Missouri Weekly Influenza Surveillance Report
2016-2017 Influenza Season[1]

Week 14: April 2 – April 8, 2017

All data are preliminary and may change as more reports are received.

Summary:

- The estimated influenza activity in Missouri decreased to Regional[2].

- A season-to-date total of 68,792 laboratory-positive[3] influenza cases (45,094 influenza A, 22,474 influenza B, and 1,224 untyped) have been reported in Missouri as of Week 14. The influenza type for reported cases season-to-date includes 65% influenza A, 33% influenza B, and 2% untyped. The highest season-to-date rates of reported laboratory-positive influenza cases are among children aged 0-4 years (2,678 cases per 100,000 population) and 5-14 years (2,432 cases per 100,000). One laboratory-confirmed case of influenza B (Yamagata) was reported by the Missouri State Public Health Laboratory (MSPHL) during Week 14.

- The Centers for Disease Control and Prevention (CDC) has antigenically characterized 16 influenza isolates from Missouri, to date, this influenza season. Nine viruses were antigenically similar to the A/Hong Kong/4801/2014-like (H3N2) virus, four viruses were antigenically similar to the B/Brisbane/60/2008-like virus, two viruses were antigenically similar to the B/Phuket/3073/2013-like virus, and one virus was antigenically similar to the A/California/07/2009-like (H1N1)pdm09 virus. An A/Hong Kong/4801/2014-like (H3N2) virus, a B/Brisbane/60/2008-like virus, and an A/California/07/2009-like (H1N1)pdm09 virus are included in the 2016-2017 Northern Hemisphere trivalent and quadrivalent vaccine formulations. A B/Phuket/3073/2013-like virus is included in the 2016-2017 Northern Hemisphere quadrivalent vaccine formulation.

- Influenza-like illness (ILI) activity is above baseline for both the Missouri Outpatient ILI Surveillance Network (ILINet) and the hospital emergency room visit chief complaint data reported through ESSENCE. The reported percentage of visits for ILI was 1.90% and 1.68% through ILINet and ESSENCE respectively.[4] The percentage of respiratory specimens testing positive for influenza in clinical laboratories decreased during Week 14.

- Ninety-three influenza-associated deaths have been reported in Missouri as of Week 14. During Week 13, 56 deaths involving Pneumonia and Influenza (P&I) were reported to the Bureau of Vital Records, resulting in a season-to-date total of 1,805 P&I associated deaths in Missouri.[5]

- Forty-five influenza or ILI-associated outbreaks have been reported in Missouri as of Week 14. Eleven influenza or ILI-associated school closures have been reported in Missouri as of Week 14.

- Influenza activity decreased but remained elevated in the U.S. during Week 13. National influenza surveillance information is prepared by CDC and is included in the weekly FluView report, which is available online at http://www.cdc.gov/flu/weekly/fluactivitysurv.htm.

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[1]The 2016-2017 influenza season begins CDC Week 40 (week ending October 8, 2016) and ends CDC Week 39 (week ending September 30, 2017).

[2]Regional is defined as: Outbreaks of influenza or increases in ILI and recent laboratory-confirmed influenza in at least two but less than half the regions of the state with recent laboratory evidence of influenza in those regions.

[3]Laboratory-positive influenza includes the following test methods: rapid influenza diagnostic tests (antigen), reverse transcriptase polymerase chain reaction (RT-PCR) and other molecular assays, immunofluorescence antibody staining (Direct (DFA) or Indirect (IFA)), or viral culture.

[4]Influenza-like illness (ILI) is defined by ILINet as fever (temperature of 100°F [37.8°C] or greater) and a cough and/or a sore throat without a known cause other than influenza. Influenza-like illness (ILI) is defined by ESSENCE as Emergency Department chief complaints that contain keywords such as "flu", "flulike", "influenza" or "fever" plus "cough" or "fever" plus "sore throat".

