

2023-2024 Influenza Surveillance Seasonal Summary Report

Division of Epidemiology & Public Health Preparedness (EPHP) 775-328-2447

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Key Summary Statistics for the 2023-2024 Season*

Measure	High (MMWR week)	Low (MMWR week)	Average per Week
ILI Activity (% of visits)	5.9% (52)	1.5% (42)	2.8%
ILI ED/UC Visits (% of visits)	7.7% (52)	0.7% (42)	3.2%
Hospitalizations (rate per 100K)	54 (01)	0 (40, 43)	13.7
Deaths (Counts)	6 (05)	0 (17 weeks)	1.0
PIC (% of deaths)	9.9% (49)	1.7% (19)	5.8%
RSV (Counts)	288 (51, 01)	1 (19)	86.2

*For definition and specifics on metrics summarized, please refer to corresponding sections.

2023-2024 Influenza Surveillance Season Summary

- Started October 1, 2023, and ended May 18, 2024.
- Influenza-like-illness (ILI) activity increased progressively from week 40 (Oct. 1- Oct. 7) through the peak at week 52 (Dec. 24-Dec. 30).
- The 0-4-year-old age group represented the highest proportion of patients presenting with ILI.
- Washoe County specimens sequenced were mostly influenza A (76%), and of those subtyped, most were A (2009 H1N1).
- There was a total of 453 influenza-associated hospitalizations, the highest cumulative hospitalization rate since the 2017-2018 season.
- The peak of hospitalizations occurred between December 17, 2023, and January 13, 2024.
- Of the hospitalized, most were infected with influenza A (84%), a majority were not vaccinated (76%), 18% were admitted into the ICU and 4% expired.
- Those >65-years-old had the highest cumulative hospitalization rate this season.
- There were 33 influenza related deaths reported this season: 39.4% (13) were not hospitalized, 69.7% were not vaccinated with a seasonal influenza vaccine and 97.0% had

at least one documented underlying medical condition that contributes to an increased risk for influenza-related complications.

- Eighty-five percent of influenza deaths were among persons diagnosed with influenza A and 15.2% with influenza B.
- Ages of those who died ranged from 4 to 94-years of age, with an average of 64-years of age.
- The total number of respiratory syncytial virus (RSV) cases reported was 2,846; the most cases reported in the last 23 influenza seasons on record.

Discussion

The 2023-2024 influenza season was the first in which the three most common viral respiratory pathogens- influenza, COVID-19, RSV- each had a vaccine available.¹ Further, according to interim estimates, the influenza flu vaccine was moderately effective (42% overall) in preventing influenza, equal to or better than any season since 2016-2017, and effective against both influenza A (mostly 2009 H1N1) and B (Victoria) viruses, which both circulated this influenza season.² However, nationally influenza vaccine doses distributed lagged behind previous seasons, with this season having the lowest vaccine distribution number compared to all past influenza seasons since 2019-2020 (low of 158 million doses in the 2023-24 season, with high of 194 million doses in the 2020-2021 season).³ Vaccination coverage for children was 2.2 percentage points lower compared with the previous season (8.5 percentage points lower compared with pre-pandemic coverage); however, adult coverage was 2.3 percentage points higher compared to last season.⁴ Ultimately, the 2023-2024 influenza season was considered moderate across all ages based on influenza-like illness (ILI) outpatient visits, influenza-related hospitalizations, and influenza deaths.⁵ The cumulative hospitalization rate this season was the second highest recorded since 2016-2017, with only the 2017-2018 season exceeding it (80.2 in 2023-2024, 102.9 in 2017-2018).⁶ Most hospitalizations were among those 65-years-of age or older and most were associated with influenza A virus (2009 H1N1 & H3 among subtyped), followed by influenza B virus.⁷ Influenza B circulated prominently this season, the first time since prior to the 2020-2021 season.⁶ However, as has been the case since March 2020, influenza B (Yamagata) was not detected globally.⁸ Consequently, all U.S. influenza vaccines for the 2024-2025 season will no longer have the influenza B (Yamagata) vaccine component (i.e., trivalent).⁸ Influenza vaccine will be assessed annually for seasonal updates to the components. Another significant note from the 2023-2024 season included the detection of human H5 bird influenza cases in the U.S. (five cases as of July 1, 2024) one in poultry associated (2021) and four associated with dairy cows.⁹ These cases

are part of a multistate outbreak of A(H5N1) in U.S. dairy cows; no human cases were associated with the others and exposures were traced to infected herds. These detections support the need not only for seasonal influenza vaccination efforts to avoid co-infections, but for continued, year-round influenza surveillance incorporating testing, screening, and monitoring when necessary.⁹

¹ Mossad SB. Hey, Doc: Could the 2023-2024 cold and flu season finally be the calm after the storm? *Cleve Clin J Med*. 2023 Dec 1;90(12):729-734. doi: 10.3949/ccjm.90a.23088. PMID: 38040436.

