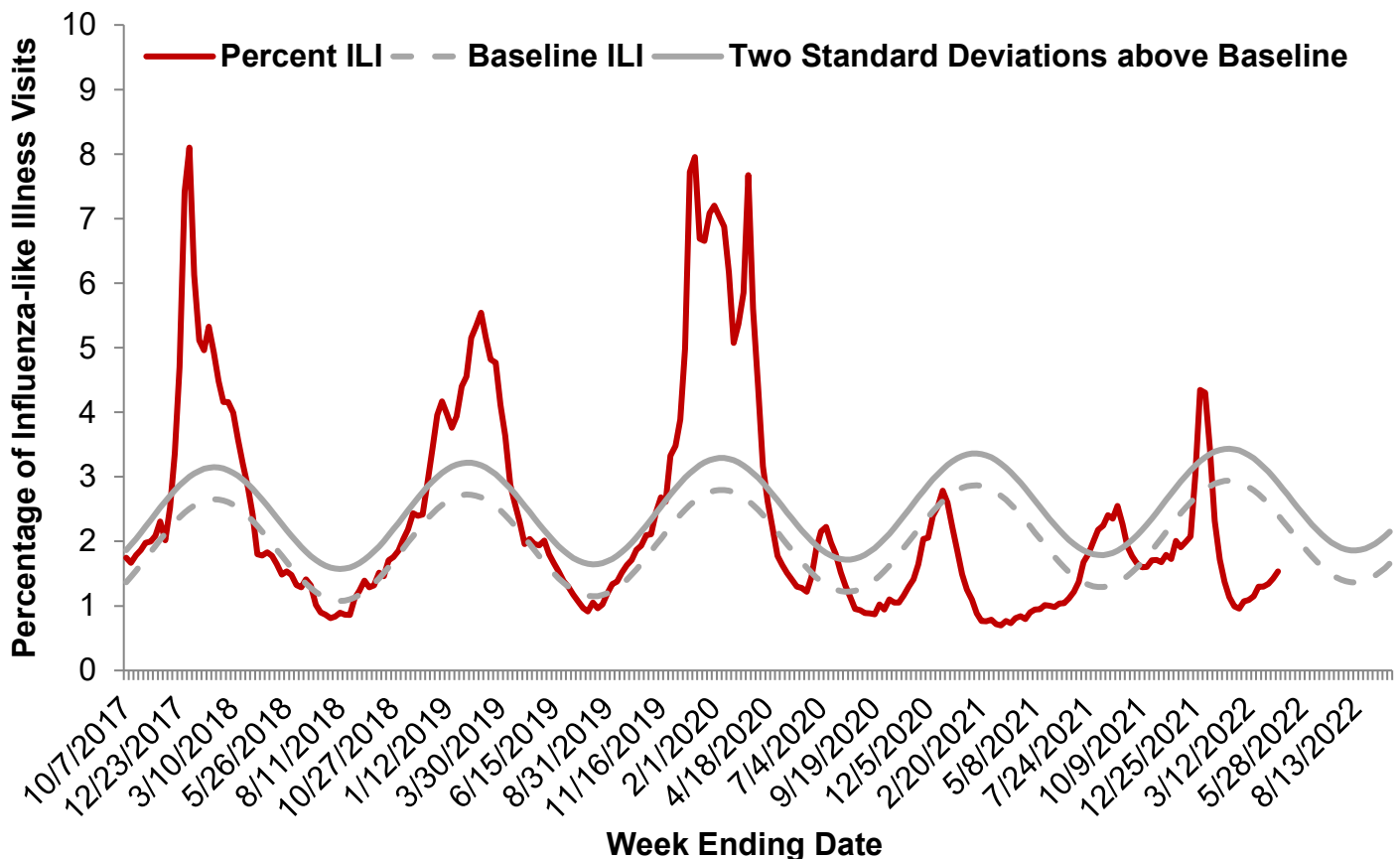
A. Outpatient, Inpatient, and Death Data

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. Please note that historic data for large sentinel providers enrolled during the 2021–2022 season have been included to account for impacts on baselines and allow for comparison to previous season data.

A total of 136 enrolled sentinel providers have reported data for Week 16. Based on available data, the percentage of visits for ILI during Week 16 was 1.5% compared to Week 15 (1.4%) and is within expected levels for this time of year (Figure 1). Increases in ILI-related outpatient visits might also include people seeking care for other respiratory illnesses, including COVID-19.

Figure 1. Percentage of Influenza-like Illness Visits Among Patients Seen by California Sentinel Providers, 2017–2022



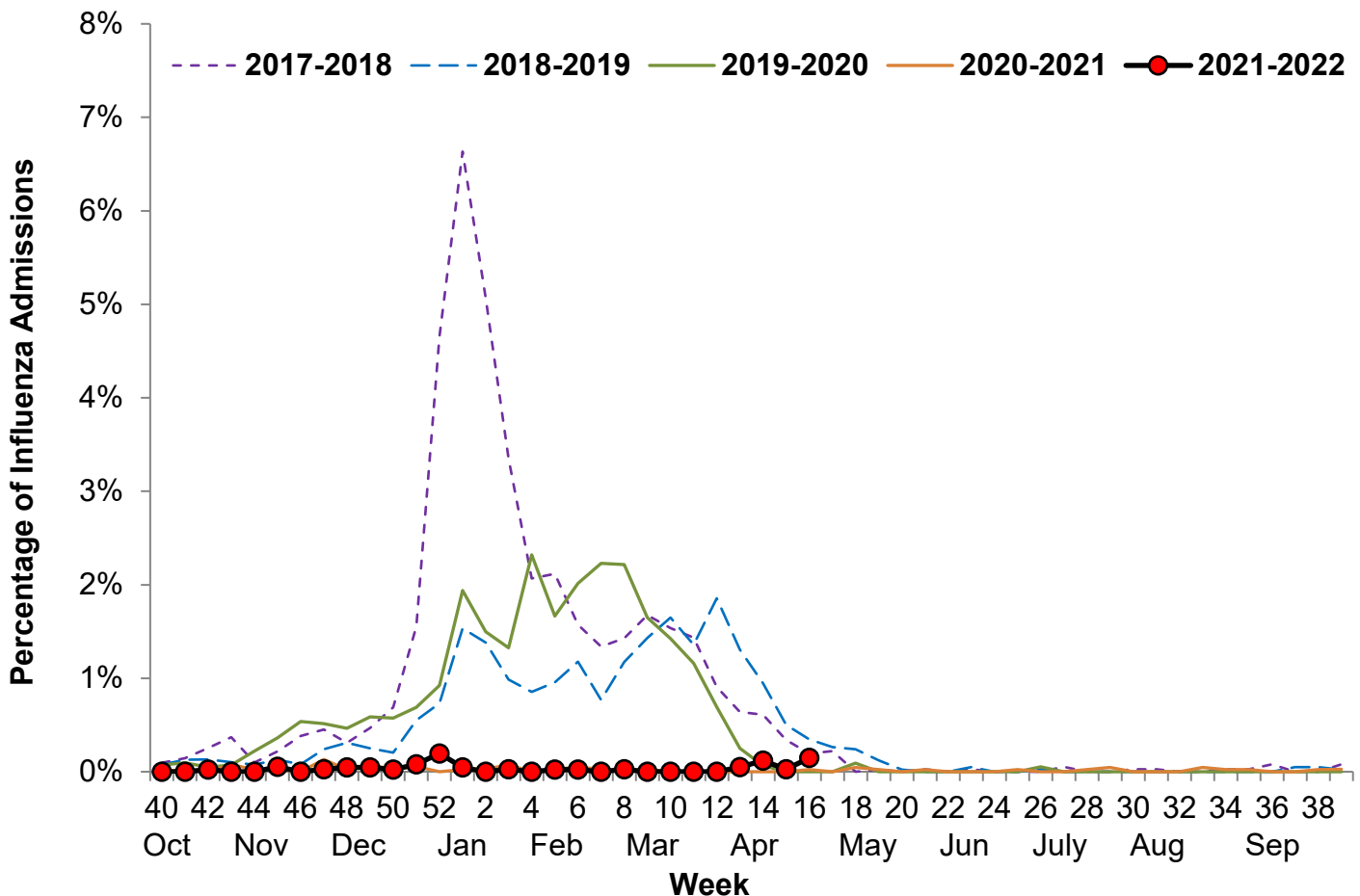
The seasonal baseline was calculated using a regression model applied to data from the five years before the COVID-19 pandemic. Two standard deviations above the seasonal baseline is the point at which the observed percentage of ILI is significantly higher than would be expected at that time of year. Historic data for large sentinel providers enrolled during the 2021–2022 season are included to account for impacts on baselines and allow for comparison to previous season data.

