

Disclaimer

The end of season report provides a summary of South Carolina's influenza surveillance components acquired through both mandatory and voluntary reporting procedures. Mandatory reporting elements consist of positive lab-confirmed tests (i.e. culture, RT-PCRs, DFAs, and IFAs), positive rapid antigen testing, and laboratory-confirmed hospitalizations and deaths. Voluntary reporting is accomplished by sentinel provider participation in the U.S. Outpatient Influenza-like Illness Network (ILINet). Data in this report is provisional. This report reflects data collected from October 1, 2017 to May 19, 2018 (MMWR Week 40- MMWR Week 20).

Summary

The 2017-18 influenza season was a severe season with widespread activity lasting for 11 consecutive weeks. The number of reported influenza infections, influenza-associated hospitalizations, and influenza-associated deaths exceeded data reported during the same time period (MMWR week 40 to MMWR week 20) from the 2012-13 to 2016-17 seasons. Overall, influenza activity significantly increased during the week ending December 23, 2017 (MMWR week 51) and peaked during the weeks ending January 27, 2018 to February 10, 2018 (MMWR Weeks 4-6).

The percentage of reported circulating influenza viruses by type was 67.5% influenza A and 32.5% influenza B. Among lab-confirmed testing results, influenza A(not subtyped) was most frequently reported. Among influenza A viruses subtyped, influenza A(H3) was most frequently reported. Influenza B Yamagata was the predominantly reported influenza B virus when lineage was determined. There were a total 3,575 positive lab-confirmed tests and 131,570 positive rapid antigen detection tests reported during this time period.

The percentage of outpatient visits attributed to an influenza-like illness was above the state baseline (3.13%) for 18 consecutive weeks. The intensity observed during the peak week (week ending February 10) was 14.6%. The statewide cumulative influenza-associated hospitalization rate and influenza-associated mortality rate during this season was 90.5 and 5.8 per 100,000, respectively. Individuals aged 65 and older were most afflicted this season, accounting for 57% of all influenza-associated hospitalizations and 72% of all influenza-associated deaths. A total of 4,489 hospitalizations and 289 deaths were reported.

Season Total Numbers for Selected Surveillance Indicators Displayed by Public Health Region

Upstate

2017 pop estimate: 1.47 million
48,639 influenza positive tests*
1,285 hospitalization
81 deaths



Midlands

2017 pop estimate: 1.46 million
35,683 influenza positive tests*
1,196 hospitalizations
92 deaths



Pee Dee

2017 pop estimate: 925 thousand
25,860 influenza positive tests*
976 hospitalizations
56 deaths



Lowcountry

2017 pop estimate: 1.17 million
24,963 influenza positive tests*
1,032 hospitalizations
60 deaths



*The number of reported influenza infections is dependent on the provider's discretion to test or not test.

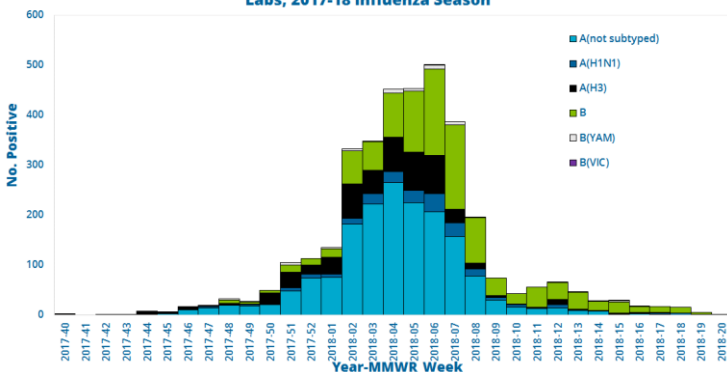
Virologic Surveillance: Lab-Confirmed influenza

Laboratory-confirmed results (e.g. culture, rt-PCR, DFA, and IFA) and positive rapid antigen test reporting provide surveillance data that aid in monitoring influenza trends at the county/regional/state level, identify type/subtype/lineage of influenza circulating, detect novel strains, determining geographic spread, and guiding vaccination efforts. Results are received from the DHEC Public Health Laboratories (PHL), commercial, and clinical laboratories. Of the 3,575 positive influenza reports, PHL and commercial/clinical

laboratories reported 241 (6.7%) and 3334 (93.3%) positive results, respectively.