² Frutos AM, Price AM, Harker E, et al. Interim Estimates of 2023–24 Seasonal Influenza Vaccine Effectiveness — United States. *MMWR Morb Mortal Wkly Rep* 2024;73:168–174. DOI: <http://dx.doi.org/10.15585/mmwr.mm7308a3>

³ Influenza Vaccine Doses Distributed, United States. Atlanta, GA: National Center for Immunization and Respiratory Diseases, CDC, Mar. 2024. Accessed June 2024 <https://www.cdc.gov/flu/fluview/dashboard/vaccination-doses-distributed.html>

⁴ Weekly Flu Vaccination Dashboard, United States. Atlanta, GA: National Center for Immunization and Respiratory Diseases, CDC, May 2024. Accessed June 2024 <https://www.cdc.gov/flu/fluview/dashboard/vaccination-dashboard.html>

⁵ Preliminary In-Season Severity Assessment for the US 2023-2024 Season (Oct. 1, 2023-May 25, 2024), United States. Atlanta, GA: National Center for Immunization and Respiratory Diseases, CDC, May. 2024. Accessed May 2024 <https://www.cdc.gov/flu/about/classifies-flu-severity-inseason.htm>

⁶ Weekly U.S. Influenza Surveillance Report, United States. Atlanta, GA: National Center for Immunization and Respiratory Diseases, CDC, May. 2024. Accessed June 2024 <https://www.cdc.gov/flu/weekly/>

⁷ Laboratory-Confirmed Influenza Hospitalizations, United States. Atlanta, GA: National Center for Immunization and Respiratory Diseases, CDC, May. 2024. Accessed June 2024 <https://gis.cdc.gov/GRASP/Fluview/FluHospRates.html>

⁸ Trivalent Influenza Vaccines. Atlanta, GA: National Center for Immunization and Respiratory Diseases, CDC, Mar. 2024. Accessed April 2024 <https://www.cdc.gov/flu/prevent/trivalent.htm>

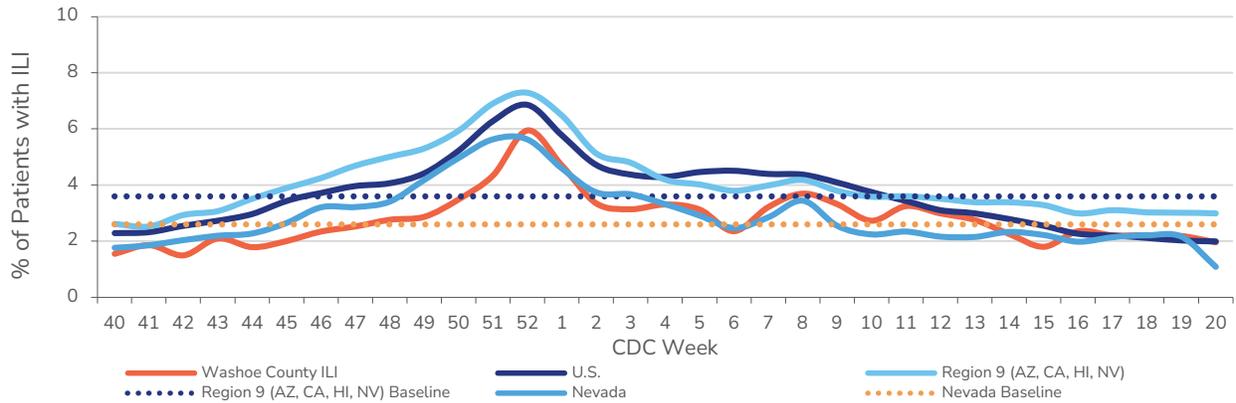
⁹ CDC Confirms Second Human H5 Bird Flu Case in Michigan; Third Case Tied to Dairy Outbreak. Atlanta, GA: National Center for Immunization and Respiratory Diseases, CDC, May. 2024. Accessed June 2024 <https://www.cdc.gov/media/releases/2024/p0530-h5-human-case-michigan.html>

Influenza-like-illness (ILI)

Influenza-like-illness (ILI) is defined as fever ($\geq 100^{\circ}\text{F}$ [37.8°C]) and cough and/or sore throat. ILI data is submitted weekly by inpatient and outpatient health services who have completed the onboarding process to be a sentinel surveillance provider. ILI activity levels use the proportion of outpatient visits to healthcare providers for respiratory illness, not laboratory confirmed influenza. ILI activity may capture patient visits due to other respiratory pathogens that cause similar symptoms to influenza.

