INFLUENZA

National Influenza Surveillance Data

During the 2016-17 season, influenza activity was moderate. The season was notable for the predominant circulation of influenza A (H3N2) viruses. Nationally, influenza activity peaked in mid-February, with influenza A (H3N2) viruses predominate early in the season through the week ending March 25, 2017 (week 12). Influenza B viruses became the predominant virus starting during week 13 (the week ending April 1, 2017) and remained the predominant virus through the end of May. The timing of peak influenza activity varied across the United States. Influenza activity peaked at least 1 month earlier (week 52 to week 2) in the western United States than in the rest of the country. During the 2016-17 season, severity indicators (e.g., hospitalization and mortality rates) were within the range that has been observed during previous seasons when, influenza A(H3N2) viruses predominated. Previous influenza A(H3N2) predominant seasons have been associated with increased hospitalizations and deaths compared with A(H1N1) predominant, especially among children aged <5 years and adults aged $\geq$ 65 years (3,4). The majority of influenza viruses antigenically characterized at CDC were similar to the reference viruses representing the recommended components for the 2016-17 vaccine. A small subset of antigenically distinct influenza B/Victoria viruses was detected. No antiviral resistance to oseltamivir, zanamivir, or peramivir was identified among tested influenza viruses from the 2016-17 season.

Final vaccine effectiveness estimates of 34% (95% CI = 24%-42%) against illness caused by influenza A(H3N2) viruses and 56% (95% CI = 47%-64%) against illness caused by influenza B viruses were similar to previous seasons when recommended vaccine viruses have been well matched to (i.e., "like") circulating viruses, including the lower effectiveness observed against well-matched A(H3N2) viruses. Evidence of reduced protection against A(H3N2) viruses, even when vaccine viruses and circulating viruses are well matched, has been observed since the 2011-12 season. In general, vaccination with inactivated influenza vaccine has offered better protection against influenza A(H1N1) and influenza B viruses. Even during seasons when vaccine effectiveness is reduced, vaccination can offer substantial benefit and reduce the likelihood of severe outcomes such as hospitalization and death. During the 2012-13 season with estimated vaccination effectiveness against A(H3N2) related illness of 39% (95% CI = 39-47%), vaccination averted an estimated 5.6 million illnesses, 2.7 million medical visits, 61,500 hospitalizations, and 1,800 deaths.

Influenza antiviral medications are an important adjunct to vaccination in the treatment and prevention of influenza. Treatment with influenza antiviral medications as close to the onset of illness as possible is recommended for patients with confirmed or suspected influenza who have severe, complicated, or progressive illness; who require hospitalization; or who are at high rate for influenza complications. Antiviral treatment should not be withheld from patients who are high risk for complications or who are severely ill with suspected influenza infection, even if rapid antigen – detection influenza diagnostic test results are negative.

Although summer influenza activity in the United States typically is low, influenza cases and outbreaks have occurred during summer months and clinicians should remain vigilant in considering influenza in the differential diagnosis of summer respiratory illnesses. Testing for seasonal influenza viruses and monitoring for novel

influenza A virus infections should continue year round. Health care providers also are reminded to consider novel influenza virus infections in persons with influenza-like illness and swine or poultry exposure, or with severe acute respiratory infection after travel to areas where avian influenza viruses have been detected. Providers should alert the local public health department if novel influenza virus infection is suspected. Clinical laboratories using a commercially available influenza diagnostic assay that includes influenza A virus subtype determination should contact their state public health laboratory to facilitate, transport, and additional testing of any specimen that is positive for influenza A, but for which the subtype cannot be determined. Public Health laboratories should immediately send influenza A virus specimens that they cannot subtype using standard methods to CDC and submit all specimens that are otherwise unusual as soon as possible after identification.

