

2022-2023 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 1,840,747 ⁽¹⁾, which is approximately 43% of the population of Oregon.

This report summarizes FluSurv-NET surveillance in Oregon during the 2022–2023 season (October 1, 2022–April 30, 2023).

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, 2022–April 30, 2023, 1,081 influenza-related hospitalizations were reported in Oregon’s EIP surveillance area—991 adult (≥ 18 years) cases and 90 pediatric (< 18 years) cases. This represents a crude rate of 58.7 cases per 100,000 residents. Table 1 shows the sex, age, ethnicity, and race of Oregon EIP FluSurv-NET cases in the 2022-2023 season. The median age of hospitalized cases was 66 years (range, 1 months–102 years). 51.9% of hospitalizations occurred in persons aged 65 years and older, 53.3% of cases were female, and 71.8% of cases identified as Non-Hispanic White.

Table 1. Characteristics of Oregon EIP FluSurv-NET hospitalization cases, 2022–2023

Case Characteristics		n = 1,081 (%)
Sex	Male	505 (46.7%)
	Female	576 (53.3%)
Age	<6 months	6 (0.6%)
	6-23 months	14 (1.3%)
	24-59 months	22 (2.0%)
	5-10 years	29 (2.7%)
	11-17 years	19 (1.8%)
	18-49 years	209 (19.3%)
	50-64 years	221 (20.4%)
	65+ years	561 (51.9%)
Race	Hispanic	115 (10.6%)
	White, Non-Hispanic	776 (71.8%)
	Black, Non-Hispanic	64 (5.9%)
	Asian	49 (4.5%)
	American Indian/Alaska Native	13 (1.2%)
	Native Hawaiian or other Pacific Islander	13 (1.2%)
	Multiple Races	1 (0.1%)
	Unknown	50 (4.6%)

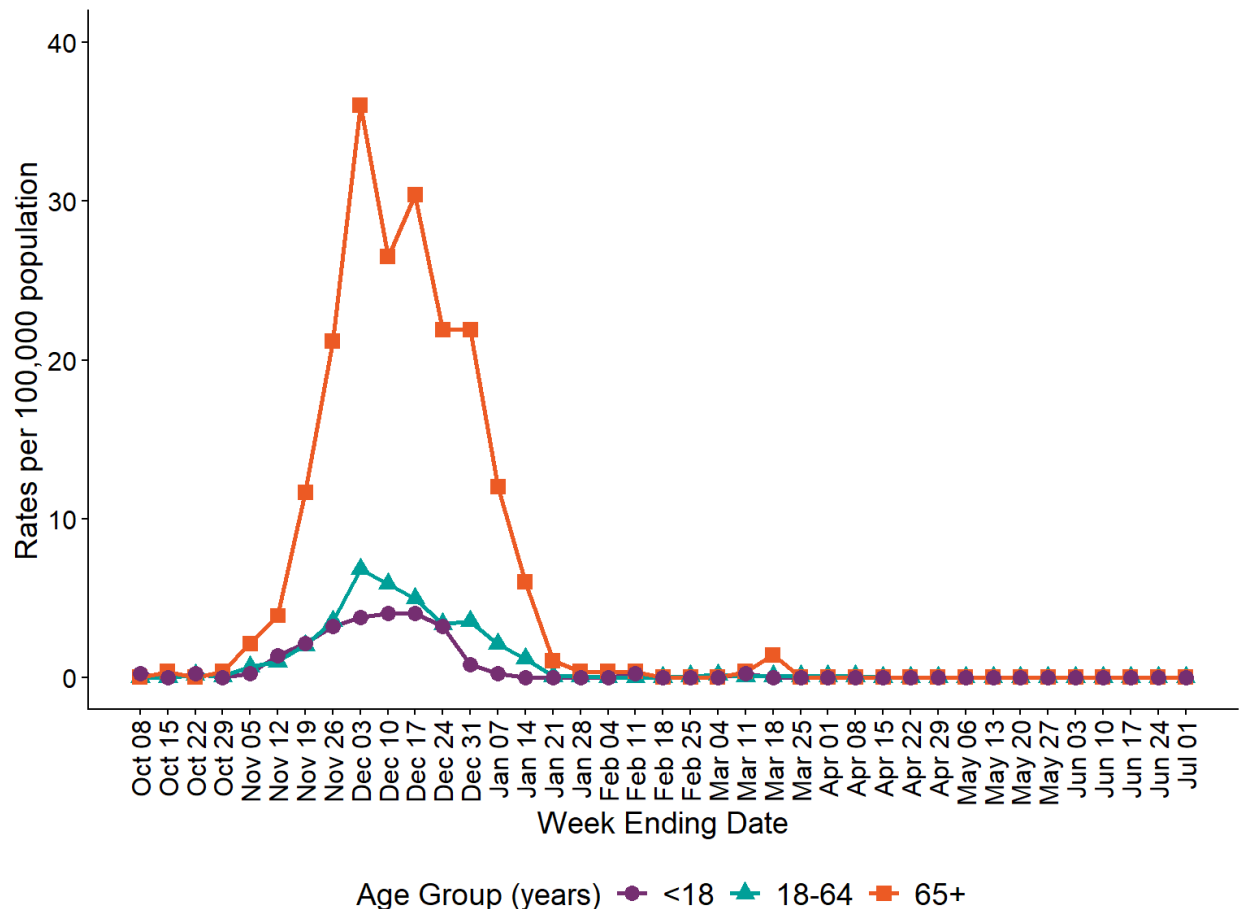
Table 2 shows the number and rates ⁽¹⁾ of Oregon EIP FluSurv-NET hospitalizations by age group during the 2022–2023 season.

