

Date: Monday, September 17, 2018

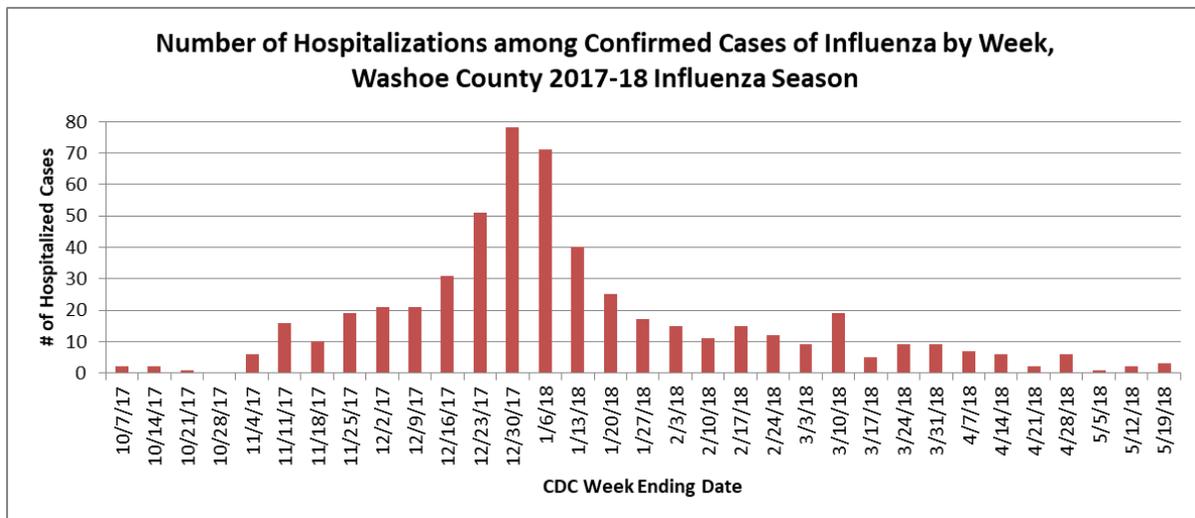
Overview of Hospitalized Cases, 2017-18 Influenza Surveillance

Out of 5,522 laboratory-confirmed influenza cases, 542 (9.8%) were hospitalized for >24 hours during the 2017-2018 influenza season in Washoe County. While this is a greater number of hospitalizations compared to the 2016-17 season, the percentage of confirmed cases in 2017-2018 is much lower (9.8% vs. 13%, P<0.001). This report focuses on those patients hospitalized >24 hours.

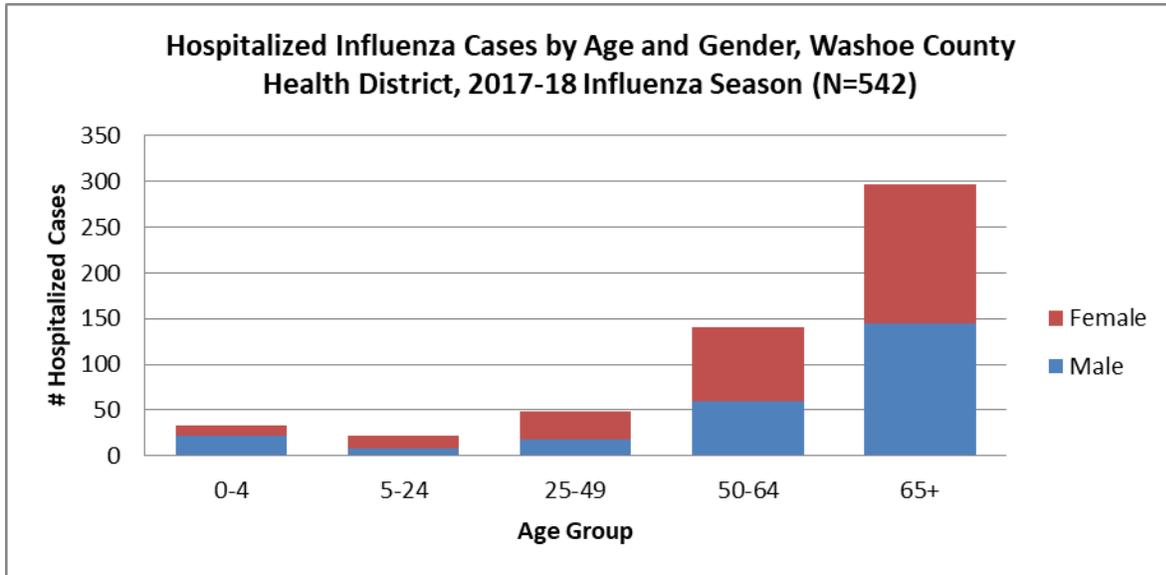
Among hospitalized cases, 404 (75%) were positive for influenza type A and 138 (25%) were positive for influenza type B. Of the influenza type A positive cases, 289 (72%) had PCR testing performed. PCR identified 13 cases as influenza A (H3), 3 cases as influenza A (2009H1N1), and 273 as influenza A (not-subtyped). Of the influenza type B positive cases, 110 (80%) had PCR testing performed.

