

2021-2022 Influenza Hospitalization Report

Background

Since 2003, the Oregon Emerging Infections Program (EIP) has conducted surveillance for pediatric influenza hospitalizations in collaboration with the Centers for Disease Control and Prevention (CDC) Influenza-Associated Hospitalization Surveillance Network (FluSurv-NET). Surveillance for adult influenza-associated hospitalizations was added in 2005.

The objectives of EIP FluSurv-NET surveillance are:

- To estimate age-, race-, and ethnicity-specific hospitalization rates
- To describe temporal trends of laboratory-confirmed influenza hospitalization
- To describe characteristics of persons hospitalized with influenza
- To describe clinical features and the course of influenza disease among persons hospitalized with influenza

In Oregon, the EIP surveillance area for influenza hospitalizations comprises the Portland tri-county area (Clackamas, Multnomah, and Washington counties) with its 2021 population of 1,840,747¹, which is approximately 43% of the population of Oregon.

This report summarizes FluSurv-NET surveillance in Oregon during the 2021–2022 season (October 1, 2021–June 30, 2022).²

Methods

Cases are defined as laboratory-confirmed influenza hospitalizations among residents of the EIP surveillance area who test positive for influenza within 14 days before admission or 3 days after admission. Cases are reported by hospitals in the tri-county area. Medical records are reviewed by trained personnel, who use the EIP case-report form to collect standardized data regarding demographic characteristics, clinical manifestations, underlying conditions, and outcomes.

Surveillance Results

During October 1, 2021–June 30, 2022, 79 influenza-related hospitalizations were reported in Oregon’s EIP surveillance area—68 adult (≥ 18 years) cases and 11 pediatric (< 18 years) cases. This represents a crude rate of 4.3 cases per 100,000 residents.

Table 1 shows the sex, age, ethnicity, and race of Oregon EIP FluSurv-NET cases in the 2021–2022 season. The median age of hospitalized cases was 59 years (range, 2 months–93 years). 44.3% of hospitalizations occurred in persons aged 65 years and older, 57.0% of cases were female, and 46.8% of cases identified as Non-Hispanic White.

Table 1. Characteristics of Oregon EIP FluSurv-NET hospitalization cases, 2021–2022

Case Characteristics		n = 79 (%)
Sex	Male	34 (43.0%)
	Female	45 (57.0%)
Age	<6 months	2 (2.5%)
	6-23 months	0 (0.0%)
	24-59 months	3 (3.8%)
	5-10 years	1 (1.3%)
	11-17 years	5 (6.3%)
	18-49 years	25 (31.6%)
	50-64 years	8 (10.1%)
	65+ years	35 (44.3%)
Race	Hispanic	20 (25.3%)
	White, Non-Hispanic	37 (46.8%)
	Black, Non-Hispanic	5 (6.3%)
	Asian/Hawaiian or Pacific Islander	5 (6.3%)
	American Indian/Alaska Native	1 (1.3%)
	Multiple Races	0 (0.0%)
	Unknown	11 (13.9%)

