Previous incidence estimates, derived primarily from modeling studies, have ranged from 84 to 190/100K population in adults >65 years of age. Accurate burden data are critical to inform RSV vaccine development for adults. We used active surveillance among hospitalized adults to determine population-based incidence rates of RSV infection.

Methods. Hospitalized adults ≥ 18 years old residing in the surveillance area with >2 ARI symptoms or exacerbation of underlying cardiopulmonary disease were screened for eligibility during October 2017–April 2018 and October 2018 to April 2019 in 3 hospitals in Rochester, NY and New York City. Respiratory specimens were tested for RSV using PCR assays. RSV incidence per 100,000 persons (per 2010 US Census data) was adjusted by percent market share for study hospitals in their catchment area.

Results. In total, 8,217 hospitalized adults residing in the surveillance area that met the surveillance case definition were tested for RSV; 768 (9.4%) were positive. Adults were aged 18–49 (12%), 50–64 (30%), and ≥65 years old (58%); 55% were female. RSV infection incidence varied from year 1 to year 2 and was highest in patients aged ≥65 years old (table).

Conclusion. This is the largest prospective RSV incidence study to date. Preliminary results indicate that the incidence of RSV infection may be higher than previously reported, especially in urban-dwelling adults >65 years of age. Results confirm the need for vaccines to prevent RSV infections in older adults.

	October 2017 – April 2018			October 2018 – April 2019		
Age Groups	Rochester, NY Hospital A	Rochester, NY Hospital B	New York City	Rochester, NY Hospital A	Rochester, NY Hospital B	New York City
18-49 years	11.0	9.5	10.3	7.8	12.3	9.1
50-64 years	52.2	44.1	50.2	41.0	61.7	67.0
≥65 years	173.5	123.4	213.8	120.1	155.9	254.6
All Adults	53.2	43.4	50.0	38.5	57.5	59.2

Disclosures. **All Authors:** No reported Disclosures.

93. Trends in the Laboratory Detection of Rotavirus Before and After Implementation of Routine Rotavirus Vaccination: the United States, 2000–2018

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Session: 34. Viral Infections - Host, Pathogen, and Impact of Intervention
Thursday, October 3, 2019: 10:42 AM

Background. Before the introduction of rotavirus vaccine in the United States in 2006, rotavirus infection was the leading cause of severe gastroenteritis among US children.

Methods. To evaluate the long-term impact of rotavirus vaccination on disease burden in the United States, CDC analyzed national laboratory testing data for rotavirus from laboratories participating in CDC's National Respiratory and Enteric Viruses Surveillance System (NREVSS) during the pre- (2000–2006) and post-vaccine (2007–2018) periods.

Results. Nationally, the median annual percentage of positive rotavirus tests declined from 25.6% (range: 25.2–29.4%) in the pre-vaccine era to 6.1% (range: 2.6–11.1%) in the post-vaccine period. When comparing the pre- and post-vaccine era, the annual peak in rotavirus positivity declined from a median of 43.1% (range: 43.8–56.3%) to a median 14.0% (range: 4.8–27.3%) while the season duration was reduced from a median of 26 weeks (range: 23–27 weeks) to 9 weeks (range: 0–18 weeks). In the post-vaccine period, a biennial pattern emerged with alternating years of low and high rotavirus activity.

Conclusion. The implementation of rotavirus vaccine has dramatically reduced the disease burden and altered seasonal patterns of rotavirus in the United States; these changes have been sustained over 11 post-vaccine introduction seasons.

Disclosures. **All Authors:** No reported Disclosures.

