



Emerging Infections Newsletter for Clinicians

Dec. 19, 2023

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Polio

- Eradication of polio is believed to be possible. Of the three wild types of poliovirus, only type 1 still circulates in the world.
- In 2023 only Afghanistan and Pakistan continue to have endemic wild type 1 polio, and only 11 cases have been reported this year up through Nov.14.
- It is mostly in the Nangahar province in eastern Afghanistan (blue arrow), and in seven different districts in Northwestern Pakistan (red arrows).
- Afghanistan has identified six cases of poliomyelitis and 46 positive environmental samples. Pakistan has reported five cases of poliomyelitis but has identified 62 positive environmental samples from a larger area.



- To put this in perspective, there were almost 58,000 cases of polio identified in the United States in 1952, before the polio vaccine. In 1979, the estimated number of new cases in the world was [350,000](#).
- Although humans are the only known natural host of the poliovirus, eradication of polio is different from smallpox. Smallpox very rarely, if ever, causes asymptomatic infections.
- On the other hand, the polio virus is estimated to be asymptomatic up to 95% of the time, with carriage lasting usually for several weeks. Symptomatic persons usually have mild, nonspecific complaints including fever, malaise, headache, nausea, and vomiting, with only a small percentage developing poliomyelitis.
- This means that the virus, if re-introduced, could spread widely before it would be recognized. In addition, live vaccine virus can circulate, regain virulence, and lead to outbreaks.

- Eradication will require elimination of virus-derived polio strains and all countries converting to using the inactive polio vaccine. As discussed in [Nature news](#) Nov. 21, this is a complex process that requires careful planning. Wastewater will need to be monitored.
- Test for polio in appropriate circumstances, especially with unexplained acute flaccid weakness.
- **Inactivated Polio Vaccine (IPV):** On Dec. 8, the CDC published an [MMWR](#) summarizing Advisory Committee on Immunization Practices (ACIP)-revised recommendations for IPV. IPV is recommended for adults who are identified as being at increased risk for poliovirus exposure.
- Following a case of paralytic polio in 2022 caused by vaccine-derived poliovirus type 2 in an unvaccinated young adult in New York, transmission was further compounded by low polio vaccination rates in the community. New ACIP recommendations for IPV are as follows:
 - Adults aged ≥18 years who are known or suspected to be unvaccinated or incompletely vaccinated against polio should complete a primary IPV series, which consists of three doses (dose 1-2 spaced 4-8 weeks apart followed by a third dose after 6-12 months).
 - Adults who have received a primary series of oral (OPV) or IPV in any combination and who are at increased risk for exposure to poliovirus may receive another dose of IPV.
 - Risk-based recommendations for IPV boosters have not changed.
- **Poliovirus Take-Home:**

Eradication of polio is still possible. That is different than elimination of the virus. Future introductions of this virus remain possible.

 - ACIP updated their recommendations for use of the inactivated polio vaccine in the United States.
 - Although anticipated to remain a rare diagnosis at this time, consider testing for polio in patients with unexplained acute flaccid weakness, especially if unvaccinated or incompletely vaccinated.

Neisseria meningitidis (Meningococcus)

- Meningococcal meningitis and/or sepsis are caused by several different serogroups of *N. meningitidis*. Serogroups B, C and Y cause the majority of infections in the [United States](#) but serogroup W and ungroupable organisms also cause a small portion of the disease.
- The [WHO](#) reports that outbreaks of serogroup W are being identified more frequently recently.
- [Lancet](#) published the results of a 15-year study from the Netherlands in April. Of the 428 episodes of meningococcal meningitis, serogroup B was the most common, comprising 77% of the cases. Notably 8% were due to Group W. The mortality of patients with Serogroup W was 24% compared to 3% for the rest of the patients.
- *Open Forum Infectious Diseases* recently [published](#) a report from France of serogroup W meningococcal epiglottitis. The epiglottis is the cartilage that covers the larynx during swallowing to prevent aspiration. When swollen, patients present with fever, dysphagia, sore throat, stridor and a weak or inaudible voice. *Hemophilus influenzae* type b (HiB) was the most common etiology prior to the widespread use of the HiB vaccine.
 - From 2015 through June 2023, the publication identified 3,024 cases of invasive meningococcal disease, usually meningitis or sepsis with bacteremia, with 13 cases of epiglottitis.
 - The incidence of epiglottitis was 0.2% pre-COVID, 0.0% during the COVID lockdowns, and 1.7% after the lockdowns were lifted.
 - All cases were in adults 40 years and older with a median age of 79 years.
 - All cases were due to the hypervirulent group W clade complex (cc) 11.

