Respiratory Illness Trends in TRPHD: 2023 and 2024 Seasons

Respiratory Illness in TRPHD - 2024 Season

The 2024 respiratory illness season across the TRPHD reflected significant trends in influenza, respiratory syncytial virus (RSV), and COVID-19 activity. Cumulative totals as of Week 30 indicate 1,234 positive influenza tests, 197 RSV cases, and 419 COVID-19 cases across the seven-county district, with influenza, particularly Influenza A, dominating the season's disease burden.

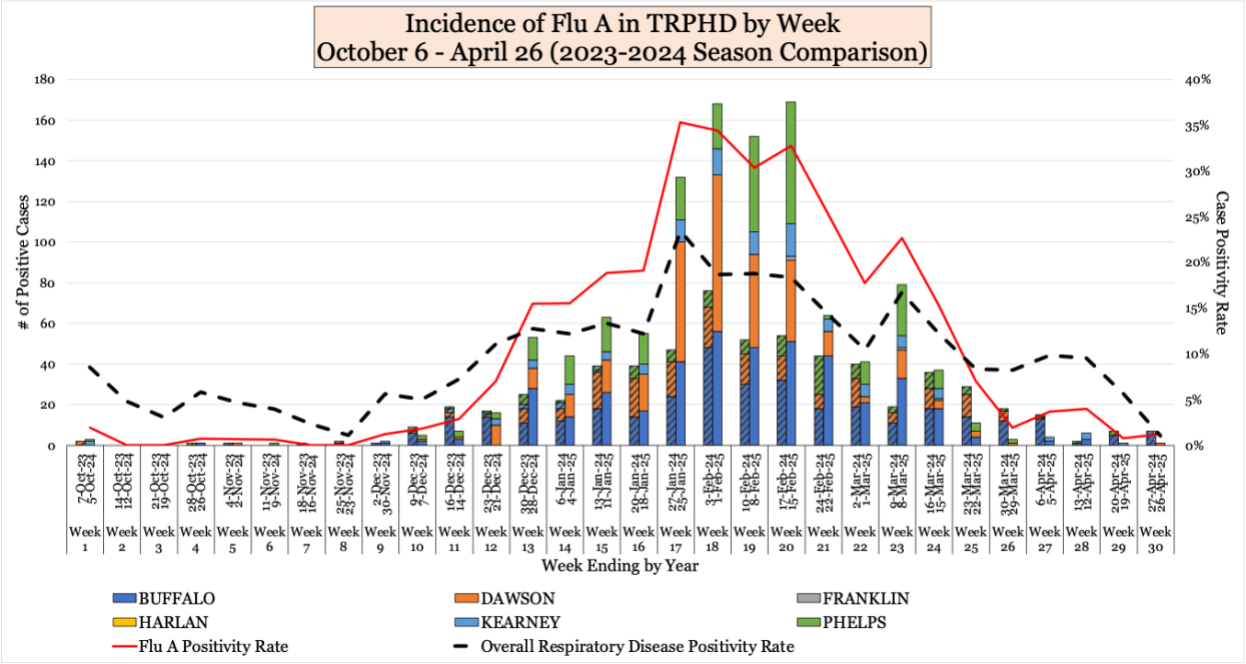
Influenza (Flu A and Flu B) Trends (2024)