[5]The P&I data are available one week later. The P&I data for the CDC Week provided is the most current data available.

Surveillance Data:

Interactive Maps

The county specific influenza data are provided though interactive maps available at http://arcg.is/2p6mJ23. *Click on the county to view the influenza data specific to that county.*

- **Reported Laboratory-positive Influenza Cases by Influenza Type by County, CDC Week 14**
- **Reported Laboratory-positive Influenza Cases by Influenza Type by County, Season-to-Date**
- **Reported Rate per 100,000 Population, CDC Week 14**

Data Figures

Figure 1. Number of Laboratory-positive† Influenza Cases by Influenza Type, Missouri, CDC Week 14 (April 2 – April 8, 2017)*

Influenza Type	Week 12	Week 13	Week 14	2016-2017* Season-to-Date
Influenza A	871	616	212	45,094
Influenza B	2,026	1,793	756	22,474
Influenza Unknown Or Untyped	32	17	11	1,224
Total	2,929	2,426	979	68,792

†Laboratory-positive influenza includes the following test methods: rapid influenza diagnostic tests (antigen), reverse transcriptase polymerase chain reaction (RT-PCR) and other molecular assays, immunofluorescence antibody staining (Direct (DFA) or Indirect (IFA)), or viral culture.
*Influenza season begins week ending October 8, 2016 (CDC Week 40) Data Source: Missouri Health Information Surveillance System (WebSurv).

Figure 2. Number of Laboratory-positive† Influenza Cases and Case Rates by Age Group, Missouri, CDC Week 14 (April 2 – April 8, 2017)*‡

Age Group	Week 14 Cases	Week 14 Rate‡	2016-2017* Season-to-Date	2016-2017* Season-to-Date Rate‡
00-04	160	43	10,025	2,678
05-14	325	42	19,005	2,432
15-64	404	10	30,715	773
65+	90	10	9,045	970
Total	979	16	68,792	1,135