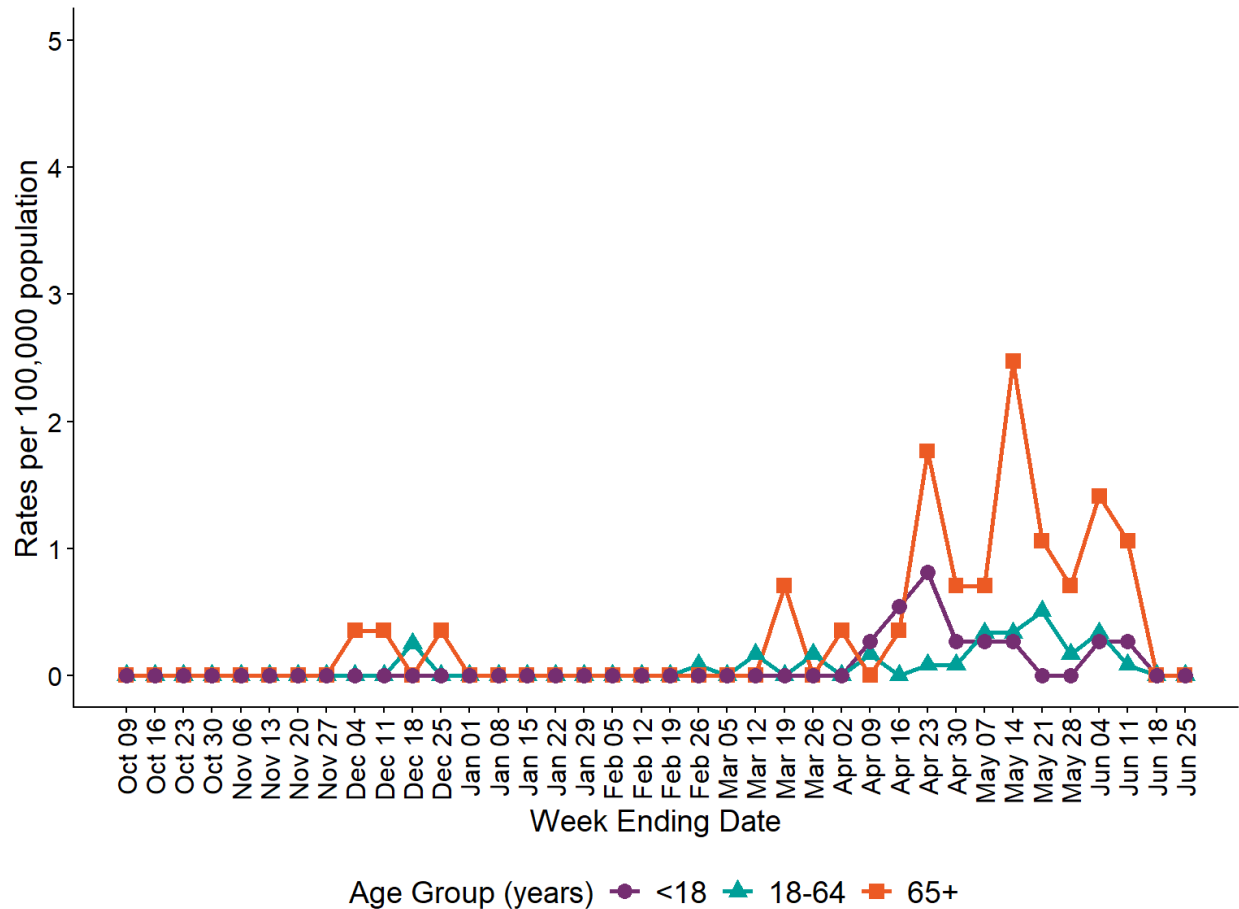
Table 2 shows the number and rates of Oregon EIP FluSurv-NET hospitalizations by age group during the 2021–2022 season.

Table 2. 2021–2022 Oregon EIP FluSurv-NET hospitalization rates by age group

Age Group (years)	n = 79	Rates per 100,000 people
0-4	5	5.2
5-17	6	2.2
18-49	25	2.9
50-64	8	2.4
65+	35	12.4

Figure 1 shows the distribution of Oregon EIP FluSurv-NET hospitalization rates by age group during the influenza season. The peak of influenza-associated hospitalizations occurred during MMWR week 19 of 2022 (May 08, 2022–May 14, 2022). The first case was reported during MMWR week 48 (November 28, 2021–December 04, 2021), and the last case was reported during MMWR week 23 (June 05, 2022–June 11, 2022).

Figure 1. Rates of Oregon EIP FluSurv-NET hospitalizations, by age, 2021–2022



All cases admitted between October 1, 2021–April 30, 2022, 25 adult and 7 pediatric cases, were selected for medical-record review. Medical-record review was not conducted for cases admitted between May 1, 2022 - June 30, 2022.

Table 3 shows selected outcomes and underlying medical conditions for pediatric cases. 71.4% of pediatric cases had an underlying medical condition. The most frequently reported underlying medical conditions among pediatric cases were asthma (42.9%) and obesity (28.6%).

