



Emerging Infections Newsletter for Clinicians

Jan. 24, 2024

Written by Dr. Silvers with contributions from Dr. Joan Etzell (Lab), Lisa Rieg (Pharmacy), and Gordon Sproul (Pharmacy). Please use Google Chrome for the best experience.

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Measles

- This is only January and already measles is being reported in multiple states. The Philadelphia outbreak has confirmed nine cases.
- [Washington](#) state has identified three epidemiologically linked cases in unvaccinated adults. [Delaware](#) reported a pre-symptomatic, contagious patient in a children's hospital that potentially exposed 20-30 people. [New Jersey](#) has identified a case and is investigating contacts. [Missouri](#) identified a person who landed at Kansas City International Airport on Jan. 4 and went to the hospital the following day. [Virginia](#) identified a person returning from international travel.
- The rate of infections after measles has increased in children in both low- and high-resource settings. This is known as "measles-induced immune amnesia," which is believed to result from a reduction in the diversity of the immune memory after measles infection.
- [Science 2019](#) published a study in 77 unvaccinated children demonstrating that 11% to 73% of about 400 pathogen-specific, anti-viral antibodies in the blood disappeared after the person developed measles.
- Total IgG, IgA, and IgM levels were unchanged, reflecting a specific loss of anti-viral protection. Re-exposure to a pathogen resulted in the re-development of antibodies, showing that the person became susceptible to pathogens again similar to the first exposure.
- Uninfected, unvaccinated, cohort controls did not have any similar findings. MMR (measles, mumps and rubella) vaccines did not impair the immune response.
- [Frontiers in Pediatrics](#) June 2022 published a retrospective cohort study comparing 250 children with measles versus 502 matched, uninfected children and 498 non-measles, infectious disease controls.
- The study population was in children in Germany between October 2014 and November 2015. Repeat visits within 3 years were recorded. The relative risk of a person post-measles presenting three or more times with an infection was 1.8 (95% Ci 1.3-2.4, p=0.01) compared to non-infectious controls and 1.4 (95%ci 1.0-1.9, p=0.04) for non-measles, infectious controls.

Measles Take-home

Measles is a vaccine-preventable, emerging infectious disease.

- Vaccine hesitancy remains a major risk for outbreaks.
- Aside from the associated hospitalizations, morbidity and mortality from measles, longer-term effects on the immune system can increase the risk of subsequent infections from other pathogens.
- Children with measles are statistically more likely over the following 3 years to be seen with additional infections compared to non-infectious controls and non-measles, infectious controls.

The Tripledemic

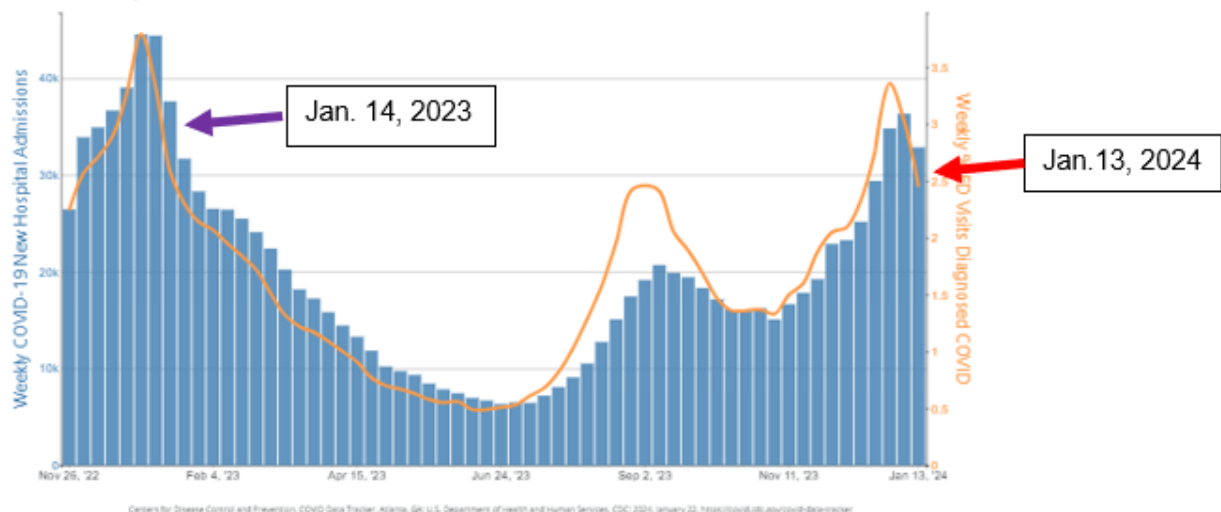
- JN.1 now dominates over other SARS-CoV-2 strains, being identified in over 80% of sequenced isolates in the United States, including amongst international travelers landing in the U.S.
- SARS-CoV-2 positivity rates remain elevated, but stable above 10% in the United States and Europe. Weekly hospitalizations with COVID as a diagnosis (severity not indicated) are only a little higher than the same time last year.
- Wastewater levels remain high and case levels due to JN.1 are anticipated to stay high for four to six weeks, based on historical trends.

- The RSV season appears to be on the decline. Positivity rates, although still elevated, are dropping in California and throughout Sutter. Children under 6 years old still comprise most patients. Illness rates in persons \geq 60 years old are showing the same reduction pattern.
- Influenza activity is the highest of the three respiratory viruses in Europe and the United States. It is still too early to declare the course of this flu season.
- It is critical to note that regardless of the trends, all three infections are circulating at increased levels and a lot of people will continue to get sick.
- Even with decreasing RSV levels, infants and very young children still remain at risk. Nirsevimab for newborns and children entering their first RSV season should be administered to appropriate children, when available.
- Influenza vaccine matches circulating strains in the world.