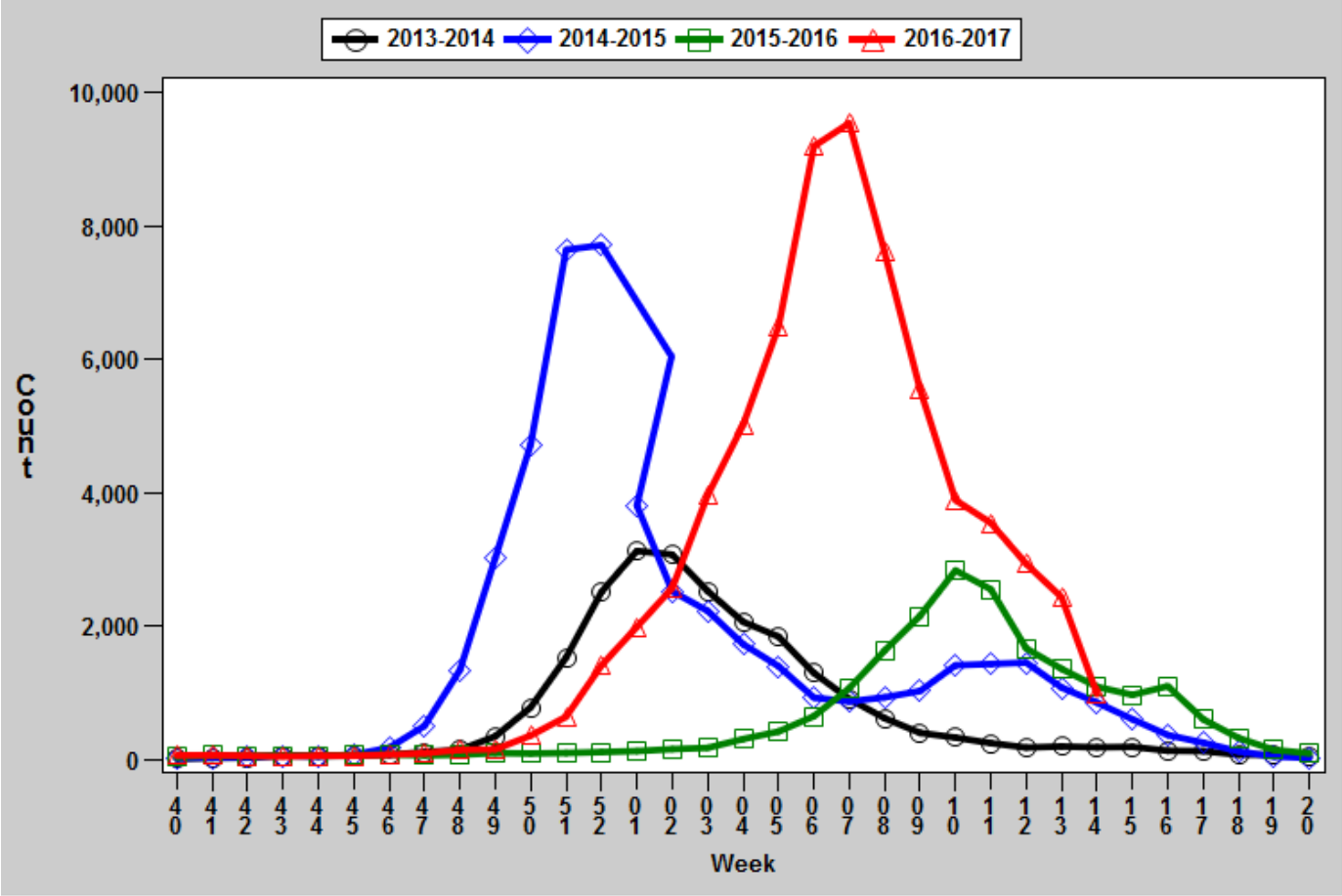
†Laboratory-positive influenza includes the following test methods: rapid influenza diagnostic tests (antigen), reverse transcriptase polymerase chain reaction (RT-PCR) and other molecular assays, immunofluorescence antibody staining (Direct (DFA) or Indirect (IFA)), or viral culture.
*Influenza season begins week ending October 8, 2016 (CDC Week 40) Data Source: Missouri Health Information Surveillance System (WebSurv)
‡Incidence Rate per 100,000 population

Figure 3. Number of Laboratory-positive[†] Influenza Cases and Case Rates by Region, Missouri, CDC Week 14 (April 2 – April 8, 2017)[*‡]

District	Week 14 Cases	Week 14 Rate[‡]	2016-2017* Season-to-Date	2016-2017* Season-to-Date Rate[‡]
CE	63	10	6,427	970
EA	510	23	21,389	947
NW	139	9	21,672	1,362
SE	108	23	9,575	2,011
SW	159	15	9,729	904
Total	979	16	68,792	1,135