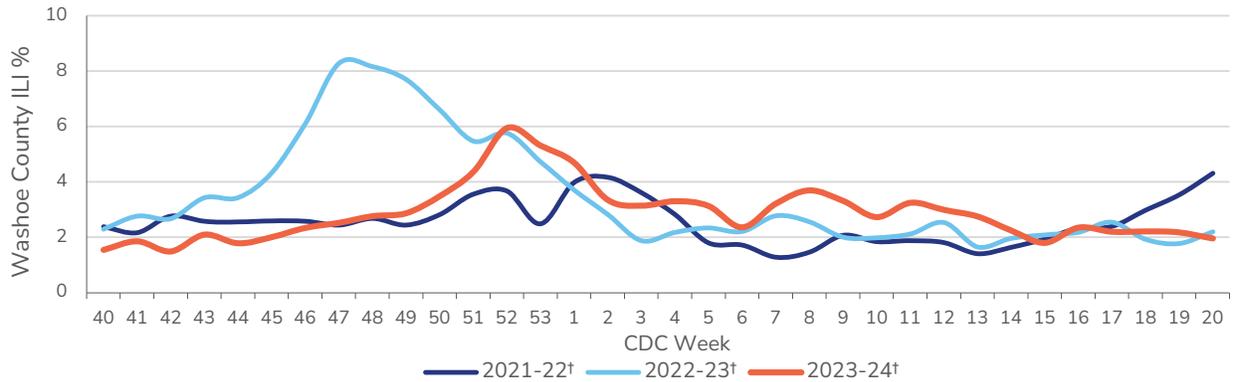
Week 52 was the peak for ILI activity for the United States (6.9%), Region 9 (7.3%), Nevada (5.6%), and Washoe County (5.9%). From week 52 through week 14 (Mar. 31- Apr. 6), ILI declined but activity remained elevated nationally, statewide, and locally (except for week 6). The 0-4-year-old age group represented the highest proportion of patients presenting with ILI throughout the 2023-2024 influenza season.

Figure 1. Comparison of ILI Activity at the Local, State, Regional, and National Level, Washoe County, 2023-2024



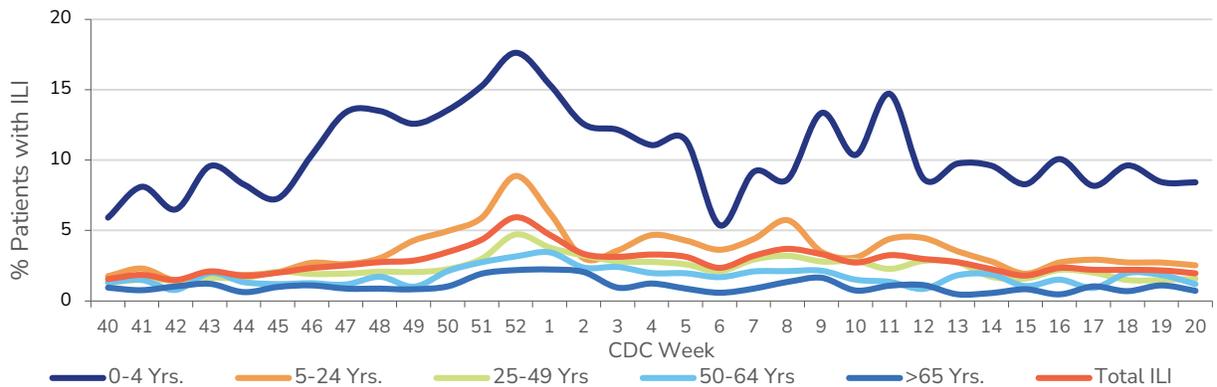
Data source for U.S., Region 9, and Nevada ILI activity and baselines: <https://www.cdc.gov/flu/weekly/fluviewinteractive.htm>. Region 9 & U.S. data are weighted, Nevada is unweighted. CDC methods: <https://www.cdc.gov/flu/weekly/overview.htm#ILINet>

Figure 2. ILI Activity Reported by Sentinel Providers, Washoe County, 2021-2023 Season†



† Does not have a week 53, so the week 53 value is an average of week 52 and week 1.

Figure 3. ILI Activity Reported by Sentinel Providers by Age Group, Washoe County, 2023-2024



Data presented in this report is preliminary and may be updated in future reports as additional information is received throughout the influenza season.

Nevada State Public Health Laboratory (NSPHL) Test Results

The NSPHL performs influenza subtyping of specimens submitted for surveillance purposes. Specimens are primarily submitted to the NSPHL by sentinel provider sites; however, all typed specimens are included in surveillance, even those not submitted by sentinel providers.

NSPHL sequenced 489 samples this season. Most were found to be influenza A (76.3%, n=373) while 23.7% were influenza B (n=116). Among those subtyped (n=116), 60.3% were influenza A (2009 H1N1) (n=70), 22.4% were influenza B (Victoria) (n=26), and 17.2% were influenza A (H3) (n=20). While influenza A dominated the season, influenza B circulated more than recent seasons. Influenza B began to be dominant over Influenza A in the spring of 2024, from February 11, 2024, through April 20, 2024. Of the 33 weeks of the season, A was the dominant influenza type for 58% of the weeks, while B was dominant 33%, and A and B were equivalent for 9% of the season. B (Yamagata) has not been detected locally, nationally, or globally since March of 2020.

