RI Influenza Surveillance Summary 2012–2013

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The United States experienced a severe and prolonged influenza season between October 2012 and April 2013. Influenza A (H3N2), influenza A (H1N1), and influenza B viruses co-circulated. Compared with recent influenza seasons, this season had a higher percentage of outpatient and Emergency Department (ED) visits for influenza-like illness (ILI), higher rates of hospitalizations, and more deaths.1 Rhode Island was no exception to this national trend.

The circulating strains of influenza were a good match to the vaccine strains, but vaccine effectiveness was observed to be poor. Vaccine effectiveness (adjusted for age, site, race/ethnicity, self-rated health, and days from illness onset to enrollment) against influenza A and B virus infections associated with medically attended acute respiratory illness was 56%.2 The circulating influenza A strains were sensitive to oseltamivir and zanamivir.

METHODOLOGY

The Division of Infectious Disease and Epidemiology (IDE) at the Rhode Island Department of Health (HEALTH) has a robust year round influenza surveillance system composed of six component surveillance systems. These include a sentinel provider network (Influenza-like Illness Network or ILINet), syndromic surveillance from emergency departments, laboratory surveillance, hospitalization reporting, institutional outbreak reporting of respiratory illness clusters and school absenteeism reporting. Continually collecting, monitoring and analyzing data from all of these components provides a comprehensive understanding of the spread and severity of influenza activity in Rhode Island.

Sentinel Providers
Rhode Island has a network of 20 physician practices that have agreed to be year round sentinel providers. These practices are geographically dispersed throughout the state and are representative of the state population as a whole. These sentinels submit a weekly report to the Centers for Disease Control and Prevention (CDC), which includes the total number of patients seen that week, and the total number of patients seen for influenza-like illness. Influenza-like illness is defined as a fever ≥ 100°F [37.80°C] and cough and/or sore throat, in the absence of a known cause. Sentinel providers record the total number of patient visits and number of patient visits for ILI by age group [0-4 years, 5-24 years, 25-49, 50-64 years, ≥ 65 years]. Participating sentinel physicians are also required to submit swabs to the State Health Laboratory (SHL) for testing three times during the year: at the beginning, middle, and end of the influenza season. These test results provide information on circulating strains. Sentinel data are regularly monitored by IDE in order to assess geographic spread of influenza activity by county, age distribution, and strain type.

Laboratory Surveillance
The Rhode Island State Health Laboratory analyzes specimens collected from sentinel providers using polymerase chain reaction (PCR) methods. If the specimen is positive for influenza, the SHL will “type” the strain of influenza, which would detect any novel influenza strains in the process. In addition, the SHL supports confirmation of outbreak specimens for institutional outbreak scenarios. Unsubtypeable specimens from hospital laboratories are also typed by the SHL or sent on to CDC for typing. Laboratory testing provides critical information for national surveillance efforts on whether the circulating strain is a match with the vaccine strains, and also to determine sensitivity to antiviral agents.

Syndromic Surveillance
Eight acute care hospital emergency departments throughout Rhode Island report chief complaint data through a web-based system called Realtime Outbreak Detection Surveillance System (RODS). The chief complaints are classified into syndromes from a list of symptoms. The syndromes are respiratory, constitutional, gastrointestinal, hemorrhagic and neurologic. The system also captures “all visits” or denominator data. The system updates every four hours and is able to generate alerts based on statistically significant deviations from a threshold norm calculated from historical data. Constitutional symptoms most closely resemble those of influenza (fever, myalgia, or chief complaint of flu). Syndrome trends are also analyzed by child vs. adult distribution, hospital and zip code. The RODS system is continually monitored by IDE for constitutional syndrome in order to assess the number of people who are seeking care at emergency departments for ILI.

Hospital Reporting
The eleven major acute care hospitals in Rhode Island submit hospitalization data to IDE on an ongoing basis. The data are typically submitted weekly, but in severe influenza seasons, the data are submitted daily. Data include demographic information on each individual hospitalized with laboratory-confirmed influenza. These data are critical to
determining severity of circulating influenza and inform hospital capacity decisions as part of statewide planning.

**Respiratory Outbreaks in Institutions**

All respiratory outbreaks, defined as one confirmed case of influenza or two cases of influenza-like illness, must be reported to IDE. The Division of Infectious Disease and Epidemiology conducts daily monitoring with the facility, assesses attack rates among the residents as well as the staff, and reviews infection control procedures and antiviral prophylaxis recommendations to prevent the outbreak from spreading. In addition, IDE coordinates specimen submission to the SHL to confirm the outbreak and determine which strain of influenza is causing illness.