HOSPITALIZATIONS

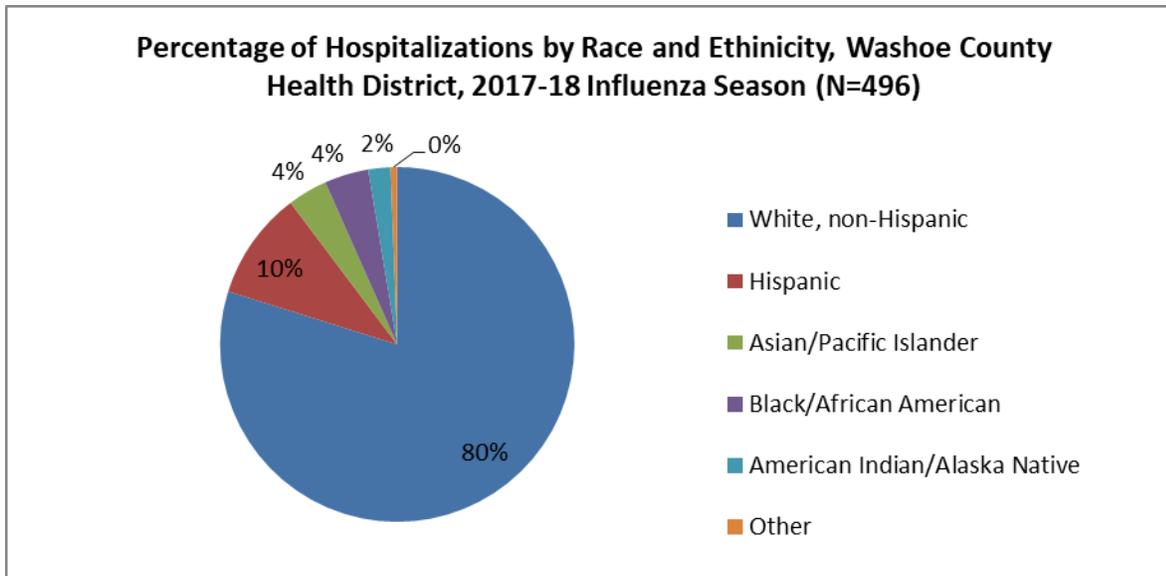
Hospitalizations were reported as early as Centers for Disease Control and Prevention (CDC) Week 40 (week ending October 7, 2017) and continued to be reported for the duration of influenza season (through Week 20, ending May 19, 2018). Hospitalizations were reported every week during influenza season except for Week 43 (week ending October 28, 2017). Hospitalizations peaked during Week 52 (week ending December 30, 2017) with a total of 78 hospitalizations. Twenty of these hospitalizations (3.7%) resulted in death due to infection with influenza. Six additional deaths due to influenza occurred in people who were not hospitalized or hospitalized for less than 24 hours.



The median age of hospitalized cases was 68 years (range: 0 - 99 years). The majority of hospitalized cases (55%) were aged 65 years or older. Males constituted 46% (n=251) of hospitalized cases, and females constituted 54% (n=291) of hospitalized cases.



The majority of cases with known race or ethnicity were white, non-Hispanic (80%). The median length of hospital stay was 3 days (range: 1-66 days).



