



Texas Influenza Surveillance Report 2016–2017 Season/2017 MMWR Week 18

(Apr. 30, 2017 – May 6, 2017)

Report produced on 05/12/2017

Summary

Influenza (flu) activity has decreased the past few months in Texas; it appears to have peaked in mid-February. Compared to the previous week, the percentage of specimens testing positive for influenza reported by hospital and public health laboratories and patient visits due to influenza-like illness (ILI) slightly increased. No influenza outbreaks were reported. No influenza-associated pediatric deaths were reported. In addition to flu, other respiratory viruses—especially rhino/enteroviruses—were detected in Texas during week 18.

Table 1: Summary of Texas Influenza (Flu) and Influenza-like Illness (ILI) Activity for the Current Week

| Texas Surveillance Component | Change from Previous Week | Current Week | Previous Week† | Page of Report |
|---|---------------------------|--------------|----------------|----------------|
| Statewide influenza activity level reported to CDC (geographic spread of influenza) | Decreased | Sporadic | Local | -- |
| Statewide ILINet Activity Indicator assigned by CDC (intensity of influenza-like illness) | No Change | Minimal | Minimal | -- |
| Percentage of specimens positive for influenza by hospital laboratories | ▲0.40% | 6.06% | 5.66% | 1 |
| Percentage of specimens positive for influenza by public health laboratories | ▲4.17% | 29.17% | 25.00% | 2 |
| Percentage of visits due to ILI (ILINet) | ▲0.54% | 3.96% | 3.42% | 4 |
| Number of regions reporting increased flu/ILI activity | No change | 0 | 0 | 7 |
| Number of regions reporting decreased flu/ILI activity | ▲3 | 8 | 5 | 7 |
| Number of variant/novel influenza infections | No Cases Reported | 0 | 1 | 7 |
| Number of ILI/influenza outbreaks | No Change | 0 | 0 | 7 |
| Number of pediatric influenza deaths | No Cases Reported | 0 | 1 | 8 |

†Data displayed have been updated since last week's flu report with any new reports received.

Laboratory Results

Influenza

Hospital laboratories across Texas voluntarily report influenza tests (antigen, culture, and PCR) to the National Respiratory and Enteric Virus Surveillance System (NREVSS). Providers throughout Texas also submit specimens for influenza testing (PCR) to Texas public health laboratories, including the Texas Department of State Health Services (DSHS) state laboratory in Austin and the nine Texas Laboratory Response Network (LRN) laboratories. The results reported by Texas NREVSS participants and public health laboratories for the current week are summarized in the two tables below. Additional influenza test results (rapid tests, culture, PCR) and ILI activity were reported from providers and public health departments throughout the state (see county map at the end of this report).

Table 2: Influenza Testing Performed by Texas Hospital Laboratories for the Current Week

| | Week 18 | Season to Date |
|---|--------------------|----------------------|
| Number of labs reporting flu tests | 7 | |
| Number of specimens tested | 775 | 83918 |
| Number of positive specimens (%)† | 47 (6.06%) | 13348 (15.91%) |
| Percentage of total tests that were antigen detection tests | 30.06% | |
| Positive specimens by type/subtype [n (%)] | | |
| Influenza A | 18 (38.30%) | 9843 (73.74%) |
| Subtyping performed | 3 (16.67%) | 2272 (23.08%) |
| A (H1N1) | 1 (33.33%) | 369 (16.24%) |
| A (H3N2) | 2 (66.67%) | 1903 (83.76%) |
| Subtyping not performed | 15 (83.33%) | 7571 (76.92%) |
| Influenza B | 29 (61.70%) | 3505 (26.26%) |

†Laboratory data in 2016-2017 season reports may not be comparable to reports from previous seasons because the data only includes hospital laboratories data for the current season.

Figure 1: Number and Percentage of Tests (Antigen, Culture, PCR) Positive for Influenza by Type and Subtype Reported by Texas Hospital Laboratories, 2016–2017 Season