Figure 4. Positive Specimens Submitted to NSPHL, Subtyping by Week, Washoe County, 2023-2024

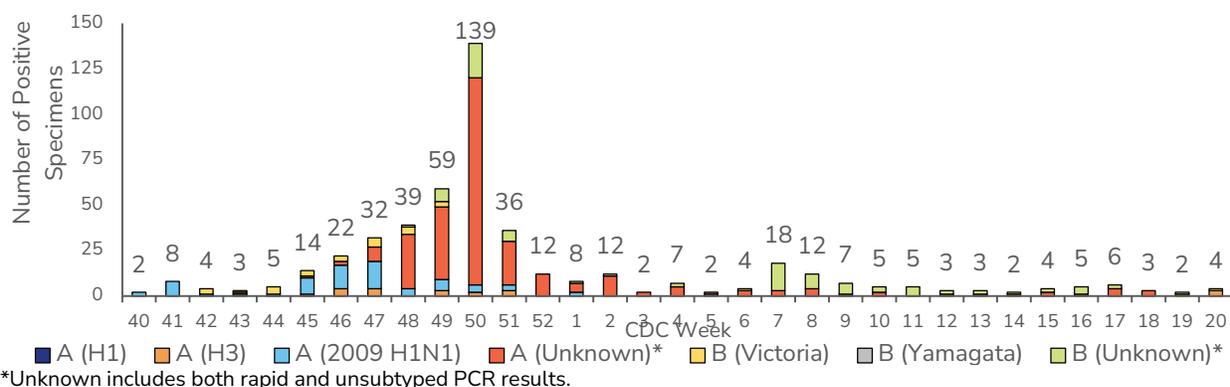
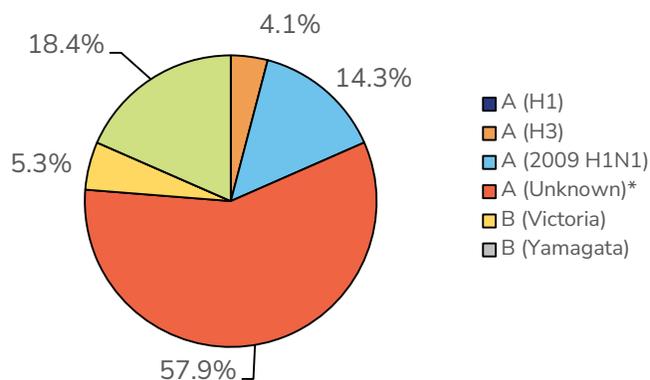


Table 1 & Figure 5. Specimens Submitted to NSPHL for Subtyping, Washoe County, 2023-2024

Influenza Subtype	# of Specimens	% of Total Specimens
A (H1)	0	0.0%
A (H3)	20	4.1%
A (2009 H1N1)	70	14.3%
A (Unknown)*	283	57.9%
B (Victoria)	26	5.3%
B (Yamagata)	0	0.0%
B (Unknown)*	90	18.4%
Total	489	100%



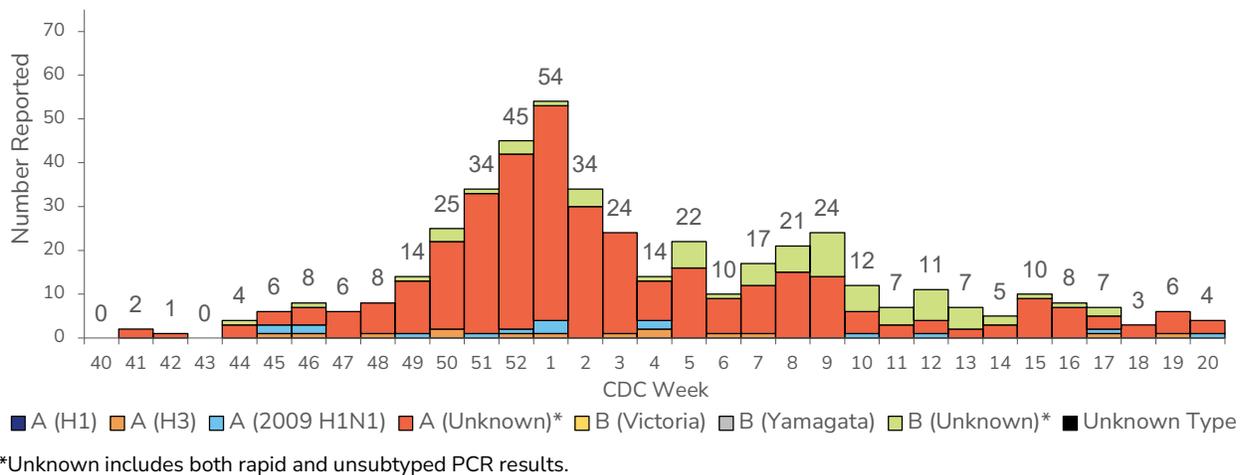
*Unknown includes both rapid and untyped PCR results.