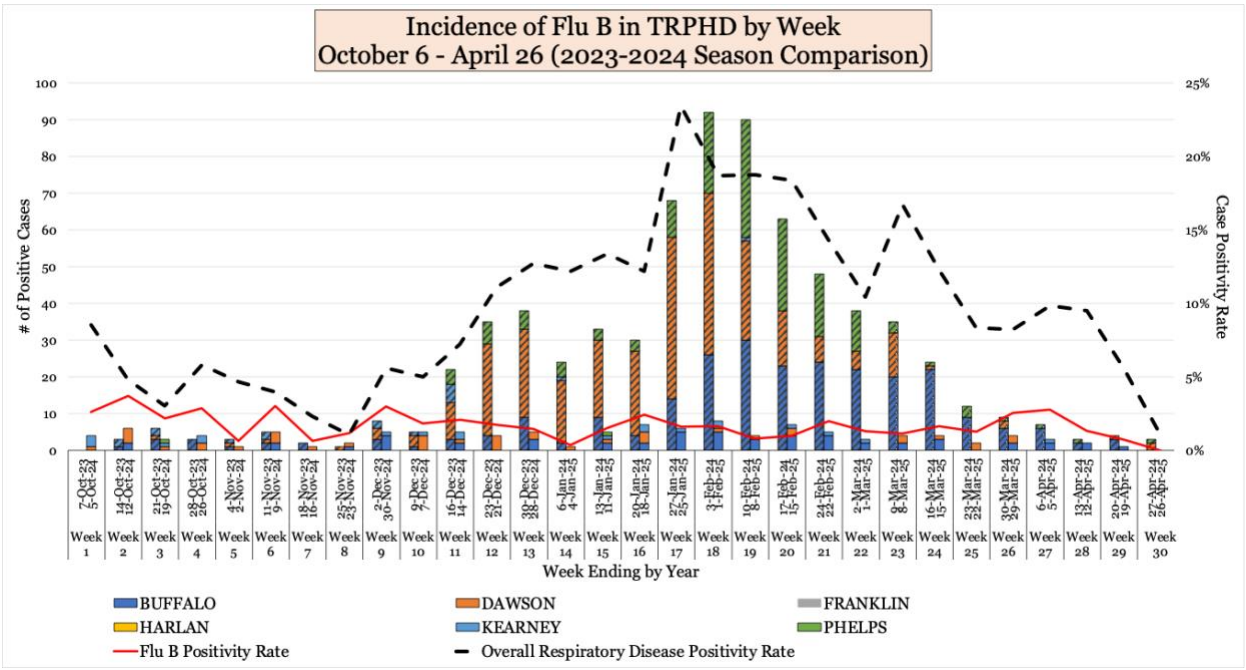
Influenza activity began its seasonal rise in early October 2024 (Week 1 of reporting) with only scattered cases, but by December (Weeks 10–12), activity accelerated. The first notable increase in Flu A occurred in mid-December, when a districtwide jump increased counts to nearly 90 new Flu A positives. From then on, influenza activity (primarily Flu A), continued to climb steadily through the winter, peaking between Weeks 18 and 21 (late January to mid-February 2024). The highest weekly Flu A total occurred in Week 20 (10-17 Feb), with 169 positive cases reported across the district. Buffalo, Dawson, and Phelps counties were the key drivers. By the end of the season (Week 30), **Flu A accounted for 1,118 of the total 1,234** influenza cases, representing over 90% of all flu activity. County-level surveillance revealed that **Buffalo County (412 cases) and Dawson County (328 cases) were the epicenters** of Flu A transmission. Phelps (270 cases) and Kearney (104) also showed notable activity. Some counties, including Franklin (4), Harlan (0), and Gosper (data not reported), recorded minimal or no Flu A cases, reflecting either true low incidence or lower levels of testing/reporting.

Flu B activity remained modest and regionally limited. A total of 116 Flu B cases were reported over the course of the season, most of them concentrated in Buffalo (53), Dawson (41), and Kearney (20). Weekly Flu B activity never surpassed 10 positives and were distributed sporadically between Weeks 6 and 18, with brief upticks followed by a return to previous levels. This **aligns with national and regional surveillance trends**, suggesting lower Flu B circulation in 2024–2025.

Two Rivers
PUBLIC HEALTH DEPARTMENT

The graph below describes the **weekly case counts for Influenza A and Influenza B in TRPHD, comparing 2023 to 2024**. The shaded bar graph describes weekly counts in 2023 and the clear bar depicts 2024. Colors indicate case counts from each county.