- **Meningococcal vaccines** (MenACWY and MenB) continue to be recommended for children and adults who are at risk for invasive meningococcal disease, including in patients who receive complement inhibitor therapy such as eculizumab (Soliris®) or ravulizumab (Ultomiris®). The risk of meningococcal is 1,000-2,000 times greater in those on complement inhibitor therapy without known history of meningococcal vaccination. However, even patients who are up to date with meningococcal vaccination can still develop meningococcal disease.
- An [MMWR](#) published by the CDC on July 7, 2017, summarizes the impact:
 - From 2008-2016, 69% (11/16) cases of meningococcal disease in patients on eculizumab were caused by non-groupable *N. meningitidis*, which is not covered by MenACWY or MenB vaccination. Non-groupable *N. meningitidis* is often carried asymptotically in the nasopharynx and rarely causes disease in healthy persons.
 - Fourteen patients had documentation of receipt of at least one dose of meningococcal vaccine before disease onset.
 - Antimicrobial prophylaxis for patients is occasionally recommended, as the duration of complement inhibitor therapy (and thus meningococcal disease risk) is often lifelong despite vaccination efforts.
 - Cross-protection in patients with vaccination history has not been assessed.
- **Meningococcus Take-Home:**
 - Most invasive meningococcal infections are present as meningitis or sepsis with bacteremia. They are usually due to serogroups B, C, or Y in the United States.
 - Invasive disease can present in other ways. In France, they have identified an increase in serogroup W cc11 meningococcal epiglottitis. Notably it was in adults, with a median age of 79 years old.
 - Providers should continue to follow ACIP recommendations for recipients of complement inhibitor therapy to receive both MenACWY and MenB vaccines to provide protection against *N. meningitidis* groupable strains.

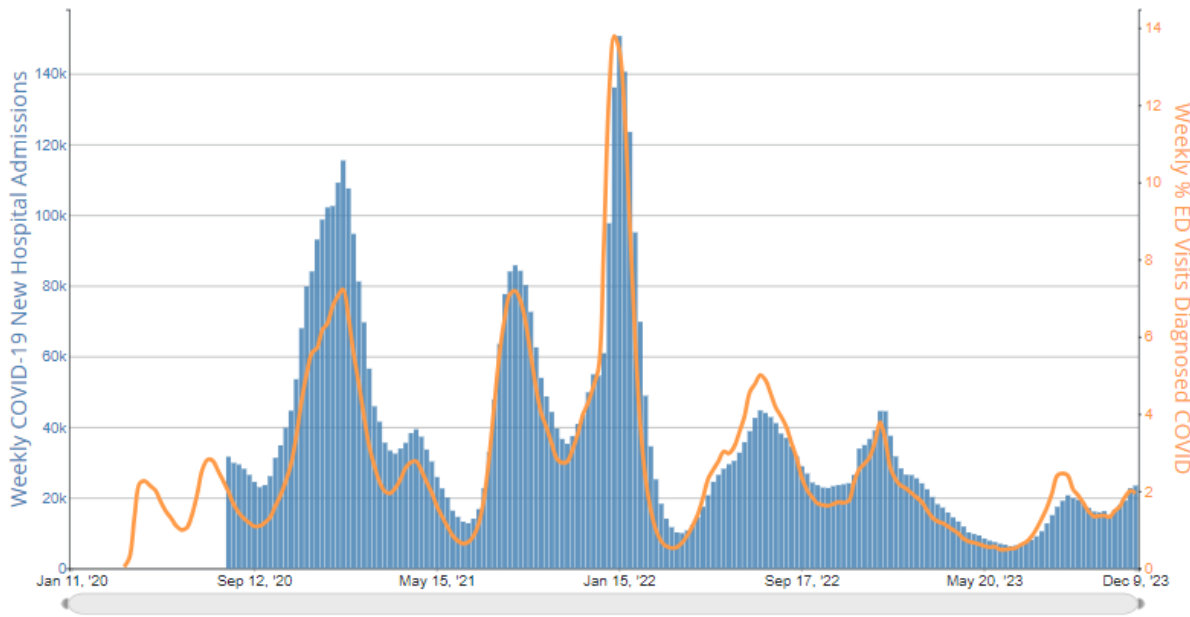
The Tripledemic

- The tripledemic is here. As a reminder, the tripledemic is a term that refers to the simultaneous circulation of three respiratory viruses, specifically SARS-CoV-2, RSV and influenza.
- It is not too late to get vaccinated. Mask, perform frequent hand hygiene and stay home if you are sick.

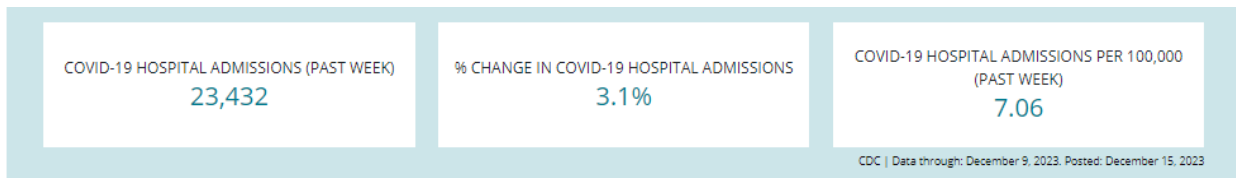
COVID-19

- [Hospitalizations](#) in the United States are a surrogate for the virulence of the circulating strain. The graph below and the subsequent table show continued increases in hospitalization rates (blue vertical bars) and the percentage of patients being diagnosed with COVID in emergency departments (orange run line).

