2315. The Relationship of Pre-Hospital Functional Status and Clinical Outcomes in Patients with Laboratory-Confirmed RSV Infection: Active Population-Based Surveillance, 2017–2019
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Background. Respiratory syncytial virus (RSV) infection is a common cause of acute respiratory infection (ARI) in adults. Prospective surveillance enables collection of representative data on demographic and clinical characteristics. Few data of this kind are available for adults hospitalized with RSV infection. We used active population-based surveillance to identify patients with laboratory-confirmed RSV infection and evaluated demographic characteristics and clinical outcomes.
Methods. Hospitalized adults ≥18 years old residing in a predefined catchment area with ≥2 ARI symptoms or exacerbation of underlying cardiopulmonary disease were screened for eligibility during October 2017–April 2018 and October 2018–April 2019 in 3 hospitals in Rochester, NY and New York City. Respiratory specimens were tested for RSV using PCR assays. Clinical and demographic data were abstracted from the medical record. Multivariate analysis was used to evaluate the relationship of patient characteristics with clinical outcomes.
Results. 8,217 hospitalized adults were screened and 9.4% positive for RSV infection. Preliminary clinical and demographic data were available for 348 patients including 14% 18–49 years, 28% 50–64 years and 58% > 65 years. Mean age was 68 years and 60% were female (Figure 1). Patient age had a mean of 3 co-morbidities, with diabetes (40%), chronic obstructive pulmonary disease (30%), chronic kidney disease (28%), congestive heart failure (28%), coronary artery disease (25%) and asthma (24%) the most common co-morbidities (Figure 2). Median hospital length of stay was 6 days (IQR 4–10), 13% of patients were admitted to the ICU; 5% were mechanically ventilated and 5% died during admission and 12% within 6 months. In multivariate analysis having >3 comorbidities, cardiac disease or a lower baseline functional status measured by activities of daily living scores was significantly associated with 6-month mortality.
Conclusion. The majority of hospitalized patients with RSV infection were older adults with ≥3 chronic comorbid conditions. Baseline functional status may be predictive of worse clinical outcomes in patients with RSV infection. These insights into patient characteristics and clinical outcomes will provide information for prevention programs.

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2316. RSV Mortality: 19 Years’ Experience in a Pediatric Hospital in Argentina
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Background. Respiratory syncytial virus (RSV) is the leading cause of acute lower respiratory infection (ALRI) in children. We aimed to describe the clinical-epidemiological pattern and risk factors for mortality associated with RSV infection.
Methods. Prospective, cross-sectional study of ALRI in children admitted to a Children’s Hospital among 2000–2018. Viral diagnosis was made by fluorescent antibody techniques or real-time PCR. We compared clinical-epidemiological characteristics of RSV infection in nonfatal vs. fatal cases. Multiple logistic regression was used to identify independent predictors of mortality.
Results. From a total 16,018 patients with ALRI, 13,545(84.6%) were tested for respiratory viruses, 6047 (45%) were positive: RSV 81.1% (4,907), influenza 7.5% (456), parainfluenza 6.9% (419) and adenovirus 4.4% (265). RSV had a seasonal epidemic pattern coinciding with months of lowest average temperature. RSV mortality rate: 1.7% (83/4,853). Fatal cases had a higher proportion of: prematurity (P < 0.01), perinatal respiratory history (P < 0.01), malnourishment (P < 0.01), congenital heart disease (P < 0.01), chronic neurological disease (P < 0.01) and pneumonia as clinical presentation (<0.01). No significant difference between gender was observed. The annual mortality rate distribution was not stable over the study period with the highest mortality in the year 2000. Most deaths occurred among children who had complications: respiratory distress (80.7%), sepsis (31.3%) and atelectasis (13.2%). Independent predictors of RSV mortality were: moderate to severe malnourishment OR 3.64 (95% CI 1.96–6.74) P < 0.01, chronic neurological disease OR 3.99 (95% CI 2.04–7.79) P < 0.01, congenital heart disease OR 4.10 (95% CI 3.6–7.15) P < 0.01. Children under months OR 1.96 (95% CI 1.23–3.11) < 0.01.
Conclusion. RSV showed an epidemic seasonal pattern. Malnourishment, chronic neurological disease, congenital heart disease, age under 6 months and pneumonia were the independent risk factors for RSV mortality.

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2317. Excess Influenza-Attributable Mortality in Los Angeles County (LAC) for the 2013–2014 Through 2017–2018 Seasons
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Background. Deaths caused by seasonal influenza are impossible to measure directly and are typically estimated using statistical models. We applied a previously developed model to Los Angeles County (LAC) data for the 2013–2014 through 2017–2018 influenza seasons.
Methods. Excess deaths attributable to influenza were estimated using a negative binomial regression model incorporating laboratory surveillance data and weekly counts of deaths with an underlying respiratory or circulatory cause of death. We obtained death data from the National Vital Statistics System. Population estimates for LAC were prepared by Hedderman Demographic Services for LAC Internal Services Department. The weekly total number of respiratory specimens tested and number positive for influenza or respiratory syncytial virus were provided by nine health-care systems in LAC. Influenza-associated deaths in all ages are reportable to LAC Department of Public Health; confirmed reports are counted as observed deaths.
Results. The midyear LAC population increased from 10,019,362 in 2013 to 10,277,648 in 2017. The median number of observed influenza deaths reported to public health was 81 in 2015–2016 (minimum [min]: 56 in 2015–2016, maximum [max]: 288 in 2017–2018). The median number of seasonal deaths with an underlying respiratory or circulatory cause was 27,455 (min: 25,828, max: 28,732). The median estimate of influenza-attributable deaths was 1,478 (95% confidence interval [CI]: 823–2,613) in 2015–2016, with a min of 1,045 deaths (CI: 629–2,258) in 2013–2014 and a max of 1,905 (CI: 1,075–3,269) in 2017–2018.
Conclusion. Although influenza-associated deaths at all ages are reportable in LAC, a variety of barriers to reporting exist. Our estimates indicate that influenza-associated deaths in LAC are underreported. The more comprehensive modeled estimate of the burden of influenza can better inform local policy and planning decisions.
Table 1. Estimated and Observed Influenza-Attributable Deaths in Los Angeles County (LAC) for the 2013–14 through 2017–18 influenza seasons.

