Background. Influenza infection in children can be severe, resulting in complications such as pneumonia, but may be mitigated by early recognition and administration of antivirals. In this study, we identified risk factors for hospitalization and pneumonia in a pediatric population presenting with influenza-like illness (ILI) in Thailand.

Methods. Our study included pediatric patients (age < 18 years) presenting with ILI to inpatient and outpatient departments at a public hospital in Bangkok, Thailand, from 2009 to 2016. ILI was defined as fever plus cough or sore-throat, and pneumonia was defined as either lung radiographic or pulmonary examination abnormalities. Demographic and clinical data, as well as nasal and throat swabs, were collected during a one-time interview with patients presenting with ILI. Influenza infections were confirmed via RT-PCR testing of respiratory specimens. Retrospective chart review was used to collect data on individuals with pneumonia admitted for inpatient care.

Results. 5,968 children (33.6%) were enrolled with ILI, of whom 1,530 (25.6%) were confirmed to be influenza by RT-PCR, of which 25.5% were influenza A(H1N1) pdm09, 31.5% influenza A(H3N2), and 43.0% influenza B. 124 (8.1%) patients were admitted, and 41 of these children (33.1%) developed pneumonia. Predictors of hospitalization included earlier age group (1.41 yrs for infants vs. 5.6 yrs) and higher presenting temperature (38.6°C for infant vs. 38.0°C) (both P < 0.05). Among children hospitalized with influenza, influenza subtype was not associated with pneumonia risk. Co-detection of Klebsiella pneumoniae was associated with an increased risk of pneumonia (P < 0.05). Patients with pneumonia were younger (4.1 yrs vs. 6.4 yrs, P = NS), had a longer interval from fever onset to presentation at the hospital, and required longer hospital stays. Risk of pneumonia was decreased in patients who received oseltamivir within 48 hours of fever onset (odds ratio 0.36, 95% confidence interval 0.16–0.91).

Conclusion. Post viral pneumonia is a potentially serious complication of influenza, requiring longer hospital stay and hospitalization for pediatric patients with influenza. The risk of pneumonia can be reduced with early presentation for clinical care and prompt administration of oseltamivir following fever onset.

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715. Increase in Reported Respiratory Syncytial Virus Cases Among Adults in the Minneapolis-St. Paul Metropolitan Area, 2014–2018
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Background. Respiratory syncytial virus (RSV) is a common cause of respiratory infection, typically causing severe disease in young children. We were interested in evaluating trends of RSV infections in adults.

Methods. The Minnesota Department of Health conducts active surveillance for laboratory-confirmed RSV in hospitalized patients in the Minneapolis-St. Paul metropolitan area as part of the CDC Emerging Infections Program. Adults (≥18 years) cases identified during the RSV season (10/1–4/30) from 2014 through 2018 were analyzed and surveys of catchment-area hospital laboratories were conducted regarding respiratory virus panel (RVP) testing.

Results. Twenty-three catchment area hospitals serve adults. Four hospitals offered RVP during 2014–2015 and 2015–2016; eight offered RVP during the 2016–2017 and 2017–2018 seasons. Three hundred and fifty-five cases were identified. Three hundred and nine (87%) were reported from four hospitals where RVP was offered throughout the study period. Case increases were observed at three hospitals of these hospitals offered RVP throughout the surveillance period; increases were not observed at hospitals where RVP was added for the 2016–2017 and 2017–2018 seasons. Cases increased from 42 in 2014–2015 to 198 in 2017–2018 (P = 0.01), the proportion of cases reported by year was 12%, 15%, 17% and 26% during consecutive seasons. Cases by age group over time generally did not differ; however, cases 285 years increased from 7% of total cases in 2014–2015 to 19% in 2017–2018 (P = 6.14, P = 0.01). Overall, 23% of cases were admitted to the ICU and 7% died during hospitalization. The proportion of ICU admissions and deaths did not change over time.

Conclusion. We found an increase in adult RSV hospitalizations from 2014 to 2018, especially among the oldest age group. This increase was observed only at hospitals where RVP testing was offered throughout the surveillance period. It is unclear if this represents a true increase in RSV or a change in testing practices. However, it does illustrate that RSV should be considered as a cause of severe respiratory illness (SARI) in adults, particularly among the elderly. A more systematic approach in identifying the causes of SARI in adults would be informative, particularly as RSV vaccines and antivirals approach licensure.

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716. Molecular Epidemiology of Respiratory Syncytial Virus in Children and Adults in Seattle, WA
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Background. Respiratory syncytial virus (RSV) is the most important cause of pneumonia in children <5 years worldwide and may cause severe disease in elderly and high-risk adults. Multiple RSV strains co-circulate and evolve over seasons. We seek to describe the evolution of RSV over five seasons in Seattle, WA, USA with two seasons reported here.

Methods. From 2014 to 2016, subjects 6 months and older seeking outpatient care for acute respiratory illness at Kaiser Permanente Washington were enrolled in the Influenza Vaccine Efficacy Network (Flu VE Network) and a respiratory swab was collected. Real-time polymerase chain reaction (RT-PCR) was performed to test and quantify RSV and subtype positive samples. A subset of RSV samples with cycle threshold (CT) value <30 will be sequenced using a metagenomic next-generation sequencing (NGS) approach. Specific RSV genotypes will be associated with severe disease, defined as requiring emergency department care or hospitalization, or chest radiographic findings.

Results. A total of 8,730 patients were enrolled in the Flu VE Network and PCR testing of seasons 2014/2015 and 2015/2016 resulted in 562 of 4,137 (13.6%) RSV-positive specimens. Of patients with RSV-positive specimens, 204 (36.5%) were adults 18–64 years and 112 (20.0%) were 65+ years. RSV-B predominated in the 2014/2015 season (n = 298; 83.7%), whereas RSV-A was more common in the 2015/2016 season (n = 154; 79.8%) (Figure 1). The median (IQR) CT value for RSV-A specimens was 26.7 (23.3–29.9) compared with 27.9 (25.2–31.3) for RSV-B.

Conclusion. One RSV subtype predominated within each season. Similar RSV subtype distributions were seen across age categories. With multiple RSV vaccine candidates in development, understanding the genetic diversity and circulation of RSV various viruses within a population is important for analyzing the effects of a vaccine on the evolution of RSV.

Figure 1. Total counts (A) and proportions (B) of RSV-A and RSV-B specimens collected from state patients, WA during 2014/2015 and 2015/2016 seasons, by age category.

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