Hospitalizations

Medical records are reviewed for cases with evidence of a positive influenza test who were hospitalized for greater than or equal to 24 hours. Information on the number of hospitalized cases, the number of hospitalized cases vaccinated at least two weeks prior to symptom onset, number of intensive care unit (ICU) admissions, and number of deaths among hospitalized cases are reported in Table 2.

The seasonal cumulative hospitalization rate per 100,000 population is presented in Figure 7, and by age group in Figure 8. There were 453 influenza related hospitalizations reported among Washoe County residents. The majority (84.1%) of hospitalized cases were identified as having influenza type A with 15.9% identified as having influenza type B. Among these samples subtyped (n=30), 53.3% were influenza A (2009 H1N1) (n=16) and 46.7% (n=14) were influenza A (H3) (n=14).

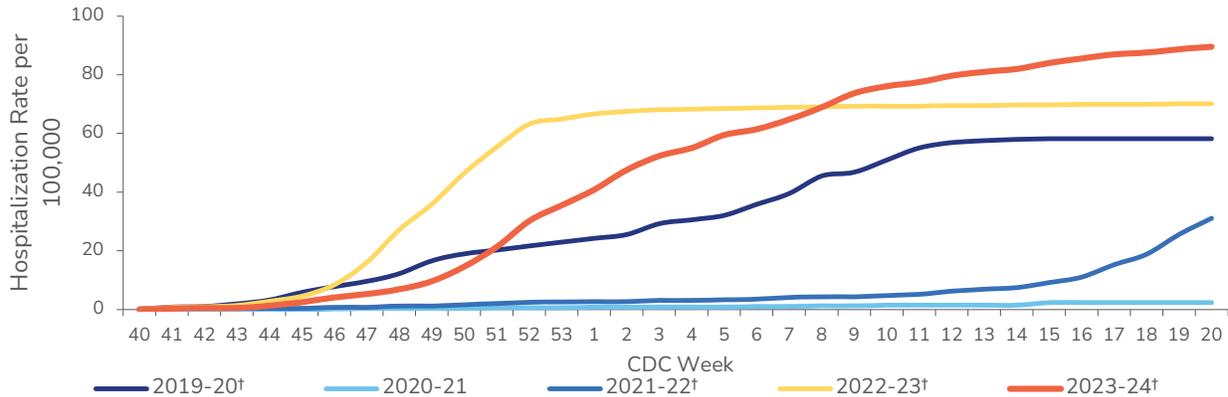
Figure 6. Influenza Positive Tests Among Hospitalized Cases by Week Reported, Washoe County, 2023-2024



Of hospitalized cases, the highest rate of hospitalization per 100,000 persons was among the >65-year age group at 253.2 and the lowest rate was among the 5-24-year age group at 27.1. Among hospitalized, 51% were female and 49% were male; 70% were White, Non-Hispanic, 16% Hispanic, 6% Black, Non-Hispanic, 4% Asian/Pacific Islander, Non-Hispanic, 2% Other, Non-Hispanic, and 2% American Indian/Alaskan Native, Non-Hispanic. Hospitalization increases during the 2023-2024 season occurred later compared to last season, but similar to the 2019-2020 season. The peak of hospitalizations occurred between weeks 51-02 (December 17, 2023, and January 13, 2024) with 167 hospitalizations of Washoe County

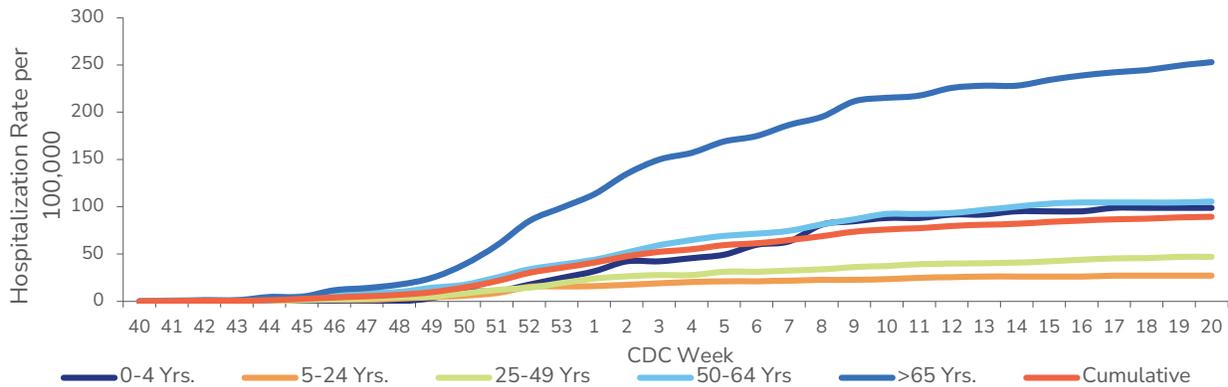
residents, with continued elevation in numbers for the remaining weeks of the season. The 2023-2024 season had the highest cumulative hospitalization rate (89.6 per 100,000) compared to the five most recent seasons (2018-2019, 2019-2020, 2020-2021, 2021-2022, 2022-2023).