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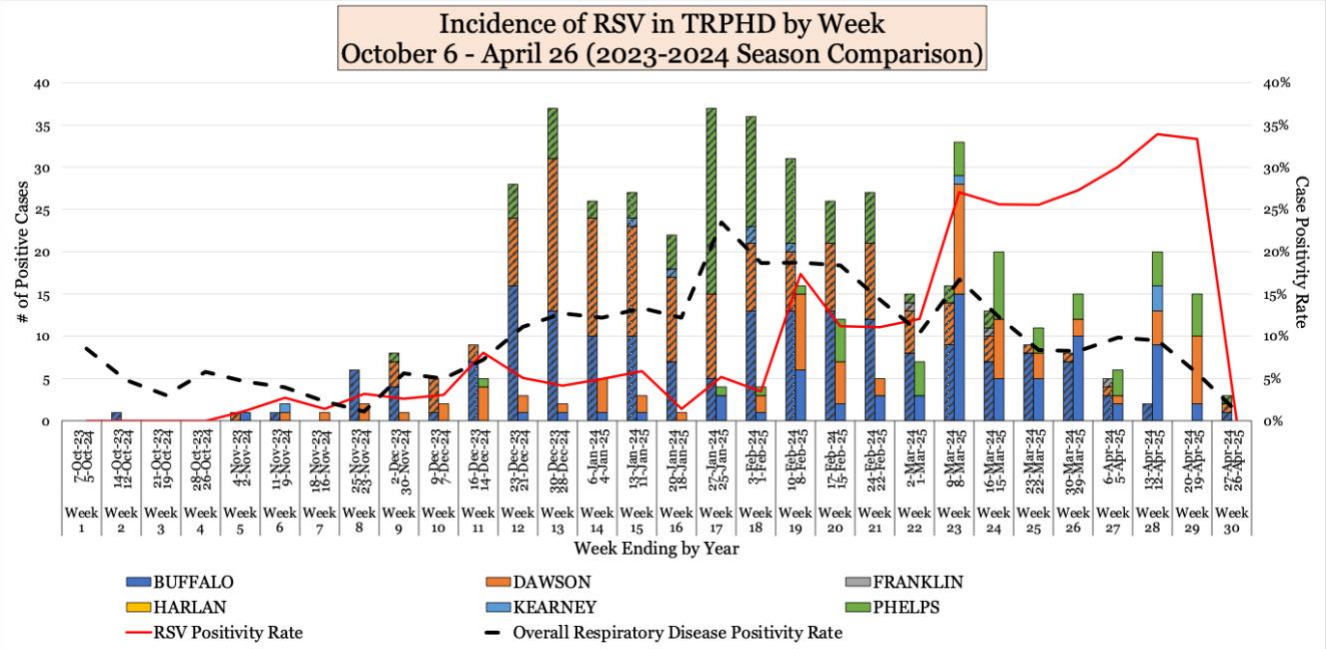
Respiratory Syncytial Virus (RSV) Patterns (2024)

RSV activity was relatively subdued in 2024 compared to previous years. By Week 30, TRPHD reported a total of **197 RSV cases, with Dawson (77) and Buffalo (72)** counties contributing the majority. Phelps followed with 43 RSV positives, while **Franklin, Harlan, and Gosper reported no RSV** cases. It is unclear whether this reflects lower testing volume in those counties or a truly limited outbreak. RSV detections began modestly in October but picked up in late February (Week 19) and into March. The highest weekly RSV case count (33 positives) was seen in Week 23, led by increases in Buffalo and Phelps counties. While the 2024 RSV burden was less than the 399 cases recorded in 2023, a few weeks, particularly Weeks 23, 24, and 28 saw brief localized transmission spikes.

The graph below describes the **weekly case counts for RSV in TRPHD, comparing 2023 to 2024**. The shaded bar graph describes weekly counts in 2023 and the clear bar depicts 2024. Colors indicate case counts from each county.