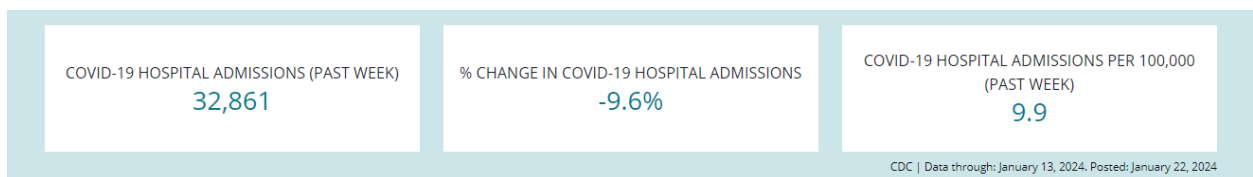
COVID-19

- JN.1 has established itself as the most dominant strain in the world.
- The [WHO](#) reports surveillance positivity rates in Europe are stable to decreasing.
- [Hospitalizations](#) in the United States are a surrogate for the virulence of the circulating strain. The graph below has been modified to make it easier to see trends from the last 15 months.
- As before, the blue vertical bars represent the number of hospitalizations per week and the orange run line demonstrates the percentage of patients being diagnosed with COVID in emergency departments.
- Hospitalization rates are very similar now compared to 1 year ago. The week of Jan.14, 2023 had 37,615 hospitalizations (purple arrow) compared to 32,861 during the week ending Jan. 13, 2024 (red arrow).

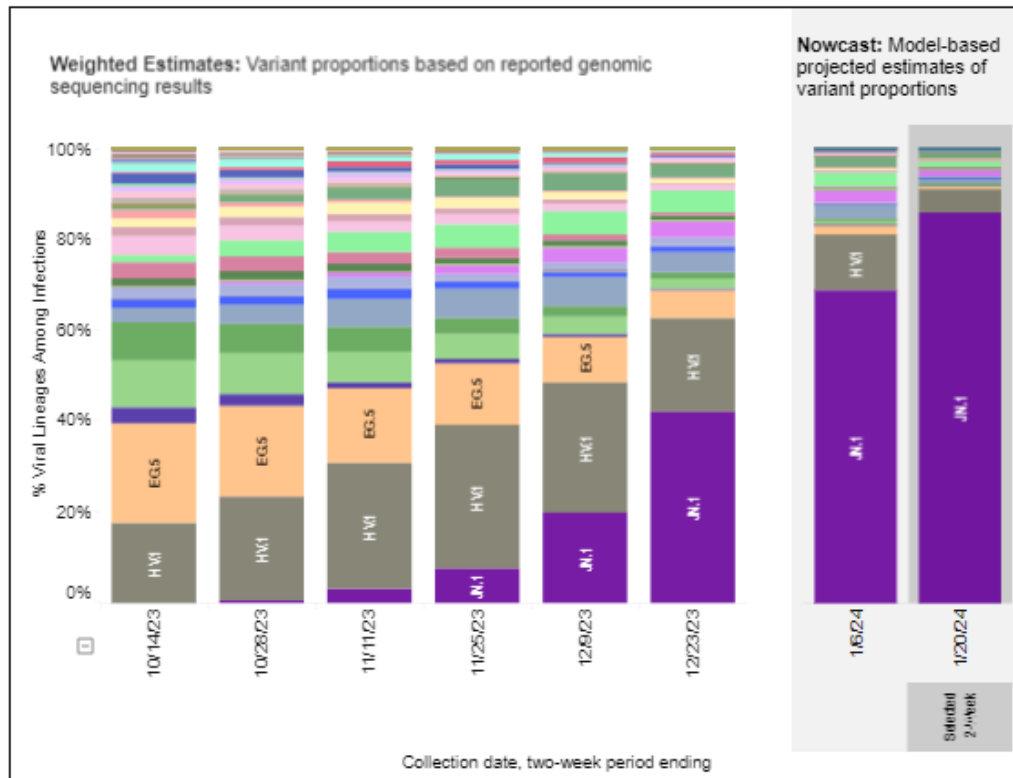
COVID-19 New Hospital Admissions and Percentage of Emergency Department (ED) Visits Diagnosed as COVID-19, by Week, in The United States, Reported to CDC



- The CDC tracks hospital admissions per 100,000 county population. Less than 10/100,000 is considered a low number of new hospital admissions. National rates have declined and are now below that threshold at 9.9/100,000.

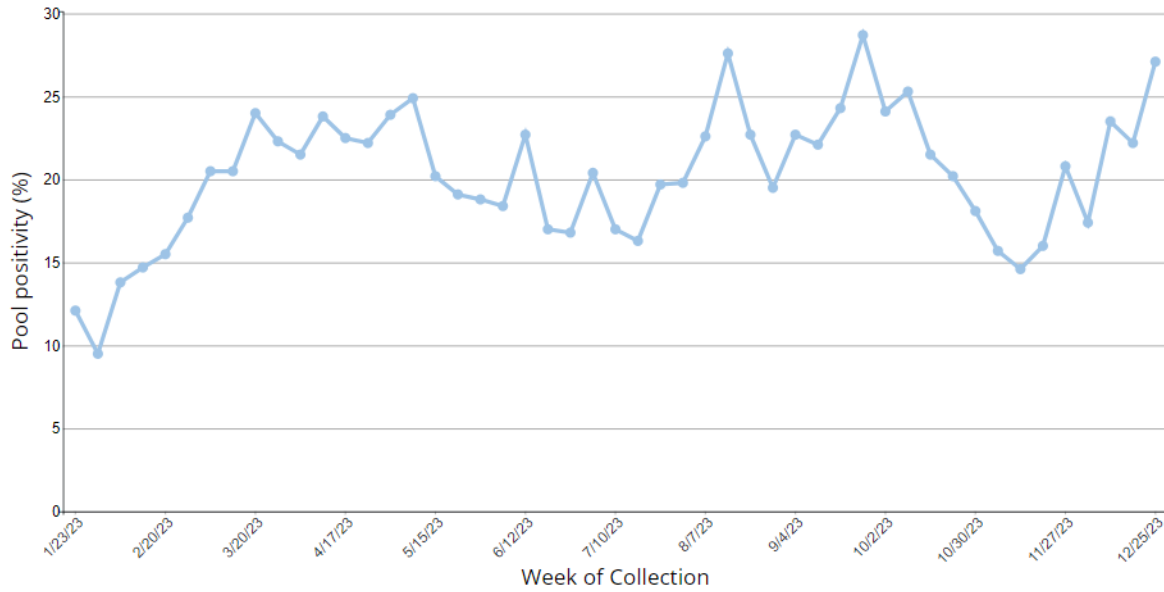


- [National genomic sequencing](#) by the CDC was updated on Jan.19 and is shown on the graph below. The most recent report includes estimates from Jan. 7 to Jan. 20.
- As expected, JN.1 has clearly established itself as the overwhelmingly dominant variant at 85.7% of sequenced isolates (purple bar).
- JN.1 has only one spike protein amino acid change from BA.2.86. That extra mutation has increased the SARS-CoV-2 ability to escape host immune recognition. All other strains are minor at this time.