2. Kaiser Permanente Hospitalization Data

Inpatients at Kaiser Permanente Northern California facilities with an admission diagnosis including the keywords "flu," "influenza," or variants of the keywords are defined as influenza-related admissions. The number of influenza admissions is divided by the total number of hospital admissions occurring in the same time period to estimate the percentage of influenza admissions. Admissions for pregnancy, labor and delivery, birth, and outpatient procedures are excluded from the denominator. Influenza admission data is not comparable to previous seasons reports which included pneumonia and influenza (P&I) admissions.

The percentage of admissions for influenza in Kaiser Permanente facilities in northern California during Week 16 was 0.1% compared to Week 15 (0.0%) (Figure 2).

Figure 2. Percentage of Influenza Admissions in Kaiser Permanente Northern California Hospitals, 2017–2022

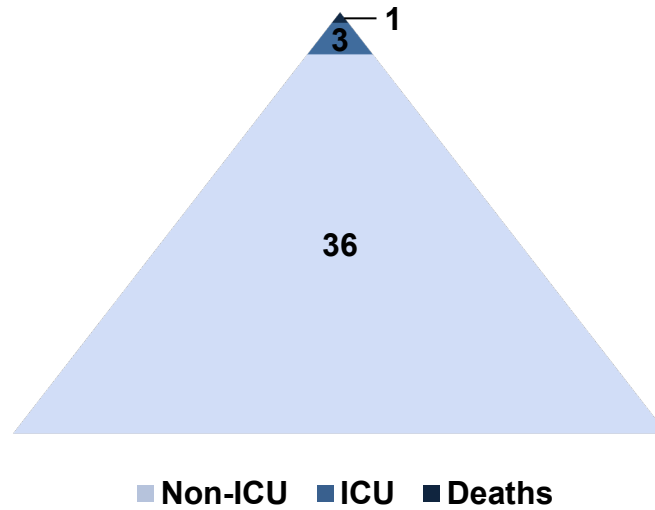


Note: Data have been shifted so that week 1 aligns across years.

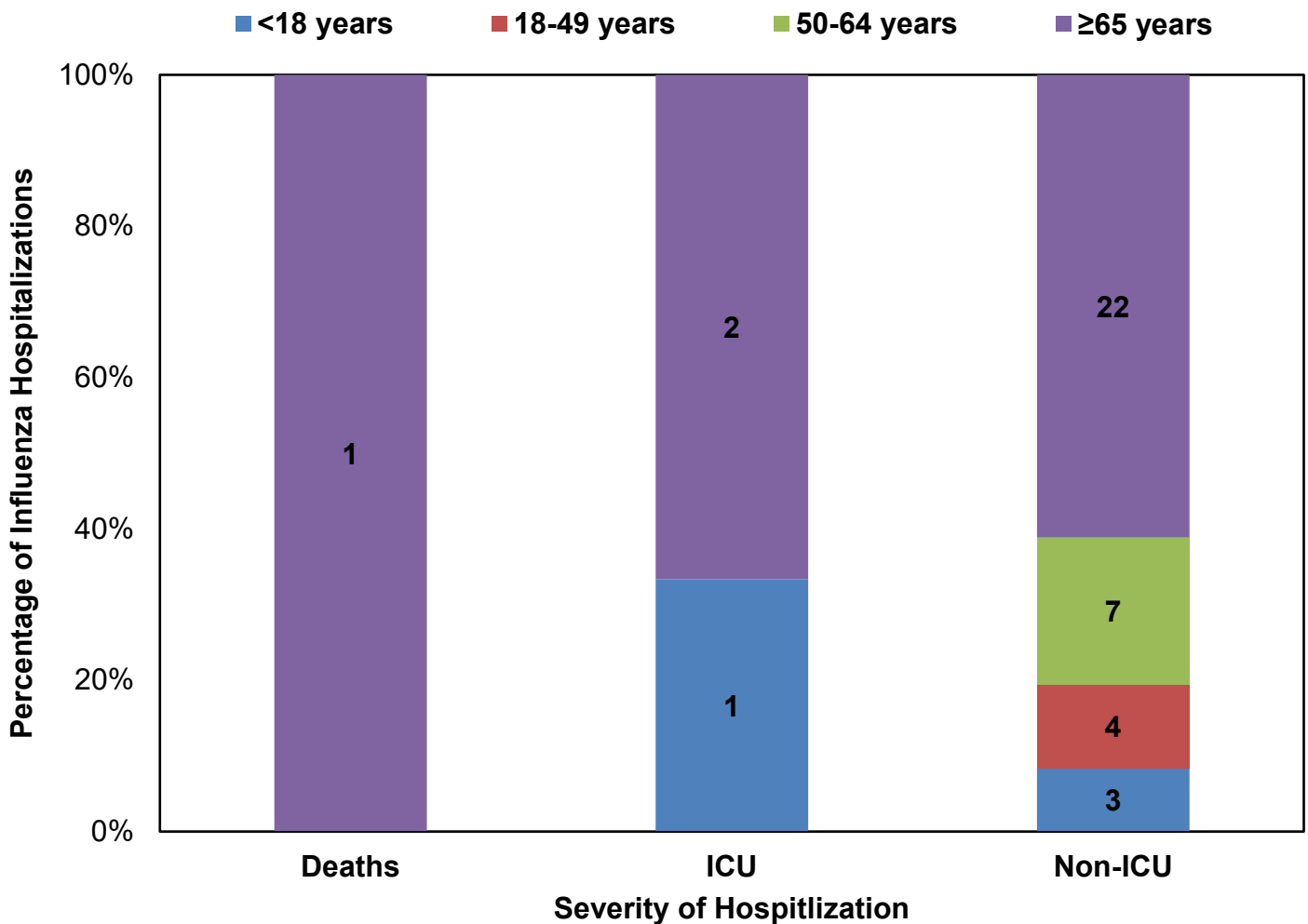
To date, 36 non-intensive care unit (ICU) hospitalizations, three ICU admissions, and one death have occurred among persons with influenza admission diagnoses (Figures 3a). Most influenza admissions occurred among persons ≥ 65 years (Figure 3b). Please note that influenza admissions serve as a proxy for influenza activity, but do not necessarily represent laboratory-confirmed influenza infections.

Figure 3. Number (a) and age group distribution (b) of non-ICU, ICU, and deaths associated with Influenza Admissions in Kaiser Permanente Northern California hospitals, 2021–2022 season to date

(a)



(b)

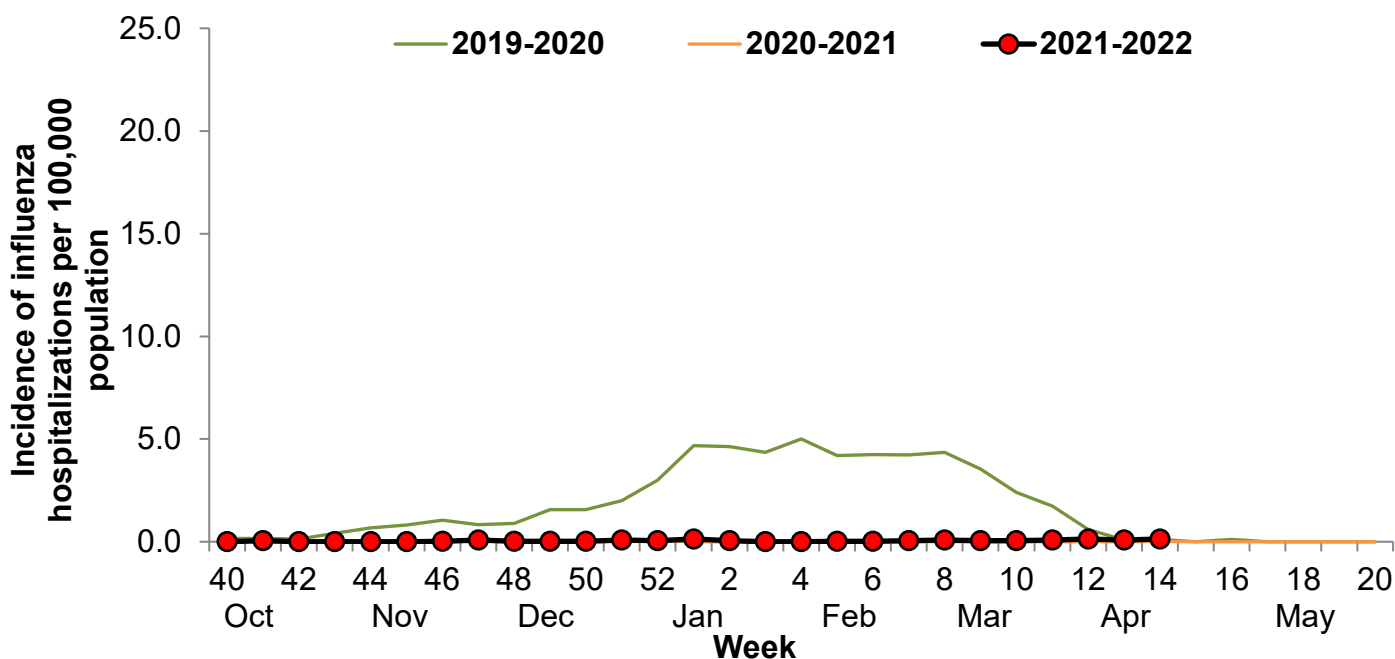


3. Influenza-Associated Hospitalizations, California Emerging Infections Program

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.