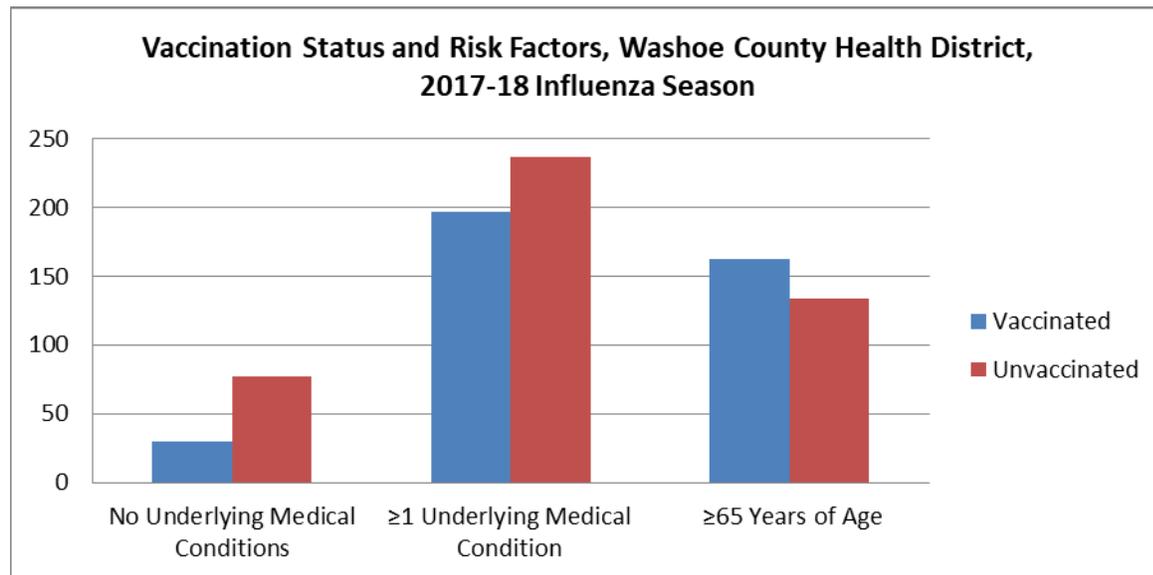
The Washoe County Health District Communicable Disease (WCHD CD) program staff reviewed available medical records of hospitalized influenza cases to obtain key information, such as demographics, length of hospital stay, past medical history, treatment information, and vaccination history. The following information was ascertained:

Vaccination

Vaccination status was ascertained for 541 hospitalized cases from either medical records or Nevada’s statewide immunization registry, WebIZ. Two hundred and twenty seven (42%) hospitalized cases had a documented history of current seasonal flu vaccine at least two weeks prior to illness onset. One hundred and ninety-seven (87%) hospitalized immunized cases had at least one underlying medical condition documented in their medical history and 163 (72%) were aged 65 years or older.

A total of 314 hospitalized cases (58%) did not have a documented history of a current seasonal flu vaccine at least two weeks prior to illness onset (henceforth referred to as “unimmunized” for the purposes of this report). Thirteen (4%) were too young to receive vaccine. Two hundred and thirty-seven (75%) had at least one documented underlying medical condition in their medical history that contributed to an increased risk for flu-related complications. In addition, 134 (43%) of these unvaccinated hospitalized cases were aged 65 years or older.

Three of seven pregnant cases (43%) were unimmunized. Nine of the twenty-six cases who died from influenza (35%) were unimmunized.



CDC notes that vaccination is particularly important for persons at increased risk for flu-related complications. While the number of flu-associated hospitalizations in our community that may have been prevented by immunization cannot be calculated, these data demonstrate that many vulnerable patients who should have been recommended for immunization did not receive a timely vaccine and were subsequently hospitalized. Providers are encouraged to vaccinate their patients. CDC recommends an annual flu vaccine for all persons aged 6 months and older. Vaccination is especially important for persons who are at increased risk for severe complications from influenza as well as those people who live with or care for persons at higher risk for influenza-related complications (including health care providers).

Underlying Medical Conditions

A total of 435 (80%) hospitalized cases had at least one documented underlying medical condition within their medical history that contributed to an increased risk for flu-related complications. The most

commonly reported medical conditions were cardiac disease (e.g., congestive heart failure, coronary artery disease), chronic pulmonary disorders (e.g., chronic obstructive pulmonary disease), diabetes, immunocompromising conditions (e.g., cancer), and asthma. Age 65 years and above is also a risk factor for flu-related complications; 297 hospitalized cases (55%) were aged 65 years or older.

Medical Condition (Not Mutually Exclusive)	# Hospitalized Cases with Condition	% of Hospitalized Cases with Condition
Cardiac Disease	164	30%
Chronic Pulmonary Disorders	150	28%
Diabetes	146	27%
Immunocompromising Conditions	96	18%
Asthma	94	17%

Among 443 cases with a documented smoking status, 82 (19%) were current smokers and 205 (46%) were former smokers. Among 379 adults with reported body mass index (BMI), 250 (66%) were overweight or obese.