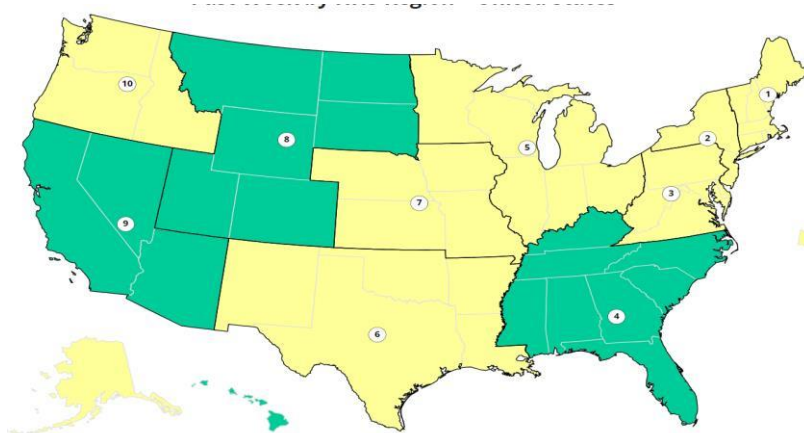


- Surveillance of international air travelers is conducted at several major U.S. airports as an early warning system and to fill gaps in worldwide genomic surveillance. It covers flights from more than 135 countries.
- Traveler-based genomic surveillance positivity rates are on the graph below. Positivity rates for the latest week reported (ending Dec. 25) were up to 27%. JN.1 is now being separated out from BA.2.86. JN.1 represents 80% of sequenced international isolates (data not shown).

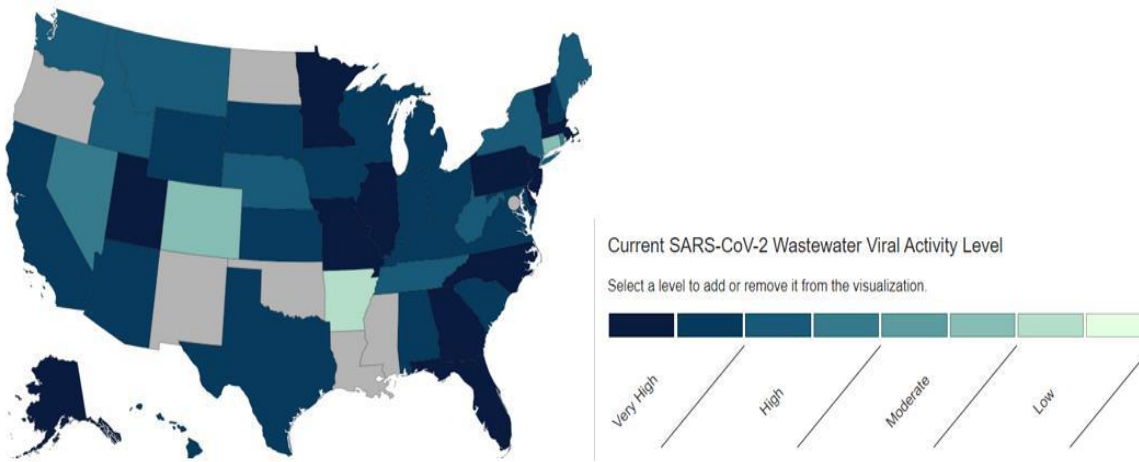
Positivity Rate for Pooled Samples, by Collection Week



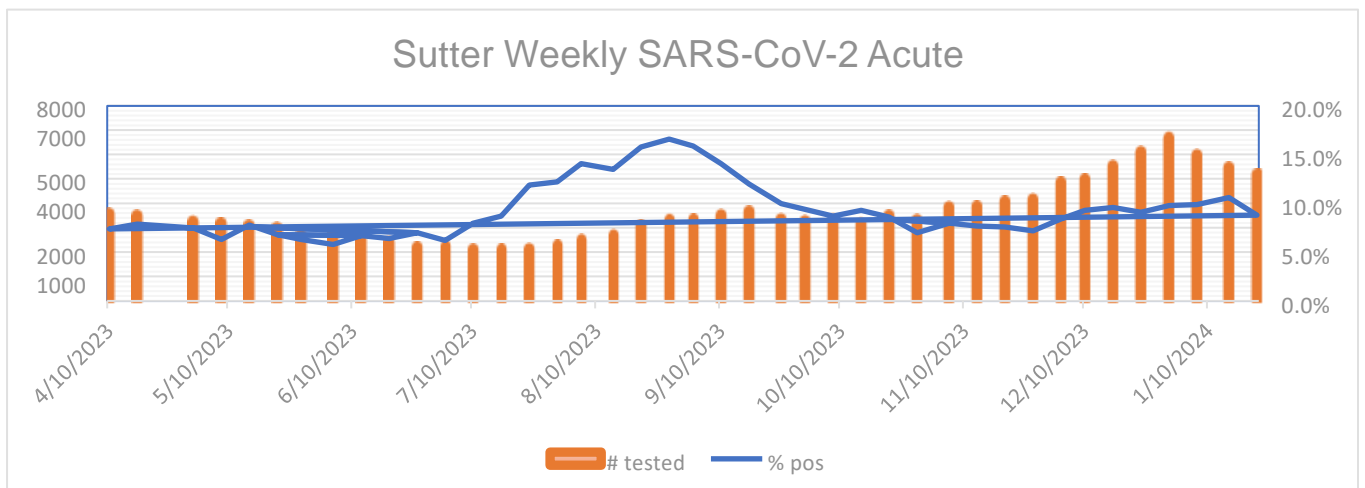
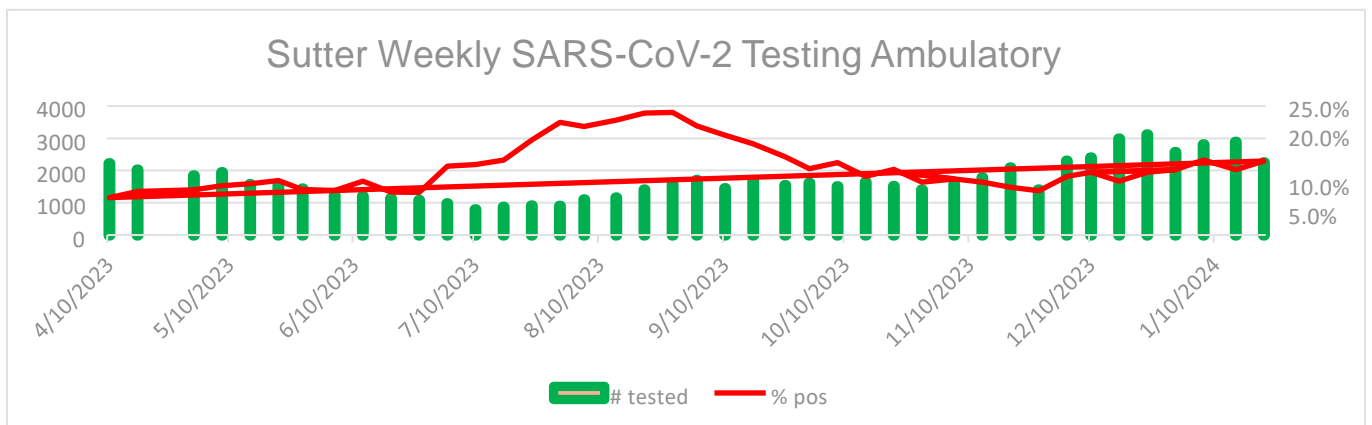
- The map below shows [national](#) molecular test positivity rates by region (updated on Jan. 22). Despite the rapid rise of JN.1, three regions still have positivity rates <10% (green). Seven regions are yellow (10-14.9% positivity). None are higher.