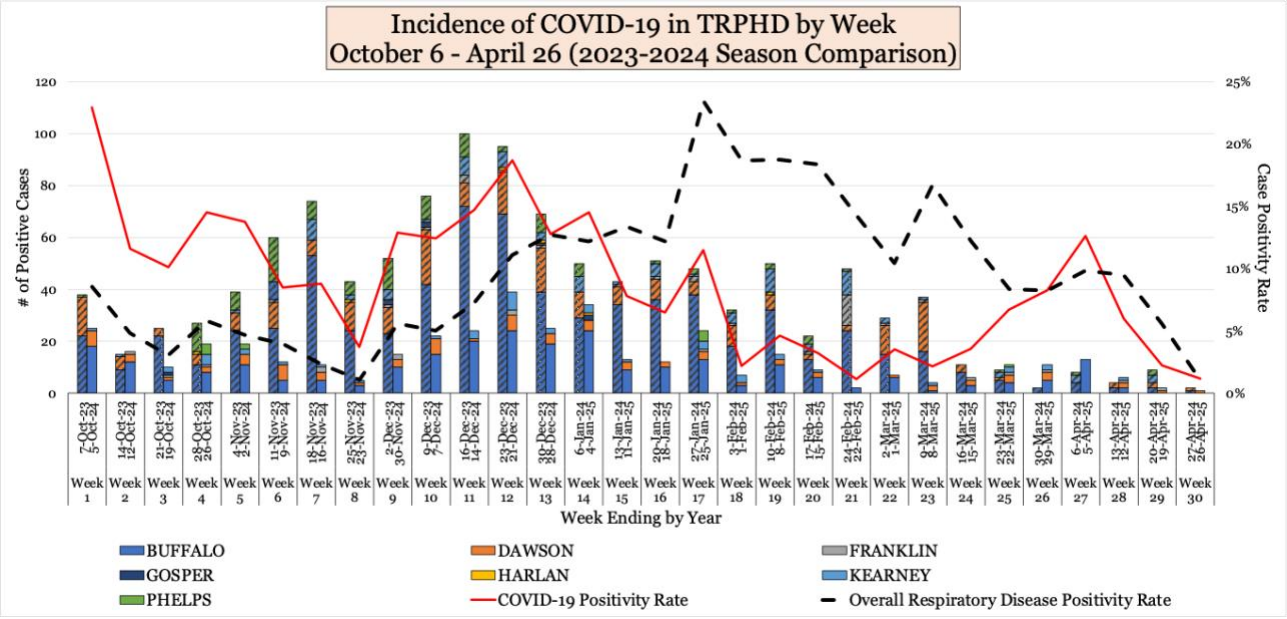


COVID-19 Activity (2024)

COVID-19 showed a continued decline in case burden across the TRPHD jurisdiction in 2024. A total of 419 lab-confirmed cases were reported between October 2024 and April 2025, down from over 1,100 cases during the 2023 season. The lower burden suggests that **COVID-19 is stabilizing as an endemic pathogen with sporadic peaks**, likely influenced by variant shifts and local vaccination coverage. COVID-19 activity followed a somewhat bimodal pattern, with a first peak in late December (Week 12) and a more modest, scattered rise in late February and March. The highest weekly case count (51 positives) occurred in Week 13, closely aligning with peak flu transmission. Buffalo County again accounted for the majority of COVID cases (267), followed by

Dawson (78), Franklin (15), Kearney (44) and Phelps (11). Several counties, including Harlan and Gosper, reported very low totals (3 or fewer), consistent with either low incidence or minimal testing. Notably, there was only one new case added between Weeks 29 and 30, confirming that by mid-April, COVID activity had largely subsided for the season.

The graph below describes the **weekly case counts for COVID in TRPHD, comparing 2023 to 2024**. The shaded bar graph describes weekly counts in 2023 and the clear bar depicts 2024. Colors indicate case counts from each county.



Respiratory Illness Trends in TRPHD – Historic Perspective (2023 Season)

The 2023 respiratory illness season across the Two Rivers Public Health District (TRPHD) was marked by a moderate yet sustained burden of influenza, respiratory syncytial virus (RSV), and COVID-19 cases. Cumulative totals through Week 30 (ending in April 2024) included 1,338 influenza cases, 399 RSV cases, and 1,131 lab-confirmed COVID-19 cases. While COVID-19 led in terms of total diagnoses, influenza activity, especially Influenza A, emerged as a notable contributor to seasonal respiratory illness, particularly during the winter peak.