Table 2. 2022–2023 Oregon EIP FluSurv-NET hospitalization rates by age group

Age Group (years)	n = 1,081	Rates per 100,000 people
0-4	42	44.0
5-17	48	17.5
18-49	209	24.4
50-64	221	66.5
65+	561	198.2

Figure 1 shows the distribution of Oregon EIP FluSurv-NET hospitalization rates⁽¹⁾ by age group during the influenza season. The peak of influenza-associated hospitalizations occurred during MMWR week 48 of 2022 (November 27, 2022–December 03, 2022). The first case was reported during MMWR week 40 (October 02, 2022–October 08, 2022), and the last case was reported during MMWR week 14 (April 02, 2023–April 08, 2023).

Figure 1. Rates of Oregon EIP FluSurv-NET hospitalizations, by age, 2022–2023



90 pediatric cases and 991 adult cases were admitted between October 1, 2022–April 30, 2023. All pediatric cases and 262 out of 991 adult cases were sampled for medical chart review.

Table 3 shows selected outcomes and underlying medical conditions for pediatric cases. 47.8% of pediatric cases had an underlying medical condition. The most frequently reported underlying medical conditions among pediatric cases were asthma (13.4%) and neurologic disease (11.2%).

Table 3. Selected outcomes and underlying medical conditions for pediatric Oregon EIP FluSurv-NET cases, 2022–2023

Outcomes and underlying medical conditions		n = 90 (Weighted %)*
Treatment and intervention	ICU admission	11 (12.4%)
	Mechanical ventilation	2 (2.2%)
	Treated with antivirals†	50 (56.2%)
Condition‡	Asthma	12 (13.4%)
	Autoimmune disease	0 (0%)
	Blood disorders	0 (0%)
	Cardiovascular disease	2 (2.2%)
	Chronic lung disease	1 (1.1%)
	Chronic metabolic disease	2 (2.2%)
	Gastrointestinal/liver disease	1 (1.1%)
	Hypertension	1 (1.1%)
	Immunosuppression	8 (9%)
	Neurologic disease	10 (11.2%)
	Obese§	9 (10%)
	Pregnancy	1 (33.3%)
	Renal disease	0 (0%)
Vaccine status	Yes	31 (34.8%)
	No	50 (56.1%)
	Unknown	9 (9%)

*Data are reported as raw counts among sampled cases with weighted percents calculated based on sampling scheme.