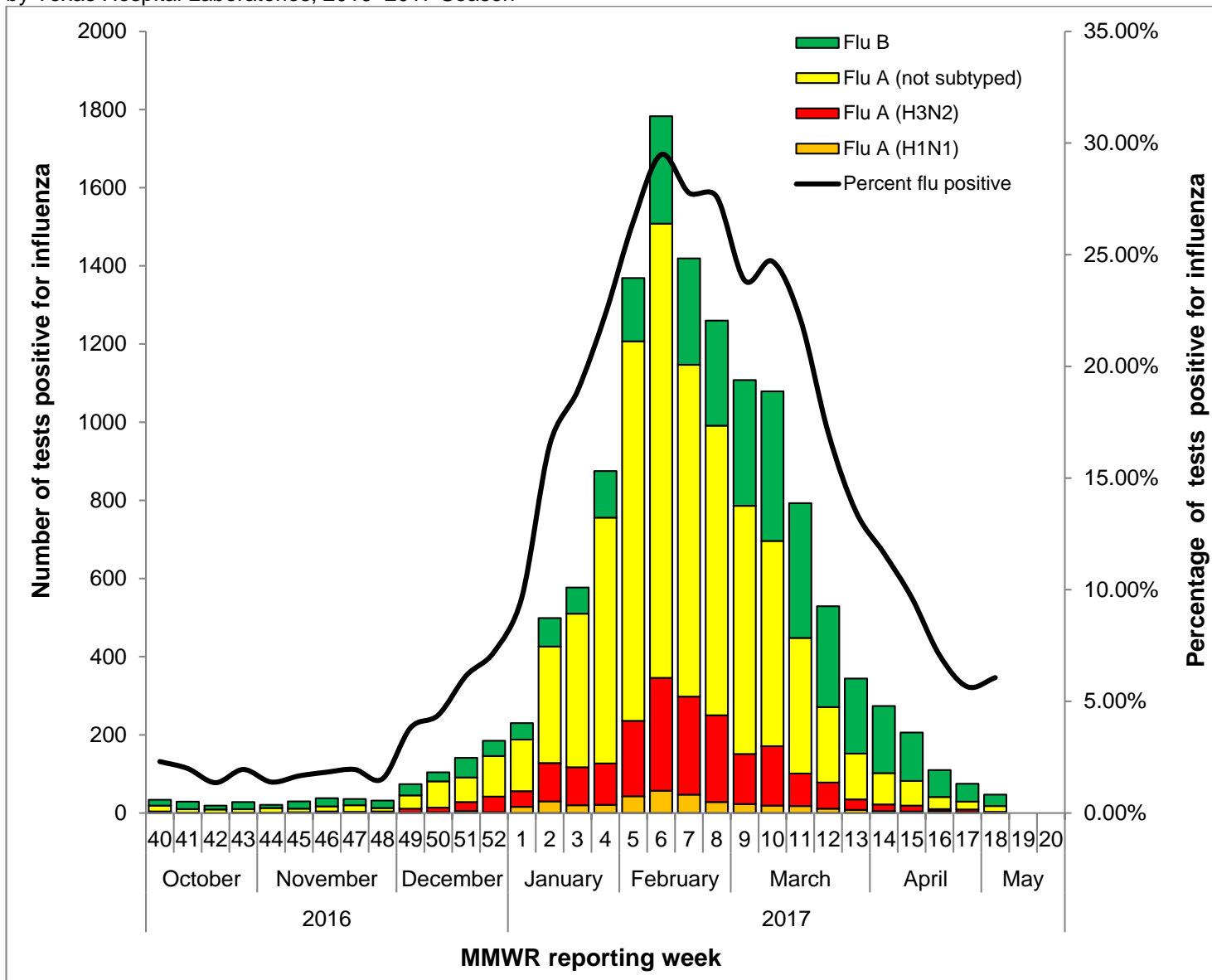
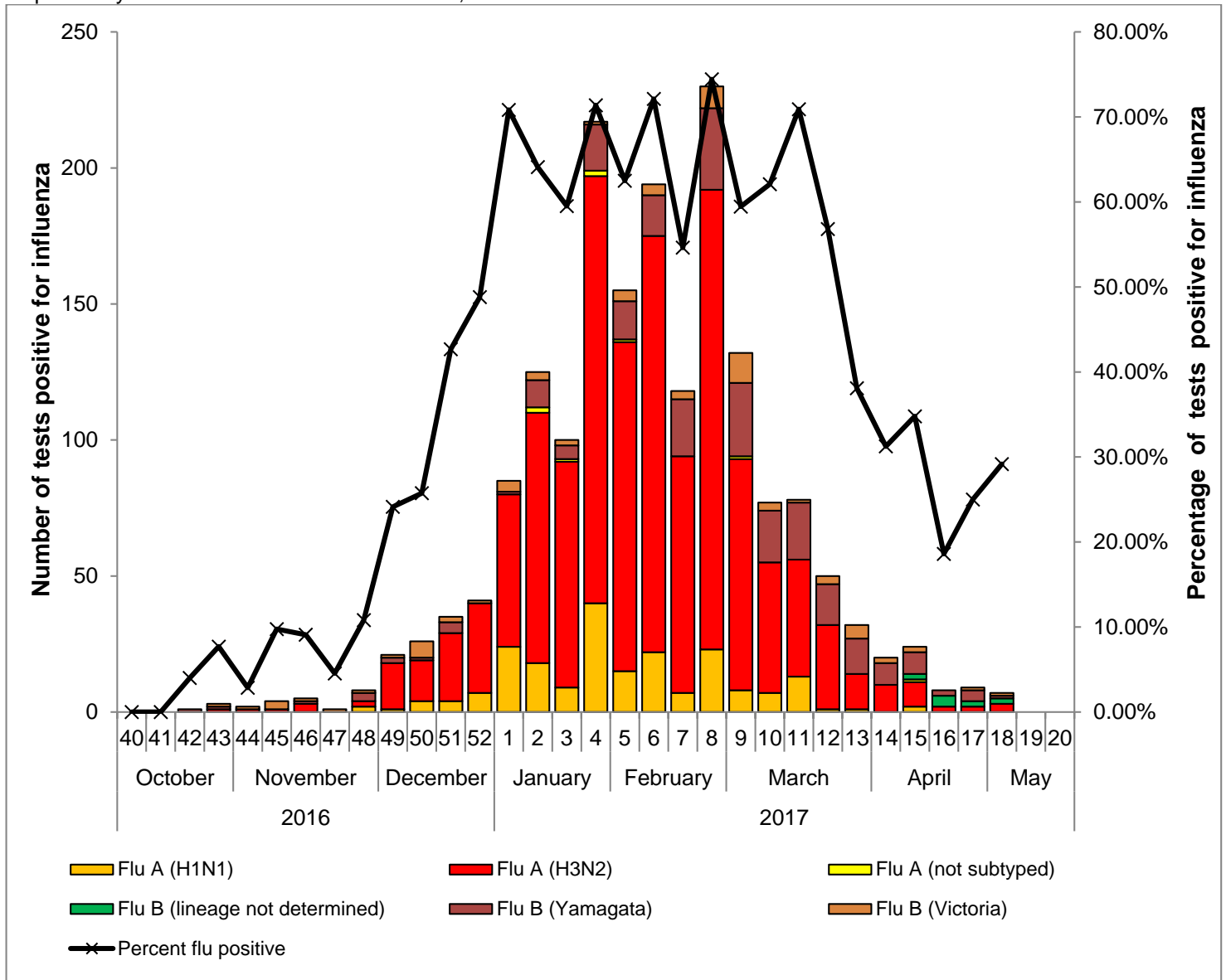