Five influenza-associated hospitalizations were reported during Week 14 (Figure 4). To date during the 2021–2022 influenza season, 48 influenza hospitalizations have been reported. Data for the most recent two weeks are not presented because results are still being collected and are likely to change.

Figure 4. Incidence of Influenza Hospitalizations per 100,000 Population in CEIP Counties, 2019–2022



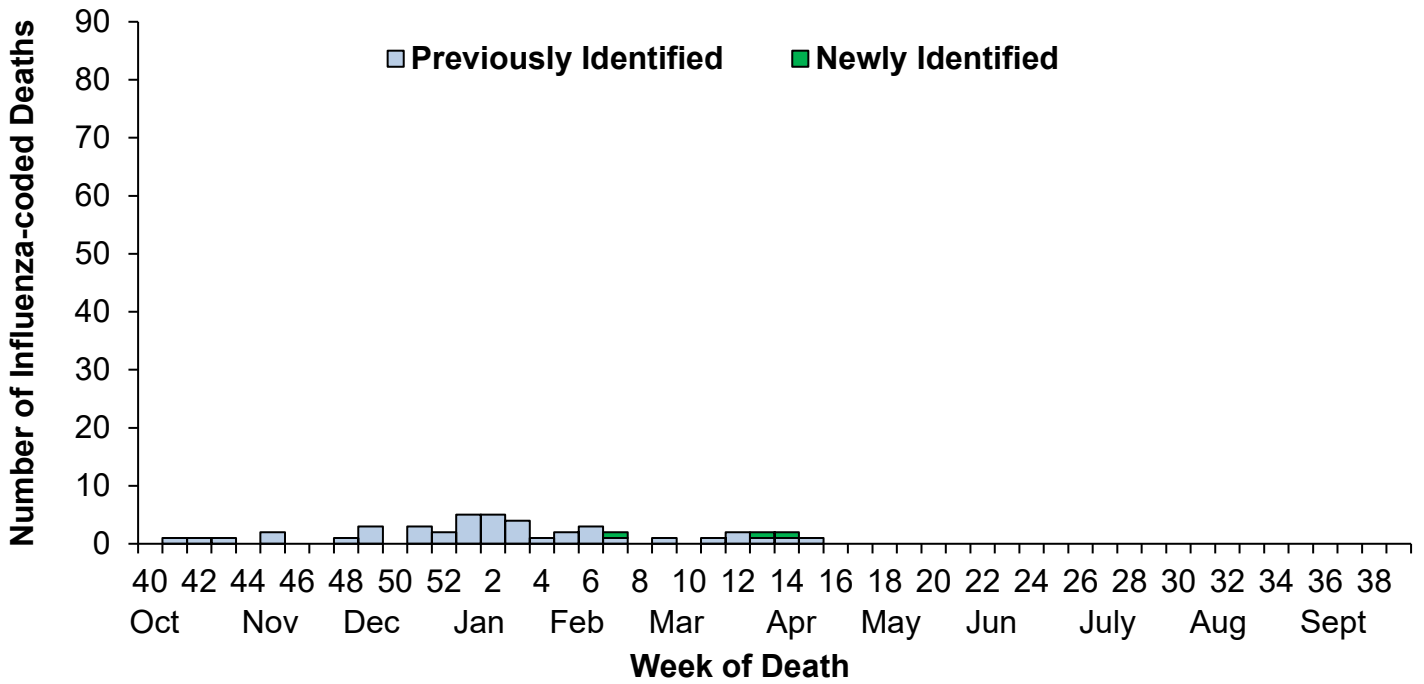
Note: Data have been shifted so that week 1 aligns across years.

4. Influenza Mortality Surveillance from Death Certificates

Deaths occurring in California among residents who had influenza noted in any cause of death field on the death certificate (text or coded) are defined as “influenza-coded deaths.” The percentage of influenza-coded deaths is calculated by dividing the number of influenza-coded deaths by the total number of all-cause deaths during the same period. Influenza-coded deaths are not necessarily laboratory-confirmed and are an underestimate of all influenza-associated deaths.

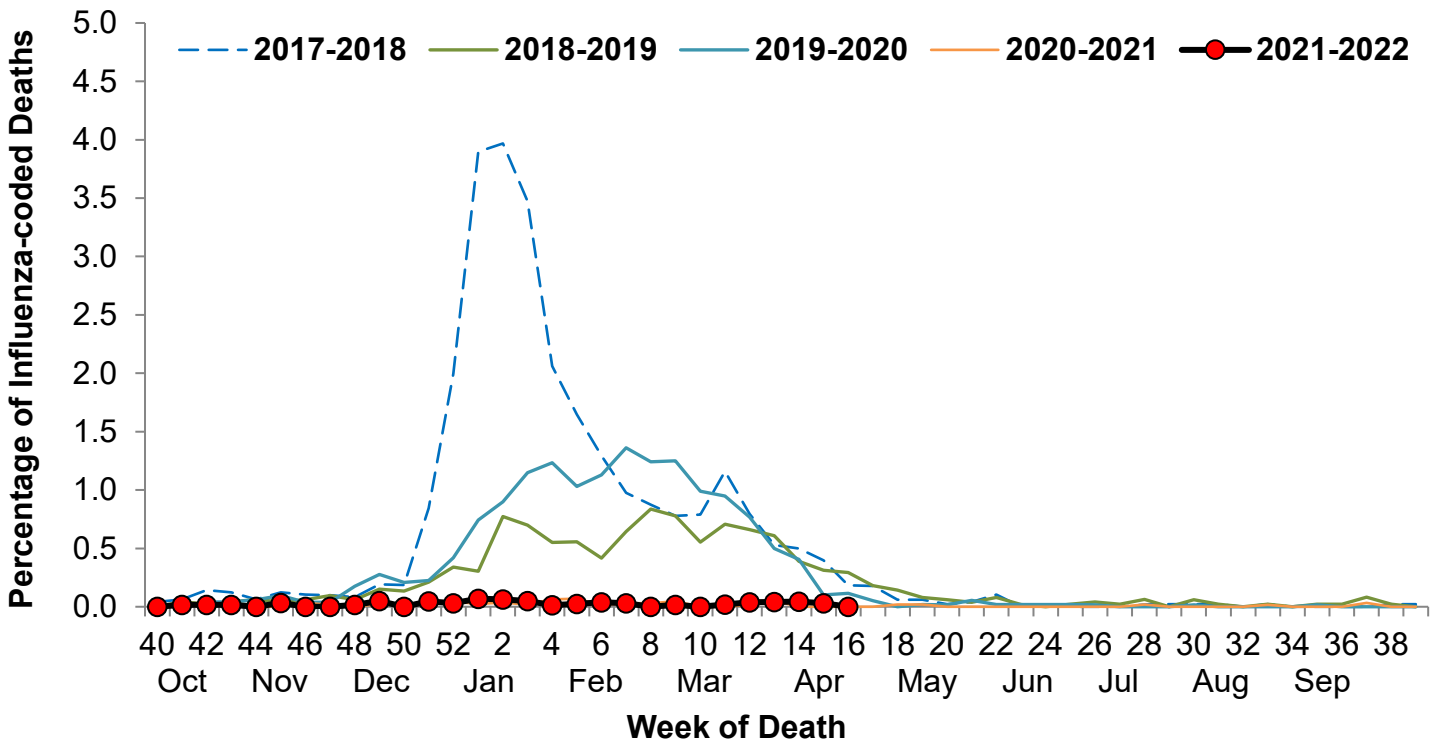
During Week 16, three influenza-coded deaths were identified. To date during the 2021–2022 influenza season, 45 influenza-coded deaths have been identified (Figure 5). The percentage of deaths coded as influenza during Week 16 was 0.0% compared to 0.0% during Week 15 (Figure 6).