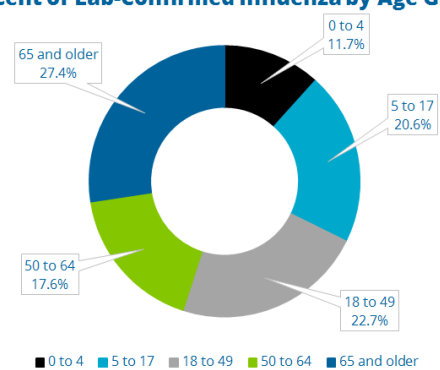
Influenza type A (n=2447; 68.4%) was most frequently reported by both PHL and commercial/clinical labs. Of those influenza A virus subtyped (n=744; 30.4%), influenza A(H3) accounted for 71.5% (n=532) of the specimens tested. Among influenza B viruses (n=1,128; 31.6%) where lineage was performed, influenza B Yamagata (n=55; 96.5%) was most frequently reported. There were 19 co-infections of influenza reported of which 11 (57.9%) were A/B, 2 (10.5%) A(H3)/B, 5 (26.3%) A(H3)/A(H1N1) pdm09, and 1 (5.3%) A(H3)/B(YAM).

Laboratory-Confirmed Influenza Reported by Clinical and Public Health Labs, 2017-18 Influenza Season



The number of lab-confirmed influenza results peaked during the weeks ending January 27 to February 10, 2018. During the peak weeks, the total number of lab-confirmed influenza reported ranged from 96 to 181. The median age of lab-confirmed influenza was 43 years (IQR 11-67). Individuals aged 65 and older accounted for the majority of reports at 27.4% (n=980). Additionally, reported lab-confirmed influenza by age group were as follows: ages 0-4, 11.6% (n=417); ages 5 to 17, 20.6% (n=737); ages 18 to 49, 22.7% (n=813); and ages 50 to 64, 17.6% (n=628). Influenza A (not

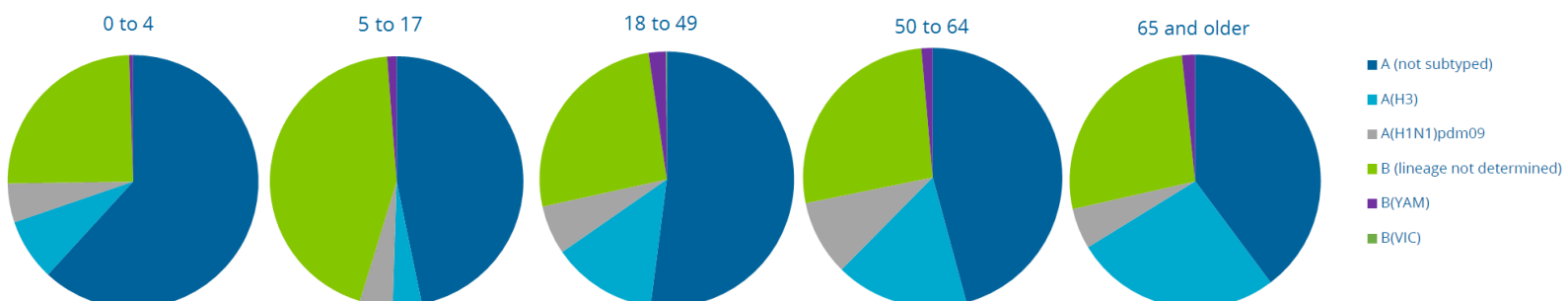
Percent of Lab-Confirmed Influenza by Age Group



subtyped) was most frequently reported among all age group.

The largest percent of influenza B (lineage not determined) was noted in individuals aged 5 to 17. The percent of influenza A to B was similar (71%-75% to 25%-29%) for all age groups except for ages 5 to 17, where the percent of influenza A to B was 55% to 45%. Statewide females accounted for more lab-confirmed influenza (54%) compared to males (46%).