Table 3. Selected outcomes and underlying medical conditions for pediatric Oregon EIP FluSurv-NET cases, 2021–2022

Outcomes and underlying medical conditions		n = 7 (%)
Treatment and intervention	ICU admission	2 (28.6%)
	Mechanical ventilation	0 (0.0%)
	Treated with antivirals*	6 (85.7%)
Condition†	Asthma	3 (42.9%)
	Autoimmune disease	0 (0.0%)
	Blood disorders	0 (0.0%)
	Cardiovascular disease	0 (0.0%)
	Chronic lung disease	0 (0.0%)
	Chronic metabolic disease	0 (0.0%)
	Gastrointestinal/liver disease	0 (0.0%)
	Hypertension	0 (0.0%)
	Immunesuppression	0 (0.0%)
	Neurologic disease	0 (0.0%)
	Obese‡	2 (28.6%)
	Renal disease	0 (0.0%)
Vaccine status	Yes	4 (57.1%)
	No	6 (85.7%)
	Unknown	0 (0.0%)

* Treated with antivirals defined as antiviral treatment during the course of illness.

†Cases may have more than one underlying condition; categories are not mutually exclusive.

‡ Obesity defined as BMI≥30. BMI is not calculated for cases under <2 years.

Table 4 shows selected outcomes and underlying medical conditions for adult cases. 88.0% of adult cases had at least one underlying medical condition prior to admission. The most frequently reported underlying medical conditions among adults were hypertension (44.0%) and cardiovascular disease (40.0%).

Table 4. Selected outcomes and underlying medical conditions for adult Oregon EIP FluSurv-NET cases, 2021–2022

Outcomes and underlying medical conditions		n = 25 (%)
Treatment and intervention	ICU admission	3 (12.0%)
	Mechanical ventilation	0 (0.0%)
	Treated with antivirals*	17 (68.0%)
Condition[†]	Asthma	3 (12.0%)
	Autoimmune disease	0 (0.0%)
	Blood disorders	0 (0.0%)
	Cardiovascular disease	10 (40.0%)
	Chronic lung disease	5 (20.0%)
	Chronic metabolic disease	7 (28.0%)
	Gastrointestinal/liver disease	1 (4.0%)
	Hypertension	11 (44.0%)
	Immunosuppression	0 (0.0%)
	Neurologic disease	1 (4.0%)
	Obese [‡]	5 (20.0%)
	Pregnancy [§]	4 (16.0%)
	Renal disease	2 (8.0%)
Vaccine status	Yes	20 (80.0%)
	No	11 (44.0%)
	Unknown	0 (0.0%)

* Treated with antivirals defined as antiviral treatment during the course of illness.

† Cases may have more than one underlying condition; categories are not mutually exclusive.