Influenza (Flu A and Flu B) Trends (2023)

Influenza circulation began quietly in October 2023 (Week 1 of surveillance) and ***remained relatively low through early November but began to rise steadily in December****. A sharp rise in influenza transmission occurred between late December – January and 76 Flu A and 92 Flu B cases were recorded in late January. Peak weekly count was 168 influenza cases. Buffalo, Dawson, and Kearney counties consistently led in total flu burden throughout the season. TRPHD reported 624 Flu A cases and 714 Flu B cases for a total of 1,338 lab-confirmed influenza infections between October - April. Notably, this made* ***2023 a more flu-heavy season than 2024*** *(53% of cases were Flu B). While Flu A dominated early in the season, Flu B overtook Flu A in absolute numbers by spring, peaking later and remaining persistently elevated through March.*

Respiratory Syncytial Virus (RSV) Patterns (2023)

The RSV season in 2023 followed a more traditional winter seasonal pattern but was relatively more active than 2024. By Week 30, TRPHD had recorded 399 confirmed RSV cases, with a noticeable increase in activity during Weeks 18 through 24 (February through March). Peak RSV activity was on Week 23, with over 35 weekly positive cases. Case clusters were especially notable in Buffalo, Dawson, and Kearney Counties, where testing levels were also higher. RSV detections remained minimal until December, peaking in March before declining in April. Phelps County contributed significantly with over 40 cases, while Franklin, Harlan, and Gosper remained low or unreported. ***Overall, 2023 RSV season was moderate in intensity, exceeding 2024's 197 cases by more than 100%, but still within expected seasonal bounds****. The peak aligned closely with flu season, complicating clinical diagnosis due to overlapping symptoms and co-infections.*

COVID-19 Activity (2023)

COVID-19 maintained a substantial presence in TRPHD throughout the 2023 season, with 1,131 total confirmed cases between October 2023 and April 2024. Activity began with relatively modest case counts in the fall, but case numbers grew rapidly during the winter months, peaking between Weeks 7 and 10 (November to December). After Week 16, case numbers declined gradually, although sporadic weekly spikes continued into March.

Comparison of Respiratory Illness Trends in TRPHD: 2023 vs. 2024 Seasons

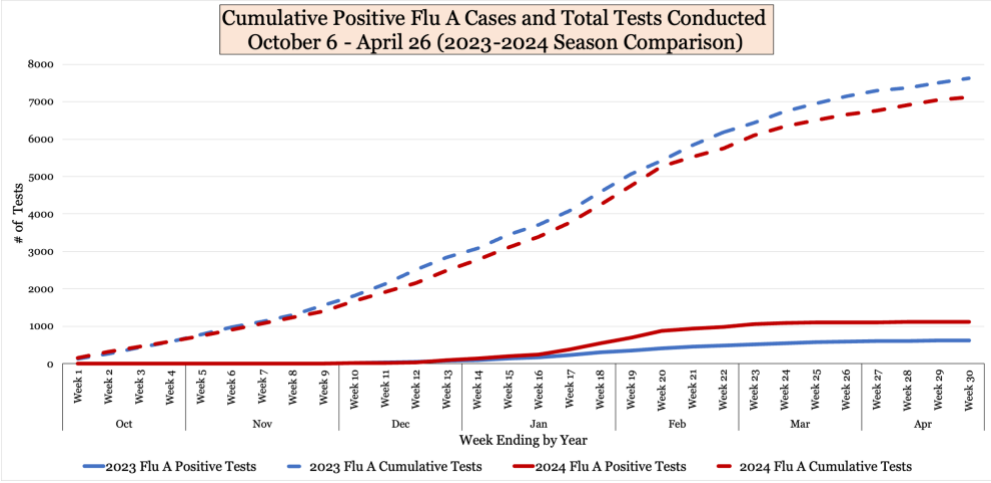
The respiratory illness seasons of 2023 and 2024 across TRPHD provide valuable insight into the changing dynamics of influenza, respiratory syncytial virus (RSV), and COVID-19 in southcentral Nebraska. In 2023, TRPHD recorded 1,338 cases of influenza, including 624 Flu A and 714 Flu B cases, alongside 399 cases of RSV and 1,131 confirmed COVID-19 cases. The following year, in 2024, the district reported 1,234 influenza cases (1,118 Flu A and 116 Flu B), 197 RSV cases, and 419 COVID-19 cases. This **year-over-year shift reflects a pronounced increase in Flu A dominance, a steep drop in Flu B, and more than 50% reductions in RSV and COVID-19 incidence.** These findings underscore the **influence of changing viral circulation patterns, community immunity, and testing behaviors**, and can help guide future public health response.