† 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.

§ Children 2 to 17 y old were classified as having obesity if they had BMI (kg/m²) ≥95th percentile for age and sex on the basis of CDC growth charts, International Classification of

Diseases-10 codes for obesity in the electronic medical record, or obesity selected on the case report form.

|| Unweighted percentage. Total number of females ≥15-18 years of age (n=3)

Table 4 shows selected outcomes and underlying medical conditions for adult cases. 96.2% of adult cases had at least one underlying medical condition prior to admission. The most frequently reported underlying medical conditions among adults were hypertension (58.4%) and cardiovascular disease (52.1%).

Table 4. Selected outcomes and underlying medical conditions for adult Oregon EIP FluSurv-NET cases, 2022–2023

Outcomes and underlying medical conditions		n = 262 (Weighted %)*
Treatment and intervention	ICU admission	46 (16.9%)
	Mechanical ventilation	19 (6.9%)
	Treated with antivirals†	190 (72.9%)
Condition†1	Asthma	38 (18.2%)
	Autoimmune disease	19 (6.9%)
	Blood disorders	9 (4.8%)
	Cardiovascular disease	152 (52.1%)
	Chronic lung disease	93 (35.8%)
	Chronic metabolic disease	118 (45.7%)
	Gastrointestinal/liver disease	17 (6.8%)
	Hypertension	159 (58.4%)
	Immunesuppression	22 (9.1%)
	Neurologic disease	90 (32.7%)
	Obese§	102 (42.5%)
	Pregnancy	64 (49.2%)
	Renal disease	72 (24.2%)
Vaccine status	Yes	98 (35.6%)
	No	125 (50.5%)
	Unknown	42 (15.5%)

*Data are reported as raw counts among sampled cases with weighted percents calculated based on sampling scheme.

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

†1Cases may have more than one underlying condition; categories are not mutually exclusive.

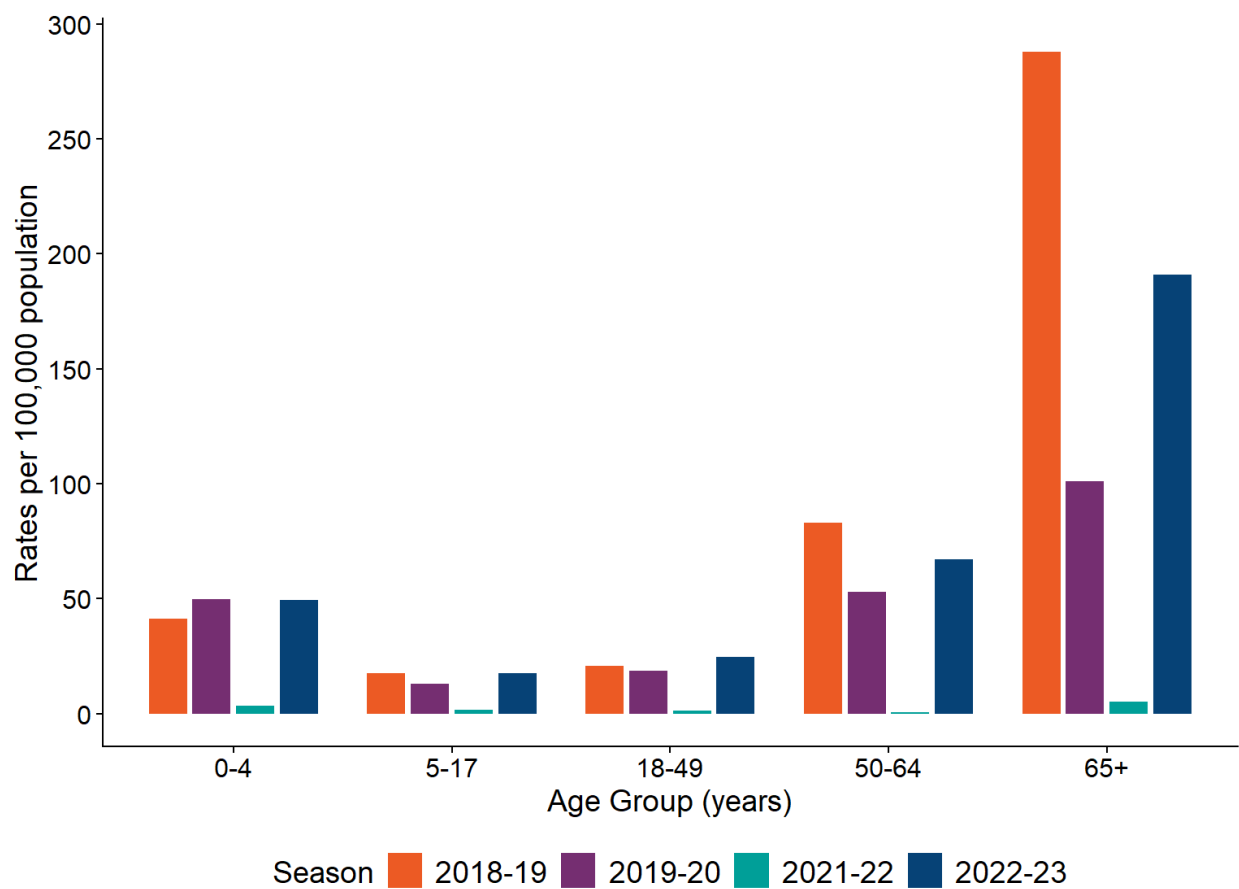
§ Obesity among children aged 2 years and older defined as body mass index (BMI) ≥ 30 , calculated using height and weight if known; otherwise, as indicated in medical record.