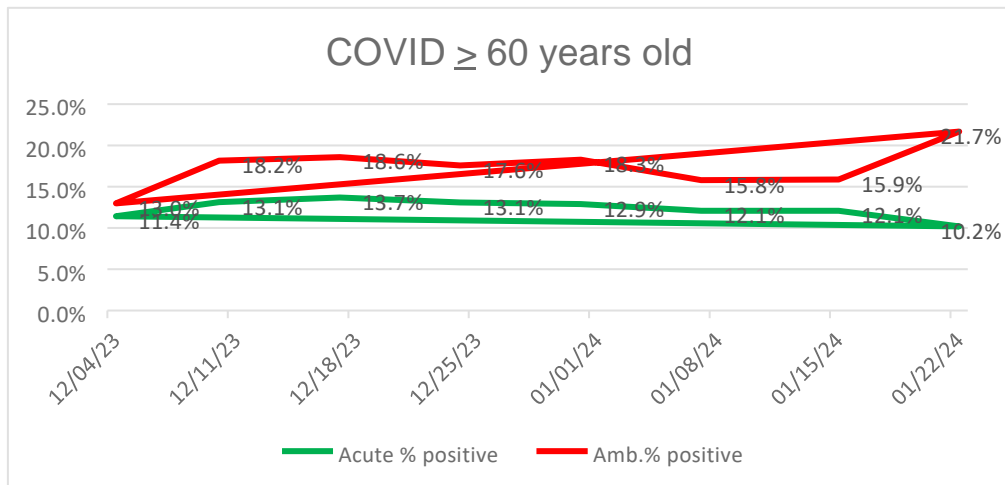
- SARS-Co-V-2 wastewater levels remain high to very high almost everywhere that it is measured. The map below is from the [CDC](#) site, grey represents insufficient data. Arkansas is the only state with low levels.



- Updated Sutter testing data below show stable, elevated, positivity rates in combination with high levels of testing. Rates are only a little higher than April through June of 2023.



- COVID test positivity rates in persons greater than 60 years old are being pulled out to analyze. Rates in this age group are higher than the total cohort of all ages. Notably acute (ED) rates are decreasing but ambulatory rates are going in the opposite direction. This suggests increasing, mostly mild-moderate disease.



Treatment

The search continues for better tolerated, more effective, less expensive, oral therapies for SARS-CoV-2. Oral simnotrelvir + ritonavir is available in China under a government-issued Emergency Use Authorization for treatment of COVID-19. The [NEJM](#), Jan. 18 published a Chinese, phase 2/3, multicenter, placebo-controlled study of mild to moderate COVID, less than 3 days from onset.

- Time to sustained resolution of COVID-19 symptoms was significantly shorter in the simnotrelvir group than the placebo group (180.1 versus 216.0 hours) among patients in the modified intention-to-treat population.
- The decrease in viral load from baseline was greater in the simnotrelvir group than in the placebo group on day 5 (mean difference, $-1.51 \pm 0.14 \log_{10}$ copies/mL).
- A higher incidence of adverse events during treatment was seen in the simnotrelvir group versus placebo group (29.0 versus 21.6 percent); most of the adverse events were mild or moderate.
- No comparison data versus Paxlovid®, molnupiravir, or a 3-day course of remdesivir.

COVID-19 Take-Home:

JN.1 dominates in the United States and in international travelers coming to the United States.

- Wastewater rates are very high.
- SARS-CoV-2 positivity rates remain elevated in Europe, nationally and within Sutter.
- Although positivity rates are relatively stable, we should anticipate that they might not drop in the near term.
- Persons 60 years and older, which comprise a very high-risk group, have a higher positivity rate than the composite of all ages. However, higher ambulatory rates suggest that hospitalizations will not dramatically increase.
- Simnotrelvir plus ritonavir in early mild to moderate COVID shortens the time to resolution of symptoms compared to placebo. Additional efficacious treatment options may help lower the overall cost of therapy and improve equity in distribution.