Table 3: Influenza Testing Performed by Texas Public Health Laboratories for the Current Week

| | Week 18 | Season to Date |
|--|-------------------|----------------------|
| Number of labs reporting flu tests | 3 | |
| Number of specimens tested | 24 | 3417 |
| Number of positive specimens (%) [†] | 7 (29.17%) | 1809 (52.94%) |
| Positive specimens by type/subtype/lineage [n (%)] | | |
| Influenza A | 3 (42.86%) | 1478 (81.70%) |
| Subtyping performed | 3 (100.00%) | 1470 (99.46%) |
| A (H1N1) | 0 (0.00%) | 208 (14.15%) |
| A (H3N2) | 3 (100.00%) | 1262 (85.85%) |
| Subtyping not performed | 0 (0.00%) | 8 (0.54%) |
| Influenza B | 4 (57.14%) | 331 (18.30%) |
| Lineage testing performed | 2 (50.00%) | 320 (96.68%) |
| B/Victoria | 1 (50.00%) | 76 (23.75%) |
| B/Yamagata | 1 (50.00%) | 244 (76.25%) |
| Lineage testing not performed | 2 (50.00%) | 11 (3.32%) |

[†]Laboratory data in 2016-2017 season reports may not be comparable to reports from previous seasons because the data only includes DSHS and LRN laboratory data for the current season.

Figure 2: Number and Percentage of Tests (Culture, PCR) Positive for Influenza by Type, Subtype, and Lineage Reported by Texas Public Health Laboratories, 2016–2017 Season



Other Respiratory Viruses

The NREVSS system collects information on a variety of respiratory viruses in addition to influenza including parainfluenza virus, respiratory syncytial virus (RSV), rhinovirus, human metapneumovirus (HMPV), seasonal coronavirus, and respiratory adenovirus. The results for the current week are summarized below.

Table 4: Non-Influenza Respiratory Virus Testing Performed by Texas NREVSS Laboratories for the Current Week

| Virus | Number of Laboratories Testing | Tests Performed | Positive Tests | Percentage of Tests Positive |
|--|--------------------------------|-----------------|----------------|------------------------------|
| Adenovirus (respiratory) | 4 | 495 | 21 | 4.24% |
| HMPV | 4 | 495 | 25 | 5.05% |
| Parainfluenza | 4 | 495 | 36 | 7.27% |
| Rhinovirus | 4 | 495 | 132 | 26.67% |
| RSV | 7 | 584 | 10 | 1.71% |
| Seasonal coronavirus (does not include MERS-CoV) | 4 | 495 | 3 | 0.61% |

[†]RSV tests displayed in the table are a combination of antigen detection, PCR, and culture tests. Some non-NREVSS reporters also contribute to the RSV data.

[^]Numbers and percentage may differ from the weekly RSV report. The weekly RSV report may be accessed at <http://www.dshs.texas.gov/IDCU/disease/rsv/Data.doc>.

Antigenic Characterization

Since October 02, 2016, CDC has reported antigenic characterization results from twenty-eight influenza A (H3N2) viruses, nineteen influenza A (H1N1) viruses and thirty-five influenza B viruses received from the Texas Department of State Health Services (DSHS) Laboratory, the Dallas County Health and Human Services Laboratory Response Network (LRN) Laboratory, and the San Antonio LRN Laboratory. The DSHS Laboratory and the two LRN laboratories send a representative sample of influenza viruses to the CDC throughout the flu season.

Influenza A (H3N2) [28]

- Twenty-eight (100.0%) viruses were related to A/Hong Kong/4801/2014 virus, the influenza A (H3N2) component of the 2016-2017 Northern Hemisphere influenza vaccine.

Influenza A (H1N1) [19]

- Nineteen (100.0%) viruses were related to A/California/07/2009. This virus strain was included in the 2016-2017 influenza vaccine for the Northern Hemisphere.

Influenza B [35]

- Victoria lineage [16]: Sixteen (45.71%) influenza B/Victoria-lineage viruses has been characterized as B/Brisbane/60/2008-like, which is included as an influenza B component of the 2016-2017 Northern Hemisphere trivalent and quadrivalent influenza vaccines.
- Yamagata lineage [19]: Nineteen (54.29%) influenza B/Yamagata-lineage viruses have been characterized from Texas. A B/Phuket/3073/2013-like virus, which belongs to the B/Yamagata lineage, is included as an influenza B component of the 2016-2017 Northern Hemisphere quadrivalent influenza vaccine.