Influenza Patterns

Influenza trends differed significantly between the two years. **In 2023, Flu A and B each played a major role**, with Flu B accounting for 53% of all influenza cases. The season began with low activity in October, gradually rising through December and peaking between Weeks 13 and 18, with the highest combined weekly total (168 cases) occurring in Week 18. Flu B continued circulating through March, contributing to a long and relatively even seasonal curve.

In contrast, the **2024 flu season was driven almost entirely by Flu A**, which accounted for more than 90% of all influenza cases. Flu A activity surged quickly in December and peaked sharply between Weeks 18 and 20, with Week 20 seeing 169 Flu A positives. Flu B circulation was minimal and sporadic, never surpassing 10 weekly cases. The result was a season that felt more intense at its peak, even though the total number of flu cases was slightly lower than in 2023.

This **reversal in influenza subtype dominance** is notable. It suggests a **possible strain mismatch or shift in transmissibility**, with Flu A potentially better evading prior immunity in 2024. Conversely, the strong Flu B presence in 2023 may reflect lower population exposure to B strains during the pandemic years, leading to greater susceptibility.



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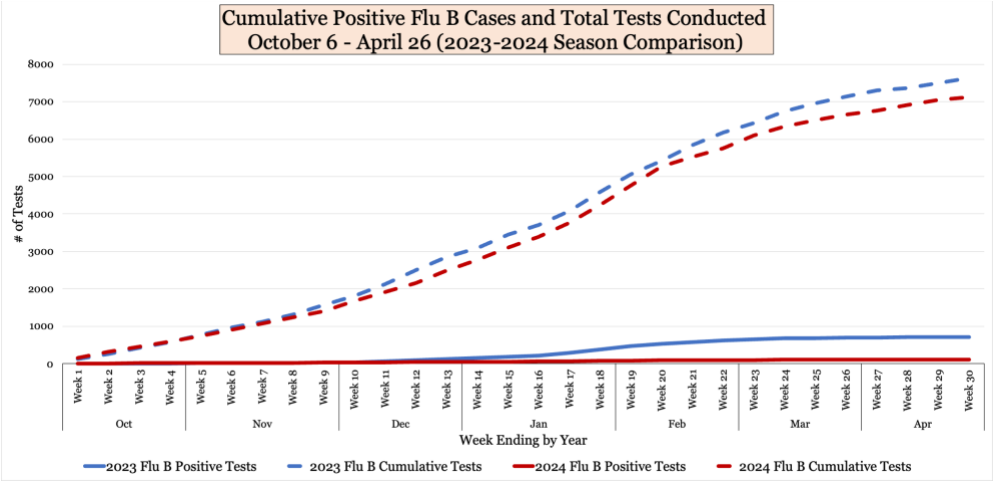
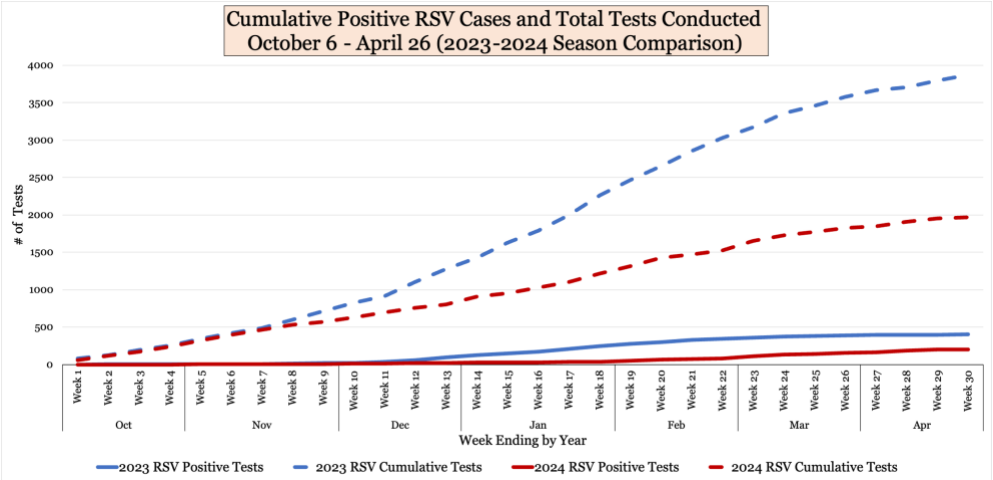