|| Unweighted percentage. Total number of females ≥ 18 -49 years of age (n=133)

Among all individuals hospitalized for influenza during the 2022-2023 season, 40 (3.7%) died during their hospitalization. All deaths were among adults (4.0% of all influenza-associated adult hospitalizations).

Figure 2 displays rates ⁽²⁾ of influenza-associated hospitalizations by age group and season, 2018–2023. During the 2022–2023 season, the highest rate of hospitalization occurred among persons 65 years and older, at 198.2 cases per 100,000 population, followed by persons 50–64 years of age, at 66.5 cases per 100,000 population. The overall influenza hospitalization rate for the 2022–2023 season was 58.7 cases per 100,000 population.

Figure 2. Rates of Oregon EIP influenza-associated hospitalizations by age group and year, 2018–2023



2020-2021 season data not included due to minimal detections

Figure 3 shows cumulative rates of influenza-associated hospitalizations by race and ethnicity⁽¹⁾ for pediatric cases during the 2022–2023 season; the highest rate occurred among the Hispanic population, at 25.9 cases per 100,000 people followed by Asian/Hawaiian or Pacific Islanders at 23.9 cases per 100,000 people.

Figure 3. Cumulative rates of Oregon EIP influenza-associated hospitalizations by race and ethnicity among children, 2022–2023

