

Influenza Surveillance in New Mexico 2013 - 2014 Season Summary

Influenza sentinel provider surveillance was instituted by the New Mexico Department of Health (NMDOH) during the 1990-1991 season. Data are collected on outpatient visits for influenza-like illness (ILI) to track the annual influenza season; ILI is defined as temperature of $\geq 100^{\circ}$ F and cough and/or sore throat in a patient with no other explainable cause for these signs and symptoms. ILI sentinel provider surveillance is one component of New Mexico's influenza surveillance system. The other components include: rapid influenza test data collected from a state-wide network of reference and hospital clinical labs; virologic information gained from polymerase chain reaction (PCR) and/or viral culture testing performed at the state public health laboratory; influenza-related hospitalizations; and mortality data including pediatric influenza-associated deaths. Weekly data from these systems are used to assess the burden or "activity level" of influenza during the annual influenza season which ranges somewhere between early October and late May. This state activity level is reported to the Centers for Disease Control and Prevention (CDC) and included in a weekly national report of influenza's geographical spread throughout the 50 states and territories.

The 2013-14 influenza surveillance system in New Mexico included 29 sentinel provider sites, and 33 laboratories throughout the state. Five of the 29 sentinel provider sites are also represented in the Border Influenza Surveillance Network (BISN) of the Paso del Norte Region, which also includes sites in northern Chihuahua, Mexico. The provider sites reported total number of patients seen for all-cause visits and total number of patients seen *with ILI* on a weekly basis (ILI visits/all-cause visits = weekly ILI %). The hospital and reference laboratory sites reported weekly aggregate test results (e.g., rapid influenza diagnostic testing [RIDT's] and direct fluorescent antibody [DFA] testing). RIDT's are a common method of determining influenza type (e.g., influenza type A) at clinic settings and hospital-based labs in New Mexico.

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Both the clinical and laboratory data aid in the detection of seasonal influenza onset, peak and end as well as changes in activity throughout the season.

Outpatient ILI Surveillance

For the 2013-14 season, each of the 29 provider sites submitted reports for >50% of the 33-week season. New Mexico ILI sentinel provider visits peaked at 7.0% during the 2013-14 influenza season (week ending 1/4/2014) (Figure 1). In the previous influenza season (2012-13), ILI visits in New Mexico peaked one week earlier at 7.1% (week ending 12/29/12). National ILI for 2013-14 peaked one week earlier than New Mexico ILI at 4.6%, as compared to a peak of 6.1% in the previous season. During the 2013-14 influenza season, New Mexico reported "widespread" activity (defined as increased ILI in greater than half of a state's regions) for 3 weeks (weeks ending 1/4/14-1/18/14 and "regional" activity (defined as increased ILI in less than half of a state's regions) for 3 weeks (weeks ending 12/28/14, and 1/25/14 to 2/8/14).

Rapid Influenza Test Surveillance

During the 2013-14 season, the 33 sentinel labs performed 31,064 rapid influenza tests. Typing results of these tests indicated: 3701 (11.9%) were positive for influenza A, 399 (1.3%) were positive for influenza B and 17 (0.1%) were positive for influenza but unable to be typed. The percentage of positive rapid influenza tests first peaked at 21.4% in week 52 (week ending 12/28/13), one week prior the peak in New Mexico ILI (Figure 1). In the previous influenza season, percentage of positive rapid influenza tests peaked one week later at 27.8% than the peak in 2013-14 ILI.

Virologic Surveillance

The Scientific Laboratory Division (SLD) performs influenza viral isolation and/or PCR testing on specimens submitted from the outpatient sentinel and laboratory sites throughout the influenza season. From October 2013 to May 2014, SLD received 1,314 specimens. Of those specimens, 363 (27.2%) specimens were positive for influenza by PCR or viral culture (Figure 2). The first positive result, influenza A (2009 H1N1), was collected during week 49 (week ending 12/7/13); the first specimen positive for influenza A (H3 subtype) was reported during week 51 (week ending 12/21/13); and the first positive result, influenza B, was reported during week 10 (week ending 3/8/14). The number of positive PCR/culture specimens submitted to SLD peaked at 49 in week 5 (week ending 2/1/14), 8 weeks after the first PCR/culture positive. In the previous influenza season, the number of positive PCR/culture specimens peaked at 36 in week 11 (week ending 3/16/13), 20 weeks after the first PCR/culture positive. Overall during the 2013-14 season, influenza A predominated as 98.3% of positive specimens were influenza type A (25.1% were subtype H3, 71.3% were subtype 2009 pandemic H1 and 1.9% were not subtyped). Antigenic characterization on a subset of 23 influenza A/H3 and 22 A/H1N1 isolates matched strains included in the 2013-14 vaccine (A/Perth/16/2009). Among six influenza B strains isolated in New Mexico, five were identified as B-Victoria lineage and one B-Yamagata lineage. B/Massachusetts (Yamagata lineage) was a component of both the quadrivalent and trivalent vaccines. The B/Brisbane (Victoria lineage) was a component of the quadrivalent vaccine, but not the trivalent vaccine. Type A/H1 characterization was not performed.