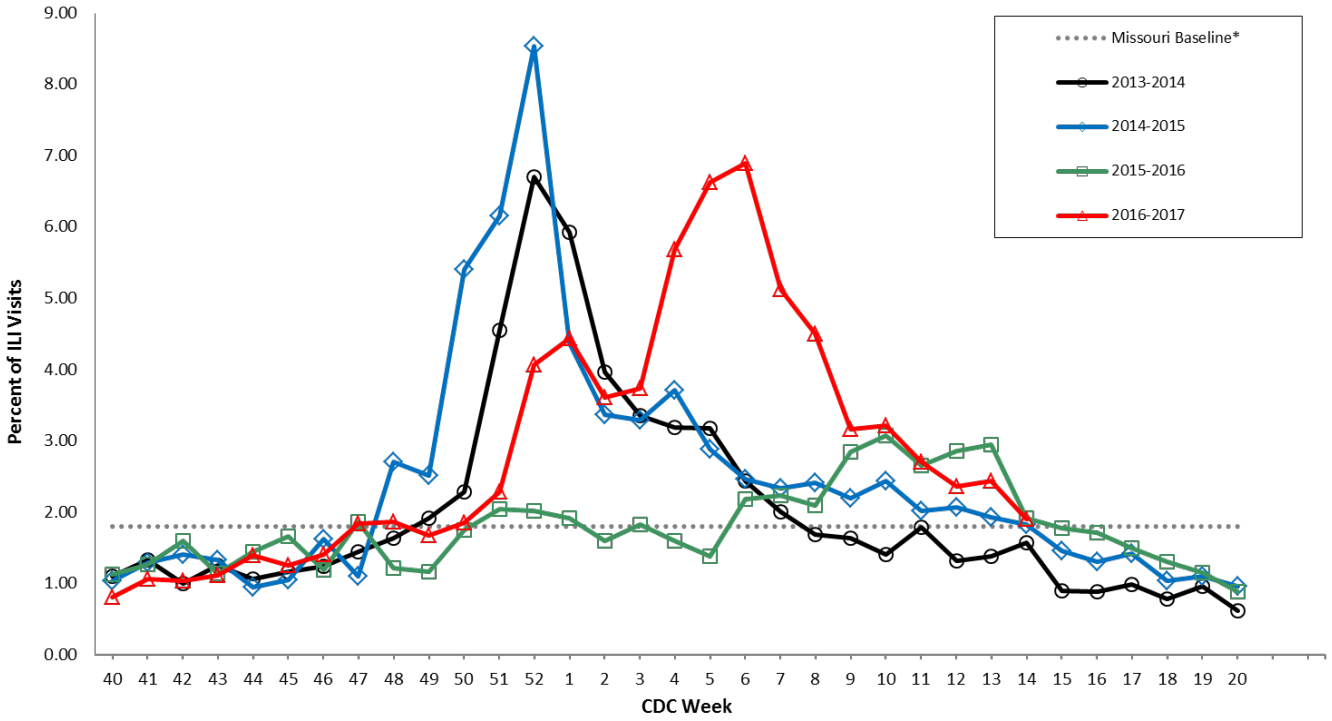
[†]Laboratory-positive influenza includes the following test methods: rapid influenza diagnostic tests (antigen), reverse transcriptase polymerase chain reaction (RT-PCR) and other molecular assays, immunofluorescence antibody staining (Direct (DFA) or Indirect (IFA)), or viral culture.
*Influenza season begins week ending October 8, 2016 (CDC Week 40) Data Source: Missouri Health Information Surveillance System (WebSurv)
[‡]Incidence Rate per 100,000 population

Figure 4. Number of Laboratory-positive[†] Influenza Cases by CDC Week, Missouri, 2013-2017[*]