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

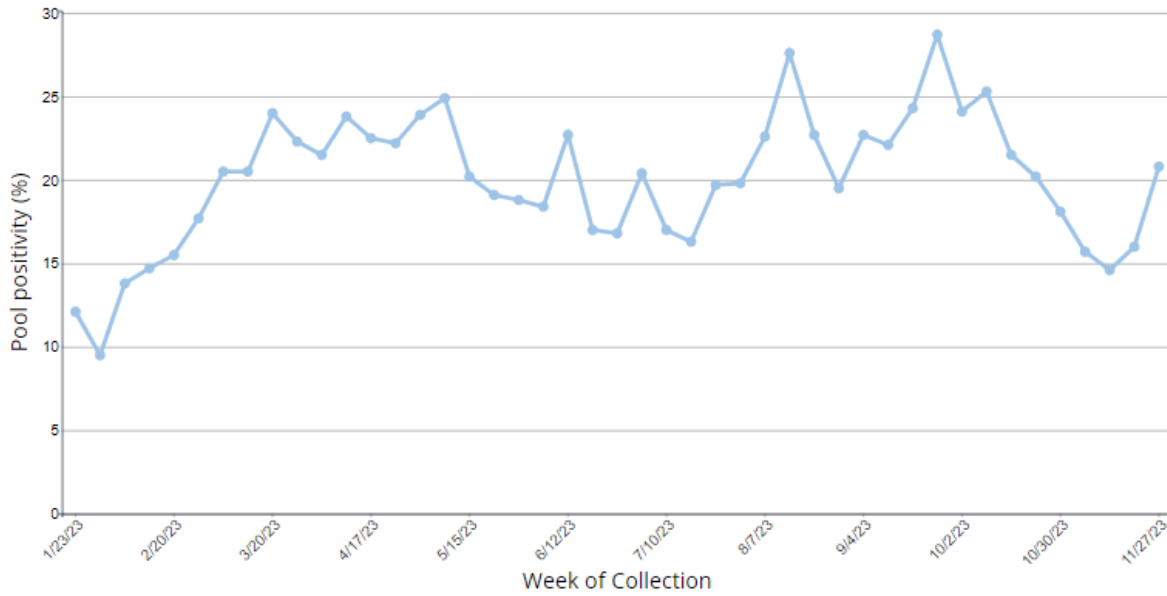


- The CDC tracks hospital admissions per 100,000 county population. Less than 10/100,000 is considered a low number of new hospital admissions. In the last week, national rates increased from 6.78/100,000 to 7.06/100,000. That is only a 3.1% increase in hospitalizations during the last week (17.6% the previous week).