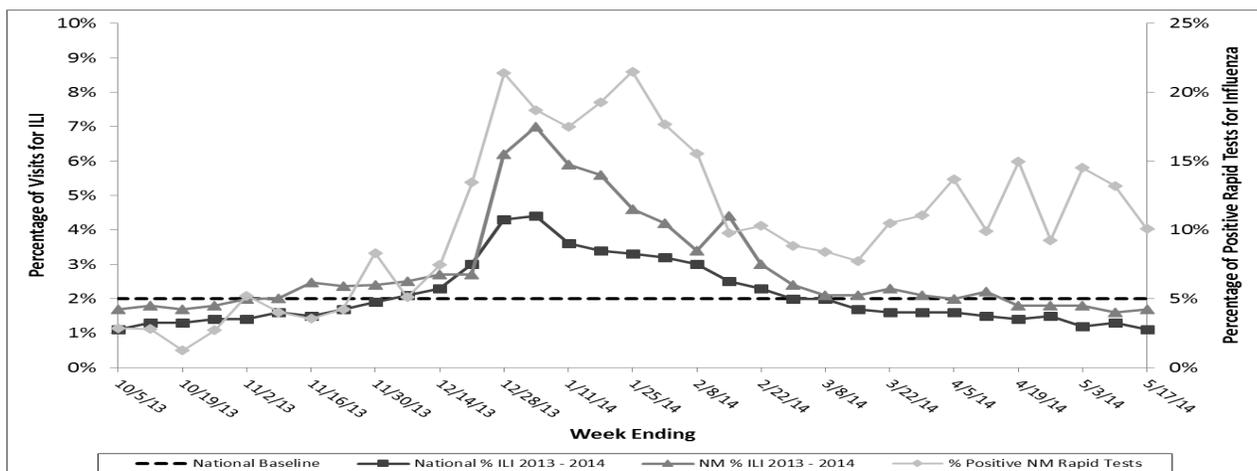
Mortality Surveillance – Pneumonia and Influenza Deaths

Surveillance for pneumonia and influenza (P&I) deaths is conducted by the NMDOH's Bureau of Vital Records and Health Statistics through death certificate reporting. P&I deaths serve as an indirect measurement of the severity of influenza during a season. There were 242 deaths in the P&I categories in the 2013-14 influenza season from September 29th through May 17th. The crude death rate for P&I was 11.6/100,000 for New Mexico residents, lower than the death rate of 13.4/100,000 observed during the previous 2012-13 season. One hundred and eighty-one (or 75%) of those deaths were observed among persons 65 years and older (Figure 3). By gender, males exceeded females (54% to 46%). There was one pediatric death that occurred during the 2013-14 season as compared to four pediatric deaths during the 2012-13 season.

Hospitalization Surveillance

The New Mexico Emerging Infections Program (EIP) conducts population-based, active surveillance for laboratory-confirmed influenza hospitalizations in seven counties that reflect the racial and ethnic make-up of the state. This work includes a medical chart review to ascertain information on course of illness, clinical management, vaccination history, and underlying risk factors for severe complications of influenza. During the 2013-14 season, the hospitalization rate for New Mexico was 36.2 per 100,000 population compared to 28.9 per 100,000 population in 2012-13 season. Hospitalization rates were highest in persons 4 years and younger (Figure 4).

Figure 1. Sentinel provider ILI visits and New Mexico laboratory influenza testing trends, New Mexico and U.S., 2013-14 influenza season



Border Influenza Surveillance Network - Paseo Del Norte Region

NMDOH collaborates with the Chihuahua State Health Services and the City of El Paso Department of Public Health to conduct outpatient ILI and laboratory surveillance at 5 sites in New Mexico and 6 sites in Northern Chihuahua. ILI double peaked at 1.2% in week 5 (week ending 2/1/14) and week 11 (week ending 3/15/14). Of 372 rapid tests performed, 70 (18.8%) were positive for influenza A and 2 (0.5%) were positive for influenza B. Of PCR/culture tests performed, 157 (26.8%) tested positive for influenza. Of those that tested positive, zero were positive for influenza type B and 157 (100%) were positive for influenza type A (9% subtype H3 and 17% subtype H1 2009 pandemic strain, 1% unable to subtype).