Lab-Confirmed Influenza Type by Age Group

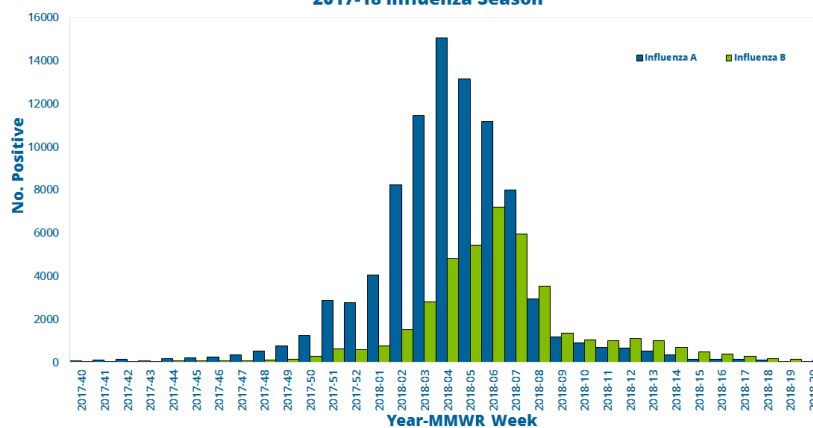


Virologic Surveillance: Positive Rapid Antigen Tests

Positive rapid antigen tests are reported weekly in aggregate counts by influenza type. During this reporting period, a total of 131,570 positive tests were reported. Positive tests reported by type were 67.5% (n=88,811) influenza A, 32.1% (n=42,244) influenza B, and 0.4% (n=515) influenza not typed. Influenza A infections peaked during the week ending January 27 at 15,072 while influenza B infections peaked during the week ending February 10 at 7,226.

On a regional level, influenza A infections peaked during the week ending January 27 in the Upstate, Midlands, and Pee Dee regions. However, in the Lowcountry region, the peak week for influenza A infections occurred during the week ending February 3. During the week ending February 10, influenza B infections peaked for all public health regions. In the Upstate region, there was a 3% overall increase in the number of reported positive rapid antigen tests, specifically influenza A infections, which occurred during the week ending February 17 while other regions experienced a 36% to 44% overall decrease.

Positive Rapid Antigen Tests Reported by Clinical and Public Health Labs, 2017-18 Influenza Season



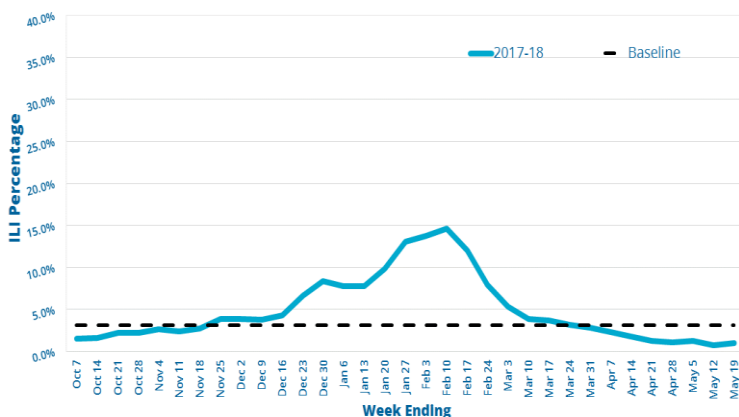
Outpatient Influenza-like Illness Surveillance

The U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet) is a voluntary surveillance system that collects patient visit information on influenza-like illnesses from healthcare professionals seen in outpatient settings. During the 2017-18 influenza season, the percentage of visits attributed to ILI peaked during the week ending February 10 at 14.6%. The ILI percent exceeded the state baseline level of

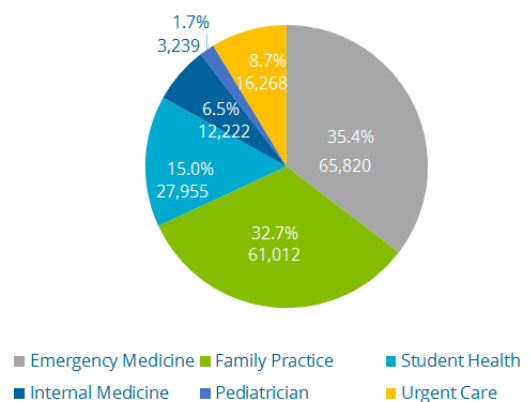
3.13% for 18 of the 33 weeks. The ILI activity level was high for 17 consecutive weeks.

There were 24 enrolled ILINet sentinel providers for the 2017-18 season, of which 18 (75.0%) reported. Sentinel providers reported 186,516 patient visits of which 9,771 (5.2%) were attributed to ILI. The age groups with the most reported ILI visits were 5-24 years and 25-49 years. Approximately 68% of patient visits occurred in either a family practice clinic or emergency department.

Percentage of Influenza-like Illness (ILI) Visits Reported by Sentinel Providers



Patient Visits by Provider Type (n=186,516)