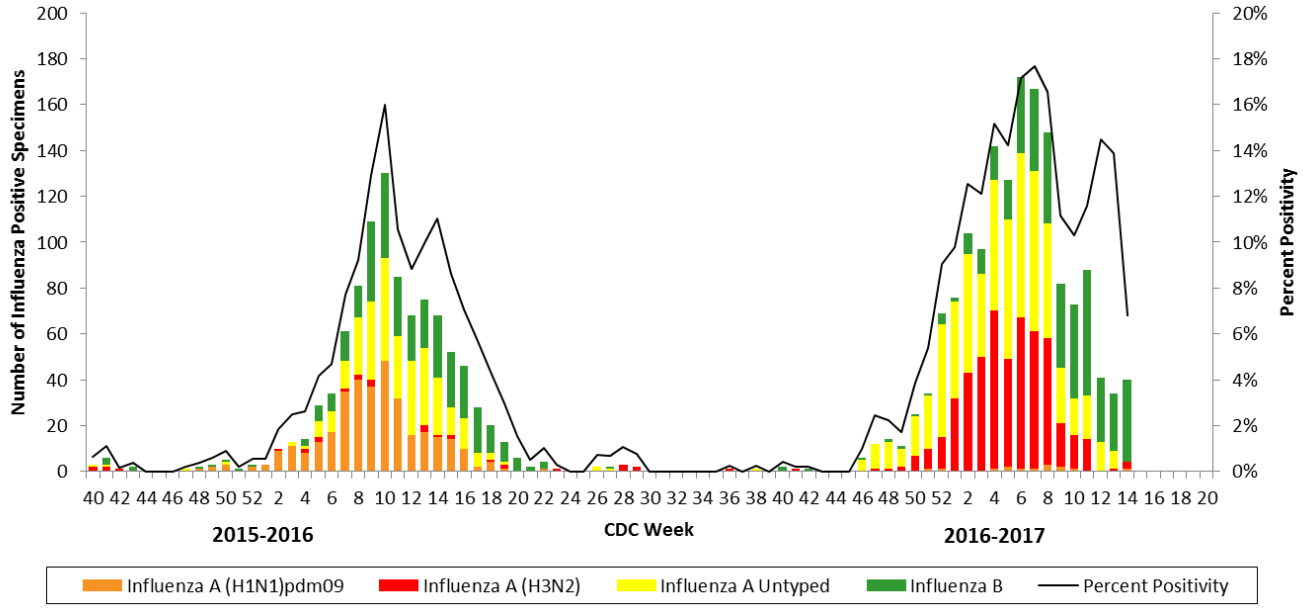
[†]Laboratory-positive influenza includes the following test methods: rapid influenza diagnostic tests (antigen), reverse transcriptase polymerase chain reaction (RT-PCR) and other molecular assays, immunofluorescence antibody staining (Direct (DFA) or Indirect (IFA)), or viral culture.
*2016-2017 season-to-date through the week ending May 20, 2017 (Week 20). The 2014-2015 season had 53 weeks rather than the usual 52. Week 53, 2014-2015 flu season has 3,082 reported confirmed cases. Data Source: Missouri Health Information Surveillance System (WebSurv).

Figure 5. Percentage of Outpatient Visits for Influenza-like Illness (ILI), Missouri Outpatient ILI Surveillance Network (ILINet) 2013-2017*†



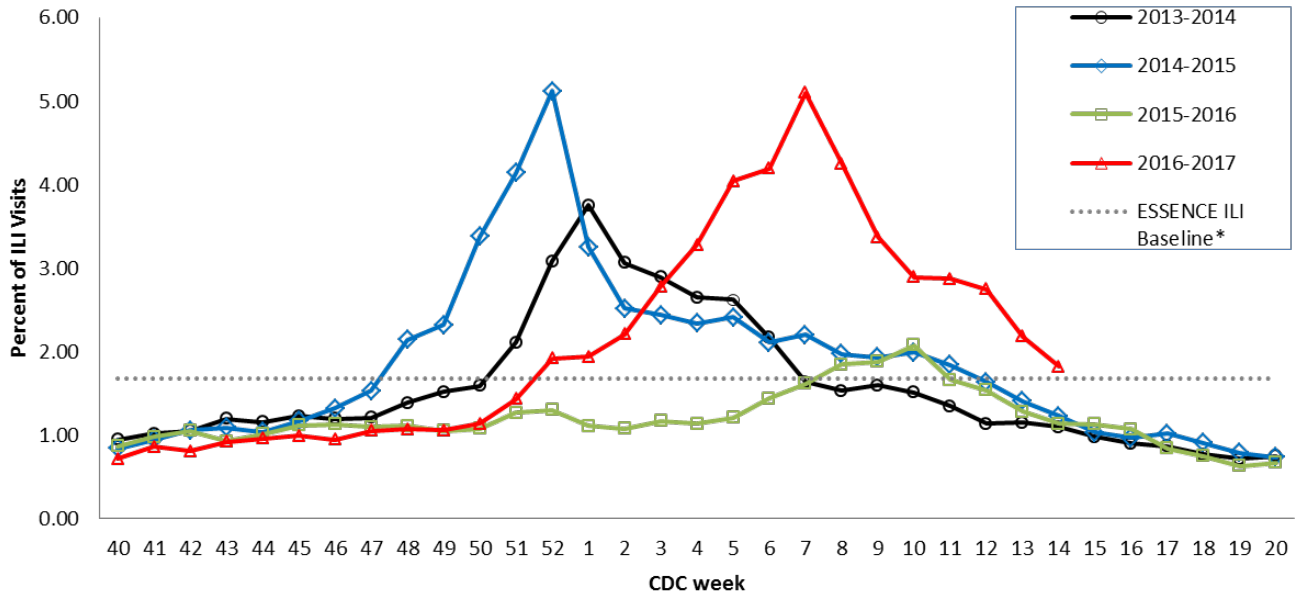
*The ILINet Region 7 (MO, IA, KS, NE) baseline is the mean percentage of patient visits for ILI during non-influenza weeks for the previous three seasons, plus two standard deviations. A non-influenza week is defined as periods of two or more consecutive weeks in which each week accounted for less than 2% of the season's total number of specimens that tested positive for influenza.
Data Source: U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), Centers for Disease Control and Prevention (CDC).
†2016-2017 season-to-date through the week ending May 20, 2017 (Week 20). The 2014-2015 season had 53 weeks rather than the usual 52. The percentage of outpatient visits for ILI during Week 53 was 7.63.