Antiviral Resistance

Table 5: Cumulative Antiviral Resistance Results from Texas Influenza Viruses, 2016-2017 Season[†]

| | Oseltamivir | | Zanamivir | | Peramivir [^] | |
|--------------------|--------------------------|-------------------------------|--------------------------|-------------------------------|--------------------------|-------------------------------|
| | Virus samples tested (n) | Resistant viruses, number (%) | Virus samples tested (n) | Resistant viruses, number (%) | Virus samples tested (n) | Resistant viruses, number (%) |
| Influenza A (H1N1) | 11 | 0 (0%) | 0 | 0 (0%) | 0 | 0 (0%) |
| Influenza A (H3N2) | 0 | 0 (0%) | 0 | 0 (0%) | 0 | 0 (0%) |
| Influenza B | 0 | 0 (0%) | 0 | 0 (0%) | 0 | 0 (0%) |

[†]This table includes specimens submitted as part of routine surveillance and not for diagnostic purposes.

[^] Peramivir is an intravenous antiviral medication that was FDA-approved for use on December 19, 2014.

U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet)

Table 6: Texas ILINet Reporting and Patient Visit Summary for the Current Week

| | Week 18 |
|--|-------------|
| Number of providers reporting [†] | 90 |
| Number of providers reporting patient visits | 90 |
| Number (%) of providers with at least one ILI case | 80 (88.89%) |
| Percentage of all visits due to ILI | 3.96% |
| Texas ILINet baseline [‡] , 2016–2017 | 6.64% |

[†]Reporting providers include both ILINet and RVSP providers.

[‡]The 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 a week that accounted for less than 2% of the season's total number of specimens that tested positive for influenza

Table 7: Percentage of Visits for Influenza-like Illness Reported by Texas ILINet Providers (as of 05/11/17 1:30 PM)

| Week | Providers Reporting | Number of ILI Cases by Age Group (Years) | | | | | Total ILI (all ages) | Total Patients | % ILI |
|--------|---------------------|--|------|-------|-------|-----|----------------------|----------------|-------|
| | | 0-4 | 5-24 | 25-49 | 50-64 | 65+ | | | |
| 201640 | 125 | 166 | 345 | 142 | 106 | 145 | 904 | 33457 | 2.70% |
| 201641 | 123 | 140 | 303 | 151 | 87 | 137 | 818 | 31233 | 2.62% |
| 201642 | 119 | 132 | 263 | 127 | 118 | 109 | 749 | 30871 | 2.43% |
| 201643 | 119 | 138 | 314 | 149 | 139 | 125 | 865 | 30754 | 2.81% |

| Week | Providers Reporting | Number of ILI Cases by Age Group (Years) | | | | | Total ILI (all ages) | Total Patients | % ILI |
|--------|---------------------|--|------|-------|-------|-----|----------------------|----------------|--------|
| | | 0-4 | 5-24 | 25-49 | 50-64 | 65+ | | | |
| 201644 | 112 | 115 | 295 | 102 | 36 | 33 | 581 | 28878 | 2.01% |
| 201645 | 121 | 153 | 273 | 167 | 104 | 133 | 830 | 30824 | 2.69% |
| 201646 | 121 | 186 | 357 | 143 | 116 | 148 | 950 | 31953 | 2.97% |
| 201647 | 119 | 146 | 215 | 141 | 115 | 116 | 733 | 22334 | 3.28% |
| 201648 | 117 | 197 | 302 | 185 | 165 | 192 | 1041 | 29957 | 3.47% |
| 201649 | 118 | 226 | 337 | 219 | 182 | 196 | 1160 | 28629 | 4.05% |
| 201650 | 112 | 241 | 377 | 184 | 93 | 67 | 962 | 26540 | 3.62% |
| 201651 | 113 | 232 | 342 | 316 | 210 | 200 | 1300 | 24910 | 5.22% |
| 201652 | 114 | 180 | 233 | 357 | 220 | 185 | 1175 | 23112 | 5.08% |
| 201701 | 118 | 188 | 316 | 394 | 222 | 212 | 1332 | 27199 | 4.90% |
| 201702 | 117 | 223 | 628 | 420 | 296 | 243 | 1810 | 30922 | 5.85% |
| 201703 | 117 | 242 | 731 | 413 | 255 | 225 | 1866 | 30815 | 6.06% |
| 201704 | 108 | 254 | 911 | 408 | 169 | 68 | 1810 | 29558 | 6.12% |
| 201705 | 118 | 380 | 1422 | 680 | 354 | 270 | 3106 | 36254 | 8.57% |
| 201706 | 118 | 418 | 1739 | 938 | 476 | 326 | 3897 | 36284 | 10.74% |
| 201707 | 93 | 201 | 1267 | 779 | 444 | 264 | 2955 | 29550 | 10.00% |
| 201708 | 111 | 339 | 1212 | 744 | 397 | 224 | 2916 | 31344 | 9.30% |
| 201709 | 112 | 291 | 1042 | 683 | 323 | 226 | 2565 | 32282 | 7.95% |
| 201710 | 110 | 225 | 969 | 645 | 331 | 204 | 2374 | 31148 | 7.62% |
| 201711 | 108 | 213 | 502 | 456 | 245 | 151 | 1567 | 24988 | 6.27% |
| 201712 | 108 | 175 | 509 | 389 | 240 | 180 | 1493 | 29832 | 5.00% |
| 201713 | 105 | 161 | 467 | 314 | 183 | 170 | 1295 | 28234 | 4.59% |
| 201714 | 106 | 159 | 427 | 283 | 150 | 151 | 1170 | 27705 | 4.22% |
| 201715 | 102 | 118 | 432 | 214 | 138 | 139 | 1041 | 25963 | 4.01% |
| 201716 | 85 | 146 | 327 | 145 | 127 | 142 | 887 | 20887 | 4.25% |
| 201717 | 102 | 130 | 335 | 220 | 151 | 140 | 976 | 28565 | 3.42% |
| 201718 | 90 | 126 | 274 | 209 | 115 | 116 | 840 | 21186 | 3.96% |