Conclusions

Outpatient ILI, laboratory and mortality indicators suggest that in 2013-14 New Mexico experienced less influenza activity than 2012-13. However, a higher rate of hospitalization in 2013-14 was observed than during the 2012-13 season. This information along with a

lower 2013-14 season mortality rate may indicate that persons who contracted influenza this past season experienced greater severity of disease but were more likely to recover than in 2012-13 season. Although a reference laboratory reported the first PCR/culture confirmed influenza case early in the season in September 2013, laboratory-confirmed influenza and ILI activity peaked at the end of December/early January and at lower levels than the preceding season. Rapid test activity peaked within one week of the ILI indicator. During this time the state experienced three weeks of 'widespread' ILI activity. Trends in border, state and national ILI activity identified similar onset of influenza activity, peak activity and circulating influenza strains.

Acknowledgement

This effort is not possible without the participation of many contributors including the dedicated staff of the sentinel provider and lab sites who report weekly data to the New Mexico Influenza Sentinel Surveillance Program.

Figure 3. Pneumonia and influenza deaths by age group, New Mexico, 2013-14 influenza season

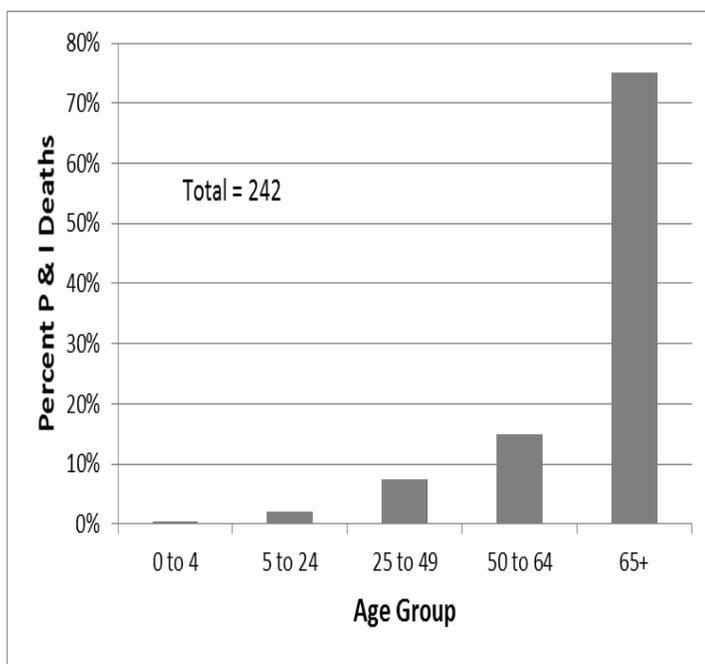
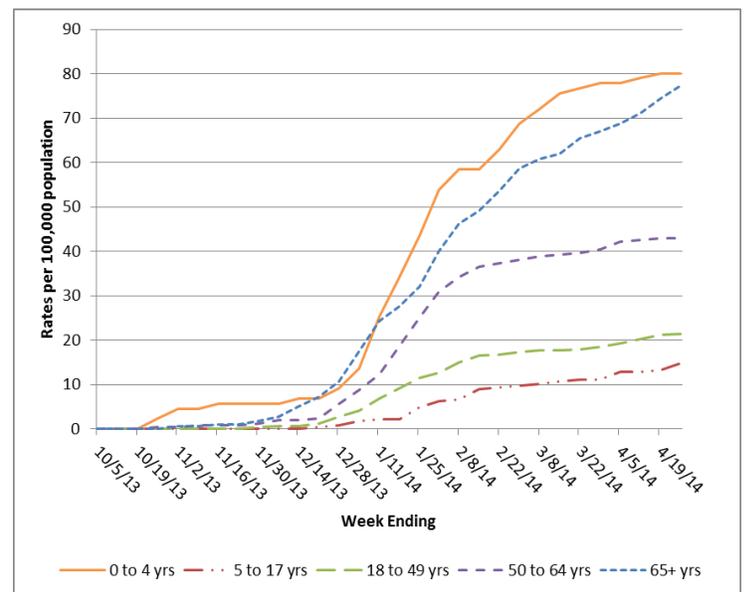


Figure 4. Laboratory-confirmed hospitalization rate over time by age group, New Mexico 2013-14 influenza season*



* rates as of August 15, 2012

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Figure 2. Scientific Laboratory Division (SLD) positive test results by type/subtype, New Mexico 2013-14 influenza season