**School Absenteeism**

Increases above normal trends in school absenteeism can serve as an indicator of influenza activity within a school. In an effort to detect outbreaks, IDE monitors school absenteeism data reported through the Rhode Island Department of Education (RIDE). If higher than expected baseline school absenteeism rates are detected for three consecutive days, IDE contacts the school nurse teacher, inquires about the reason for the increased absenteeism, and reviews infection control measures should influenza-like illness be the reason for the increased absenteeism.

**RESULTS**

**Sentinel Providers**

During the 2012-2013 influenza season, data from sentinel providers indicated that ILI began to increase during MMWR week 47 (week ending 11/24/2012; ILI=0.31), and spread very rapidly. Influenza was declared widespread throughout the state during week 49 (week ending 12/8/2012; ILI = 1.21%), and peaked at 4.05% in MMWR week 52 (week ending 12/26/2012). The percent ILI continued to decrease for the next six weeks until ILI was 0.91% in week 6 (week ending 2/9/2013), below the north east regional baseline of 1.0%. [Figure 1]

**Laboratory Surveillance**

During this time, the SHL tested 483 specimens for influenza. Of the 319 confirmed influenza specimens tested, 200 (90%) were Influenza A [H3 N2], 5 (2%) were 2009 influenza A H1N1, and 26 (8%) were influenza B. [Figure 2]

**Syndromic Surveillance**

Data from the syndromic surveillance system mimicked the trend seen by the sentinel providers. Chief complaint data for constitutional syndrome began to increase during week 47 with a value of 5.9%. It continued to increase until it peaked at 9.7% in week 52, and then proceeded to decrease steadily back down to 5.8% in week seven. [Figure 3]
Hospital Reporting
There were 831 hospitalizations during the 2012–2013 influenza season in Rhode Island. Among these, 792 (95.3%) were influenza A; 29 (3.5%) were influenza B; and 10 (1.2%) were 2009 novel influenza A strain H1N1.

More than half (484; 58.2%) of the 831 individuals who were hospitalized were aged 65 or older. The distribution of these hospitalizations among other age groups was as follows: 50 - 64, n = 150 (18.1%); 25 - 49, n = 114 (13.7%); 5 - 24, n = 56 (6.7%); and 0 - 4, n = 27 (3.3%).

Respiratory Outbreaks in Institutions
There were a total of 69 respiratory outbreaks during the 2012–2013 influenza season, 94% of which were in long-term care facilities. The remaining outbreaks were in schools and adult day care centers. The attack rate among residents ranged from 0 to 44%, and the attack rate among staff ranged from 0 to 95%. The Rhode Island Department of Health declared each outbreak over when there were no new cases for ten consecutive days after the illness onset date of the last case.

School Absenteeism
On average, 60% of schools reported their absenteeism data each week. Reporting improved as time went on with 53% of schools reporting during the beginning of influenza season [September-November 2012] and nearly 70% [mean of 65%] reporting for January to April 2013. The highest increase in absenteeism was observed during Thanksgiving week and Christmas week, suggesting that absenteeism was more likely a result of the holidays than influenza-like illness. Increased absenteeism rates for three consecutive days were observed for schools 21 times during the 2012–2013 influenza season. Phone calls to school nurse teachers at these times indicated that outbreaks of influenza-like illness were not the likely cause of absenteeism.

DISCUSSION
The 2012–2013 influenza season hit earlier than in previous years, with the Rhode Island Department of Health declaring influenza to be widespread throughout the state on December 5, 2012. This declaration was made based on the CDC’s definition of widespread, which means there is increased influenza-like illness or confirmed outbreaks in at least half of the state’s regions1 in Rhode Island a region is a county).

The predominant strain of influenza during the 2012–2013 season was influenza A, H3N2. This strain of influenza is known for increased severity, which was reflected in the high rate of ED visits, hospitalizations and deaths. Currently only pediatric influenza deaths are reportable in Rhode Island, so IDE cannot quantify the number of influenza-related deaths among adults during the 2012–2013 season. There were no pediatric deaths this past season, and there have not been any pediatric influenza deaths since the pandemic in 2009–2010.

The Rhode Island Department of Health’s multi-faceted influenza surveillance system allows IDE to have a complete understanding of the spread and severity of influenza throughout the state. Should there be a gap in one aspect of the surveillance system, the remaining components provide sufficient data to monitor influenza trends and inform policy decisions.

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References

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