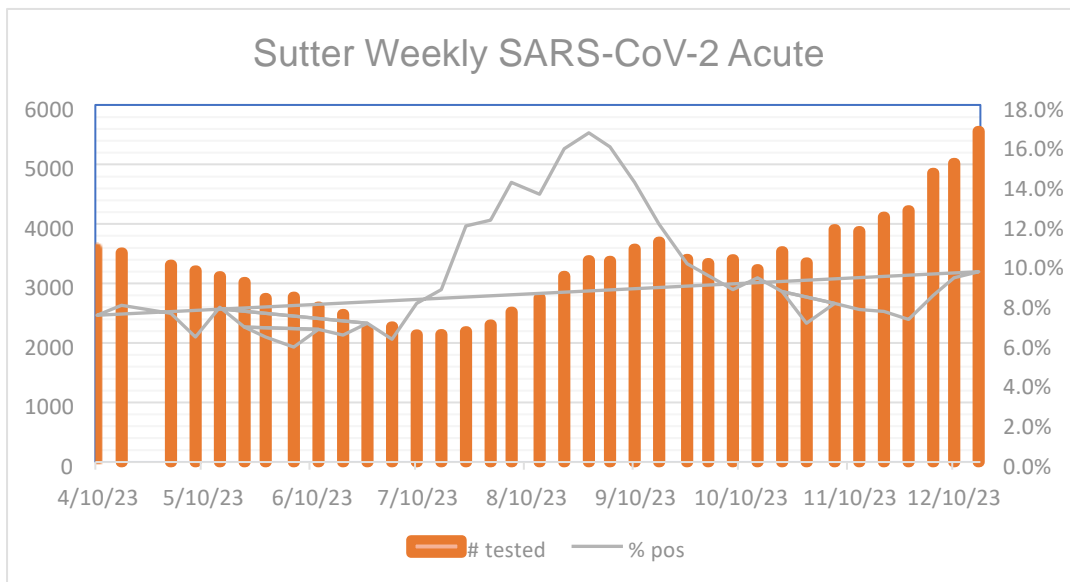


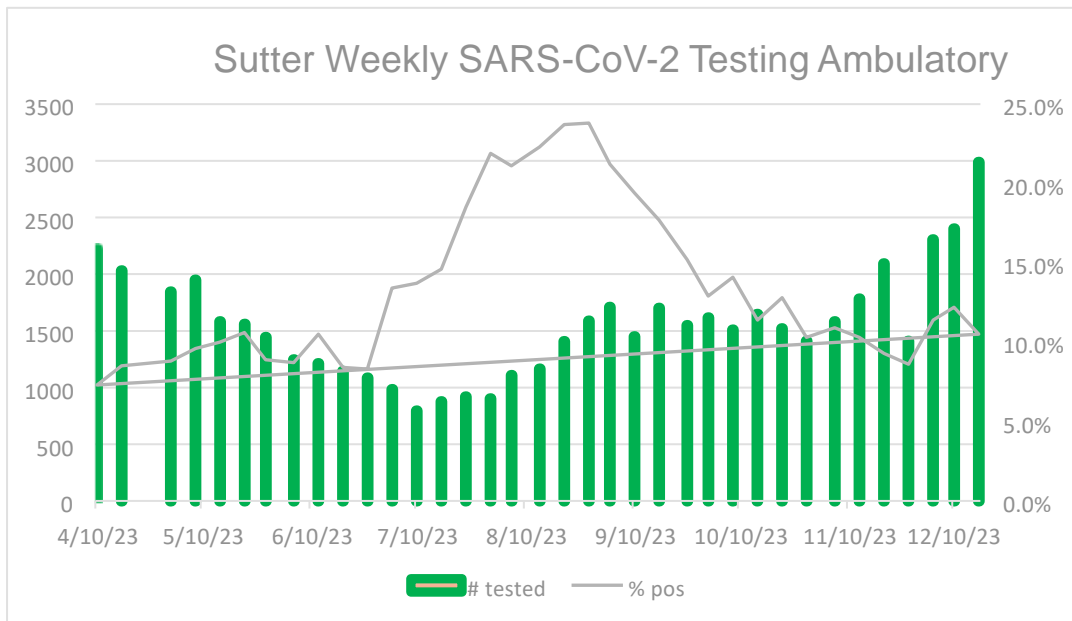
- [National genomic sequencing](#) is updated by the CDC every 2 weeks.
- Voluntary surveillance of international air travelers is conducted at six major U.S. airports as an early warning system and to fill gaps in worldwide genomic surveillance. It covers flights from more than 135 countries.
- Participating returning international travelers self-collect a nasal swab and answer a short survey. A weakness of the survey is that it only determines where the final flight originated, and not where participants actually spent their last 10 days.
- The graph below shows an increase in the positivity rate, now 20.1%.
- [Ten](#) different strains were identified the week of Nov. 23 (data not shown). BA.2.86 has increased from 25% to 63% of isolates in only two weeks.
- JN.1, derived from BA.2.86 and increasing rapidly in the United States, is still not mentioned in this data. Reporting of international data is delayed by 2 weeks and the lag may explain this variation from national data. If true, JN.1 should start to appear within the next 2 weeks.

Positivity Rate for Pooled Samples, by Collection Week



- Updated Sutter testing data below show increasing positivity rates in combination with significantly increased testing being performed in emergency departments and ambulatory environments. The actual number of positives in the last week in each of the two settings was the highest since September.





- COVID test positivity rates in persons greater than 60 years old are now being evaluated compared to the entire tested cohort from Sutter data. Positivity rates remain higher in this age group (red) than the composite of all ages (purple). They comprise a higher risk group for severe COVID, and vaccination should be strongly encouraged.

COVID Location	≥ 60 years old		Composite Positivity Rates for All Ages
	Number Tested	% Positive (number)	
Ambulatory	478	18.6% (89)	10.5%
Acute (ED)	1,932	13.7% (265)	9.6%

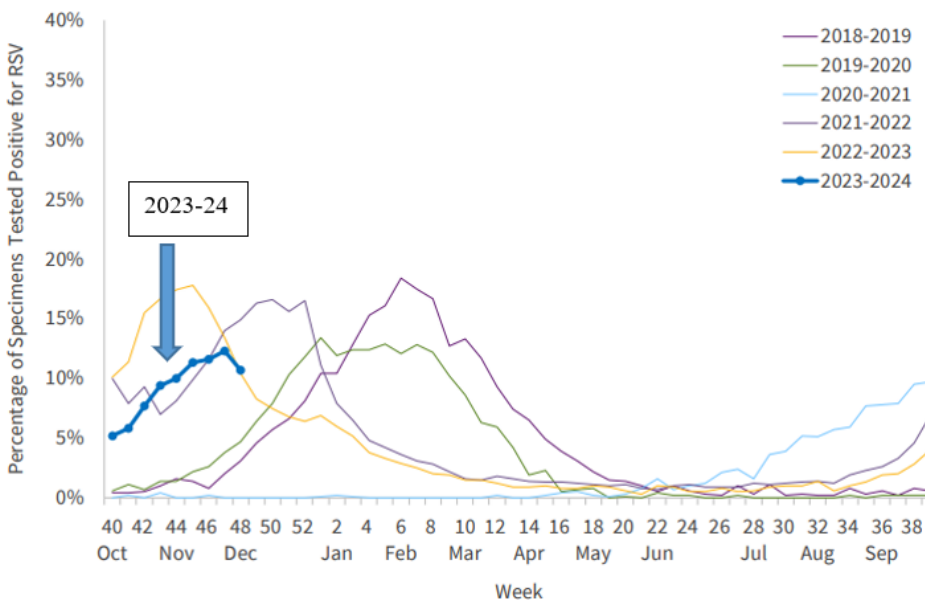
- **COVID-19 Take-Home:**
 - Hospitalizations and emergency department visits, nationally and at Sutter, are increasing. The weekly absolute number of positive tests in Sutter is increasing at a substantial rate. Persons 60 years and older have a higher positivity rate than the composite of all ages.
 - The new subvariant JN.1 is from BA.2.86. BA.2.86 had over 30 new mutations whereas the JN.1 only has one important change. It still appears that BA.2.86, or one of its new derivatives, is likely to dominate the circulating strains.
 - The Pango lineage naming is confusing and similar strains can have extremely different names.
 - Combined with the influenza and RSV trends discussed below, the risk from the tripledemic remains quite significant.
 - Sutter ambulatory and emergency department positivity rates are stable at 10.5% and 9.6%, respectively. However, more tests are being performed. Stable rates with increased testing still translate to more patients being seen with disease.
 - The vaccine should provide coverage against BA.2.86 and derivatives. Encourage vaccinations, especially in those with co-morbidities and 60 years or older in age.