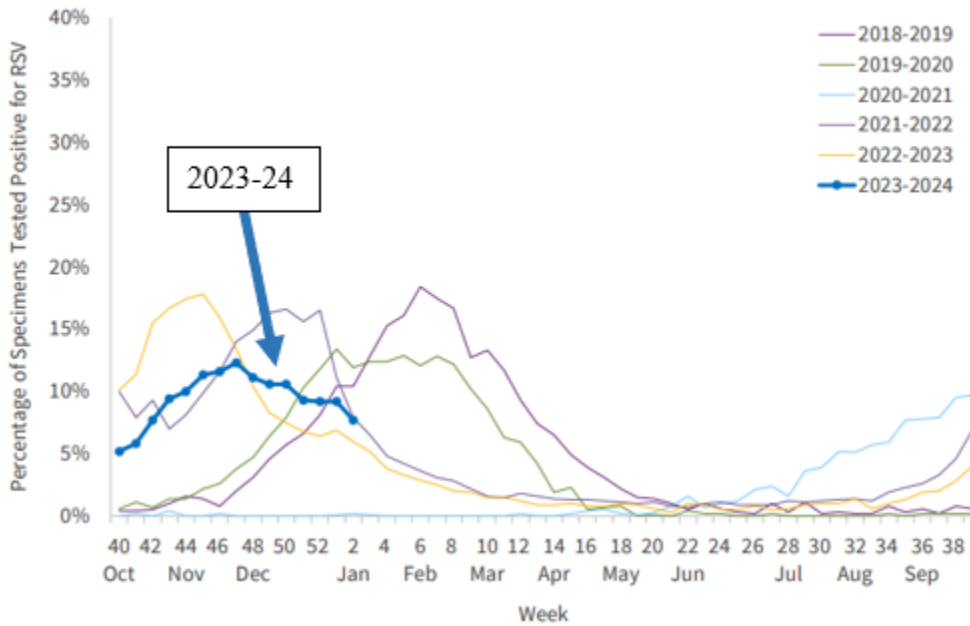
Related Links

- [CDC Caring for Patients](#)
- [CDC Data Tracker](#)
- [CDC Latest Updates](#)
- [CDC Vaccine Information](#)
- [CDPH Tracking and Vaccination Updates](#)
- [Sutter Health for Clinicians](#)

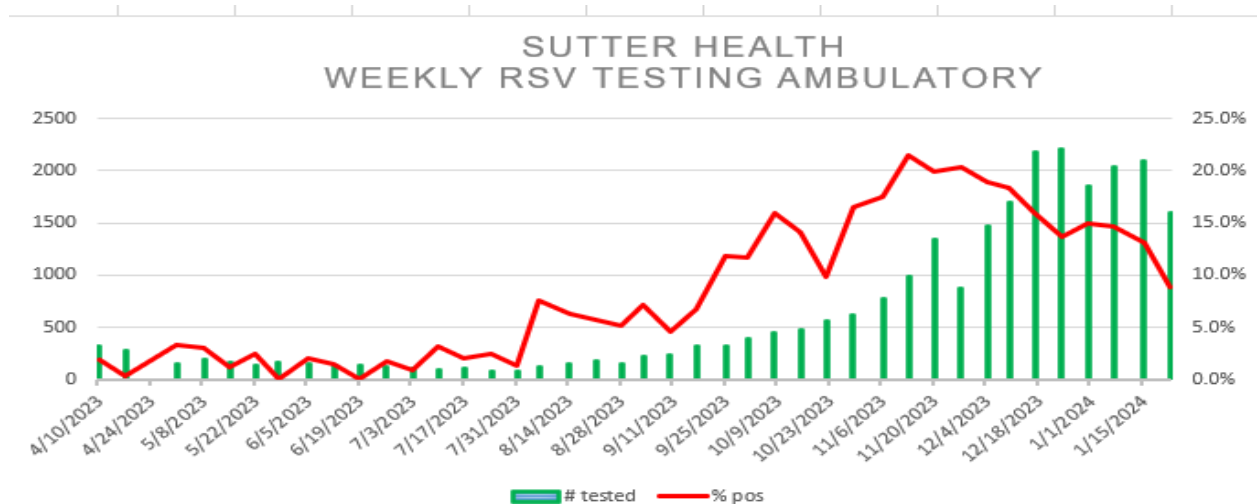
- [Sutter Health for Patients](#)
- [WHO Table of Contents](#)

RSV

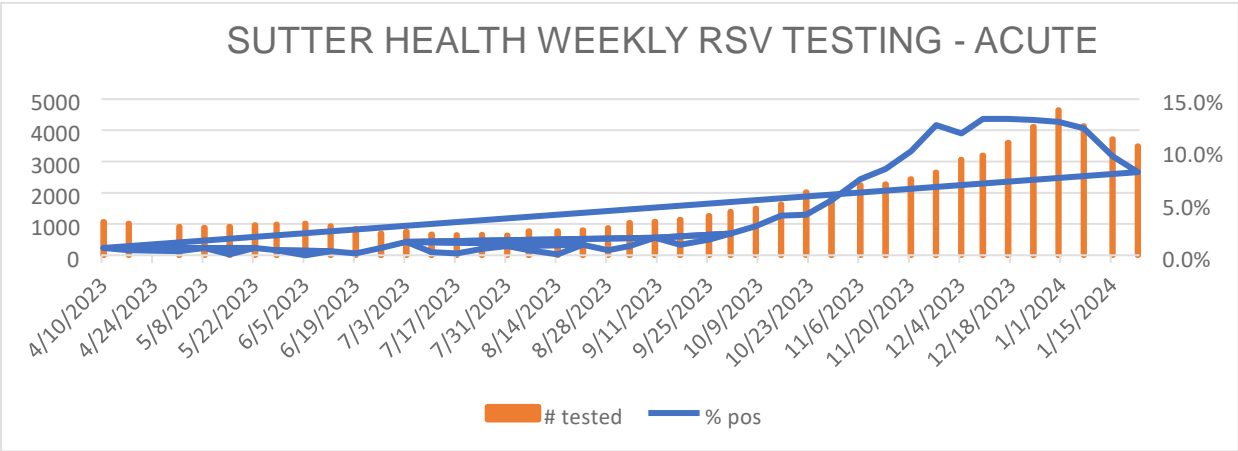
- [CDPH](#) reports RSV data weekly during the season. The CDPH graph below demonstrates the California RSV season (blue arrow) compared to other seasons since 2018. RSV rates are still elevated but they are progressively decreasing.