Figure 7. Influenza Hospitalization Rate per 100,000 Population, Washoe County, 2023-2024



† Does not have a week 53, so the week 53 value is an average of week 52 and week 1.

Figure 8. Influenza Hospitalization Rate per 100,000 Population by Age Group, Washoe County, 2023-2024



† Does not have a week 53, so the week 53 value is an average of week 52 and week 1.

Of hospitalized cases, 17.9% were admitted to the ICU and 4.4% died. Only 23.6% were vaccinated with a seasonal influenza vaccine. Of the unvaccinated hospitalized cases, 1.2% were under the age of six months and too young to receive the vaccine and 39.9% were over 65-years of age and were considered high risk for developing serious influenza-related complications. Additionally, of the unvaccinated hospitalized cases, 84.4% had at least one documented underlying medical condition that contributed to an increased risk for influenza-related complications.

Table 2. Number of Hospitalized Cases with Lab-Confirmed Influenza by Vaccination, ICU, and Death Status, Washoe County, 2023-2024

	Cumulative for 2023-2024 Influenza Season October 1, 2023 - May 18, 2024							
	Hosp.		Vax [§]		ICU		Death	
	#	%	#	%	#	%	#	%
Total # of cases reported	453	N/A	107	24	81	18	20	4
Influenza A (H1)	0	0	0	0	0	0	0	0
Influenza A (H3)	14	3	4	4	4	5	1	5
Influenza A (2009 H1N1)	16	4	4	4	4	5	0	0
Influenza A (Unknown)*	351	77	90	84	58	72	15	75
Influenza B (Victoria)	0	0	0	0	0	0	0	0
Influenza B (Yamagata)	0	0	0	0	0	0	0	0
Influenza B (Unknown)*	72	16	9	8	15	19	4	20
Influenza Unknown Type	0	0	0	0	0	0	0	0

*Unknown includes both rapid and untyped PCR results.

§Vaccination status determined among hospitalized cases only. Patient is considered vaccinated if they received a flu vaccine ≥ 2 weeks prior to illness onset.

Deaths

For surveillance purposes, an influenza-associated death is defined as a death resulting from a clinically compatible illness that was confirmed to be influenza by an appropriate laboratory or rapid diagnostic test with no period of complete recovery between the illness and death. Only pediatric deaths are considered reportable. Hospitalization is not required to be considered an influenza-associated death; therefore, counts presented here may be higher than those presented among hospitalized cases.

There was a total of 33 influenza-associated deaths this season; 85% were infected with Influenza A, 15% were infected with Influenza B. Of samples subtyped, most were influenza A (2009 H1N1). Among those who died, 48% were female and 52% were male; 73% White, Non-Hispanic; 15% Hispanic, 6% Black, Non-Hispanic; and 6% American Indian/Alaskan Native, Non-Hispanic. Among these, 70% were not vaccinated for influenza this season, 61% had been hospitalized (39% had not been hospitalized), and 97% had at least one underlying health condition that put them at risk for severe illness from influenza. Most deaths were >65-years old (76%), followed by 50-64-years old (12%), and 25-49-years-old (9%). There was one pediatric death; this case was not hospitalized, had an underlying health condition, and had not been vaccinated for influenza this season. The peak of influenza-associated deaths occurred in January 2024 (30%), followed by February 2024 (24%), and December 2023 (21%). The

remaining deaths (21%) occurred between March-May 2024. Only 3% of deaths occurred in November 2023.

Table 3. Number of Influenza-Associated Deaths by Age Group & Hospitalization Status, Washoe County, 2023-2024

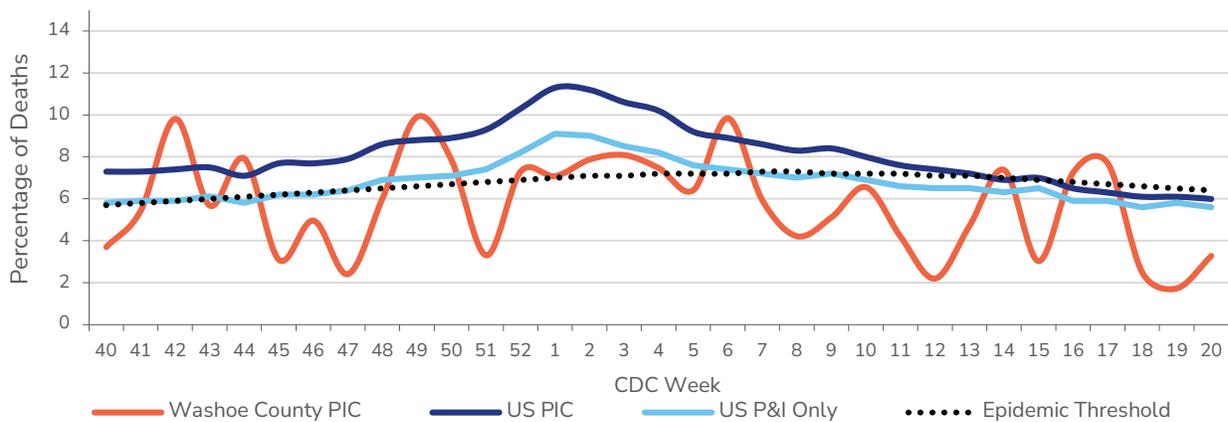
Age Group	Deaths (Hospitalized)	Deaths (All)
0-4 Yrs.	0	1
5-24 Yrs.	0	0
25-49 Yrs.	0	3
50-64 Yrs.	2	4
>65 Yrs.	18	25
Total	20	33