Figure 3: Percentage of Visits Due to Influenza-like Illness Reported by Texas ILINet Participants, 2016–2017 Season

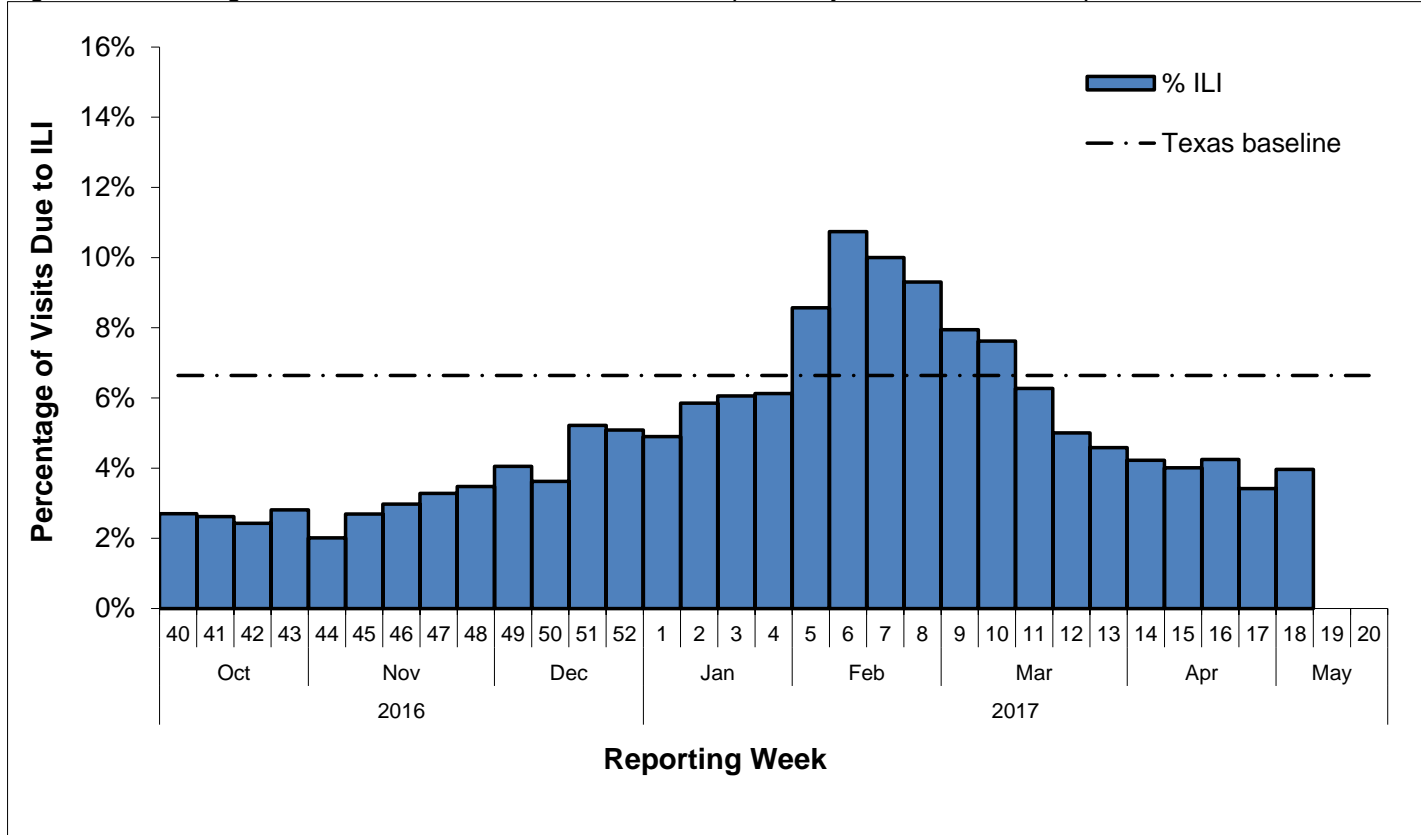
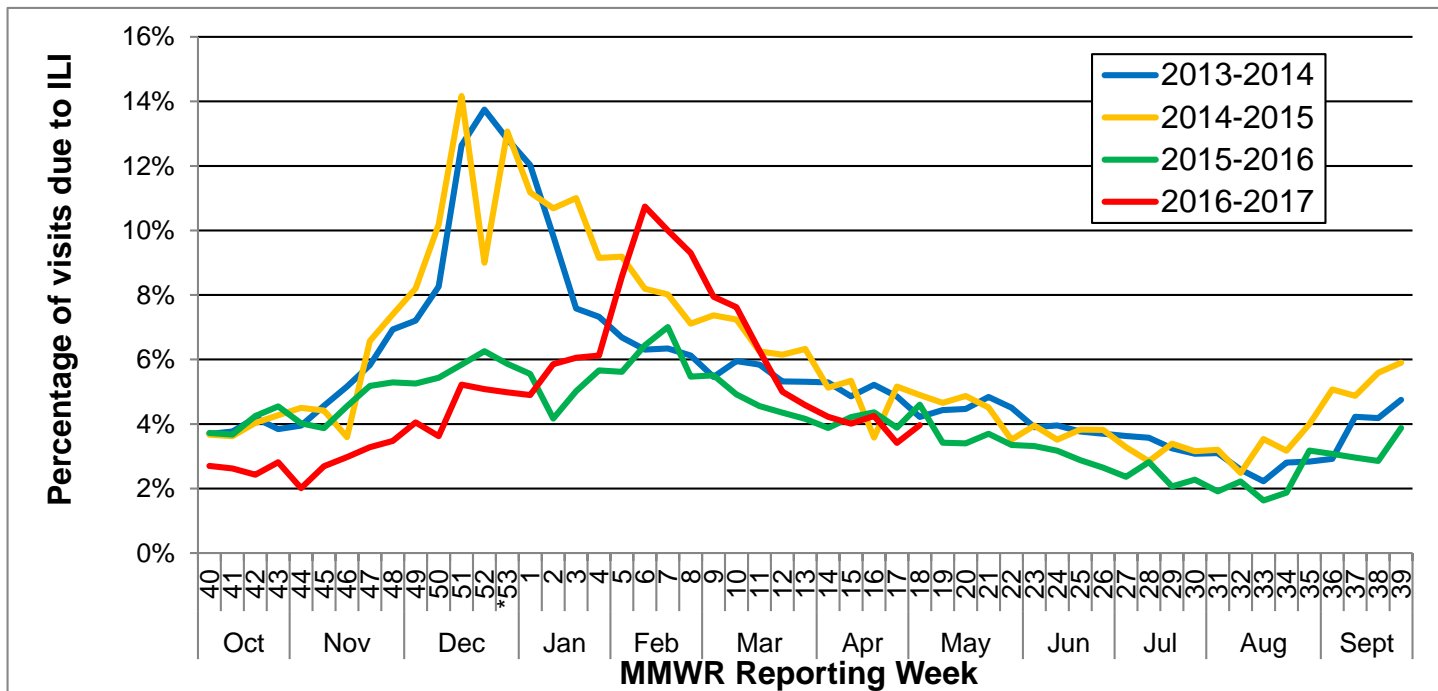