- RSV identification rates remain elevated in both the ambulatory (8.9%) and emergency departments (8.0%) in Sutter but are clearly decreasing, consistent with CDPH data. See two graphs below.



, consistent



- RSV results by age are in the following table for the week ending Jan. 22. Positivity rates at all ages are decreasing significantly. Children less than 6 years old still dominate.

Location	<6 years old		6 to < 12 years old		≥ 60 years old	
	Number Tested	% Positive (number)	Number Tested	% Positive (number)	Number Tested	% Positive (number)
Acute (ED)	646	20.9% (135)	168	4.2% (7)	1,728	5.8% (100)
Ambulatory	404	15.6% (63)	171	4.7% (8)	302	9.6% (29)

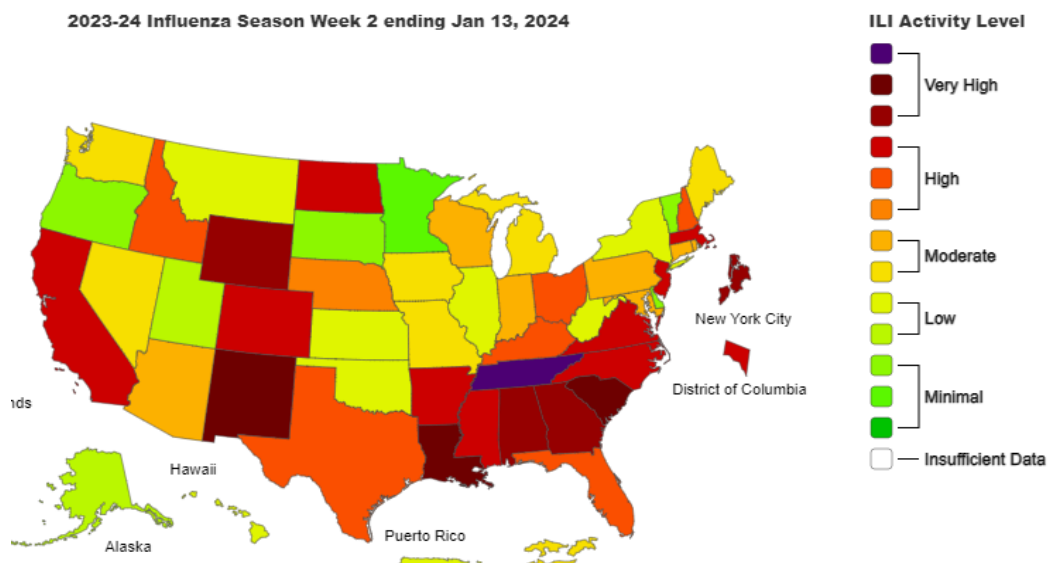
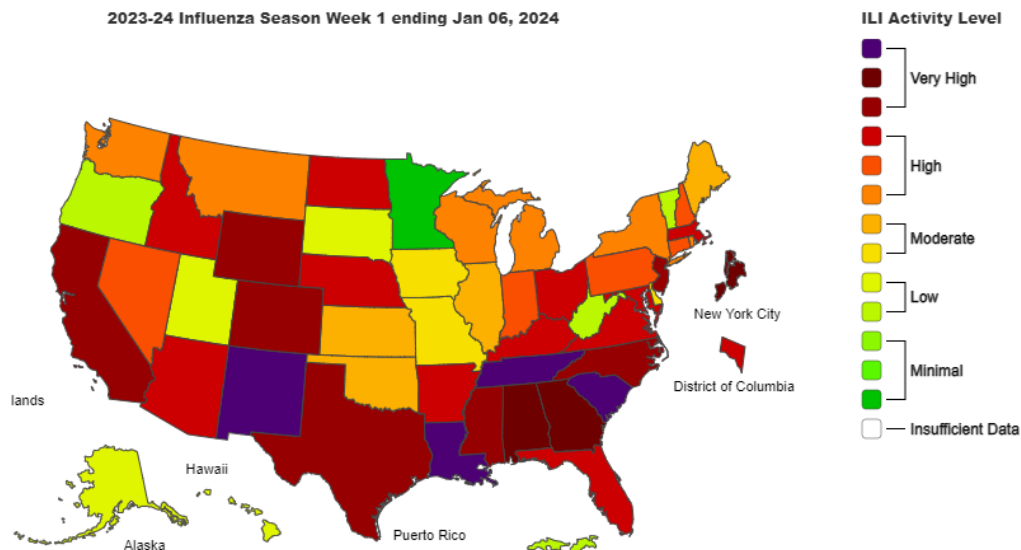
RSV Take-Home:

- RSV positivity rates remain elevated, but the season appears to be on the decline in California.
- High positivity rates continue in children < 6 years old.