Pneumonia, Influenza, and COVID-19 Mortality

Data from the National Center for Health Statistics Mortality Surveillance are used to determine the percentage of deaths that occurred each week due to pneumonia, influenza, and/or COVID-19 (PIC). Washoe County vital statistic records are reviewed to calculate the percentage of deaths attributed to PIC. Records were pulled based on the CDC week deaths are registered and not date of death.

PIC deaths peaked in week 49 (Dec. 3-Dec. 9), representing 9.9% of total reported deaths for that week. Of note, 27.9% of the total PIC deaths reported listed COVID-19 as a contributing factor.

Figure 9. Pneumonia, Influenza, and COVID-19 Mortality, Washoe County and the United States, 2023-2024



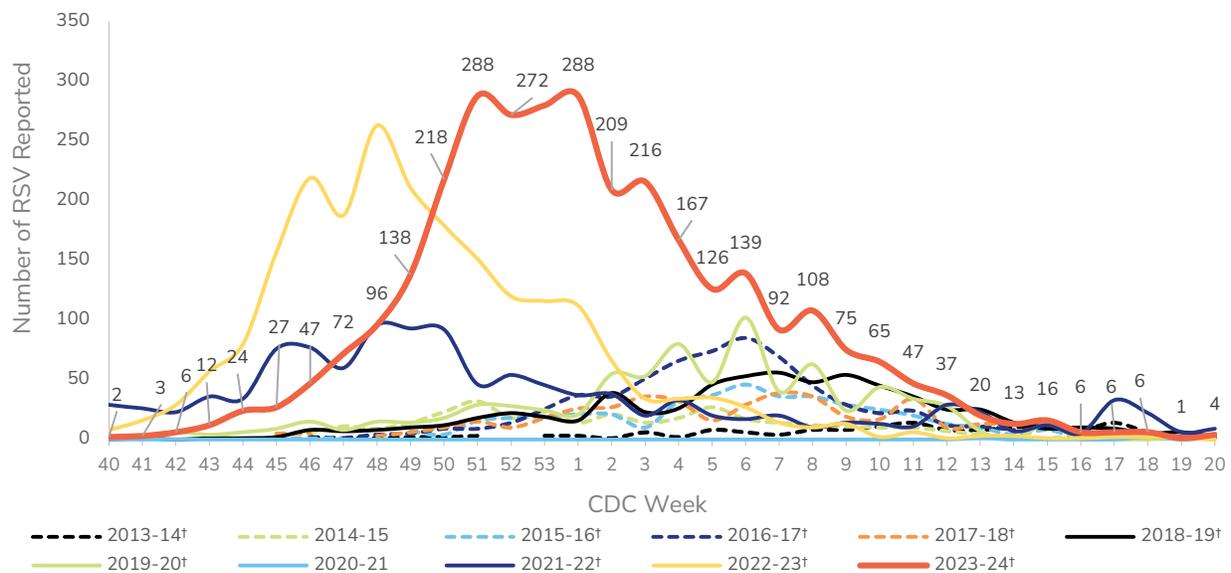
Data sources: National Center for Health Statistics (NCHS) Mortality Surveillance available at <https://www.cdc.gov/flu/weekly/#S2> and Nevada Vital Records.

Respiratory Syncytial Virus

Respiratory Syncytial Virus (RSV) is a common respiratory virus that can present with influenza-like signs and symptoms (e.g., fever, coughing, runny nose). RSV, while usually presented with mild symptoms, can be serious, especially for infants and older adults. It is the most common cause of bronchiolitis and pneumonia in children younger than 1 year of age. RSV is a reportable condition in Nevada.

There was a total of 2,846 reported laboratory-confirmed RSV cases reported. This season exceeded last season's record 2,045 cases. This season had the highest cumulative number for any season recorded since 2000 and the six of the highest reported weeks (highest 288 cases) among recorded seasons, while the other four highest reported were from last season (highest 263 cases). Most cases were among the 0-4 age group, followed by the >65 years age group. The peak of RSV cases was between December 17, 2023, and January 6, 2024 (848 cases in those three weeks).

Figure 10. Number of RSV Cases Reported by Week, Washoe County, 2013-2023 Season†



† Does not have a week 53, so the week 53 value is an average of week 52 and week 1.