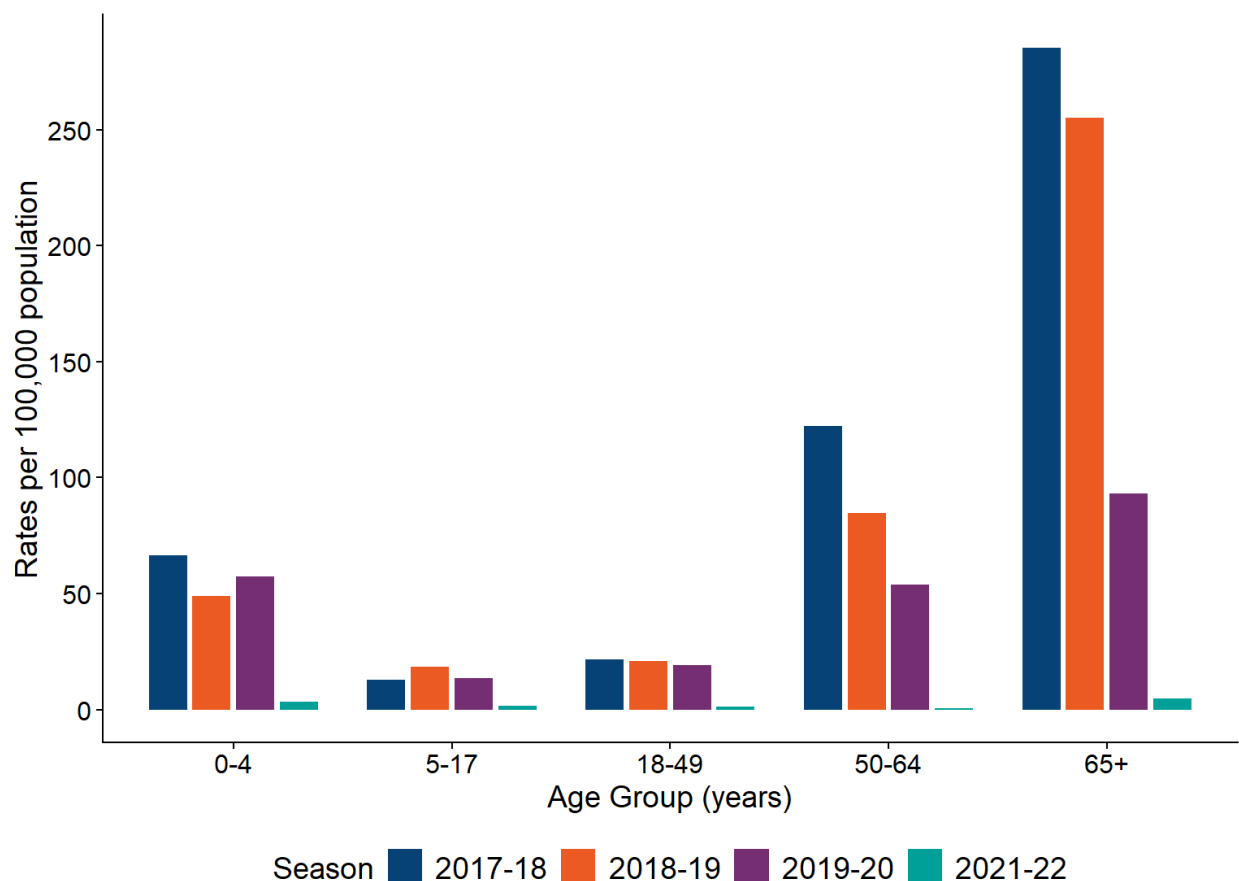
‡ Obesity among children aged 2 years and older defined as body mass index (BMI) ≥ 30 , calculated using height and weight if known; otherwise, as indicated in medical record.

§ Total number of females ≥ 15 –49 years of age (n=21)

Among all individuals hospitalized for influenza during the 2021–2022 season, 2 (2.5%) died during their hospitalization. All deaths were among adults (2.9% of all influenza-associated adult hospitalizations).

Figure 2 displays rates of influenza-associated hospitalizations by age group and season, 2019–2022. During the 2021–2022 season, the highest rate of hospitalization occurred among persons 65 years and older, at 12.4 cases per 100,000 population, followed by persons 0–4 years of age, at 5.2 cases per 100,000 population. The overall influenza hospitalization rate for the 2021–2022 season was 4.3 cases per 100,000 population.

Figure 2. Rates of Oregon EIP influenza-associated hospitalizations by age group and year, 2017–2022



2020–2021 season data not included due to minimal detections

Figure 3 shows cumulative rates of influenza-associated hospitalizations by race and ethnicity for pediatric cases during the 2021–2022 season; the highest rate occurred among the Hispanic population, at 5.2 cases per 100,000 people followed by Black, Non-Hispanics at 4.5 cases per 100,000 people.

Figure 3. Cumulative rates of Oregon EIP influenza-associated hospitalizations by race and ethnicity among children, 2021–2022