Figure 5. Number of Influenza-coded Deaths Identified from Death Certificates by Week of Death, 2021–2022 Season



Note: Coding of deaths can be delayed by several weeks. Influenza-coded deaths will be included once enough information is available to identify them.

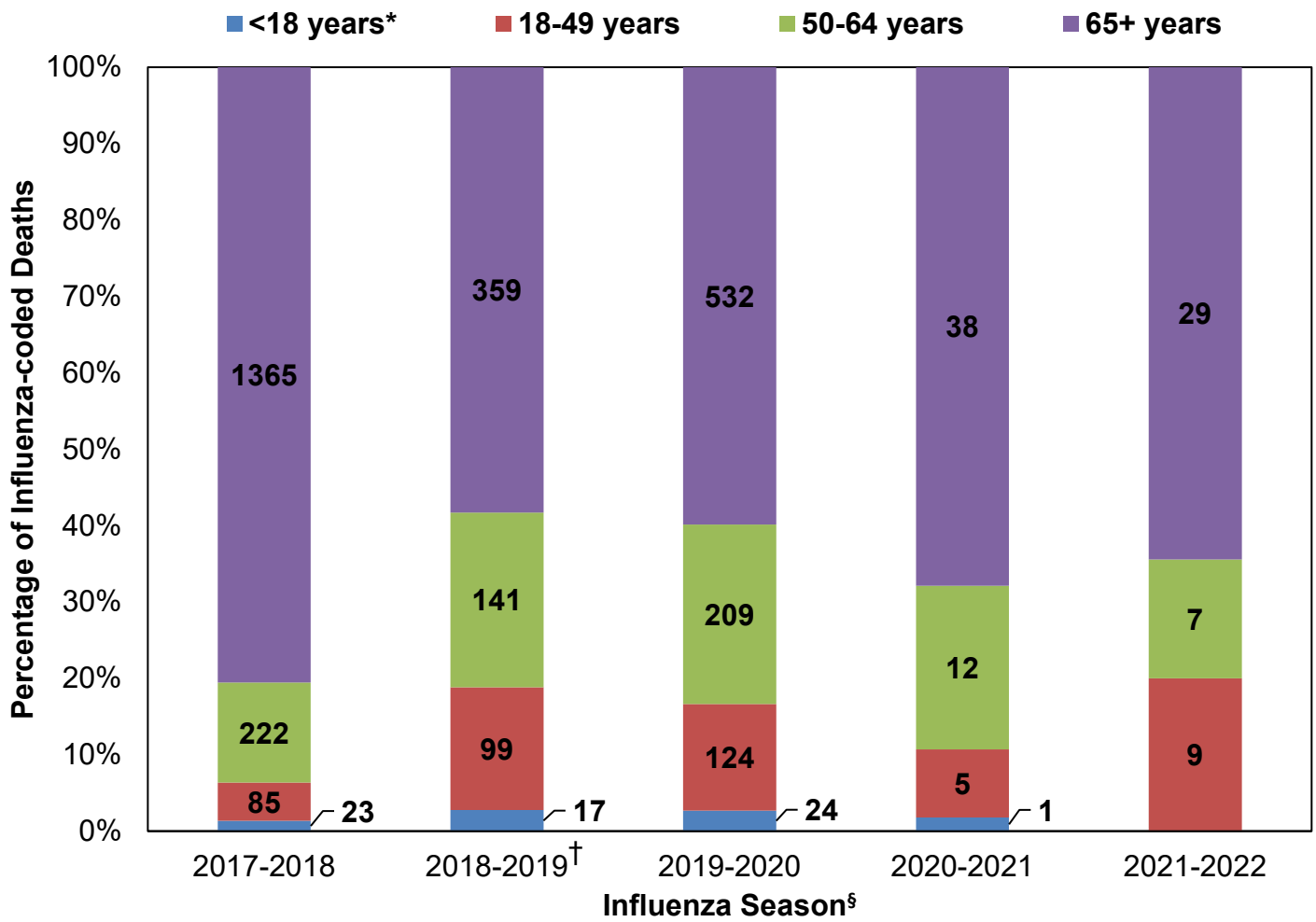
Figure 6. Percentage of Influenza-coded Deaths Occurring in California among California Residents, 2017–2022



Note: Data have been shifted so that week 1 aligns across years.

To date, the majority of influenza-coded deaths (64.4%) have been identified among persons ≥ 65 years of age during the 2021–2022 influenza season (Figure 7).

Figure 7. Age Distribution of Influenza-coded Deaths Occurring in California among California Residents, 2017–2018 Season through 2021–2022 Season



* Methods used to identify pediatric influenza-coded deaths on death certificates differ from those used to identify the influenza-associated pediatric deaths presented below.

[†] One death during the 2018–2019 influenza season has unknown age and is not included in the figure.

[§] 2017–2018 influenza season: October 1, 2017–September 29, 2018; influenza A (H3N2) predominant season

2018–2019 influenza season: September 30, 2018–September 28, 2019; mixed influenza A (H1N1)pdm09 and influenza A (H3N2) season

2019–2020 influenza season: September 29, 2019–September 26, 2020; mixed influenza B (Victoria) and influenza A (H1N1)pdm09 season

2020–2021 influenza season: September 27, 2020–October 2, 2021; Influenza activity was too low to determine a predominant strain

2021–2022 influenza season: October 3, 2021–October 1, 2022; primarily influenza A (H3N2) viruses circulating at this time

5. Laboratory-confirmed Influenza-associated Pediatric Deaths

Influenza-associated deaths in children <18 years of age are nationally notifiable. The weekly influenza report includes confirmed deaths formally reported to CDPH through April 23, 2022 (Week 16). Methods used to identify pediatric influenza-coded deaths on death certificates differ from those used to identify the influenza-associated pediatric deaths presented below and might not include the same individuals.

No laboratory-confirmed influenza-associated deaths among children <18 years of age were reported to CDPH during Week 16. To date, CDPH has received no reports of laboratory-confirmed influenza-associated deaths among persons <18 years of age during the 2021–2022 influenza season.

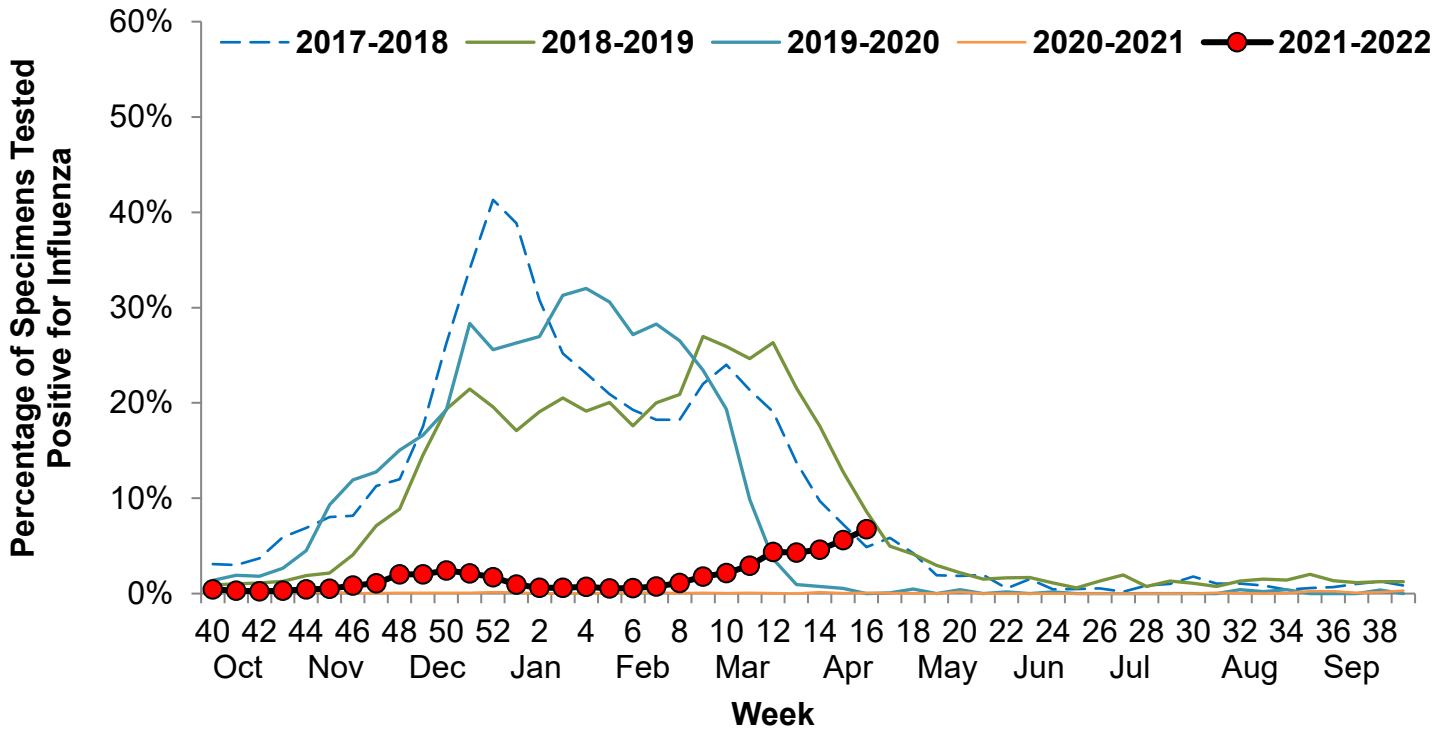
B. Laboratory Update – Influenza

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 16 (6.8%) was higher compared to Week 15 (5.6%) (Figure 8). Additional details, including influenza typing and subtyping information from public health laboratories can be found in Figures 8 and 9 and Tables 1 and 2.