Figure 4: Percentage of Visits Due to Influenza-like Illness Reported by Texas ILINet Participants, 2013–2017 Seasons*



*There was a week 53 in the 2014-2015 influenza season, but there is not a week 53 in the 2016-2017 influenza season or the other previous seasons; therefore the week 53 data point for those seasons is an average of week 52 and 1.

Reports from Health Service Regions

Reports were received from all Health Service Regions (HSRs) during week 18.

Table 8: Influenza Activity Compared to Week 17 by Health Service Region (HSR)

| Influenza Activity Comparison | |
|-------------------------------|--|
| Increased | |
| Same | |
| Decreased | 1, 2/3, 4/5N, 6/5S, 7, 8, 9/10, and 11 |
| Unsure | |

Variant Influenza Viruses

No new variant influenza viruses were reported during week 18.

One human infection with an influenza A variant virus was reported during week 17 (week ending April 29, 2017). The infection was in a child less than 5 years of age who is a resident of HSR 8. The child was infected with an influenza A (H3N2) variant (H3N2v) virus. This H3N2v virus was detected through the Department of Defense Global, Laboratory-based Influenza Surveillance Program. The child became ill with respiratory symptoms in February 2017, was not hospitalized, and has fully recovered from their illness. Swine contact at an agricultural event was reported in the week preceding illness onset.

Influenza viruses that circulate in swine are called swine influenza viruses when isolated from swine, but are called variant influenza viruses when isolated from humans. Early identification and investigation of human infections with novel influenza A viruses are critical so that the risk of infection can be more fully understood and appropriate public health measures can be taken. Additional information on influenza in swine, variant influenza infection in humans, and strategies to interact safely with swine can be found at <http://www.cdc.gov/flu/swineflu/index.htm>.

Institutional Outbreaks and School Closures

During week 18, no institutional outbreaks were reported.

No school closures were reported during week 18.

TX P&I Mortality Surveillance Data

Pneumonia and influenza (P&I) death data are obtained from death certificates of Texas residents whose underlying or contributing cause(s) of death is reported as pneumonia or influenza. P&I deaths are identified based on ICD-10 multiple cause of death codes. In particular, P&I deaths are based on ICD-10 pneumonia and influenza mortality codes.

Six thousand one hundred and thirty-one P&I deaths have been reported in Texas during the 2016-2017 influenza season.

Table 9: Texas P&I Deaths Occurring Oct. 02, 2016- May 10, 2017* by Age

| Age Category (years) | Number of P&I Deaths ⁺ | Mortality Rate (per 100,000) |
|----------------------|-----------------------------------|------------------------------|
| 0 - 4 | 28 | 1.35 |
| 5 - 17 | 18 | 0.33 |
| 18 - 49 | 349 | 2.74 |
| 50 - 64 | 998 | 19.77 |
| 65 + | 4738 | 134.90 |
| Overall | 6131 | 21.29 |

*NOTE: Data are provisional and subject to change, errors, and duplicates

⁺ If the cell count is less than 10, the number of P&I deaths is suppressed and <10 is written in the cell.