BMI Range	BMI Interpretation	# Hospitalized Cases	% Hospitalized Cases
<18.5	Underweight	9	2%
18.5-24.9	Healthy	120	32%
25.0-29.9	Overweight	128	34%
30.0+	Obese	122	32%

Treatment

A total of 490 (90%) hospitalized cases were treated with Oseltamivir (Tamiflu). Length of stay data was available for 483 of these treated cases. The median length of stay or hospitalization for treated cases was 3 days with a range of 1-45 days.

Of the 52 hospitalized cases that did not receive treatment or for whom treatment status was unknown, length of stay data was available for 45. The median length of stay or hospitalization for untreated cases was 3 days with a range of 1-66 days.

Outcome

Altogether 88 (16%) of the hospitalized cases were admitted to the intensive care unit (ICU). Of ICU admits, 33 (38%) required ventilator support and 22 (25%) died. Influenza was listed as a factor contributing to the cause of death for 13 of these ICU cases.

DEATHS

Twenty-six deaths attributed to laboratory-confirmed influenza were reported during the 2017-18 influenza season; twenty (77%) were hospitalized >24 hours while six (23%) were not hospitalized or hospitalized for less than 24 hours. Thirteen deceased cases (50%) were admitted to the ICU and eight (31%) were placed on a ventilator. These deaths occurred as early as November and as late as April. The majority of deaths (85%) occurred December through February during the peak of flu activity.

The median age of the deceased cases was 85.5 years. Of the 26 deceased cases, 12 (46%) were male and 14 (54%) were female.

The percentage of confirmed cases that were fatal was similar in the 2016-2017 season with no statistical significance (4.7 deaths per 1,000 cases vs. 3.3 deaths per 1,000 cases, $P > 0.05$)

Age Group	Deaths	Age Group	Deaths
0-4	1	25-49	1
5-17	0	50-64	1
18-24	0	65+	23

Of the 26 deaths, 17 (65%) were positive for influenza A and 9 (35%) were positive for influenza B. Subtype information was not available for influenza A deaths. Seventeen of the 26 deceased cases (65%) had a documented dose of seasonal flu vaccine. Seventeen of the deceased cases (65%) received antiviral treatment. All deceased cases were considered at high-risk for developing serious flu-related complications, either due to age, underlying medical conditions, or some combination of the two.

VACCINE EFFECTIVENESS

According to vaccine effectiveness studies by CDC, getting the flu vaccine overall reduced the risk of going to the doctor for a flu illness by 40%. Vaccine effectiveness was highest against influenza A (H1N1) viruses (65%), followed by influenza B viruses (49%) and influenza A H3N2 viruses (25%).¹ This follows the trend in which vaccine effectiveness is generally better against influenza B and influenza A (H1N1) viruses than influenza A (H3N2) viruses. This is because genetic changes in influenza A (H3N2) viruses have more frequently resulted in differences between the virus components of the vaccine and circulating influenza viruses compared with influenza A (H1N1) and influenza B viruses. This means that the changes are more likely to impact how well the flu vaccine works. In addition, when grown in eggs as part of vaccine production, influenza A (H3N2) viruses are more likely to undergo these changes compared with influenza A (H1N1) and influenza B viruses.²

It is worth noting that even during seasons when vaccine effectiveness is reduced, vaccination is still beneficial. During the 2016-17 influenza season, vaccination is estimated to have prevented 5.3 million illnesses, 2.6 million medical visits, and 85,000 hospitalizations.³ Flu vaccination has also been shown to reduce a child's risk of dying from influenza and reduce the risk of flu-associated hospitalizations among adults. Furthermore vaccination reduces deaths, ICU admissions, ICU length of stay, and overall duration of hospitalization among hospitalized flu patients. Getting vaccinated may also protect people around the vaccinated individual, including those who are more vulnerable to serious flu illness, like infants and young children, older people, and people with certain chronic health conditions.¹

¹ Centers for Disease Control and Prevention. "Summary of the 2017-2018 Influenza Season." Updated 31 Aug 2018. Accessed 7 Sep 2018. <https://www.cdc.gov/flu/about/season/flu-season-2017-2018.htm>.

² Centers for Disease Control and Prevention. "Vaccine Effectiveness – How Well Does the Flu Vaccine Work?" Updated 6 Sept 2018. Accessed 7 Sep 2018. <https://www.cdc.gov/flu/about/qa/vaccineeffect.htm>.

³ Centers for Disease Control and Prevention. "CDC Reports on Vaccine Benefits from 2016-2017 Season." Updated 22 May 2018. Accessed 7 Sep 2018. <https://www.cdc.gov/flu/spotlights/reports-vaccine-benefits-2016-2017.htm>.