- **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](#)

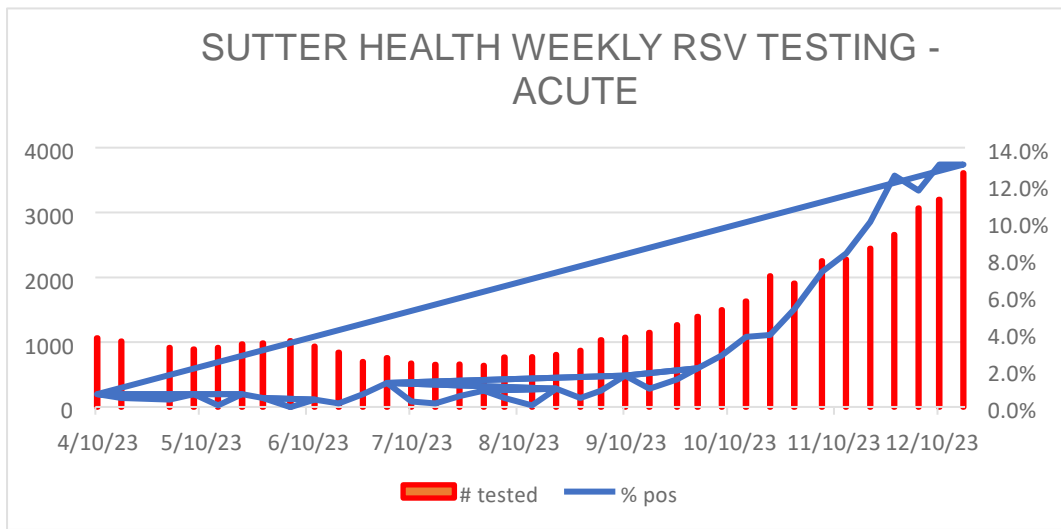
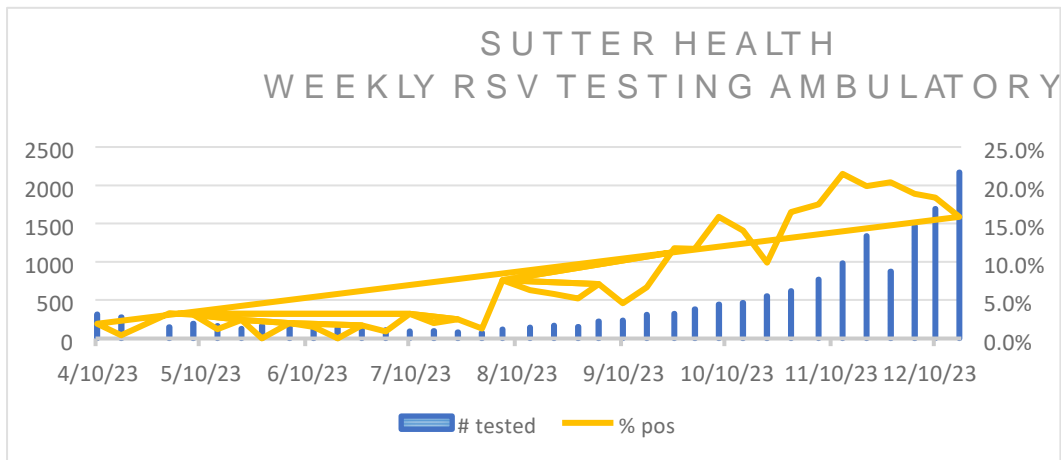
RSV

- Many countries do not track RSV. With the widespread availability of molecular testing the number of countries reporting RSV surveillance data is anticipated to increase. As reported by the [WHO](#), RSV activity is increased in North America and most reporting countries in Europe.
- [CDPH](#) reports RSV data weekly during the season. The CDPH graph below demonstrates our RSV season (blue arrow) compared to other seasons since 2018. No conclusions can be drawn yet about whether we are past the peak, but RSV rates remain elevated.

Figure 12. Percentage of RSV Detections at Clinical Sentinel Laboratories, 2018–2024 Season to Date



- RSV identification rates remain elevated in both the ambulatory and emergency departments in Sutter. The amount of testing continues to increase. Positivity rates in ambulatory are down to 15.9%. Emergency departments' positivity rates for RSV are stable at 13.1%. The RSV season in Northern California remains widespread. See two graphs below.



- RSV results by age are in the following table for the week ending Dec. 3. Children less than 6 years old still dominate, with positivity rates of 35.2% in ambulatory and 31.0% in acute care settings.
 - Our Sutter data show that the vast majority of diagnosed infections this season continue to be in children less than 6 years old.
- The table below shows that positivity rates in children 6 to <12 years old are also elevated.
- The number of people 60 years and older being diagnosed with RSV has been stable for the last few weeks. In the emergency department the positivity rate was 5.5% (down from 5.7% last week). Ambulatory positivity increased from 12.1% to 13.4%.