Table 10: Texas P&I Deaths Occurring Oct. 02, 2016- May 10, 2017* by Health Service Region (HSR)

| HSR | Number of P&I Deaths ⁺ | Mortality Rate (per 100,000) |
|----------------|-----------------------------------|------------------------------|
| 1 | 267 | 29.34 |
| 2/3 | 1665 | 20.00 |
| 4/5N | 478 | 29.78 |
| 6/5S | 1347 | 17.93 |
| 7 | 690 | 19.74 |
| 8 | 712 | 23.90 |
| 9/10 | 352 | 22.66 |
| 11 | 618 | 25.57 |
| Unknown | <10 | N/A |
| Overall | 6131 | 21.29 |

*NOTE: Data are provisional and subject to change, errors, and duplicates

⁺ If the cell count is less than 10, the number of P&I deaths is suppressed and <10 is written in the cell.

Influenza-Associated Pediatric Mortality

No new influenza-associated pediatric deaths were reported in Texas during week 18.

Five influenza-associated pediatric deaths have been reported in Texas during the 2016-2017 influenza season. Cases of influenza-associated pediatric mortality (children <18 years of age) are reportable year-round and by law in Texas.

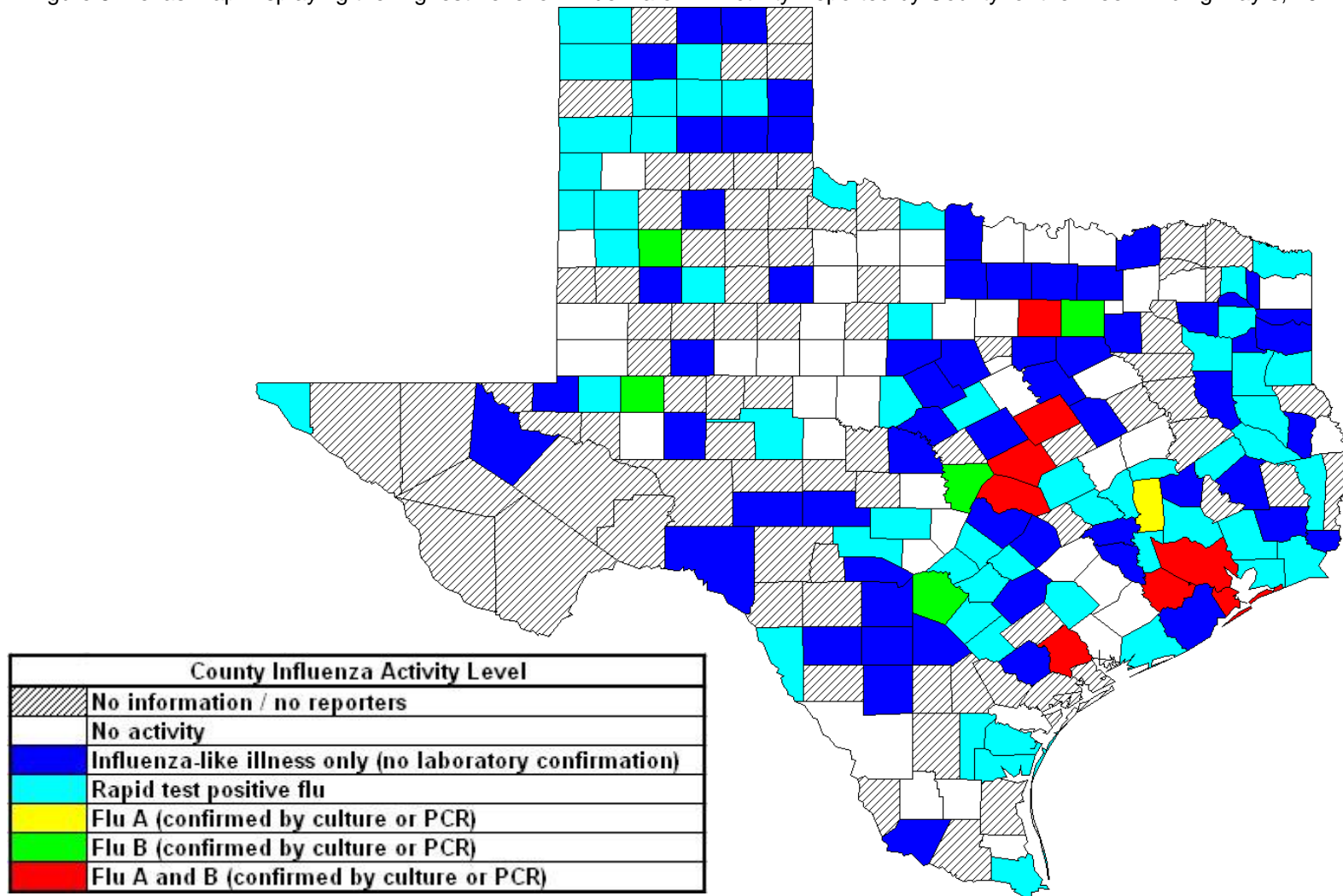
Table 11: Influenza-Associated Pediatric Deaths Reported in Texas during the 2016–2017 Season

| Month of Pediatric Death | Influenza A (H1N1) [#] | Influenza A (H3N2) | Influenza A (Not Subtyped) | Influenza B | Influenza, Not Typed / Not Differentiated | Influenza virus co-infection: A (not subtyped) and B | Total, All Influenza Types / Subtypes |
|--------------------------|---------------------------------|--------------------|----------------------------|-------------|---|--|---------------------------------------|
| 2016 | | | | | | | |
| October | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| November | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| December | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2017 | | | | | | | |
| January | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| February | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| March | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| April | 1 | 0 | 0 | 1 | 0 | 0 | 2 |
| Total | 1 | 2 | 0 | 2 | 0 | 0 | 5 |