94. Pneumonia Severity Scores Poorly Predict Severe Outcomes Among Adults Hospitalized with Influenza

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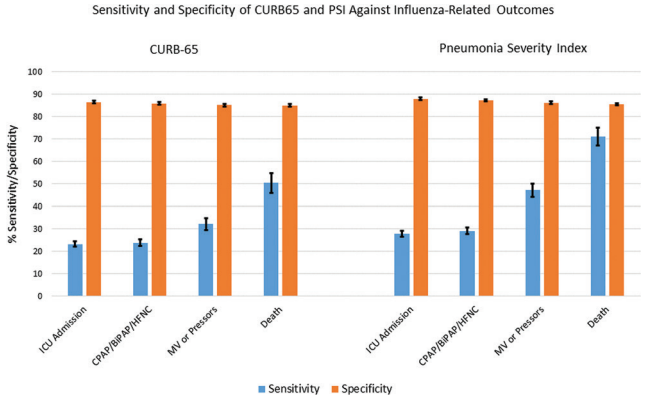
Session: 34. Viral Infections - Host, Pathogen, and Impact of Intervention
Thursday, October 3, 2019: 10:55 AM

Background. Influenza can lead to severe outcomes among adults hospitalized with influenza, and causes substantial annual morbidity and mortality. We evaluated the performance of validated pneumonia severity indices in predicting severe influenza-associated outcomes.

Methods. We conducted a multicenter study within CDC's Influenza Hospitalization Surveillance Network (FluSurv-NET) which included adults (≥ 18 years) hospitalized with laboratory-confirmed influenza during the 2017–18 influenza season. Medical charts were abstracted to obtain data on vital signs and laboratory values at admission on a stratified random sample of cases at a subset of hospitals at 11 network sites. Estimates were weighted to reflect the probability of selection. Cases were assigned to low- and high-risk groups based on the CURB-65 ('Confusion, Urea, Respiratory rate, Blood pressure, Age ≥65') index (high-risk cutoff = score ≥ 3), and the Pneumonia Severity Index (PSI) (high-risk cutoff = category V). We calculated area under receiver operating characteristic curves (AUROC), sensitivity, and specificity to estimate the performance of each index in predicting severe outcome categories: (1) intensive care unit (ICU) admission, 2) noninvasive mechanical ventilation (NIMV), (3) mechanical ventilation (MV), vasopressors, extracorporeal membrane oxygenation (ECMO) and (4) death.

Results. Among 27,523 adults hospitalized with influenza, 8665 (31%) were sampled for inclusion in this analysis; median age was 70 years and 92% had ≥ 1 chronic condition. A total of 1,366 (16%) were classified as high-risk by CURB-65 and 1,249 (14%) by PSI. Both indices had low discrimination for severe outcomes; the AUROC for CURB-65 ranged from 0.55 for ICU admission to 0.65 for death, and for PSI ranged from 0.58 for ICU admission to 0.73 for death. Risk status by CURB-65 was less sensitive than PSI in predicting MV, vasopressor, or ECMO usage as well as death (figure). The specificity of CURB-65 and PSI was similar against all outcomes (figure).

Conclusion. The CURB-65 and PSI indices performed poorly in predicting severe outcomes other than death; PSI had the best discrimination overall. Alternative approaches are needed to predict severe influenza-related outcomes and optimize clinical care.



Disclosures. **All Authors:** No reported Disclosures.

95. Impact of Influenza-Like Illnesses on Academic and Work Performance on a College Campus

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Session: 34. Viral Infections - Host, Pathogen, and Impact of Intervention
Thursday, October 3, 2019: 11:07 AM

Background. Influenza-like illnesses are estimated to cause 500,000 hospitalizations and 50,000 deaths each year in the United States. The high-contact environment of a college campus makes students, faculty, and staff especially prone to respiratory illness, but the impact of these illnesses on academic and work performance is not well understood.