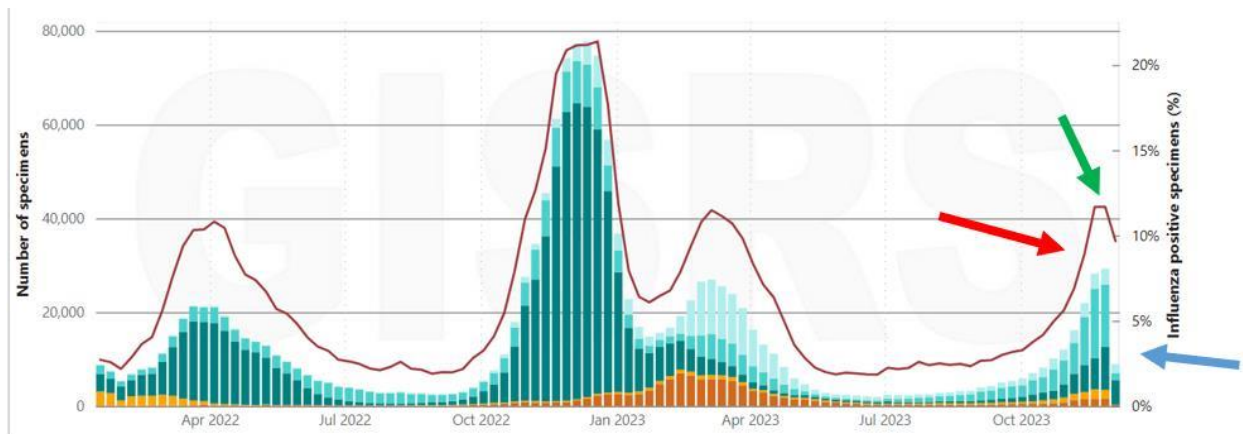
Location	<6 years old		6 to < 12 years old		≥ 60 years old	
	Number Tested	% Positive (number)	Number Tested	% Positive (number)	Number Tested	% Positive (number)
Ambulatory	874	35.2% (308)	241	9.1% (22)	343	13.4% (46)
Acute (ED)	745	31.0% (197)	288	10.8% (31)	1,676	5.5% (92)

- **RSV Take-Home:**

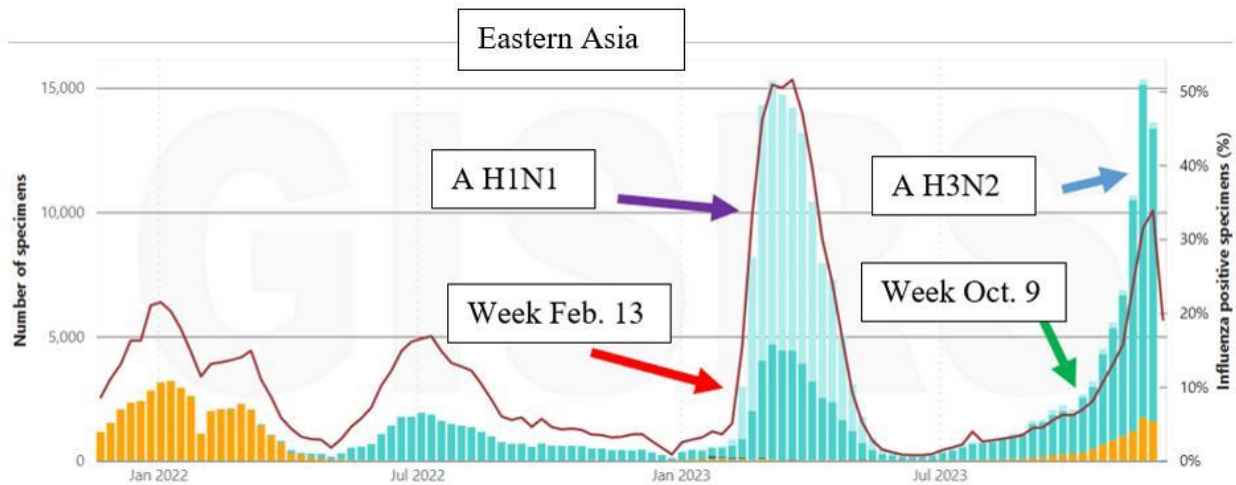
- The RSV season in California started earlier than the pre-COVID “normal,” but not as early as last season. Within Sutter, high positivity rates continue, especially amongst children <6 years old.
- Higher numbers of cases are also being seen in persons 60 years and older. The risk of hospitalization and/or death related to RSV increases in older persons, especially if the person also has a history of heart failure or chronic obstructive lung disease.
- Nirsevimab supply is anticipated to increase in January with Sanofi releasing an additional 230,000 doses. This should help decrease the number of RSV infections and hospitalizations in infants and some high-risk toddlers.
- Vaccinate all eligible pregnant persons between 32-36 weeks of gestation against RSV.
- Persons 60 years and older, especially with co-morbidities, should be vaccinated against RSV.

Influenza

- The [WHO](#) released its biweekly global influenza update on Dec. 11. This includes the most recent two weeks of data up to Nov. 26.
 - Increased activity is being identified in parts of Europe, North America, and Asia (central, eastern, and western).
 - Influenza A predominates with both A H3N2 and A H1N1 being detected.
 - The Southern Hemisphere continues with inter-seasonal, low levels of detection.
 - From Nov. 13 to Nov. 26, 301,639 specimens were tested. That is a 30% decrease in the number of tests performed compared to the prior 2-week report. However, there was a 42% increase in positive results (36,530 positive).
 - 88% were influenza A, with H3N2 now more than four times as common as H1N1.
- The graph below shows influenza activity in the Northern Hemisphere for the last 2 years. Cases are rising (shown by the blue arrow). Shades of teal represent influenza A and brown represents influenza B. The drop in the most recent week is due to incomplete data.
- The red arrow points out that the positivity rate continues to spike up. The sharp plateau and decrease at the end are artifacts of incomplete data (green arrow).