Influenza

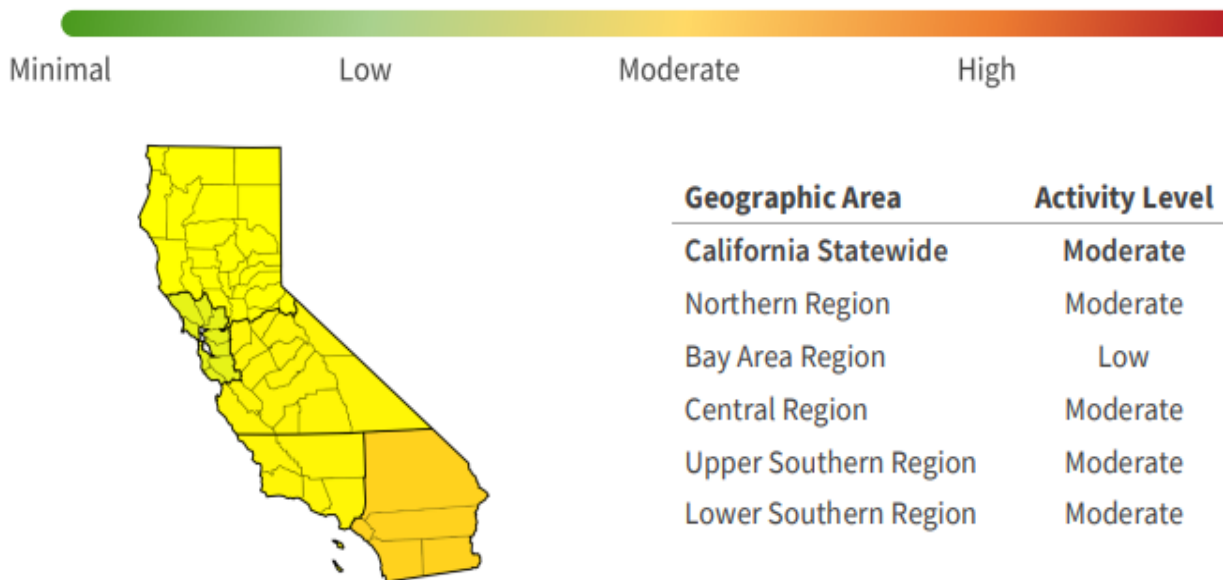
- Influenza rates were higher in 30 countries in [Europe](#) than RSV or SARS-CoV-2 during the second week of January. It is predominantly A H1N1, similar to the United States. About one-third report medium to high levels of widespread disease.
- The weekly [CDC](#) Influenza Surveillance Report was released on Jan. 19.
- For two consecutive weeks, seasonal activity has decreased slightly in terms of hospitalizations and outpatient respiratory illness, with stable positivity rates.
- In the last two weeks, influenza-associated hospitalizations have decreased from 20,066 to 14,874. That is a welcome 26% decrease.
- Although influenza A continues to dominate throughout the United States, influenza B identifications are increasing. Rates vary by state and region.

- Influenza-like illness (ILI), the surrogate for influenza used by the [CDC](#), is represented by the 2 consecutive-week maps below. The first one shows data for the week ending Jan. 6 and the second has data ending Jan. 13. Notice the color difference between the states on the two maps. This demonstrates continued high rates of disease but a notable decrease of ILI reported nationally between the two weeks.



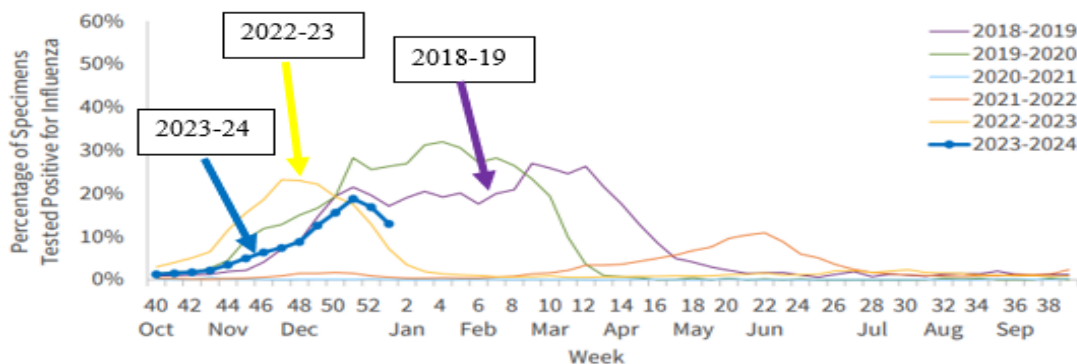
- The [CDPH](#) map below of influenza (last updated through Jan. 13), shows that influenza rates are still moderate through most of the state but down to low (<10%) in the Bay Area. The state influenza positivity rate in the report released Jan.12 was down to 13.0% from 16.8% the week before.

Influenza Activity Levels[†]

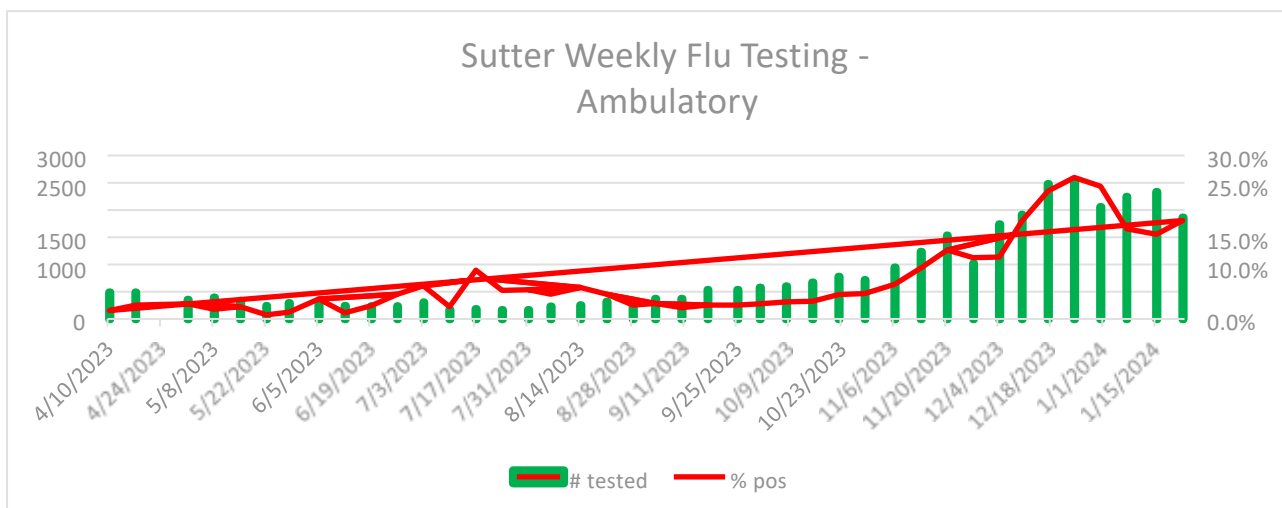
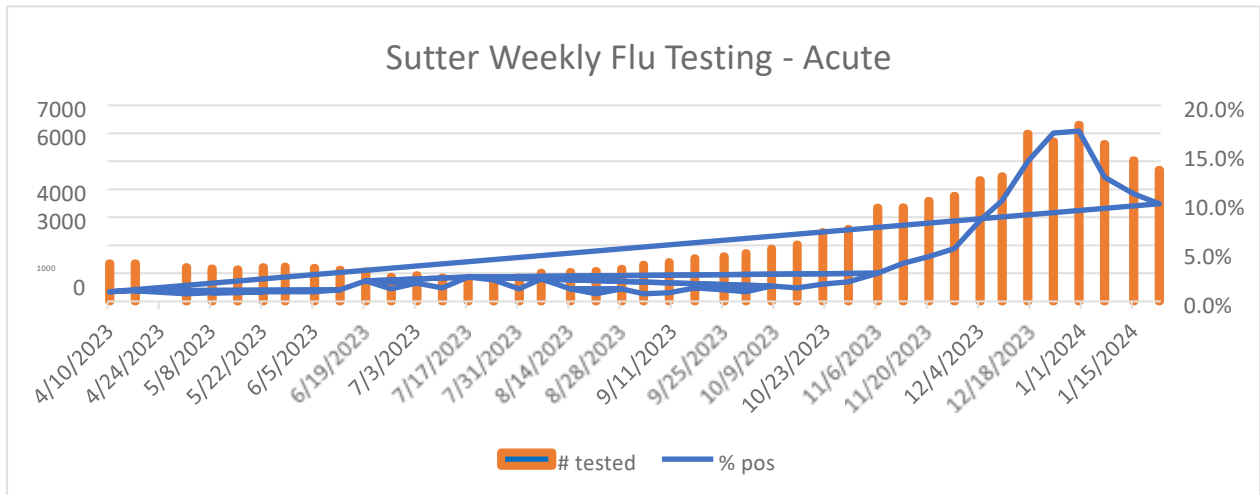