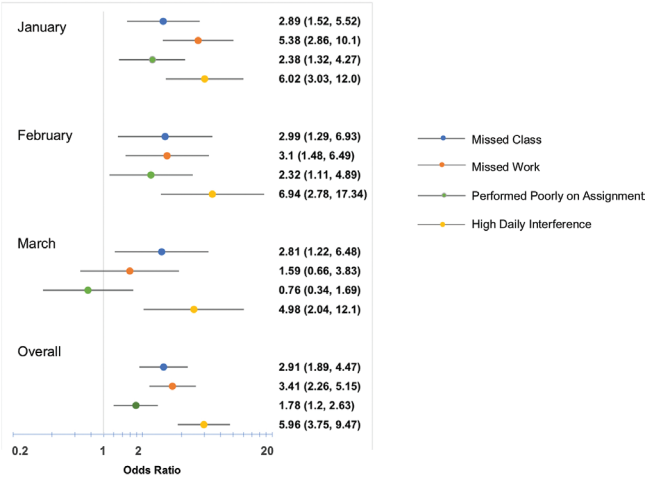
Methods. Between January 14 and April 3, 2019, the Seattle Flu Study enrolled participants with respiratory symptoms throughout the Seattle metropolitan area, including the University of Washington's main campus. Individuals with at least two self-reported respiratory symptoms in the previous 7 days were eligible to enroll. Participants completed a questionnaire with questions about their medical history, current illness episode, and other behavioral characteristics; a corresponding mid-nasal swab was also collected. Influenza-like illness (ILI) was defined as self-reported fever with a cough and/or sore throat. Laboratory results are pending. Logistic regression was used to assess the association between ILI and work and academic outcomes, including missing class, missing work, performing poorly on an assignment or examination, and experiencing high interference on daily life.

Results. A total of 497 participants enrolled at the University of Washington. Participants had a median age of 22, and 61% were female. Of those with self-reported ILI, 27% reported smoking, 22% had traveled out of state, and 14% had traveled internationally in the month before enrollment. These characteristics did not differ between

those with ILI and those with non-ILI. Having symptoms of ILI was associated with reports of missing work (OR 2.9; 95% CI: 1.9, 4.5), missing class (OR 3.4; 95% CI: 2.3, 5.2), performing poorly on assignments and exams (OR 1.8; 95% CI: 1.2, 2.6), and having high interference with daily life (OR 6.0; 95% CI: 3.8, 9.5) as compared with individuals with a non-ILI illness. These impacts were strongest during January and February.

Conclusion. A high prevalence of ILI was observed on campus. These symptoms were found to have a substantial impact on academic and occupational productivity. This demonstrates the need for greater illness prevention efforts on college campuses during influenza season.

Figure 1. Odds ratios of performance outcomes among those with ILI compared to those with other illness symptoms stratified by enrollment month.



Disclosures. **All Authors:** No reported Disclosures.

96. Human Papilloma Viruses Associated Diseases in a Cohort of Patients with Idiopathic CD4 Lymphopenia

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Session: 34. Virus Infections - Host, Pathogen, and Impact of Intervention
Thursday, October 3, 2019: 11:19 AM

Background. Idiopathic CD4 Lymphocytopenia (ICL) is a rare immunodeficiency characterized by an absolute CD4+ T count of < 300 cells/μL, in absence of HIV-infection or any other known cause. Patients with ICL have an increased risk of opportunistic infections. The prevalence, natural history, and spectrum of Human Papillomaviruses (HPV) associated diseases in ICL patients are unknown.

Methods. ICL patients were enrolled in a prospective observational study (N = 90). Demographic, clinical, and immunologic data were analyzed by nonparametric Methods. Immunophenotyping was performed by flow cytometry.

Results. The median age of ICL patients was 48 years, 47% were women, and 92% were Caucasian. Sixty-five percent of patients had at least one opportunistic infection, with HPV being the most prevalent (34.4%), followed by cryptococcal disease (22%), shingles (15.5%), molluscum contagiosum (8.8%), *Histoplasma capsulatum* (4.4%), *Mycobacterium avium* complex (4.4%), and progressive multifocal encephalopathy (2.2%). HPV-related diseases were identified in 18 women and 13 men. ICL patients with HPV disease were younger compared with those without (median age 34 vs. 53.5 years, $P < 0.0001$). Nine (29%) had anogenital, 9 (29%) had a cutaneous disease (verruca plana, verrucous carcinoma, squamous cell carcinoma) while 13 (42%) had both anogenital and cutaneous disease. Patients with HPV-related disease were also more likely to have history of cryptococcal disease, shingles or molluscum ($P = 0.036$, $P = 0.22$ and 0.11, respectively). Thirteen patients had HPV-associated cancers: 7 both mucosal and skin and 3 either skin or mucosal malignancies. Patients with HPV-disease had lower CD4+ T cells (median CD4 70 vs. 114 cells/μL, $P = 0.036$). No differences were observed in the numbers of CD8+ T cells, B cells, NK cells, and levels of IgG between patients with and without HPV disease.

