Southern Nevada Health District

Pediatric Early Warning Sentinel Surveillance (PEWSS) System Overview and Methodology

The Pediatric Early Warning Sentinel Surveillance (PEWSS) is a year-round surveillance system developed by the Southern Nevada Health District (SNHD) to identify the respiratory pathogens circulating in the community. Each week, several sentinel healthcare providers submit nasal swabs to the Southern Nevada Public Health Laboratory for testing. The specimens are collected from children who present with a fever >100°F accompanied by a cough and/or sore throat. The use of molecular methodologies has allowed us to accurately identify numerous pathogens in submitted specimens, and to rapidly summarize and distribute these results to the medical and general community every week throughout the year.

PEWSS evolved out of community-based 2009 H1N1 influenza surveillance conducted in response to the discovery of the virus in 2009. In June 2010, PEWSS began testing for the following respiratory viruses:
- Adenovirus
- Human metapneumovirus
- Human parainfluenza virus 1
- Human parainfluenza virus 2
- Human parainfluenza virus 3
- Influenza A (H1, 2009 H1N1, and H3)
- Influenza B
- Respiratory syncytial virus

In December 2013, PEWSS was expanded to include the following respiratory viruses and bacteria:
- Coronavirus HKU1
- Coronavirus NL63
- Coronavirus 229E
- Coronavirus OC43
- Human parainfluenza virus 4
- Rhinovirus/Enterovirus
- *Bordetella pertussis*
- *Chlamydophila pneumoniae*
- *Mycoplasma pneumoniae*

METHODOLOGY

Table 1

Last week

Organisms are displayed as either "Detected" (one or more positives), or "—" (zero positives) within the past week.

Four-week levels

Organisms that have a history of being commonly detected are categorized by their level of detection. The positive count from the most recent week is compared to the distribution of the number of positives in all weeks in the previous three years, where the pathogen has been detected. If the current week is in:

- The lowest 50% of that distribution, it is displayed at "Low" levels.
- The 50%-75% range of that distribution, it is displayed at "Moderate" levels.
- The top 25% of that distribution, it is displayed at "High" levels.

A weighted four-week average is also used to determine the levels of circulation of the organisms. The weighted average places a greater weight (1.5) on the most recent week and a lower weight (0.5) on the first week, with the two middle weeks remaining unweighted (*i.e.* weighted at 1). The four-week level of pathogens are displayed as "Sporadic" if they were identified in two or fewer of the past four weeks, unless they were identified in two consecutive weeks of the previous three weeks.

Trend

The four-week trend is determined only for pathogens with sufficient historical data to calculate the level of circulation for the past week or past four weeks. The slope of the line through the current four weeks is calculated, then categorized using the standard deviation of the four-week slopes identified over the previous three years.

Slopes that are:

- Within one standard deviation of the mean were categorized as being level (displayed as →).
- Greater than one standard deviation but less than two standard deviations above the mean are categorized as increasing (displayed as ↗).
- Less than one standard deviation but more than two standard deviations below the mean are categorized as decreasing (↘).
- Two or more standard deviations above the mean are categorized as highly increasing (displayed as ↑).
- Two or more standard deviations below the mean are categorized as highly decreasing (displayed as ↓).

For questions about the PEWSS program, please contact the Office of Epidemiology at (702) 759-1300.