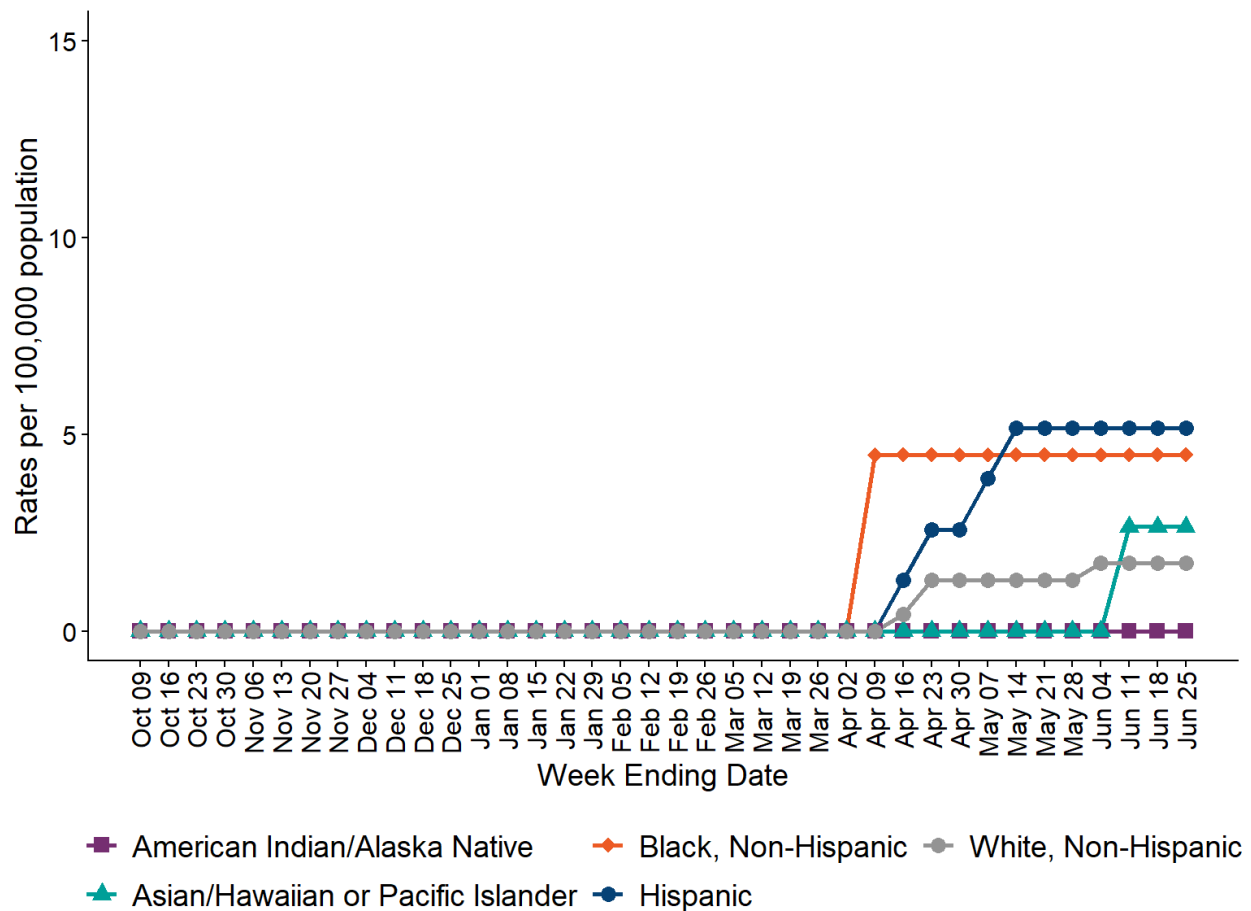


Figure 4 displays age-adjusted cumulative rates of influenza-associated hospitalization by race and ethnicity among adults during the 2021–2022 season. The highest rate occurred among the Hispanic population, at 15.7 cases per 100,000 people followed by Black, Non-Hispanics at 6.9 cases per 100,000 people.

Figure 4. Age-adjusted cumulative rates of Oregon EIP influenza-associated hospitalizations by race and ethnicity among adults, 2021–2022