RSV Activity

RSV cases dropped significantly from 2023 to 2024. In 2023, TRPHD reported 399 RSV cases, with activity beginning in November and peaking in Weeks 12 and 17. The season was prolonged, with cases recorded steadily through late March. Weekly case counts during peak periods reached the mid-30s. In contrast, 2024 saw only 197 RSV cases—a **51% reduction.** RSV activity **started later**, with significant increases beginning in Week 19, peaking around Week 23 with 33 cases, and declining rapidly by Week 25. The season was both shorter and less intense.

County-level data showed Buffalo and Dawson counties leading RSV counts in both years, but with lower intensity and more sporadic spread in 2024. Several counties (Franklin, Harlan, and Gosper) reported **no RSV positives** in either year, possibly due to low testing volume or true absence of virus circulation. The reduction in RSV burden in 2024 may be due to increased population immunity, changes in RSV strain circulation, or improved preventive measures. It may also reflect a shift in the age groups affected, as infant and elderly immunizations became more available.

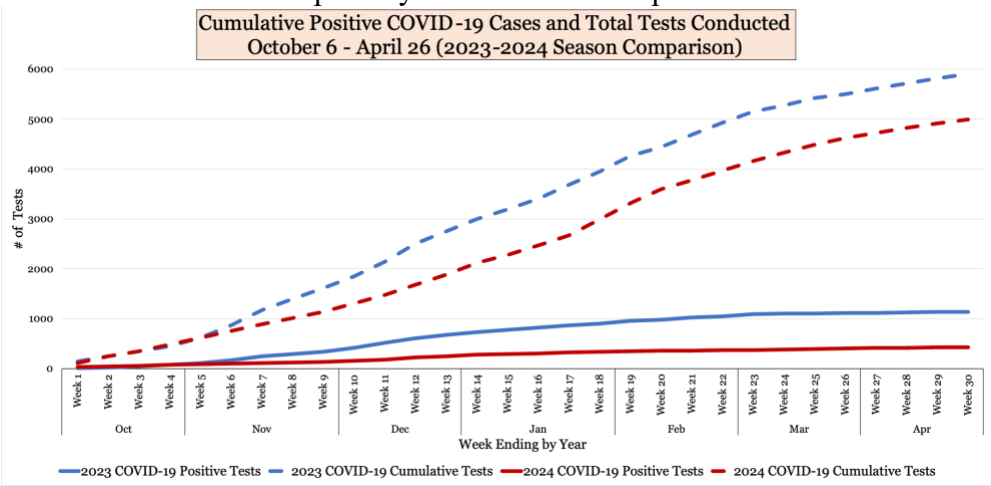


COVID-19 Activity

COVID-19 demonstrated the most dramatic year-to-year change. In **2023, it was the most prevalent respiratory illness,** with 1,131 cases. Weekly counts rose sharply in December, peaking between Weeks 7 and 11, and maintaining moderate levels until Week 24. **In 2024, however, COVID-19 accounted for just 419 cases**,

a 63% reduction. The virus still followed a **winter peak** pattern, with the highest weekly case count (39) occurring in Week 12, but activity declined more rapidly, with only one case added between Weeks 29 and 30.

This decline likely reflects **increasing population immunity, both from vaccination and prior infection, as well as reduced testing frequency.** As COVID-19 continues to **shift toward endemicity**, its seasonality and interactions with other respiratory viruses will be important to monitor.