Figure 8. Percentage of Influenza Detections at Clinical Sentinel Laboratories, 2017–2022



Note: Data have been shifted so that week 1 aligns across years.

Figure 9. Number of Influenza Detections by Type and Subtype Detected in the Respiratory Laboratory Network, 2021–2022

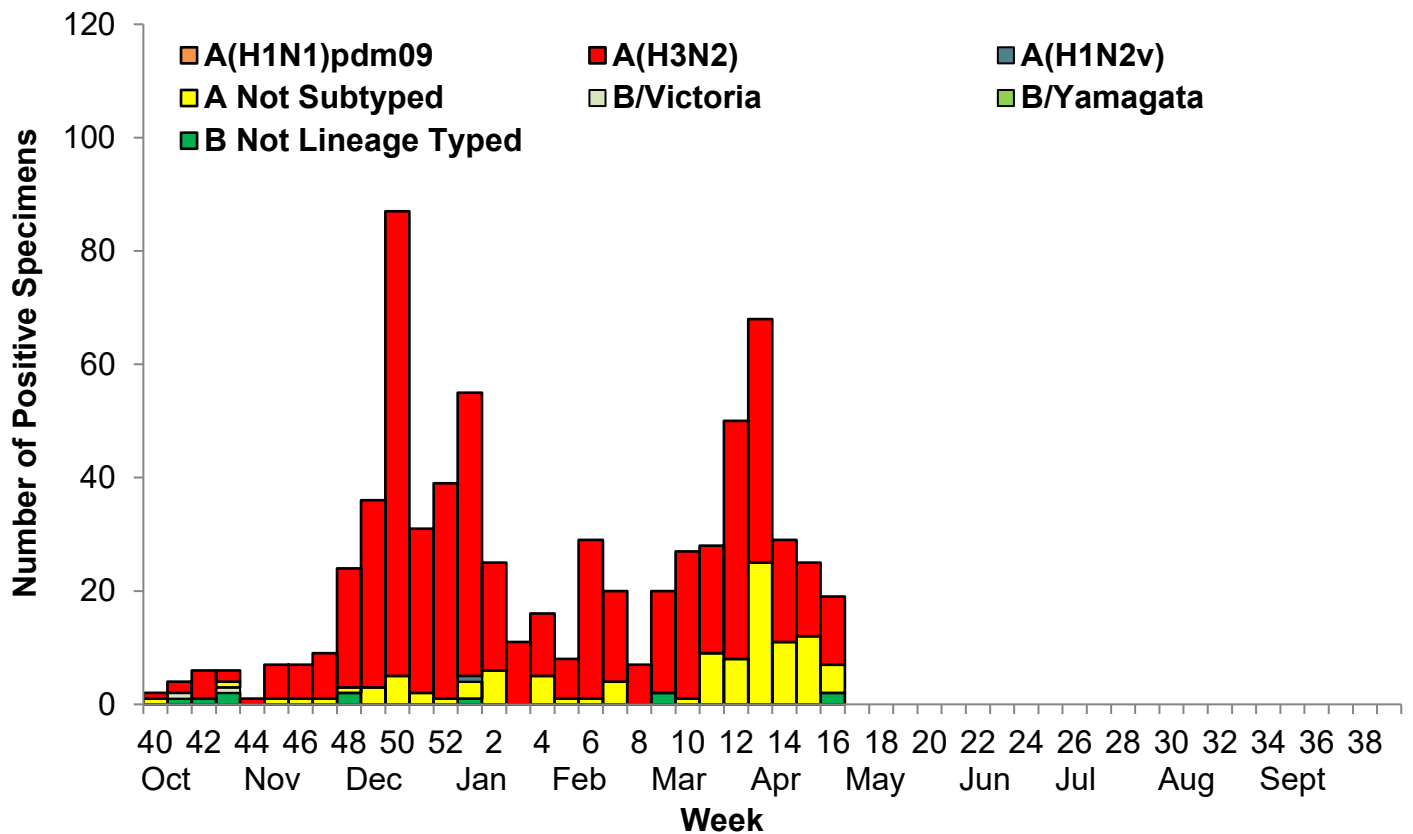


Table 1. Respiratory Specimens Testing Positive for Influenza – Clinical Sentinel Laboratories, Current Week and Season to Date

	Current Week Number	Current Week Percent	Season to Date Number	Season to Date Percent
Number of Specimens Tested	6,154		200,486	
Influenza Positive	416	6.8	3,620	1.8
A	416	100.0*	3,562	98.4*
B	0	0.0*	58	1.6*

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	19		696	
A	17	89.5*	683	98.1*
A (H1)pdm09	0	0.0 [†]	0	0.0 [†]
A (H3)	12	70.6 [†]	574	84.0 [†]
A (H1N2v)	0	0.0 [†]	1	0.1 [†]
A, not subtyped	5	29.4 [†]	108	15.8 [†]
B	2	10.5*	13	1.9*
B Victoria	0	0.0 [‡]	2	15.4 [‡]
B Yamagata	0	0.0 [‡]	0	0.0 [‡]
B, not lineage typed	2	100.0 [‡]	11	84.6 [‡]

2. Novel Influenza A Viruses

No new human infections with a novel influenza A virus were reported to CDPH. To date, CDPH has received one report of a human infection with a novel influenza A virus (H1N2v) variant.

When an influenza virus that normally circulates in swine (but not people) is detected in a person, it is called a “variant influenza virus.” Most human infections with variant influenza viruses occur following close proximity to swine, but person-to-person transmission can occur. In most cases, variant influenza viruses have not shown the ability to spread easily and sustainably from person to person. Early identification and investigation of human infections with novel influenza A viruses are critical so that the risk of infection can be more fully understood and appropriate public health measures can be taken. Additional information on influenza in swine, variant influenza virus infection in humans, and strategies to interact safely with swine can be found on the [CDC Swine/Variant Influenza website](#). Additional information regarding human infections

* Percent of specimens positive for influenza

[†] Percent of influenza A positives

[‡] Percent of influenza B positives

with novel influenza A viruses can be found on the [CDC FluView Interactive Novel Influenza A Virus Infections website](#).

3. Antiviral Resistance Testing

Of the influenza specimens tested by the CDPH-VRDL to date this season, none have been found to be resistant to Neuraminidase inhibitors (Table 3).

Table 3. Number of Specimens Tested for Neuraminidase Inhibitor Resistance, 2021–2022

	Neuraminidase Inhibitor Resistance
Influenza A (H1)pdm09	0/0
Influenza A (H3)	0/16
Influenza B	0/1

4. Influenza Virus Characterization

Close monitoring of influenza viruses is required to better assess the potential impact on public health. CDC characterizes influenza viruses through one or more tests including genetic characterization by analyzing viral [genome sequences](#), and antigenic characterization by [hemagglutination inhibition \(HI\)](#) assays and/or neutralization based Focus Reduction assays (FRA). These data are used to compare how similar, or well-inhibited, currently circulating influenza viruses are to the reference viruses. Antigenic and genetic characterization of circulating influenza viruses gives an indication of the influenza vaccine's ability to induce an immune response against the wide array of influenza viruses that are co-circulating every season. However, annual [vaccine effectiveness estimates](#) are needed to determine how much protection was provided to the population by vaccination.

One hundred six influenza A (H3N2) viruses from California have been genetically characterized to date during the 2021–2022 influenza season. All 106 influenza A (H3N2) virus were members of the 3C.2a1b.2a2 clade and subclade (Table 4a). Antigenic characterization information will be presented once available.

No influenza A (H1N1)pdm09 viruses from California have been genetically or antigenically characterized to date during the 2021–2022 influenza season (Table 4b).