| Season       | Model estimate (95% CI) | Reported to LACDPH† | Underlying respiratory or circulatory COD | Population ** |
|--------------|-------------------------|----------------------|----------------------------------------|--------------|
| 2013–14      | 1.045                   | (629–2.258)          | 112                                    | 25,828       | 10,019,362 |
| 2014–15      | 1.502                   | (929–2.154)          | 56                                     | 26,716       | 10,069,036 |
| 2015–16      | 1.478                   | (823–2.613)          | 81                                     | 28,080       | 10,192,376 |
| 2016–17      | 1.392                   | (823–2.613)          | 80                                     | 27,455       | 10,227,450 |
| 2017–18      | 1.905                   | (1.075–3.249)        | 288                                    | 28,732       | 10,272,648 |

† Excludes deaths in residents of the cities of Long Beach and Pasadena.
** The estimated LAC population includes all non-institutional residents of the urbanized area of Los Angeles County.

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2318. Prevalence of Influenza-like Illness in Sheltered Homeless Populations: A Cross-Sectional Study in Seattle, WA

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Background. Individuals experiencing homelessness are at an increased risk of respiratory illness due to high prevalence of underlying chronic conditions, inadequate ventilation and crowding in shelters, and difficulty accessing health services. Few studies have investigated the prevalence and transmission of viral respiratory infections within shelters. We sought to determine the prevalence and risk factors for influenza-like illness (ILI) at two homeless shelters in Seattle, WA.

Methods. Between January and April 2019, we conducted a cross-sectional study of adults experiencing homelessness who identified their primary residence as one of the two shelters in Seattle. Participants voluntarily enrolled if they self-reported at least two symptoms of acute respiratory illness in the past week. Demographic, clinical, and behavioral data were ascertained via questionnaire, and a mid-nasal swab was collected. ILI was defined as fever with cough or sore throat. Chronic lung disease was defined as chronic obstructive pulmonary disease, asthma, and/or chronic bronchitis.

Results. Among the 480 participants enrolled in the study, 204 (42.5%) reported ILI symptoms. Of those enrolled, 144 (30.0%) had chronic lung disease. The prevalence of ILI was higher among individuals with chronic lung disease (53.5% vs. 42.5%, P = 0.002). Of those with ILI that sought care, 46 (54.8%, P = 0.001). A total of 422 (87.9%) had health insurance; the prevalence of ILI was lower of ILI was higher among individuals with chronic lung disease (53.5% vs. 42.5%, P = 0.001). A total of 422 (87.9%) had health insurance; the prevalence of ILI was lower among those with health insurance (42.4% vs. 57.8%, P = 0.66). 216 (45.0%) of participants received flu vaccine; the prevalence of ILI was lower among those who received the vaccine than those that did not (42.6% vs. 42.4%, P = 1.00). 129 (30.6%) of those with health insurance sought care for their reported symptoms; ILI was more prevalent in those that sought care than those that did not throughout the observation period (33.8% vs. 21.7%, P = 0.002). Of those with ILI that sought care, 46 (54.8%, P = 0.42) received antivirals or antibiotics. Laboratory results for the corresponding mid-nasal swabs are pending.

Conclusion. A large proportion of our study population self-reported ILI and chronic lung disease. Despite high insurance coverage, a low proportion of homeless enrolled sought care for their symptoms or received treatment.

2319. Clinical Predictors of Influenza and Hospitalization of Children with Influenza in an Emergent Care Setting

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Background. Objective measures utilizing early vital sign data show promise in predicting more severe outcomes among adults with influenza, but data are sparse in children. The objectives of this study were to determine the value of vital signs in predicting influenza infection or hospitalization due to influenza infection among children evaluated in an emergency department (ED) or urgent care (UC) setting in Colorado.

Methods. We evaluated vital signs obtained from a prospective cohort study of children aged 6 months to 8 years of age with influenza like illness evaluated at an ED/UC site in Aurora, CO from 2016–2018, and who underwent influenza testing by PCR. We collected the first set of vital signs, peak heart rate and temperature, and converted heart rate (HR) and respiratory rate (RR) to z-scores by age. HR z-scores were further adjusted for temperature. Bivariable analyses for each vital sign as a predictor of influenza-related hospitalization and influenza infection as main outcomes were conducted. Predictors with P < 0.2 were entered into a multivariable logistic regression model to determine odds ratios (OR) and 95% CI; model performance was assessed using the Brier score and discriminative ability with the C statistic.

Results. Among 1478 children, 41 were positive for influenza, of which 28 were hospitalized. In multivariable analyses, among children with influenza infection, lower initial oxygen saturation (OR 0.87, 95% CI 0.78–0.98, P = 0.026) and higher adjusted respiratory rate (OR 2.09, 95% CI 1.23–3.61, P = 0.0083) were significant predictors of hospitalization. Among children with ILI, higher peak temperature (OR 2.09, 95% CI 1.23–3.61, P = 0.0083) were significant predictors of hospitalization.

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