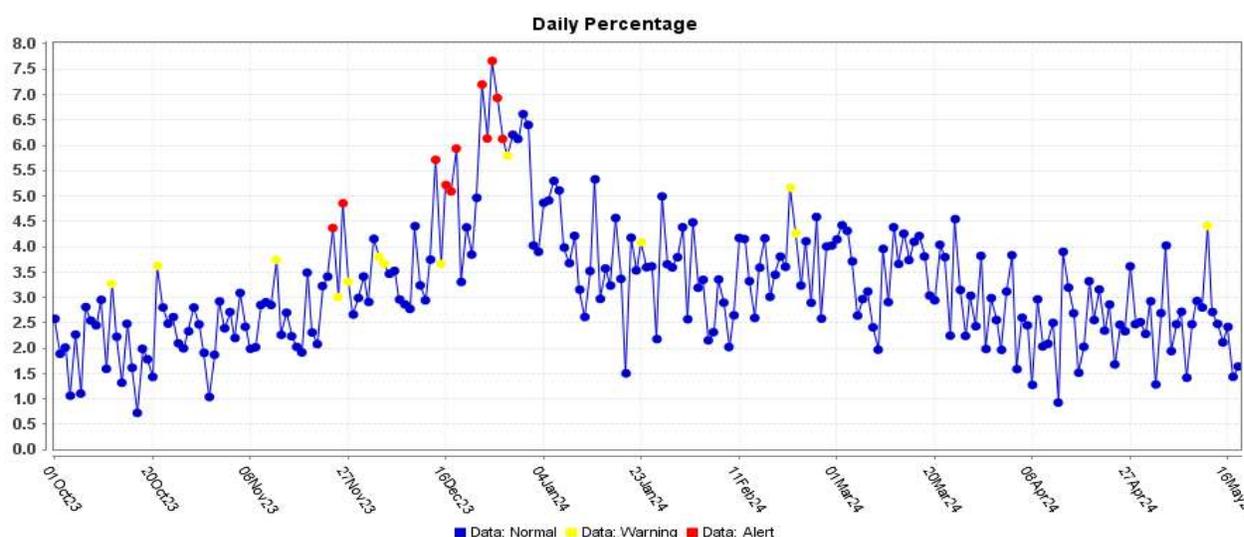
Syndromic Surveillance

Emergency Department (ED) Visits and Urgent Care (UC) Visits

Percentage of patients seen for ILI in ED and UC is presented in Figure 11. ILI is defined as influenza or fever and a cough and/or a sore throat. The overlay below depicts ILI syndrome in blue. Alerts appear as yellow and/or red dots, indicating an unusually high percentage of ILI visits according to ESSENCE algorithms.

According to ESSENCE, there were a total of 13 days detected as having a “warning” signal and 11 days detected as having an “alert” signal at ED and UCs. For over the count sales for cough and cold remedies, the syndromic surveillance system did not detect any increases over the threshold at any time.

Figure 11. Percentage of ED and UC* Visits for ILI for Weeks 40-20, Washoe County, 2023-2024



Data source: ESSENCE (National), *13 Emergency Departments/Urgent Cares reporting to ESSENCE.

Table 4. Dates of Increase in ILI ED and UC visits, Washoe County, 2023-2024

Detection	2023	2024
Warning	Oct. 12, 21; Nov. 13, 25, 27; Dec. 3, 4, 15, 28	Jan. 23; Feb. 21, 22; May 12
Alert	Nov. 24, 26; Dec. 14, 16, 17, 18, 23, 24, 25, 26, 27	-

Over the Counter (OTC) Sales for Cough and/or Cold Remedies

Figure 12. OTC Sales for Cough and/or Cold Remedies for Weeks 40-20, Washoe County, 2023-2024



Data source: National Retail Data Monitor Data coverage in Washoe County

Surveillance Changes 2023-2024 Season

- Starting with the 2023-2024 influenza season, Nevada implemented the use of ESSENCE data for ILI data reporting to CDC's ILINet. As a result, Nevada's baseline was recalculated using historical ESSENCE data and the number of reporters for ILI for the state of Nevada went from 32 to 66 (13 to 14 for Washoe County, 11 now reporting using ESSENCE). Historical ILI data was recalculated with ESSENCE data to ensure comparability with the current season. See Influenza-like-illness & Syndromic Surveillance sections of this report for where ESSENCE data is utilized; this data should not be compared to previous reports published in prior seasons.
- Season 2022-2023 Influenza Report's Figure 2 was removed as it showed ILI activity in Washoe County reported by sentinel providers from 2018-2021 using a previous case definition for ILI. It was no longer comparable to the seasons that proceeded 2021.
- Table 3 was added to depict influenza-associated deaths by age group and by hospitalization status.
- One sentinel provider, an urgent care, was re-onboarded. It had previously been a reporter but had been closed during the 2022-2023 season.
- Influenza typing has been standardized throughout the report. Influenza A (H1) is reported separately from influenza A (2009 H1N1). Rapids are no longer reported separately, instead are combined with unknown subtypes cumulatively as either influenza A (unknown) or influenza B (unknown).
- Some figures and tables were rearranged within the report.