Figure 6. Season-to-Date PCR (+) Tests for Influenza in Missouri



Data Source: National Respiratory and Enteric Virus Surveillance System (NREVSS), Centers for Disease Control and Prevention (CDC).
2016-2017 season-to-date through the week ending May 20, 2017 (Week 20).

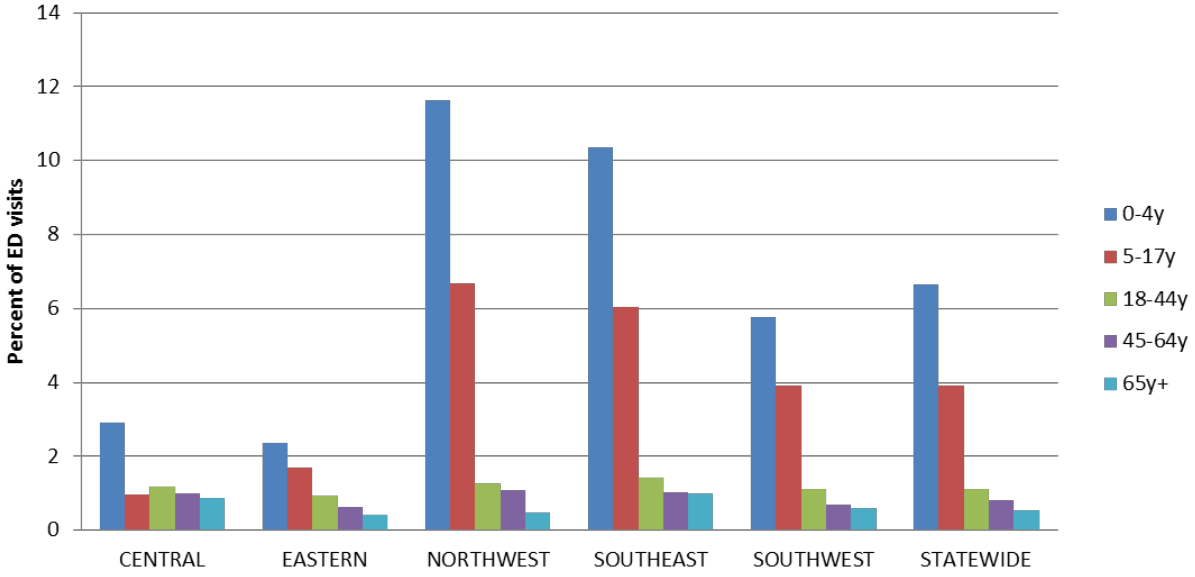
Figure 7. Weekly Percentage of Influenza-like Illness (ILI) in ESSENCE Participating Hospitals, for 2013-2017 Influenza Seasons*†