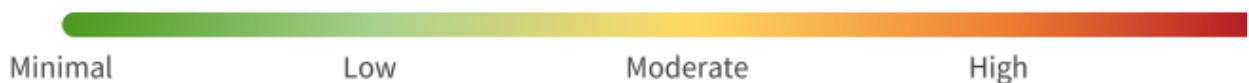


- The WHO graph below shows the data for Eastern Asia for the last 2 years. Influenza season began the middle of February in 2022 (red arrow) but started 4 months earlier this season (green arrow), beginning the week of Oct. 9.
- The darker teal represents A H3N2 (blue arrow), which dominates the results this season. In the prior season A H1N1 dominated (light blue with purple arrow). Dominant A H3N2 in Eastern Asia and A H1N1 in the United States support that we may ultimately see significant cases of both A H1N1 and A H3N2 this season.



- The weekly [CDC](#) Influenza Surveillance Report was released on Dec. 15.
- Influenza-associated hospitalizations continue to increase. Out of 90,439 specimens tested by clinical labs during week 48 (ending Dec. 2), 9,212 were positive (up to 10.2% from 6.8% in the prior week).
- Influenza A H1N1 continues to dominate, but A H3N2 continues to comprise 25% of Influenza A isolates.
 - Influenza-like illness (ILI), the surrogate for influenza used by the [CDC](#), was not updated this week.
- The [CDPH](#) map below of influenza (last updated Dec. 15), shows that influenza is increasing throughout California, with all levels now moderate (10% to <20% positivity rates). The state influenza positivity rate has increased in the last week to 12.5%.
- CDPH measure true influenza and the CDC uses a surrogate for influenza. At this time, they appear to be providing similar conclusions.

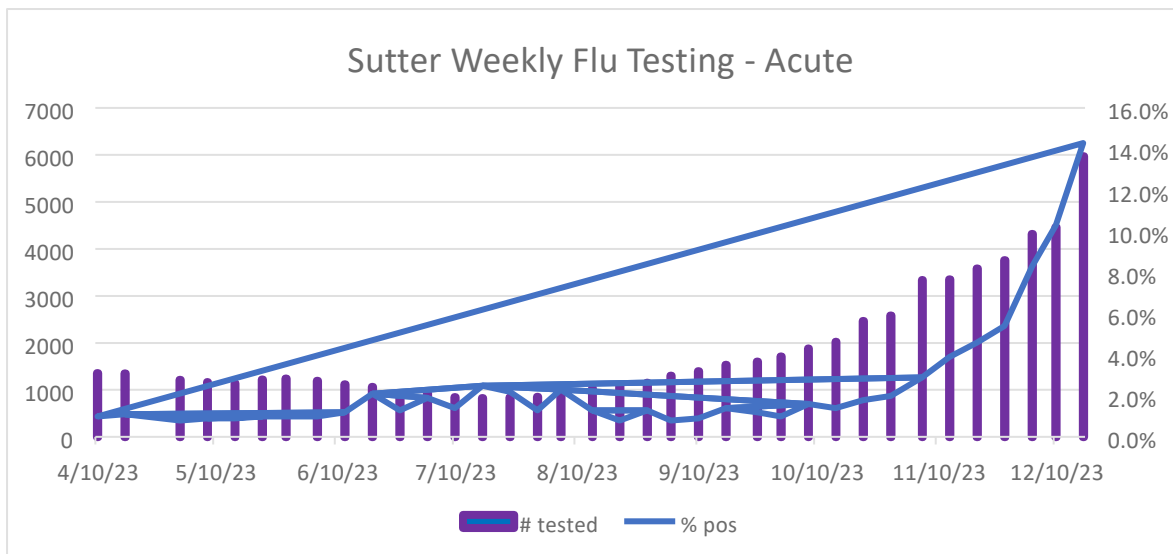
Influenza Activity Levels⁺



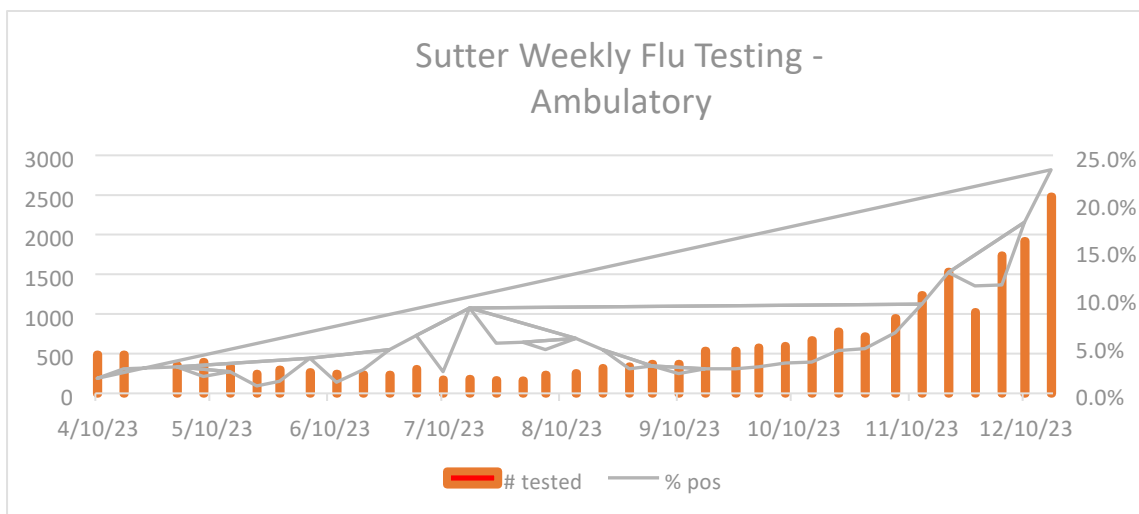
Geographic Area	Activity Level
California Statewide	Moderate
Northern Region	Moderate
Bay Area Region	Moderate
Central Region	Moderate
Upper Southern Region	Moderate
Lower Southern Region	Moderate

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 graph below shows Sutter emergency department and ambulatory influenza positivity rates. In the acute setting (emergency departments), positivity rates increased to 14.3% in the last week. In the ambulatory setting, the rate is up to 23.5%. This is higher than CDPH data, but CDPH information lags behind by 1 week.