Frequently Asked Questions and Insights on Respiratory Disease Dynamics

- Why does the Respiratory report cover mostly the Winter months (October – April)?
  - Influenza transmission increases monotonically with decreasing temperature, thus flu transmission is higher when temperatures are lower. This explains the observed heightened influenza activity in the winter months.
  - There is a U-shaped relationship between influenza transmission and absolute humidity, such that transmission increases when absolute humidity is either low or very high.
  - RSV transmission appears to increase with lower absolute humidity and higher precipitation.
  - In addition, respiratory diseases spread more efficiently when vulnerable people are **indoors** in spaces with **insufficient ventilation** (eg: nursing homes, family gatherings, movie theaters).
  - October – December in the American Midwest is marked by Holidays that offer opportunities for greater congregation.
  - We observe a **reduction in transmissibility** of influenza and RSV as **temperatures increase**, and **transmissibility increase** of both viruses with **increasing absolute humidity when controlling for temperature.**
- Is there a relationship between influenza and RSV transmission patterns? If so, how does one affect the other?
  - There exists a **negative, bidirectional interaction between influenza and RSV**, with a duration of up to several months. Put simply, an **RSV outbreak substantially reduces** the size and transmission of an influenza outbreak, and vice versa

- Influenza and RSV epidemic patterns are consistent from year to year. There is **considerable overlap** of influenza and RSV activity during most outbreaks, although peak activity for influenza almost always **precedes** peak activity for RSV
- There also exists considerable evidence that immunization for influenza through Live Attenuated Influenza Vaccine (LAIV) at the population level can reduce the incidence of RSV. This means that achieving higher influenza vaccination rates could potentially reduce the chances of an RSV outbreak.

- What is the relationship between Influenza A and B outbreaks in the same population? How does an outbreak of one strain affect the other?
  - The interplay between Influenza A and B is complex but consistent: **strong A activity often suppresses or delays B**, due to **temporary cross-immunity** and shifting population susceptibility.
  - Influenza B typically follows A once immune protection wanes—and vice versa. These 'lagged peaks' are typically separated by weeks or months in time.
  - Influenza B outbreaks often peak after influenza A, commonly about a month later
- What does the respiratory disease data for Two Rivers region for 2023 and 2024 tell us about the patterns of RSV, Influenza and COVID transmission in the 7-county region?
  - In 2023, COVID-19 and Flu B were dominant forces in TRPHD, with RSV adding a meaningful burden. The incidence of RSV, after having surged around the month of January, began to stabilize and drop following the increase in flu A cases in February.
  - In 2024, Flu A surged dramatically, while RSV and COVID-19 declined in both intensity and duration
  - This seems to point to a temporary cross-immunity that occurred due to influenza surges in 2024 that suppressed RSV incidence
  - COVID incidence in 2024 dropped to its lowest level in the past 5 years, thus reinforcing the endemic status of COVID in 2024.
  - Thus, both temporary cross-immunity and negative correlation of incidence rates were both seen in TRPHD when analyzing rates of COVID and RSV in the district.
- What are some of the unique features of respiratory disease testing and outbreak incidence in TRPHD?
  - Cumulative COVID cases in 2024 were about a third those in 2023, reflecting a declining trajectory of COVID across TRPHD over the past 5 years.
  - Although fewer influenza tests were carried out in 2024 as compared to 2023, the overall incidence of influenza A was higher in 2024. This represents a puzzling phenomenon – when increased incidence did not prompt more testing of the general population. Clinicians must respond to ongoing outbreaks with higher testing of the general population, in order to better understand emergent hotspots and outbreak dynamics
  - Overall, testing for influenza, COVID and RSV dropped in 2024 compared to the previous year. Although the reasons for this are not immediately clear, the role of clinician-ordered tests as 'sentinel surveys' in public health surveillance efforts cannot be overemphasized. **It is important for public health laboratory and surveillance mechanisms to support and encourage clinicians to move towards universal testing of symptomatic patients** and contacts, to enable a better understanding of emergent pandemics.

- A lack of test results from some TRPHD counties (especially Gosper) is cause for concern. It is unclear at this time whether the lower testing levels reflect lesser clinical suspicion or a reluctance by clinicians to test for respiratory diseases among the population.
- Influenza-like-Illnesses (ILI) related hospitalizations peaked in late February/ March in TRPHD, following the peak of the influenza A outbreak. However, people aged 50-64 saw a peak in ILI related hospitalizations in December-January as compared to February-March for people aged 65 years and over. The bulk of the hospitalizations burden was borne by the oldest age group in the district, ie 64+ year olds.