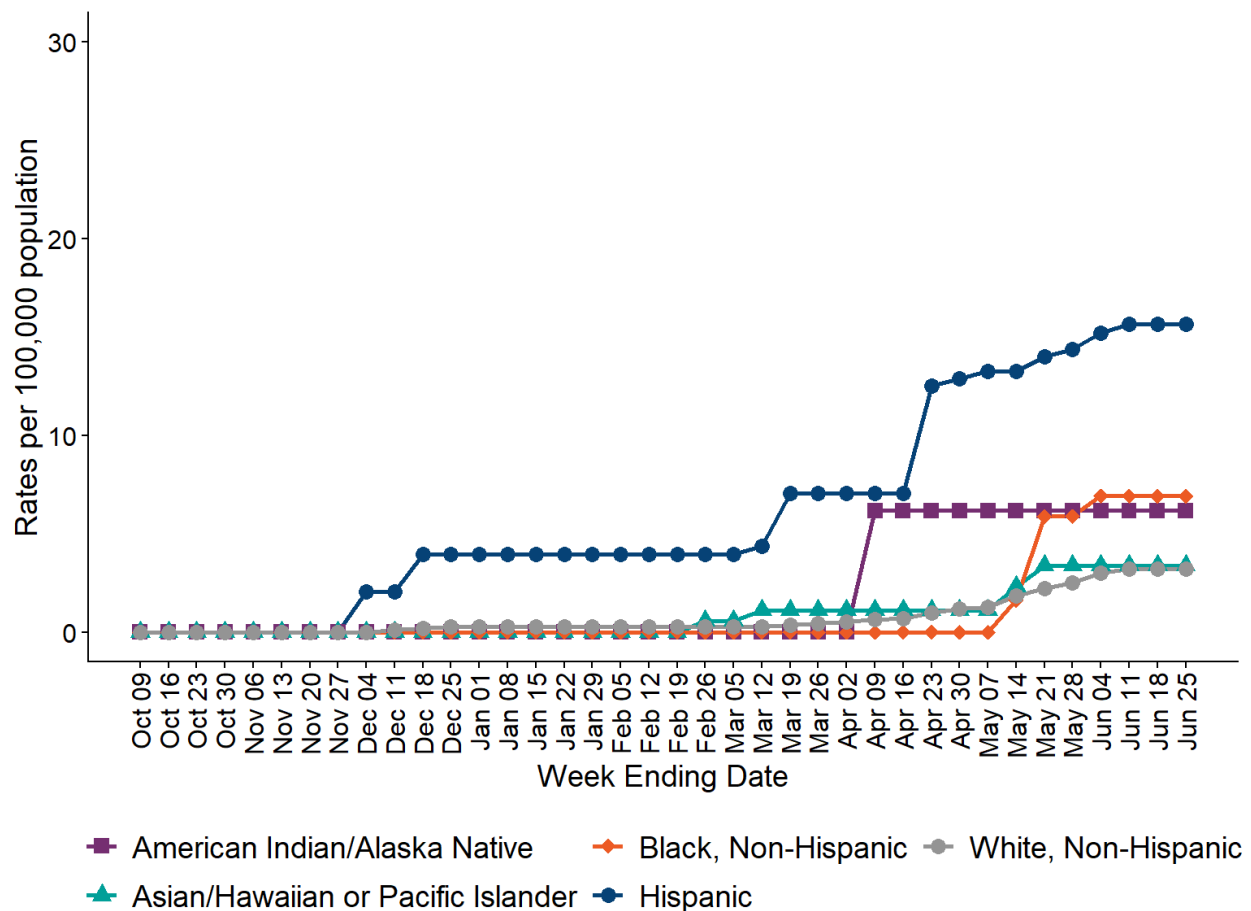


Table 5 shows the frequency of virus types and subtypes detected among Oregon EIP FluSurv-NET cases. The primary subtype during the 2021–2022 season was influenza A H3.

Table 5. Influenza virus types and subtypes among Oregon EIP FluSurv-NET cases, 2021–2022.

Virus		n = 79 (%)
Influenza A	2009 H1N1	3 (3.8%)
	H3	12 (15.2%)
	Influenza A, No Subtype	64 (81.0%)
Influenza B	Victoria Lineage	0 (0.0%)
	Yamagata Lineage	0 (0.0%)
	Influenza B, No Subtype	0 (0.0%)

Influenza-Associated Pediatric Mortality

During the 2021–2022 influenza season there were 0 reported cases of influenza-associated pediatric mortality in Oregon. More information on influenza-associated pediatric mortality is available from the [CDC](https://www.cdc.gov).

References

1. National Center for Health Statistics. Vintage 2020 postcensal estimates of the resident population of the United States (April 1, 2010, July 1, 2010–July 1, 2020), by year, county, single-year of age [0, 1, 2, ..., 85 years and over], bridged race, Hispanic origin, and sex. Prepared under a collaborative arrangement with the U.S. Census Bureau. Available from: [/nchs/nvss/bridged_race.htm](https://www.census.gov/data/tables/2020/cenbr/bridged_race.html) as of September 22, 2021, following release by the U.S. Census Bureau of the unbridged Vintage 2020 postcensal estimates by 5-year age group on June 17, 2021
2. The influenza season traditionally runs from October 1 to April 30 of each season but was extended to June 30, 2025 for the 2021–2022 season.