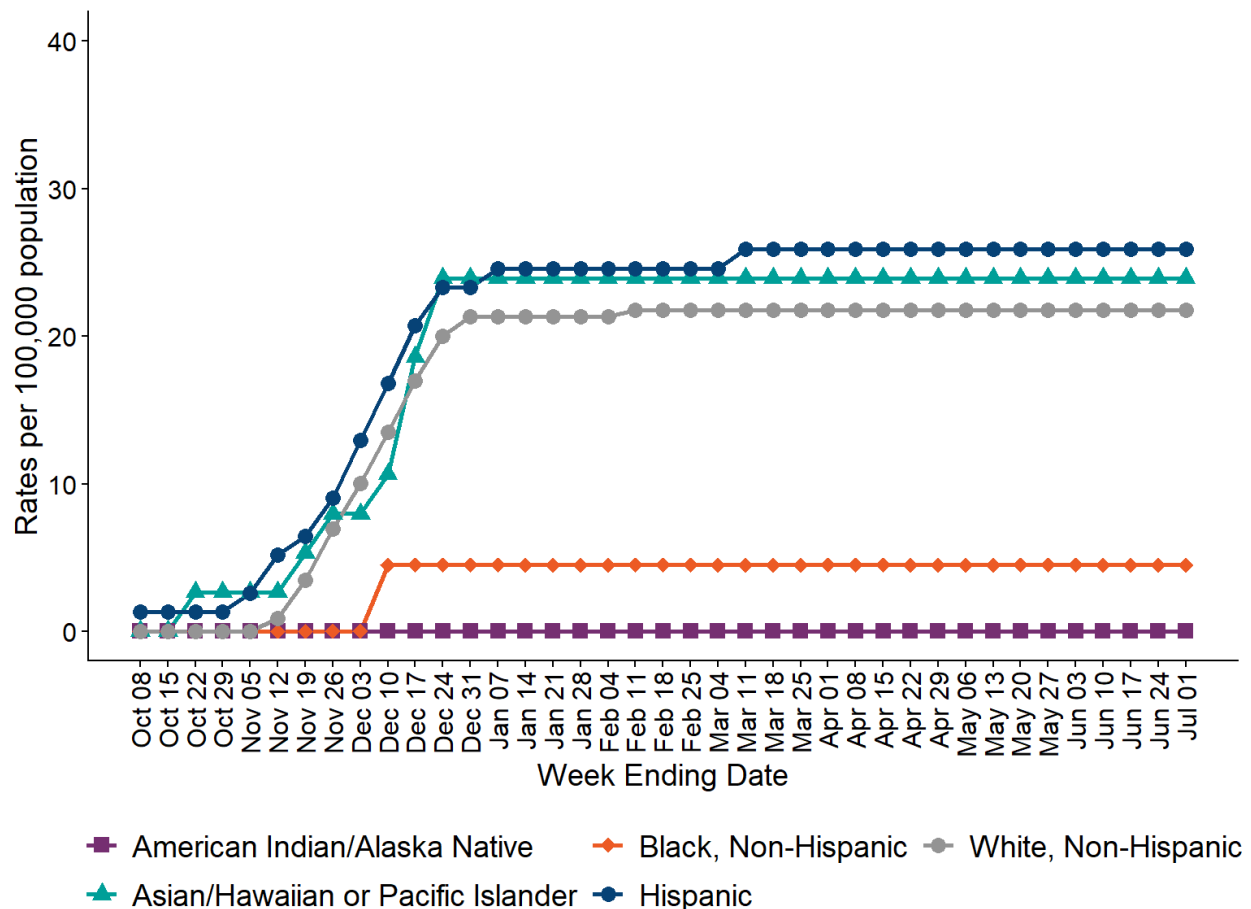


Figure 4 displays age-adjusted cumulative rates of influenza-associated hospitalization by race and ethnicity⁽¹⁾ among adults during the 2022–2023 season. The highest rate occurred among the American Indian/Alaska Native population, at 211.9 cases per 100,000 people followed by Black, Non-Hispanics at 143.1 cases per 100,000 people.

Figure 4. Age-adjusted cumulative rates of Oregon EIP influenza-associated hospitalizations by race and ethnicity among adults, 2022–2023