[#]Based upon additional information, the influenza-associated pediatric mortality reported earlier in the season was determined to be a non-Texas resident and will not be counted as a Texas case.

Statewide Influenza Activity Map

Figure 5: Texas Map Displaying the Highest Level of Influenza or ILI Activity Reported by County for the Week Ending May 6, 2017 (MMWR Week 18)



Please note: The majority of influenza cases are not reportable by law in Texas. This map contains data from sentinel sites and only displays influenza and ILI cases that were reported to public health. Positive laboratory results are reported according to specimen collection date, or date received in the laboratory if the former is unknown.

Texas Influenza Surveillance Components and Measures

Activity codes (see <http://www.cdc.gov/flu/weekly/overview.htm>)

Statewide influenza activity level

A code reported weekly by states and territories to CDC indicating the geographic spread of influenza in the state. Levels are no activity, sporadic, local, regional, and widespread.

ILINet Activity Indicator

A statewide level of influenza-like illness intensity (on a scale of 1-10, with 1 being the lowest level) assigned to each state weekly by CDC based on data reported through ILINet.

Morbidity

Novel/variant influenza

Thorough investigations are performed on all cases of novel/variant influenza. *This condition is reportable by law in Texas.*

Texas ILINet

Providers voluntarily report weekly to CDC's ILINet system on the number of outpatient visits for ILI and total outpatient visits. Providers may submit up to 5 specimens per month for influenza testing. See <http://www.dshs.state.tx.us/idcu/disease/influenza/surveillance/ILINet/> for information on how to become an ILINet provider.

ILI activity

Non-ILINet providers report ILI or influenza data weekly to local or regional health departments.

Outbreaks

Healthcare, schools, childcare, and correctional facilities report ILI and influenza outbreaks to health departments in Texas. *This condition is reportable by law in Texas.*

Mortality

Pneumonia and Influenza (P&I) Mortality Surveillance

The DSHS Vital Statistics Unit collects death certificate information for all deaths on Texas residents from various partners such as funeral homes and local registrars around the state. The death certificates are then sent to the National Center for Health Statistics (NCHS) where the cause of death and underlying causes of death on the death certificates are coded with ICD-10 mortality codes. Once death certificates are coded, the information is sent back to DSHS Center for Health Statistics (CHS). CHS produces a Weekly Pneumonia and Influenza (P&I) Death Report and sends it to the State Influenza Surveillance Coordinator for inclusion in the Texas Weekly Flu Report. P&I deaths are identified based on ICD-10 multiple cause of death codes, and in particular, pneumonia and influenza mortality codes. Delays inherent in death reporting and coding practices may cause the number of reported P&I deaths to vary considerably each week.

Influenza-associated pediatric deaths

Deaths that are associated with influenza in children < 18 years of age are reported to health departments in Texas. *This condition is reportable by law in Texas.* <http://www.dshs.state.tx.us/idcu/disease/IAPM/>

Laboratory

DSHS Austin laboratory

Providers voluntarily submit specimens to the DSHS Austin laboratory for influenza PCR testing throughout the season. Providers sign up for this program through their local health departments.

Laboratory Response Network (LRN) laboratories

Providers voluntarily submit specimens to one of the 9 Texas LRNs for influenza PCR testing throughout the season. Providers sign up for this program through their local health departments.

NREVSS

Laboratories voluntarily report influenza and other respiratory virus data weekly through the CDC's online NREVSS reporting system. **Laboratories sign up for this program by contacting DSHS.** <http://www.cdc.gov/surveillance/nrevss/>

Recommended Resources

Texas Department of State Health Services

DSHS influenza page: <http://www.texasflu.org/>

Influenza surveillance data and reports: <http://www.dshs.state.tx.us/idcu/disease/influenza/surveillance/>

Map of Texas Health Service Regions: <http://www.dshs.state.tx.us/regions/state.shtm>

Centers for Disease Control and Prevention

National FluView weekly flu report: <http://www.cdc.gov/flu/weekly/>

Variant influenza viruses: <http://www.cdc.gov/flu/swineflu/variant.htm>

Avian influenza viruses: <http://www.cdc.gov/flu/avianflu/index.htm>

Swine influenza viruses: <http://www.cdc.gov/flu/swineflu/index.htm>

Infection Control in Healthcare Facilities: <http://www.cdc.gov/flu/professionals/infectioncontrol/>

Seasonal Flu Information for Schools and Childcare Providers: <http://www.cdc.gov/flu/school/index.htm>

World Health Organization

Influenza page: <http://www.who.int/topics/influenza/en/>

Disease Outbreak News: <http://www.who.int/csr/don/en/>