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South Dakota Influenza Epidemiology and Laboratory Surveillance

The South Dakota Department of Health (SD DOH) and SD Public Health Laboratory (SDPHL) conduct surveillance for influenza year-round, and conducts enhanced surveillance October through May. The components of South Dakota's influenza surveillance program for the 2016-17 season included 63 laboratory sentinel sites; 40 Influenza Like Illness Network (ILINet) providers); viral culture, PCR and DFA testing for confirmatory testing; reporting of aggregate rapid antigen results; influenza associated hospitalizations and deaths, and institutional outbreaks. During the influenza season, weekly summary reports are posted on the SD DOH website at: www.doh.sd.gov/Flu/.

During the 2016-17 flu season, there were 2,070 confirmed influenza cases, A(H3N2) 837 (40%), A(H1N1) 20 (1%), A-not subtyped 537 (26%) and 675 (33%) influenza B, were reported to SDDOH. Additionally, 74,720 rapid antigen influenza tests were accomplished with 16,397 positive (22%), 10,614 (14%) positive for influenza A and 5,783 (8%) positive for influenza B.
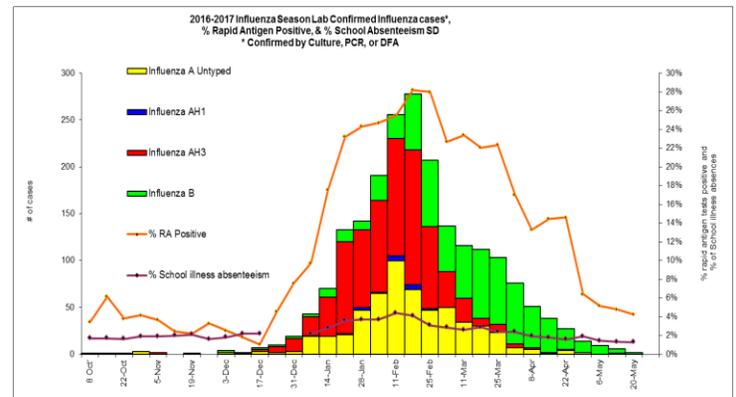
South Dakota seasonal distribution of influenza by MMWR week

The 2016-17 influenza viruses had a substantial impact on all age groups. The median age of confirmed influenza cases was 41 years with an age range of 1 week to 105 years.

Lab Confirmed Influenza Cases (by DFA, PCR, or culture)		Influenza Associated Hospitalizations		Influenza Associated Deaths
Age Group	# Cases (%)		# Hosp (%)	# Deaths
0-4	319	(15%)	77 (8%)	0
5-18	395	(19%)	27 (3%)	0
19-49	387	(19%)	94 (10%)	2 (5%)
50-64	289	(14%)	171 (18%)	3 (7%)
> 64	680	(33%)	591 (62%)	38 (88%)
Total	2070		960	43

South Dakota distribution of influenza hospitalizations & deaths by age

The first confirmed case of influenza was reported the first week of October 2016 and the last case reported late Aug 2017. The peak of the season was the third week in February 2017 with A(H1N1), A(H3N2) and

Influenza B viruses all circulating at the same time.

Forty-three individuals died due to influenza and its complications during the 2016-17 season. Gender breakdown was 53% female and 47% male. The median age was 88 years, with an age range of 32 years to 105 years. 79% of the influenza associated deaths were White and 16% were Unknown and 5% were Native American.

There were 960 individuals reported hospitalized during the 2016-17 influenza season. This was the most influenza associated hospitalizations in South Dakota ever reported. The first hospitalization was identified 1st week of October 2016 and the last was reported late August 2017. Hospitalizations peaked 3rd week of February. For patients who were hospitalized with influenza, the age range was 1 week to 100 years with a median age of 71 years.

Other viral respiratory pathogen reports included 183 Adenovirus, 271 Corona Virus OC43, 135 Corona Virus 229E, 4 Chlamydiophila Pneumonia, 30 Human Metapneumo Virus, 522 Parainfluenza-1, 180 Parainfluenza-2, 6 Parainfluenza-3, 53 Parainfluenza-4, 259 Respiratory Syncytial Virus, and 918 Rhino/Enterovirus.