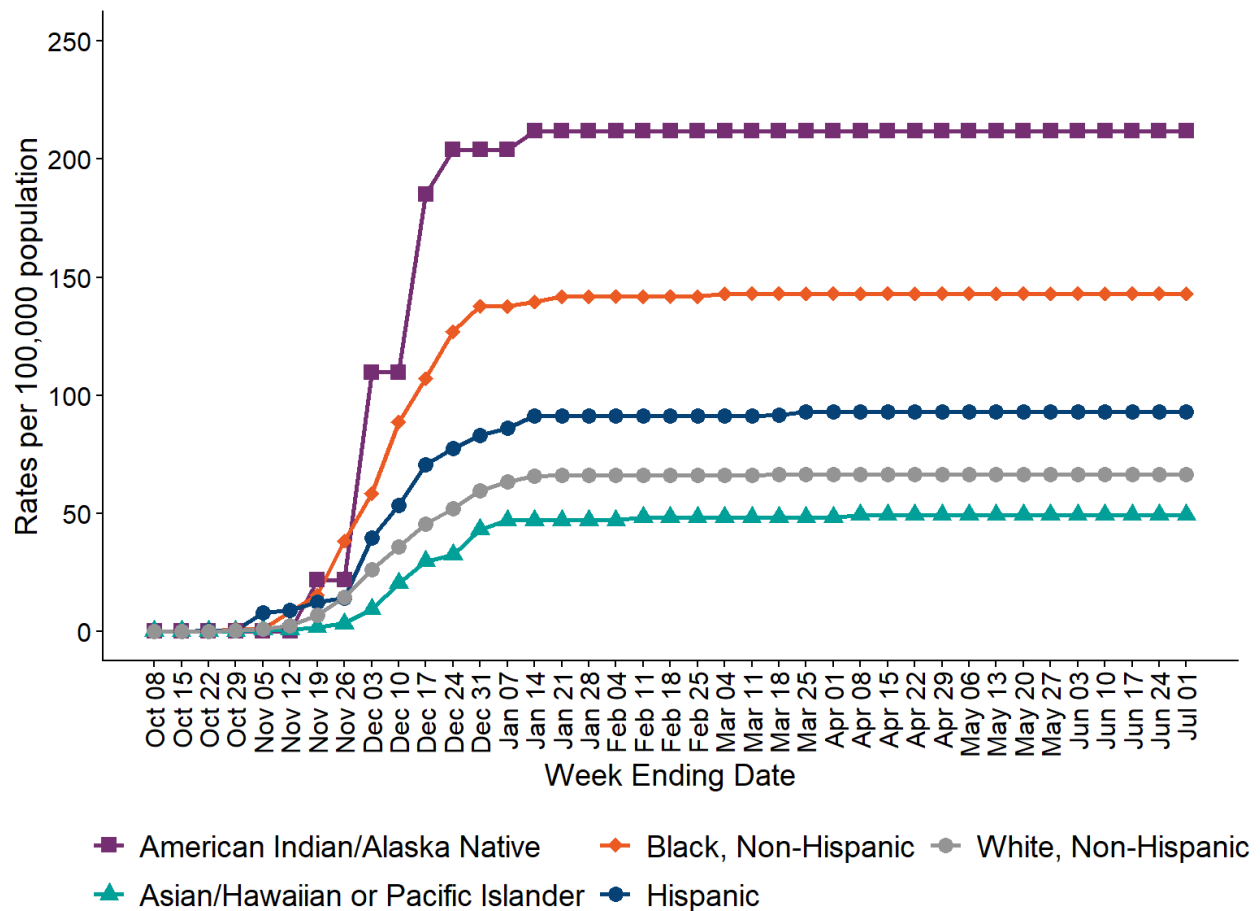


Table 5 shows the frequency of virus types and subtypes detected among Oregon EIP FluSurv-NET cases. The primary subtype during the 2022–2023 season was influenza A H3, Influenza B, No Subtype, Flu A&B.

Table 5. Influenza virus types and subtypes among Oregon EIP FluSurv-NET cases, 2022–2023.

Virus		n = 1082 (%)
Influenza A	2009 H1N1	101 (9.3%)
	H3	201 (18.6%)
	Influenza A, No Subtype	778 (71.9%)
Influenza B	Influenza B, No Subtype	1 (0.1%)
	Victoria Lineage	0 (0.0%)
	Yamagata Lineage	0 (0.0%)
	Flu A&B	1 (0.1%)

Influenza-Associated Pediatric Mortality

During the 2022–2023 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. Multiseason hospitalization rates available from <https://gis.cdc.gov/GRASP/Fluview/FluHospRates.html>. Prepared under a collaborative arrangement with the U.S. Census Bureau and the Centers for Disease Control and Prevention (CDC)