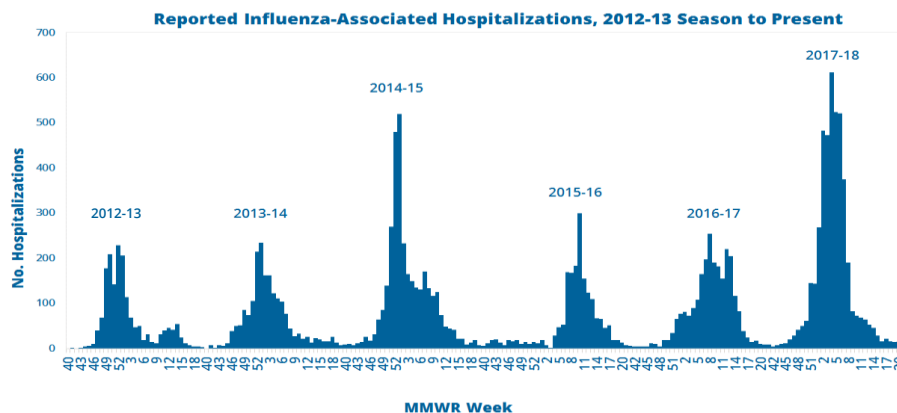


Influenza-Associated Hospitalizations

Surveillance data obtained from the reporting of influenza-associated hospitalizations aids in monitoring the epidemiology of severe influenza infections and assessing the severity of the season. Influenza-associated hospitalizations are reported weekly by age group. Laboratory confirmation (i.e. rt-PCR, DFA, IFA, culture, or rapid antigen test) is a required component of the surveillance definition. During the 2017-18 season, a total of 4,489 influenza-associated hospitalizations were reported. The highest number of hospitalizations (n=612) was reported during the week ending January 27. Moreover, during the same week hospitalizations peaked for individuals aged 0 to 4 and 65 and older. The peak weeks for other age groups are as follows: week ending February 3 for ages 5 to 64, weeks ending February 3 to February 10

for ages 18 to 49, and week ending February 10 for ages 5 to 17. Of the 4,489 hospitalizations, 159 (3.5%) occurred in ages 0-4, 141 (3.1%) in ages 15-17, 584 (13.0%) in ages 18-49, 1052 (23.4%) in ages 50-64, and 2,553 (57.0%) in ages 65 and older.

The overall statewide cumulative hospitalization rate during this period was 90.5 per 100,000 persons. The highest hospitalization rate of 404.0 per 100,000 was observed in individuals 65 years of age and older while the lowest rate, 17.5 was observed in the 5-17 year olds. In comparison to previous seasons, the cumulative hospitalization rate was higher overall and for all age groups this season except for individuals < 18 years of age. In individuals aged 50 to 64, the hospitalization rate (115.5) was twice the average observed during the past five seasons.



Influenza-Associated Deaths

Influenza-associated deaths are defined as a death resulting directly or indirectly from a clinically compatible illness that was confirmed to be influenza by an appropriate laboratory or rapid diagnostic test or autopsy report. Additionally, there should be no period of complete recovery between the illness and death. This season, a total of 289 influenza-associated deaths were reported, of which 3 occurred in individuals < 18 years of age. The highest number of deaths (n=44) was reported during the week ending

January 27. The highest number of deaths reported by age group occurred in the following weeks: week ending February 24 for ages 0 to 4, weeks ending January 27 to February 3 for adults under 65, and weeks ending January 20 to January 27 for adults 65 and older. There were no reported influenza-associated deaths among individuals ages 5 to 17. Females (51%) accounted for more influenza-associated deaths upon comparison to males (49%).

Influenza-Associated Deaths cont.

The median age at time of death was 75 years (IQR 63-86 years). Of the 289 deaths, 3 (1.0%) occurred in ages 0-4, 27 (9.3%) in ages 18-49, 50 (17.3%) in ages 50-64, and 209 (72.4%) in ages 65 and older. The overall statewide cumulative mortality rate was 5.8 per 100,000. The highest mortality rate of 33.1 per 100,000 was reported in individuals 65 and older. In ages 0-4, 18-49, and 50-64 the mortality rate was 1.0, 1.3, and 5.5, respectively.

Influenza A and influenza B contributed to 75.6% and 24.4% of deaths reported, respectively. Of the influenza A viruses subtyped, 17.3% were influenza A(H3). The median time from illness onset to death was 7 days (IQR 3-13 days). When comparing age groups, the median time from illness onset to death in ages 18 to 49 was 5 days (IQR 2-8 days); 2 days shorter

than reported in ages 50 to 64 and 65 and older at 7 days (IQR 4-12 and IQR 3-14, respectively). Approximately, 93% of influenza-associated deaths were reported to have been diagnosed with one or more comorbidities. The most commonly reported pre-existing medical condition was cardiac disease (75%).

Influenza vaccination history was collected on all reported deaths. Data sources for influenza vaccination history included: immunization record, medical record, immunization registry, or parent/family member report. Of the 289 deaths, 139 (48.1%) individuals had received this season's flu vaccine and 150 (51.9%) individuals either had not been vaccinated or vaccination history was unknown.