Conclusion. HPV-related disease represents the most common opportunistic infection in ICL patients. Patients with ICL and HPV disease are younger, have lower CD4s and high prevalence of HPV-associated malignancies. Therefore, for patients presenting early in life with severe HPV disease further immunological workup should be considered and for patients with ICL excessive screening for HPV-related malignancies should be a priority.

Disclosures. **All Authors:** No reported Disclosures.

97. Competition Experiments for the Baloxavir-Resistant I38T Influenza A Mutant

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Session: 34. Viral Infections - Host, Pathogen, and Impact of Intervention
Thursday, October 3, 2019: 11:31 AM

Background. Baloxavir marboxil (BXM), a cap-dependent endonuclease inhibitor, has been recently approved in the United States for the treatment of influenza infections. It is superior to oseltamivir for reducing the time of viral shedding but is reported to have a low barrier of resistance. We sought to evaluate the viral fitness of the predominant BXM-resistant I38T PA mutant in the A/H1N1 and A/H3N2 viral backgrounds.

Methods. Recombinant A/Quebec/144147/2009 (H1N1) and A/Switzerland/9715293/2013 (H3N2) influenza viruses and their respective I38T PA mutants were generated by reverse genetics. Standardized inoculums (500 PFUs) of wild-type (WT) and mutant mixtures were inoculated on α2,6 MDCK cells. On day 3 post-infection (pi), the supernatants were collected and the ratios of WT/mutant viruses were determined by droplet digital PCR using specific LNA probes. Single infections and competitive experiments were also performed in C56/BL6 mice with quantification of lung viral titers on days 3 and 6 pi.

Results. *In vitro* A/H1N1 studies showed similar total copy numbers for the WT and mutant viruses on day 3 pi (1.2×10^9 and 1.3×10^9 copies/mL, respectively). The initial 50%/50% mixture became 70%/30% (WT/mutant) after one passage in cells. For A/H3N2, the total copy numbers were 8.1×10^9 and 1.0×10^9 copies/mL for the WT and mutant viruses. The initial 50%/50% mixture became 94%/6% (WT/mutant) after one passage. The I38T mutants remained stable after 4 passages in α2,6 MDCK cells. In mice, the A/H1N1 WT and I38T mutant induced similar weight loss and generated comparable lung titers on days 3 and 6 pi. In contrast, the weight loss of the A/H3N2 mutant was greater than that of the WT between days 3 and 7 pi with comparable lung titers on days 3 and 6. Following infection with 50%/50% mixtures, the mutant virus predominated over the WT on day 3 pi (73% A/H1N1 and 58% A/H3N2).

Conclusion. The BXM-resistant I38T PA mutant replicates well both *in vitro* and *in vivo* in the A/H1N1 and A/H3N2 backgrounds. Surveillance for the emergence and transmission of such mutant in the community is required.

Disclosures. **All Authors:** No reported Disclosures.

837. Prior Hospitalizations Among Cases of Community-Associated Clostridioides difficile Infection—10 US States, 2014–2015

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Session: 81. *Clostridium difficile*
Thursday, October 3, 2019: 1:45 PM

Background. Despite overall progress in preventing *Clostridioides difficile* Infection (CDI), community-associated (CA) infections have been steadily increasing. Although the incubation period of CDI is thought to be relatively short, gastrointestinal microbial disruption from remote healthcare exposures (e.g., inpatient antibiotic use) may be associated with CA-CDI. To assess this potential association, we linked CA-CDI infections identified through CDC's Emerging Infections Program (EIP) to Medicare claims data to describe prior healthcare utilization.