One influenza B (Victoria) virus from California has been genetically characterized to date during the 2021–2022 influenza season. The one influenza B (Victoria) virus was a member of the V1A.3 subclade (Table 4c). Antigenic characterization information will be presented once available.

No influenza B (Yamagata) viruses from California have been genetically or antigenically characterized to date during the 2021–2022 influenza season (Table 4d).

Table 4 a–d. Influenza virus antigenic characterization and genomic sequencing by influenza A subtype and influenza B lineage type – California, 2021–2022 influenza season

a. Influenza A (H3N2) viruses

Antigenic Characterization	Virus Clade/ Subclade 3C.2a1b.2a1[§]	Virus Clade/ Subclade 3C.2a1b.2a2	Total
Well inhibited by A/Cambodia/e0826360/2020 [§]	0	0	0
Poorly inhibited by A/Cambodia/e0826360/2020 [§]	0	0	0
Not antigenically characterized	0	106	106
Total A (H3N2)	0	106	106

b. Influenza A (H1N1)pdm09 viruses

Antigenic Characterization	Virus Clade 6B.1A.5a.1	Virus Clade 6B.1A.5a.2^{**}	Total
Well inhibited by A/Victoria/2570/2019 or A/Wisconsin/588/2019 ^{**}	0	0	0
Poorly inhibited A/Victoria/2570/2019 or A/Wisconsin/588/2019 ^{**}	0	0	0
Not antigenically characterized	0	0	0
Total A (H1N1)pdm09	0	0	0

c. Influenza B (Victoria) viruses

Antigenic Characterization	Virus Subclade V1A.3^{††}	Virus Subclade V1A.3a.2	Total
Well inhibited by B/Washington/02/2019 ^{††}	0	0	0
Poorly inhibited by B/Washington/02/2019 ^{††}	0	0	0
Not antigenically characterized	1	0	1
Total B (Victoria)	1	0	1

[§] A/Cambodia/e0826360/2020-like virus (egg-based and cell-based vaccines) is the influenza A (H3N2) component included in the 2021–2022 quadrivalent influenza vaccine and is a member of the 3c.2a1b.2a1 clade and subclade

^{**} A/Victoria/2570/2019-like virus (egg-based vaccine) and A/Wisconsin/588/2019-like (cell-based vaccine) are the influenza A (H1N1)pdm09 components included in the 2021–2022 quadrivalent influenza vaccine and are members of the 6B.1A.5a.2 clade

^{††} B/Washington/02/2019-like virus (egg-based and cell-based vaccines) is the influenza B (Victoria) lineage component included in the 2021–2022 quadrivalent influenza vaccine and is a member of the V1A.3 subclade

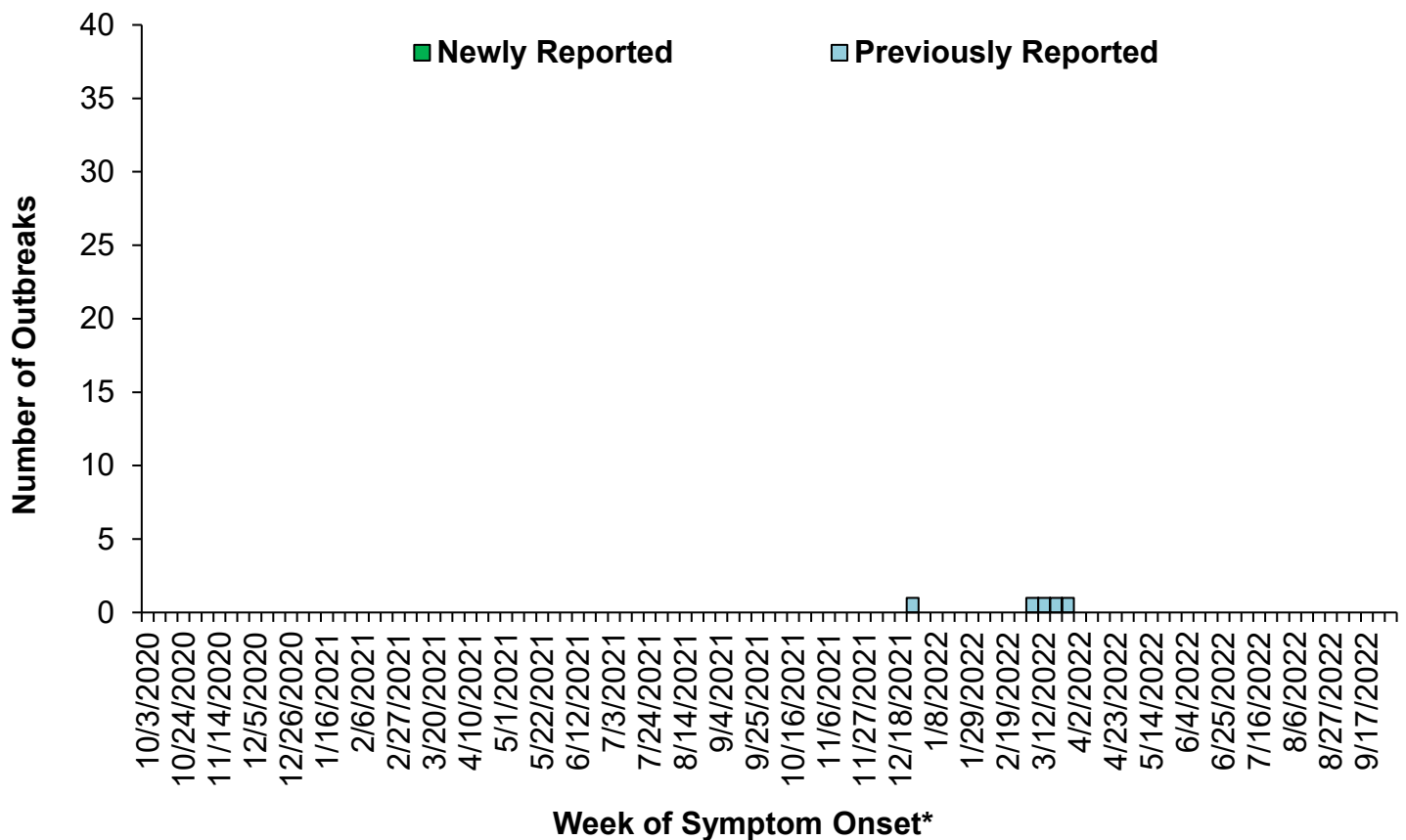
d. Influenza B (Yamagata) viruses

Antigenic Characterization	Virus Clade Y3**	Total
Well inhibited by B/Phuket/3073/2013**	0	0
Poorly inhibited by B/Phuket/3073/2013**	0	0
Not antigenically characterized	0	0
Total B (Yamagata)	0	0

C. Influenza-associated Outbreaks

No new laboratory-confirmed influenza outbreaks were reported to CDPH during Week 16. To date, five laboratory-confirmed influenza outbreaks have been reported to CDPH for the 2021–2022 season.

Figure 10. Number of Laboratory-confirmed Influenza-associated Outbreaks by Week of First Onset, 2020–2022



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

** B/Phuket/3073/2013-like virus (egg-based and cell-based vaccines) is the influenza B (Yamagata) component included in the 2021–2022 quadrivalent influenza vaccine and is a member of the Y3 clade