*The ESSENCE ILI Baseline is the mean percent of ILI visits for each week during the previous three years (2013-15) when percentage of ILI visits were less than 2% of total visits, plus two standard deviations.
Data Source: Missouri Department of Health and Senior Services (DHSS), Bureau of Reportable Disease Informatics, ESSENCE.

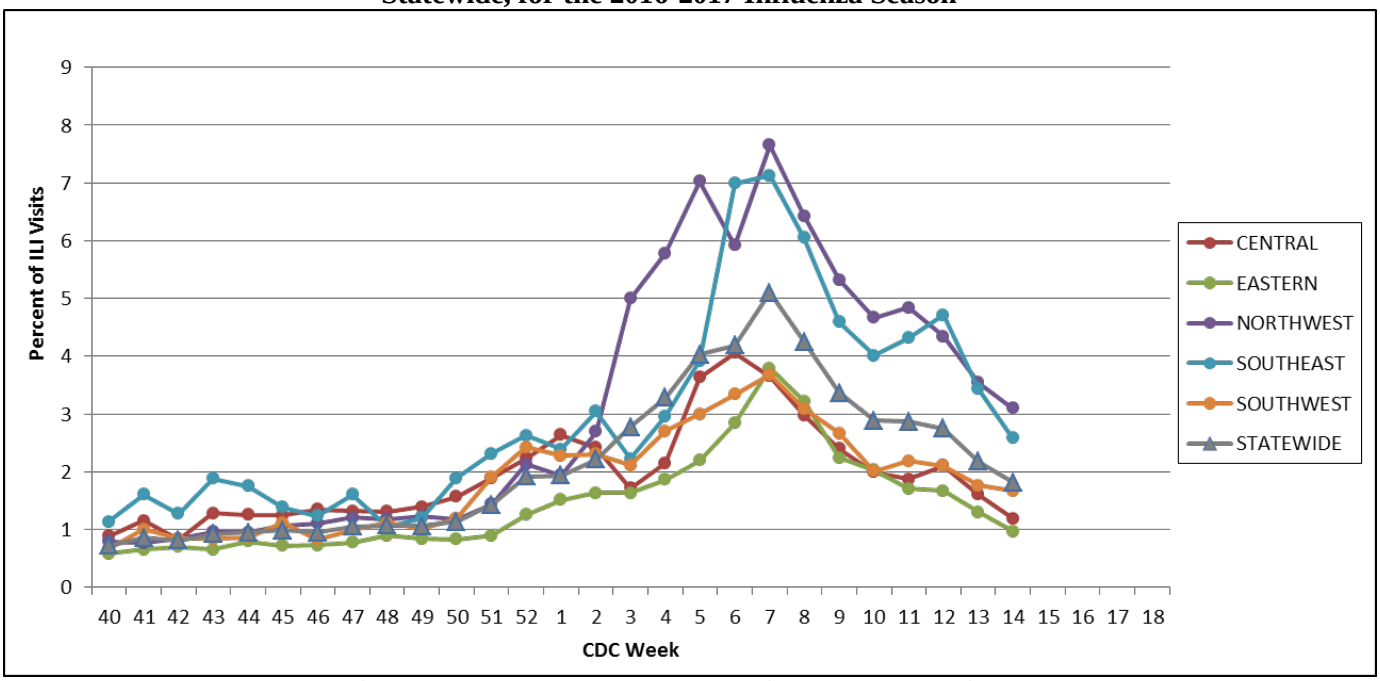
†The 2014-2015 season had 53 weeks rather than the usual 52. The percentage of visits for ILI in ESSENCE participating hospitals during Week 53 was 4.3.