- Now that influenza is widely circulating, false positive rapid influenza diagnostic tests should be uncommon.



- Sutter influenza test positivity rates in persons greater than 60 years old are shown below. Influenza rates in this population are about 50% of the composite positivity rates for all ages.

This is not an unusual pattern and mimics what we saw with the initial RSV outbreak this season. Influenza typically causes outbreaks in children before older adults.

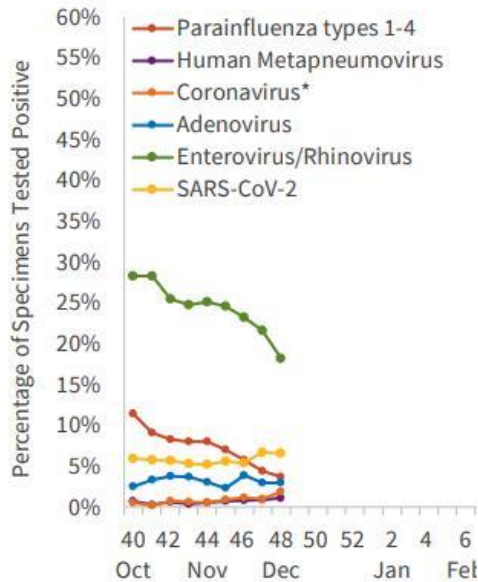
Influenza Location	≥ 60 years old		Composite Positivity Rates for All Ages
	Number Tested	% Positive (number)	
Ambulatory	358	12.0% (43)	23.5%
Acute (ED)	1,754	7.0% (122)	14.3%

- **Take-Home Influenza:**

- Influenza activity is increasing in the Northern Hemisphere. In the last 2 weeks between WHO reports, testing decreased by 30% but positive results increased by 42%. The positivity rate doubled from 6.0% to 12.2%.
- In the WHO report, influenza A comprises 88% of the positive results. Notably influenza A H3N2 is now identified more than four times as often as A H1N1 in most of the Northern Hemisphere. This is the opposite of the United States where A H1N1 continues to dominate.
- This continues to suggest that A H3N2 could ultimately displace A H1N1 in the United States later in this season.
- Fortunately, the current vaccine match looks good for both strains.
- Influenza-associated hospitalizations are continuing to increase in the United States.
- The CDC and CDPH have different methodologies for estimating influenza activity. Their approaches appear to be giving congruent results at this time.
- Sutter emergency department positivity rates of 14.3% were noted during the week ending Dec. 17. Ambulatory tests were positive 23.5% of the time, consistent with high levels of influenza by CDPH criteria.
- Treat patients with influenza who are at increased risk of complications, even if treatment is started more than 48 hours after illness onset.
- Influenza vaccination is a critical strategy to help protect high-risk and older adults against influenza-related hospitalizations and continues to be recommended throughout the influenza season.

Other Respiratory Viruses

- [CDPH](#) tracks respiratory viruses beyond SARS-CoV-2, flu and RSV. They started reporting again in October. The graph below shows that other viruses are all declining with Enterovirus/Rhinovirus remaining the one most commonly identified. These are usually identified on multiplex respiratory panels other than the Cepheid panel (COVID, RSV, Flu A/B). No denominators are provided.



- **Final Take-Home Message**

- Vaccines work. They are not perfect, but they can:
 - ✦ eradicate polio induced paralysis.
 - ✦ protect against meningococcal infections including meningitis, sepsis, and death.
 - ✦ lower the risk of hospitalization and death from RSV, influenza and SARS-CoV-2.
- The tripledemic is here. The impact is being seen and the peak has not been reached. It appears likely that hospitalization rates will continue to increase.
- BA.2.86 is 63% of international isolates whereas JN.1 is the fastest increasing sequenced isolate in the United States. JN.1 is directly derived from BA.2.86. It is not clear whether the international sequencing separates out BA.2.86 from JN.1 but it seems likely because of the delay in reporting the international travelers' results.
- RSV remains predominantly a disease of children <6 years old but disease in persons >60 years old is increasing.
- Influenza activity is widespread in California. Anticipate increasing cases in older persons and patients with co-morbidities. There is a definite possibility that A H3N2 will ultimately replace A H1N1, but more data are needed. The good news is that the vaccine appears to be a very good match at this time.
- The CDC issued a [health alert](#) on Dec. 14 because of low vaccination rates against RSV, COVID-19 and influenza. Eligible persons should be immunized against these viruses.
- Encourage proper hand hygiene, use appropriate PPE, encourage broader use of masks, vaccinate appropriate candidates, stay home if sick and treat influenza following CDC guidelines.
- Wishing everyone a safe, happy and healthy 2024.