CDPH Influenza Activity Levels[‡]

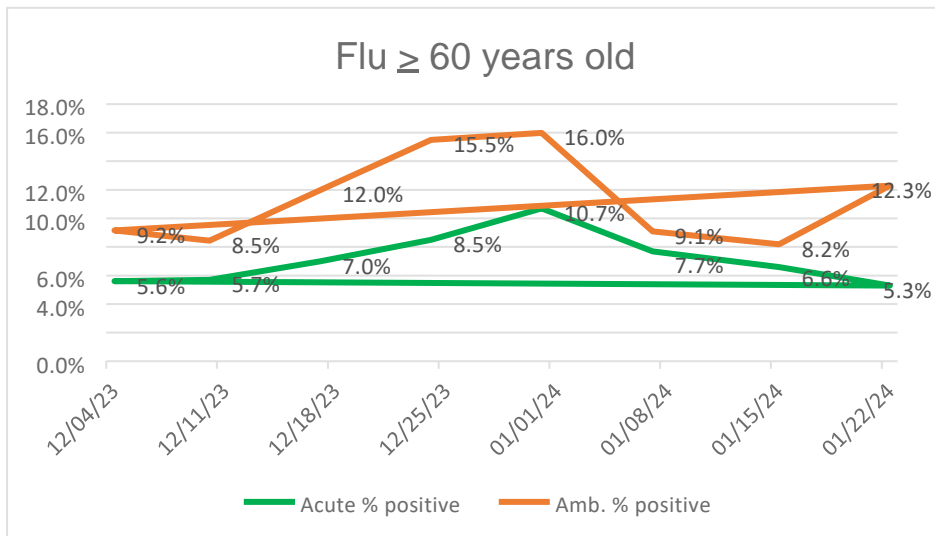
- **Minimal:** The percentage of specimens positive for influenza is <2%.
 - **Low:** The percentage of specimens positive for influenza is between 2% and <10%.
 - **Moderate:** The percentage of specimens positive for influenza is between 10% and <20%.
 - **High:** The percentage of specimens positive for influenza is between 20% and <40%.
 - **Very High:** The percentage of specimens positive for influenza is $\geq 40\%$.
- The [CDPH graph](#) below demonstrates that our present influenza season (blue arrow) continues to be similar to the pre-COVID 2018-19 season (purple arrow).
 - Based on our last season (yellow arrow), we could be seeing an early end to the flu season. However, the WHO report above showed that the number of positive tests increased by 40% in the most recent 2 weeks and rates are rising in Europe. In addition, influenza B is starting to be identified more frequently in the Southern part of the United States as a second wave.
 - Adding this information to the graph below (showing similarities between our present season and the 2018-19 season) suggests that rates will continue to be elevated for at least another month.



- The graph below shows Sutter emergency department and ambulatory influenza positivity rates. In the acute setting (emergency departments), positivity rates decreased to 10.0% in the last week, but in the ambulatory setting, the rate increased to 18.1%. These are similar to state rates. Testing numbers have been decreasing.



- The positivity rate in persons ≥ 60 years old is shown on the following graph. Rates are increasing in ambulatory but not in the ED. This is consistent with mild disease in the older age group, likely because of increased vaccinations in this population, and the good vaccine match to circulating strains.



Take-Home Influenza:

- Influenza associated hospitalizations have decreased significantly in the last 2 weeks. Although that is very encouraging, influenza seasons can be biphasic when a second strain appears later in the season after the first one has diminished.
- Positivity rates remain well above the 10% epidemic threshold in North America and Europe.
- Influenza is widespread in the United States. Most cases are due to influenza A. Influenza B varies by region and state.
- ILI levels have decreased but remain very high in multiple states.
- During the week ending Jan. 14, Sutter emergency department positivity rates were down to 11% and ambulatory rates up to 15.6%.
- Influenza rates in persons ≥ 60 years old have also been declining. Rates among this high-risk group are lower than the all-ages cohort, possibly because of higher vaccine uptake in the older population.
- The flu vaccine appears to be a good match against circulating strains.

Other Respiratory Viruses

- [CDPH](#) tracks respiratory viruses beyond SARS-CoV-2, influenza and RSV. They started reporting again in October. SARS-CoV-2 (yellow arrow), included in the graph below, remains the main virus that is increasing. Human Metapneumovirus also appears to be increasing (purple arrow).
- Enterovirus/Rhinovirus (green arrow) remains the one most commonly identified as a percentage of positive tests but positivity rates between SARS-CoV-2 and rhinoviruses continue to converge.