Figure 8. Percentage of Visits for Influenza-like Illness (ILI) in ESSENCE Participating Hospitals, by Age-group, District and Statewide, CDC Week 14, 2017



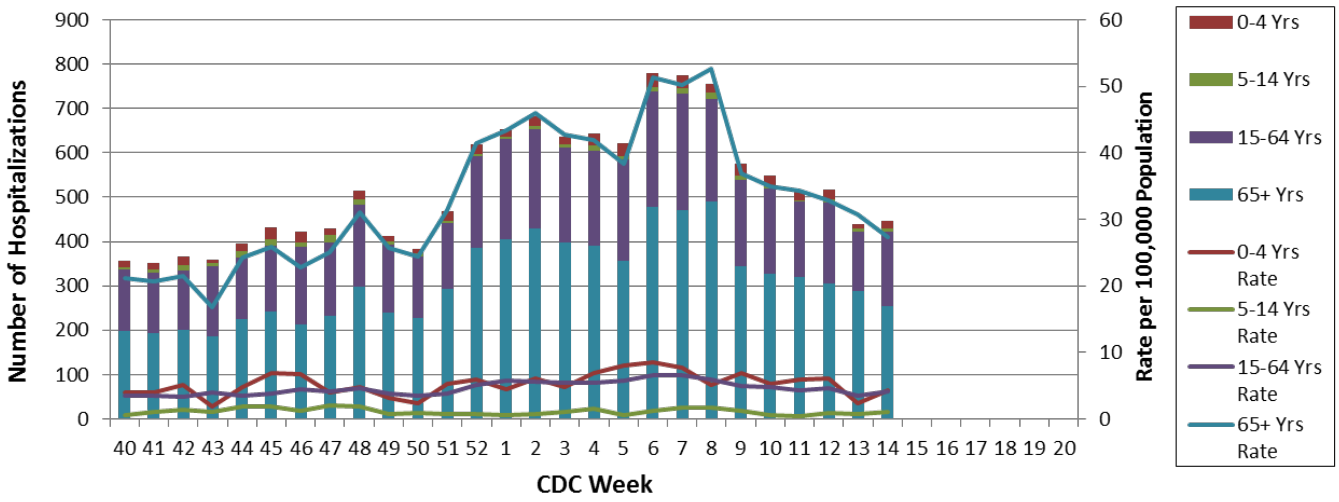
Data Source: Missouri Department of Health and Senior Services (DHSS), Bureau of Reportable Disease Informatics, ESSENCE.

Figure 9. Percentage of Visits for Influenza-like Illness (ILI) in ESSENCE Participating Hospitals, by District and Statewide, for the 2016-2017 Influenza Season*†



Data Source: Missouri Department of Health and Senior Services (DHSS), Bureau of Reportable Disease Informatics, ESSENCE.
*Changes in ILI surveillance for the Northwest District were implemented on January 16, 2017.
†Not all data was available for the Northwest District during Week 6.

Figure 10. Patients Hospitalized with Influenza and/or Pneumonia Syndromes from Participating Missouri Hospitals, by Age Group, CDC Week 14, 2017



Data Source: Missouri Department of Health and Senior Services (DHSS), Bureau of Reportable Disease Informatics, ESSENCE. Population data from DHSS Population MICA 2014 (http://health.mo.gov/data/mica/mica/population.php).

Additional Influenza Data Sources:

Centers for Disease Control and Prevention: National Influenza Surveillance (FluView):
http://www.cdc.gov/flu/weekly/fluactivitysurv.htm

The National Respiratory and Enteric Virus Surveillance System (NREVSS):
https://www.cdc.gov/surveillance/nrevss/

World Health Organization: International Influenza Surveillance:
http://www.who.int/influenza/surveillance_monitoring/en/