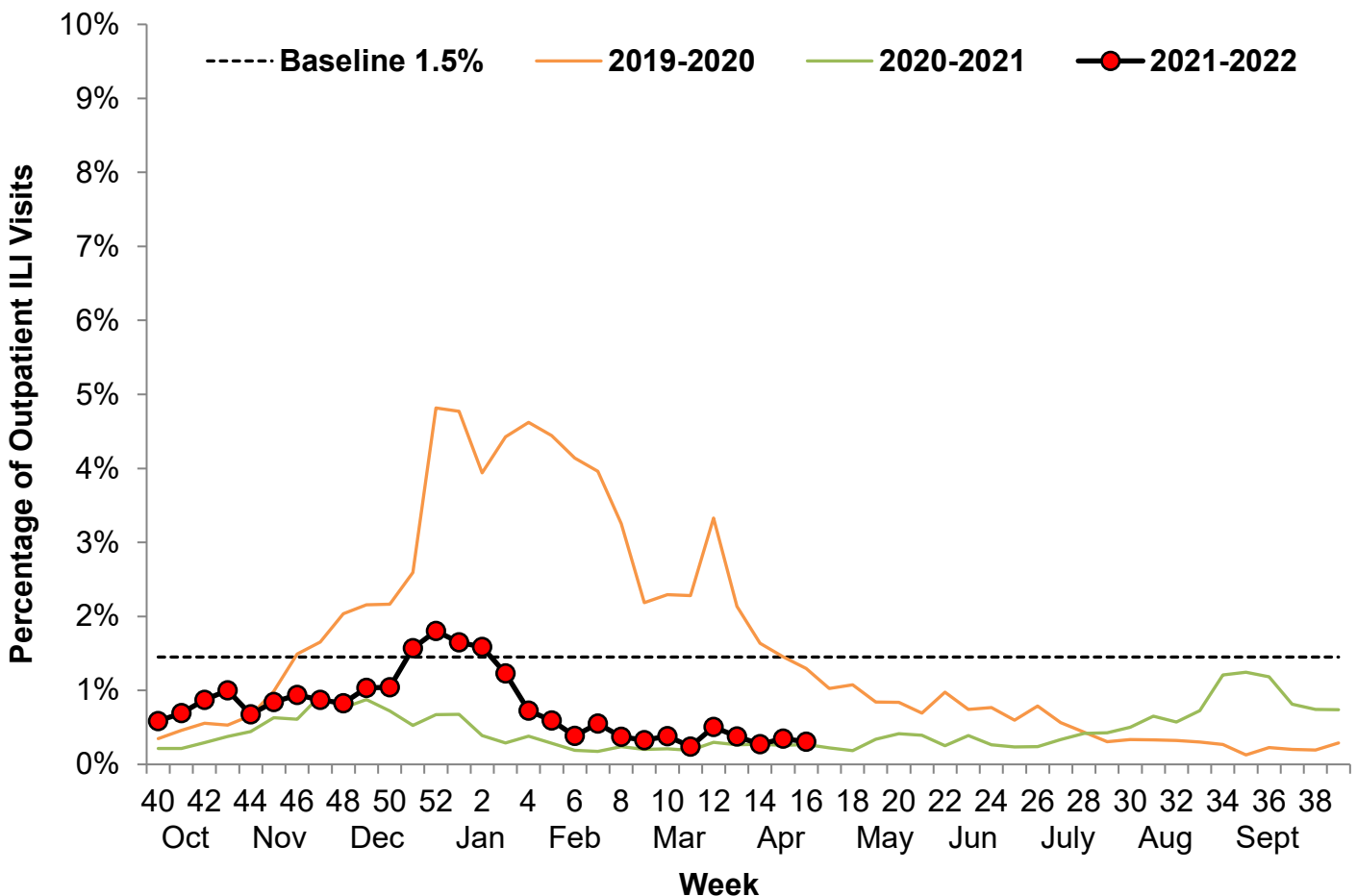
D. California Border Region Influenza Surveillance Network Data

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 16. The total number of patients screened by all sentinel sites for ILI during Week 16 was 12,025. Outpatient ILI activity was 0.3% in Week 16. ILI activity for the California border region during Week 16 was lower when compared to activity for the same week during the 2019–2020 season and higher when compared to activity for the same week during the 2020–2021 season (Figure 11). All influenza syndromic data summarized for the border region represent a subset of CDC influenza sentinel providers in California. Increases in ILI-related outpatient visits might also include people seeking care for other respiratory illness, including COVID-19.

Figure 11. Percentage of Influenza-like Illness Visits among Patients Seen by Sentinel Providers – California Border Region, 2019–2022



Note: Data have been shifted so that week 1 aligns across years.

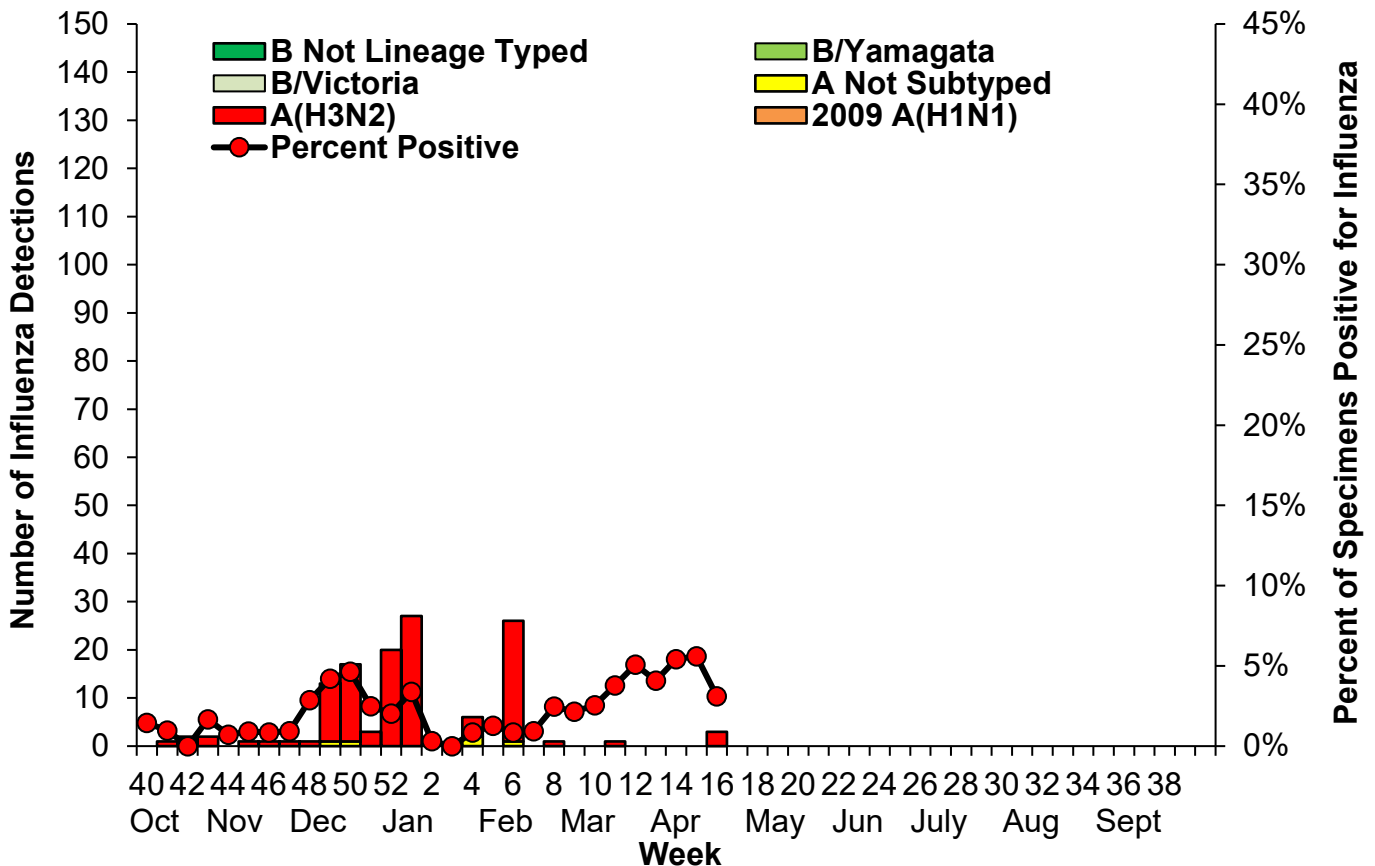
2. Virologic Surveillance Update

During Week 16, 290 respiratory specimens were tested from border region sentinel clinical laboratories; of these, nine (3.1%) tested positive for influenza (nine [100.0%] influenza A). Cumulatively this season, a total of 9,306 respiratory specimens were tested from border region sentinel clinical laboratories; of these, 211 (2.3%) tested positive for influenza (204 [96.7%] influenza A and seven [3.3%] influenza B).

During Week 16, three influenza positive specimens were reported from border region RLN laboratories; of which three (100.0%) were influenza A. Of the three specimens that tested positive for influenza A at RLN laboratories, three (100.0%) were subtyped as A (H3). Cumulatively this season, a total of 126 influenza positive specimens have been detected at border region RLN laboratories; of which, 126 (100.0%) were influenza A. Of the 126 specimens that tested positive for influenza A at RLN laboratories, 121 (96.0%) were subtyped as A (H3) and five (4.0%) had no further subtyping performed.

Laboratory data summarized in Figure 12 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 12. 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, 2021–2022



E. Other Respiratory Viruses

1. Laboratory-confirmed Respiratory Syncytial Virus-associated Death 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 April 23, 2022 (Week 16).

No laboratory-confirmed RSV-associated deaths among children <5 years of age were reported to CDPH during Week 16. To date, CDPH has received four reports of laboratory-confirmed RSV-associated deaths among children <5 years of age during the 2021–2022 influenza season.

2. Other Respiratory Virus Laboratory Update

During Week 16, 5,433 specimens were tested for RSV and 71 (1.3%) were positive, which is the same compared to Week 15 (1.3%) (Figure 13). During Week 16, parainfluenza activity increased; adenovirus, coronavirus (non-SARS-CoV-2), and human metapneumovirus activity decreased; and rhinovirus/enterovirus activity remained the same (Figure 14).

Figure 13. Percentage of RSV Detections at Clinical Sentinel Laboratories, 2017–2022

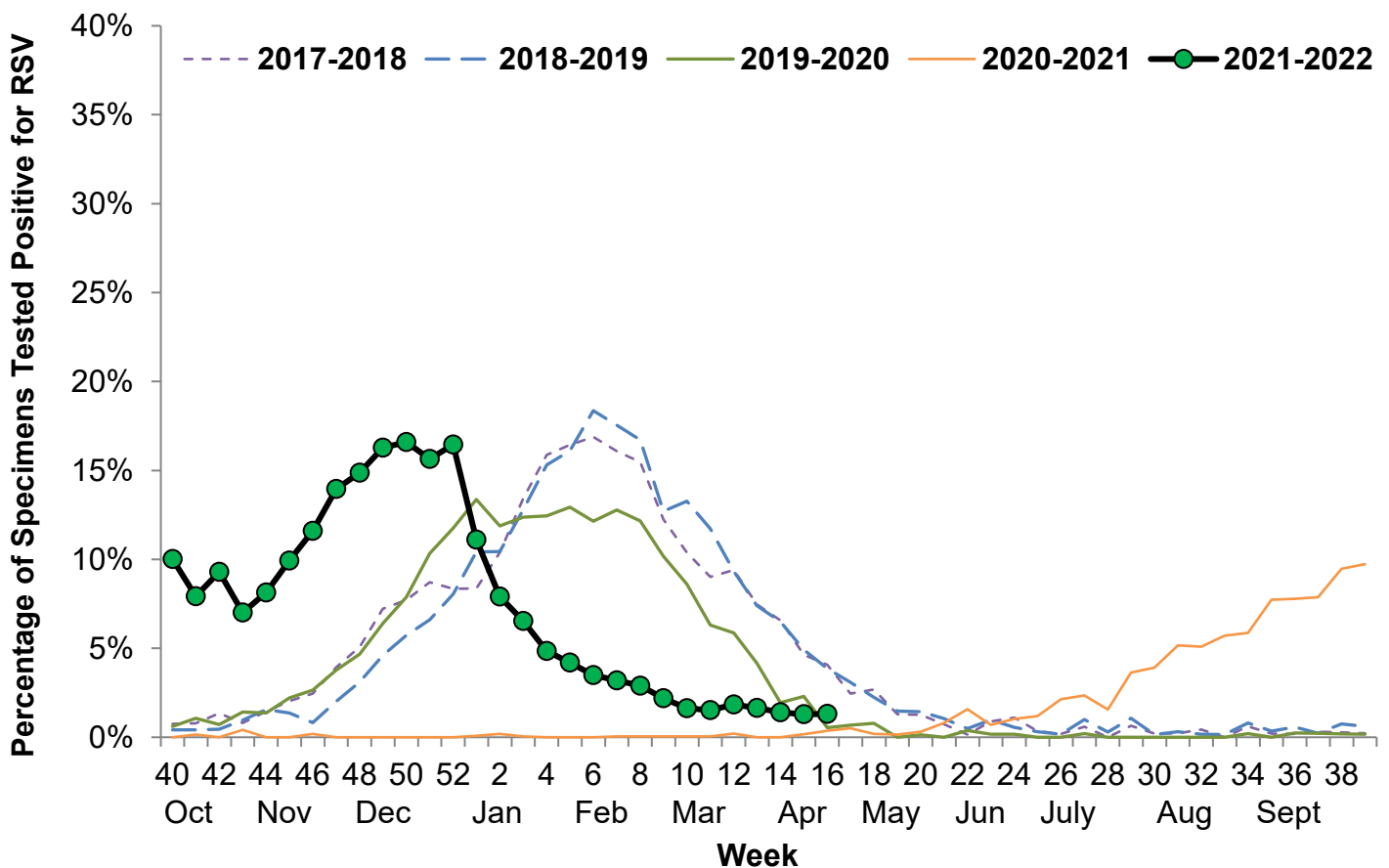
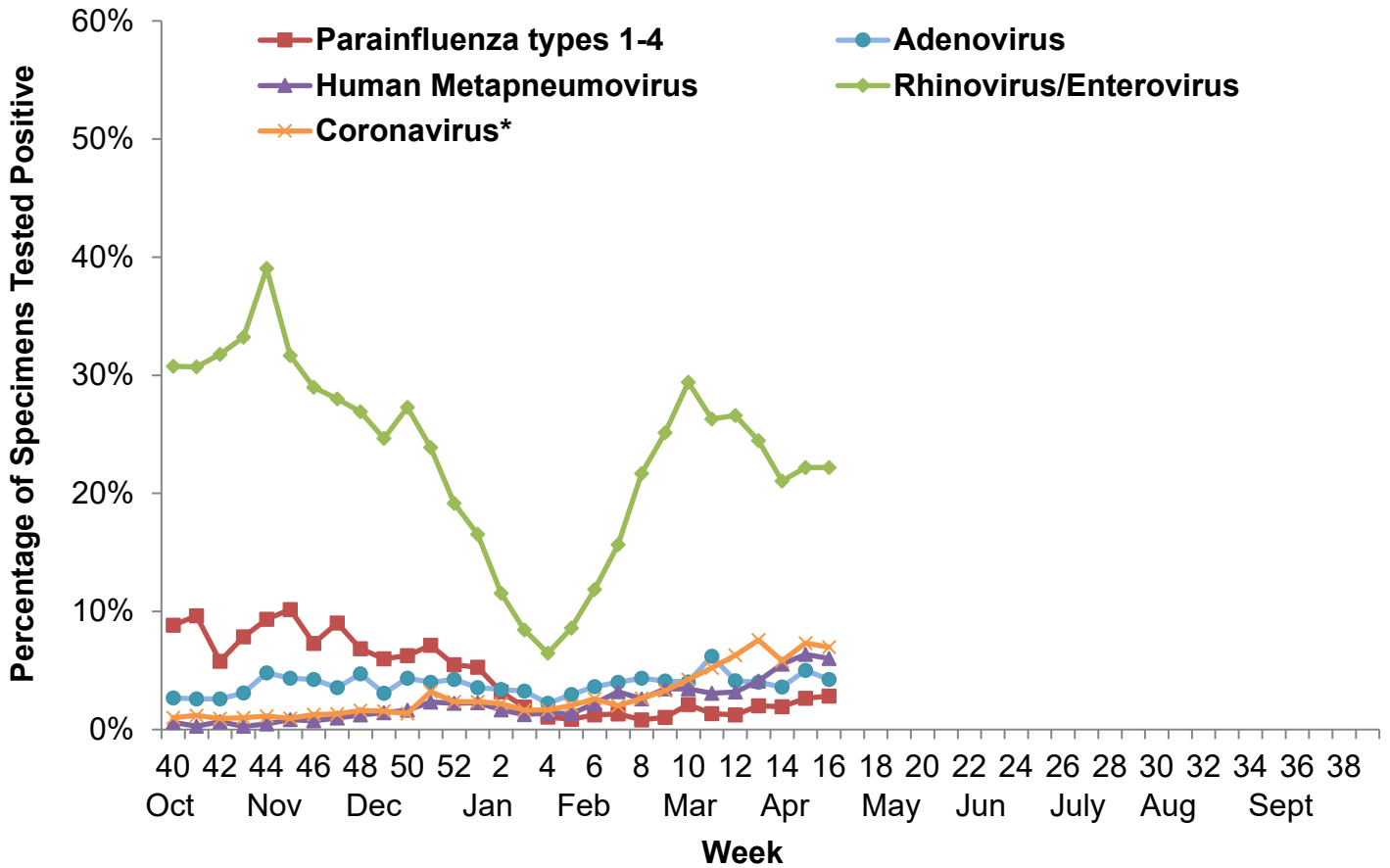


Figure 14. Percentage of Other Respiratory Pathogen Detections at Clinical Sentinel Laboratories, 2021–2022



*Coronaviruses identified include common human coronaviruses 229E, NL63, OC43, and HKU1 and do NOT include SARS-CoV-2.

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

An accessible excel file with data for all figures can be downloaded from the [CDPH Flu webpage](#)

(http://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/Immuni zation/Week2021-2216_DataTables.xlsx)

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](#) (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](#) (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](#) (www.cdc.gov/flu/weekly/index.htm) and [FluView Interactive](#) (www.cdc.gov/flu/weekly/fluviewinteractive.htm) websites.

For information about COVID-19 in California, please visit the [CA COVID website](#) (covid19.ca.gov).

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